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HEAT NETWORKS: BUILDING A MARKET FRAMEWORK

Closing date:13 February 2022

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Contents

Introduction

The UK is the first major economy in the world to pass laws to reduce our greenhouse gas emissions to net zero by 2050 and has already shown the world that it is possible to cut emissions whilst achieving economic success. However, to meet this new UK wide emissions target, we, in Northern Ireland, must do our part in cutting carbon emissions.

The new Northern Ireland Energy Strategy "Path to Net Zero Energy", published on 16 December, sets out our vision for net zero carbon and affordable energy.

Energy accounts for almost 60% of Northern Ireland's greenhouse gas emissions. The Energy Strategy sets out a pathway to 2030 that will mobilise the skills, technologies and behaviours needed to take us towards our vision of net zero carbon and affordable energy by 2050. In doing so, we will make a major contribution to the Climate Change Committee's (CCC) pathway to net zero carbon by 2050, and the Northern Ireland Green Growth Strategy.

For the UK as a whole, to achieve net zero, virtually all emissions from heat in buildings and industry must be eliminated. There is no one solution that can provide the best option for everyone - a mix of technologies and customer options will need to be available to decarbonise heat. Heat networks are a crucial piece of the puzzle. They are a proven, cost-effective way of providing reliable low carbon heat at a fair price to consumers, while supporting local regeneration.

The proposals contained in this consultation put consumers at the heart of heat network market growth along with new regulatory powers to ensure all consumers are treated fairly and networks are run to high standards. Further work alongside the Department for Business, Energy and Industrial Strategy (BEIS) will also seek to provide help for operators to run their heat networks as cost-efficiently as possible, delivering further savings for consumers.

The proposals will make it easier for investors to enter the sector and level the playing field with other utilities. A clear regulatory framework is needed to raise investor confidence in the sector. Proposed new statutory rights for developers will reduce their build out costs and burdens. In addition, greater standardisation across the sector as heat networks become more popular across NI will make it easier for all stakeholders to understand what they need to do.

There is a need to maximise carbon savings from both new and existing heat networks and, in due course, the Department will be setting out proposals to decarbonise our existing networks.

Although there are only around one hundred heat networks in Northern Ireland at present, our unique geology means that there is significant potential for increasing numbers of low carbon heat networks, using geothermal energy, to become operational and the Department is committed to putting in place a regulatory framework that provides the certainty investors and users need. This is an exciting time for the heat network sector. It has a critical role to play as we move towards decarbonising heat. The Department is committed to ensuring it does so in a way that both protects consumers and contributes to a thriving economy in NI.

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General information

Why we are consulting

To set out the Department for the Economy's preferred approach to regulation of heat networks and to seek stakeholder's views on the proposed system.

Consultation details

Issued: 12 January 2022

Respond by: 13 February 2022

Enquiries to:
Heat Policy Team
Department for the Economy
Netherleigh
Massey Avenue
Belfast
BT4 2JP
Email: DfEHeatpolicy@economy-ni.gov.uk

Consultation reference: Heat Networks: Building a Market Framework in NI

Audiences:

This consultation will be of particular interest to the heat network industry in NI as well as stakeholders interested in the net-zero target to decarbonise NI's heating.

Territorial extent:

This consultation relates to the regulation of heat networks across NI.

How to respond

Email to: DfEHeatpolicy@economy-ni.gov.uk

Write to:
Heat Policy Team
Department for the Economy
Netherleigh
Massey Avenue
Belfast
BT4 2JP

When responding, please state whether you are responding as an individual or representing the views of an organisation.

Your response will be most useful if it includes evidence to support your views.

Confidentiality and data protection

A summary of all responses will be placed on the Department's website at: https://www.economy-ni.gov.uk/consultations/heat-networks-building-market-framework . This will include a list of the organisations that responded but will not include personal details for example, people's names, home addresses or contact details.

However, information provided in response to this consultation, including personal information, may be subject to publication or disclosure under access to information legislation (primarily the Data Protection Act 2018/the General Data Protection Regulation 2018; Freedom of Information Act 2000, and the Environmental Information Regulations 2004).

For this reason you should identify in your response any information you do not wish to be disclosed and explain why this is the case. Please note that an automatic confidentiality disclaimer generated by your IT system will not, of itself, be regarded as binding on the Department.

If we receive a request for disclosure of this information we will take full account of your explanation, but we cannot give an assurance that confidentiality can be maintained in all circumstances.

For further information about how we process your personal data, please see our Privacy Notice which has been published alongside this consultation document.

Quality assurance

This consultation has been carried out in accordance with guidelines set out at nidirect public consultations

Complaints

If you have any complaints about the consultation process (as opposed to comments about the issues which are the subject of the consultation) please address them to: Heat Policy Branch or to the Departmental Complaints Officer at DfEmail@economy-ni.gov.uk.

Details of the Department's Complaint Process can be found at: Customer Service Complaints Procedure | Department for the Economy (economy-ni.gov.uk)

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Executive Summary

The NI Executive is committed to contributing to achieving the UK's target of net-zero greenhouse gas emissions by 2050. Meeting this legal commitment will require virtually all heat in buildings to be decarbonised, and heat in industry to be reduced to close to zero carbon emissions. Presently, heat is responsible for 24% of NI's greenhouse gas emissions. Heat networks can provide a crucial element of the path towards decarbonising heat. In the right circumstances, they can reduce bills, support local regeneration and can be a cost-effective way of reducing carbon emissions from heating. In this consultation, proposals are set out to drive forward low-carbon heat networks' growth in a regulatory framework that protects consumers and ensures fair pricing.

There are currently around 100 heat networks in NI, providing heating and hot water to approximately 3,000 consumers. Heat networks can deliver heating, hot water, and/or cooling from a central source or sources to domestic dwellings, public sector buildings, shops, offices, sport facilities, hospitals and universities. They are uniquely able to unlock otherwise inaccessible larger scale renewable and recovered heat sources such as waste heat and heat from rivers, sedimentary aquifers and mines.

There is significant potential for the number and scale of heat networks to increase dramatically. The Executive's commitment to low-carbon heating in new homes creates a significant opportunity for faster roll-out of low-carbon heat networks. This consultation includes consideration of approaches to accelerate the move of heat networks to low carbon energy, such as waste heat and heat pumps.

Across the whole of the UK, but especially in NI, the market is still in relatively early stages compared with other utilities. It will be critical to share learning and expertise across the sector and wider UK to give parties a strong starting base and encourage market growth at pace.

Heat networks are best developed as local solutions to local circumstances. Consideration will be given to piloting a programme to help develop local heat decarbonisation plans; identify heat network zones where appropriate; and understand how supportive policy measures can be used to reinforce connection to networks.

It will also be proposed to make legislative changes to give heat network developers equivalent statutory rights and undertakings similar to other utilities, such as gas and electricity. These additional rights would ease developers' costs and burdens when building out new networks or extensions. Plans to establish a licensing arrangement for parties who wished to secure these additional powers are set out in this consultation.

Any market expansion must be accompanied by consumer protections to ensure people receive good quality outcomes at a fair price. Whilst the Department believes that most heat network consumers in Northern Ireland do have comparable levels of satisfaction to people on oil, gas and electricity networks, and that they are paying a

fair price, evidence from GB suggests that this may not always be the case and the proposals in this consultation are aimed at supporting a growing sector and at the same time reducing the risk of problems for consumers, in the future.

The Department is committed to supporting heat network operators to identify and address performance issues in poorer performing existing networks. BEIS are working with some existing GB projects to identify solutions to performance challenges on their networks to improve their consumers' experience, and the Department will use these findings to develop guidance to inform business case development for cost effective interventions that will improve consumer outcomes.

In this consultation, it is proposed to introduce a regulatory framework that would give the chosen regulator (in this case our preferred option would be the Utility Regulator for Northern Ireland (UR)), oversight and enforcement powers across quality of service, provision of information and pricing arrangements for all domestic heat network consumers. Options will also be explored for ensuring networks are built to robust technical standards. Given the limited numbers of networks, it is proposed to use an authorisation regulatory model for consumer protection rather than a licensing model. The authorisation process would be funded through fees, scaled according to the regulated party's size. As policy evolves, the balance between robust consumer measures and proportionate regulatory costs and burden will be kept under review.

Consumer protection and heat policy are devolved to NI, however, the Department will continue to work with the other administrations to maximise transparency of arrangements for heat network consumers and businesses across the UK.

Following this consultation, the Department will engage further with stakeholders as policy is developed and refined ahead of implementation of the regulatory framework. The establishment of a heat network regulator will require new primary powers and BEIS are seeking to introduce a Westminster Bill in the coming months.

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Context

Heating is responsible for 24% of NI's greenhouse gas emissions. In 2019 the UK Government set a legally binding target to achieve net-zero greenhouse gas emissions by 2050. Meeting this net-zero target will require virtually all heat in buildings to be decarbonised, and heat in industry to be reduced to close to zero carbon emissions.

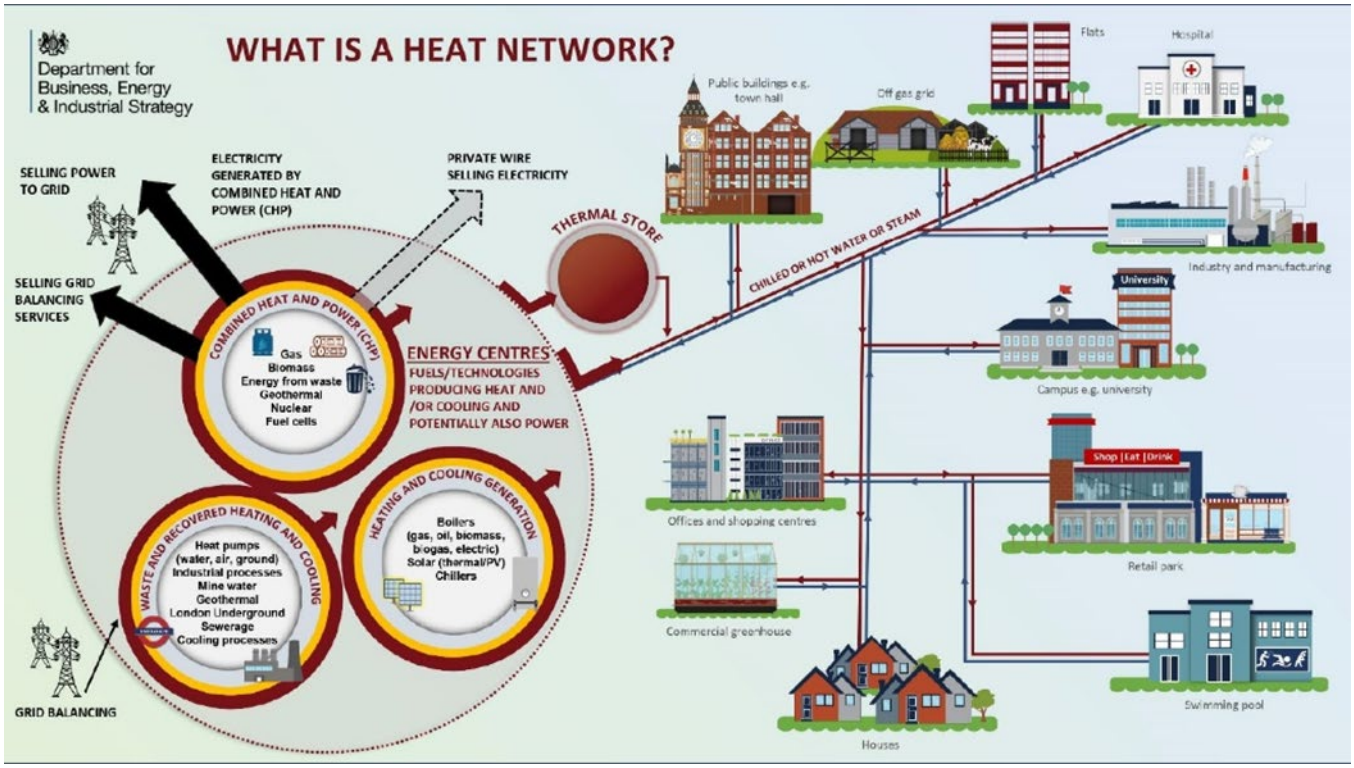
Heat networks are a crucial aspect of the path towards decarbonising heat and achieving net-zero commitment. They deliver heating, hot water, and/or cooling from a central source or sources to a variety of different customers such as domestic residential units, public sector buildings, shops, offices, sport facilities, universities. Heat networks are uniquely able to unlock otherwise inaccessible sources of larger scale renewable and recovered heat such as waste heat and heat from rivers, sedimentary aquifers and mines.

In 2015 the Committee on Climate Change (CCC) estimated that around 18% of UK heat will need to come from heat networks by 2050 if the UK as a whole is to meet the carbon targets cost-effectively. The potential for homes in Northern Ireland to be served by heat networks is likely to be lower than this figure. While the number of networks in NI has been growing, a step change is needed in the pace of rollout and adoption of heat networks with lower-carbon heat sources to meet our carbon reduction targets.

To date, the dominant heating competitors to heat networks have been individual oil or gas boilers. Going forward there is a risk that the drive towards low carbon heating sources may mean that developers will move to direct electric heating. Therefore, within the consultation the Department has proposed that a householder affordability rating is introduced to make it harder for property developers to install direct electric heating where it results in higher costs for consumers. It is expected that there will be a shift towards heat networks on new developments where this is the best low carbon solution for the local circumstances. Presently, the majority of heat networks are themselves fuelled by oil or gas. However, there is a broad range of low-carbon technology options for networks (see figure 1) and the uptake of lower carbon solutions among new networks in NI is very much encouraged.

In the right circumstances, heat networks deliver good quality outcomes for consumers, support local regeneration and can be a cost-effective way of reducing carbon emissions from heating. This consultation sets out proposals for a market framework that brings these three strands together. Although this consultation focuses on heating, it is recognised the growing role heat networks are likely to play increasingly in providing cooling services. Therefore, our proposals should be read in relation to both heating and cooling.

Figure 1: Diagram illustrating the potential for using waste, and recovered heat from combined heat and power and industrial heating and cooling processes to heat or cool to a wide range of buildings that are connected through a heat network.



Protecting consumers

Across the UK there are approximately 480,000 customers spread across around 12,000 communal heat networks (serving only one building) and 2,000 district heat networks (serving multiple buildings)[1]. District heat networks currently supply around 10TWh of heat which represents just under 2% of UK heat demand[2]. Further detail on the location of heat networks is given in Figure 2 below.

In NI there are around 3,000 customers across approximately 100 heat networks. This suggests there is clear room to expand and increase the number of heat networks across NI.

