

The Built Environment Special Interest Group

Data and its role in decarbonisation of the built environment

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Panel

Jennifer Schooling, Director, Centre for Smart Infrastructure and Construction, University of Cambridge

Ajith Kumar Parlikad, Professor of Asset Management, University of Cambridge

Srinivasan Keshav, Professor of Computer Science, University of Cambridge

Janet Fogg, Climate Change Officer, Cambridge City Council

Giles Greenfield, Second Bursar, Darwin College, University of Cambridge

Xiang Cheng, Building Energy Manager, Estates Division, University of Cambridge

Rapporteur: Rebecca Ward

For more information, contact decarbnetwork@admin.cam.ac.uk

Challenges

- Measuring materials and resources used in construction, including temporary works and re-work.
- Ensuring through-life data quality and compatibility with different end-uses.
- Insufficient reliability and granularity of energy consumption data.
- Ensuring robust sensing network.
- Interpretation of data to facilitate decision making.
- Lack of internal and financial resource for installation of sensors and data interpretation.

Discussion Points

- To what extent do privacy issues hinder data collection? Data collection can reveal patterns of life and impact on physical security, particularly in a residential setting.
- There are a lot of sources of data that are already accessible and do not impact on privacy. It may be possible to collect alternative non-private data and infer quantities of interest. It may also be possible to use virtual sensing i.e. infer values from sparse sensing having trained a model on a large data set.
- It is important to quantify the minimum quantity of data required to answer a question.
- Data granularity and spatial distribution of sensors are key issues. Too often there are insufficient sensors in a building giving too high a level of information, or the sensors present are in the wrong place or are not working.
- To identify the impact of activities in a space on energy consumption it is essential to monitor consumption at an appropriate spatial density. This must be done to quantify waste and identify contributing behaviours.
- How can data best be used to make strategic decisions? If there is too much data available it is very difficult to process and interpret. There are many sensors installed but not used as the processes are not in place to facilitate interpretation.
- Different systems report in different formats. Ensuring compatibility across data sources will make interpretation easier and faster.
- The whole chain needs to be maintained and trustworthy. Maintenance of sensor networks and issues around sensor health and tolerance can increasingly be dealt with using commercial systems such as Azure Sphere.
- The University has a large quantity of energy consumption data for the non-domestic building stock accessible through SystemsLink. There are also a number of buildings with live operational and environmental data. By comparison the colleges have limited resources and insufficient data to support strategic decision making.

Opportunities

- Development of systems for interpretation and visualisation of large data sets.
- Codifying knowledge and merging asset knowledge and data sets throughout the lifetime of a building.
- Accurate measurement and record keeping of materials and resources through complete building history.
- Development of data ontologies appropriate to building systems.

