

Huge changes to regulate UK heat networks - including technical standards, zoning and consumer protection

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Abstract

UK Heat networks are on a trajectory to become a regulated utility in 2025, similar to gas and electricity. This includes regulation of heat networks by Ofgem, the introduction of minimum technical standards, consumer protection measures and the introduction of heat network zones. These are very significant changes for the heat network sector.

At the 2023 CIBSE Technical Symposium we presented some early thoughts on the principles and potential shape of the Heat Network Technical Assurance Scheme (HNTAS), setting minimum technical standards for the sector. Since then, the whole of the forthcoming Heat Network Regulatory Framework has become clearer, ready for implementation in 2025. Also, the development of HNTAS itself has progressed rapidly, and many of its key components will be fully drafted in April 2024. This follow-up review paper provides:

- A review of the forthcoming changes in the new regulatory landscape for Heat Networks, being implemented in 2025.
- A more detailed update of HNTAS minimum technical requirements and the procedures that will need to be followed under the new assurance scheme.
- The likely business opportunities this could bring for consultancies, design practices and ESCo's around Heat Networks.

Heat networks are a key part of the Government's strategy to reach net zero emissions by 2050. The heat network market is expected to grow rapidly, and the Government is supporting its growth with financial support and a new regulatory regime.

It is essential that the new regulatory framework is underpinned by robust technical standards to ensure high performance and good consumer outcomes. Work has been undertaken to develop a Heat Networks Technical Assurance Scheme that will provide the necessary governance, structures, procedures, and standards required to assess and certify heat networks in the UK.

This review paper sets out the progress to date in developing the Heat Network Technical Assurance Scheme.

Keywords: Heat Networks, District Heating, Technical Standards, Assurance Scheme, Low carbon heat, low carbon technology

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1. Introduction

It should be noted that this review paper gives an overview of the current state of thinking and does not represent finalised government policy. However, we believe it is important to set out the likely direction of travel, to help the sector to prepare for the substantial changes that will accompany the introduction of the new regulatory framework. This review paper follows on from the work presented at the CIBSE Technical Symposium paper 2023 (1) on this topic. Whilst the key principles have not changed, all this work has been developing, with increasing detail regarding the practicalities of the assurance scheme.

Heat networks are a key part of the Government's strategy to reach net zero emissions by 2050. The heat network market is set to grow rapidly, and the Government is encouraging its growth with financial support and a new regulatory regime, in recognition of the Climate Change Committee's recommendation (2) that around 18% of UK heat should come from heat networks by 2050. They currently provide about 2-3%.

In support of market development, heat networks are on a trajectory to become a regulated utility, similar to gas and electricity. This will involve improved consumer protection and the development of heat network zones. The first part of this review paper provides an overview of the very significant changes coming as a result of this new regulatory framework.

A key component of the new regulatory framework is the introduction of minimum technical standards for heat networks to ensure high performance and good consumer outcomes. Work to develop a full draft of a Heat Networks Technical Assurance Scheme (HNTAS) is now nearing completion. This work sets out the necessary governance, structures, procedures, and standards required to ensure a minimum level of performance and reliability for heat networks in the UK. The second part of this review paper sets out the progress made in developing the assurance scheme.

HNTAS will heavily reference an updated version of CIBSE's Code of Practice CP1 (2020) (3), which has gained general consensus within the market, but is still voluntary. HNTAS will move the sector to a mandatory assurance regime for both new heat networks, and the 14,000 existing heat networks across the UK.

Heat networks are complex systems, with multiple constituent parts that are often designed, built, owned, and operated by different parties. Regulating heat networks and introducing new mechanism such as zoning and technical assurance is not straightforward, and it is therefore important to give this growth sector early sight of the direction of travel.

2. Overview of forthcoming Heat Network regulations

The government has been developing a new regulatory landscape for Heat Networks, often referred to as the Heat Networks Market Framework (4). A new Energy Act (5) has laid the foundations for this.

2.1. The Energy Act

- Sponsored by the Department for Energy, Security and Net Zero (DESNZ), the Energy Act 2023 has now passed into law and will provide powers to regulate the heat networks sector and appoint Ofgem as the regulator.
- The Act gives ministers powers to introduce consumer protection rules and carbon emissions limits on heat networks.
- These measures will also establish a licensing regime which will enable those building new heat networks or modifying existing ones to obtain the same powers enjoyed by other utilities, such as the right to dig up roads.
- The measures will protect consumers in the event their supplier goes out of business and ensure their heat supply is maintained.
- The legislation also provides the Secretary of State with powers to introduce a price cap, should it be necessary to protect consumers. In addition, legislation will give Ofgem powers to investigate and intervene on networks where prices for consumers appear to be unfair, or if prices are significantly higher than comparable heating systems.

- The act sets powers for heat network zoning and mandated connection of some buildings within these zones.
- The Market Framework will also introduce mandatory technical standards, building on existing industry-led initiatives like CIBSE CP1 (2020), to ensure that new and existing heat networks are designed, built, operated, and maintained as efficiently as possible to ensure a higher quality of service and good consumer outcomes.
- Further regulations in the form of Statutory Instruments, will be laid to implement these measures, and will start to come into force in 2025. The market framework will become fully operational by 2026.

2.2. Heat Network Zoning

Heat network zoning (6) will fundamentally transform the development of new heat networks in towns and cities across England. By designating geographic zones where heat networks are expected to be the lowest cost solution for decarbonising heat, local authorities and heat network developers will quickly be able to identify where new heat networks should be built. This will also allow for multiple networks to be built in the same city, with the opportunity to connect them together to create larger city-wide networks.

Specific buildings within zones will be required to connect to a heat network within a prescribed timeframe. This approach of mandating connection aims to give developers 'connection assurance', to encourage greater investment and growth of heat networks. By identifying a larger number of heat consumers within a given area, a critical mass can be reached and provide the certainty needed to support long-term investment in heat networks.

Buildings mandated to connect could include:

- New buildings
- Large public sector buildings
- Large non-domestic buildings – such as office blocks or shopping centres
- Domestic premises which are already communally heated – such as flats with a communal building-level heating system.

There will be some exemptions to this – such as where it would not be cost-effective to connect to a heat network or where a better low carbon solution exists. The details will be confirmed in forthcoming secondary legislation. Homes within zones which are not already communally heated will not be required to connect. However, should they wish to, they will be able to.

