



## Department for Energy Security and Net Zero

### Consultation

### Proposals for heat network zoning 2023

### Submission from CIBSE

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## THE RESPONDENT

### The Chartered Institution of Building Services Engineers (CIBSE)

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CIBSE is unusual amongst built environment professional bodies because it embraces design professionals and also installers and manufacturers and those who operate and maintain engineering systems in buildings, with an interest throughout the life cycle of buildings.

CIBSE has over 20,000 members, with around 75% operating in the UK and many of the remainder in the Gulf, Hong Kong and Australasia. CIBSE is the sixth largest professional engineering Institution, and along with the Institution of Structural Engineers is the largest dedicated to engineering in the built environment. Our members have international experience and knowledge of life safety requirements in many other jurisdictions.

CIBSE publishes Guidance and Codes providing best practice advice and internationally recognised as authoritative, including **CP1 Code of Practice**. The CIBSE Knowledge Portal makes our Guidance available online to all CIBSE members, and is the leading systematic engineering resource for the building services sector. It is used regularly by our members to access the latest guidance material for the profession. Currently we have users in over 170 countries, demonstrating the world leading position of UK engineering expertise in this field.

## CONSULTATION RESPONSE

We are responding as a document by email rather than online, because:

- We are providing evidence such as charts and tables, in Appendix, which cannot be submitted online.
- There were comments on the proposals which we could not otherwise make, as the questions are quite specific, and there is no “Any other comment?” question.

## EXECUTIVE SUMMARY

### 1 - COMMENTS WHICH APPLY TO BOTH THIS CONSULTATION AND THE FHS/FBS CONSULTATION

1 – 1 The proposals in this zoning consultation seek to encourage the expansion of heat networks, but not their decarbonisation. This is reinforced by proposals under

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the current FHS / FBS consultation, in particular sleeving proposals. If heat networks are to be encouraged:

- This must be on the basis of evidence and justified carbon accounting.
- There must be clear requirements and incentives for their decarbonisation, much beyond the current proposals. The current proposals are far from encouraging decarbonisation of existing networks, and they allow the continuing development of high-carbon networks, which will by 2050 require additional expenditure and efforts to decarbonise.

1 – 2 The **decarbonisation of networks which are currently in operation or being planned** must be addressed.

This is a very real issue: the very large majority of heat networks operating in the UK (10,766 of the 11,847 networks, i.e. 91%) use natural gas or oil as their primary fuel (see *Appendix A1*).

In addition, the pipeline of expansions to existing networks continues the reliance on gas further into the future: over 45% of expansions have gas (for boilers or CHP) as their primary fuel (see *Appendix B*).

Neither this consultation, nor the FHS/FBS one, sufficiently address this need to decarbonise heat networks, nor do they set out a clear expectation and reasonable timeframe:

- Proposals for **sleeving** (under the FHS / FBS consultation) do NOT sufficiently encourage the decarbonisation of existing networks: they only address, potentially, the installation of low carbon plant to serve new connections, not the existing fossil fuel plant. In addition, the proposed sleeving methodology may well in fact result in some existing networks increasing their average carbon content of heat – we are detailing this in our response to the FHS / FBS consultation.
- The **methodology for carbon limits** in this consultation must be reviewed to truly account for the carbon emissions of networks (i.e. account for secondary losses, and not artificially reward electricity produced by gas CHP).
- Alongside the initial 2030 limit, DESNZ should provide a **trajectory of carbon limits** applying to heat networks, through to their decarbonisation, so that networks have a clear direction and are encouraged to take early measures, before being required to do so.
- Government must not wait until the mid-2030s, as currently proposed, to develop (maybe not even implement?) **low carbon standards** for networks. Given the scale of the issue and the significant time lags between planning and operation of heat networks, these standards must be created as soon as possible to provide a direction, and to start informing policy. CIBSE would welcome the opportunity to discuss this with DESNZ, as CP1 could play a role in this by establishing forward-looking best practice recommendations.

1 – 3 The current proposals, through **artificial factors and accounting methods**, create a real risk of misleading assessments against alternatives, and significantly under-estimating and misrepresenting the operational carbon impacts of heat

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networks: this applies to the calculation of carbon emissions from networks, in this consultation (see point 2-3 below), and to the setting of the notional network in the FHS / FBS consultation.

1 – 4 Central to our recommendations on both this consultation and the FHS/FBS one, and to support robust and transparent policy, it is crucial that a **comprehensive public register of networks be created, maintained, and regularly audited by an organisation independent from heat networks interests**. This public register could possibly be the fully rebuilt PCDB promised by this consultation. It should:

- Be publicly available
- Be maintained and regularly audited (from a very simple review, we have found worrying indications that the current heat register is not sufficiently audited: see details in Appendix, with clearly erroneous information on heat generation vs supply).
- Include access to data from previous years, to allow tracking of progress
- Be the single source of information for any policy relying on operational performance of networks, in order to provide full transparency and avoid loopholes and double accounting i.e. not just for FHS / FBS calculations, but also planning applications, EPC calculations, and other relevant policies and financial incentives. It should also be used for reporting linked to heat metering regulations, to reduce the reporting burden and improve consistency of information across data sources.
- Include information currently included in the heat metering register, but with additional data on individual networks, and including energy use per fuel, allowing analysis of primary and secondary losses, and carbon content of heat. Details of the amount and source of “sleeved” heat should be declared. See details in Appendix A3.

This is far from being provided by the current PCDB, which is empty, and by the Heat Billing Regulations - Heat Network Register, as illustrated in Appendix A3. **The upcoming regulation of heat by Ofgem creates the perfect opportunity to address this**. CIBSE would be happy to support and discuss this with DESNZ at the earliest opportunity.

