



CIBSE response to DESNZ consultation on alternatives to clean heating solutions (February 2026)

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About CIBSE

CIBSE is the leading global body for building services professionals, championing sustainability, innovation and building performance across the built environment. We empower and equip professionals with the expertise, guidance and standards needed to deliver safe, efficient and future-ready buildings. Through our leadership in decarbonisation, building performance and continuous professional development, we support a community dedicated to creating better places for people and the planet.

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Executive summary of CIBSE response

CIBSE supports a strategic, system-led approach to heat decarbonisation that advances net zero objectives. To achieve this in practice, we suggest prioritising:

- Demand reduction and whole-building performance
- Electrification via high-performance heat pumps and heat networks
- Protection of consumers from high running costs
- Competence, professional training and measurable in-use performance

Alternative technologies have a role in some circumstances, but should be assessed against whole-system efficiency, lifecycle carbon, grid impact, and consumer affordability.

CIBSE's evidence draws on its technical guidance (including CIBSE Guides A, B, and F), Technical Memoranda (e.g. TM54 on operational performance, TM59 on overheating), weather data used in compliance modelling, and its training and competence frameworks supporting the building services profession.

CIBSE is pleased to support the Government and industry through technical guidance, professional training, performance evaluation methodologies and cross-sector convening power.



Responses to consultation questions

Q1 - Do you agree that electric boilers should play a limited role in decarbonising heat, given their comparatively low efficiency and limited ability to load shift, leading to high running costs for consumers?

Yes.

CIBSE agrees electric boilers should only play a limited role. From a building physics and systems perspective, 1:1 electric resistance heating cannot compete with heat pump's seasonal performance. Mass deployment of electric boilers would increase peak winter electricity demand.

CIBSE's operational performance work (e.g. TM54) highlights the importance of designing for real-world efficiency, not nominal performance. Electric boilers offer no system efficiency amplification and therefore increase consumer exposure to volatile electricity pricing.

Limited use cases may exist (e.g. small, low heat demand dwellings or temporary installations) if used in combination with solar PV, but they should not be considered a mainstream decarbonisation pathway.

Q2 - Do you agree that (a) thermal energy storage systems and (b) electrical energy generation and storage (solar PV and batteries) can enable electric boilers to become a more efficient and cost-effective option to decarbonise heat?

Don't know.

Thermal or electrical storage may mitigate some limitations but does not fundamentally resolve efficiency concerns. CIBSE would support further evidence gathering in this area to support policy development.

Q3 – Do you have any evidence or views on the role infrared heating could play in decarbonising heat?

While infrared heating and other alternative electric heating technologies may have a role in specific use cases (such as well-insulated dwellings, intermittently occupied spaces, or targeted retrofit scenarios), the current evidence base on their whole-home performance, system efficiency and carbon impact remains limited when assessed against heat pumps and heat networks.

Facilities such as the [Salford Energy House](#) and Energy House 2.0 provide valuable empirical insight in this area. Full-scale, environmental chamber testing allows different heating systems to be evaluated under controlled climatic conditions, assessing not only energy consumption but also thermal comfort, responsiveness and interaction with building fabric performance. This type of monitored demonstrator work is critical in moving beyond theoretical modelling toward real-world performance data.



CIBSE Guide A sets established criteria for thermal comfort based on operative temperature and mean radiant temperature, rather than air temperature alone. As infrared systems operate primarily through radiant heat transfer, their performance should be assessed against these established comfort parameters, including spatial uniformity and avoidance of local discomfort. Robust testing against recognised comfort standards is therefore essential.

Q4 – Do you agree that panel heaters and electric radiators should play a smaller role in decarbonising heat, given their comparatively lower efficiency (than heat pumps) and limited ability to load shift, leading to high running costs for consumers?

Panel heaters and electric radiators should play only a small role in decarbonising heat due to low efficiency relative to heat pumps and running costs. Wide-scale deployment risks worsening fuel poverty, increasing grid peaks, and lock-in into an inefficient system in the UK building stock.

Q5 – In what circumstances, if any, would panel heaters or electric radiators be more suitable than heat pumps, thermal energy storage systems, biomass heating systems or hybrid heat pumps?

- Small dwellings with low heat demand
- Short-term or temporary installations
- Intermittent-use buildings
- When it is not feasible to install heat pumps due to physical or acoustic constraints

Q6 – Do you agree that high temperature heat pumps could play a key role in decarbonising heating of buildings?

