

Consultation on Heat Network Zoning

techUK input to the proposals

November 2021

Context

These comments are made on behalf of the UK data centre sector. Heat reuse is a topic of significant interest to data centre operators but there are barriers to sharing waste heat that make it less straightforward than external observers tend to assume. Nevertheless, there are now plenty of examples of the successful reuse of data centre waste heat that may help to inform this process, albeit few in the UK. We would therefore welcome more opportunities to reuse our heat and are keen to engage in further dialogue to establish the best ways for data centres to make a viable contribution to UK energy efficiency in this way.

What are Data Centres?

Data centres consolidate IT functions into specialised, purpose-built facilities. This approach delivers very significant energy efficiency benefits compared to distributed computing, where servers remain on office premises in rooms and cupboards. The by-product of computer processing is heat and where large numbers of servers are located together the heat output is considerable. Data centre operations therefore require cooling to ensure that the servers do not overheat and malfunction. Cooling is delivered in various ways – chilled water, chilled air or fresh air ventilation for example but in most cases heat is rejected in the form of warm air at around 32°C. Other more novel cooling approaches are under development, for instance using fluids where the heat is extracted in liquid form, probably around 65°C, but adoption is neither widespread nor guaranteed.

Comments on the proposals

The zoning process

Iterative review: The current proposal includes a review process after the operational phase. We suggest that the review process be continuous and implemented at each stage rather than just retrospectively.

Designation

Standardised approach: In principle we welcome the approach to zoning and agree that a standardised approach may be a good starting point. However, mindful of the factors and stakeholders that need to be aligned, we think the overall decision process may need to be more iterative / bespoke. We therefore support the “approved document” proposal, provided that this is not used as a back door to add obligations that increase the compliance burden.

Statutory Consultees: We agree that the list of statutory consultees should be captured in secondary legislation

Requiring connections: as providers of low grade heat that may be less attractive to a heat network operator than other sources, but impose high costs of connection, it is important that there are robust cost-effectiveness and carbon-effectiveness provisions in place. We welcome the attention that is given to these factors in the proposals.

Retrofitting vs. new build: The operational and cost burdens of retrofitting an existing data centre to supply waste heat are different to those that would be imposed if this process is designed in at the start, so it may be necessary to differentiate new from existing providers in the legislative approach.

Regulation

Improving confidence: We welcome the proposal to regulate heat networks. The current, unregulated, market has resulted in some well-publicised instances of bad practice that will erode confidence in both customers and providers.

Protecting providers and consumers: We agree that regulation is required to ensure that retail consumers connected to the DH network are adequately protected, but regulation must protect both the heat provider and the customer.

Accommodating supply variation: Data centres may not provide consistent levels of heat into a network and there may be interruptions in supply due to maintenance, seasonality or downtime. Therefore it is important that legislation does not penalise operators if their facilities cannot deliver a constant supply. In particular we must avoid situations where operators are required to run processes unnecessarily or inefficiently just to create waste heat. We would view that as a perverse outcome.

Obligation to connect

Viability: We welcome the cost effectiveness and carbon criteria which will be essential to protect both consumers and providers. This must be applied in both directions. We recommend a systems approach when evaluating potential for connecting to a heat network. Provisioning a data centre to provide waste heat usually adds some degree of operational energy overhead (i.e. reduces operational efficiency) which operators will be extremely sensitive about – facilities compete on the efficiency of the infrastructure. So we need to ensure that the environmental benefit of providing waste heat is not eroded away by energy burdens elsewhere.

Requirement to provide information

Information to zoning coordinator: it is difficult to respond to this question until we know the level of detail required. Data centres already operate under an enormous reporting burden that is duplicative and unnecessarily complex. So the information required, and the burden imposed on operators to collect and present it, must be minimal.

Compliance burdens:

Administrative burden: We seek more clarity regarding administrative and compliance costs that may be imposed on heat providers in addition to the physical costs required to retrofit an existing site, or provision a new site in order to connect.