## 2 - SUMMARY OF RESPONSES SPECIFIC TO THIS ZONING CONSULTATION

2 – 1 CIBSE agree in principle that if heat networks are to be encouraged and deployed, heat zoning would help by providing more certainty and a more consistent process and methodology for developers and local authorities. However, the purpose of encouraging heat networks is to allow heat decarbonisation in a cost effective manner. We are concerned that the current proposals do not do this. Given it is the stated justification for networks, then **carbon performance and costs to consumers should be central** to the following elements, but is not in the current proposals:

- **Zoning methodology:** see response to Q48

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- **Exemptions for buildings not to connect:** see response to Q31: carbon emissions and cost to consumers were proposed as part of the exemption criteria in the 2021, and were supported by the majority of respondents. In this consultation, only capital cost to consumers and timing are in the current list of allowable exemptions, with a non-committal note that carbon emissions may be an allowable exemption in certain circumstances. No justification is provided for this. It is a serious risk to carbon emissions reductions, and to consumers. This must be revisited.
  - **Monitoring and reporting:** see response to Q71
  - **Revoking process:** see response to Q75
  - **Carbon limits for networks within zones:** see response to Q43.

While it may be implicit, we are concerned that a number of gaps exist. **Carbon objectives must be clearly stated and central to the proposals so that all actors – Regulator, Central Authority, Zone Coordinators, and network developers and operators - are clear from the onset about their objectives and duties.**

## 2 – 2 Zoning methodology

The methodology should be made public, open to input in its development and subject to regular review and scrutiny, with open data. CIBSE would welcome the opportunity to be involved.

The mapping and assessment of opportunities must be of opportunities for networks to **save carbon**, or provide the **same carbon savings at lower cost** i.e. hard to decarbonise properties, and genuine opportunities that heat networks could capture which on-site plant would not or not as easily e.g. waste heat from other sources such as from datacentres and supermarkets (not Energy from Waste plants).

We strongly recommend that the methodology should make use of the National Building Model (NBM), also commissioned by DESNZ: <https://www.ucl.ac.uk/bartlett/energy/news/2023/nov/national-building-database-step-change-understanding-energy-performance-buildings> . This will represent a powerful and comprehensive resource, including every building in England, Wales and Scotland, its activities, building characteristics, and energy use. A key purpose of the NBM is precisely to inform decarbonisation policies, so this is obvious opportunity to capitalise on efforts and on digitalisation, to provide a robust and consistent assessment of policy options. Heat zoning should seek to make use of it (and, in return, the zoning methodology pilots could inform development of the NBM).

## 2 – 3 Carbon performance requirements on heat networks

We strongly agree that heat networks should meet carbon performance requirements if they are to be included in a heat network zone.

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However, we do not agree with the proposed limits, because under the proposed methodology, **emissions from networks risk being significantly under-estimated** - see details in Q43:

- Under the current proposals, the carbon content of heat would be calculated including primary distribution losses only. Secondary losses may be at least as high (see Appendix A2). They must be included in order to reflect the real carbon content of heat delivered to the customer.
- The carbon content attributed to electricity produced by CHP (304g/kWhe), i.e. seen as a benefit from gas CHP attributed to heat networks, is completely unrepresentative of current electricity networks in the UK, let alone how they will be in the next few years as the electricity grid continues to decarbonise– and the factor is proposed for 2030 (!): it is almost double the average carbon content of electricity from all District Network Operators in England in 2023 - see Appendix C. None of the 11 DNOs in England had an annual average carbon content reaching that value.
- Even when looking at half-hourly data, on the theoretical assumption that CHP may be controlled to run at times of high-carbon grid electricity, this is a highly unlikely carbon factor: the England average exceeded it for just 36 hours in 2023. Of the 11 DNOs in England, two did not operate a single hour in 2023 above that value, another six had only less than 10% of annual hours above that value, and two between 10 and 20%. The remaining two networks operated only between 30 and 40% of the time above that value. It is therefore likely that, in the vast majority of the time, in the majority of networks in England, CHP would run when much lower carbon electricity would in fact be available from the grid.

## 2 – 4 Impact Assessment

The impact assessment does not provide sufficient information to understand how the results were arrived at; we would like to see the full assumptions and methodology behind it, as well as the criteria (e.g. is the main criterion £ / ton CO<sub>2</sub> saved?).

In addition, we do not agree that the main counter-factual to heat network zoning is a “do nothing” counterfactual: there needs to be much more attention to the “lower carbon” counterfactual i.e. other options for heat decarbonisation: this is the real test of whether heat networks offer a cost effective decarbonisation option.

## RESPONSES TO INDIVIDUAL QUESTIONS

**1. Do you agree with the roles and responsibilities set out for the Central Authority?**

***If not, please set out a) which ones you disagree with and why, and/or b) additional duties you expect them to perform and why.***

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No. Duties should explicitly include monitoring of the performance of heat network zones and raising any related issues with the Regulator, including consumer costs and carbon emissions: this should be added to Tasks 3 Data Management, 4 Zone Coordinator oversight, and 5 Monitoring & Reporting. While it will ultimately be the duty of the Regulator to take redress action where needed, the Central Authority, with its ownership of the methodology, register, and oversight of the Zone Coordinators, should be very well placed to identify issues as they arise.

**2. Do you agree with the housing of the Central Authority within the Department for Energy Security and Net Zero, for the initial period? If not, please set out why not, what alternative you would propose, and what benefits this alternative could bring.**

Yes.

**3. Do you agree with the roles and responsibilities set out for the Zone Coordinator? If not, please set out a) which ones you disagree with and why, and/or b) any additional duties you expect them to perform and why.**

No. Reporting duties should explicitly include raising performance issues with the Regulator, including consumer costs and carbon emissions: this should be added to Task 3 Zone Operation. While the Regulator may not automatically take action, there should be a way for them to be directly and regularly updated. These performance issues should also be included in the public register.

