

The Built Environment Special Interest Group

Decarbonising the Heating of the University Estate 15 Mar 2023

Panel

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Challenges

- University buildings can have complex retrofitting and demand requirements.
- Listed buildings & special permissions.
- Design thinking in shared resources (space, facilities, data, knowledge).
- Efficiently integrating solutions.
- Educating industry and enabling transition in engineering practices.
- Financing new technologies and the policy space enabling this.
- Better using waste-heat.

Discussion Points

- Need for decarbonisation has now been accepted in industry and there exists appetite for more sustainable approaches.
- Colleges have started working together to tackle decarbonising heat. First [inter-collegiate sustainability report](#) has been produced. Most colleges have a decarbonising strategy and their goals are generally aligned. Residential heating is key for colleges. Projects exist/are underway that offer integrated/district-level solutions, e.g. using river Cam.
- Degasifying starts by low-hanging fruits, e.g., thermo-radiator valves), reducing demand & retrofit, then supplying heat more sustainably, such as using the ground or river. Retrofitting makes heat supply easier and allows more sustainable solutions (e.g., Entopia building).
- Sustainable technologies become more efficient, while gas prices go up, meaning the markets can now compete. Technical problems (e.g., integration, design, weight) can be tackled, through research, e.g., by using better materials.
- New technologies face more problems than just technical. Infrastructure, policy, and societal change is needed. Current policies often do not enable transition. Educational challenge also exists, industry does not like change and associated risk.
- Design thinking for new systems governed more by contractual obligation, than emissions. We need to strategically think how to design and incorporate better ways to quantify uncertainties and risks, e.g., engage with end-users to better understand how buildings are used.
- Heat rejection is easier than expected using reversable heat pumps. University tries to balance heating and cooling for efficient operation of GSHP.
- Electrical grid capacity an issue, linked more to usage growth than decarbonising (water supply similar). Overengineering has been the standard practice, but this is changing.
- University report states that energy consumption increases. This is due to growth in Estates. Transitions are still underway (Cavendish Lab) which will contribute to drops. Very active programme at re-shaping estates and using space more efficiently. No new gas boilers are put in!

Opportunities

- Tackle problem at city level, working with stakeholders to harness economies of scale. Networks and multiple sources/sinks of heat need to be part of solution
- Quantify uncertainties and risks to assist industry transitioning to sustainable technologies.
- Integrating technologies (e.g., solar thermal & GSHPs) and educating industry.
- Policy can drive technological adoption and bring down costs.