Developing heat network zones across the country will require tens of billions of pounds of investment and has the potential to create tens of thousands of jobs. Local authorities and heat network developers will work closely together to build new networks and deliver a low carbon heating revolution across the country. The Department of Energy Security and Net Zero (DESNZ) is working with a wide range of partners to deliver this transformation.

2.2.1 Why heat network zoning?

By identifying areas where heat networks are the lowest cost, low carbon heating option, buildings within the zones will benefit from a national framework that has assessed the best options to decarbonise their heating. Furthermore, heat networks provide the ultimate flexibility and security as they can deliver heat provided by a variety of different sources. This will avoid some of the cost of enlarging our electricity grid for net-zero and means that heat networks are futureproofed as different heat sources emerge in the future.

Heat networks also work best when they have many different types of buildings connected. This results in greater efficiencies, which helps lower the cost of low carbon heat for everyone connected to the network. In creating heat network zones where certain buildings will be required to connect, the required economies of scale can be reached within each zone identified, which will provide the very best outcomes for everyone connected. Heat network zones also provide project sponsors and developers with the certainty about connections that will be required to secure the investment for construction.

2.2.2 Identifying locations for heat network zones

To identify heat network zones in a consistent manner in every town and city across the country, a methodology has been developed to identify and designate heat network zones. This process will require data from a variety of sources, such as the building type, size and existing energy usage.

DESNZ are working with 19 English cities and towns in a pilot project to refine and test the proposed methodology. The findings from the pilot will be used to finalise the model and further information will be shared during a consultation in 2024.

DESNZ are also developing a cutting-edge digital tool to provide detailed maps and information on the proposed zones and enable various stakeholders to identify where they may be able to access lowest-cost, low-carbon heat from a proposed network. See example in Figure 1.

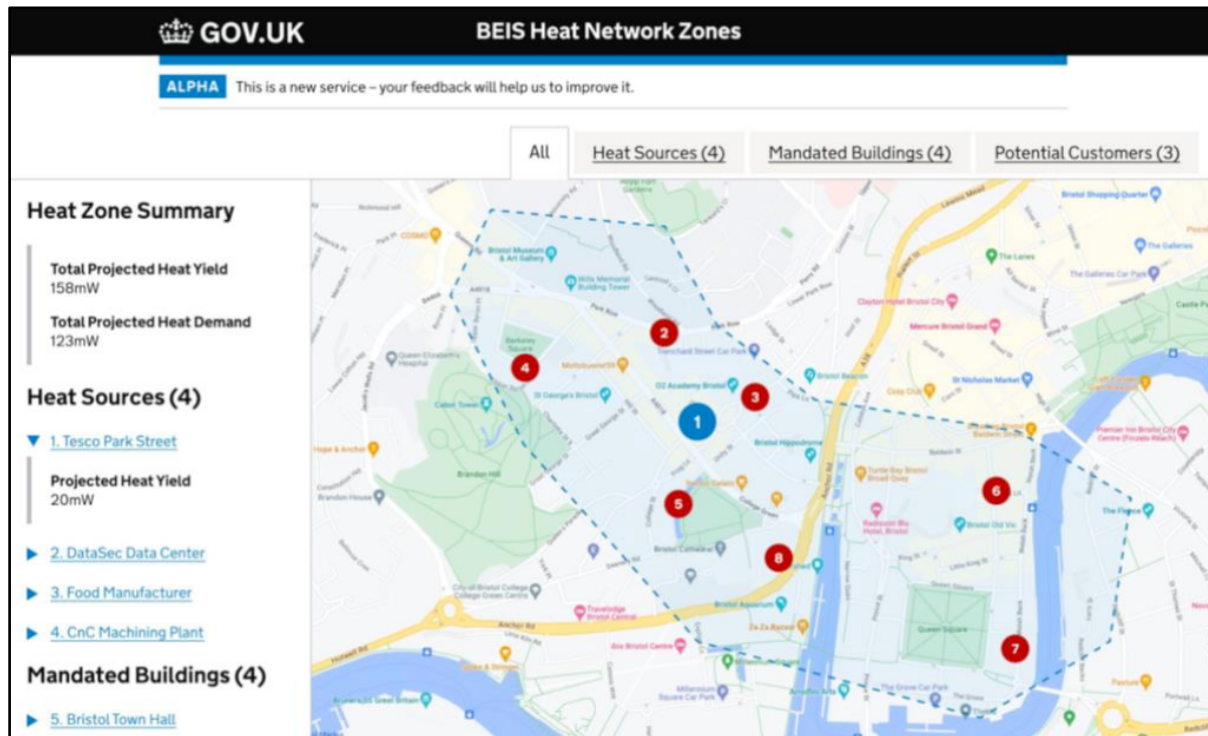


Figure 1 - Example map (for illustrative purposes only, and not representative of a final zone)

2.2.3 The zoning process

DESNZ are exploring the potential for a central body that will oversee the implementation of heat network zoning and set national standards. Local zoning co-ordinators will be established with responsibility for designating areas as heat network zones and enforcing requirements within them. In general, it is likely that this Zone Coordinator role will generally be assumed by local government, although this is likely to be supported by expert consultants through supplier frameworks to provide support in activities such as zone refinement and implementation processes.

When the national modelling process has identified a potential heat network zone in a town or city, the zoning co-ordinators will play an important role in refining the zone boundaries and consider local factors. This will ensure the very best outcome for each zone is identified. In some areas, there may not be a relevant organisation able to take on the role of zoning co-ordinator. In this situation, the central body will adopt the role of the zone co-ordinator.

DESNZ is also exploring the potential to provide standardised routes for the procurement of zones, enabling each zone co-ordinator to quickly access technical, legal, and commercial guidance and a range of standard contracts. This will lower the cost of procurement and ensure a consistent approach across the country.

The work in piloting heat network zones, coupled with the development of a range of support measures and resources for zoning co-ordinators, will enable a number of zones to start construction in early 2025.

2.3. Consumer Protection

Alongside heat network zoning, comprehensive consumer protection regulation of the heat network sector will be put into place through the Heat Network Market Framework. Ofgem is taking on the role of regulator and will have new powers to regulate prices in the sector and investigate disproportionate pricing across all heat networks.

Within the sector, this will secure fair pricing for domestic customers as well as ensuring transparency, guaranteed standards of performance and other protections, providing market assurance and encouraging investment in the industry. Regulations also extend to technical and performance standards, to ensure that heat networks provide the highest levels of service and reliability for connected consumers.

