techUK

IHRS Consultation
Industrial Heat Recovery Support Programme
Informal comments: UK data centre sector

4 January 2018

These comments are made on behalf of the UK data centre sector, which is not currently within the scope of the proposals. While discussions within the sector regarding heat reuse are not mature enough for us to contribute substantively to the consultation, we do feel able to make some informal observations that we hope are helpful. We also take this opportunity to confirm that this is a topic of interest to the sector and that we would welcome further dialogue if it can help establish whether data centres can make a viable contribution to energy efficiency through heat reuse.

What are data centres?

Data centres consolidate corporate and government IT functions into specialised, purpose built facilities[1]. This approach delivers very significant energy efficiency benefits compared to distributed computing, where servers remain on office premises in 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. Other more novel cooling approaches are under development. Cooling typically accounts for nearly 1/3 of energy costs, so is the focus of much R&D and commercial attention. The UK's commercial data centre sector (third party providers known as colocation operators) consumes 2.57TWh of power a year and we think that in house facilities (run by banks, government, retailers, etc.) probably consume at least the same again, putting total electricity consumption somewhere between 6TWh and 7Wh a year. We supply these figures because there has been an unfortunate tendency to overestimate the energy consumption of the sector and therefore the potential savings that can be achieved under policy initiatives.

General Observations

We think that there could be scope for the reuse of waste heat from data centre facilities: there are plenty of case studies elsewhere in Europe where heat is being reused but there is less clarity on how cost effective it is. The sector has even adopted a performance metric based on the proportion of waste hear that is reused: ERF or Energy Reuse Factor[2]. In the UK the provision of waste heat is frequently a planning requirement and operators duly implement the required infrastructure but anecdotal evidence suggests they fail to find customers. Relevant research is being done at the University of Leeds by Professor Simon Rees on viable approaches to reusing waste heat in data centres.

We have held some preliminary discussions with members and identified a number of barriers. These are iterated below. In terms of incentives the opportunity to meet CCA targets is likely to be more effective than income from sale of exported heat because efficient operation is part of the data centre business offering and selling heat services is not.

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[1] See: Er What IS a Data Centre: http://www.techuk.org/insights/reports/item/273-er-what-is-a-data-centre
[2] See: Data Centre Performance Metrics for Tiny Tots)

Specific comments on the consultation

1. Data centres are currently not in scope. Until we know more about viability we recommend that they are not excluded from scope.

2. The ONS code references could be unhelpful. Data centres are not described by a single SIC code. Most facilities are listed under 63110 but a significant number are listed under other codes.

3. We have identified the following barriers, reported by operators, to implementing heat reuse.
   - Technical difficulty in retrofitting infrastructure.
   - Practical difficulty in retrofitting infrastructure due to lack of space in urban environments.
   - Contractual issues: service level agreements may be broken or risk to service interruption may be increased.
   - Not a priority because sale of heat is not part of the data centre offering.
   - Could be seen to provide additional complexity that adds risk: data centres are exceptionally sensitive to any activity that could affect business continuity, because 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.
   - Absence of customers within range.
   - Quality of hot air that is generated is too low to use without costly processing.
   - Lack of awareness of relevant technologies.
   - Absence of infrastructure (community heat networks are rare in the UK).
   - Regulation – the Heat Network (metering and billing) Regulation acts as a disincentive.

4. We agree that feasibility studies look sensible but we think that the most practical action in the first instance would be to learn from successful approaches and case studies elsewhere: heat reuse is common in Scandinavia and in parts of the Netherlands and it would be instructive to understand whether it is cost effective and assess the implications of infrastructural and other differences in the UK. Within a data centre context, viability varies dramatically across Europe and there is much to be learned from others.

Potential next steps

Commercial heat reuse is not a priority for data centre operators but some would be happy to provide waste heat for free if customers were available and resilience unaffected. Many operators however are likely to regard the provision of waste heat as adding unwelcome complexity to a mission critical operation. So the case that needs to be made is not just a financial one. We would be very happy to host and facilitate workshops or discussions to explore the factors that limit heat reuse in the sector and identify ways they can be overcome.

Further information

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