Scottish Renewables

Supporting & De-risking Investment in District Heat Networks
Proposals for Scottish Government

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1. Introduction

Context

The Scottish Government has been working on a package of regulation for the district heat and communal heating sectors for a number of years with the aims of accelerating deployment to meet carbon and fuel poverty targets as well as improving standards and customer service. We welcome this ambition and would like to see Scotland capitalise on the good foundations laid through Scottish Government schemes such as the LCITP. The full benefits of district heat networks will only be realised if we move from today's patchwork of small-scale networks, serving a handful of buildings on a University Campus or Hospital, to a future of large city and town-wide networks. These will enable the economies of scale required to reduce risks and costs and enable a more diverse mix of heat inputs; it is only at this scale that district heat networks (DHN) can achieve the key role that they play in most energy decarbonisation scenarios.

We welcome the Scottish Government's decision to revisit how it could support the growth of the sector in its spring 2019 consultation[1] and subsequent regulation working group. Scottish Renewables and its members were previously disappointed to see the second Scottish Government consultation in 2018[2] drop two key measures that would help the sector grow: exclusive concessions and obligations to connect. We believe that these measures are vital to enable more projects to proceed and to attract investment. They will also help the Scottish Government meet its objectives to direct heat network development in a strategic manner. Implementing the regulatory package as currently proposed (to introduce a Scottish DHN license and consent) risks introducing more regulatory burden without commensurate benefits, potentially harming investment.

[1] Scottish Government, 2019, Energy Efficient Scotland: Consultation
[2] Scottish Government, 2018, Second Consultation on Local Heat & Energy Efficiency Strategies & Regulation of District and Communal Heating

The purpose of this discussion paper is to set out in more detail how key these regulations could be implemented within existing Scottish Government powers and responsibilities. The ideas have been inspired by discussions with colleagues in the UK as well as Denmark and the Netherlands where a similar regulatory approach has been implemented. Both of these countries are subject to European competition law and the ECHR in the same way as Scotland and the UK and both have taken forward policies similar to those contained within this paper.

The Scottish Government has recently declared a 'Climate Emergency' in recognition of the severe impacts that climate change will bring and the little time left to reduce emissions in line with the goals of the Paris Agreement. Heat networks are a proven means of scaling up the supply of low-carbon heat to our building stock, one of the most difficult challenges on the way to net-zero emissions. Implementing the proposals in this paper would provide a transformational boost to the heat network market in Scotland and send a signal that the Scottish Government is serious about action, following its recent positive announcements.

2. Proposals Overview

The key elements of the regulatory package, building on the original Scottish Government proposals, are summarised below. These should be thought of as a linked set of measures - removing one element will reduce the effectiveness of those that remain.

1. Low-Carbon Heat

Policy support is required to enable heat network projects to be built using low-carbon heat from day one. We recommend the following measures:

- **Continued revenue support:** through the RHI (or similar) to make low-carbon heat competitive against natural gas where a DHN is serving existing buildings.
- **Capital funding:** in addition to the above Scottish Government should provide capital funding for the civil engineering (boreholes, water abstraction, energy centre construction) that are needed to make low-carbon heat inputs competitive against gas where DHN serve existing buildings.
- **Phase out gas in new builds**: follow the UK Government lead and implement this as soon as possible through Scottish building regulations and require all buildings to be heat network ready (e.g. low-temperature heating, plant room space).

2. De-risk Demand (existing buildings)

Existing buildings are an important market for heat networks both in terms of growth and carbon reduction and policies will be needed to de-risk demand:

- **Facilitate connections by introducing a legal power or necessary wayleave for a district heating connection:** that would require buildings (within an LHEES DHN zone) to connect to a heat network or grant licensed operators a right to connect a building to their network.

3. De-risk Demand (new buildings)

New-builds also provide important opportunities to integrate or connect to heat networks. Scottish planning policy should be revised to direct connections to DHN as much as possible within LHEES DHN zones:

- **Integrate LHEES into LDPs:** SPP should clearly state that LHEES DHN zones and the new-build developments flagged within them (as well as potential sources of heat) are to be integrated into the LDP at the outset and when allocating land.
- **Planning obligations:** the next version of SPP should clearly direct planning authorities[3] to use planning obligations to require connections to DHN networks for suitable new developments located within LHEES DHN zones.
- **Central support for Local Authorities**: the Scottish Government's *Energy Efficient Scotland* 'delivery mechanism' should support local authorities in the vetting and negotiation of planning applications and the setting of DHN obligations.

4. District Heating Concessions

Concessions should be created and awarded through competitive tender, granting exclusive rights to operate heat networks within LHEES identified DHN zones. These concessions should comprise of two core elements:

a. **An exclusive right for the holder to operate new heat network projects within the zone.** For example, projects coming forward from new-build developments or individual building owners. This would be enforced through the DHN license which could stipulate that holders are only allowed to operate new heat networks in LHEES DHN zones if they hold the corresponding concession.

[3] In a similar way to the London Plan (see sections 5.5 and 5.6)

b. **LHEES delivery agreement:** Scottish Government should create a standardised approach to direct local authorities to work in partnership with private sector partners to jointly deliver heat network opportunities identified within an LHEES zone. These agreements should also include a procurement framework to facilitate other public bodies contracting with the concession holding organisation.

5. Public & Private Concession Holders

Scottish Government should direct local authorities to form joint vehicles or partnerships with private sector firms to develop and deliver projects within all or part of an LHEES identified DHN zone/concession (see section 6). A joint approach that draws on the strengths of public and private sector organisations will have the best chance of delivering LHEES-identified DHN projects.

6. Other incentives

There are a number of additional barriers holding back the growth of low-carbon heat networks in Scotland that must be addressed if the sector is to grow:

- **Create a standard DHN project appraisal tool:** for the LHEES process that evaluates project viability under a range of scenarios to ensure that a wide net is cast at the outset of project scoping.
- **Public subsidy:** to cover the cost of any obligated DHN connection (in existing buildings) where this exceeds a building's existing heating system (see section 7). Consideration should also be given to how support could be provided to key infrastructure such as extensions and spine networks.
- **Business rates:** currently penalise DHN more than mains gas heating – this should be rectified.
- **Permitted Development & Wayleave rights:** for DHN construction activity; this would remove the uncertainty of gaining required permissions to install district heating/cooling pipework under roads and public land, and thereby reduce project risk. This would be in addition to the necessary wayleave proposals outlined above.

7. License

The proposed Scottish Government DHN license should specify technical standards and customer service principles. In addition, we propose that it confers:

- **Exclusivity in DHN concession areas:** the license should stipulate that the holder is only allowed to operate new heat network projects in DHN zones if they hold the relevant concession (alternatively this could be delivered through the DHN consent process). It should also confer permitted development, necessary wayleave and general wayleave rights to facilitate and de-risk heat network construction activities.

2.1 How could it work?

Scottish Ministers pass requirement for DHN operators to have a license to operate in Scotland

LAs produce LHEES, identify potential DHN projects and designate DHN zones (these are only binding, through the license, once a concession for the zone has been awarded).

LAs supported by Scottish Government to idenfity concession areas within DH zones. Concession agreement created outlining:

- Geographical extent and time duration (e.g. 20 – 30 years)
- Identified potential DHN projects with initial anchor load engagement
- New build development opportunities, read across to the next LDP
- Conditions regarding connection and heat pricing, decarbonisation of heat supply and fuel poverty.
- Procurement framework for public bodies to contract with concession organisation

LA runs competitive tender for DHN concession. Once awarded this activates requirements for licensed operators to hold the relevant concession to be allowed to operate new networks within a zone).

Proposals for development

DHN projects come forward in a number of ways:

- LHEES identified projects, developed by LA and delivered by concession holder
- New developments nearby to or built with a heat network
- Existing buildings: building owners decide to invest themselves
- Existing DHN extensions

Within active DHN concession	**Outwith active DHN concession**
Only the Concession Holder is licensed to operate new projects within the zone. Scottish License requirements direct technical and consumer protection standards. Concession holder benefits from powers to connect and is subject to additional concession conditions regarding pricing, carbon, fuel poverty etc.	Any licensed DHN operator allowed to operate new schemes. Scottish License requirements direct technical and consumer protection standards.

2.2 Impact on the market

Our members support the Scottish Government's objective to grow the role of heat networks in Scotland[4] and we have designed this package of recommendations to address current risks and barriers facing both the creation of new networks and their growth in strategic locations that can support decarbonisation and fuel poverty objectives. At present, heat networks emerge in Scotland via a number of routes. The table below summarises these different routes and how our proposals could support and stimulate more activity.

