BAXI

Decarbonising heat in schools: Challenges and opportunities

Background/Policy Context

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Decarbonising heat in schools will play a key role in achieving government targets and driving down energy use and bills for schools, while improving building conditions.

Government targets

The UK has committed to becoming net zero by 2050, and to reducing public sector buildings emissions by 50% and 75% by 2032 and 2037 respectively.

Building emissions

In 2023, buildings accounted for 20% of total UK emissions making it the second highest emitting sector. Public sector buildings, including schools, represented 11% of these emissions, with gas for heating being the dominant contributor.

Condition of schools

The condition of the UK school estate is declining, costing an estimated £11.4 billion to bring buildings up to a good standard of repair. Heating, ventilation and air conditioning systems represent £2.1 billion of the total.

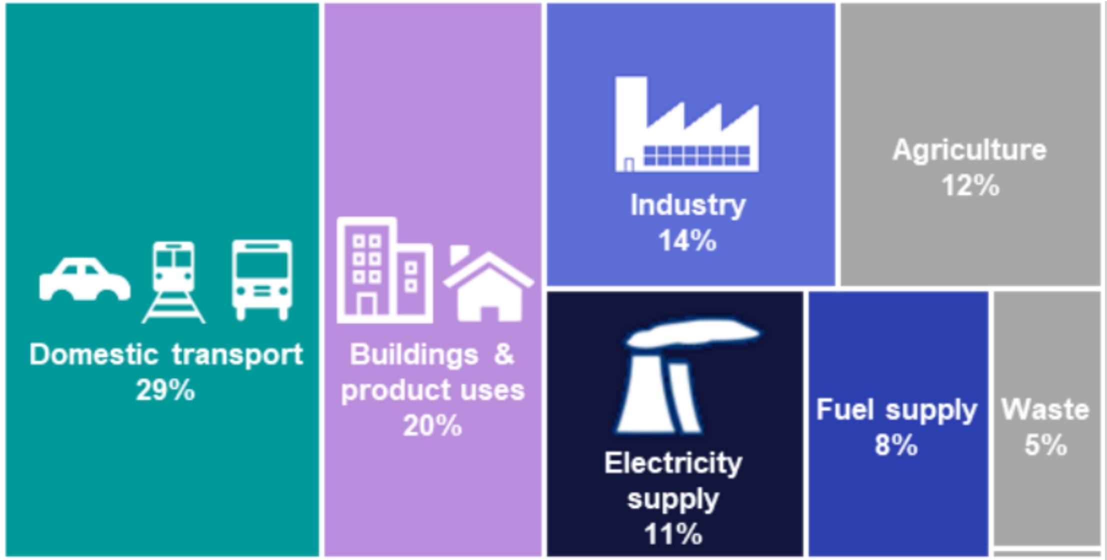

Fig. 1 – UK territorial emissions for 2023 by sector (DESNZ, 2023)

Energy use in schools

60% of energy use in education settings is for heating, leading to significant energy bills. In 2022/23, maintained schools and academies in England spent around £1.2 billion on energy.

School Decarbonisation Policy

BAXI

Policy support for decarbonising schools:

CONDITION IMPROVEMENT FUND/SCHOOL CONDITION ALLOCATION

Supports condition improvements in schools and colleges, including installation of decarbonisation measures such as replacements, upgrades or repairs for boilers.

Budget of £1.84bn for 2025-26

PUBLIC SECTOR DECARBONISATION SCHEME

Provides grants for public sector bodies to fund heat decarbonisation and energy efficiency measures.

Budget of over £1bn for 2025-2028

GREAT BRITISH ENERGY

Publicly owned energy company supporting roll out of clean energy projects. £200m has recently been invested into rooftop solar for schools and hospitals.