2.4. Heat Network Technical Assurance Scheme (HNTAS)

At the end of 2022, DESNZ announced the intention to launch a Heat Network Technical Assurance Scheme (HNTAS), to create standardised quality assurance procedures which require evidence of conformity with applicable standards. The aim of the HNTAS project is to develop an assurance scheme that ensures a minimum level of performance and reliability for heat networks in the UK. Fairheat, was appointed by DESNZ as the Technical Author for the HNTAS, tasked with developing the technical quality assurance scheme for heat networks, which will form part of the upcoming regulatory requirements.

The Technical Author has been developing the technical assurance scheme design, including developing normative documents that outline the technical requirements of the scheme and how to demonstrate compliance, as well as the governance and operating procedures for the scheme. Explanatory documents (see appendix) are being produced to underpin the rationale for each design choice, outlining the cost impact and benefits of choices made.

Fairheat's partner on the project, Gemserv, have taken the lead on developing the documents that sit within the scope of the procedural/process (Framework) stream and have been responsible for overall management of working groups.

HNTAS will enhance the transparency of heat network performance, and strengthen accountability for parties engaged in the planning, construction, management, and maintenance of heat networks. This will cover all heat networks from communal up to large district heat networks including new-build and legacy networks.

The overall objectives of HNTAS were set out in a previous paper (1), but remain the same. The objectives include; good consumer outcomes, lower cost of heat, enhanced reliability and service levels and lower carbon emissions. HNTAS will be a performance-based assurance scheme within which assessments are made with regards to claims made by a responsible party as to whether minimum standards *will* be achieved (Validation), or *have* been achieved (Verification) for identifiable elements of a heat network, in order to ensure that certain performance outcomes are achieved, and maintained.

The core principles of the scheme are that it will be; Outcomes orientated, Preventative, Proportionate, Deliverable, Adaptable and Enforceable, ready for the introduction of heat network regulation. More detailed progress on HNTAS development is set out in section 3.

2.5. Other key heat network initiatives

2.5.1 CIBSE DHW Guidance Note

Published in 2021, the CIBSE Guidance Note - *Domestic hot water temperatures from instantaneous heat interface units* (7) sets out clear reasoning behind a move to 50°C for the supply of instantaneous DHW e.g. from Heat Interface Units (HIUs). This means that primary heat network temperatures can now be designed at ~55°C flow, a gradual reduction in

temperatures of heat networks with a resultant reduction in heat losses. *Generating* instantaneous hot water at a temperature of 50°C satisfies the requirements to reduce the risk of Legionella growth and minimise the risk of scalding. *Delivering* instantaneous hot water to the kitchen tap at a minimum of 45°C within 45 seconds of opening the tap to full flow rate demonstrates an acceptable service level for users and satisfies the requirement to limit water use. This is a significant step forward for Heat Networks and shows how HIUs rival the ubiquitous gas fired combi boiler.

2.5.2 BESA HIU test standard

This recently published major update to the *BESA Test Standard for UK HIU Test Regime (2023)* (8) represents another step forward in improving Heat Interface Unit (HIU) performance across the sector. BESA has been testing HIUs since 2016, but this third edition of the Technical Standard is a very significant step change in improving HIU performance.

The standard has been restructured into a modular approach, to allow testing of additional types of HIU, with the introduction of new test variants for those HIU types, including a Non-Keep Warm test, and new tests for space heating only HIUs. There has also been the introduction of a DHW load tests and changes to the VVART calculation. This edition also introduces minimum standards which need to be met in order to pass the standard, alongside reporting of whether Best Practice standards have been achieved. Failure on the test means BESA will not be able to register the HIU.

HIUs are a key component of a heat network, ensuring heat is delivered efficiently to individual properties. Providing designers, specifiers and operators with impartial, accurate and useful information on the performance of HIUs, directly contributes to the success of the UK's energy strategy. With over 50,000 HIUs being installed each year in the UK, setting performance standards has become increasingly important.

3. Update on HNTAS development

The HNTAS project began in late 2022 as a collaboration between DESNZ, Scottish Government and Ofgem. Fairheat was appointed as the Technical Author to develop the scheme, together with their partner Gemserv. Early principles of the project were set out in a paper at CIBSE Technical Symposium 2023 (1). The development of HNTAS has been progressing at pace, with very considerable stakeholder engagement. The project has focussed on two areas:

1. Technical requirements and
2. Process/procedural requirements.

The following describes some of the key thinking so far, although this is **still work in progress and not agreed policy**. A formal public consultation around HNTAS is likely in mid 2024.

3.1. Governance structure

It is important to say that the Key Principles set out in the previous paper (1) have stood the test of time so far, and therefore remain the same. The project has developed a proposed structure for the governance of HNTAS to chart out the interactions between the key actors in the scheme. This is shown in Figure 2.

Ofgem (orange) is the regulator and can award a licence to an entity to operate/manage a CODE. The 'Code Manager' (purple), as Ofgem's licensee, is the entity that carries out the requirements of the license, operates and maintains the CODE. We envisage that an outsourced 'Service Provider' will carry out the day-to-day operation of the Heat Network Technical Assurance Scheme on behalf of the Code Manager. Various key committees are envisaged around technical, procedural and stakeholder issues. Registered assessors (blue) will be licensed by the Code Manager to carry out HNTAS assessments at various gateways and certification stages. We anticipate that organisations delivering certification activities may require UKAS accreditation. It will be important to ensure strong alignment between the HNTAS

technical requirements and CIBSE CP1 as a key technical standard (grey), through a continual update process to ensure ongoing alignment.