Whilst there is no direct data for NI in terms of the standards of service provided by heat network operators here, lessons can be learned from research in GB. In 2018, the Competition and Markets Authority (CMA) concluded its market study into heat networks in GB and found that many consumers are supplied heat at comparable consumer standards and price to the gas and electricity markets. However, it is also evident from the CMA research that some people experience poor service, including

[1] "District heat network" means the distribution of heat from a central source of production through a network to multiple buildings or sites. "Communal heat network" means the distribution of heat from a central source to multiple dwellings in a single building.

[2] BEIS (March, 2018): Energy consumption in the uk The experimental statistics may not wholly reflect the true position of the current heat network market due to networks not reporting or providing incorrect returns.

examples of high pricing. Currently, there are no sector specific protections for heat network consumers, unlike for people on other utilities such as gas, electricity or water[3]. In addition, a consumer living in a building serviced by a heat network does not have the same opportunities to switch supplier as they would for most gas and electricity supplies.

The CMA concluded that "a statutory framework should be set up that underpins the regulation of all heat networks." They recommended that "the regulatory framework should be designed to ensure that all heat network customers are adequately protected. At a minimum, they should be given a comparable level of protection to gas and electricity in the regulated energy sector[4]."

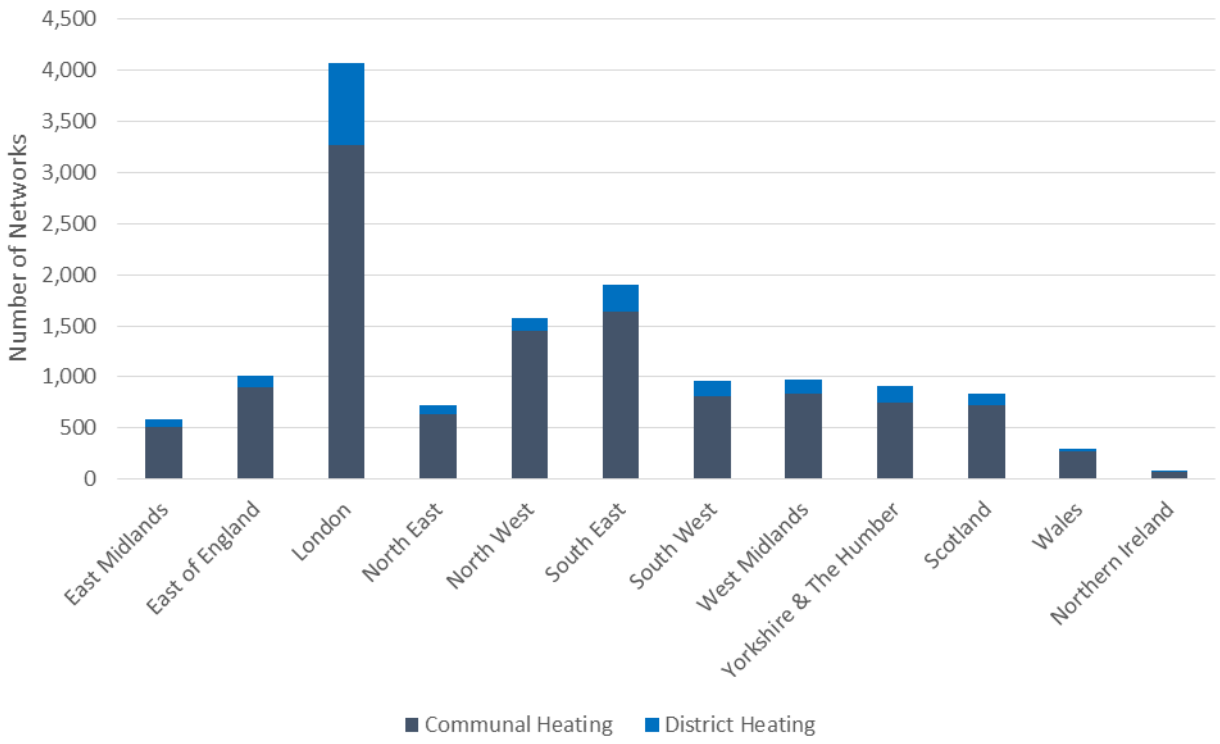


Figure 2: Location of heat networks

Source: Experimental heat network statistics[5]

In this consultation proposals are set out for an overarching regulatory model (see Proposed Regulatory Framework) for the heat network market. In the section 'Protecting Consumers' the Department is consulting on the scope of consumer protections in the regulatory framework. These are designed to build on existing

[3] The exception to this is the Heat Network Metering and Billing Regulations (2014) which provide some limited requirements regarding metering and billing arrangements. See Heat Metering and Billing section

[4] CMA (2018), Heat Networks Market Study: Heat networks market study

[5] BEIS (March, 2018), Energy Trends, special feature article – Experimental statistics on heat networks: Energy trends - March-2018 special feature article - experimental statistics on heat networks

good practice within industry. Our expectation is that all heat network domestic consumers should have ready access to information about their heat network, a good quality of service, fair and transparently priced heating and a redress option should things go wrong.

Regulation will not only help protect individuals from poor experience but will help increase confidence in the sector and facilitate its further expansion. Investors and heat network developers have said that targeted heat network regulations will help to drive up areas of lower standard, improve the market's overarching reputation and bring it more into line with other utilities, such as the water and telecoms industries.

Improving consumer outcomes ahead of regulation

It is expected future consumer protection regulation will build on existing cooperation between the Department and the sector. The aim is to put in place a common standard for the quality and level of customer service that is provided to domestic and micro-business consumers by their heat energy supplier. It also provides an independent dispute resolution service through an agreement with the Consumer Council, the independent body responsible for consumer information, enquiries and for resolving consumer complaints through its consumer resolution service.

It is anticipated that all existing heat network schemes will be covered by future regulatory requirements.

The Department, alongside BEIS, will work with industry to establish minimum standards for the design, installation and operation of heat networks through the development of a Code of Practice[6]. These voluntary requirements are comparable to the quality and performance standards for regulated utilities such as gas and electricity, and draw on legislation and industry best-practice.

Experience from GB has highlighted that as the market builds, some heat networks struggled to keep up standards in line with the rest of the sector, leading to less effective and poorer performing networks. In Northern Ireland, it will be important to address this gap as the number of heat networks increase, both to improve the experience of consumers on poorer performing networks and to address the potential negative impact on the sector's overarching reputation.

In light of the above, the Department is committed to supporting heat network operators to identify ways to optimise their networks in order to improve the end consumers' experiences.

Heat Networks and devolution

Heat policy and related consumer protection is devolved to the Northern Ireland Executive, however, there is now an opportunity to introduce a UK wide regulatory framework that will afford consumer protections and support the growth of low carbon heat networks. The Department intends to work closely with BEIS to deliver a new regulatory regime that will support the Energy Strategy's vision of net zero

[6] ADE, Code of Practice: Code of practice for heat networks

carbon and affordable energy. The proposed regulatory framework, in line with the strategy, puts consumers at the centre whilst providing the certainty that developers need to invest in low carbon heat networks.

Supporting market growth

Heat Networks are a crucial aspect of the path towards decarbonising heat and achieving net-zero commitments. The sector will need to expand significantly over the coming years, creating a substantial long-term investment opportunity. The Department's role in this challenge is to raise and promote the profile of the heat networks market and to enable the right conditions for the market to grow. The Department of Finance plans for phasing out fossil fuel heating in new buildings will be a critical component of this.

The Department wants to go further in increasing levels of investment in the sector and is committed to working with market participants to drive confidence in the sector and maximise the strong potential for growth, and will also be providing support and expertise at local level to strengthen approaches that will help generate additional demand certainty on projects. This chapter sets out ways the Department can strengthen market arrangements for participants and attract new investors.

Many of the existing perceived challenges are at least in part due to the emerging state of the market rather than fundamental barriers. These are summarised below:

- Relatively low visibility of the market and project pipeline;
- Perception of financial burden and risk for developers and investors created by complexity of market arrangements and a lack of standardised documentation or shared data;
- Limited understanding of potential costs and return on investment;
- Relatively low reputation of the sector, tending to focus on incidents of poorer consumer service/pricing. This results in weaker awareness of the benefits to individuals and local areas of heat networks, and can deter investment (e.g. in relation to outcomes for consumers on heat networks);
- Ensuring greater certainty, both in terms of the framework within which the sector operates, and the volume and timing of connections to a network.

This last point on uncertainty of connections is known as connection risk. Heat network projects need to make sufficient returns if they are to cover the high upfront cost of the infrastructure and make returns in the long-term. While the sector is increasingly attractive to investors, one of the challenges is securing firm commitments from buildings or consumers to connect to the network during the often-lengthy project development phase. When coupled with the high upfront capital costs, this uncertainty over consumer demand can deter some investors.

Progress made in addressing the challenges outlined above and situations where it is considered that further action is needed from either the Department or industry are set out below.

Reducing developer burden

Developers of heat networks can face specific complexities and challenges associated with the market. The sections below concentrate on the action taken by government and industry to address this disparity and reduce the overall burden for developers in initiating and maintaining the development of heat networks projects.

Unlike other established utilities, heat networks are not classified as statutory undertakers and do not have the range of statutory powers available to water, electricity, gas and telecommunications firms. To drive market growth and reduce the regulatory burden for heat networks the Department is proposing to develop equivalent powers for heat networks as part of sector regulation (more information is given in the rights and powers section).

Although the heat network market is underdeveloped in Northern Ireland there is significant potential for district heating systems utilising geothermal heat, therefore, the Department intends to learn from experience in GB and to consider introducing the following policy proposals to support growth in the market. Unlike established infrastructure markets there is a lack of accessible established tools and standardised documentation to aid the development of robust business cases in the heat networks market. This can create a considerable drain on time and cost resources. The Department is therefore planning to provide tools to ease this process significantly:

a. Through the Standardised Due Diligence Set ('SDDS') for heat networks which will play an integral role in facilitating greater connection of project sponsors, developers and investors. The aim of standardised due diligence is to provide the lender or investor with a detailed understanding of the company or project and, specifically, to help identify clearly defined risks that can be assessed and managed. To carry out due diligence and negotiate relevant finance or equity documents on a project, finance funders will usually appoint their own legal advisors. This is the first time the investment community has detailed their appraisal process for heat networks in order to ensure projects coming forward are of higher quality, more deliverable and more likely to perform in line with expectations, thereby securing returns on investment. The SDDS for heat networks will be critical for the market by ensuring risks on projects are manageable for investors and developers, and by improving the capability of the market to deliver on high quality heat networks at pace; and

b. Producing a standardised set of contracts. This will include the preparation of a Sales, Operations and Maintenance Set ('SOMS') of contract documentation for heat network developers and operators. The creation of standardised contracts is significant to developers by introducing a best practice approach and removing the cost of creating fundamentally similar contract forms multiple times for each project. SOMS will remove a key obstacle faced by developers and enable faster development on projects.

This will in turn build market confidence by making projects more investable and improving conversion rates through the commercialisation stage and into construction. The reduction in project capex will improve returns and costs to consumers.

These tools, in combination with other wider supporting actions will ultimately reduce the cost of capital to sponsors as standardised documentation allows risks to become uniform across projects, and therefore better understood.

Increasing understanding of costs and potential returns

Evidence from GB currently suggests that parties can struggle to secure investment in heat network development proposals. This is partly a combination of the complexity of some projects and limited understanding of how best to determine associated costings. Access to quality data is critical to enabling strategic investment and business development decisions. We intend to learn from policies being developed in GB and take steps to improve and support the sharing of data by:

a. Finding robust means of gathering and supporting the sharing of data to enable us to understand better and build evidence of heat consumption. Understanding heat consumption, both of a single building and of a group of potentially connected buildings, is an essential part of good heat network design. Heat consumption is a complex area which cuts across different disciplines, such as facilities management, architecture and engineering as well as involving occupants' preferences and behaviour. The Department will explore the data that is already collected, consider where there are gaps, and the role it should play in filling these. This will enable investors and network developers to build their business cases on a more robust evidence base which in turn should help to reduce uncertainty and cost. Development of an appropriate heat data strategy will be important not just for heat network market development but also as a contribution to wider ambitions around the transition to low carbon heating.

b. Developing our understanding of the actual cost of heating a building can be complex, however it is critical to securing investor confidence. Using the Whole Life Cost of Energy Calculator allows you to evaluate the cost of on-site energy generation for a building. It can be used by building owners considering connecting to a heat network; if they know their existing cost of heat, they will be in a better position to assess prices of alternative heating options. The output of the Calculator can feed into heat network tariff negotiations as well as improve the credibility of heat off-take tariffs modelled for heat networks. This should provide investors with greater confidence that the energy tariffs proposed and modelled will be reflective of a discount to the true cost of self-supplying energy by key off-takers.

c. A well developed and open supply chain is critical to market growth and success. Current information on supply chain activity is relatively limited. BEIS has committed to publishing annual low carbon heating metrics, which will give a high-level overview of the low-carbon heating supply chain, using a basket of indicators grouped across the three key themes of increased market demand, increased supply and market efficiency and innovation.

Addressing connection risk

Going forward the Department intends to learn from GB where discussions with industry stakeholders have indicated that there is appetite for an interventionist approach such as 'Regulated Asset Base' and 'Demand Assurance' to address connection risk. The Department will consider the appropriateness for such interventions as the heat network market in NI grows. Approaches such as 'Regulated Asset Base' and 'Demand Assurance' rely on providing financial support mechanisms to address the risk that expected connections to a heat network do not materialise. Consideration of how these approaches would work is set out below.

Regulated Asset Base

The Regulated Asset Base (RAB) model has been considered due to its success in sustaining investment and socialising cost and risk across a wide consumer base in other regulated markets, such as gas and electricity[7].

A RAB model is a type of economic regulation typically used in the UK for monopoly infrastructure assets such as water, gas and electricity networks. The company receives a licence from an economic regulator, which grants it the right to charge a regulated price to users in exchange for provision of the infrastructure in question. To prevent monopolistic disadvantages, the charge is set by an independent regulator who holds the company to account to ensure any expenditure is in the interest of users.

RAB-funded infrastructure has received significant quantities of investment from private sector players over the last 20-30 years. As of 2018 the total RAB value across the UK electricity, gas, water and airport sectors is almost £160bn (2018 prices).

A potential RAB model for heat networks would entail a central regulator that scrutinised the finances of projects and decided on a 'permitted return' that would determine the prices that operators would charge to consumers. Aspects of this price can be flexed to permit extension or development of new networks to share the costs between the heat network companies and consumers.