Potential Impact of Proposals on the Heat Network Market

Current market	Impact of proposals
End-user driven (retrofit): a University or housing association with multiple buildings looks to fit a system to serve these more efficiently. Smaller networks have also been built in rural areas.	Exclusive concessions will ensure that new networks coming forward in DHN zones are operated by a single ESCO which will facilitate interconnection, expansion and economies of scale.
New build: housing developments or large non-domestic buildings will sometimes choose to fit DHN.	Tightening requirements in planning policy for developments to consider DHN (particularly in DHN zones) will increase the number of these installing or connecting to heat networks, helping to grow the market.
Local Authority led: LAs have been supported by the Scottish Government to identify and deliver heat network opportunities. These can cover existing and new builds and a number of low-carbon networks are/have been built (e.g. Glenrothes, Clydebank) with the help of LCITP funding. However, LAs do not have the capacity to deliver projects at scale (e.g. several at once).	The LHEES process, supported by the additional recommendations in this paper, should ensure that more of these types of project (typically serving existing buildings) get built, further expanding the market and laying the foundations for area-wide networks in strategic locations. Policies to reduce demand-risk (powers to connect, exclusive concessions) will help make more of these projects viable.
Expansion of existing schemes: Scotland has a limited number of established and large heat networks and some of these have expanded slowly over the years (e.g. Aberdeen, Dunfermline).	Exclusive concessions and powers to connect will help existing networks expand, as will wider measures to de-risk the sector.

It is important to note that in the absence of both the RHI and grant funding such as the LCITP, new heat network projects serving existing buildings and using sources of low-carbon heat like heat pumps and biomass will not be financially viable. It is imperative that the Scottish and UK Governments work together to resolve this policy uncertainty.

[4] Scottish government, 2019, Energy Efficient Scotland: consultation

3. Low-Carbon Heat

To meet Scotland and the UK's climate change goals we need to be building low-carbon heat networks today. DHN have to compete on cost with heat from natural gas as they are usually built in on-gas areas. Without heavier taxation of gas (to reflect carbon costs) it is very difficult for low-carbon heat inputs to compete as in most cases the heating cost of a heat pump or biomass driven DHN will be slightly higher than a gas driven one. This reflects the need for additional capital works (e.g. boreholes for ground source heat pumps, water access for river source) and the fact that these technologies are at an early stage of commercial development in the UK. It is also because a gas driven heat network will use a Combined Heat and Power (CHP) plant whose electricity generation in effect subsidises the heating costs; it is also worth noting that in all cases heat from natural gas does not currently bear the costs of its carbon pollution (through taxation, as happens in the electricity sector). For these reasons, the majority of heat networks built in the UK today are built using gas CHP.

Scotland has taken a lead in rolling out low-carbon heat networks to both existing and new buildings (for example the Queens Quay, Caird Park in Dundee and the Glenrothes schemes using heat pumps and biomass) thanks to the capital support offered through the Low Carbon Infrastructure Transition Programme – LCITP) which can be combined with payments from the Renewable Heat Incentive (RHI). The LCITP is coming to a close and the RHI will end in April 2021 – **very** soon in terms of commercial project delivery. Without this support it will not be possible to construct low-carbon heat networks if they must compete with heat from natural gas, which will be the case for most new projects identified by LHEES serving existing buildings.

New build & retrofit

The use of low-carbon heat in new-build developments is helped to a small degree by building standards, which impose tighter energy and carbon performance requirements that may encourage building designers to look at heat network options. In England and Wales, the recent Government announcement that gas will be phased out of new-build housing developments should drive the adoption of low-carbon heat networks, as gas will no longer be an option.

The uncertainty of financial support (RHI and LCITP) will mainly impact heat network projects looking to serve existing buildings. Building standards impose no requirement to use low-carbon heat and therefore any heat network must compete on price with natural gas to attract customers. Subsidy is therefore required to cover the additional upfront costs of renewable heat sources (e.g. heat pumps and biomass) in the absence of higher (carbon) taxation of natural gas. It is these projects that the proposals in this paper are aimed at accelerating, and it is therefore crucially important that future funding be clarified by both the Scottish and UK Governments.

Financial support

It is vitally important that the Scottish Government clarifies what support there will be for low-carbon heat generation feeding heat networks beyond 2021 if future DHN projects in retrofit situations are to be low-carbon.

We make three recommendations to Scottish Government:

- **Continued revenue support:** through the RHI (or similar) to make low-carbon heat competitive against natural gas where a DHN is serving existing buildings. Tariffs could be lowered slightly and still contribute to making heat pump and biomass projects economically viable.

- **Capital funding:** the Scottish Government could provide capital funding for the civil engineering (boreholes, water abstraction, energy centre construction) that are needed for heat pump installations. It would still be challenging for heat pumps to compete against gas/CHP however.

- **Phase out gas from new-builds:** the Scottish Government should follow the UK Government's lead and phase out gas for new-build homes and explore tightening carbon standards for larger buildings too. This would make low-carbon heat the default option for DHN serving new developments and would not require public funding.

There is an urgent need to resolve the policy uncertainty regarding low-carbon heat for DHN – a number of tenders have come forward in Scotland for new projects to serve existing and new buildings that are specifying low-carbon heat, but which cannot be built before the end of the RHI. These projects will likely install gas heating instead, locking them into higher carbon infrastructure for 15 – 20 years (until the equipment needs replacing).

Decarbonisation requirements

All new heat network developments should consider how they will reduce their carbon emissions in future and this should be included as part of the conditions in any DHN concession (see section 5). Mandatory obligations for low-carbon networks should be driven in new-builds through changes to building standards (by following the UK Government decision to phase out gas in new homes from 2025).

Mandatory standards regarding the decarbonisation of networks serving existing buildings should not be introduced until the uncertainty regarding future funding (RHI and LCITP) is resolved. Any obligations implemented in the absence of such support would make projects unviable.

4. Addressing Demand Risk (existing buildings)

4.1 Introduction

One the key problems facing heat networks is that the uncertainty about whether connections to buildings (providing demand for heat) will happen and that they will occur at the point envisaged in a business plan. Customers are vital to the construction of new networks and extensions, but many may prefer to wait until the network is constructed before signing up – preventing that very construction from taking place.

The proposal for an obligation to connect some existing buildings to heat networks, subject to conditions, was set out in the first Scottish Government consultation of January 2017. It is our members' view that some form of this proposal is an essential component of any regulation to enable the market to grow by enabling projects to proceed, whether led by the private or public sectors. Obtaining agreement from large heat users to 'anchor' a new system is one of the single biggest challenges preventing the creation of new heat networks. Regulation can help overcome the unfamiliarity with the technology, perceived risk and loss of control that often prevent agreement in cases where the heat network will provide a similar or better heat service to the end-user.

Visibility and confidence in potential future customers will also enable heat network developers to take account of future expansion at an early stage and ensure that initial infrastructure is future proofed (by sizing for future anticipated loads). More broadly this measure will help further de-risk investment into the sector, lowering the costs of capital and make more projects viable.

The two key objectives to address demand-risk should be:

- Help secure initial connections to anchor loads
- De-risk connection of future loads to enable upfront investment (future proofing)

4.2 Scottish Government proposals

Paragraphs 60 and 61 in the 2017 Scottish Government consultation set out, in general terms, a proposal 'to allow public authorities to direct buildings to connect to district heating'. This power was to be applied in relation to existing buildings, with an alternative approach based on the planning system for new buildings and developments.

Legal concerns

The 2019 consultation sets out Scottish Government concerns that such obligations 'for either homes or businesses – would require strong consumer protections to balance the associated risk'. It also notes that the obligation 'could give rise to a range of legal issues in connection with compliance with the European Convention on Human Rights, their relationship to reserved matters in respect of consumer protection and including competition law competence of the Scottish Parliament and State Aid regulations'.

The original proposal upon which this legal advice is based did not define in detail how such an obligation could be implemented in a manner a that does not infringe on these laws and rights. We set out below suggestions for how this could be done, borrowing from practice elsewhere in Europe.

4.3 Facilitating connections

Danish approach

The Scottish Government scoping proposal (in the 2017 consultation) does not define in detail what a 'connection' to a district heat network would entail, with the consultation suggesting that it could be both a

physical connection *and* a requirement to draw and use heat from a network. In Denmark, where such obligations have been used for three decades, the legal requirement is to have a physical connection, or pay the heat network standing charge. This creates flexibility for building owners who are free to install a different heating system if they wish (e.g. an individual boiler) although with the regulations designed to encourage well planned, economically viable district heat network projects in practice they have little incentive to do so. There are also exemptions for low-energy buildings or those already heated from low-carbon sources which are the main reasons why building owners might refuse a DHN connection.