Budget of £8.3bn over course of parliament

Methodology

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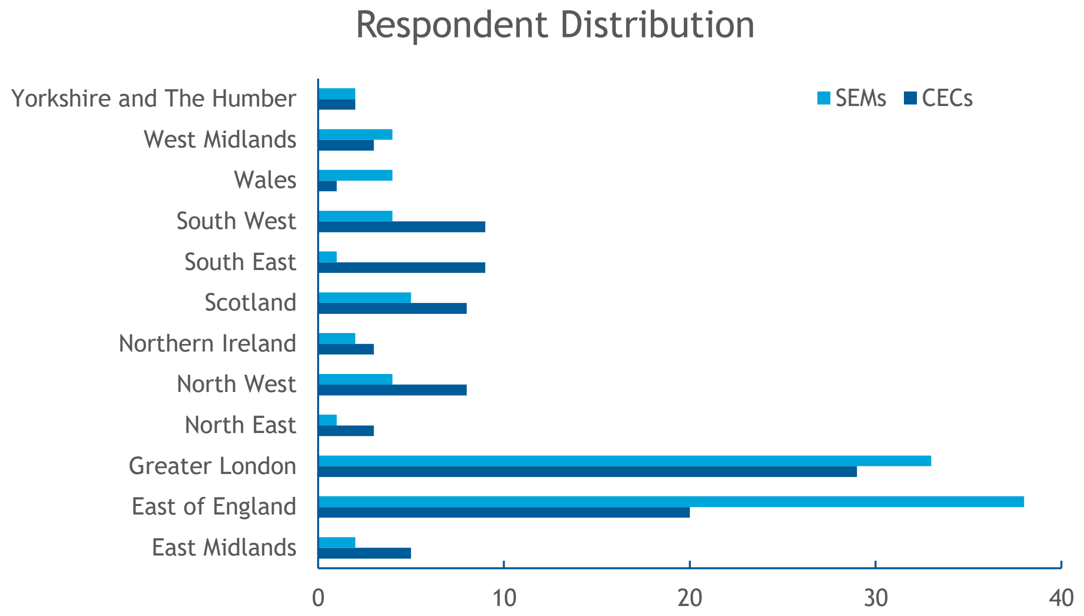
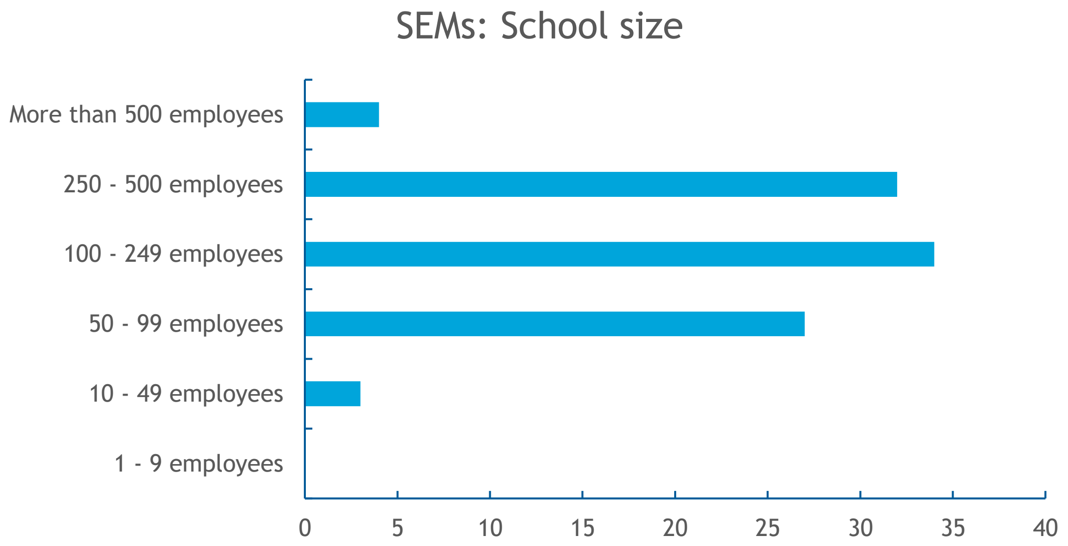
Survey

- Geography: UK
- Respondents: 100 School Estates Managers (SEM), 100 Consultant Engineers/M&E Contractors (CEC)
- Date of Survey: SEMs 18 – 20 Feb. 2025, CECs 21 Feb. 2025 – 25 Feb. 2025
- The data was collected through double opt-in online surveys
- There is a potential for non-response bias in the sample (93% of respondents had experience replacing a school's boiler with a heat pump). Regardless of whether the sample is representative of all SEMs and CECs, the respondents are primarily those with experience of installing / using heat pumps.