In theory, this cost-sharing mechanism could ensure that the connection risk is mitigated. This is because in instances where connections fall through, the overrun

[7] BEIS (2019), BEIS published consultations looking at whether a RAB model would be appropriate to finance the development of new nuclear generation and as a potential model for financing carbon dioxide transport and storage networks. Carbon capture usage and storage - CCUS business models

costs are split between the company and the consumers. This model works well in the electricity and gas sectors because cost overruns can be spread across the large numbers of consumers connected to a distribution network. The Department considers that this principle would not be appropriate for heat networks, as the benefits of extending one heat network through a RAB cost-sharing mechanism would not be equally shared by consumers connected to other separate heat networks. It would therefore be unfair to levy charges that are not shared by all consumers. This problem would still apply even if the model was applied regionally as in the electricity distribution market or across company portfolios.

In addition, any RAB model requires a regulator to assess the finances of the projects and companies being funded to determine if the returns being earned are legitimate. The costs of doing so are then levied on consumers. Such burdens are appropriate for the electricity and gas sectors because of the scale of the market but, considering that heat networks currently represent under 3% of UK heat demand, the administrative costs to a future regulator of scrutinising the finances of heat network projects would be disproportionately high[8]. This cost, which would have to be levied on consumer bills, would be disproportionate to the benefits it could bring.

Having considered its applicability, the Department does not consider that a RAB model is appropriate at this stage of the heat networks market. This is primarily due to the difficulties in socialising costs across the heat networks consumer base, which is not extensive enough and could mean high increases in consumer costs. However, a RAB model will be further considered as the market develops, as in future it may be better suited to funding the separate piping and transmission infrastructure of large-scale networks. Such systems, common in continental Europe, are likely to develop in the UK as the market matures.

Demand Assurance

Demand Assurance is a model designed to address connection risk, recommended by the ADE led Industry Task Force in their report Shared Warmth in January 2018[9]. Under this model a heat network developer would seek approval of a strategic plan (from a regulator or local agent) which sets out estimated heat demand arising from consumer connections as the heat network is built out. If approved, the heat demand would be assured to cover any future demand shortfall or some element of it. It is assumed that this risk would need to be underwritten by government and funded by either taxpayers or through consumer bills (potentially heat network consumers or wider energy consumers).

The Department has considered a range of ways in which demand assurance could work in practice and recognises that it could create additional confidence in the market by reducing investment risk. However, there are a number of issues which

[8] BEIS (March, 2018), Energy trends, special feature article – experimental statistics on heat networks: Energy trends -March 2018 special feature article - experimental statistics on heat networks The experimental statistics may not wholly reflect the true position of the current heat network market due to networks not reporting or providing incorrect returns.

[9] ADE (2018), Shared Warmth: Shared Warmth - A heat network market that benefits customers, investors, and the environment

make it unfeasible for government to take forward in its current incarnation. Firstly, it would create uncertain and potentially costly liabilities for the body responsible for underwriting the risk, which is likely to be government. In addition, there may be risks that a demand assurance scheme could reduce the incentive for developers to deliver cost effective projects and maximise returns, by providing an incentive for projects to over-expand. The scale of regulatory intervention required to assess the strategic case for a large number of schemes is likely to be burdensome with high administration costs. This is particularly true given the need for stringent checks to guard against spurious applications for possible future connections. Ultimately, it is likely these costs would be passed on to consumers as a result of the high financial burden, it is therefore unlikely that demand assurance will be appropriate for the whole heat networks sector.

There may be benefit in considering how demand assurance could be targeted at certain sections of the heat networks market. For example, where it supports the development of large, strategically important networks or alternatively where it is used to underwrite the risk for retrofitting buildings to allow them to connect to a heat network. However, at the current stage of market development for heat networks, such an intervention is not considered necessary. As a result, demand assurance is not thought to be an appropriate or feasible model to take forward at present.

The Department is committed to ensuring that there are sustainable routes to investment in low-carbon strategic networks. Both of the options considered above, however, assume a national central body having a role in managing connection risk. Heat networks consist of local infrastructure, providing local solutions to low carbon heating. They are more effective when taken forward as part of wider local infrastructure planning. The Department therefore sees most benefit in considering how best to address connection risk and associated concerns through local interventions and is focusing on opportunities to work with local areas to understand whether any further government intervention may be required.

Strengthening local approaches

A number of councils in NI have announced climate change targets for the 2020s and beyond to deliver net-zero commitments. Heat networks are already an important way to decarbonise a local area's heating requirements, balance demands on the local power grid, and to provide a catalyst for business and housing regeneration. The Department will engage with councils to achieve a unified approach in the development of heat networks.

The heat network market in NI is very small and at this time it is not clear whether changes in planning policy will be required to promote its expansion and the Department intends to work closely with the Department for Infrastructure and local councils to ensure that policy development supports market growth. The Department recognises that **planning policies in combination with concession arrangements** can also be used as part of a zoning approach to ensure new build developments connect and/or to grant an area of exclusivity that enables development of one or

more designated networks. A 'concession arrangement' can be described as a contract between an authority and another party (generally from the private sector); creating a vehicle to support the implementation of heat networks projects for joint benefit, such as the provision of upfront capital or guarantee of consumer demand. Concession arrangements can be a useful tool to develop a heat network if private sector investment is required and where local authorities can guarantee initial anchor load to the network, for instance through planning requirements for certain buildings, such as public sector buildings. The Department have seen that these arrangements work well where good communication, shared objectives and clear targets exist.

Local councils are often best placed to identify where developing a heat network is the right solution for local needs and to incorporate this within any wider local decarbonisation plans and have the detailed local knowledge to identify appropriate energy sources, sites, opportunities for storage and areas for expansion. The Department intends to work closely with councils as the heat network market expands to ensure that appropriate policies are in place in Local Development Plans. Further policy development is likely to include consideration of the differing roles the Department could play in supporting development of local solutions, including zoning where appropriate in Local Development Plans.

The Department will also consider the need for a similar approach to mandate heat planning as in England and Wales.

The Department intends to work across government including with local councils to drive development of clean growth and to support local clean growth investment. The key focus is building capability and expertise to identify and deliver projects at a local level.

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Regulatory framework overview

This chapter sets out the proposed model for the introduction of new regulatory provisions in relation to heat networks.

Overarching scope of the regulator

There is currently no organisation or regulatory body with statutory powers able to set and enforce cross-cutting regulatory requirements specific to heat networks. It is therefore proposed that the Department appoint a regulatory body, for Northern Ireland, subject to further engagement, this could, potentially, be the Utility Regulator. The Department will ensure that the appointed body has the powers to set and enforce regulatory requirements and set rules and guidance in relation to the distribution and supply of heating and/or cooling through networks.

The appointed regulator would be responsible for protecting the interests of current and future consumers in relation to the heating and cooling conveyed by heat networks. Their responsibilities would include setting rules and guidance relating to:

- **Provision of information** (including contracts and billing), to improve transparency (see Transparency section)[10]
- **Pricing** (see Pricing section)
- **Quality of service**, including granting consumers statutory access to a redress scheme for complaints (see Quality of Service section)

The regulator would also be responsible for monitoring compliance with any regulatory requirements within their powers and taking enforcement action, including issuing financial penalties, where necessary and with responsibility for:

- **Monitoring compliance with relevant technical standards**
- **Issuing licences for statutory rights and powers** (see rights and powers section)

The Department is also considering whether it would be appropriate for the regulator to have powers to require compliance with decarbonisation targets specific to heat networks, or whether this may sit more appropriately with a separate body (see further details in the Decarbonisation section).

Features of the proposed heat network regulatory framework

The Department plans to introduce a flexible regulatory framework which accommodates both existing and new service models, supports innovation, and maximises the economic and low-carbon potential of heat networks. Any regulatory regime should be proportionate and account for the great variety of operators within the heat network sector. An outcome-based approach is proposed, where instead of prescriptive rules firms are judged based on their ability to deliver certain outcomes.

[10] The Heat Networks (Metering and Billing Regulations 2014 contain some provisions relevant to billing. These regulations are currently enforced by the Office for Product Safety and Standards (OPSS) within BEIS.

This can give firms flexibility in how they meet the specific needs of their consumers while developing innovative services and business propositions.

The NI heat network market is in its relative infancy with only around 100 communal heat networks. There are also only a small number of heat network suppliers, based on the data collected from notifications required under the Heat Network (Metering and Billing) Regulations.

Based on these considerations, the Department has identified key features that should characterise any approach taken to regulating the sector. These are summarised in the table below.

Table 1: Features of a regulatory framework for heat networks

Feature	Detail
Clear	The framework should provide clarity to industry and consumers about which activities are regulated and who is responsible and/or accountable for implementing them.
Principle-based	Requirements of the framework should, in the main, be outcome-focused rather than prescriptive.
Proportionate	Requirements imposed by the framework should be reasonable and necessary for securing good outcomes for consumers, on both quality and cost, while supporting market growth.
Enforceable	The framework should allow the Regulator to target inspections and interventions on higher risk businesses/activities, minimising burdens on well-performing networks/businesses.
Flexible	The framework should allow innovative business/delivery models to emerge and give the Regulator scope to determine appropriate dispensations or exemptions in cases where requirements may be disproportionately onerous.

Consumers covered by the proposed heat network regulatory framework

All domestic consumers on a heat network should be protected by this regime, regardless of the size of the heat network scheme. This includes residential consumers on a mixed-use network (which means one which covers both residential

and business properties). On a mixed-use network, however consumer protection requirements will apply only to micro businesses and the domestic consumers.

It is proposed that the consumer protections should also apply to micro-businesses because, similarly to domestic consumers, they lack resources and negotiating power to ensure good service from their operator. In doing so, it is anticipated that an approach consistent with that taken by Heat Trust will be applied. This reflects the usual size classification for micro-businesses consumers (fewer than 10 employees) and affords additional consumer protections to these types of businesses[11].

Non-domestic consumers are better able to negotiate specific prices and terms of service for their connection; hence the Department does not expect them to be covered by consumer protection requirements.

However, it is expected that requirements relating to technical standards and/or decarbonisation should apply to all networks, including those consisting exclusively of non-domestic customers. Technical standards will aim to drive new networks' performance and facilitate networks' expansion and interconnection; this would benefit all networks, regardless of the types of consumers served. Similarly, it is considered that any potential future decarbonisation requirement should apply to all heat networks and their customers.

Definition of "heat network"

There are a number of ways in which a heat network might be defined. The Department is keen to ensure that the definition for future regulatory purposes is clearly understandable and reflects existing and emerging technology and infrastructure. It should also cover both communal and district networks, as well as those delivering heating and cooling.

There are existing definitions in the Heat Network (Metering and Billing) Regulations 2014 for district heat networks and communal heating systems[12]:

- **Communal heating**: "the distribution of thermal energy in the form of steam, hot water, or chilled liquids from a central source in a building which is occupied by more than one final customer, for the use of space or process heating, cooling or hot water;"
- **District heat network**: "the distribution of thermal energy in the form of steam, hot water or chilled liquids from a central source of production through a network to multiple buildings or sites for the use of space or process heating, cooling or hot water"

The Department believes that these definitions do not necessarily cover **ambient temperature networks**. These types of network operate at a much lower (ambient) temperature than conventional ones, tend to have both heating and cooling supplied by one combined system of primary piping, and are likely to include decentralised

[11] Ofgem (2019), Micro-business consumers: your questions answered: Micro-business consumers - your questions answered
[12] The Heat Network (Metering and Billing) Regulations 2014

generation and storage. It is expected that the number of ambient networks in NI will grow as the sector decarbonises.

It is considered that ambient networks are likely to have similar consumer and performance issues which would warrant these networks being in scope of regulation. Principally this is because for the network to operate, it requires a party other than the end consumer to be responsible for the supply of heat and/or cooling to the consumers and because consumers have limited freedom to change their heating suppliers. There seems to be no justification for excluding such consumers.

Therefore, the definition in the Heat Network (Metering and Billing) Regulations is not sufficient for the wider regulatory framework. While there is a need to protect against regulatory divergence between the market framework and the existing regulations it is proposed that the framework should have a new definition of heat networks that centres on[13]:

- **The network being able to distribute thermal energy in the form of steam or liquids (including heating or cooling) from a central source, or a number of significant generation sites, to multiple buildings or consumers where an operator is responsible for delivery of the thermal energy to the consumers.**

It is not proposed that **ground source heat pumps with a shared ground-loop**, where the heat is boosted by individual heat pumps for each dwelling, will be in scope of this definition. This is because, based on evidence from GB, there are unlikely to be the same consumer protection issues that have been found in other networks. In shared ground loop networks there is not a central operator of the scheme responsible for interactions with consumers, and the individuals connected to the shared ground loop typically have independent control over their heat pump, are billed separately and are still able to switch their energy supplier (which avoids being locked into the costs of a centralised heat network scheme).

Preferred Regulator

Outside of the requirements conferred by the Heat Network (Metering and Billing) Regulations 2014, for which the regulatory body is the Office of Product Safety and Standards (OPSS), the heat network sector in NI is not currently regulated. However, the Department considers that the Utility Regulator (UR) would be best placed to take on the role of regulator and intends to engage closely with them in seeking their agreement to undertake this important role. The heat network market is considerably different from the oil, gas and electricity markets; for instance, there is no competition in the supply of heat through a heat network and the number, size and types of suppliers active in the heat network market are not comparable to any of the other utility sectors. As set out in this document, regulating heat networks will require

[13] The Government of Wales Act 2006 contains a reservation for heat and cooling networks, defined as *'a system or network by which steam, hot water or chilled liquid is distributed from a central source for supplying heat or cooling to various consumers or premises'*.

adopting a novel approach and a new set of skills and capabilities, and the Department will be discussing the steps and changes that would be needed to administer the new framework.

The UR has significant experience in developing and enforcing consumer protection measures. Having a single energy regulator would benefit heat network consumers.

Establishing an entirely new regulatory body would likely incur higher costs and take longer to set up. The Department therefore proposes to engage with the UR with a view to expanding its remit to include protecting heat network consumers. This will incur additional resourcing and management costs for the appointed regulator. Options for funding are being considered for the additional resource requirements, including the option to grant the appointed regulator the power to raise fees from regulated heat networks to fund its regulatory activities. It is anticipated that fees would be scaled according to the regulated entity's size. The Department will be considering the balance between potential costs of funding the regulator's activities – which may affect consumer bills – against the level of oversight and anticipated compliance activity required for this market. Consideration will be made of how best to ensure regulation is proportionate and that any resulting costs to consumers remain appropriate to the benefits delivered.

Regulatory models

Given that this proposal is for a UK wide regulatory framework, the work of BEIS has formed the basis of the design of the regulatory model. The Department considers that the model is suitable for application in NI and that it provides a sound basis on which to grow the heat network sector here. In developing a regulatory framework for the heat network sector, BEIS have reviewed existing models adopted by other utilities, in particular the licensing model used for water and sewerage, gas and electricity and the authorisation model, adopted in the telecommunication sector and financial services. The various regulatory models currently in operation have evolved depending on the characteristics of the utility or market in question, and reflecting the priorities and risks associated with the activities undertaken. There is no single model that could be directly transferable to the heat network market, given the complex range of ownership and operation structures, the number of participants, and the essentially monopolistic nature of the service to end consumers.