**5. Do you agree with the proposed list of Fitness to Operate Assessment criteria set out in Table 1? If not, please explain why.**

Yes

**6. Do you agree with the Zone Coordinator governance requirements set out above? If not, please set out a) which ones you disagree with and why, and/or b) which additional requirements you consider are necessary.**

No.

4 – Conflicts of Interest: CIBSE think that the proposed safeguards against conflicts of interest are not sufficient: the Central Authority should be involved in the decision whether to accept conflicts of interest, and other parties (e.g. buildings within the zone) should be informed before the decision is made, and able to raise the matter with the Regulator.

5 - Transparency: the annual report should include performance of the networks against key criteria, including carbon performance and costs to consumers as well as key requirements for example as set-out in the HNTAS e.g. reliability and quality of heat, customer service.

**7. Do you agree that, longer-term, heat network developers should pay a greater proportion of the costs of Zone Coordinators related to zones they are formally engaged with? What challenges and opportunities do you see with this approach?**

As noted in the proposals, the challenge will be to avoid conflicts of interest, so it will be important to avoid any funding of enforcement and compliance functions.

**8. Please suggest the features a building must have to be considered “heat network ready”, meaning the characteristics required to enable a future connection to a district heat network.**

Buildings which demonstrate they have or will implement heating which is of similar or lower carbon content than the proposed heat network should not have to connect, nor to be “network ready”.

**9. Do you agree that new buildings within a zone should be required to be “heat network ready” if they cannot connect immediately on completion of construction? If not, please provide further detail, including any factors related to cost-effectiveness.**

No:

- Requiring new buildings to connect is taken as a given in this consultation. In the first zoning consultation, CIBSE objected to this, as new buildings may have lower carbon options available. We continue to recommend against this unless suitable exemptions are in place – see our response to Q31.
- Cost effectiveness **must** not be the only criterion:
  - o Carbon savings must also be a criterion. If some buildings are willing to spend more to save more carbon, this should be welcome not prevented.
  - o Cost effectiveness to future consumers must also be a criterion.
- “New building” should be defined as one that applies for planning permission following the designation of a zone, **not** one which receives planning permission following the designation of a zone: planning applicants need certainty, there would be significant implications including re-design if, between their planning application and granting of planning permission (which typically takes several months), a zone became designated and they were told they had to connect.

**10. Do you agree that all existing buildings with communal heating systems should be within the scope of the requirement to connect?**

No. They may be considered on a zone by zone basis but, as noted in Question 9 for new buildings, imposing a requirement on existing buildings to connect should be subject to carbon saving potential and cost to consumers, not just cost effectiveness.

**11. What impacts, if any, may this have on building owners, tenants, residents and other communally heated building users? Please provide any mitigations.**



The impacts could include:

- Running costs compared to on-site options
- Capital costs, space planning and disruption associated with the works on site
- Carbon emissions, with potential impact on existing decarbonisation commitments e.g. corporate commitments to shareholders. This has been highlighted to CIBSE as a potentially significant issue, as many existing and planned networks are not low carbon, and many rely on Energy from Waste, Appendix A1 and B - which often does not align with CSR requirements.

**12. Please describe any implications for local authorities from the requirement to connect existing publicly owned, communally heated buildings to district heat networks.**

The impacts could include:

- Running costs compared to on-site options
- Capital costs, space planning and disruption associated with the works on site
- Carbon emissions, with potential impact on existing decarbonisation commitments.

**13. Which types of multi-unit residential buildings, if any, should be “heat network ready” following significant refurbishment? Please describe any impacts of this on owners or other users of these buildings and any appropriate mitigations.**

As per Q9 and Q10: these requirements should be subject to the performance of networks in terms of carbon savings and costs to consumers. Impacts would be as per Q11 and Q12.

Mitigation should be ensured by suitable assessment of networks against on-site options in terms of carbon savings and costs to consumers – see comments on the Zoning Methodology in Q38 and on the Exemptions in Q31.

**14. Please suggest how to assess the cost-effectiveness of making buildings “heat network ready” during significant refurbishment, including which costs should be considered.**

As noted in previous questions, this should not only consider the cost effectiveness, but also total carbon saving potential, and running cost impacts on consumers, against on-site low carbon heating options.

Costs should include capital works within the building, from the consumers to the heat network connection (a network being “within connection distance” of a site does not mean there may not be some distance between the site boundary and the end users).

**15. Please suggest a suitable definition of “significant refurbishment”. If possible, the definition should be unambiguous, enforceable, and definitive.**

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We recommend using existing thresholds and systems, by aligning it with works that:

- involve a change in the heating and/or hot water system, and
- require building regulations approval, as this would some way to know that works are being planned, and
- trigger the need for consequential improvements, as this would align with an existing threshold for significance.

**16. Among the metrics listed in Table 2, which, if any, do you think should determine whether a non-communally heated, non-domestic building is within scope of a requirement to connect? Please provide alternative metrics if you disagree with those listed.**

Reported annual average heat demand probably remains the most useful indicator.

Total installed heat capacity is unlikely to be reliable, as plant is often over-sized and/or with significant back-up capacity.

Gross / net internal floor area would only be useful alongside other characteristics such as building use and building characteristics, to estimate the extent of heat demand.

**20. What, if any, unintended consequences for building developers, owners, and residents, may result from requiring existing buildings to connect at a time determined by heat network developers? Describe any mitigations.**

As noted in previous questions: potential consequences on running costs and existing decarbonisation commitments.

**21. What types of incentives could encourage connections to heat networks? For each suggestion, describe how the incentive will encourage connection, for instance by specifying which barrier to connecting.**

The most effective incentive would be for networks to demonstrably deliver low carbon, cost effective (capex and opex) heat. See our recommendations for:

- Performance of networks – Q43.
- Requirements and exemptions for connection – Q31.