Desk-based research

- Online research conducted to identify relevant policies and schemes to improve energy efficiency of schools
- Policies examined to understand eligibility of hybrid heating system upgrades



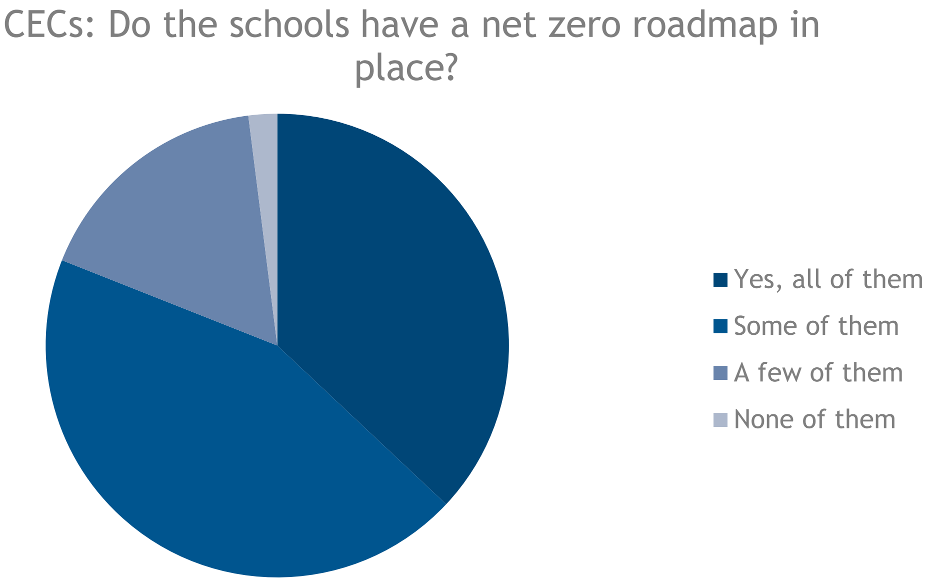


Survey findings

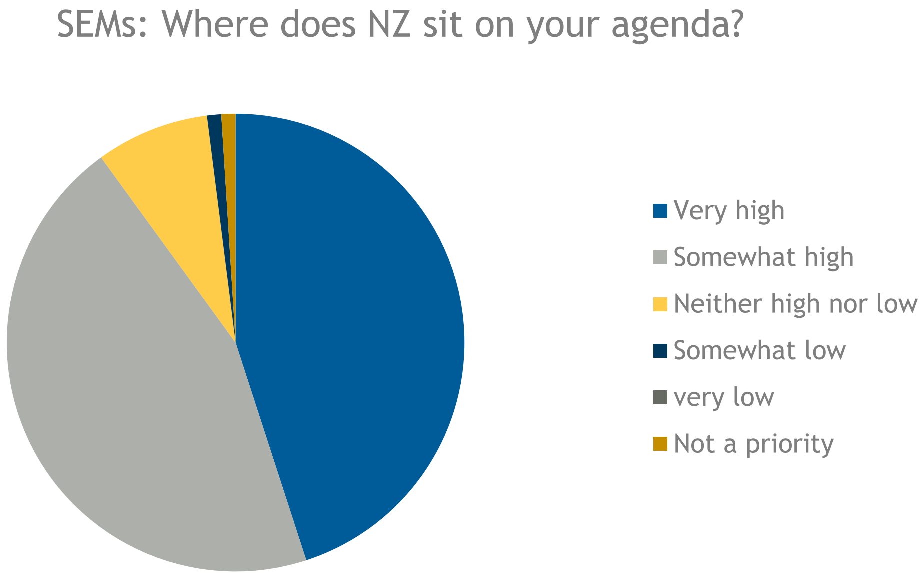
- Net zero agendas in schools
- Current heating systems
- Experience of decarbonising heat
- Heating upgrade option preferences
- Barriers to decarbonisation

Net zero agendas in schools

Net zero agendas are high on schools' agendas, but CECs suggest that net zero roadmaps are not as widespread as school estates managers report. This suggests that there is widespread enthusiasm for decarbonisation, but that some schools may need to develop firm strategies to do so.