Working alongside Ofgem (the GB energy regulator) BEIS identified that the current GB energy retail market design, including the 'one size fits all' supply licence, is starting to hold back progress by preventing consumers from benefitting from innovation, and is slowing down decarbonisation. In November 2018, BEIS and Ofgem launched a joint review to investigate what policy, legal and regulatory changes might be needed to ensure that the GB energy retail market is fit for the future. In developing a regulatory model for heat networks, emerging findings from this work has been considered with a view to maximising alignment with wider changes taking place in the energy market.

Licensing

In a licensing model, entities wanting to undertake regulated activities are required to secure a licence from a regulator before they can provide such services. To secure a licence, entities often need to demonstrate that they have the appropriate capabilities to undertake the regulated activities. The licence to operate is granted on the basis that the licensee will meet all conditions and requirements specified in the licence, which can be tailored to individual entities. The licensee is responsible for ensuring these conditions are met, and ultimately failure to comply can result in the licence being revoked. This model is used in many regulated utilities, including gas and electricity (see box below).

Licensing model: gas and electricity. For energy suppliers, the conditions that all suppliers must adhere to, in order to supply gas or electricity to domestic and non-domestic consumers, are set out in the Utility Regulator's supplier licences. Suppliers must hold a licence (or be granted an exemption) before they can operate in the market and are expected to meet entry requirements to demonstrate that they are 'fit and proper' to hold a supply licence. Supply licences describe how the licensee must interact with customers, both domestic and non-domestic (as applicable) structure and market its products. They also define other obligations on the supplier, such as compliance with industry codes. Licensed suppliers are effectively the sole suppliers of energy to customers and are required to comply with an often complex set of rules.

Authorisation

Under a general authorisation model, entities are authorised to provide specific services, as long as they meet a set of conditions and requirements set by the regulator. This allows a consistent approach towards all entities that provide the same class of service, whilst facilitating market entry by not requiring entities to apply for a licence upfront. However, while the costs of reporting and application are minimised, they are not removed altogether. Service providers are usually required to notify a regulator when they commence providing their services and could be asked to report on their activities.

General Authorisation: electronic telecommunications

Unlike gas and electricity suppliers, since 2003 electronic communications providers do not need any specific licence or permission to operate, because they are "generally authorised" so long as they comply with General Conditions of entitlement set out by the telecommunications regulator, Ofcom (NI).

Some larger providers are however subject to specific terms, of which they are notified separately, for example, in relation to the provision of access to their networks to third-party providers, or in relation to their having significant market power. Additionally, providers of certain types of networks or services need specific authorisation e.g. anyone using radio spectrum, such as satellite service providers, still require a specific licence.

Specific Authorisation: financial services, firms and financial markets

The financial services market is characterised by a large number of players with differing levels of capability. At the end of 2018, the Financial Conduct Authority (FCA) was the conduct regulator for more than 58,000 firms, ranging from large banks to single independent financial advisers. The FCA recognises that complex regulation can be difficult for smaller firms or those new to the market with new products so it uses a specific authorisation regime that operates with a risk based approach. The FCA ensures that all regulated firms meet common minimum standards before being authorised, referred to as 'Threshold Conditions'. For individuals the minimum standards are known as the 'Fit and Proper' test.

Proposed regulatory approach

This section identifies the issues that any regulatory approach would need to address and the range of regulatory options that could be used. Views are sought on a possible bespoke regulatory model for heat networks.

Considerations in designing the regulatory model

In order to design an appropriate regulatory model for heat networks, a number of areas where decisions are needed, have been identified. These are discussed in more detail below.

Project stages and requirements that should be subject to regulation

There are generally three main stages of a heat network's development – design, build and operation (including ongoing maintenance). The primary outcome from legislation is well-protected consumers. This is largely dependent on how schemes perform in the third stage i.e. once they are in operation. However, the operational phase will be affected by how the network was originally designed and built. Ensuring that networks are correctly designed and built will help optimise their performance and minimise the likelihood of network failures. This in turn should result in lower operating costs and improve the consumer experience and reduce bills.

There is also a need to minimise the administrative and regulatory burdens for both regulated entities and the regulator to help manage associated costs. The Department considers that regulation should focus on the stages with a direct impact on the consumer experience i.e. operation and maintenance.

Requirements relating to the direct consumer experience such as pricing, quality of service and transparency should be part of the regulatory requirement placed on all schemes with domestic consumers at operation and maintenance stage (see Protecting Consumers section below). Schemes would then be required to report on their performance against these requirements to allow consumers and the regulator to assess whether they are being offered a good quality service and a fair price for their heat.

This could be balanced with a general requirement that in order for schemes to be allowed to operate, they must be able to demonstrate compliance with a number of design and build requirements, such as for technical standards or decarbonisation. It is envisaged that this could be achieved through a certification process, whereby regulated entities demonstrate they are compliant with minimum technical standards through an accredited certification scheme (see Technical Standards and Decarbonisation sections).

Entity responsible and accountable for meeting regulatory requirements

The heat network market in NI is very small. The Department, therefore, has relied on experiences in GB to help inform its understanding of the complexities of a much larger and more diverse market. The heat networks market has a diverse stakeholder landscape with many different models and structures for the ownership and operation of schemes. Frequently, elements are sub-contracted to organisations with the relevant expertise including to dedicated heat service companies who are responsible for billing customers but may not necessarily be involved in the day-to-day operation of the network.

Given this complex stakeholder landscape, there may be no single, one size-fits-all approach for selecting who should be the regulated entity. An approach would be to define which activities are subject to regulation and then designate the party (or parties) responsible for carrying out these activities as the regulated entity (or entities). This would allow maximum flexibility of business models but is likely to increase the number of regulated entities and add to the complexity for consumers in understanding where responsibility for their service sits.

At this stage of the market's development, the Department is keen to keep the regulatory approach as simple as possible in order to minimise the overarching regulatory burden and to ensure there is clarity for the end consumer and the regulator as to where responsibility sits.

Therefore, a range of possibilities, will be explored for who the responsible or regulated entity could be:

(a) **Asset owner** – organisations that own the heat network infrastructure including the pipework, the buildings and the energy centre. This would place the overall responsibility for ensuring that heat networks are designed, built, operated and maintained correctly directly on the owner of the asset, who, unlike operators, are involved in developing the specifications for the project. Asset owners with no direct involvement in the day-to-day running of the heat network could delegate their responsibilities through contractual arrangements. The asset owner would then remain responsible for ensuring regulatory compliance by the third parties through its contractual arrangements.

(b) **Project Sponsor** – organisations that initiate or direct the development of the heat network. This could include the local council, a housing association, a building management company, an Energy Service Company (ESCo) or a community energy company. The project sponsor is very likely to be involved at every stage of a heat network's development.

(c) **Developer** – organisations that develop and build the network or buildings connecting to the network. Developers who build a network have a key role in ensuring any technical standards are met, which will have an impact on how networks perform during their operation. Developers will not necessarily have a direct relationship with end consumers but their involvement will affect the degree to which networks run efficiently and reliably and therefore they have an indirect impact on consumer outcomes, both in terms of the quality of their heat supply and associated costs.

(d) **Network operator** – organisations that operate the network. Network operators are most likely to have involvement in the day-to-day operation and maintenance of heat networks and therefore have influence over the quality of service outcomes for consumers. They may also have direct relationships with consumers, depending on the structure of the network.

(e) **Heat supplier** – organisations that supply heat to end consumers. Heat suppliers tend to have a direct contractual relationship with consumers for their heat supply. They will therefore have a significant influence on issues affecting consumers' heating provision including pricing and quality of service.

Scope for exemptions, size thresholds and transition periods

For a light-touch and proportionate regime, the regulator should have the power to differentiate between types of networks when assessing whether a network has met the regulated requirement. This is in order to accommodate the full range of networks from very large mixed-use networks to very small communal schemes.

While our preference is that all domestic and micro-business consumers should be covered by regulatory consumer protections, there are some networks with very few such consumers connected. These can be broadly categorised as either very small communal schemes, or mixed-use schemes with only one or two residential single dwellings connected to a non-domestic use network. The Department would be interested in your views about whether there is justification for a de minimis threshold for either or both categories. This would exempt the relevant entity from the proposed regulatory consumer protection requirements (other than potentially a

basic notification). This would be because the costs of meeting the requirements may be considered overly burdensome and result in detrimentally increased costs for the end consumer.

The Department would also like to understand whether it would be appropriate to introduce a size threshold for regulatory requirements (see box below) on the grounds that larger suppliers have greater market power with proportionately greater impact on consumer outcomes, so their activities should be subject to increased levels of scrutiny. For schemes above the threshold this could include additional requirements related to technical standards or decarbonisation at the build phase, or additional requirements on consumer protection, once networks are operational, such as a duty to report in more detail or more frequently to the regulator.

Indicative Size Threshold

There are various options for how a threshold could be implemented including volume of heat capacity, volume of heat generation or number of heat customers. Building on experiences from GB where analysis of the heat network notification data has been carried out it is proposed that a reasonable threshold would be all suppliers delivering heat and/or cooling to more than 2,000 customers. This would mean that none of the heat networks currently in operation in Northern Ireland would be within scope but would create a future proofed regulatory regime that would support wider roll out of large district heating schemes.

It is expected that all networks would be subject to the consumer protection elements of the regulatory framework. Given the diversity of existing networks and current contracting arrangements, there may be grounds for some transitionary arrangements in certain cases. Any such arrangements would predominantly be applicable to circumstances involving smaller networks less readily able to meet the requirements immediately. The need for, and potential scope of, transitionary arrangements will be considered as further policy work is undertaken.

Regulatory model options

Four principal regulatory design options:

(1) General Authorisation
(2) Full Licensing Regime
(3) General Authorisation with obligatory licence above a size threshold and optional licence for rights and powers
(4) General Authorisation with optional licence for rights and powers (our preferred approach)

The Department considers that option (2) – **a full licensing regime**, is not appropriate for the heat networks market. While it is recognised that there are a number of benefits to licensing, it is considered that these are outweighed by the associated burdens.

A licensing system for heat networks would help ensure that the right capabilities were in place to manage each scheme and it would raise standards consistently across the industry. The responsibility for protecting consumers would sit clearly with the licence holder and the licence would specify what actions they would need to take to this effect. However, these advantages need not be exclusive to a licensing route.

The Department is of the view that a full licensing regime would create an unduly burdensome approach for this market. The large number of market participants relative to other utilities could give rise to significant additional regulatory and administrative burden, which could result in higher consumer bills. This would be exacerbated if capabilities had to be tested upfront or the licensing approach had to include exemption options to manage the diverse range of business models being covered. The Department is not proposing to take this option forward.

The Department believes that there is greater advantage in basing its approach on option (1) - **a general authorisation regime**. Primarily this is because placing a duty on networks to notify the regulator of their operation is inherently lighter touch than having to apply for, then be checked and considered suitable for a licence. Authorisation also means there is no need to update or amend individual licences if new innovations or requirements are introduced. Instead, general authorisation requirements can be changed which will then apply to all. It is also possible to introduce specific thresholds within the authorisation regime so that only certain requirements apply to certain types of schemes. Additionally, and perhaps most importantly, general authorisation could allow segmentation of the market by having activity-specific rules that would apply selectively to any entity carrying out each class of activity. For example, the authorisation requirements could, in time, be adapted to enable requirements on metering and billing to apply to all metering and billing agents, irrespective of whether they are also directly involved in the supply of heat.

The Department does not consider that adopting a general authorisation approach need negatively affect outcomes for consumers, compared to adopting a licensing system. However, for the authorisation system to work effectively, a different enforcement approach might be required. For example, the Regulator might rely more on the use of consumer complaints to identify when things go wrong which may be the result of a breach of requirements by a regulated entity.

Some licensing and specific (rather than general) authorisation models adopt **a fitness test** to ascertain the suitability of applicants in carrying out regulated activities or their ability to meet predetermined standards. This increases the regulatory burden for both the potential regulated entity and the regulator. In the general case of consumer protections and heat networks, it is considered that a pre-authorisation fitness test would create unnecessary complexity and burden, potentially creating a barrier to entry. Any such test would need to reflect the wider range of financing and ownership models within the heat network market, including private schemes, local authority-led and housing association ownerships. Instead, the Department considers that the risks of removing such upfront scrutiny could be adequately mitigated by an appropriate enforcement approach.

However, it is considered that there is greater need for an optional licence arrangement for rights and powers. This would be a licence which parties could voluntarily apply for, should they wish to take advantage of proposed heat network statutory rights and powers (see rights and powers section). While it is not thought that there is a need for a fitness test for regulated entities for the wider framework, the Department considers that there is greater justification where the party is seeking rights and powers. By having a licence for rights and powers the regulator would be able to determine whether an organisation would be financially capable of paying compensation in case the powers are used incorrectly, and that it would be using the powers for the purposes of heat network development.

The Department therefore proposes to take forward a regulatory model that comprises of **general authorisation for all networks (option 1), to protect consumers from the point in which the network becomes operational, with an option for parties to apply for a licence for rights and powers (option 4)**. The holder of the rights and powers licence need not be the regulated entity under the general authorisation regime. For example, a developer may want to secure the licence to ease the network build process, but they may not be the relevant body for regulation once the network comes into operation. This model is discussed further below.

Consideration has been given to extending this further to include an **obligatory licence option above a certain size threshold (option 3)**. This could offer the benefits of a licensing approach but at reduced burden. Analysis, by BEIS in relation to the heat network market framework proposal suggests this could meaningfully reduce the costs of regulation from a full licensing route (see detail in the Impact Assessment). It would concentrate on the regulated entities with capacity to affect outcomes for the largest numbers of consumers. Schemes captured by the size threshold may be required to meet extra conditions. These could cover technical standards and decarbonisation requirements at the build phase, and additional requirements on consumer protection, once networks are operational. The extra requirements relating to consumer protection could include a duty to report in more detail or more frequently against the same requirements included in the general condition of authorisation or meet a more stringent set of requirements.

However, it is anticipated that the regulator would be able to adapt a general authorisation approach to put specific requirements on segments of the market, should this be necessary. The Department is concerned that adopting an obligatory licence approach above a size threshold could unintentionally incentivise asset owners to restrict the size of their portfolios below the proposed threshold, to avoid having to secure a licence. Therefore the department does not propose to develop this option (of an obligatory licence for schemes above a size threshold) further.