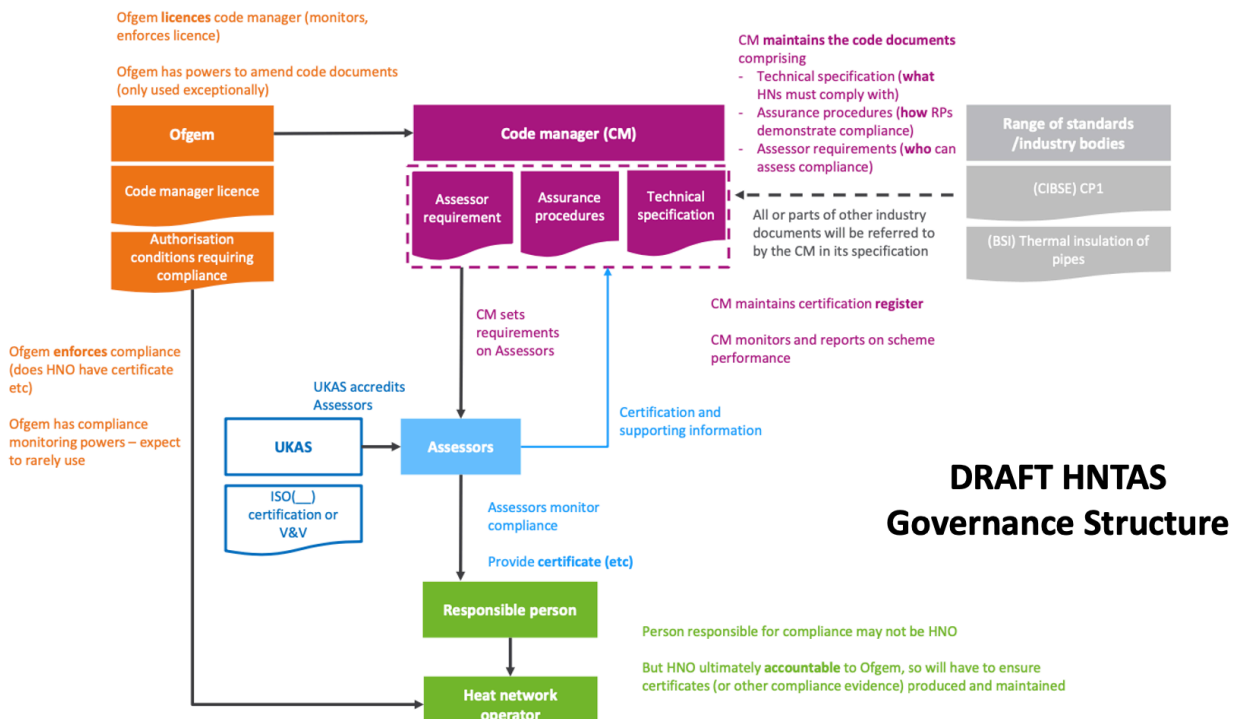


Figure 2 - Draft HNTAS governance structure

Table 4 in the appendix shows a list of the Framework Explanatory Documents (FEDs) under development. These documents set out the processes and procedural elements of the scheme, and provide a good overview of the issues being addressed by the assurance scheme. Many of these FEDs are already drafted and are ready to be finalised for implementation.

3.2. Stakeholder Engagement

Over the last year, a series of 4-hour workshops was launched for technical sub-working groups to focus on the development of normative documents, which will set out the minimum requirements and KPIs for each element at each stage of heat network development. Each of these technical sub-working groups have focussed on a separate critical element of a heat network at a specific stage in a network’s lifecycle. The focus of each of these technical sub-working groups are set out in the previous paper, and shown in Figure 3.

Overall, there have been 25 technical sub-working group workshops, bringing together 69 stakeholders from 44 diverse organisations. This collaboration has been a melting pot of ideas and expertise, featuring manufacturers, Housing Associations, Local Authorities, consultancies, developers, contractors, ESCos, Trade Associations, and professional bodies.

For each stage of a heat network project, these sub-working groups have diligently worked to provide feedback on proposed requirements and key failures for each element. Their insights and contributions in these workshops have been instrumental in structuring industry technical regulations that are robust, practical, and forward-thinking.

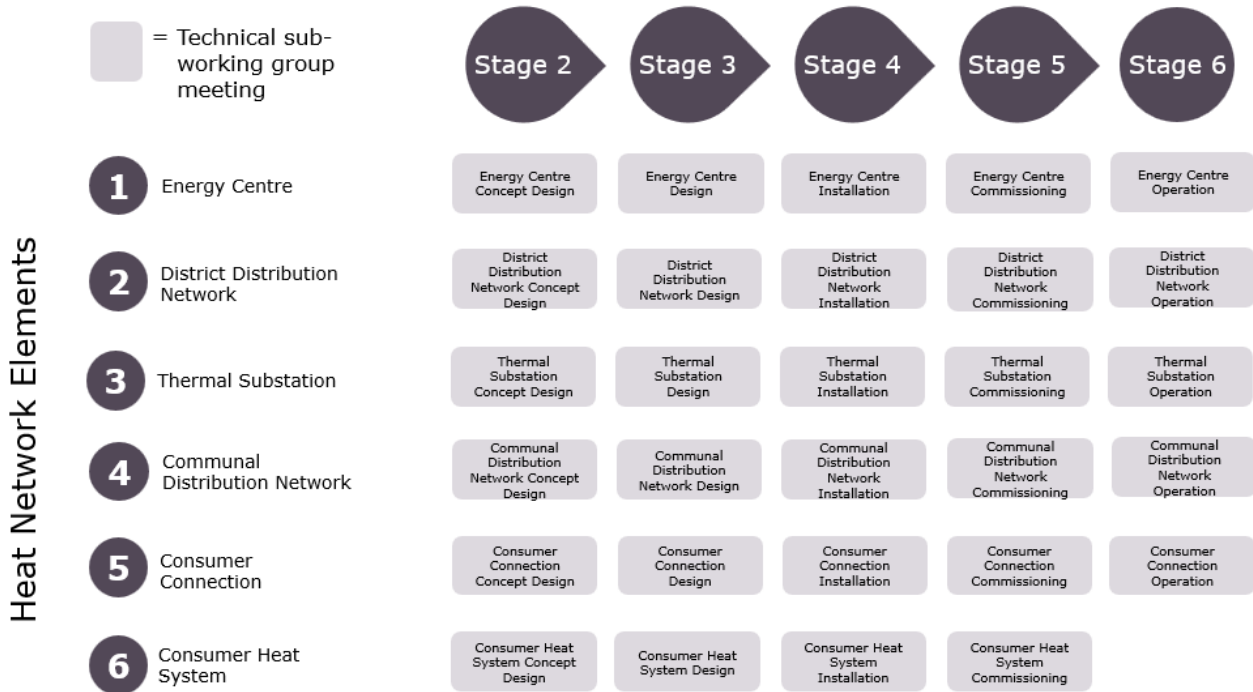


Figure 3 - Technical Working Groups structured around heat network elements

3.3. Technical specifications

Across 2023, the technical workstream, led by Fairheat, has been producing a series of Technical Explanatory Documents (TEDs) that underpin the selection of standards and assessment levels required. The working groups have helped Fairheat develop these papers, a list of which can be found in Table 3 of the appendix. The TED papers cover areas including: defining elements of heat networks, the cost of non-assurance of heat networks, the key failures of heat networks, and key performance indicators to be used within the scheme. The TEDs also define the stages at which conformity (gateway) assessments will take place, the levels of assessment required, and competency levels of assessors. The cost of non-assurance is set out in the accompanying 2024 paper from Adamson et al - Evaluating the Financial Impact of Non-Assurance: The Necessity of the HNTAS (9).