Yes.

The consultation's focus on heat pump categories appears weighted towards domestic heat pump deployment. In the non-domestic sector, the market is evolving toward larger capacity and high-temperature heat pump applications in commercial and industrial settings, as documented in industry analyses and reflected in CIBSE guidance for non-domestic heat pump design (e.g., AM17). CIBSE is also in the process of developing AM17.1 - which will offer industry led guidance on heat pump deployment in non-domestic retrofit projects.

This trend is consistent with broader market research showing increasing adoption of higher capacity heat pump applications in commercial and industrial facilities, which aligns with the shifting market towards higher temperature operation where it supports existing distribution systems and diversified heat demands.

HTHPs can also play an important transitional role in domestic buildings, particularly in retrofit where emitter upgrades are disruptive or cost prohibitive. HTHPs generally operate at lower COPs than low-temperature systems, but still significantly outperform direct electric heating. The key is correct system design. CIBSE's training and CPD programmes aim to support the profession in delivering high-performing installations, emphasising:



- Fabric improvement first
- Correct emitter sizing
- Accurate load calculations
- Proper commissioning and controls

Q7 – What are the key barriers that are preventing the installation of high temperature heat pumps in (a) domestic properties and (b) non-domestic buildings? How could these barriers be removed?

High-temperature heat pumps offer important opportunities across both domestic and non-domestic sectors, but their successful deployment depends on addressing several key challenges.

- **Capital cost** remains a primary barrier, particularly in domestic retrofit and in larger non-domestic buildings where plant replacement may require electrical upgrades, hydraulic redesign and controls integration.
- **Refrigerant choice and regulation** are also significant considerations. The UK F-Gas phase-down and the transition toward low-GWP refrigerants introduce implications for long-term compliance, plantroom design, safety management and maintenance competence.
- **Commercial, public sector and light industrial buildings** often require higher output temperatures, making high-temperature heat pumps a potentially important pathway. However, larger systems introduce greater design complexity and infrastructure considerations.
- **Skill-development and consumer awareness.**

Where appropriately designed and commissioned, these technologies can: support electrification of heat in retrofit contexts; enable decarbonisation of higher temperature applications; and reduce reliance on fossil fuels while maintaining system compatibility.

CIBSE emphasises that performance outcomes are dependent on competent design and operation. Our technical guidance (including Guide A, Guide B and AM17) and training programmes support safe, efficient and evidence-based deployment. Policy frameworks should therefore prioritise whole-system performance, workforce competence and long-term regulatory clarity to maximise the benefits of alternative clean heating solutions including HTHPs.

Q8 – Do you agree that air-to-air heat pumps could play a key role in decarbonising heating of buildings without wet central heating systems?

Yes.

Air-to-air heat pump systems can make a meaningful contribution to the decarbonisation of building heat and remain comparatively underutilised in the UK (domestic) market. They offer several advantages:



- Typically lower capital cost than wet distribution systems
- High operational efficiency when properly designed and commissioned
- Ability to provide both heating and cooling through reversible operation

ASHPs are already widely used in the non-domestic sector, although in domestic settings, there continues to be a cultural preference (particularly in the UK) for wet radiator-based systems.

As climate risk intensifies, the ability of reversible air-to-air systems to provide active cooling becomes increasingly relevant. The UK building stock faces a growing risk of overheating, particularly in dwellings and urban environments. Appropriately specified air-to-air systems can mitigate overheating risk by providing controlled, efficient cooling during extreme heat events.

A passive-first approach, including fabric performance, shading, ventilation strategy and solar control, remains essential to minimise cooling demand and avoid exacerbating summer electricity peak loads.

CIBSE has particular expertise in this area, including:

- Overheating risk assessment methodologies (e.g. TM59 for residential buildings)
- Future weather files and climate modelling to account for projected warming
- Analysis of cooling demand growth and its system-wide implications

Policy development should therefore recognise the dual role of reversible systems in both decarbonising heat and enhancing climate resilience, while ensuring deployment is aligned with robust overheating risk assessment and demand management principles.

Q9 – What are the key barriers that are preventing the installation of air-to-air heat pumps in (a) domestic properties and (b) non-domestic buildings? How could these barriers be removed?

In addition to the points above, ways to manage current barriers might include:

- Raising consumer awareness and trust-building
- Training and skill development of HP designers and installers
- Addressing the current lack of market drivers through mechanisms that increase demand.