Proposed model: General authorisation with optional licence for schemes requiring rights and powers

Under this option, all heat networks would be covered by an authorisation to operate. A separate licence, available to entities of all sizes, would only be required for the purpose of being granted rights and powers. **The licence granting rights and**

powers will not be scheme specific, with the exception of granting easement rights. It is proposed that licensees should be able to use the powers granted by the licence on any heat network, or for the purpose of building any new heat network. For easements, the licence will allow licensees to submit an application to the Department to secure this power in relation to a specific scheme. As easements can amend existing property rights to land, they require decisions to be taken on a case by case basis.

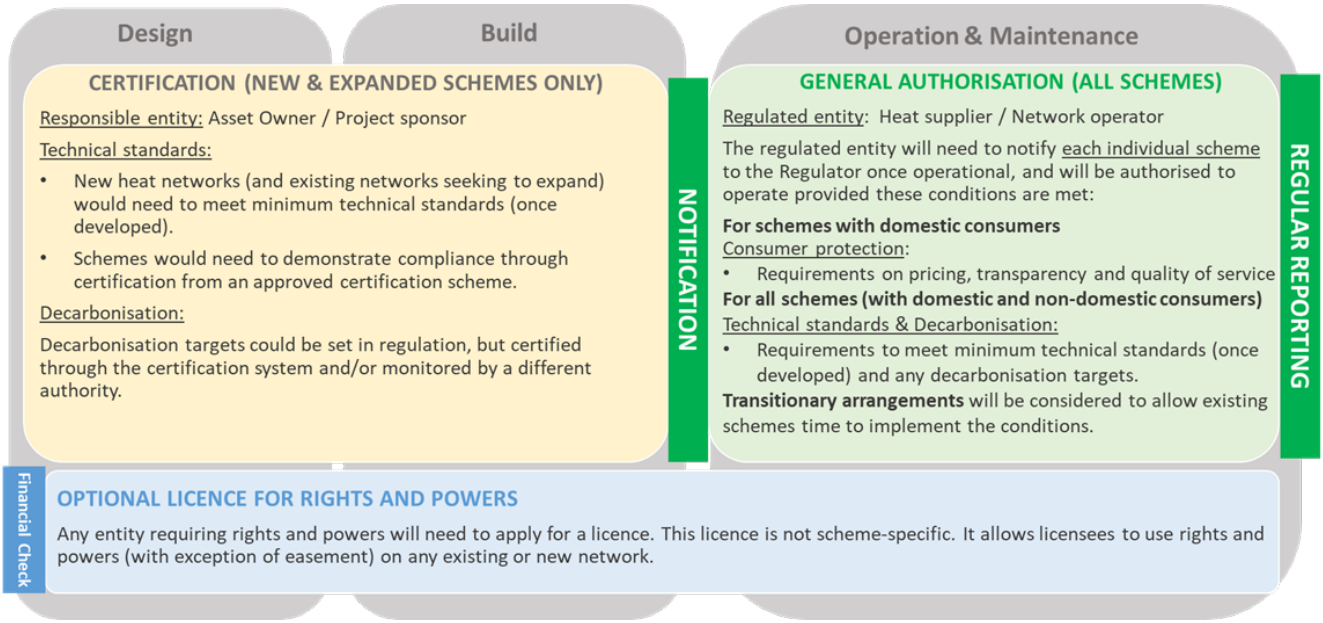

Figure 3: Regulatory Model – General Authorisation with optional licence for rights and powers

In this model, **it is envisaged that the heat supplier or the network operator becomes the regulated entity from the point of operation**. These are the entities most likely to interface directly with consumers so will be well placed to implement consumer protection conditions. Heat suppliers or network operators would be required to notify and secure authorisation from the regulator for each of their schemes at the point at which they become operational. Where the supplier and the heat network operator are not the same entity, views are welcomed on which of them should be regulated.

Authorised schemes would be expected to report yearly and pay an annual fee proportionate to their size. The Department would seek to align with existing reporting requirements under the Heat Network (Metering and Billing) Regulations to avoid duplication of reporting.

For new schemes, at point of operation, the potential regulated entity would need to demonstrate that the scheme had been developed in compliance with any prescribed technical standards in order to secure authorisation. It is envisaged that this would happen through evidence that the scheme had been certified as compliant with standards by an accredited certification scheme (see Technical Standards). Further

consideration will be given to how best to align this with situations in which an existing and authorised network is expanded.

Where the regulated entity was not the same party as that responsible for the design and build, the Department would expect them to require the asset owner or project sponsor to provide evidence of compliance at the point of agreeing contracts for the network's operation. The regulated entity would then provide this evidence to the regulator as part of the authorisation process (see Figure 3).

In practice, the asset owner or project sponsor and the heat supplier or network operator could be either the same or a different entity, depending on the type of structure of that particular heat network. The regulations should be sufficiently flexible in this regard. The key stipulation is that only one party is responsible for regulatory compliance at any stage in the process.

Emerging business models

The small and underdeveloped heat network market in Northern Ireland has meant that the Department has depended on work undertaken by BEIS to understand the issues in relation to business models. The Department is committed to ensuring that the regulatory framework works for the current market arrangements but is also sufficiently adaptable to respond to emerging business models where these are able to deliver good outcomes for consumers at a fair price. In GB there has been ongoing consideration of routes to unbundle investment across different components of a heat network, for example, such as through a PipeCo funding model. The Department is keen to ensure that the regulatory approach does not preclude such developments in Northern Ireland and is interested in your views on whether the proposed regulatory approach would be sufficiently flexible to accommodate this or other potential business models.

PipeCo: the pipework would be unbundled in order to de-risk refinancing of the asset and potentially open up the network to competition in heat supply. Establishing a separate company responsible for the distribution element of the network, which has a longer lifetime of 50-60 years compared with other elements such as the generation assets which have lifetimes of 15-20 years, could offer additional opportunities to attract investors interested in long term, low risk investments such as pension funds who may be prepared to accept lower internal rates of return. It also offers opportunities for dedicated pipework companies to establish a portfolio approach to distribution assets across the country to achieve economies of scale.

If you wish to discuss other business models with the Department, in confidence, please email us directly using the email address **DfEHeatpolicy@economy-ni.gov.uk.**

Enforcement powers

The Department is not aware of significant issues in relation to consumer standards and quality of service in the heat networks market in Northern Ireland, and understands that the majority of consumers are happy with their service.

The Department also knows that companies can fall short and their customers are left with inadequate service. Because of this, the Department considers that a future regulator will require enforcement powers to ensure consistent application of the regulatory framework requirements. Our preferred regulator, the Utility Regulator, has the requisite experience as an enforcement agency in the electricity and gas sectors. The Department intends to work with the regulator to ensure that oversight and enforcement is reflective of the emerging state of the market and that the smaller entities within it are not unduly burdened by regulation.

The Department envisages giving the chosen regulator equivalent enforcement powers in this new role as it currently has in the electricity and gas markets. The Department would want to ensure that any regulator is able to apply powers to investigate and take action against general contractual terms under the Consumer Rights Act[14]. Specifically, the Department intends to grant the regulator the powers to levy fines against companies for failure to meet the regulatory requirements described in this consultation, as well as to take legal action against companies to ensure that they comply. There is a risk that fining a company for poor performance may result in the company passing on the costs to the end consumer through higher bills. While this applies to any markets subject to financial penalty regimes, it is recognised that there may be an increased risk due to the large numbers of smaller companies operating in the heat network market that have a constrained ability to fund unplanned for costs such as fines.

The Department expects that any regulatory fines would be proportionate to the specific circumstances and only imposed once non-financial measures had been tried. It is also expected that the regulator will use pricing transparency provisions to monitor for any subsequent price hike that could suggest that fines were being unreasonably passed through to the consumer. Were the regulator to find evidence of such practice occurring on a repeated basis within the market, this could strengthen the argument for increased price control measures. However, where the regulated entity is operating on a not for profit basis, the option of financial penalties may be less appropriate. The Department is considering whether there would need to be a different enforcement approach in relation to such schemes.

When the future regulator does levy fines, the Department agrees with the current approach applied by the Utility Regulator in seeking redress payments from companies that can be redistributed to consumers where possible but, on occasions where a fine is levied in excess of the level of consumer detriment, some money will also return to the government. Ensuring that the regulator is not funded directly through money collected in penalties avoids creating perverse incentives for the regulator to be heavy-handed in using its powers. Regulation will be designed to

[14] Consumer Rights Act (2015)

ensure that in circumstances where a regulated entity considers the regulator to have taken inappropriate or incorrect enforcement measures that they can appeal through the courts system in the same ways as other regulated entities.

The Department also believes that the regulator should be able to act on powers to investigate competition issues in the heat networks market, and to refer investigations to the Competition and Markets Authority if necessary, as occurs in other regulated utility markets. Effective enforcement action requires the regulator to have access to relevant data and information from parties under investigation. The Department will be considering what legislative powers the regulator may require for this purpose. Given the ambition for the market to develop at pace, it is particularly important to ensure there is ongoing oversight of any competition concerns that potentially could emerge.

The Department recognises that there are cases where network owners or operators run a number of schemes rather than a single network. It is considered that the regulator should have the power to impose penalties that are proportionate to the scale of all the heat networks controlled by the regulated entity rather than the scale of individual networks. The Department will be considering whether it is the controlling parent company who should be liable for any enforcement penalty to ensure that they can be issued at the scale necessary to act as a sufficient deterrent. Where only one network within the entity's group of networks is failing to meet its compliance requirements, it is envisaged that the regulator should have powers to revoke the regulated entity's authorisation for that particular network, without affecting their authorisation or licence to operate the other networks in their group. However, for compliance issues that are more widespread within the entity's entire set of networks, the regulator should have powers to revoke the authorisation or licence at the entity level, rather than the network level.

As in other regulated markets it is proposed that individual consumer complaints about heat networks should be addressed to an independent complaints body. The new powers of the regulator will be reserved for issues which are more systemic by companies. It is proposed that regulated companies would be required to offer their domestic consumers access to a complaints service which would be able to adjudicate on individual complaints, including pricing.

The Department considers the **Consumer Council** would be best placed for this role. Following this consultation the Department intends to work with the Consumer Council in seeking their agreement to undertake this role going forward. It is expected that the Consumer Council would build on its expertise in handling related issues from gas and electricity consumers. In such circumstances, the Department anticipates a similar funding model to that used in other areas of the Consumer Council's work.

The Department is also considering whether there are grounds to extend the Consumer Council's role in consumer advocacy to heat, similar to those that exist for energy, water and postal consumers. In these other regulated services, the consumer advocacy function ensures that there is a champion able to represent consumer interests collectively, and that individual consumers have access to

independent advice and support. Given the current number of heat network consumers relative to these other sectors, further consideration is needed on the potential costs and benefits of creating such a function.

Step-in Arrangements

In addition to the general enforcement powers proposed above, the Department is considering step-in arrangements to cover worst-case scenarios. It is expected that these steps would be used very rarely. This is a complex area, not least because of the range of circumstances that might trigger step-in arrangements and the risk of consumers being left without heating or cooling suddenly. This latter aspect is an important distinction from gas and electricity supply arrangements where a supplier may cease to operate or lose their licence, but the gas/electricity will continue to flow through the distribution network into the end consumer's property.

The Department envisages that there are three overarching circumstances when step-in arrangements might be required.

1. Where the regulated entity is no longer able to provide heating and cooling to its consumers due to insolvency. This creates a clear need for rapid step-in arrangements to manage resulting stranded consumers. There are, however, very few examples of such cases from either GB or internationally.
2. Where there has been significant and persistently poor performance by the regulated party, causing substantial harm to the end consumer, such as through repeated excessive pricing. In such extreme cases it is considered that there is justification for the regulator to be able to "de-authorise" the party from supplying the consumer or remove its licence as applicable.
3. Where there has been significant and persistently poor consumer experience (such as ongoing network failures and/or extremely high pricing) but this is due to historical technical deficiencies of the network that the current regulated entity is unable to address.

Currently, the risk of consumers being left stranded is left to contracting arrangements to designate step-in rights to, for example, the original developer. However, these are not standardised and would not necessarily cover persistent poor performance. Looking abroad, there is a notable absence of step-in provisions. In Finland and Germany, for example, no specific provisions were found. Norway has provisions for consumers where connections arrive late but there are none for insolvency. This is despite both Germany and Norway having a range of heat network providers within their markets. In Sweden, there are also no provisions, despite previous government consideration of managing bankruptcies through a mutual fund set up with operator contributors[15]. The Department is also aware of relatively few instances of consumers being left stranded, either in GB or internationally. Nevertheless, it is important that all consumers are protected from the risk of their heat supply being discontinued. The Department also considers that

[15] BEIS, CAG Consultants (March, 2019), International Heat Networks

giving the regulator the powers to remove a party's authorisation creates a strong deterrent against sustained poor performance.

Given the complexities of this area, it is likely that the nature of step-in arrangements may vary according to circumstances. For example, the condition of the network assets will affect the viability of another party being willing, or even able, to step in and pick up running the network. Additionally, where the situation has arisen from prolonged poor performance, the regulator will have been better placed to initiate step-in arrangements in advance of any consumers being left stranded. Alternatively, where the situation occurs with limited warning, urgent interim measures will be necessary to ensure continuity of heating.

The ownership of the scheme may affect arrangements. Where a local authority is responsible for a heat network, either directly or via an ESCo, for example, they may be better placed than the regulator to step in and ensure contingency arrangements are applied. It is acknowledged that the most appropriate arrangements may be affected by who the regulated entity is. Should this be the heat network supplier, for example, then the asset owner could be considered the first point of contingency. They would have a vested interest in ensuring the network remained an ongoing concern.

The Department anticipates that our final step-in arrangements will include a number of components, of which this is an illustrative list:

- A requirement on all authorised parties to be able to evidence contingency plans to avoid a loss of heat supply to the consumer;
- A requirement on all authorised parties to hold reserve funds to manage transition through any later financial difficulties that might risk the ongoing operation of the network. Such a provision would need to be proportionate to the size of the regulated entity and its business model; for example, a not for profit organisation may be less able to allocate such reserved funds.
- The right for the regulator to seek an alternative company willing to take over supplying to consumers on the relevant scheme. This would be most viable in circumstances of financial difficulties or poor performance unrelated to the integrity of the network's assets. This model could be similar to the Supplier of Last Resort arrangements for gas and electricity.
- Provisions for an administrator of the scheme to be appointed where, for example, there is no appetite among existing regulated heat network organisations to take up the particular scheme. This could be funded by a requirement on regulated entities contributing to a centrally held reserve fund.

The Department will continue to explore potential step-in arrangements as the overarching regulatory model is refined. The Department is interested to hear more about existing contingency arrangements currently managed through contracting and stakeholders' views on potential options.

Devolution

The regulation of heat networks and consumer protection are devolved to the Northern Ireland Executive. However, the proposed regulatory framework, outlined in this consultation, will be delivered through legislation brought forward in Westminster. BEIS has agreed that the proposed legislative and regulatory framework will be extended to Northern Ireland.