CECs: Do the schools have a net zero roadmap in place?



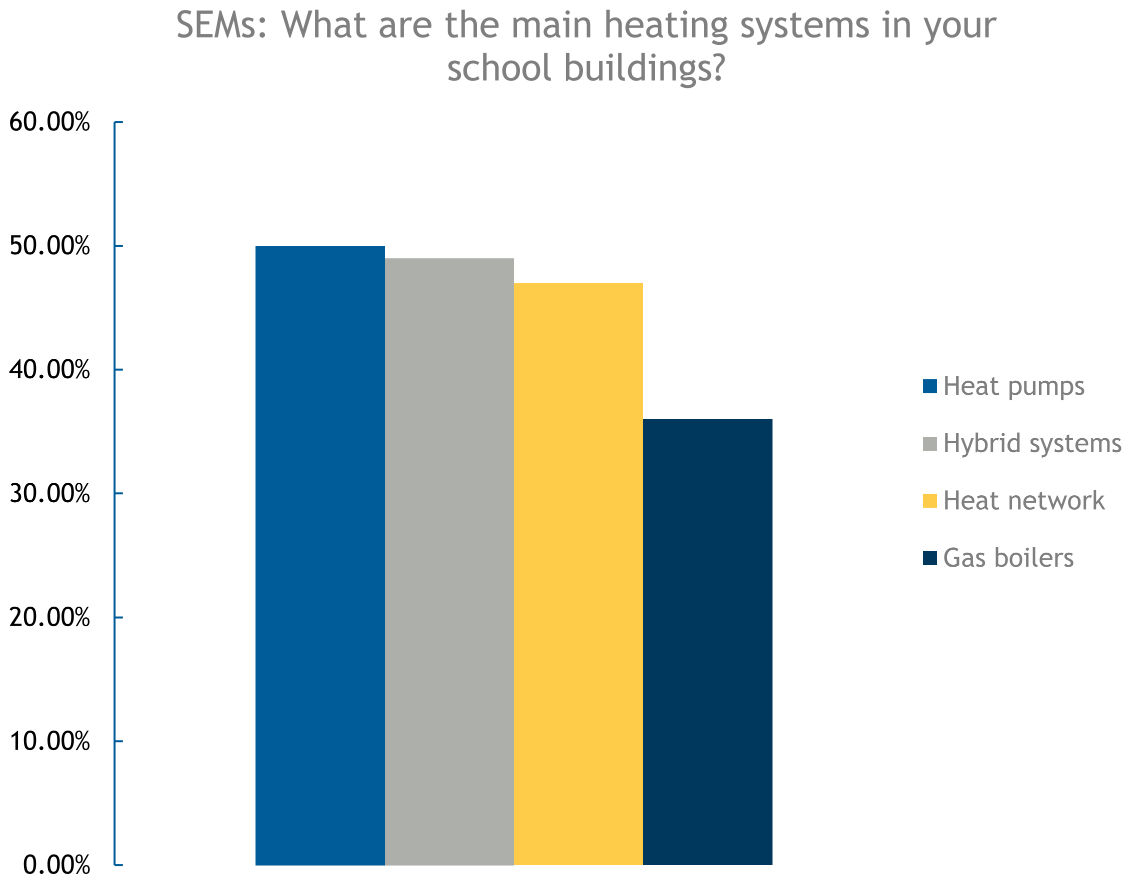
SEMs: Where does NZ sit on your agenda?

- 37% of CECs say that **all** the schools they work with have a net zero roadmap
- 78% say that net zero is typically high on the agenda of the schools they work with

- 99% of SEMs report to have a net zero roadmap in place
- 90% say that net zero is either very, or somewhat high on their agenda
- 98% were happy about decarbonising the heating system in their estates

Current heating systems

The distribution of heating types systems in schools is relatively even, but gas boilers still make up a significant minority. Schools, however, are very happy with their current heating arrangements.



Gas boilers are still present as a main heating system for buildings in 36% of the schools. There is a significant opportunity for further decarbonisation in schools using low-carbon heating systems.