Q10 – Do you have any evidence on the potential for air-to-air heat pumps to use alternative refrigerants?

CIBSE supports alignment with the F-gas phase-down and greater adoption of low-GWP refrigerants, such as R290 and CO₂.

Government support can help to address installer competence, safety standards, and clear regulatory trajectory.



CIBSE's training and professional registration frameworks are directly relevant to ensuring safe deployment of such solutions.

Q11 – Please provide any evidence or views on a) the promotion of passive cooling measures to increase their uptake, so that active cooling is only used when and where needed, and b) local network impacts during extreme weather events.

CIBSE supports passive-first cooling. Through TM52, TM59 and future weather data files used in Part L modelling, CIBSE has established methodologies for assessing overheating risk.

Without passive measures (external shading, cross-ventilation, efficient building envelope and design measures such as orientation, form and layout), cooling demand could significantly increase during the summer months. Failing to meet the cooling demand or maintaining a comfortable indoor environment during summer would lead to negative impact on health and well-being, heat-stress, productivity, and disproportionately put vulnerable groups at higher risks.

Local electricity networks must plan for both winter heating peaks and increasing summer cooling demand. CIBSE would support further evidence gathering in this area, specifically investigate and compare the summer and winter peak demand on grids, to support policy development.

Q12 – Do you agree that networked heat pumps may have a key role to play for buildings with limited outdoor space for individual heat pumps per dwelling?

Yes.

Networked or ambient loop heat pumps are a promising solution, particularly for flats or constrained sites. Benefits include load diversity, improved efficiency, shared infrastructure, reduced need for individual outdoor units.

CIBSE's expertise in heat networks and building services integration positions us well to support standards development and professional training.

Q13 – Do you have any evidence or views on a) which business models would be most effective at bringing forward networked heat pumps, where appropriate, and b) what steps would be necessary to support the development of such business models?

See previous response.

Q14 – Do you have any evidence or views on a) the public appetite to make use of clean heat solutions relying on shared infrastructure, b) where clean heat solutions that rely on shared infrastructure have been implemented, and c) what steps have been most effective at persuading households to participate in projects?

N/A

Q15 – Do you have any evidence or views on the role exhaust air heat pumps could play in decarbonising heat?

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N/A

Q16 – Do you have any views on whether exhaust air heat pumps should be targeted primarily at buildings with a) limited outdoor space b) a higher risk of air-tightness c) lower heat demand d) new-builds?

N/A

Q17 – Do you have any evidence or views on the role heat batteries could play in decarbonising heat?

Thermal storage has system value if:

- Properly sized relative to heat load
- Smart-controlled
- Integrated with time-of-use tariffs

CIBSE's system modelling expertise supports further exploration of phase change materials, smart load shifting and integration with heat pumps. However, poorly specified systems risk increasing costs without delivering peak reduction.

Q18 – Do you have any views on what further criteria, in addition to existing scheme criteria (e.g. MCS certification and SAP-eligibility), should be required for heat batteries that are supported through government grant schemes to prevent systems from drawing energy at peak times?

Grant eligibility criteria should prioritise measurable system performance and whole-system impact. In particular:

- Demonstrated peak demand management capability, including the ability to operate flexibly or integrate with thermal storage or smart controls, in order to avoid exacerbating winter electricity peak loads.
- Verified performance under cold design conditions, reflecting UK winter temperatures and real-world operating conditions, rather than nominal test performance alone.
- Transparent, building-specific heat loss data, ensuring systems are correctly sized and reducing the risk of poor performance or unnecessary oversizing.

Electricity pricing structures will also materially affect outcomes. Without reform to address the relative cost of electricity versus gas, grant schemes alone may not deliver sustained market transformation or optimal system operation.

Q19 – Do you have any evidence or views on how future developments in the thermal energy storage market might help reduce strain on the electricity grid and how this could work with other technologies (like heat pumps or electric boilers) to become more cost effective?



Referenced in responses to Q17-18. Thermal energy storage can help reduce grid strain by enabling load shifting and better matching demand with renewable generation. However, buildings should not be treated in isolation. Effective deployment requires coordination with whole electricity system factors including network capacity, time-of-use pricing, and distributed generation to prevent unintended grid stress.

CIBSE supports approaches that integrate building-level solutions within wider system planning.

Q20 – Do you have any evidence or views on the role storage heaters could play in decarbonising heat?