**25. Do you foresee the process for connecting new buildings introducing any burden or delays on the building development process? Please suggest any mitigations.**

Yes: the definition of “new building” must be modified in order not to lead to re-design in the middle of or after planning permission – see Q9.

**26. Do you foresee any of the proposals in this consultation placing disproportionate burdens on the following? If so, indicate what the impact could be on housing supply.**

**a. Housing developers in general,**

***b. SME housing developers.***

See Q25. In addition, specifically for SME housing developers, there would be questions about the burden of examining cost effectiveness or otherwise of heat networks, and applying for exemptions where relevant.

***27. Do you agree that the agreement phase is an appropriate time for buildings owners to apply for exemptions? If not, please provide an alternative suggestion.***

No. Buildings should also have the opportunity to apply for exemption if, post-agreement, the network was shown not to meet the original conditions e.g. in the case of new networks that did not yet have verified operational performance, or existing networks that were going through improvements and did not yet have verified operational performance post-improvement works.

***28. Do you agree with that exemptions should be either temporary or conditional? If not, please provide further details or suggest alternatives.***

No. Even where they are conditional and conditions change, building owners and users need certainty just as networks do. Exemptions should be valid:

- For a minimum amount of time so as not to place a burden on buildings to re-examine a potential connection e.g. 10 years.
- As long as there are no significant improvements to the network carbon performance or its capital or operational cost of connection that would justify a re-examination of its benefits to the exempted building.

***29. Should leaseholders be provided with a route for requesting an exemption?***

***Please provide further details, such as when this may be allowed.***

Yes, they must, just as building owners do, as:

- they would be the ones with the burden of operating costs e.g. residents in a multi-residential block
- they may have decarbonisation commitments which would be impacted by the connection e.g. tenants in a non-domestic building.

To reduce uncertainty for network developers, this could apply, for example, for lease over a certain duration, such as 2 years, so that short-term leaseholders may not apply and the exemptions in these cases would only be available to building owners.

***30. How frequently should buildings holding a conditional exemption have to reapply? Please suggest a single number of years and any mitigations to reduce the burden of reapplying on building owners.***

See question 28

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**31. Do you agree that building owners or developers should be able to apply for exemptions on grounds of either a) cost or b) timing? If not, please explain why.**

No. CIBSE strongly disagrees. CIBSE agrees that exemptions should be available, as proposed, on grounds of capital costs or timings. However, there must also be exemptions on the grounds of:

- **Carbon emissions** i.e. if building owners or users have access to options that deliver heat for similar or lower carbon emissions. The statement further in the consultation that buildings with low carbon heating systems will be eligible “depending on circumstances” is much too vague. Carbon emissions must be a prominent reason for exemption, given they are a key driver behind heat network policy.
- **Operational costs to consumers:** consumers should not be forced to connect if this will lead to higher costs of heat.

This may be examined at the zone level, although please note our caveats regarding the proposed methodology, in Q38. However, as noted by the consultation, there will be circumstances for individual buildings which a zone-wide assessment cannot capture. Consumers must not be forced into higher-carbon, higher-cost heating.

Heat networks are encouraged by government on the promise that they will deliver heat decarbonisation at lower costs. This must be safeguarded and delivered by zoning regulation. This is very much against the stated objective, and against the previous consultation proposals, which did include carbon emissions and cost effectiveness to consumers as criteria (Q26): this was supported by the majority of respondents. For the avoidance of doubt, we repeat here our previous response: “*as listed, carbon performance and impact on consumers, including affordability, are essential criteria.*” **There is no justification here why proposals have changed, to omit these essential criteria. A justification should be provided and we urge a re-visit to bring the list of exemptions back in line with the original, supported, one.**

**32. What costs should the Zone Coordinator consider when assessing a cost-based exemption, and what is a suitable counterfactual?**

All costs incurred by the connection onto consumers and building owners should be considered, and the counter-factual should be the building’s alternative on-site systems. It must not be the “do nothing” option used in this consultation’s impact assessment, which is very unrepresentative.

In addition, as noted in Q31, operational costs for consumers and building owners should be considered against the counterfactual.

**33. Do you agree that an exemption extension may be granted if connecting to the heat network will increase the carbon intensity of a building’s heating systems?**

***Note, this will only apply to exemptions based on having an existing low-carbon heating system. If not, please provide further detail.***

Yes, exemption must be granted if sought on these grounds. See response to Question 31.

***38. Do you agree that heat network developers should be required to include heat source plans in their Zone Development Plans? If not, please provide further detail.***

Yes.

***39. Should owners of heat sources be able to appeal a decision requiring them to connect to a heat network or give access to a heat source? If not, please provide further detail.***

Yes. They may have other plans for reasons including operational costs, carbon emissions, business operations, or others. For example, they may currently have waste heat but plan to reduce this through a change in equipment or more efficient operation. Or they may have plans to make other uses of the heat, for example to use it in one of their processes. Or they may plan to go through a retrofit, reduce their demand, and switch off part of their plant altogether, reducing on-site management requirements or freeing space for other uses... or any other number of reasons.

It is difficult to think of a precedent in another market, where a party would be forced to sell a product they own, and to do so to a specific other party. Networks should be open about the heat sources they expect to be able to use (as per Q38), and they should make it sufficient attractive to owners of heat sources to connect. This should not be overly restrictive since, in a majority of cases, heat source owners are likely to want to take the benefits and make their waste heat or their spare heat capacity available; however, they should not have to do so.