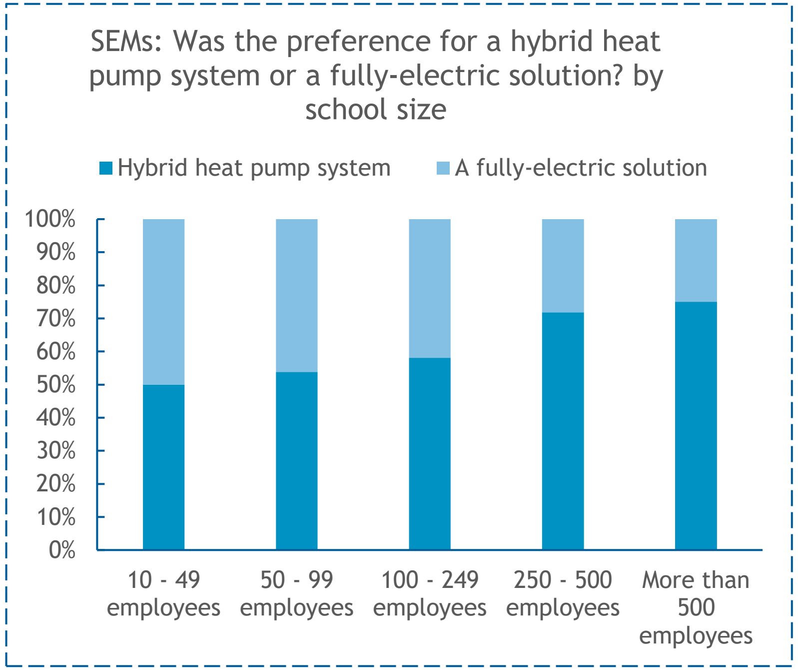
However, 98% of school estates managers thought their current heating system works well

Although this could indicate low demand for improvement, it could also demonstrate product satisfaction with low-carbon heat systems since nearly all respondents had experience replacing a gas boiler with a heat pump

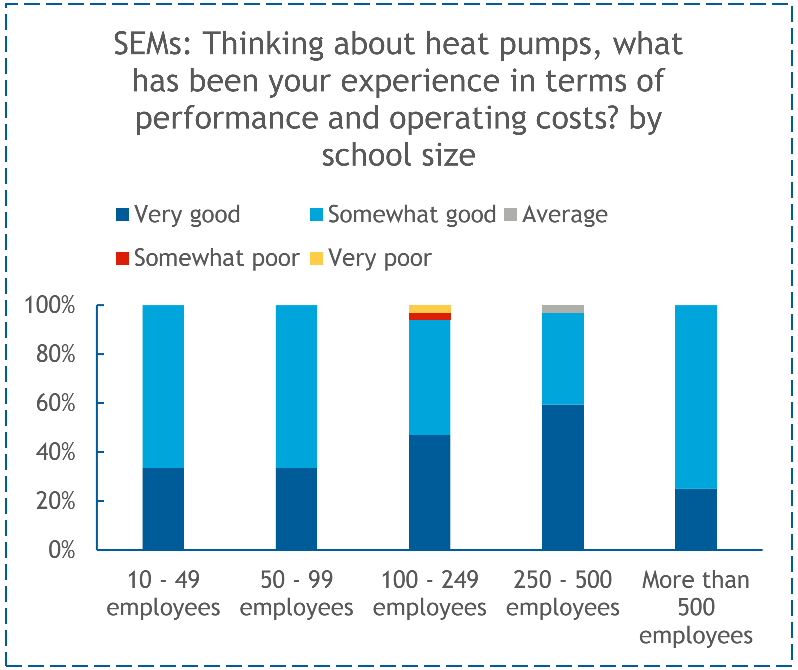
Experience of decarbonising heat

There is widespread experience among SEMs and CECs in decarbonising heat in schools. Heat pumps have been very well received, and there exists a preference for selecting hybrid heat pump systems in schools.

- 95% of school estates managers and 91% of consultant engineers and contractors have replaced a school boiler with a heat pump.
- This reflects experience and enthusiasm for heat pump installation, with respondents expressing a preference for hybrid systems – but could potentially be reflective of respondent bias in the sample.
- Most consultant engineers and contractors consider it easy to move away from gas. 34% consider it ‘very easy’, and 51% somewhat easy. Only 7% consider the switch to be ‘somewhat difficult’.
- Although challenges to decarbonising heat exist, the task is considered entirely achievable.