These TEDs are being firmed up into technical specifications or 'normative documents'. A proposed layout of the Technical Specification is shown in Figure 4 including:

1. KPIs to be met.
2. Technical Standards (Minimum Requirements) to be met for each element at each measurement point **PLUS** evidence Requirements and level of assessment for that standard.
3. Key failures that the Responsible Person and Assessor need to ensure will be avoided.

1. Key Performance indicators		
KPI	Measurement approach	Target
KPI 1		
KPI 2		
KPI 3		

2. Standards			
Minimum requirement	Evidence Requirement	Level of assessment	Assessment type
1.1.1		1	
1.1.2		2	
1.1.3		3	

3. Key failures
<p>Key failures at [stage] for [element]</p> <p>Lack of architectural consideration for the following:</p> <ol style="list-style-type: none"> Spatial requirements within riser cupboards and ceiling voids to ensure insulation requirements can be met Building / floor plate layouts to accommodate multi-riser communal distribution networks <p>No network routing assessment undertaken to minimise pipework length</p> <p>Inappropriate selection of network temperature profile</p> <p>Lack of consideration of system pressures in tall buildings with respect to requirement for substations as pressure breaks</p> <p>Spatial requirements for equipment not accurately determined</p>

Figure 4 - Draft technical specification

3.4. HNTAS proposed approach

We envisage these normative documents setting out the minimum requirements at a series of assessment gateways through design, construction, and commissioning. At these stages, we expect there will be a requirement for assessment to validate that the design is likely to meet future operational performance targets. Following commissioning, when the network is ready to supply heat, we expect a gateway assessment to verify that minimum technical requirements have been met and key failures avoided. There is a clear requirement to have binary yes/no decision at this point, with certification awarded to networks that meet minimum technical requirements. It is anticipated that certification will be required before authorisation is granted to supply heat to customers.

By requiring heat network responsible persons to demonstrate that their heat network performance meets KPI thresholds, before a network their allowed to pass through each assessment gateway, the scheme is 'preventative' and 'outcomes based' (two of the core principles of HNTAS). This approach aims to ensure that the great majority of heat networks pass at the point of certification, and that key failures in the market are avoided (Preventative). Verification of installation and commissioning (in line with design, workmanship etc to deliver KPIs and avoid key failures) is a key part of this. Once a network has passed through all required assessment gateways, a final certificate can be issued (ideally by an independent 3rd party Certification Organisation), triggering the granting of authorisation to supply heat. 28 KPIs have now been determined and categorised into 6 categories, as set out in the accompanying 2024 paper by Sherburn et al - Establishing KPIs for the UK's Heat Networks through the HNTAS (10). These KPIs set a framework for measuring and monitoring heat network performance.

The proposed stages of gateway assessments and certification are shown in Figure 5. The orange areas indicate the gateway assessments, and the green areas indicate the certification points.

- This approach separates assessment and certification into two distinct processes. We expect that assessment activities will be undertaken by HNTAS licensed Assessor Organisations, based on the Validation and Verification principles set out in ISO 1729.

- We expect that certification activities will be undertaken by an accredited certification organisation, with Certificate 1 issued post commissioning before heat is supplied to customers and Certificate 2 issued after a period of operation to ensure technical requirements continue to be met.
- Assessment Gateways will be go/no-go to proceed.

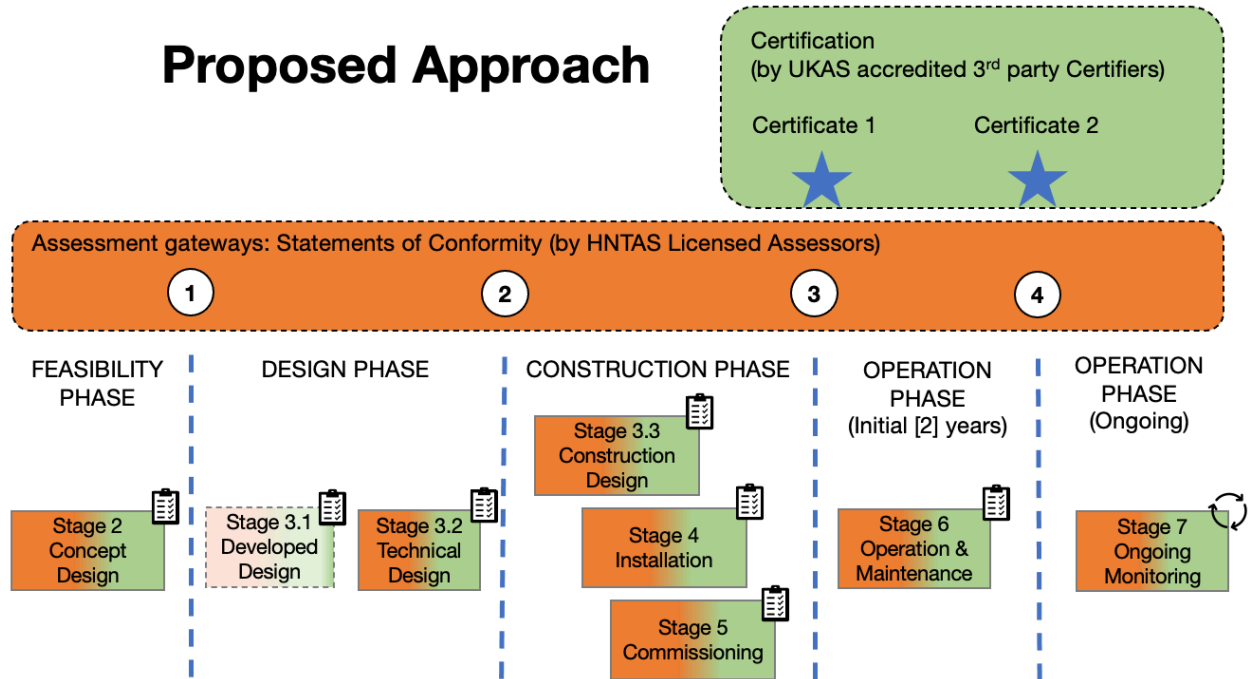


Figure 5 - Proposed stages of assessment and certification

Certification would focus on three things:

- Evidence that requisite duty holders (including Assessors) are in place throughout the process (similar to the CDM/Building Safety Act) (11).
- Requisite Conformity Statements are in place (shown as clipboards, with a continual assessment in operation)
- Evidence has been provided that the network meets requisite performance requirements (e.g. KPIs from Acceptance Testing)

HNTAS is proposing Duty Holders to cover all stages and a Golden Thread similar to the Building Safety Act, see section 3.7.

