



Theme:
Non-domestic Energy

Overview

Reducing the energy use in non-domestic buildings is a challenge because so many people are involved. Building owners, building managers and users of the building can all influence energy demand. Buildings can also be used for very different things, from manufacturing to retail, which have different energy requirements. As a result there is little evidence regarding how behaviour change can reduce energy use from non-domestic buildings. A number of TEDDINET projects are focused on improving understanding of energy use in non-domestic buildings in order to reduce energy consumption.

Examples from three project's published work on this subject are provided here.

Key Messages

Communication is essential - A significant reduction in energy demand from non-domestic buildings is possible. Research has shown that a greater level of communication between building users and managers, coupled with greater energy visualisation could lead to quick wins resulting in significant energy savings with little capital investment.

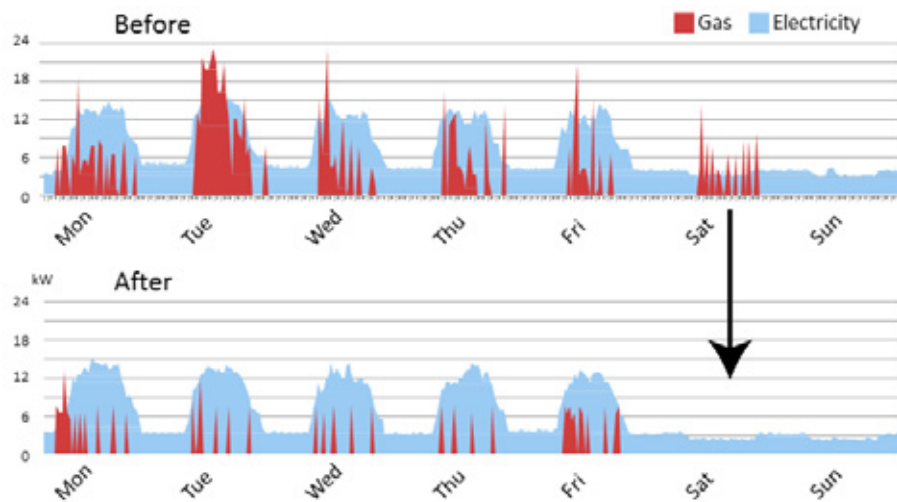
Government can lead - Following the Australian lead, where possible green leases should be required on Government owned buildings in the UK. This will promote the value of green leases and result in long term energy demand reduction in non-domestic buildings.

Continued research - More research is required into non-domestic buildings due to the diverse building stock and potential uses for those buildings.

Example: Ctech – Creating the Energy for Change

Researchers on the Ctech project used interviews and energy use data to understand energy use in an office building. They found that there were inconsistencies in the understanding of how the building was operated between the various stakeholders. For example, building managers do not always work in the building that they manage so may not know specific details about how they are operated. This has a knock on effect on how energy is used. One example of this highlighted the importance of energy visualisation. Researchers found that gas was being used unnecessarily on Saturdays when the building was empty. This error was rectified and 20% of gas consumption was saved in the building.

Researchers suggest that most complex buildings are likely to have similar ‘errors’ which will result in wasted energy. The findings suggest that large energy saving will be possible if collaboration between building managers, users and other stakeholders is improved.



Example of energy visualisation which resulted in energy savings

Information gathered from

Bedwell, B., Costanza, E. & Jewell, M. (2016) Understanding energy consumption at work: learning from arrow hill. CSCW 2016: 19th ACM Conference on Computer Supported Cooperative Work and Social Computing, San Francisco, US, 27 Feb - 02 Mar 2016. ACM12pp. CSCW 2016: 19th ACM Conference on Computer Supported Cooperative Work and Social Computing, San Francisco, US, 27 Feb - 02 Mar 2016. ACM12pp.

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<http://www.teddinet.org/project.php?s=ctech>

Example: WICKED

Researchers on the WICKED project undertook five case studies about green leases. Green leases enable landlords and tenants to meet environmental targets by challenging organisational practices. Such leases have green clauses which encourage energy efficiency. For example, they might stipulate that tenants must make energy efficiency improvements to the building or ensure that the landlords are supplied with energy use figures.

Researchers studied examples of green leases for buildings in Australia and the UK. They found that green leases are more common in office buildings than retail and are usually instigated by powerful landlords. The Australian Government require some of the buildings which they own/rent to have green leases and are therefore the world leaders in this area. Researchers indicated that the green leases in Australia tended to be more ambitious than those from the UK partly because more of the clauses are legally binding. Many of the clauses included in UK green leases were made in 'good faith' and consequently there is room for improvement in the UK.

The research suggests that a system which colour codes leases depending on how ambitious and enforceable they are should be used. An increase in uptake of green leases, especially if these are ambitious and enforceable, could ensure improved energy governance in buildings. This could be encouraged in the UK if more powerful landlords or tenants insisted on using green leases.

Information gathered from

Janda K.B., Bright S., Patrick J., Wilkinson S. & Dixon T.J. (2016):
The evolution of green leases: towards inter-organizational environmental governance, Building Research & Information. Building Research & Information.

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<http://www.teddinet.org/project.php?s=wicked>

Example: ENHANCE

Researchers on the Enhance project are using a Living Lab methodology in order to study energy use in commercial buildings. The idea is that people who use the building are part of the research and are able to influence how the research is conducted. Understanding organisation behaviour is a key part of the research and all meetings, negotiations and interactions that take place in the study buildings are part of the Living Lab. Initial findings have confirmed that complex interactions between energy managers are required in large commercial buildings. Researchers have found that energy costs tend to be covered centrally and not by building/facilities managers who actually understand the building. This means that it is harder to make the required energy saving changes to behaviour and infrastructure. Researchers have also found that building managers often have limited control over the building as control can be overridden by users. These issues can cause tension in the organisation and lead to energy waste.



Information gathered from

Webb L., Morgan E., Carter C., Webb J. & Goddard N. (2016) A living lab co-creational approach to energy demand reduction in non-domestic buildings: Understanding the organisation. Behave 2016 - 4th European Conference on Behaviour and Energy Efficiency, Portugal.

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<http://www.teddinet.org/project.php?s=enhance>