***40. Do you agree that a) the requirement to connect should prioritise high temperature heat sources, and b) the requirement to give access should apply to low temperature infrastructure heat sources and the location specific ambient heat sources? If not, please provide further detail.***

See response to Q39. Heat sources should not be required to connect, it should just be attractive to them to do so.

***41. Do you agree that this is the right general approach for the Zone Coordinator to take in assessing whether a heat source should be required to connect? If not, please provide further detail.***

See response to Q39. Heat sources should not be required to connect, it should just be attractive to them to do so.

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**42. Do you agree with the following proposals? If not, please provide further detail.**

**a. All consumers will be guaranteed transparency on the prices charged by heat networks.**

**b. Standardised templates will set out how pricing should be presented to heat network customers within zones.**

**c. Zone Coordinators will be permitted, but not required, to set pricing conditions on the award of a zone to a developer.**

No. We agree with points a), b) and in addition, please note our response to Questions 1 and 3 for further transparency and monitoring, and Questions 9-13 on including “costs to consumers” within the allowable exemptions. On point c), we are concerned that this provides little consumer protection. We agree that there should be national standards in terms of costs of connection; but equally, there must be oversight of pricing of **heat per unit**, especially given that some consumers will be forced to connect.

**43. Which, if any, of the three proposed emissions limits should be set as the initial limit in 2030? If none, please provide an alternative proposal for the initial limit on emissions.**

None. We strongly agree that heat networks should meet carbon performance requirements if they are to be included in a heat network zone. However, we do not agree with the proposed limits, because under the **proposed methodology, emissions from networks risk being significantly under-estimated and therefore could be assessed as meeting the limits when in fact their emissions would be much higher:**

- Under the current proposals, the carbon content of heat would be calculated including primary distribution losses only. **Secondary losses** are often at least as high – for example, the record of networks under the heat metering regulations shows 29% losses from generated to supplied heat in communal networks (see Appendix A2). These secondary losses must be included in order to reflect the real carbon content of heat delivered to the customer.
- The carbon content attributed to **electricity produced by CHP**, i.e. seen as a benefit of gas CHP, is completely un-representative of current electricity networks in the UK, let alone how they will be in the next few years: the current proposals are to follow the SAP 10.2 v2 methodology, whereby one unit of electricity produced i.e. displaced by gas CHP is attributed a carbon content of heat of 0.304 kgCO<sub>2</sub>/kWh. As detailed in Appendix C, this is much higher than the actual current grid average: it is almost double the average carbon content of electricity from all 11 District Network Operators (DNOs) in England in 2023. All of these 11 DNOs had an average carbon content of electricity below that value.
- It is sometimes argued that, regardless of the annual average, CHP can operate at times when the grid is higher carbon and therefore that it can save carbon at those times. However, in fact, the England grid average exceeded 304 g/kWh for just 36 hours in 2023. Two DNOs did not operate a single hour in 2023 above that value, another six had only less than 10% of annual hours

above that value, and two between 10 and 20%. The remaining two DNOs operated between 30% and 40% of the time above that value. In other words, the savings attributed to CHP networks if this factor is used will not be realised: we doubt, and have not seen any evidence, that CHP would be financially viable to run on a carbon saving-led basis; it is likely instead that, in the vast majority of the time, in the majority of networks in England, CHP would run when much lower carbon electricity would in fact be available from the grid.

Even at today's carbon content of electricity, Option 2 represents a significantly higher carbon content of heat than an on-site heat pump. The difference will be even higher by 2030, when the limits come into place. While it would represent an improvement compared to on-site gas boilers, it would be far from decarbonised heat and could still allow networks to substantially rely on gas. There must be a trajectory for tightening of these limits, so that networks have a clear incentive, followed by a requirement, to decarbonise.

***44. Do you agree that introducing the emissions limit from 2030 will give adequate time for heat networks to adapt? If you disagree, what would be an adequate alternative timeline?***

Yes. New heat networks should already be able to meet these. For existing networks, it is needed, because existing networks are in huge majority on gas or oil (over 90% - see Appendix A1), and the current pipeline of heat networks expansions shows a continuing high dependence on gas (45% for gas boilers and CHP, and a further 28% on Energy from Waste – Incineration) - see Appendix B. This must be addressed with further incentives and regulations.

***45. What would be appropriate intervals for reviewing the national zoning emissions limit?***

As starting point we recommend every 5 years, in line with the CCC budget reviews and broad cycle of Building Regulations reviews. However, in addition to reviews, we also strongly recommend that a **downward trajectory for the limits is published** at the same time as the 2030 limits, giving a clear direction to networks and the opportunity to transition early.

***47. Please provide comments, if you have any, on the above initiatives to make heat provided by heat networks affordable and any further suggestions if you have them.***

Please note our response to Q42: in addition to the various heat network support schemes mentioned here, there must be requirements and incentives for networks to operate efficiently, as otherwise high energy use risks being passed onto consumers as part of energy bills. Costs to consumers (in unit price, not just connection costs) must be a requirement, it must be reported, and it must be part of the allowable exemptions. This will encourage networks to operate efficiently, and to make use of the opportunities which are in theory available e.g. use of waste heat sources;

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demand management, including storage, to make use of cheap electricity at times when it is available.