Heat Network (Metering and Billing) Regulations

The Heat Network (Metering and Billing) Regulations 2014 ("the Regulations") require heat network notification to the Office for Product Safety and Standards (OPSS). They further contain provisions for the installation of meters, bills and billing information for final customers on district and communal heating and cooling networks, implementing the relevant requirements of the Energy Efficiency Directive 2012 (2012/27/EU). These Regulations apply UK wide and are enforced by the OPSS.

The installation of consumption meters and billing based on consumption, support our proposals in this document for greater transparency and fair pricing. In the future it may become necessary to amend the Regulations to be consistent with the UK Government's heat networks market framework and the regulation of heat networks in Scotland.

As part of the Withdrawal Agreement, the UK and the EU agreed to an implementation period in order to provide assurance, continuity and certainty for businesses and individuals. Amendments to the Regulations may be necessary to implement relevant requirements in the revised Energy Efficiency Directive 2018 during this period. Therefore, it is expected that there will be a further consultation on wider implementation of these provisions.

More details on current and potential future metering and billing requirements can be found in the Transparency section.

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Protecting consumers

The Department wants heat network consumers to be well informed about their heating and cooling, receiving good quality service at a fair price and have ready access to redress should things go wrong. In the typical comparator markets of oil, gas and electricity supply, consumers are in-part protected by their ability to switch suppliers. For a heat network consumer, that option rarely applies without moving location. It is therefore particularly important that they have clear information about the service they can expect and what protections are available to them.

To enable the sector to grow sustainably and to protect its reputation as it does so, it is recognised that issues and concerns raised by consumers on heat networks must be addressed. The Department is keen to ensure that the outcome of regulation is to drive up the standards of network performance and to provide all consumers on heat networks with high quality of service and fair pricing.

Three core strands for consumer protections have been identified:

- Transparency of the heat network service, including before first joining the network;
- Fair and accurate pricing;
- Quality of service - for example expectations on outage management and customer complaints handling.

These three components should in principle apply to all domestic and micro-business heat network consumers and therefore to any regulated entity that covers some such consumers. This would include mixed-use networks (which supply both domestic and non-domestic consumers), although only with regard to residential or micro-business consumers on the network.

However, it is recognised that there are circumstances in which the regulatory burden may outweigh the potential benefits for consumers, for example where the network is extremely small such as a single business connected to one or two homes. Views as to whether there are any such categories which might be exempted from regulation are welcomed.

There is a strong argument for a regulatory role in overseeing technical compliance. Technical standards can affect how well the system is operated and maintained, and the quality to which it has been built. While it may not be immediately apparent to the consumer where technical standards are not met, they can have significant impacts on the consumer experience. Proposals on the way forward can be found in the section on Technical Standards.

Transparency

In this section proposals for tackling transparency issues are considered.

Pre-contractual transparency

Typically domestic consumers have low awareness or knowledge of heating systems at the point in which they take decisions regarding renting or buying a property. They often start to understand and appreciate the differences between heat networks and alternatives, such as individual gas boilers or electric heating, only after they have moved into their new property.

Heat networks consumers are already protected by consumer and competition law[16], which requires traders to provide consumers with the information they need to make informed purchasing decisions.

Transparent information is important to increase current and prospective consumers' confidence in the sector. Suppliers can do more to help consumers make informed decisions, by sharing information upfront. Therefore, it is proposed that regulated companies should be required to make publicly available minimum pre-contractual information in relation to their systems.

Heat suppliers are not necessarily involved in property transactions, and therefore they might not be aware of new residential consumers moving into the properties to which they provide heating until after the transactions have been completed. Hence, the Department is not proposing that suppliers should be responsible for providing such information directly to individual prospective consumers, as this would not always be possible. Instead, it is proposed that suppliers should develop relevant such information and guidance which can be made available online direct to consumers, and shared with developers and estate/letting agents for prospective consumers.

While the exact information requirements for authorised and/or licensed organisations will be determined by the regulator, subject to further consultation with stakeholders, minimum information could include:

- the age and type of heat network system
- the contractual arrangements in place,
- a summary of terms of service, and
- price information, including estimates of annual costs

Publishing clear and understandable pricing information in an easy to access manner would certainly help consumers understand better their future ongoing heating costs. Measures to increase price transparency are discussed in more detail below.

Potentially, information overload during the transaction process, however, means that consumers might not always consider the implications of their property being served by a heat network, even when adequate information is provided. This is likely

[16] The Consumer Protection from Unfair Trading Regulations 2008; The Competition Act 1998; The Consumer Rights Act 2015

to improve as heat networks become more common, but suppliers and government have both a role to play in increasing public awareness of heat networks.

The Department is committed to working with other Departments, local authorities and statutory bodies on measures to improve transparency, for example by including references to heating systems in existing guidance on property transactions, such as the "how to rent", "how to let", "how to lease" and "how to buy" guides. The Department will also consider the need for further guidance ahead of the regulatory framework coming into force.

Transparency during residency

The very small heat network market in Northern Ireland means that there is a lack of first hand data available, therefore, the Department has learned from experience in GB. In addition to issues relating to pre-contractual transparency, it is suggested that only a limited number of domestic customers in GB are currently provided with heat supply contracts. In addition, domestic heat network consumers are also less likely to receive any form of bill, account summary or statement, and these tend to include less information compared with those of non-heat network consumers, as shown in Table 2 below. This poor transparency regarding heating bills, including their calculation, limits consumers' ability to challenge their heat suppliers, and may reinforce a perception that prices are unjustified. This is exacerbated by a general lack of consistency across schemes in relation to how heating costs are calculated. Measures to improve transparency and consistency in pricing are discussed in the pricing section.

The Department considers that there should be regulations in place relating to transparency and billing, to adequately protect consumers. These should include provisions relating to back-billing.

What is back-billing?

A back-bill is a 'catch-up' bill sent to consumers by their energy supplier when they haven't been correctly charged for their energy use. Back-bills can be for any amount, but rules should be introduced which define when a supplier can charge its customers, and to prevent back-billing beyond 12 months.

Table 2: Receipt of bills, summaries and statements, and frequency of receipt

	Heat network	Non-heat network
Base (all who pay for heating and hot water / energy separately)	*(1,800)*	*(1,649)*
Whether receive a bill, summary or statement	73%	83%
Base (all who receive a bill)	*(2,375)*	*(1,461)*
Annually	27%	11%
Twice a year	8%	9%
Quarterly	27%	48%
Monthly (or more often)	25%	18%
No fixed pattern	2%	3%
Online (whenever I like)	4%	9%
Other	2%	1%
Don't know/no answer	7%	5%

Source: Heat network consumer survey 2017[17]

The Department therefore proposes to secure powers to regulate and monitor the provision of information during residency.

This would include powers to set and enforce:

- Requirements regarding the provision of heat supply agreements or equivalent. Requirements regarding billing information, billing frequency, and back-billing.

Transparency during residency – existing provisions

Heat Network (Metering and Billing) Regulations 2014

These Regulations require all heat suppliers to notify their network to the Office for Product Safety and Standards (OPSS). In certain cases, the installation of final consumer meters in buildings supplied by district heating is mandatory. In other cases, the obligation to install final consumer meters is subject to being technically feasible and cost-effective. In any case, where meters are installed under the Regulations, billing must be based on consumption, if technically and economically feasible. There are further requirements on billing frequency and information. For example, billing must be based on actual consumption at least

[17] Heat networks consumer survey 2017, Results report

once a year and billing information must be issued at least twice a year, or quarterly in case of electronic billing or if requested by the customer.

The Regulations were amended in 2020 to introduce a new methodology for assessing the cost-effectiveness of installing heat meters and to extend provisions on meter accuracy, maintenance, and billing based on consumption to all customers with individual meters, including those whose meters were not required under the Regulations.

Revised Energy Efficiency Directive (2018/2002/EU)

The revised Energy Efficiency Directive (EED 2018) contains additional requirements in relation to metering and billing. This includes the introduction of the concept of a "final consumer" of heat, who may not have a direct contractual relationship with the heat supplier. Furthermore, it introduces a staggered requirement for meters to be remotely readable, changes instances where cost-effectiveness determines the requirement to install final consumption meters and increases the minimum frequency of billing or consumption information.

As part of the Withdrawal Agreement, the UK and the EU agreed to an implementation period in order to provide assurance, continuity and certainty for businesses and individuals. Amendments to the Regulations may be necessary to implement relevant requirements in the revised Energy Efficiency Directive 2018 during this period. Therefore, further consultation implementation of these provisions is likely to take place.

Pricing

The Department hold no NI specific information in relation to pricing, however, the CMA's 2018 research suggested that, on average, prices for heat networks' consumers were close to or lower than those of consumers served by alternative gas heating systems. However, their study also found that there was great variability on prices between different networks, with some providing poor value for money to their customers. Price variation is a common feature even in mature energy markets. In the heat network market, it is often dependent on the size of the scheme or the type of heat source. However, the CMA also found that higher prices in their sample were often associated with privately-operated schemes, and individually metered schemes. This does not mean that the installation of individual meters results in higher costs; instead it is likely a reflection that privately-owned schemes are more likely to have individual meters, unlike networks that are run on a non-profit basis.

The CMA's findings were consistent with the results of the 2017 BEIS Heat Networks Consumers Survey. The mean average bill price reported for properties on heat networks and GB domestic gas systems were similar and the median price suggested that heat network consumers paid, on average, around £100 less for their heating and hot water compared with non-heat network consumers. There was greater variation in pricing in the heat network sector, however, with pockets of heat

network consumers paying high annual prices, including some consumers paying more than £1,000, or £2,000, per year.

While the existing evidence does not show a systematic gap between heat network prices relative to benchmarks based on other sectors, the CMA considered that the drivers for high prices for consumers could become embedded within the market as the sector grows. Based on these considerations, the CMA recommended that "a sector regulator should require all heat networks to comply with 'principles-based' rules or guidance on pricing".

The Department agrees with the CMA's recommendation, and proposes that the sector regulator should have specific powers to protect consumers from excessive pricing and monopoly power, as outlined in the section below. Given the nascent state of the heat networks market, the Department is keen to ensure that intervention is proportionate, and that it addresses pricing issues where these arise, while imposing the least possible burdens on heat network suppliers.

Interventions to address pricing

Mandatory price transparency

Evidence from GB suggests that there is an overarching lack of transparency on prices within the sector. This makes price comparison between heat networks schemes very difficult at present and consequently can leave consumers confused about what they are paying and unable to make a fair judgement on whether their prices are reasonable. Consumers would be more empowered to challenge their bills if they were aware of, and understood, prices being charged by equivalent schemes, or wider industry trends. Besides improving consumers' trust, price transparency will aid competition, both within the sector, where different suppliers compete for a project, and against alternative heating solutions, when seeking to secure new connections.

Transparency is a key measure adopted in both regulated and unregulated markets[18], see Table 3 below. Price transparency measures have been widely effective in increasing consumer confidence and trust in many heat networks markets. In Denmark, for example, Danish companies report prices to the government, who publish them annually. Most recently, voluntary benchmarking has been introduced to aid transparency in price comparison across schemes. This also drives improvements in the cost-effectiveness of scheme operation and performance.

In markets where there is no price regulation, the effectiveness of transparency measures in protecting consumers from unfair pricing is variable. In Germany, for example, price setting and price charges must be reported and accessible online, but there are claims that the lack of monitoring has undermined its effectiveness[19]. In Sweden, companies are required by law to publish annual reports to allow price

[18] BEIS, CAG Consultants (March, 2019), International Heat Networks
[19] ClimateXChange (2018), Lessons from European Regulation and Practice for Scottish District Heating Regulation

comparison. Transparency is also promoted through voluntary initiatives, such as the "price dialogue", which was set up in 2013. This mediates price setting between suppliers and large customers. In 2019, 75% of Swedish suppliers participated in this voluntary initiative[20], presumably driven by the reputational impact of not participating.

Table 3: Summary of pricing and price transparency measures in other countries

Country	Price regulation	Transparency measures
Denmark	Yes. Allowed recovery of costs, but no profits. Heating supply law defines which expenses can be included in the heating price, and only these expenses can be included. Furthermore, it is a prerequisite that the expense is a "necessary expense".	Regulatory Authority monitors and compares prices. Companies have to notify the regulator annually about both budgets and accounts electronically.
Sweden	No. Sector deregulated in 1996.	District heating companies must ensure prices (for heating and connection, as well as how price is determined), are easily available for customers and the general public. District heating providers must also justify any price differentials between categories of customers. All price information must be accurate and clear.
Norway	Yes. Prices are capped at the price of electric heating in the same supply area.	Licensed schemes have reporting obligations including the accrued investment costs in heat production and district heating networks and annual heat sales.
Netherlands	Yes. Prices are capped at the price of gas heating.	Study found no specific requirements.
Finland	No.	Voluntary standardised supply terms and conditions, developed by industry in consultation with consumer groups.

[20] BEIS, CAG Consultants (March, 2019), International Heat Networks: https://beisgov.sharepoint.com/:w:/r/sites/beis2/224/_layouts/15/Doc.aspx?sourcedoc=%7B0E5EF8B8-229C-4ED3-98A8-4D2F33291961%7D&file=ICHNMR%20Final%20Report.docx&action=default&mobileredirect=true

Country	Price regulation	Transparency measures
Germany	No.	Government-mandated set of rights and responsibilities for district heating suppliers, including price setting and charges to be reported online in an accessible manner.

The GB heat network industry has already developed some elements of self-regulation, such as the voluntary consumer protection scheme, Heat Trust, which was established in 2015. While the scheme has grown and continues to expand, it currently provides protections to ~10% of all residential consumers served by heat networks. It publishes a Heat Cost Calculator which provides consumers with a general indication of what they could expect to pay for heating and hot water in a similar sized property that uses an individual gas boiler[21]. However, in its voluntary membership structure, it is unable to intervene on pricing among its members and, even if the Heat Trust was available to NI customers, it would never be able to require schemes charging high prices to participate. It therefore remains difficult to monitor the extent to which pricing is a concern or to implement remedies. Given the current lack of transparency and consistency in the market it is considered that such voluntary measures would therefore be insufficient in driving the behavioural change required in the industry at the pace that is needed to protect consumers in the near future.

The Department therefore proposes that the regulator should have powers to mandate and enforce suppliers to publicly disclose their fixed charges, tariffs and unit rates and provide clear explanations about how prices are set for consumers. This could be achieved either through publication of prices on suppliers' websites, by regular reporting to the regulator, or both. To ensure intervention remains light-touch and proportionate, the regulator should have the power to differentiate between types of networks when establishing the specific requirements needed to fulfil price transparency. However, it is also envisaged that the regulator will have additional powers to intervene when there is clear evidence of systematic issues on pricing, as discussed in the pricing investigation section below.