SEMs: Was the preference for a hybrid heat pump system or a fully-electric solution? by school size

Of school estates managers that had installed heat pumps, **62%** opted for hybrid systems, and **38%** preferred fully electric solutions. The selection of hybrid systems was more common in larger schools.


SEMs: Thinking about heat pumps, what has been your experience in terms of performance and operating costs? by school size

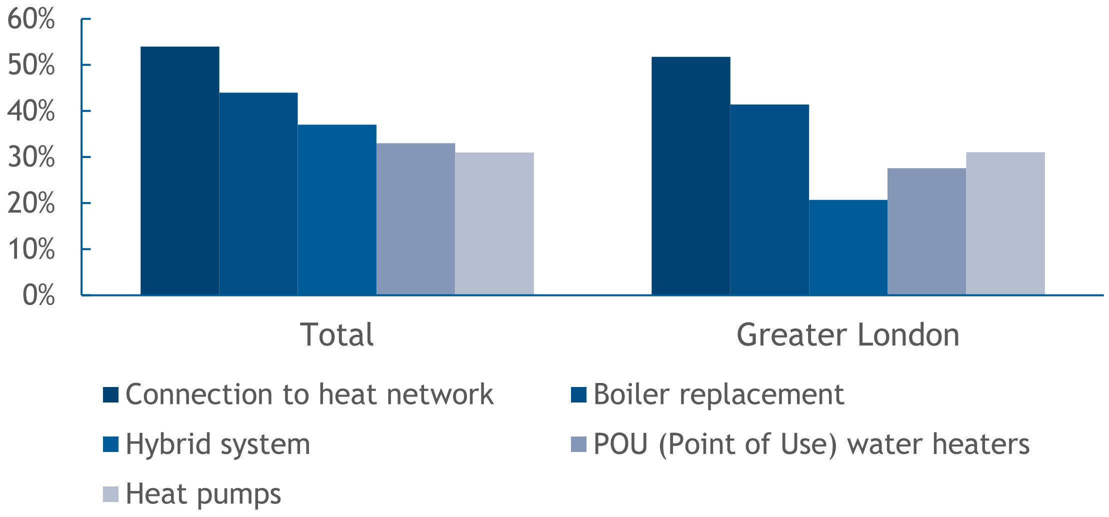
97% of school estates managers have had a good to very good experience with heat pumps in terms of operating costs and performance. Larger schools more often had very good experiences than smaller schools, except for the small group of schools with more than 500 employees.

Note. The categories “10-49 employees”, and “more than 500 employees” each had less than 5 respondents

Heating upgrade option preference

There is a high willingness to consider alternatives to gas boilers between school estates managers and consultant engineers and contractors.

CECs: If refurbishing the heating system, what are the most popular options?



93% of SEMs would be at least somewhat likely to consider a hybrid heat pump system, with 53% being very likely