**48. Should the zone refinement stage allow more general refinements? Please provide any specific examples of other factors which could be considered.**

We comment here on the proposed zoning methodology, since there is no other question allowing us to do so:

- The consultation states that the Central Authority will develop a methodology which “will assess the relative scale, value for money, project deliverability, and other such factors of different opportunities” – to state the obvious, carbon saving potential should be central to this”.
- The methodology should be made public, and its development open for consultation. For example, what are the “standard assumptions” behind the counterfactual air source heat pump (both in capital costs and efficiency)? CIBSE and its members would welcome the opportunity to comment.
- The “mapping of opportunities” must be opportunities for networks to **save carbon**, or provide the **same carbon savings at lower cost** i.e. hard to decarbonise properties, and genuine opportunities that heat networks could capture which on-site plant would not or not as easily e.g. waste heat from other sources such as datacentres and supermarkets. For the avoidance of doubt, we do mean “waste heat”, not incinerators / Energy from Waste plants.
- The methodology should make use of the National Building Model, also commissioned by DESNZ:  
<https://www.ucl.ac.uk/bartlett/energy/news/2023/nov/national-building-database-step-change-understanding-energy-performance-buildings> . This will represent a very powerful and comprehensive resource, including every building in the UK, its activities, building characteristics, and energy use. A key purpose of the NBM is precisely to inform decarbonisation policies, so heat zoning must make use of it (and, in return, the zoning pilots could inform development of the NBM).

**56. Do you agree that a consultation period of 21 days is sufficient for the formal consultation part of heat network zone designation? If not, please provide further detail.**

No. We appreciate 21 days is the standard period for a planning consultation, but major planning applications often extend longer, and a zone designation would have significant and long-term environmental, financial and commercial impacts. Stakeholders must be given a proper chance to become aware of the proposals, assess them, and respond. 21 days far from provides that. We recommend a period more similar to a standard consultation period of 12 weeks. This should also benefit the Zone Coordinator and future network developers, allowing them to genuinely engage with potential heat users and heat sources.

**58. What other information do you consider should be published prior to or during the zone designation stage?**



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- The consultation states “the Zone Coordinator may notify certain buildings that they may be subject to the requirement to connect” – this **must** be the case.
  - Expected (even if not final) heat sources should be published.

It is only fair and sensible for buildings to understand the potential implications as early as possible, as it could save them, for example, future works they were planning. Equally, it would allow engagement between the Coordinator, network operator, and future users & sources as early as possible, limiting the risk of future delays, objections and exemption processes.

**60. Do you agree with the proposed Tier 1 and Tier 2 consultees set out in Appendix 5? If not, please provide any suggested changes.**

Heat anchors and sources which the Coordinator expect to connect to the network (notwithstanding exemptions) should be statutory consultees, not optional.

**71. Do you agree with the intended outcomes for the monitoring and reporting regime in Table 7? If not, please provide further detail.**

No. Performance of the network is an essential outcome of the monitoring and reporting regime, including carbon emissions (total), carbon content of heat, and costs to consumers (fixed costs of connection + unit price). See also our response to Q1 and Q3, and Appendix A3. It is difficult to understand why this is not included; CIBSE assume it is such an obvious point that it was inadvertently omitted, but is implicitly included within other parameters – it should instead be explicit and prominent, so that the Zone Coordinators, Central Authority, Regulator and network operators start on the correct expectations.

**72. Do you agree that Zone Coordinators should be able to decide whether they want a heat network developer to hold a licence before applying for the right to develop in a zone?**

Given the significant advantages that a zone will give to heat network operators, having a licence should be a condition in all zones, it should not be up to the Coordinator; if this is not available on application to develop a zone, then it should at the latest by the time it operates.

**74. Do you agree that the Zone Coordinator and/or the Central Authority should have the power to revoke a zone?**

Yes.

**75. Do you agree with the process for revoking zones? Please provide suggestions for any further checks and balances on the zone revocation process.**

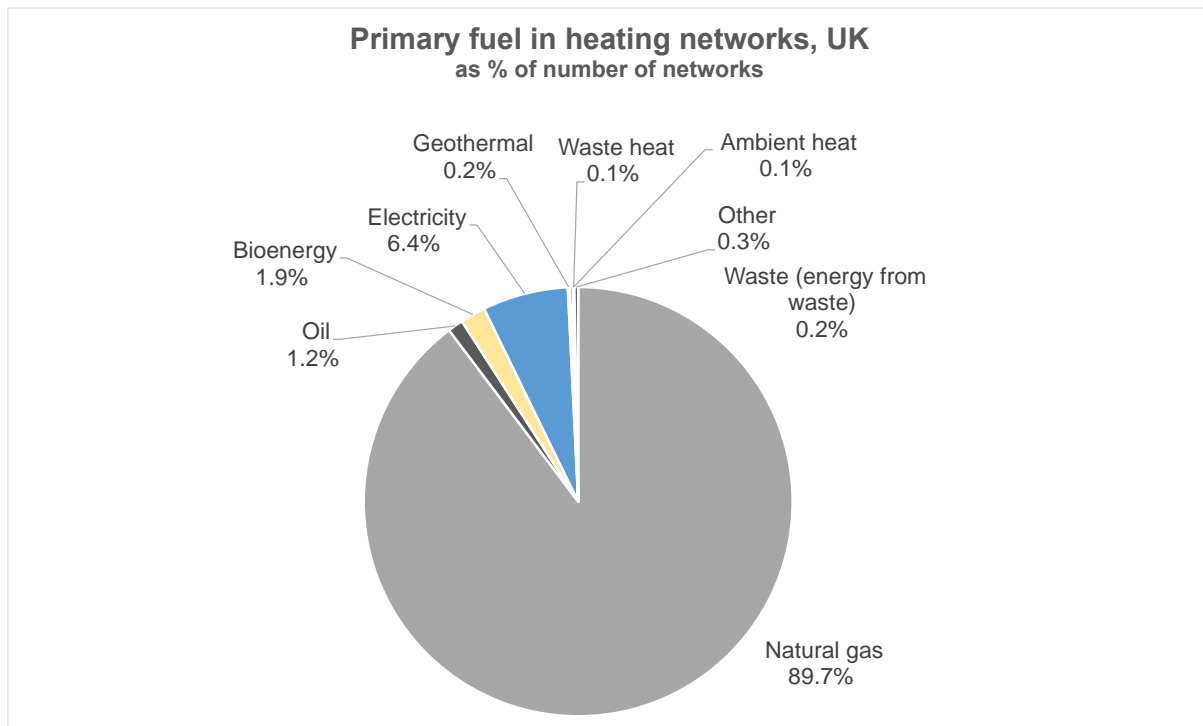
No. We agree that costs should be part of the criteria, but the following must be added to the criteria:

- Carbon performance not meeting the zone limits and no evidence of a credible and concrete plan for decarbonisation, despite notices
- Other key performance indicators (e.g. as defined by HNTAS) not being met, despite notices, including supply reliability & quality, customer service requirements, or price requirements, despite notices.