As mentioned previously, the Department does not envisage price transparency requirements to apply to networks which provide heating and cooling to non-domestic customers only, who have discretion on negotiating the terms of their larger contract agreements.

Costs can vary significantly with the nature and size of a scheme and therefore price comparisons between different schemes is not always meaningful and could lead to prices being erroneously perceived as unfair. To mitigate this, it is anticipated that the regulator will need to work with the industry to design a system for reporting,

[21] Heat Trust Calculator

monitoring and benchmarking prices that works effectively and delivers maximum benefits for consumers and suppliers.

While there may be valid reasons for price variability between schemes, depending on the size or type of the scheme or the type of energy source, the widespread lack of consistency across schemes as to how heating costs are calculated needs addressing. Heat network pricing can be particularly opaque due to the lack of consistency as to what is classed as fixed cost and what is variable. A survey carried out by Which? in 2015[22] found a wide variation in the structure of tariffs for metered consumers. Most metered consumers pay a unit rate and a single fixed charge; however, it is often unclear what costs are recovered through these charges. Furthermore, in some schemes it is possible to find just a single unit rate, or more than one-unit rate, or more than one fixed charge - for example monthly standing charges and capital replacement charges.

Variation in pricing structures is also common amongst unmetered schemes. Residents can pay a flat charge irrespective of property size, or the charge can be set according to occupancy levels, the number of bedrooms, habitable rooms or square footage. This variation can cause confusion amongst consumers and make it very difficult to compare prices.

It is therefore proposed that the regulations include provisions for the regulator to set upfront pricing requirements such as cost allocation rules e.g. on what costs should be recovered through fixed and variable charges. This will drive fair pricing, aid price transparency and reporting, and help eliminate current inconsistencies in the market.

There is merit in developers considering whole life costs during the design and build phases of new networks, and assuming reasonable consumer prices when assessing the financial viability of schemes. The Department will consider further how this could be achieved in our next phase of work, but envisage whole life cost considerations to be within the remit of technical standards certification schemes (see technical standards section).

Pricing investigations

Price transparency would allow consumers to assess if the price they pay is reasonable, by using prices of other heat networks schemes and/or other alternative heating or cooling solutions as a comparator. This information would help empower them to put pressure on suppliers to justify their costs appropriately. This would encourage industry to self-regulate prices, as a result of suppliers wanting to avoid a bad reputation. However, the limited ability of consumers to switch or disconnect from their heat network supplier remains a limiting factor to the effectiveness of this measure in isolation.

The Department therefore proposes that the regulator should also have powers to investigate networks where prices for domestic consumers appear to be disproportionate compared with systems with similar characteristics, or if prices were significantly higher than those consumers would expect to pay if they were served by

[22] Which? (2015) Turning up the heat: getting a fair deal for district heating users

an alternative heating system. This measure would allow the regulator to intervene in situations where there are systematic issues on pricing. For complaints relating to the supply of heat or cooling through a heat network or relating to the way in which suppliers have handled complaints, consumers would have statutory access to an independent redress scheme (see enforcement section).

Price investigations would be conducted with a view to identify an appropriate set of actions to lower consumers' cost. If this was not possible, the regulator could consider the suitability of switching to alternative low carbon heating solutions. For example, the regulator could require a scheme to justify their costs and where these are the cause of higher prices, recommend a performance review to identify interventions for long term cost reductions. The extent to which these interventions should be mandated would need to be based on their cost-effectiveness and their potential impact on consumers' bills. Failure to comply with mandated improvement measures could lead to penalties on the regulated party. Additionally, where there is evidence of persistent disproportionate pricing occurring, the regulator should be able to impose scheme specific pricing restrictions.

Investigations could significantly increase regulatory costs, which would then be recovered from suppliers and would most likely be passed onto consumers. Minimising such costs is in the interest of all parties involved. Hence, it is proposed that the regulator should adopt a risk-based approach to investigations and take into account all available evidence, including monitoring data on network performance, and quality of service and complaints, when establishing if an investigation is required.

A clear methodology or framework for price comparisons is needed to identify unfair pricing amongst heat networks. This will require careful consideration and further consultation with stakeholders, in addition to greater access to pricing data. It is expected that the introduction of mandatory transparency measures will help inform development of the appropriate framework for investigations.

Price regulation

Price regulation is an additional cross-market upfront measure that would prevent heat network suppliers from using their market power to charge excessive prices. This would entail securing powers for the regulator to set prices for domestic consumers, either by capping prices using alternative heating solutions as a comparison, or by regulating returns of individual companies or schemes to ensure recovery of costs plus a reasonable profit margin.

International evidence suggests that a price cap for heat networks based on alternative heating solutions could be difficult to implement, as has been the case in Netherlands, due to the level of complexity in developing an appropriate methodology to report prices and calculate the cap[23]. The research commissioned

[23] BEIS, CAG Consultants (March, 2019), International Heat Networks: https://beisgov.sharepoint.com/:w:/r/sites/beis2/224/_layouts/15/Doc.aspx?sourcedoc=%7B0E5EF8B8-229C-4ED3-98A8-4D2F33291961%7D&file=ICHNMR%20Final%20Report.docx&action=default&mobileredirect=true

by BEIS on international heat networks frameworks[24] found evidence that introducing a price cap based on the cost of natural gas has affected the ability of some schemes to recover costs. This is because the tariff calculation system does not reflect the actual costs of the heat supply, which are very different from the costs incurred when using gas boilers. This has led to costs being recovered from building owners when establishing a heat network[25].

Price-cap regulation could compel suppliers to find ways to reduce their costs in order to improve their profit margins, while ensuring consumers are adequately protected. However, these measures could also deter investors from entering the market. This could be damaging for heat networks at this point in time, as the sector is still emerging, and investment risks are perceived as high.

Alternatively, prices, revenues or earnings could be capped based on estimates of the running costs and revenue of heat network schemes, rather than in comparison to a counterfactual alternative. Regulation of profits has been adopted in some heat networks markets. In Hungary and Poland, for example, the cost profile of heat networks companies is regulated, and operators must have their tariffs approved on the basis of justifiable costs, plus allowed profits ("cost-plus")[26]. However, there are significant implementation challenges associated with this approach, particularly in respect of the heterogeneity of the heat network market, and the regulatory costs involved in reviewing tariffs for individual schemes or companies.

Developing an appropriate framework for capping prices, profits or revenues that takes into account different types of heat networks would be very complex. The Department does not consider that the existing evidence justifies such level of intervention at this point in time and nor did the CMA recommend that it was required. Instead, it is proposed that the regulator, alongside carrying out pricing investigations, should have the power to introduce rules and/or guidance to ensure prices are set in a fair and consistent way and aid enforcement against unfair pricing. This approach is aligned with the recommendations made by the CMA in its market study and the Department considers it is appropriate in light of the pricing issues that some consumers on heat networks currently face.

There is merit in developers considering whole life costs during the design and build phases of new networks, and assuming reasonable consumer prices when assessing the financial viability of schemes. Further consideration will be given to how this could be achieved in subsequent phases of work, but it is envisaged that whole life cost considerations to be within the remit of technical certification schemes (see technical standards section).

Nevertheless, as the market expands, the risk of excessive pricing for consumers may change, and, given the monopolistic nature of heat networks, price regulation may be required in the future to protect domestic consumers while ensuring

[24] Ibid.
[25] Ibid.
[26] ClimateXChange (2018): Lessons from European regulation and practice for Scottish district heating regulation

companies are able to make a reasonable return on their investment. Consequently, it is proposed that the Department should be able to direct the introduction of price regulation such as through a price cap, should evidence suggest such measures become required. It is anticipated that this would be subject to further consultation on the specifics before any such measure was introduced.

Quality of Service Standards

The CMA in its heat network market study said that measurable performance indicators and related minimum standards for service quality are an important part of safeguarding consumers. The Department agrees that steps are needed now to strengthen quality of service standards which underpin the long-term success of heat networks. However, these must reflect the size of the current market and its distinct characteristics relative to other regulated utilities.

Gas and electricity markets are well-established with infrastructure assets deployed at national level and a large customer base across which to socialise costs. The heat network market is much smaller and less well established, with infrastructure scaled to meet heating requirements at a local level. Evidence from GB suggests the market is more diverse; from small communal operators to large energy service companies (ESCo), whereas there are only a few gas and electricity suppliers in NI. This has practical implications for the application of any regultory regime. It could also have significant cost implications, particularly for consumers on small schemes where the benefit of a regulated service may be outweighed by the implementation costs that operators may seek to recover from them.

The CMA in its study also said that consumers on heat networks should have comparable levels of service and protection as consumers in other regulated utilities, such as for gas and electricity. This customer service provision includes information about their service, notice of any system interruptions, addressing faults and emergencies within an agreed timeframe, dealing with customer complaints, having access to independent redress and protecting vulnerable consumers.

This recommendation is agreed in principle. As consumers on heat networks have long term contracts and cannot readily switch heat supplier as consumers of other energy services can, it is essential to ensure that their rights are protected and that they have recourse to independent arbitration services such as those offered by the Consumer Council. Additionally, it is expected that specific measures will be required to protect vulnerable consumers on heat networks, for example, to ensure that information about their heating is accessible. However, the Department recognises that more complex standards are likely to increase compliance and enforcement costs. The Department will be considering further how to maintain an appropriate balance between robust consumer protections and associated costs.

The Department is considering a range of options for driving up consumer protections through improved service standards. This includes allowing a regulator greater flexibility to determine appropriate standards for the industry.

A voluntary approach is limited in a number of ways. It does not apply to all heat networks, so the consumer experience will not improve uniformly and at the same rate across the whole industry. It also does not come with enforcement powers as seen in equivalent arrangements for other utility customers.

Mandating minimum service standards in regulations would be more precise, and therefore potentially more certain for operators, and could achieve a uniform rate of improvement across the sector. However, it could give rise to higher compliance costs and limit scope for innovation.

An outcome-based approach would be more flexible, can encourage alternative approaches to compliance and encourage operators to take more responsibility and be more adaptive to changes in the market[27]. The regulator may wish to provide more prescriptive standards or examples where required to underpin the expected outcome. It would also allow the regulator to tailor its approach to enforcement.

It is considered that an outcome-based approach to achieving strengthened customer service provisions for heat network consumers will ultimately lead to lower compliance costs and support sustained investment in the sector. This approach will allow suppliers to tailor their solutions to the specific needs of their consumers and their businesses, whereas prescriptive requirements may, in some circumstances, increase costs without delivering the expected benefits.

The Department therefore proposes to give the regulator powers to set outcome-based quality of service standards in order to improve consumer protections. It is envisaged that this type of approach would allow flexibility both in terms of implementation and enforcement, depending on the nature and size of heat networks, and draw on service standards such as those developed by Heat Trust, along the lines set out in Table 4 below.

Table 4: Outcome-based quality of service standards

Desired Outcome	Example Measure
Consumers are clear about the terms and conditions of their heating service (including many of the issues identified below)	Heat supply agreements
Consumers understand when there will be a planned interruption to their supply, and required periods of notice their supplier needs to give them	Outages and Notice periods

[27] BEIS (2018), Goals-based and rules-based approaches to regulation

Consumers understand who to contact to report faults and emergencies and what response times they can expect	Customer helpline
Consumers understand how to make a complaint and what response times they can expect	Complaints handling policy and procedure
Consumers understand how to access independent arbitration services such as the Consumer Council if they are unhappy about their service or how a complaint has been handled	Access to independent redress
Consumers understand who is eligible for guaranteed service payments and in what circumstances, the level of any compensation offered and when it will be paid	Compensation arrangements
Consumers understand how heating supplies will be assured in the event of a supply or network failure	Step in arrangements
Vulnerable consumers are identified and clear about available support, including protection they will be offered in the event of a supply failure	Vulnerable/priority consumers register

Technical Standards

The quality of the design build and maintenance of a heat network can significantly impact the network's performance and reliability. The CMA recommended that technical standards should be part of the broader regulatory framework. A well designed, built and maintained network can deliver a reliable and efficient service for the end consumer. The consumer should be largely unaffected by the day to day maintenance of the network and feel confident in their heat supply. Conversely, poorly designed, built and maintained schemes are likely to create inefficient and less reliable networks, with more outages and potentially higher consumer bills. This not only affects the end consumers on that network but negatively impacts the wider reputation of the heat network market.

At present, standards vary considerably across heat networks in terms of the quality of the design, the build and/or the ongoing maintenance of the infrastructure. In addition, the implications of a network's design and build can reach well beyond the network initially envisaged. For example, pipework can have an extended lifecycle of up to 60 years. A well designed and built network may be able to capitalise on existing pipework to support network expansion as strategic growth opportunities materialise. On the reverse, poorly installed pipework will be costly and complicated

to replace, leading to ongoing inefficiencies in the initial network and lost expansion opportunities.

Existing codes of practice, guidance and standards for heat networks

There are very few formal technical standards for heat networks in the UK. There has been significant work by parts of industry in GB to develop voluntary approaches. The heat networks industry, with UK government support, developed a voluntary Code of Practice (Heat Networks: Code of Practice for the UK; or 'CP1'). This Code was published by Chartered Institution of Building Services Engineers (CIBSE) in July 2015 and was produced as a joint project between CIBSE and the Association for Decentralised Energy (ADE). It covers many aspects of heat networks and offers guidance on their design, installation and operation. It advises on minimum requirements and best practice across the development cycle of a heat network incorporating checklists and evidence packs to support compliance of the Code on schemes. The Code is designed to be applicable to both new and existing buildings. It is now well established within the UK heat network market and used in some contracting for network builds. It is designed to be applicable to both new and existing buildings, and is currently being updated following industry consultation and review.

Internationally, there has been an adoption of industry developed standards, for example:

- In Denmark, technical guidance is well developed but not mandated. They are maintained by industry and the Danish district heating association. Standards are usually included in contracts.
- In Germany, there are seven groups of technical standards which are non-binding, including customer installations, operational safety and security, heat metering and billing, heat production and heat distribution. These are reported to be widely adopted by operators and they help to maintain high standards.
- Both the Netherlands and Norway have a regulated heat network market, but neither country seems to have mandated technical standards.

Rationale for mandating technical standards

The Department has considered the extent to which regulatory intervention is required on technical standards. The experience from more established international heat network markets suggests that a voluntary approach remains a viable option.

Such an approach could be strengthened by the introduction of a voluntary compliance scheme to monitor practice against the Code. A voluntary approach would mean developers could choose whether to participate in the scheme, reducing directly related costs for those opting out and therefore across the industry as a whole. However, this would also mean that a significant number of schemes could be expected to remain unchecked in terms of technical standards with continued risk of costly interventions being required at a future date.