Modern high-retention storage heaters are preferable to legacy systems but remain inferior to heat pumps in system efficiency. They may serve limited roles e.g. in small dwellings or flats with limited retrofit scope. Smart charging and tariff alignment are critical.

Q21 – Do you have any views on what further criteria, in addition to existing scheme criteria (e.g. SAP-eligibility), should be required for high heat retention storage heaters that are supported through government grant schemes, to prevent systems from drawing energy at peak times?

See previous response.

Q22 – Do you have any evidence on any other types of electric heating that could play a significant role in decarbonising heat?

N/A

Q23 – Do you have any evidence or views on the role solid biomass boilers could play in decarbonising heat?

CIBSE's expertise lies primarily in building services engineering rather than feedstock economics. However, biomass can present particulate emissions challenges that will impact air quality. More generally, solid biomass boilers are more suitable in rural contexts rather than for mass urban deployment.

Q24 – Do you have any evidence on the types and/or characteristics of properties which would not be suitable for a heat pump or a heat network, but would be suitable for a biomass boiler?

See previous response.

Q25 – Do you have any further evidence or views on the sustainable implementation potential for renewable liquid heating fuel production in the UK?

N/A



Q26 – Do you have any further evidence or views on the cost at which renewable liquid heating fuels – produced from sustainable feedstocks - could be made available to UK consumers?

N/A

Q27 – Do you have any evidence or views on the potential of renewable liquid fuels to be used in buildings where other low carbon solutions may not be the best solution?

N/A

Q28 – Do you have any evidence or views on the practical implications that may arise if some off-grid consumers start using renewable liquid heating fuels?

N/A

Q29 – Do you have any evidence or views – especially on cost and availability of sustainable feedstock - to demonstrate that a possible initial blend approach could be increased to a 100% renewable liquid fuel solution for consumers?

N/A

Q30 – Do you have any evidence or views on the role that hybrid heat pumps, comprising of a heat pump and an appliance using 100% renewable liquid fuels, could play in decarbonising heat?

While hybrid heat pumps may reduce peak electricity demand, it risks locking in combustion infrastructure. It could be seen as a transition technology where full electrification is unviable.

Q31 – Are there any other alternative low carbon heat sources not discussed in this consultation which you consider could offer further benefits if installed as part of a hybrid heat pump system compatible with net zero?

Electric underfloor heating is one area that is not directly covered and this is playing a role in decarbonising heat.

Q32 – Do you have any evidence or views that could help inform future decisions on whether to implement a Renewable Liquid Heating Fuel Obligation, and if so, how?

N/A

Q33 – Do you agree that evidence of affordability to consumers, and availability at scale of sustainable feedstock are key factors in determining if the government should pursue the implementation of a Renewable Liquid Heating Fuel Obligation? If not, what other factors do you think are significant and why?

N/A



Q34 – Do you have any views on what other steps government or industry could take to develop the market for renewable liquid heating fuels, ahead of making a decision on whether to implement a Renewable Liquid Heating Fuel Obligation?

N/A

Q35 – Do you have any views on whether the introduction of the Renewable Liquid Heating Fuel Obligation would be an effective tool in fully decarbonising oil heated homes or whether it is a transitional solution to decarbonisation (if either)?

N/A

Q36 – Do you have any evidence or views on the role other low carbon heating systems, not discussed in this consultation, could play in decarbonising heat?

Not that hasn't been covered in other responses.

Q37 – Do you have any evidence or views on what steps the government could be taking to support the development of early-stage heating technologies that have legitimate potential in decarbonising properties?

There are several steps the Government could take to support the development of early-stage heating technologies:

- Fund monitored demonstrators
- Mandate post-installation performance evaluation
- Support professional competence development
- Use public sector procurement to de-risk innovation

CIBSE is well placed to support with guidance development, training, convening industry expertise and supporting performance data dissemination.

Q38 – Do you have any additional evidence on how people with protected characteristics under the Equality Act 2010 may be affected by the installation of any of the alternative heating technologies included in this consultation?

High running-cost technologies disproportionately affect low-income households, elderly residents, and those with medical vulnerabilities.

As energy demand for cooling in the summer increases, this impact will become more significant as will the impact of overheating on these groups.

Policy must ensure running cost protection, accessible controls, clear consumer advice and ultimately ensure the avoidance of fuel poverty and overheating risks.