## APPENDIX A: CURRENT HEAT NETWORKS IN THE UK

The below analysis is based on DESNZ *Heat Networks registered under the Heat Network (Metering and Billing) Regulations: January 2019-December 2022 (UK)*, issued 2023.

### A1 – PRIMARY FUEL



### A2 – LOSSES BETWEEN HEAT GENERATED AND SUPPLIED

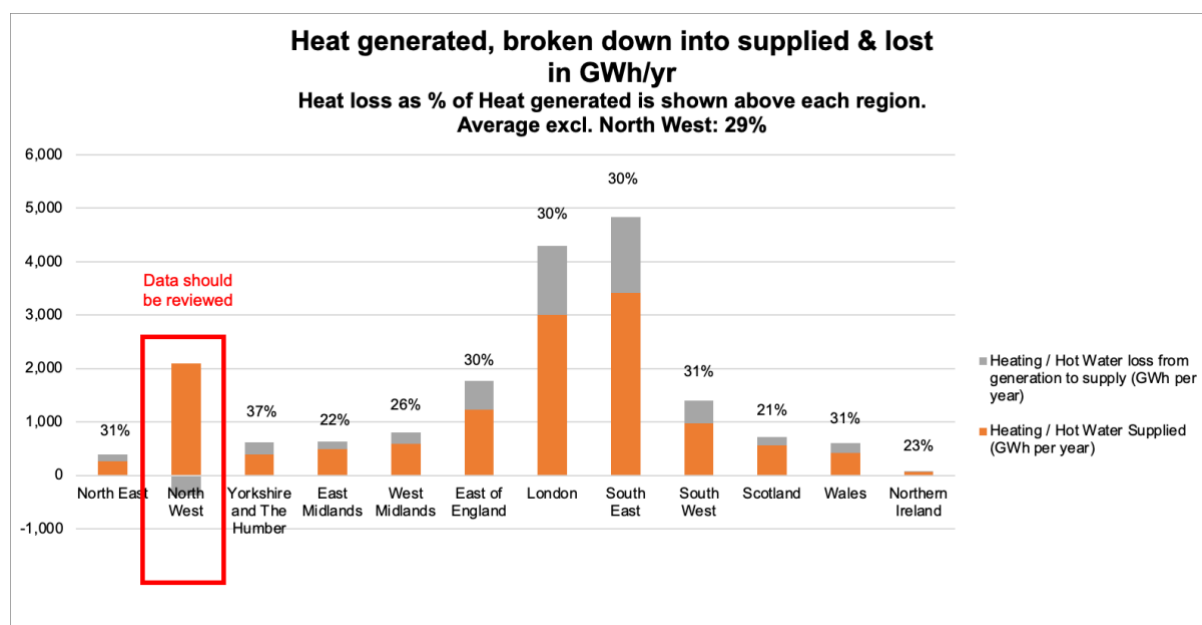
On average across all networks, excluding the North West: **29% of heat generated is lost, before being supplied.**

The 29% loss figure is the same when looking separately at district heating networks, and at communal networks.

This raises three important points:

- Are *district* heating networks really reporting heat supplied to the end consumers, or are some reporting heat supplied to the building, before its distribution to end users (i.e. not accounting for all secondary losses)? The register implies it is the former, but we recommend that this should be audited.

- Secondary losses i.e. the only ones in a communal networks, are large (29% on average). They **must not** be omitted from the calculation of emissions from networks.
- **The data must be audited.** The register states that QA has been carried out, however it is clearly insufficient, since the data implies that for district heating networks in the North West, heat supplied is higher than heat generated. By the register’s own statement (Glossary Tab), “*Supply should always be less than generation due to heat losses within the system.*”



A3 – REPORTING INFORMATION

Examples of information which the register currently requires	Important information which the register does NOT currently require, but should
Primary fuel e.g. “gas”, “electricity”	<b>Annual fuel use, from all fuels</b> e.g. “x MWh gas / year + x MWh electricity / year”  Together with the heat supplied (which is already provided), this would allow an estimate of: <ul style="list-style-type: none"> <li>- Generation efficiency</li> <li>- Carbon emissions in any given year, and carbon content of heat</li> </ul>
Annual heat generated, MWh/year	
Annual heat supplied, MWh/year	
Heat / hot water generation capacity, MW	
Regional totals	<b>Information for each individual network.</b>  This would generate much more useful information to consumers, academia, industry and policy-makers.