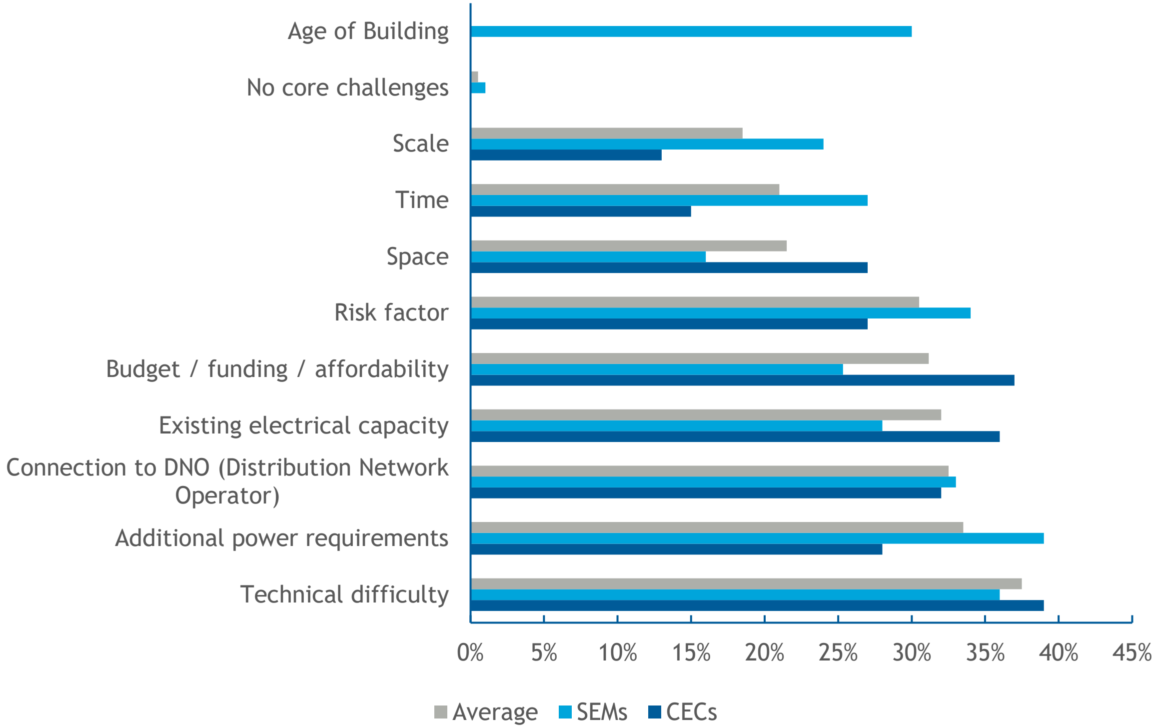
99% of SEMs would be at least somewhat likely to consider a prefabricated heating solution such as a packaged energy centre with 46% being very likely

- CECs report that heat networks are the most popular option for schools refurbishing their heating systems.
- Hybrid systems are less popular in London. This could point towards regional differences such as rurality, funding opportunities, or surrounding infrastructure that affect the suitability of different systems.
- Boiler replacements are still a very popular option for system refurbishments, presenting an opportunity to capture more of the boiler replacement market for heat pump and hybrid options, as well as its strength as an incumbent technology.

Barriers to decarbonisation

School estates managers and consultant engineers and contractors identified many core challenges facing decarbonising heat in schools. Power/electrical requirements and technical difficulties are the primary challenges to decarbonisation before funding and project constraints.

% of respondents who identified a given constraint as a core challenge when decarbonising heat in schools?



These primarily concern technical difficulty, energy infrastructure, financing, and risks. CECs did not recognise time or space as a challenge as frequently as school estates managers. Communicating these concerns may be important to beginning decarbonisation projects.

83% of CECs at felt that these challenges at least somewhat influenced the choice of system replacement

Generally, as the school size increased, affordability was less frequently recognised as a core challenge to decarbonising heat by school estates managers. Smaller schools may need greater financial support for heating projects.

Note. Age of building was not a response option for CEC respondents; the category of budget/funding/affordability was ungrouped for estates respondents so have been averaged, likely giving a downward representation of the importance of financial challenges to estates managers.

Conclusions

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IMPLICATIONS OF THE RESEARCH:

- Funding is stretched between various school improvement priorities and is competed for between public sector organisations.
- Lack of clarity over eligibility of hybrid systems within the Public Sector Decarbonisation Scheme.
- Help is required to address additional electrical infrastructure requirements of hybrid installations.
- Technical difficulty is a core barrier to decarbonising heat in schools.
- The UK has the highest electricity prices in Europe. Hybrid systems will be adversely impacted by the rising cost of electricity.

POLICY RECOMMENDATIONS:

- Protect existing funding schemes and ringfence specific funding for school heating system decarbonisation.
- Provide clarification over hybrid heating system guidance in support schemes/Relax funding rules on hybrid heating systems within support schemes.
- Utilise GB Energy to accentuate synergies between school capacity or power requirements and GB Energy clean energy projects.
- Address the skills gap to help deliver clean energy projects.
- Address the imbalance in price between gas and electricity and ensure policies/legislation following the upcoming rebalancing levies consultation are not delayed.