We are proposing that Scotland follow the Danish approach to facilitating heat network connections by introducing measures to facilitate connection of buildings to heat networks but which would not in of themselves require those buildings to *become a customer* of that heat network. This would facilitate and streamline negotiations with potential DHN customers by providing a legal backstop for the necessary infrastructure, but it would still be the decision of the building owner as to whether they become a customer of the network.

There are two ways that this could be implemented:

a) A requirement for specified building owners to **have a physical connection** to the heat network (e.g. pipework running from the network to a reasonable connection point on their property).

b) A requirement for specified buildings owners to **pay an annual fee** (e.g. the standing charge) to the heat network, regardless of whether or not they use heat from the network.

Either measure would only apply within an LHEES designated DHN zone and be a last resort measure with the proposed heat network connection evaluated to ensure that it is viable, economic and will not adversely impact the customer (see detail in following sections).

We recommend option a) given the current stage of market development and Scottish Government competencies This is because connections to large non-domestic buildings are likely to be the focus of early activity, and a standing charge approach to these buildings may not overcome the social and institutional barriers that often prevent connections. A requirement to have a physical connection would require more engagement from the obligated parties and could ultimately prove more successful. Denmark has moved to approach b) which can provide greater revenue certainty to a heat network and creates less inconvenience for obligated parties who decide not to use their connection. However, in the Scottish context we believe that the overall benefits of approach a) outweigh the disadvantages.

4.4 Options

To reduce demand-risk we therefore propose that the Scottish Government seeks to implement a form of its originally proposed ‘obligation to connect’ by placing a requirement (subject to conditions) on existing buildings to have a connection to a district heat network. A connection to a heat network is defined here as pipework running from the heat main to a suitable location for a Heat Interface Unit (HIU) which in effect replaces the previous boiler.

There are two ways that this could be implemented:

a) **A legal requirement:** that specified existing buildings (within a DHN zone) must connect (e.g. have pipework running to a ‘reasonable connection point’ within their building, subject to conditions) to a licensed heat network within a stipulated period of time. This could be enforced by a central Government body that would assess applications from heat network developers to activate the power and would issue notices to obligated buildings/land owners that they would be required to connect to the heat network. It would likely take the form a new legal regime similar to that implemented in Denmark.

b) **Necessary wayleave:** an alternative approach could be to create a specific form of 'necessary wayleave' that would grant licensed district heat operators a statutory right to install equipment to connect a designated non-domestic building to a specified heat network. This would operate as a last resort measure where a heat network could apply for the power to install equipment if it fails to come to a voluntary agreement with the potential end-user.

   This power would be separate and in addition to a necessary wayleave power for district heat networks to cross land to lay heat network pipes (e.g. to enable a network to cross land rather than directly connect to a building). This will be needed to facilitate and de-risk heat network construction.

Approach a) could be designed to be a more permissive regime whereas approach b) would, if it mirrors necessary wayleaves in the electricity market, be a legal backstop (that may pose some high transaction costs). Option b) would also be limited in terms of application – pipework could only be laid up to the curtilage of a building (not under or within it), which would be of limited use where buildings, particularly in inner-city areas, are built to the edge of their land. However, option b) may be easier for the Scottish Government to establish within its existing powers and legislation.

In both cases it is important to note that, from a heat network perspective, a large element of demand risk would remain, as a requirement for physical infrastructure is still no guarantee of securing a heat offtake agreement. The primary value of the approach is to facilitate the voluntary discussions that take place with building owners – the legal power would strengthen the heat network developer's hand where the laying of pipework is the main barrier to reaching agreement as well as demonstrate Scottish Government support. In negotiations with large buildings it can often be the connection infrastructure that is most difficult to get agreement as this typically involves several parties within the connecting organisation who may have little experience of heat networks.

Conditions

The following conditions would regulate the use of either the legal requirement or necessary wayleave. The would only be granted to authorised parties, those with a valid Scottish Government DHN license and could be limited to proposals falling within an LHEES identified DHN zone. They could be administered by a central Government body that would vet applications according to set conditions including connection costs and a requirement to show prior engagement with specified buildings and the proposed heat cost.

Exemptions

In Denmark, **low-energy** (e.g. Passivhaus) buildings and **those already using low-carbon heat** are allowed an exemption from the obligation to connect. Building owners can apply to the local authority if a notification to connect is received, and subject to qualifying evidence being presented, can receive an exemption. We recommend the same in Scotland.

4.5 Connection costs

Heat network connections are normally paid for by the building owner, recovered by the heat network through a fixed fee and the heat charges. **The principle that the connecting building pays for its connection is an important** one, that would make any necessary wayleave (or other power) different to that which operates in the electricity market.

Where a 'Necessary wayleave' is used by licensed electricity companies it is the norm for a landowner to receive compensation for the disruption and cost of having cables across their land. We believe that a different approach is required and justified in the heat network context because this connection will benefit the obligated party by providing the option of heat direct to their building (which will be either lower carbon immediately or in future, 'future proofing' their supply). In contrast, electricity cables crossing private land will be part of the wider network rather than providing a direct connection to any buildings on that land. Heat network pipes buried underground

will likely impose very little detriment to the building owner as this will not impede their decisions regarding what is built on that land, in contrast to the visual and other impacts of above-ground electricity pylons and cables.

It will important that where a mandatory connection is proposed, the costs are to be borne by the building owner. This will ensure that buildings owners are adequately incentivised to agree to use the proposed heat network connection (which should be in their interests to do so, see below).

Should the building choose not to become a DHN customer when the connection is built, they will incur the cost of the connection. However, the conditions set out below ensure fair and proportionate use of the power - the compulsion will be justifiable given that the proposed DHN connection will provide competitive heat with a viable route to decarbonisation, particularly relevant in light of the recent Scottish Government declaration of a 'Climate Emergency'.

In practise, where a heat network is able to agree a heat offtake contract with a building there will be no need to use the legal power to connect (although this will facilitate the reaching of that agreement). Where no heat offtake agreement is reached the legal powers could be used by the heat network to install a connection to that building. Although it would initially go unused, it would facilitate connection in future; the costs of the connection (capped to the counterfactual boiler) would be paid by that building owner.

Subsidise connections

With heat network connection costs falling on the building owner it will be important to ensure that any legal compulsion is only used in relation to economically viable and fair connection proposals. To provide further protection to obligated parties we therefore propose that the following:

- **The cost to the building owner of the proposed DHN connection cannot be not more than that of the counterfactual heating system (e.g. the cost of the business as usual scenario using existing heat system).**
- **Public subsidy should be available to cover any reasonable costs above the benchmarked counterfactual heating system, to prevent connection distance or complexity becoming a limiting factor to help capture early anchor loads.**

To protect building owners and enforce the 'no detriment' principle (see below) we propose that the connection cost, where no heat offtake agreement is in place, be capped at no-more than the cost of replacing the existing heating system. The Scottish Government should provide subsidy to cover any connection costs (for mandatory connections) above the benchmarked counterfactual heating system, to ensure that this cap does not act as a barrier to connections. It would prevent connection distance and complexity become a limiting factor and would help further capture early anchor loads.

The subsidy would be justified on the ground of the wider strategic benefits of creating large inner-city heat networks (as identified in the LHEES) and the long-lived nature of the infrastructure being built. Subsidy has been used in other European heat network markets to similar effect. In Denmark, subsidy ensured that those in more expensive buildings to convert (originally those without central heating systems) did not pay more than they would have otherwise for connecting to DHN.

Some additional costs could arise to the building owner where their existing heating equipment is replaced before the end of its useful life. In non-domestic buildings, old boilers could have some resale value or could be retained as a backup to the heat network, both of which could provide compensation to the building owner.

Conditions: no more than the counterfactual

A key principle in managing the relevant connection and heat costs is that the heat network connection facilitated by the necessary wayleave poses no detriment to the building owners in comparison with a standard alternative. A similar 'no-detriment' condition was outlined in the 2017 Scottish Government consultation in relation to the

proposed 'obligation to connect'. The Netherlands supports heat networks through obligations for new builds and exclusive concessions and regulation there requires heat network cost to be no higher than the counterfactual: the cost of heat from natural gas via a condensing boiler[5]. Higher taxes on natural gas and greater opportunities to use cheap surplus heat make this condition less tough to meet than it would be in Scotland and the UK.