3.5. Legacy schemes

It is clear that existing legacy networks will find it hard to meet the HNTAS minimum standards required of new networks. HNTAS is therefore taking a pragmatic transitional approach to bring legacy networks as close to full standards as possible, as soon as possible. HNTAS will set out a transition period, where improvement plans will need to be submitted and minimum levels of metering will need to be installed. Once metering is in place, networks will be in a position to accurately evidence performance and move to full certification. HNTAS is proposing the following principles and approach for legacy networks.

3.5.1 Key principles

- Ensure the market is able to comply (deliverable)
- Ensure the very worst performing networks are caught and addressed in timely manner.
- Ensure there is a steady improvement in performance over time.
- The end-state is that every network is fully certified to a minimum level of performance by the set future date.
- 'Certification' has to be protected, HNTAS cannot certify schemes unless they have 'good' performance.

Based on these key principles, the proposed approach is:

- Require minimum levels of metering and monitoring to be installed and require reporting within a relatively short period.
- Set a minimum threshold performance that all heat networks must meet within a relatively short period.
- Where needed, require heat network operators to submit a Heat Network Improvement Plan setting out how they will achieve certification within a set period following the installation of metering.
- Require certification to minimum standards within set period (longer timeframe).

It is proposed that a differentiated approach is used for those networks installed prior to 2015 and those post-2015 (when the heat networks metering and billing regulations (12) came into force).

For those networks in operation post-2015 (when the Metering & Billing Regulations [HNMBR] came into force) it is proposed that there are more stringent requirements in place for metering and monitoring early in the process, with shorter timeframes for achieving full certification. Post-2015 networks that are exempt from HNMBR are likely to fall into the pre-2015 category.

Whereas older networks, in operation pre-2015, it is proposed that the initial requirements for metering and monitoring are less stringent (limited to energy centre and network metering), with longer timeframes for achieving full certification (on the understanding that end user metering will be a condition of full certification).

More specifically, the following requirements and timeframes are proposed. It is noted that these are maximum timescales and heat network operators may wish to carry these out earlier to achieve earlier certification. Table 1 and Table 2 show the proposed milestones for post-2015 and pre-2015 heat networks.

Table 1 - Proposed milestones for post-2015 networks

Milestone	Year	Requirement
Milestone 1	1	Register heat network
Milestone 2	3	Demonstrate meeting minimum metering & monitoring requirements, including dwelling metering Demonstrate meeting threshold performance
Milestone 3*	3	Submit Heat Network Improvement Plan (to reach certification)
Milestone 4	6**	Certification

* Milestone 3 would not be required in the case that a network achieves certification by the milestone date

**Allow extension to certification milestone in cases of end-of-life replacement (in which case higher level HNTAS requirements would apply).

Table 2 - Proposed milestones for pre-2015 networks

Milestone	Year	Requirement
Milestone 1	1	Register heat network
Milestone 2	3	Demonstrate meeting minimum metering & monitoring requirements, with full plantroom and network monitoring and reporting. Demonstrate meeting threshold performance
Milestone 3*	4	Submit Heat Network Improvement Plan (to reach certification)
Milestone 4	8**	Certification, including metering & monitoring for all end user connections

* Milestone 3 would not be required in the case that a network achieves certification by the milestone date

**Allow extension to certification milestone in cases of end-of-life replacement (in which case higher level HNTAS requirements would apply).

In the case of operators with larger portfolios, consideration may be given to allowing a negotiated timeframe for hitting milestones for the improvement of the overall portfolio, with some flexibility on dates, provided that the operator can demonstrate that: (a) the worst performing networks are being prioritised; (b) that milestones are being hit over time; and (c) that overall timeframes are broadly in line with those set out for the overall scheme.

3.5.2 HNTAS Proposed operational phases

The project team are keen to ensure this is a deliverable scheme, that is proportionate and does not place too much burden or cost on heat network operators or heat network consumers. The proposed approach during the O&M phases (Stages 6 & 7) is shown in Figure 6. This is based on a soft landings period to prove performance in practice, followed by an assessment gateway using a registered assessor. If the network achieves HNTAS minimum performance standards, then it moves into Stage 7 where the heat network operator regularly submits data to the HNTAS portal to show they are still meeting the HNTAS KPI's. Where it falls outside the KPI's then more detailed assessments would be triggered. Essentially, this allows a level of ongoing self-assessment for networks that meet the minimum performance levels.

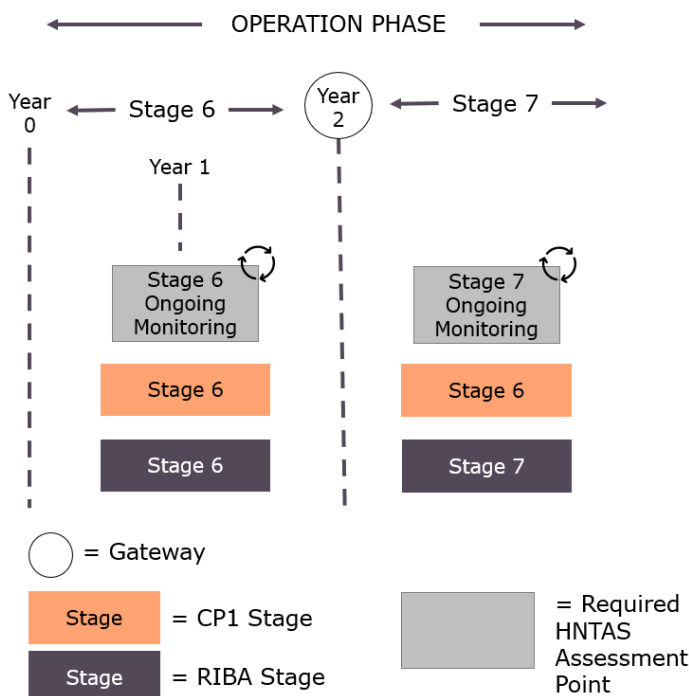


Figure 6 - Proposed approach during operation of a heat network

3.6. Metering

Clearly, in order to obtain the data required to prove that a network meets minimum performance KPI's a minimum standard of metering and data submission will be needed. The HNTAS team has developed a minimum specification of metering across all elements and for both communal and district networks. Figure 7 shows just one example of this for a larger district heat network, indicating that the monitoring of key temperatures, pressures etc are required in addition to heat metering. The specification also addresses end-to-end data capture, transmission and analysis. Without this minimum level of metering, it will not be possible to prove that a network is meeting performance KPIs with the degree of accuracy, reliability and robustness needed to underpin the assurance scheme.