The CMA was clear in their view that standards needed to be mandated in order to ensure compliance across schemes and protect consumers. There are several reasons why the Department agrees a mandated approach may be more appropriate. Our heat network market is in a very early stage of development compared with many comparator countries, including GB. Mandatory standards would ensure that the new, larger schemes are designed and built to a high quality. A voluntary approach could continue driving up quality among the market leaders but is likely to have a minimal impact on less engaged developers. A contributing factor is the range and number of players potentially involved in the design, build and operation of a network. In many instances, the same party will not be involved throughout the process. This means that the incentives may be missing in the earlier stages of the development to get the design optimised to meet an end goal of positive consumer experience and fair bills.

The Department does not consider it reasonable for some consumers to be exposed to avoidable problems on new networks because of a developer opting for a lower cost but lower quality approach to standards. Mandating requirements or outcomes would enable contracting between the different parties to set out rigorously what is expected in line with national legislation.

Standards have wider benefits. They can accelerate innovation, enhance safety and offer assurance to consumers; they can enhance efficiency, reducing costs and facilitating growth, for example, by allowing inoperability between systems and products, and removing barriers to new participants. Standards are designed to set out clear objectives and can be used to support or complement legislation. A robust standards development process involves open consultation with stakeholders to build consensus based outcomes and gives agreed standards and wider market acceptance.

Voluntary standards offer a flexible, adaptive and collaborative alternative to regulation, or can be used in support of regulation or to demonstrate compliance with regulation, by providing common terminology, guidelines and good practice developed by and for stakeholders.

There is a continuing need for further support for training and skills to enable the heat network market to respond to the growth sought. The introduction of mandatory technical requirements can help to drive accreditation processes, in turn encouraging wider roll out of training as parties compete to offer support to the market. In more established markets, that need can be less pronounced. In addition, comparative utility and service markets in NI do have mandatory technical standards. The existence of such standards can enhance a market's reputation and build investor confidence: therefore, they would be advantageous to heat networks.

Development of mandatory technical standards

There are some key considerations the Department would need to make applying to any mandatory technical requirements:

It is not considered that it is practicable to impose retrospective minimum build requirements on those networks already operating. However, there is merit

in considering whether there is benefit to phasing in minimum technical operating standards where these could be reasonably expected to improve end users' outcomes. The Code of Practice, for example, is designed to include elements which may be used to drive improvements post the design and build phase. These include:

- **The need for technical standards to take account of the development of different types of heat networks to suit local circumstances** (for example, the development of low and ambient temperature networks) and not deter new operators from entering the market.
- **The need for technical standards to apply proportionally to scheme size/capacity**. There is benefit in exploring the CMA's recommendation that any standards should be outcome focused so as to reflect the range of network circumstances, including potential cost implications for the end consumers, and to support innovation.
- **The need to avoid unfairly burdening the smallest operators, for example single building communal heat networks**. While our starting assumption is that all new heat networks would be subject to mandatory standards, the Department is interested in how this would be applicable to expanding networks and whether exemptions or reduced levels of requirement may be appropriate in some circumstances. Development and use of technical standards can increase upfront costs, even though they could deliver savings for suppliers and consumers in the long term.
- **The need to identify the key areas where minimum standards are most appropriate**. It is particularly important for some elements of heat network infrastructure to be of high quality from the start, either due to their impact on efficiencies or their long lifecycle.

There is a range of approaches to developing technical standards, with differing levels of government intervention.

One option could be to adopt the existing ADE-CIBSE Code of Practice (CP1) similar to GB as the agreed good practice specification to which parties would have to demonstrate compliance. This would have the advantage of building on an existing and recognised approach to network development, and would avoid the added cost and time required to develop an alternative specification. In this scenario, the Department would need to consider whether there was a role for the regulator or the Department in maintaining an oversight of the Code and identifying when updates were required.

Another option would be the development of a Publicly Available Specification (PAS) by the British Standards Institution (BSI). A PAS closely resembles a formal standard (BS, EN or ISO) in structure and format but has a different development model and is often produced in response to a more urgent need, typically developed within a year. PAS development is guided by subject experts who build consensus. Once developed, a PAS goes through a public consultation stage.

This route would build on an approach already understood by many developers and minimise the costs and time necessary to develop new national standards. A PAS for

heat networks could build on the work of the Code of Practice (CP1) and the resulting document could evolve further through regular reviews. A PAS would also move closer to technical standards seen in other markets, while maintaining the industry's core role.

The most prescriptive option might be to develop national standard(s) for heat networks building on those British Standards (BS) and other standards already produced to ensure the development of a full breadth of the CMA's recommendations for design, build and operation standards. Under this approach, BSI would work with industry experts to develop the standards, again building on work done to date. British Standards can individually take over 18 months and are reviewed on a five-year cycle. BS standards can in time be put forward for adoption as European Standards (EN) or international standards (ISOs), helping to position NI as a market leader and support the export of products.

This latter approach would likely be a lengthy process over a number of years, and could be seen as rather prescriptive at this stage of the market's development. The Department considers that it could be developed in the future, in parallel with one of the alternative approaches above, to enhance and further disseminate the outcomes of these approaches.

Approaches for mandating technical standards

The CMA suggested that standards were embedded through building regulations and planning guidance at a national level. The Department is not persuaded that Building Regulations are the most appropriate vehicle for this. Building Regulations apply when work is being carried out on a building and do not apply on an ongoing basis for a heat network. Building Regulations would therefore not help to improve the technical standards of operating systems in the way that would be most helpful to improve standards for consumers across the sector.

Regulated certification schemes could be mandated to ensure that regulated entities must demonstrate their network was designed and built in compliance with technical standards in order to meet authorisation requirements. The Department anticipates that this would be achieved through the development of assurance schemes and considers this approach is suitable, because it would allow such schemes to identify the best way to demonstrate compliance, potentially tailoring processes to the individual needs of specific type of heat networks. Moreover, the industry would have greater opportunity to contribute to the development of such schemes and shape them to ensure they meet their needs.

However, it would be expected that certification schemes would be able to adequately and consistently assess whether heat networks have met the relevant technical standards required at design and build stages, respectively. The Department therefore sees benefit in considering a body having responsibility for monitoring organisations offering a certification function. This would help to maintain an independent oversight of the process and encourage competition, between providers. It would also enable multiple organisations to become accredited to certify that a network is compliant with the standards and it would encourage competition

between certification organisations, driving down the compliance costs for individual schemes.

Using such schemes is likely to be a more efficient and appropriate route to monitoring compliance than, for example, requiring the regulator to develop the technical understanding and resource to oversee compliance directly.

Demonstrating compliance with technical standards would be required for new build networks only. The Department will be considering how best to ensure this incorporates significant extensions to existing networks and whether operational requirements should be applied to existing networks in due course.

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Rights and powers

Utilities such as gas, electricity and water companies have been given special status in legislation as 'statutory undertakers' because of the essential roles that they have in delivering on the basic needs of society. Being a statutory undertaker entitles them to exercise a number of rights and powers that facilitate their commercial operations. Stakeholders have indicated that these rights and powers are also important in giving investors greater certainty that projects will proceed on time and on budget.

The Department will work with heat network developers and operators as well as with local councils and investors to identify the powers necessary for heat network development. While this is not an issue at present it will be important to ensure that a lack of equivalent powers to other statutory utilities does not hamper market growth and investment and limit a heat network's ability to respond to critical consumer issues, such as being able to access piping for maintenance when there is a system failure.

Further policy development is required in this area, however, the Department would propose to introduce the majority of any new rights and powers identified through primary legislation, and that they will be accessible by licensed heat network developers and operators (under the preferred model this will be an optional licence available to any heat network company that requires it, and can prove it will use the powers for the purposes of heat network development). The process by which licences are granted by the regulator will ensure that these heat network companies are appropriate entities to be given these rights and that they are able to pay compensation in circumstances where the rights and powers are used improperly. In addition the Department is proposing that the regulator will also be responsible for investigating whether a company is systemically abusing their powers and will be able to take enforcement action against the company if necessary (see proposed regulatory approach and enforcement powers sections).

Access rights

Constructing a heat network often involves installing equipment across or under privately held land and, in the period following construction, the heat network will typically require ongoing access to sites in order to maintain equipment or respond to equipment failures. Currently, heat networks are required to negotiate these arrangements on a voluntary basis and this can often slow project development or, in extreme circumstances, can significantly increase project costs if a landowner demands high prices from a network in return for the right for the network to install equipment on their land.

Considering the length of time for which heat networks are in operation - the pipework can last typically for 50-60 years – the Department would be in favour of

granting easement arrangements for heat networks rather than wayleaves. This is because easement rights last for longer time periods and give more formalised access rights across the required land. It is envisaged that these easements powers would primarily be used to install pipework across land and our proposal is that any powers are designed with that primary purpose in mind. These easement powers would also allow heat network operators greater flexibility in responding to any emergency issues in pipes that cross over private land. The Department envisages a process similar to that operated for the electricity companies where the application for the easement would be made to the responsible Department, who would also consider any objections to the granting of it. If the easement was agreed, then the reasonable price for the land would be determined either by the parties or if necessary, by the Lands Tribunal which is the judicial body responsible for land disputes.

Street works

In addition to access rights, statutory undertakers have greater powers to excavate the roadways to develop their assets. Non-statutory undertakers who wish to carry out street works (which includes heat networks) have to apply for Street Works licences. These licences are often limited to specific circumstances and give licensees less power than an equivalent statutory undertaker. This can lead to higher prices for such street works activity. Statutory undertakers in comparison are able to apply to local authorities for street works permits which gives them more general powers to carry out their activities.

Statutory undertakers are given these powers because they provide essential services and need to be able to excavate the roadway to install, and more importantly, to maintain their assets. Because heat networks provide services of equivalent importance, in that they provide heating and cooling to homes and businesses, the Department will engage with the Department for Infrastructure to ensure that the requirements in relation to these powers are suitable for the heat network sector.

Further detail is given in the section on our proposed regulatory approach but, subject to further engagement, it is considered that companies that are licensed to build or operate heat networks should be given the status of a statutory undertaker through the licence issued by the regulator. This will let them apply for street works permits on the same basis as statutory utilities.

Bringing heat networks within the roadworks structure for statutory undertakers will also improve the ability of local authorities to coordinate excavations and other works in their area.

Rights to lay pipes under the roadway

The majority of heat networks have to install their pipes beneath the roadway in order to connect the generation of heat to the consumer. The legal rights to lay and keep assets under the roadway can be complicated and feedback from the heat network industry in GB have confirmed that establishing and then confirming the legal position can occasionally represent a significant cost to heat network

developers and can also delay projects. In comparison, the water, electricity, gas and telecoms suppliers have been given the statutory right to install and maintain their assets in the soil beneath any roadway.

The Department will engage with the Department for Infrastructure (DfI) with a view to considering giving equivalent powers to licensed organisations that build or operate heat networks in order to reduce the uncertainty and costs of developing the networks. These powers will be strictly limited to soil that is already beneath roadways and so will not represent a loss to landowners. This proposal will not represent a reduction in scrutiny of heat network plans as licensed heat network entities will still have responsibilities similar to gas network companies to notify DfI Roads in good time before carrying out their operations under the roadway.

Decarbonisation of heat networks

The UK Government set a legally binding target to meet net-zero carbon emissions by 2050. NI has its part to play in order to achieve this target. This demonstrates our clear commitment to combating climate change.

Heating is responsible for 24% of our emissions and meeting our net-zero ambition will require decarbonising nearly all heat in buildings. Heat networks are an integral technology to achieve this target because heat networks are:

- Uniquely able to unlock otherwise inaccessible sources of larger scale renewable and recovered heat such as waste-heat and heat from rivers and disused mines;
- Particularly cost-effective when deployed in dense urban areas;
- Able to be retrofitted with different heat sources so that they can be progressively decarbonised over the period to 2050[28].

There are fewer than 100 heat networks in NI with the vast majority of those providing communal heat generated from fossil fuels, mainly oil and natural gas.

As we move towards 2050, meeting climate targets will require a transition from fossil fuel dependent networks to lower carbon alternatives such as large heat-pumps, hydrogen, geothermal or waste-heat recovery.

Experience from GB has shown that one of the major reasons why heat network projects do not install low-carbon technologies at the moment is because of the up-front capital cost. The Department intends to use the proposed market framework to reduce carbon emissions from heat networks and to support the growth of larger low carbon heat networks going forward.

Consumer information

Consumers on a heat network should be able to access information on what heat sources are generating their heat, so that they can better understand their own

[28] The Helsinki Heat Network is an example of where a large-scale gas-based system has integrated large water-source heat pumps to reduce carbon emissions. DECC (2016)

impacts on the environment. As part of this market framework, requirements will be placed on heat networks to make information available on the energy performance of networks and the share of low-carbon heat sources that they use.

Building Regulations

The Department understands that reaching our net-zero target will require a mix of measures to drive decarbonisation and that, where appropriate, regulation to achieve carbon savings should be introduced.

Regulation of decarbonisation

Regulation of the carbon emissions of heat networks would involve setting a maximum carbon emission standard in future, which regulated heat networks would be obliged to meet. This would be primarily for the larger district-scale heat networks because, with their larger scale and resources, they are better able to manage the transition of installing new low-carbon generation sources. Any such future standard would be set to enable progress towards NI's 2050 net-zero target and would be in line with other measures to decarbonise the broader heating system. This would be done in order to ensure a competitive playing-field across the broader heating system.

Assessment of a heat network's carbon emissions would be based on each heat network reporting its heat source technology to an appropriate body. The Department will consider whether this role sits best with the same regulator responsible for consumer protection or whether another body would be more appropriate.

Waste-heat sources

Finally, in order to facilitate the development of lower-carbon heat networks now, the Department is exploring how best to encourage commercial and industrial sources of waste heat to connect to local networks. In order to better utilise this low-carbon and low-cost resource, and meet the scale suggested by these kinds of studies, the Department will work with stakeholders to assess whether the implementation of the environmental permitting rules could be improved and to assess whether regulations could be amended to ensure that more sources of waste heat are encouraged to connect to heat networks.

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Next steps

The Department would welcome your views on the proposals for future arrangements for the heat network market, particularly in relation to the need for greater consumer protection and the proposals to support sector growth. The consultation closes on 13 February 2022.

This consultation includes our thinking for the new legislative arrangements for the heat network market. Responses received will be used to help policy proposals, and the Department will continue to discuss emerging issues with stakeholders, and work with stakeholders including the Utility Regulator in identifying the most appropriate regulatory body to undertake the regulation of heat networks in Northern Ireland.

Following the consultation, the Department will make arrangements to ensure that suitable agreements are put in place to allow the proposed Westminster legislation to also apply to Northern Ireland. The Department anticipates that there may be grounds for transition arrangements for some aspects of the requirements and is keen to hear your views on this.