Incorporating this principle as a condition of granting mandatory connections will severely limit the situations in which they can be used. However, we believe that such a principle is needed to ensure that only the most economically viable DHN connections are progressed, enhancing public acceptance and reducing the risks of legal challenge. In the absence of wider policies to drive heat decarbonisation in all existing buildings (e.g. carbon tax on gas, boiler emissions regulation) holding buildings near to a heat network to a different counterfactual rule (e.g. low-carbon options) could be seen as discrimination and risk legal challenge. It is also prudent to adopt this condition until UK or Scotland-wide heat network price regulation is in place.

To ensure that this no-detriment condition does not become too stringent a requirement for any proposed compulsory connection or necessary wayleave, it will be necessary to do the following:

- **Clearly state the socio-economic advantages of district heat network development in law. The Danish heat act does similar, which helps justify the policies that flow from the act.**
- **Set the counterfactual heat system cost slightly higher, justified on the grounds that the heat network will enable customers to decarbonise their properties and to reflect the positive socio-economic project appraisal.**
- **Provide grant or revenue support to allow heat networks serving existing buildings to use low-carbon heat. Without subsidy they will not be able to compete against natural gas (whose costs do not currently reflect the cost of carbon pollution). See section 4 for more detail.**

Vet delivered heat

It will also likely be necessary to consider the price of the heat supplied where a compulsory connection is enforced. This will help with public acceptance and ensure that only the most economically viable connections are progressed this way. The authority granting the heat network connection order or necessary wayleave should evaluate the heat price to ensure that it is no more than that of the counterfactual, including maintenance costs and adjusted upwards as per the above to reflect the wider social benefit of a heat network.

As well as evaluating the cost of heat offered to obligated DHN connections at the time of the offer, it may also be necessary to oversee these heat costs over time, to avoid a situation where heat costs rise significantly (and unfairly) above those initially offered when a mandatory connection power or wayleave was granted. Additional guarantees from the DHN operator regarding future heating costs could be included in either the planning consent, concession or DHN license issued by Scottish Government to protect consumers from price increases beyond the initial year of connection.

Alternatively, a national system of price regulation could be implemented as has happened elsewhere in Europe. At present district heating is not regulated in the UK, although the UK Government has stated its intent to do so[6] and has begun a process to define how this could be done. This would provide greater long-term certainty that the price for heat charged remains fair and proportionate, further reducing risks that consumers suffer adverse impacts as a result of an obligation to connect.

[5] Climate Exchange, 2019, Lessons from European District Heating Regulation
[6] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/793022/Heat_Networks_letter_FINAL.pdf

4.6 Scenarios

It is important to note that where a building owner reaches agreement with a heat network to become a heat customer the issue of who pays the connection cost will become redundant – this will be agreed in the contract between the building owner and the heat network. The objective of introducing a legal power is to facilitate these voluntary agreements, rather than the laying of pipework by compulsion.

The first step to securing a building connection for a new network or extension would be voluntary engagement. However, where it is not possible to enter agreement with potential buildings the heat network developer could apply to the Scottish Government for the power to compel a connection / necessary wayleave; if granted they could resume negotiations with the building owners.

If agreement is still not reached between the heat network and the building owner, it is likely that the heat network project would not proceed if that building is an anchor load (i.e. key to the business case) and therefore the developer would not pursue the compulsory connection.

In some cases (e.g. where the proposed connection serves a smaller building in the overall scheme, or a network extension) the heat network developer could decide to build the network, using the powers / necessary wayleave to install the connection infrastructure without a heat agreement (to facilitate future connection). The building owners would still be obligated to pay for the heat network connection, justified on the grounds that it imposes no overall detriment to them (provided by the conditions set out above).

Example scenario

The proposed necessary wayleave would likely be used to support the construction of new networks, and to aid network expansion. We set out a simplified scenario for how this could work in practise below:

1. The DHN developer engages with potential heat customers voluntarily. Some potential heat customers decline to connect; if these are anchor loads they will prevent the project from progressing.
2. The DHN developer applies for the power to connect/necessary wayleave from the Scottish Government for the specified buildings. It applies the various tests to the proposed wayleaves (evidence of engagement and that the proposed costs will not impose additional costs to the end-user).
3. If granted, the DHN developer can return to the building owners to enter negotiations regarding the proposed ‘heat network connection. This should provide an additional opportunity to negotiate a heat contract which may be more successful with an assumption that the necessary pipework will be put in place.
4. If enough voluntary heat agreements with anchor loads are secured, the new heat network or extension proceeds to construction.
5. The DHN developer may choose to construct some proposed connections in the absence of a heat agreement, using the legal compulsion. These connections are installed at the same time as the network, even if they initially remain dormant.
6. The DHN developer can return to those buildings with dormant connections and try to secure them as customers.

5. Addressing Demand Risk (new buildings)

New buildings and housing developments present ideal opportunities to integrate district heat networks at the outset, significantly reducing costs and potentially laying the foundations for new area-wide heat networks. Although Scottish Planning Policy (SPP) requires local authorities to encourage consideration of heat networks through their local development plans, this requirement in practise is weak and many new developments that have a cost-effective potential for a heat network are built without one. Recent examples include the 1,100 home Kingdom Park housing development in Fife and Tornagrain in Inverness.

In Amsterdam, where a significant role out of DHN is taking place in a previously gas dominated heat market, new-build developments and major renovations provided the catalyst for early network development. Similarly, heat network construction in London has been dominated by new-builds.

5.1 Scottish Government proposals

The Scottish Government is proposing to introduce a new 'district heat consent process' which would be managed and enforced by the Local Authority. This would require that all district heat projects (both new and extensions) apply through the proposed Scottish DHN consent system for a District Heat Consent. This would ensure that applicants have the necessary district heat license (issued by Scottish Government) and could help prioritise proposals located within LHEES identified district heat zones. The 2018 consultation suggests that the consenting system would be accompanied by additional guidance for applicants and Local Authorities, could stipulate conditions (such as a commencement date) and grant permitted development and wayleave rights similar to those enjoyed by local authorities and regulated operators in the electricity and gas markets.

In terms of policy, both the 2017 and 2018 consultations state that existing guidance in relation to district heat networks in Scottish Planning Policy (SPP, which requires local development plans to support the development of district heat networks) is adequate. LHEES and Local Development Plans would operate under a separate legal regime but could potentially reference each other. No suggestions are made, however, to tighten the policy direction flowing from SPP through to LDP's to ensure that more potential heat network projects and connections are delivered from new developments.

Although the granting of permitted development and wayleave rights would help to facilitate the construction of district heat networks, the current Scottish Government proposals will not reverse the current situation where many large buildings and wider developments, suitable for district heating, are built without it.

5.2 Key proposals

New developments, particularly large or multi-building projects, are a key opportunity to build new heat networks or for connection to nearby ones, but current planning policy in Scotland leaves too much scope for such developments not to adopt them. As part of its policies to de-risk investment into the heat networks sector the Scottish Government should use the new SPP to improve the approach to DHN in new developments.

We propose a number of measures:

- **Integrate LHEES into LDPs:** SPP should clearly state that LHEES DHN zones and the new-build developments flagged within them (as well as potential sources of heat) are to be integrated into the LDP at the outset and when allocating land.

- **Planning obligations:** the next version of SPP should clearly direct planning authorities[7] to use planning obligations to require connections to DHN networks for suitable new developments located within LHEES DHN zones.

- **Central support for Local** Authorities: the Scottish Government's *Energy Efficient Scotland* 'delivery mechanism' should support local authorities in the vetting and negotiation of planning applications and the setting of DHN obligations. This would help overcome the challenges that local authorities currently face in behaving this way.

- **All scales of development & consequential improvements:** planning requirements in relation to DHN should not be restricted to 'major developments' as currently set out in SPP.

5.3 Integrate LHEES within the LDP at the outset

It will be vitally important that Local Development Plans (LDPs) reflect and integrate DHN zones identified in LHEES at the outset. This will ensure that the new-build opportunities for district heating that should be identified in an LHEES are realised through local planning policy. Including DHN zones and plans at the outset of the LDP process will ensure that they are engaged with across all the relevant local authority departments and subsequently acted on through development planning and management decisions and strategies. We therefore recommend that:

- **SPP should clearly state that LHEES DHN zones and the new-build developments flagged within them (as well as potential sources of heat) are to be integrated into the LDP at the outset and when allocating land.**

It may also be helpful for SPP to direct Local Authorities to produce a strategy setting out where and how the use of heat networks will be encouraged in new-build developments. Drawing on the LHEES this would inform the DHN concession agreement as the policy basis for encouraging new-build developments to connect to or develop their own heat networks.