HNTAS will ensure that new-build networks will have this level of metering present at design and construction and should therefore be able to prove in-use performance after 2 years operation based on real data. However, many existing legacy network will not have this level of metering. HNTAS proposals therefore include a two-stage transitional approach as shown in Figure 6. HNTAS is also working to ensure alignment with any future updates to the Heat Networks (Metering and Billing) Regulations (12).

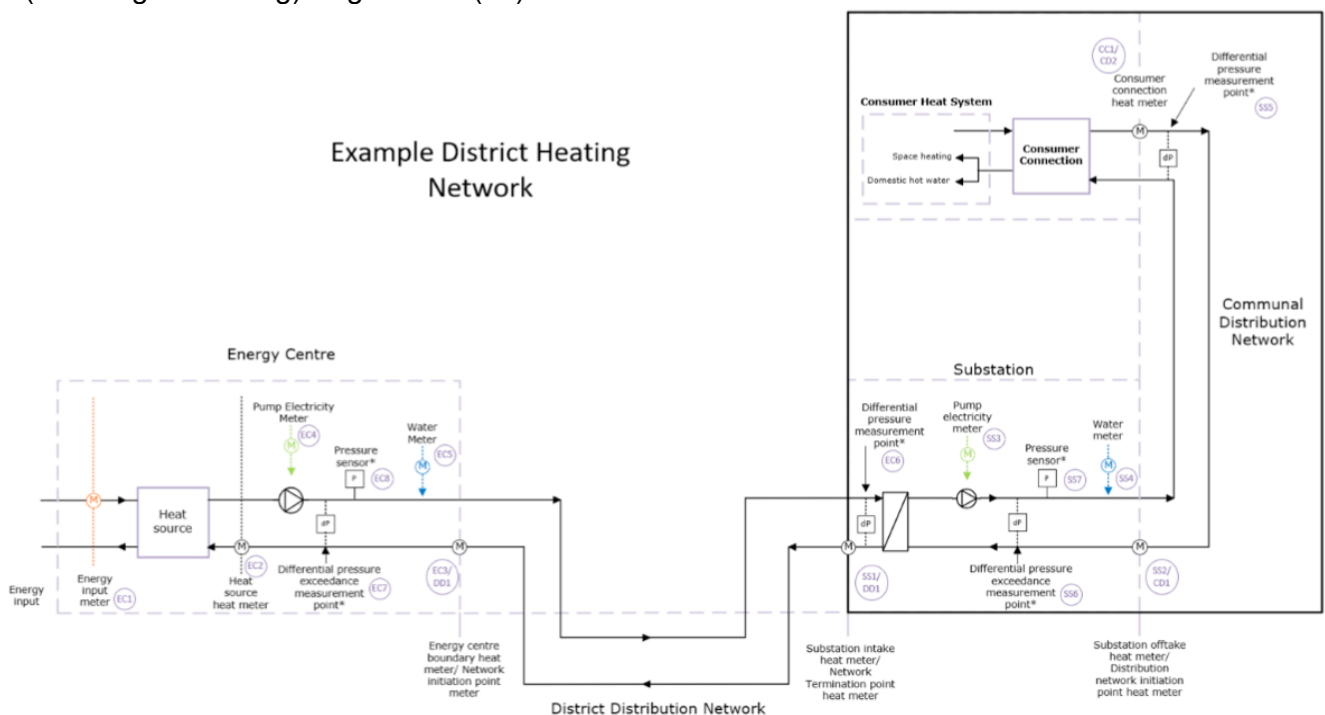


Figure 7 - Example of required metering on a large district heat network

3.7. Data requirements

DESNZ and Scottish Government have started work to develop a HNTAS web-based digital service to receive and store HNTAS data. Work is also underway to develop an Ofgem authorisation platform, to receive and hold authorisation data. We anticipate the two platforms will overlap and have the functionality to pass the necessary data between them.

Data requirements will form a 'Golden Thread' throughout all stages of a network's life, requiring actors to submit data up the HNTAS chain, ultimately into the HNTAS and Ofgem digital services. We hope that much of this data submission will be automated to minimise time and cost. We do not think it necessary that granular data (e.g. meter reading data) be passed up the chain into the HNTAS digital service. Actors will only be required to submit data that is necessary to demonstrate compliance according to the hierarchy shown in the data pyramid (see Figure 8). Data will be held in a common format and probably submitted to the data services via APIs. The HNTAS digital service will hold the necessary high level performance data for all heat networks but then pass a simple 0/1 signal to Ofgem that communicates if certification has been achieved, to trigger the granting of an authorisation to operate a heat network.

3.7.1 Heat Network Golden Thread

We envisage a data approach similar to the golden thread set out in the Building Safety Act. The working HNTAS definition is:

"The golden thread is the information that allows you to understand a heat network and the steps needed to maximise heat network performance, now and in the future."

The golden thread aims to give the right people, the right information, at the right time to maximise heat networks performance, and support duty holders and accountable persons in managing this process. The golden thread is a process that shows a heat network's compliance journey with HNTAS. It is an approach to delivering an outcome and not a product or 'software solution'.

We also anticipate formalising new roles around heat networks – Designated Designer, Designated Contractor, Designated Operator. Again, this reflects the approach of the Building Safety Act to ensure there is someone directly responsible during design, construction and operation. These duty holders will be responsible for developing, submitting, and handing over the evidence pack throughout the project life.