Connectivity and upgrade costs: In order to encourage facilities to locate in heat network zones, the costs to providers must be minimised. The heat network should therefore be responsible for the infrastructure taking heat from site boundary into the network and for treating or upgrading rejected heat from providers to meet the heat network requirements.

RIA: Regulatory Impact Assessments tend to underestimate compliance costs for businesses, often by orders of magnitude. This is usually due to a lack of technical understanding within Government of business processes and market dynamics, and of the potential scope of proposed legislation to capture operations and sectors beyond the original policy intent. When these shortcomings emerge,

the RIA is rarely if ever amended to reflect reality, even when there is compelling evidence to demonstrate its inadequacy. Will the RIA in this case be subject to review?

General comments

Flexibility in reuse options: Data centre waste heat is currently being used in multiple ways – from greenhouses to lobster farms. A heat network may not be the best use of waste heat from data centres given their individual characteristics. We strongly recommend that heat providers should be given the option to share their heat with offtakers other than the district heating network operator, including heat providers' own systems that can reuse heat, or any other compatible heat reuse application (for instance an enterprise such as a swimming pool or aquaponics process).

Avoiding unintended consequences: the approach needs to encourage the development and expansion of heat networks without adding perceived burdens or limiting choice: over-prescriptive, inflexible or burdensome requirements could blight a zone for both providers and offtakers, thus defeating the purpose.

Recognising locational attributes: We are pleased that there are no proposals to force new data centres to be located only in heat network zones: data centres have locational attributes and such a measure could compromise the deployment and functionality of the UK's digital infrastructure.

Future-proofing: An iterative approach is essential to ensure that the proposals keep pace with technological developments within sectors like data centres, where change can be exceptionally rapid and often hard to predict. So for instance, as server tolerances broaden (the temperature and humidity ranges within which they operate reliably) we may see higher temperature outputs which would be helpful or we might see lower requirements for heat rejection, which might impact viability. An inflexible scheme could compromise competitiveness and lead to stranded assets.

Policy objectives: We recommend that government keeps a close focus on the objectives of the legislation and avoid scope creep: in some countries heat networks are common but are often powered by fossil fuel so EU policy objectives tend to be focused on improving the fuel mix into existing infrastructures as well as encouraging new infrastructure. In these cases, because they use electricity from certified renewable sources, there are proposals to forcibly retrofit data centres onto these heat networks. As mentioned, data centres have locational attributes and such a move is likely to be injurious to our digital infrastructure.

Streamlining requirements: We welcome the streamlined approach that is being taken with the proposals, which bring together several policy instruments in this field and filling some important gaps. Data centres are sometimes subjected to contradictory requirements from the EA and local authorities and there are perceived conflicts with other regulations – such as the Heat Network (Metering and Billing) Regulation, which is seen as a disincentive to provide waste heat. This more joined-up approach is very welcome.

Other issues to consider

We welcome the fact that these proposals seek to address two of the primary barriers to the reuse of waste heat from data centres – the lack of infrastructure and the lack of customers for that heat. However, there are other barriers that need to be addressed which include

- Technical difficulty in retrofitting existing facilities.
- Practical difficulty in retrofitting infrastructure due to lack of space in urban environments.
- Contractual issues: service level agreements with customers may be broken or risk to service interruption may be increased.

- Perceived impact on business continuity / operational risk: data centres are exceptionally sensitive to anything that could add risk or affect business continuity: they compete on the basis of resilience.
- Perceived impact on physical security: a pipe out of a site is also a pipe into a site.

Next steps

We are very happy to engage in ongoing dialogue and would also be very pleased to connect you to individuals in other nation states who are actively developing and delivering heat reuse projects for data centres. We also have access to a number of case studies of data centres reusing waste heat that we should be able to share.

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More information:

- Data Centre Index: <https://www.techuk.org/data-centres-programme/data-centres-resource-index.html>
- techUK response to IHRS consultation, 2018: <https://www.techuk.org/asset/14906AC0-8B9A-4516-B4BA737D0510C8AA/>
- Heat reuse in data centres: article for Green Week: <https://www.techuk.org/asset/87F868CE-4168-4C3E-99CDA4B8D43F4C1F/>

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