As well as integrating LHEES DHN zones into the LDP it will be crucial that SPP directs and Scottish Government supports local authorities to use planning obligations to direct new-build projects within DHN zones to use district heat wherever possible.

5.4 Planning obligations

We believe that the new district heat consent process, proposed by Scottish Government, should empower and facilitate Local Authorities to direct the use of district heating in new build developments and those undergoing major renovation or consequential improvements located within an LHEES DHN zone, through the use of planning obligations and planning conditions.

Local Authorities in London routinely using these mechanisms, allied to policies contained within their development plans, to encourage district heat which has arguably been the biggest driver behind recent DHN growth there. In London, as in Scotland, there is a general planning requirement for major developments to demonstrate the feasibility of a DHN but the greater use of planning obligations (relative to Scotland) is what has driven far greater DHN development there.

Planning measures used in England in relation to DHN usually take the form of planning obligations (section 106 agreements, equivalent to section 75 in Scotland) although they can also appear by way of planning

[7] In a similar way to the London Plan (see sections 5.5 and 5.6)

condition. These act as pre-conditions to the granting of planning consent. Where a planning obligation is entered into, the Local Authority will negotiate with land owners and the applicant and attach requirements to connect to a DHN, or for a site-wide DHN, and reach agreement (using s106) regarding the use of district heat networks as a pre-condition of granting consent.

These obligations rest on a solid policy justification for the use of district heat networks, in this case in the London Plan[8]. This policy justification plays an important role in successfully enforcing such planning obligations when challenged[9]. The LHEES, as well as wider Scottish Government policy through the Energy Strategy and Climate Change Plan will create a similar, solid, policy justification for the use of DHN in Scotland.

Local authority concerns

A key concern for local planning authorities in Scotland is that making DHN a requirement for new developments risks driving those developments to other authority areas with lower standards. The Scottish Government can help by tightening carbon and energy requirements for new build (such that low-carbon DHN must be used in all developments, see section 4) and setting a clear policy intent across Scotland through SPP.

Implementation

Achieving greater use of planning obligations/conditions by local planning authorities will require clearer direction in the next SPP and supporting policies and requirements:

- **Planning obligations:** the next SPP should clearly direct planning authorities[10] to use planning obligations to require connections to DHN networks for suitable new developments located within LHEES DHN zones.

- **Statement of intent:** the next SPP should clearly state the Scottish Government's intention to connect new buildings (and those undergoing major renovation or alteration, subject to exemptions) within LHEES identified DHN zones to heat networks.

- **Central support for local planning authorities:** Local Authorities in Scotland are held back from using planning obligations due to a lack of experience with regards district heating, and the wider policy framework. A central Government service to support Local Authorities to analyse information received in support of planning applications and in the negotiation of planning obligations and conditions would help overcome the challenges that they currently face.

5.5 DHN options appraisal

To facilitate the use of planning obligations in relation to DHN, it will be important to tighten the requirements in SPP on new developments to assess their feasibility for the use of district heating.

We also propose that the direction given through SPP be improved through a more tightly defined requirement to show why the use of a heat network is not suitable in a new development. We propose a similar approach to the London Plan, which states that development proposals should select their energy systems in accordance with the following hierarchy:

- Connection to existing heating or cooling networks;
- A site wide heat network (where the development comprises multiple buildings)
- Communal heating and cooling (where the development comprises a single building)

[8] See policies 5.5 and 5.6 in the London Plan
[9] See Rigby, John, 2016 'The Monkerton Story' for a Local Authority account of how an injunction was successfully used to settle a disputed obligation.
[10] In a similar way to the London Plan (see sections 5.5 and 5.6)

Developers should be required to show, in detail, why they cannot connect to a DHN with this evidence evaluated by a central Government function to help local authorities both scrutinise and negotiate with proposals.

5.6 All scales of development & consequential improvements

We believe that planning requirements in relation to DHN on new-builds should not be restricted to 'major developments' as set out in SPP. Smaller developments are likely to provide opportunities for DHN development within LHEES zones, and these are being missed by current policy. Major developments like housing also tend to take place on the outskirts of citifies, where it may be less strategic to build a heat network.

SPP should clearly stipulate that smaller classes of development should also show that they have checked for a nearby operational or proposed district heat network; this will be facilitated by the LHEES zoning and DHN consenting process. This may impose an additional cost for smaller development proposals which could impact on viability, and it may be beneficial to subsidise DHN connections in these instances.

Renovations / consequential improvements: at present there is no requirement within SPP for applications for major renovation (that requires planning consent) to consider DHN. The same tests should be applied as above.

5.7 Example scenarios

Below we describe the process by which new developments could be would be encouraged to build/connect to a heat network. The approach taken will vary depending on the whether there is an existing, proposed or no heat network.

Where an <u>existing</u> network is within distance of connection:

- The applicant identifies that a heat network is close enough for a potential connection to the site. Discussions take place between the DHN operator and the applicant.
- Local Authority should reach agreement between developer and land owner using a section 75 agreement or planning condition that stipulates a connection to the district heat network, as well as a requirement to enter discussions regarding a heat offtake agreement. Please refer to the attached document[11] from the Enderby Wharf development in London for an example of how these obligations are used in practise.

Where a <u>proposed</u> network is within distance of connection:

- The Local Authority must notify the applicant that this is the case (this information will need to be shared between DHN developers and LAs).
- Local Authority should reach agreement between developer and land owner using a section 75 agreement that stipulates a connection to the district heat network. If the heat network is yet to be built, the section 75 should stipulate that a connecting infrastructure be built, but recognise that heat offtake will not take place until the heating system requires replacement.

Where there are no existing or proposed heat networks:

- If within an LHEES DHN zone: the applicant must consider site-wide or communal heating system and provide evidence as to why this is not technically or economically viable.
- The local planning authority requires the heat network option (if viable) to be taken forward through a section 75.

[11] Please see paragraph 9 of the Second Schedule (p26 of the document) which prevents the second phase of the development being occupied until it is connected to the DHN. Various other requirements / references to the site's DHN and energy centre can be seen throughout the agreement too.

6. Exclusive Concessions

6.1 Introduction

The granting of an exclusive concession to operate district heat networks in identified 'zones' to a public or private body (or a mixture of the two) is another key measure that would encourage DHN investment and expansion, ensure that this occurs in a strategic fashion (i.e. in the right places) as well as further de-risking investment in the sector. This approach has been used in other European countries (e.g. Norway and the Netherlands) with the aim of encouraging a single heat network operator within an area to facilitate expansion and interconnection of individual networks.

Encourage a strategic approach to development

If heat networks in a given area are to grow and ultimately interconnect, this is best achieved by having a single organisation operate them. This makes interconnection easier and encourages the owner/operator to plan for future expansion in the network, for example future-proofing early infrastructure and taking a longer-term and wider view of the opportunities in an area. It can also bolster a nascent local network by ensuring that new projects that arise in the area (from new buildings or existing building owners deciding to build their own DHN) are part of the local scheme, rather than 'cherry-picking' the best opportunities and closing them off from district-wide development.

The current situation in Scotland and the UK is that of small-scale networks and fragmented ownership, where new heat networks are owned by a multitude of firms and organisations. Separate ownership makes interconnection more difficult (given the need to share infrastructure and agree contractual terms). Some DHN owners and operators may also be against further expansion of their network, particularly where their core business activity lies elsewhere. Both work against the strategic development of district heating.

Aggregating heat network development in an area into a single concession and provider will particularly appeal to organisations and firms in which DHN operation and ownership is the core part of their business. 'Energy Service Companies' have emerged in mature European markets as a result, and it is this form of DHN ownership, often combined with elements of public ownership, that must be encouraged in the UK and Scotland if we are to realise the scale of deployment required to meet our climate targets. This approach will also facilitate cooperation between public and private sector actors that is required if DHN development is to change in a transformational way (see section 5 for more detail).

An exclusive concession here is defined as an agreement between public and private actors to co-develop and own heat network opportunities within all or part of an LHEES identified DHN zone.

De-risk investment

A concession approach, with exclusivity, will help de-risk investment into heat networks. It can provide clarity regarding the future scale of potential development in an area to a developer and potential investors and help justify investment in the future-proofing of early investment by providing comfort that other organisations (both district heat network developers and existing building owners) won't compete for nearby opportunities. A concession area approach would also de-risk the linked obligation to connect by preventing other operators from eroding a potential future market share in an area.