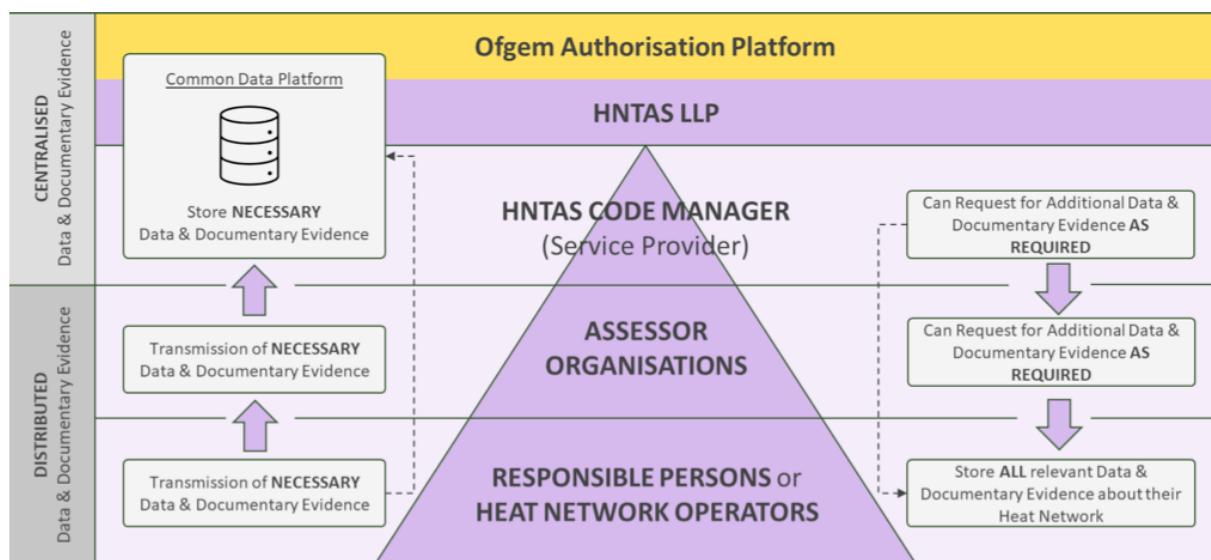


Figure 8 - HNTAS heat network data pyramid

4. Conclusions & opportunities

- Heat networks are often large complex projects with multiple stages across multiple actors and long timescales.
- Significant change is coming in 2025 as the sector transitions to a regulated heat network market.
- Setting minimum technical standards is a key part in moving to a regulatory framework.
- Assessing and ultimately certifying heat networks that meet the minimum standards through HNTAS will raise performance throughout the sector.
- Engagement with stakeholders will bring a wide consensus and buy-in for the assurance scheme.
- An assurance scheme will give network developers and operators confidence to invest in the sector.
- HNTAS must be designed to dovetail into the whole future regulatory framework, and in particular with heat network zoning.
- The HNTAS development project is expected to last until 2024 and will hopefully move into a pilot phase on real networks to test the overall scheme in practice, before final implementation in 2025.

4.1. Potential opportunities

- **Assessors** – there will be a growing market for assessors to operate in a commercial market offering services to heat network operators.
- **Certifiers** – there may eventually be a market for certifiers to offer services to heat network operators.
- **Owners, operators and ESCos** – will have an opportunity to significantly improve heat network performance, resulting in operational savings and greater viability. HNTAS will also provide help by giving weight/credibility to those who already have networks with good performance, via certification.
- **Designers** - will have opportunities to significantly improve heat network performance during the design process, with much greater clarity on minimum requirements at these preventative stages. Designers will see an increasing call on their services as the sector grows due to HNTAS.
- **Heat consumers** – will benefit through improved reliability, service levels and hopefully reduced heat prices.
- **Social landlords and local authorities** – will be able to provide more affordable heat for vulnerable tenants.
- **Government** – will take a significant step forward in encouraging growth in the sector and meeting carbon emissions targets.
- **Investors** – will see heat networks as more investable, offering commercial opportunity in this growth sector.

5. Next steps

- Work is underway to develop further heat network regulations, through consultations and secondary legislation.
- The first phase of HNTAS development (with a first draft of normative documents, procedures and processes) should be complete March 2023.
- DESNZ is aiming to publish these normative documents in some form in 2024.
- HNTAS will move into a pilot stage throughout 2024 and DESNZ are seeking heat networks operators and assessors that would like to take part.
- DESNZ is currently working to put a 'Shadow' Service Provider and Code Manger in place, to set up early governance structures and to oversee pilots, before an Ofgem licence is issued.
- Plans to update CIBSE CP1 across 2024 are being put in place, with future updates later to ensure alignment.

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Appendix

The HNTAS development project has two main workstreams; technical and procedural (framework) Table 3 shows the Technical Explanatory Documents (TEDs) currently under development. Table 4 shows the process/procedural Framework Explanatory Documents (FEDs) under development. This provides a good overview of the issues being addressed by the assurance scheme and many of these are already drafted ready to finalise for implementation.

Table 3 - Technical requirements explanatory documents currently under development

Title (Technical Explanatory Documents TED)	Purpose
TED 1 Elements	Defining key elements of a heat network (Communal and district)
TED 2 Cost of Non-Assurance	The cost impact of not introducing the technical assurance scheme, in particular the cost of key failures
TED 3 Key Failures	The key failures leading to poor performance that currently are being seen in practice
TED 4 Assessment Points	Where and when to carry out assessments, particularly to prevent key failures further down the process
TED 5 KPI's	The Key Performance Indicators required for assessment under the assurance scheme
TED 6 Identifying Standards	A review of technical standards to identify publications that HNTAS can refer to. e.g. CIBSE CP1
TED 7 Levels of Assessment	What are the different levels that might be used in assessments – from self-declaration up to detailed on-site inspections
TED 8 Competency Levels for Assessment	Setting out the levels of competency that individuals and organisations will be required to have under the scheme
TED 9 Technical Specification	The technical minimum standards required by HNTAS
TED 10 Cost of Assurance	The costs of running HNTAS, in particular the cost of assessment, certification and data submission
TED 11 Legacy Networks	How will legacy networks be addressed using transitional arrangements
TED 12 O&M approach	What are the ongoing requirements when operating a heat network

Table 4 - Process/procedural (framework) explanatory documents under development

Title (Framework Explanatory Document FED)	Purpose
FED1: Legal Entity	How to establish a legal entity that is fit for purpose and will be recognised by Ofgem as the sole Code Manager
FED2: Governance	Defining the relationships and decision-making within the scheme
FED3: Operating the Scheme	How the Code Manager will operate the scheme day to day
FED4: Using the Scheme	The end-to-end process and interactions that a Responsible Person will experience of HNTAS
FED5: CP1 Alignment	How to ensure continued, timely alignment of CP1 in an efficient and robust process
FED6: Disputes & Appeals	How the scheme will deal with complaints, disputes and appeals in a manner accepted as an honest broker
FED7: Assessor Requirements	The set of competencies, business requirements and processes to which Assessors must agree and then follow in order to become / remain HNTAS-authorized
FED8: Data Management & Reporting	What data is to be captured, shared, and retained within HNTAS, for what purpose, made available to whom etc
FED9: Audit & Oversight	Understanding at each level of the scheme how oversight will be maintained of quality, effectiveness and fairness