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	<p>It would encourage competition for performance between networks.</p> <p>It would provide a single source of information, saving repeated enquiries and investigations, and ensuring much better consistency of data to be used in planning applications, building regulations, funding applications etc.</p> <p>It would also much more easily help spot blatant mis-reporting – as shown in Appendix A-2, there is clearly an error in the data reported for the North West region, but it is not possible to identify whether that relates to a single network or systematic error with data entry.</p> <p>This is available in other countries, for example France and Denmark.</p>
	<p><b>Sleeving details</b>, if used by the network: plant capacity, heat associated to it, and connections benefited from it.</p> <p>This would prevent loopholes and double counting across various policies, so that low carbon capacity associated with sleeving is not also counted elsewhere for other reporting or regulatory purposes.</p>

**APPENDIX B: THE CURRENT HEAT NETWORK PIPELINE IN THE UK**

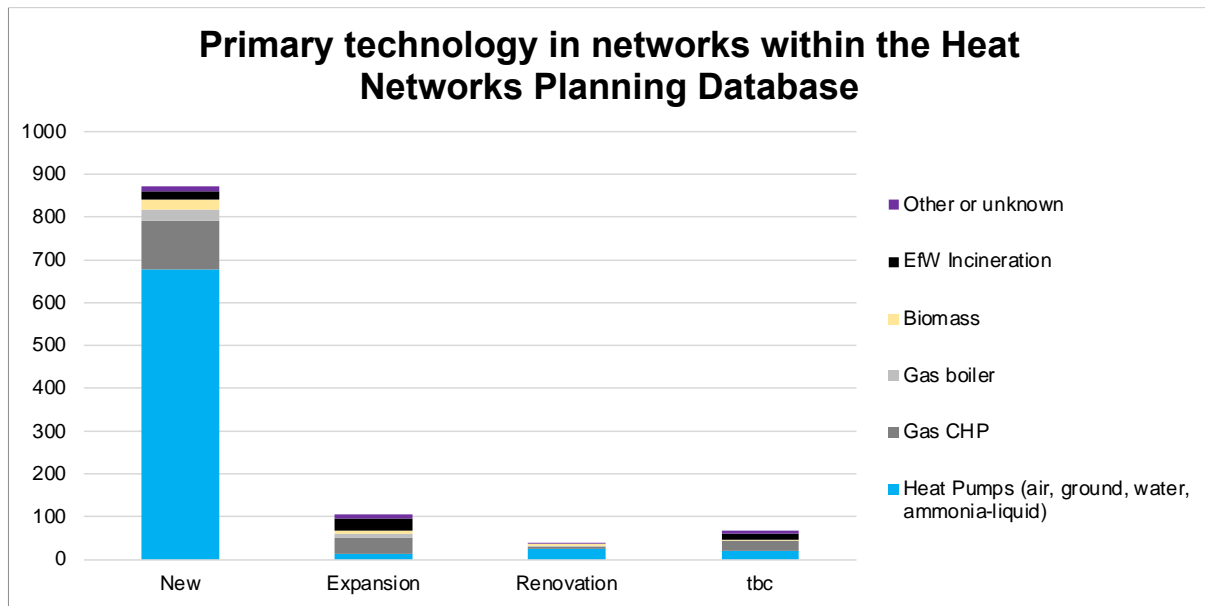
Reference: DESNZ *Heat Networks Planning Database, January 2024*

The data in the HNPDP shows that within new networks, a majority (around 75%) have heat pumps as their primary technology. This is encouraging, although operational data remains to be seen and these networks could still significantly rely on gas, if they have gas back-up.

The data also highlights that the situation is very different in expansions: in these, 46% of networks rely on gas boiler or gas CHP as primary technology, and another 28% on EfW i.e. a total of around 75% on gas. These existing networks, when they expand, must be encouraged to decarbonise. The current sleeving proposals are not sufficient, in part because they only address (theoretically allocated) plant for new connections, rather than existing fossil fuel plant, and in part due to the methodology based on peak capacity, as detailed in the CIBSE response to the FHS / FBS consultation.

PRIMARY TECHNOLOGY	New		Expansion		Renovation		tbc		Total	TOTAL
	nb	%	nb	%	nb	%	nb	%	nb	%
Air Source Heat Pumps	584	67%	5	5%	20	50%	3	4%	612	56%
Ground Source Heat Pumps	84	10%	4	4%	1	3%	6	9%	95	9%
Water Source Heat Pumps	10	1%	4	4%	2	5%	11	16%	27	2%
Ammonia-liquid Heat Pump	0	0%	0	0%	1	3%	0	0%	1	0%
Gas Fired CHP	113	13%	39	37%	5	13%	24	36%	181	17%
Gas Boiler	26	3%	9	9%	2	5%	0	0%	37	3%
Biomass (dedicated)	24	3%	6	6%	7	18%	3	4%	40	4%
Biofuel CHP	2	0%	0	0%	0	0%	1	1%	3	0%
Advanced Conversion Technologies	1	0%	1	1%	0	0%	0	0%	2	0%
EfW Incineration	19	2%	29	28%	0	0%	14	21%	62	6%
Hydrogen	1	0%	0	0%	0	0%	0	0%	1	0%
Unknown	8	1%	8	8%	2	5%	5	7%	23	2%
<b>total</b>	<b>872</b>		<b>105</b>		<b>40</b>		<b>67</b>		<b>1084</b>	

PRIMARY FUEL	New		Expansion		Renovation		tbc		Total	TOTAL
	nb	%	nb	%	nb	%	nb	%	nb	%
Electric	677	78%	13	13%	24	60%	20	30%	734	68%
Gas	160	18%	76	75%	7	18%	39	58%	282	26%
Woodchip/Pellet	9	1%	2	2%	1	3%	3	4%	15	1%
Woodchip	10	1%	2	2%	2	5%	0	0%	14	1%
Wood Pellet	1	0%	0	0%	0	0%	0	0%	1	0%
Straw	3	0%	0	0%	4	10%	0	0%	7	1%
Biofuel	2	0%	0	0%	0	0%	0	0%	2	0%
Not Specified	8	1%	9	9%	2	5%	5	7%	24	2%
	<b>870</b>		<b>102</b>		<b>40</b>		<b>67</b>		<b>1079</b>	



**APPENDIX C: 2023 CARBON CONTENT OF ELECTRICITY GRID NETWORKS**

Reference: <https://carbonintensity.org.uk> 2023 data