Facilitate the delivery of heat networks

A concession approach will also help local authorities deliver their DHN plans identified within an LHEES providing a framework for joint working or cooperation with private sector actors (this is outlined in more detail in section 5). A standardised framework for local authorities to create concessions will streamline the process and reduce the burden currently placed on their activity to drive most DHN development. Rather than attempting

to deliver heat networks individually (often using a bespoke team and approach) local authorities could tender to or partner with the private sector for the delivery of district heat networks across a wider area through the concession approach.

Summary of the benefits

The benefits of including a concession approach to DHN delivery in the Scottish Government approach can be summarised as:

- Facilitate interconnect of networks through common ownership.
- Encourage a long-term and strategic approach to investment.
- Avoid cherry-picking of the best opportunities.
- Facilitate the delivery of ambitious city-wide DHN projects to achieve wider social and environmental goals.

6.2 Scottish Government proposals

The 2017 Scottish Government consultation proposed that DHN zones identified through the LHEES would allow a range of different kinds of organisation (such as commercial or public sector companies) to competitively tender for an exclusive concession to develop new district heating within an LHEES DHN zone. The concession holder would have the option to apply for specific buildings to be required to connect to the network and could also be given specific obligations in relation to the concession area (e.g. lowering carbon content, engagement with sources of waste heat and neighbouring networks). It was also proposed that buildings within the zone could be prevented from moving to other forms of low-carbon heating.

Legal concerns

The 2018 Scottish Government consultation dropped this proposal, with the LHEES DHN zones 'indicative only' and local authorities free to use their existing powers to procure concessions or award contracts for district heating. We believe that this removes a key aspect the regulatory package that would help de-risk investment, facilitate a strategic approach to project development and encourage growth and interconnection of networks.

The 2019 consultation identifies general legal risks regarding exclusive concessions, stating that the granting of exclusive rights to develop and or operate a new heat network within an identified DHN zone could exclude other forms of heat supply in the area at an early stage in the transition to low carbon heat. The consultation also states that 'such measures are likely to give rise to a range of legal issues in connection with compliance with the European Convention on Human Rights, their relationship to reserved matters in respect of consumer protection and including competition law competence of the Scottish Parliament and State Aid regulations'.

The following proposals have been designed with these legal risks in mind. They would not exclude other technologies within concession areas (although the direction to use DHN in new-builds would be strengthened as happens elsewhere in the UK). It is also worth noting that a key advantage of heat networks is that they could be used in any low-carbon heat pathway – the heat inputs could be electric or they could be hydrogen. Similarly, rather than creating a new legal contract that would confer rights on concession holders and obligations on affected building owners, we instead propose that exclusive rights be conferred via the Scottish DHN license or consent.

6.3 Proposal

We recommend that the Scottish Government direct and assist local authorities to implement exclusive concessions for the operation of heat networks within LHEES identified DHN zones. Such concessions should be formed of two key components:

- **An exclusive right for the concession holder to operate new heat network projects within the concession area.** This would be implemented via the Scottish DHN license which would stipulate that license holders would only be entitled to operate new heat networks (above a certain size) within LHEES DHN zones if they hold the relevant geographic concession agreement (where one is active). A responsibility could also be placed on the concession holder to take on any new projects (provided they are economically viable) within the area. In practise this would mean that the operation of new projects that emerge within the zone from new-build developments or existing buildings would fall to the concession holder.

- **Procurement agreement to deliver LHEES DHN projects:** Scottish Government should implement a standardised approach to direct and support local authorities to work in partnership with private sector partners to jointly deliver heat network opportunities identified within an LHEES zone. We provide more information on this in section 6. This would ensure that a concession agreement is commercially attractive and would drive delivery of the LHEES identified projects, making the most of the benefits of the package outlined in this paper.

The exclusivity of a concession would help achieve the strategic development and risk reduction outlined previously and we set out how competition risks could be mitigated in section 5.5 below.

We recommend a joint approach between the local authority and a private delivery partner within the concession area because whilst it could be possible for local authorities to tender out the concession entirely to private sector companies or to deliver the concession themselves, in practice neither approach is unlikely to result in the kind of market development that is required to catalyse area-wide networks (see section 6 for more detail).

Concessions for district heat development have already been used elsewhere in the UK, for example at the Olympic Park[12] in London, where a single concession has been granted over the whole regeneration zone with planning obligations used to ensure connection by new developments in the zone. The approach outlined here would be innovative by creating a concession that covers both new-build developments and existing buildings – vital if area-wide heat networks are to be encouraged.

[12] See https://www.theade.co.uk/members/district-heating/london-legacy-development-corporation

How could exclusive concessions work?

1. **Local authority LHEES identifies DHN projects and defines DHN zones**

2. **LA defines DHN 'concession' for all or part of the DHN zones,** with the help of the Scottish Government. The concession offer would include:
    - Geographical extent and time duration (e.g. 20 – 30 years)
    - Identified potential DHN projects with initial anchor load engagement
    - New build development opportunities
    - Conditions regarding connection and heat pricing, customer service and decarbonisation of heat supply.
    - Procurement framework for public bodies to contract with concession organisation

3. **Competitive tender is held to find a partner for a joint public/private JV to deliver the concession.**

4. **Local authority and winning firm form Joint Venture that will operate heat networks in the concession area.**

5. **Concession comes into force**
    - Other licensed DHN operators are no longer permitted to operate new projects within the concession area
    - Work begins to deliver LHEES identified projects
    - New-build developments are instructed via planning policy to use DHN; the concession holder operates any new projects coming forward

6. **Concession term ends: local authority re-tenders for the next period**

6.4 Implementation

The geographical extent will be an important consideration in the design of concessions, as they should be large enough to encourage the development of large networks, as IRR thresholds can be lower if the overall network and market size is large (a small share of a large opportunity will be attractive just as a higher share of a small project is). If the concession area is drawn closely around the best opportunities, it will fail to encourage the right area-wide approach that can be realised if all the elements of this package are combined to de-risk activity sufficiently. The concession agreement area would not impact on the use of other heating technologies, ensuring consumers have free choice over alternative heat supplies (i.e. individual heat pumps, biomass boilers, electric heating). Exclusivity for heat network ownership and operation would be created within the concession zone by the DHN license or consents.

Governance

Local authorities would also need to be supported by the Scottish Government in terms of designing and administering the concession agreements. This would best be served by creating a central agency that could standardise the approach, provide support and vet the process to maintain standards and a harmonised approach across Scotland. This could be part of the proposed 'Energy Efficient Scotland Delivery Mechanism' which would provide a number of benefits over a more decentralised approach given the limited resources of local authorities and the competing priorities for their time and resource.

6.4.1 Exclusive rights to operate

The concession holder would benefit from an exclusive right to operate DHN within the relevant LHEES zone. This could be achieved through the DHN license or consent.

New-build opportunities within an LHEES concession

Many of the LHEES DHN zones will feature areas for new-build development (e.g. new buildings) and so it will be necessary to implement a mechanism to ensure that the operation of these projects falls to the concession holder (it will be just as important to ensure that new build proposals are directed, wherever possible, to connect to or install heat networks and the proposed approach is outlined in section 8 below). This mechanism would be important in the early phases of heat network development but should become less so over time once more networks are established, as proximity to a new-build site will give a mature existing DHN the edge over new proposals. This tool has played a key part in accelerating heat network roll-out in in the Netherlands, and particularly Amsterdam, where heat networks have grown rapidly in many parts of the city.

- **Scottish DHN license**: this could stipulate that the holder is only licensed to operate new networks within LHEES DHN zones where they hold the relevant concession. This would prevent licence holders other than the concessionaire operating new heat networks attached to new builds in the zone. Competition issues would be managed by the initial competitive tender of the concession agreement, and oversight of prices using the options set out below.

- **Scottish DHN consent:** alternatively, this aspect of a concession could be implemented through the DHN consent. Initial planning consent could be granted to the concession holder within the whole of the relevant area, again preventing other operators from achieving DHN consent for proposals within it.

New proposals within an LHEES zone

Situations could occur where organisations decide to build themselves a site wide DHN to serve multiple existing buildings within a concession area. In this situation the concession holder should again be granted exclusivity through either the license or consents system to prevent other operators from being able to develop or operate projects in the concession area. The concession agreement would see these proposals directed to the concessionaire, who would then enter negotiations to either supply heat to the local network or take on ownership of that network as part of their activities within the area.

These proposals focus on the operation/ownership of heat networks. It would be desirable to maintain some element of competition for the construction of projects, for example using the approach to 'non-contested' works in the electricity market where a developer builds the infrastructure to an agreed standard which can then be adopted by the operator.

Existing projects within DHN zones

The prevention of DHN license or consent holders from developing new projects in DHN zones would not prevent them from being licensed to continue operating their existing assets within that zone.

6.5 Competition & consumer choice

The Scottish Government expressed concerns regarding the competition law implications of granting exclusive concessions for heat network activity in its 2019 consultation. Exclusive concessions for heat network development, operation and ownership present two principle risk in this regard:

- **Competition:** granting exclusive rights to one organisation for a commercial activity over a single area could reduce competition within the area which could lead to higher prices to consumers through

monopolistic behaviour as well as create a commercial disadvantage for organisations excluded from that area.

- **Consumer choice:** connecting a building to a heat network will constraint the building owners' options for heat supply to that heat network, making it difficult for them to change heating supplier (given the physical changes required to their building).

6.5.1 Competition issues

Exclusive concessions are not problematic in principle under UK and/or EU competition law unless they have a detrimental (anti-competitive) effect on the market (foreclosing the market to other suppliers, for example) which cannot be justified by their pro-competitive effects. Exclusive agreements can meet the criteria for an individual exemption where exclusivity is necessary to produce certain demonstrable efficiencies, the benefits of which are passed on to consumers. The grant of excusive concessions which create a dominant position and/or local monopolies would therefore not in itself infringe the competition rules, provided that there are mechanisms in place to ensure that this does not result in excessive pricing or discrimination etc. This can be managed by licence conditions and/or regulatory measure (see 4.5.2 below).

[NOTE: Article 106 Treaty requires Member States to refrain from enacting or maintaining in force any measure contrary to the Treaty including Articles 101 (anti-competitive agreements) or 102 (abuse of dominance). The granting of monopoly rights could infringe this provision but there are very few cases and these cases suggest that monopoly rights are fine provided that there are protections in place to avoid abuse etc. We say no infringement of Article 101 as exclusivity would be justified and no infringement of 102 as relevant conditions and regulation will guard against this.]

Risks can be managed through:

- **Competitive tendering:** of exclusive concessions will ensure that there is competition for the contracts. If necessary, mechanisms could be built into the tendering process to prevent a single organisation from obtaining a dominant market position across the Scottish market or within individual cities and/or to encourage new entrants.

- **Time limited concessions:** we are proposing that concessions be awarded for 20 to 30 years after which time the contract would return to the market through a new auction. This duration is required to enable the concession holder to recoup the cost of their initial investment in the heat network infrastructure. This infrastructure is long-lived but will typically generate low returns, hence why a long contract period is required. Periods of exclusivity are generally considered to be necessary (and therefore acceptable under the competition law rules) to encourage investment in a project which would not otherwise proceed.

Any negative effect on competition as a result of exclusivity within the concession areas themselves would be outweighed by the significant benefits that will accrue to consumers as a result (outlined in section 4.1). We consider that exclusivity is necessary to incentivise initial investment and interconnection and therefore to maximise the potential benefits (for all customers) of integrated heat networks. This reflects the early stage of market development in Scotland and the UK.

The ownership of heat networks within a concession area by a single organisation will make the interconnection of those networks far easier and incentivise that organisation to do so. Interconnection will enable the heat network to grow, improving overall system efficiency (lowering costs to consumers) and encouraging an area-wide approach to investment by the concession holder. This will help the connection of less profitable areas that will provide benefits to those consumers (through cheaper heat) and a wider benefit to society (by facilitating the decarbonisation of a greater number of buildings).

Introduce competition into a mature market

Small monopolies granted to DHN zone concession holders will be justified in the early stages of Scotland's heat market development to help build district-wide heat networks. Once these district-wide schemes are able to connect to each other and become the dominant forms of heating in whole areas of a town or city it will then be appropriate to explore strategies to introduce competition into the various elements of heat network businesses: retail to customers, heat supply to the network and network operation.

More mature markets in Europe have begun exploring these approaches, such as third-party access[13], but we consider these inappropriate at the current stage of market development in Scotland and UK. Splitting out heat generation and supplier-facing activities whilst networks remain small and fragmented will impose higher costs which will work against the other mechanisms outlined in this paper.

If such an approach is to be introduced in the long-term, we believe it most appropriate to begin with diversification in heat-supply (to the heat networks) which can help ensure affordability for DHN customers. To introduce greater customer freedom of choice a 'single buyer approach' could be considered. In this model, the DHN operator has the unique interface to the customer but handles the individual customer contracts with third party suppliers. This approach has yet to be introduced in the more mature European DHN markets, however.

6.5.2 Consumer choice

Connecting a building to a heat network will constraint the building owners' options for heat supply to that heat network, making it difficult for them to change heating supplier (given the physical changes required to their building), in effect constraining a consumers' choice. The Consumer and Markets Authority (CMA) in its recent investigation of the heat network market[14] found that the natural monopoly that heat networks often provide was not an issue in of itself, and that for many customers, heat networks offer prices which are the same or lower than people on a gas or electricity tariff, and these customers have comparable levels of customer service. This should provide some comfort to Scottish Government that well planned, strategic heat networks will help it achieve its climate change and fuel poverty goals as well as not adversely impacting consumers.

The CMA did find some issues arising from the way that heat network contracts are agreed for new build developments, and a potential lack of mechanisms within some heat supply contracts to ensure cost-reflectiveness. The CMA recommendations to deal with these issues could be implemented in a number of ways:

- **Concession & license conditions:** Protection for consumers with regards heat prices will be particularly key to managing competition risks, and Scottish Government has a number of options in this regard. Conditions on pricing and service are already included in many heat network concessions in the UK and the Scottish Government could ensure standardisation of terms within concession agreements. Alternatively, the license and concession could grant both parties the right to refer to an arbitration body where agreement on price cannot be reached.

- **Wider regulation:** the UK Government has signalled its intention, following recommendations from the CMA report, to initiate formal regulation of the heat network industry. This could an over-arching framework to guard against the risks identified within the CMA study. Consumer protection within heat networks is not currently a devolved issue but the Scottish Government has expressed its interest in obtaining these powers to complement its package of regulation for the sector.

[13] Climate Exchange, 2019, Lessons from European District Heating Regulation
[14] CMA, 2018, Heat Networks Market Study

7. Joint Public & Private Concessions

Introduction

A key objective for the Scottish Government's regulatory package should be the delivery of LHEES identified projects. If appraised correctly (see section 8) these projects will provide the best means of stimulating new heat network projects in strategic locations (i.e. within a DHN zone) to help overcome the current piecemeal and fragmented pattern of development. We believe that this is best achieved by encouraging a joint approach between local authorities and private firms that will draw on the strengths of each and address the weaknesses of leaving delivery to either sector alone.

Context

Scottish local authorities have played an important role in stimulating new DHN project development through the Heat Network Partnership and funding available through the LCITP programme. These projects focus on public buildings that can provide large and predictable heat loads (anchor loads) and with ownership unlikely to change this provides greater certainty of demand to the developer of the heat network. Thus, public sector led projects can form the catalyst for new heat network development.

Mandatory LHEES will provide an opportunity to identify the most suitable locations for new heat networks that use public sector buildings as anchor loads, but only if the right approach to project appraisal is taken at the outset (see section 9) - this will be crucial to expand the pipeline of new networks. Just as crucial a task will be streamlining the process to deliver these so that it can be done at a faster speed and greater scale than is currently the case with existing local authority resources. We believe that joint delivery by public and private organisations is the best way to ensure the adequate skills, resource and approach is brought to delivering these projects.

The role of local authorities and the private sector today

The approach to DHN project development and investment differs between the public and the private sectors. The UK has a burgeoning district heating supply chain, with firms developing expertise in the design, build and operation of heat networks over the past two decades. These firms have the experience and skills to deliver what are complex and risky engineering projects and are seeking new opportunities for development. At present, new DHN opportunities come to this market mainly through new-build developments or organisations owning multi-building sites (like Universities or housing associations) procuring their own. These projects tend to benefit from single ownership, guaranteeing heat offtake, and thereby tend to be the least risky. This can lead to privately led development of district heat in effect 'cherry-picking' the best DHN opportunities in an area.

The public sector, in particular local authorities, is well placed to take a longer-term, strategic view of where heat networks could help deliver climate change and fuel poverty objectives. Local authorities have been supported by both the Scottish and UK Governments to identify heat network opportunities as funding of early DHN project identification cannot be supported by the private sector alone in an unregulated, and comparatively small, market. Local authorities are well placed to carry out this task as they have access to much of the relevant information and can bring together other public sector organisations.

Local authorities and the public sector can also bring a wider approach to the valuation of heat network benefits, assessing projects by social net present value, thereby including factors such as fuel poverty and climate change into decision making. They can borrow at low rates of interest (a lower cost of capital will improve project economics) and provide demand certainty by offering buildings to connect, which is crucial in the early stages of laying the foundations for large, area-wide networks. This is because as new heat networks extend away from the most lucrative 'anchor-loads' their project IRR could go down (but including these wider areas will help achieve wider social goals such as reduced emissions and fuel poverty). Part-financing by local authorities of early heat network development will therefore be crucial in making more strategic projects viable.

Despite these advantages the public sector has in practice limited resources with which to drive new DHN development. Local authority capacity to identify and deliver projects is limited, with a small number of staff devoted to district heating and who typically have a number of other duties to fulfil which acts as a brake on the speed and scale of project deployment. If local authorities are solely tasked with delivering LHEES identified DHN opportunities under current resourcing conditions, there is likely to be slow progress getting these projects built. We therefore propose that local authorities be encouraged and helped to jointly deliver their LHEES heat network opportunities with private sector partners. The right partnership can help de-risk development to enable private sector partners to bring additional resource and their expertise to deliver opportunities at the requisite scale.

Combine local authority support with private sector experience

The Scottish Government has a role to play in combining the best elements of both sectors to achieve wider project development than leaving that to either party alone – the public sector being slow to deliver due to resource constraints and the private sector driven to 'cherry-pick' the best opportunities. This should be done by facilitating a system of public and private Joint Ventures (JVs) or partnerships to deliver LHEES opportunities

A combined strategic approach between local authorities and private developers could lead to wider project development - the local authority would contribute its early project development and lower investment costs, the private sector the expertise and additional resource needed to take projects from an early stage to completion. This will help the Scottish Government achieve its climate change and fuel poverty objectives by facilitating larger heat networks that bring economies of scale, greater access to varied sources of low-carbon heat and lower risks. In time, as the heat network market expands and the other measures (licensing, concessions, obligations to connect etc.) in this package take effect, investment could be de-risked sufficiently to significantly reduce the requirement for public finance.

7.1 Proposal

We propose that the Scottish Government encourage and support local authorities to **form joint vehicles or partnerships with private sector firms to develop and deliver projects within all or part of an LHEES identified DHN zone.**

Rather than tendering out for individual heat network projects, local authorities would tender for a partner to deliver a number of identified heat network opportunities and others more generally within the DHN zone. This would encourage a strategic, area-wide approach to investment in the zone, bring the benefits of DHN operation by a single entity and combine the strengths of both public and private sector actors.

Private investment into these partnerships would also be de-risked by guarantees regarding new-build opportunities (section 8) and powers to facilitate connections to existing buildings (section 7) to address future demand-risk. In time, the concession and obligation to connect could reduce private investment hurdle rates sufficiently to reduce the need for public funds, but only once these measures have taken effect and the market is larger.

As outlined in section 5 the partnership between local authorities and private partners would form the core of a district heating concession and it would include:

- Information regarding the most viable DHN opportunities identified through the LHEES and agreement on a joint approach to detailed project appraisal and financing.
- Grant the exclusive right to operate new DHN projects that are proposed within the zone from new-build developments or the owners of large buildings acting on their own.
- Conditions requiring private partners to work to deliver lower return opportunities, the costs of heat network connections and ongoing heat costs (to protect consumer).

- Procurement framework to facilitate but also standardise: minimise transaction costs and benchmark costs which can improve investor confidence.

The joint approach to invest coupled with the other measures outlined in this paper should sufficiently de-risk development to enable a portfolio of projects in an LHEES DHN zone to be delivered. To streamline this process and encourage local authorities to adopt it, Scottish Government would likely need to provide support to LAs as they enter and progress negotiations and template contracts with clear guidance, and guidelines as to conditions (regarding connection costs and ongoing heat costs) perhaps aligned with the Scottish DHN license.

Example: Newcastle

An example of such an approach exists in Newcastle, where Newcastle City Council has entered into a partnership with private developer ENGIE to form the Regenerate Newcastle Partnership which has the rights to develop district energy schemes within the city boundaries. The agreement includes a procurement framework for any party named in an OJEU notice to use when procuring, developing or participating in a district energy scheme inside the City boundary. Named parties include (but are not limited to) NHS Hospital Trusts, local Universities and arm's length council bodies. Public sector bodies are at liberty to use the framework but are not obliged to do so but it is hoped that the time and cost savings of using the framework will encourage them to do so.

A similar approach in Scotland, building on the LHEES DHN scoping work and combined with an obligation to connect and exclusive rights in concession zones would provide a much stronger framework and has the potential to significantly de-risk investment in the sector.

7.2 Making projects economically viable

The LHEES should play a vital role in bringing new projects to the market - and this will require that enough projects are identified and developed in the first instance. It will therefore be important that the economic viability of projects is supported by a number of our proposals working together:

- **LHEES project appraisal:** joint public and private investment and joint identification of risk appetite to inform the LHEES district heat zoning process (see section 9).
- **Support for connections:** measures to aid connection of existing buildings and new-build developments, to de-risk future demand.

8. Other Support

There are two further risks that will need to be managed through policy will be vital to support the heat network market in Scotland alongside this regulatory package if we are to see the growth that we need.

8.1 LHEES identification of district heating projects & zones

Local Heat and Energy Efficiency Strategies (LHEES) will play a crucial role in delivering this vision because they will identify opportunities in strategic way and bring new DHN projects forward. These new projects will complement the projects brought forward from new developments and provide greater opportunity in city centres that could create the foundation for larger networks.

Our members have expressed concern that some of the methodologies used in the LHEES pilots to assess potential projects have been too restricted, for example seeking a project return without looking at wider ways to reduce the targeted hurdle rate. The Scottish Government should work with stakeholders to define a clear process that Local Authorities can follow when conducting their LHEES to ensure a comprehensive and standardised approach.

It will be important that DHN project identification undertaken as part of LHEES casts a wide net by using a range of assumptions regarding fuel cost, heat sales price, CAPEX, subsidy, borrowing rate etc. Whole life environmental costs and benefits should be used including carbon, NOx, SOx and PM2.5. Local authorities should also identify their risk appetite at the outset, thinking through the impact on delivery that the joint public and private approach (outlined in section 6) will have on the cost of capital and project viability.

Proposals:

- **Make LHEES a statutory obligation for Local Authorities**
- **Create a standard DHN project appraisal tool:** for the LHEES process that evaluated project viability under a range of scenarios to ensue a wide net is cast at the outset of project scoping.

8.2 Public subsidy

Heat networks serving existing buildings struggle to match the price of heat from natural gas. This is driven by a variety of reasons including the relatively immature nature of the heat network market compared to the natural gas network (reflected in higher finance costs), the need to recoup long-lived infrastructure costs and the complexity of laying the foundations for a new type of network.

Targeted public subsidy of some aspects of heat networks serving existing buildings would help overcome early market barriers and facilitate the building of core early parts of heat network infrastructure in Scotland. A successful example is the LCITP programme – grant funding has helped pay the infrastructure costs (e.g. boreholes, water abstraction) of low-carbon heating technologies in conjunction with the RHI. We have identified two areas of heat network development that would benefit from targeted subsidy provided by the Scottish Government:

- **Subsidy to cover the cost of any obligated DHN connection (in existing buildings) where this exceeds a building's existing heating system (see section 7).**

- **Consider the role of subsidy to support key infrastructure such as extensions and spine networks.**

This latter would help de-risk key heat network infrastructure where some demand-risk remains; it is easiest to secure heat customers once a network is built but customers are needed to make this happen. A revolving loan (where early loans are paid back by maturing heat networks) could be one way to support key infrastructure. Alternatively, the Scottish Government could underwrite the risk facing investors who provide finance for such extensions and spine networks.

8.3 Permitted Development & Wayleave rights

Permitted Development & Wayleave rights for DHN construction activity; this would make works easier and less risky to carry out over roads and public land. This would be in addition to the 'necessary wayleave' power outlined in section 7 and should apply to all DHN projects (even those out with an LHEES DHN zone).

8.4 Business rates

Business rates in Scotland currently penalise DHN more than natural gas installations – this should be rectified in line with the need to reduce carbon emissions urgently.