

Workshop

Smart energy technology for vulnerable households

11 October 2017



As part of Bristol's Healthy City week and supported by Nottingham University, CSE held a workshop with 30 practitioners to explore the benefits of smarter energy technologies.

We heard from makers of smart thermostats and monitoring technologies and from smart system designers (Howz, Switchee and SLS), academics researching new applications of energy and environmental sensing technology (Nottingham and Bristol Universities) and from practitioners using smart energy technologies in the field to provide new and improved services (CSE and Bristol City Council).

The availability of affordable real time monitoring of energy, temperature and humidity can deliver information technologies that could help vulnerable households make better energy choices. "Smart energy technology such as smart meters, in-home displays and temperature and humidity monitoring offers massive potential benefits for vulnerable people who are struggling to manage their energy use. It can be used to trigger warnings for support workers when a home is consistently underheated, for example. The workshop resulted in some really productive conversations about mobilising the technology for these sorts of uses" said CSE's Nick Banks, who coordinated the workshop.

Vulnerable customers are defined by Ofgem as those who are significantly less able to represent their interests in the energy market, or those who are significantly more likely to suffer detriment than the average energy consumer. In practice, 'vulnerability' manifests itself in many ways and those who are identified as 'vulnerable' may be experiencing multiple and overlapping difficulties associated with health, disability, age, financial capability or other issues.

CSE's Nicky Hodges kicked off the workshop by highlighting the need for careful thinking about what additional support vulnerable groups may need to get the best out of smart energy technology. Interpreting and acting on data is often difficult for people with low levels of literacy, numeracy and mobility and there's a risk that these groups will miss out on the benefits of smart energy information systems unlike

better off and more tech savvy households. Also, just as vulnerability comes in many forms, the presentation of data and the types of support needed to understand it should be tailored accordingly. "People can't be expected to get the best out of information technologies unless the data is presented in engaging, timely and useful formats" said Nicky.

This is demonstrated by CSE's own trials with developing energy advice services around energy, temperature and humidity sensing: Karen Smith presented findings from the CharloT and Smart and Snug projects which highlight the importance of trained staff able to interpret the deluge of data from smart technology in a client's home.

Another way in which smart energy technologies can offer benefits to vulnerable groups is in providing information to caregivers and health professionals; three of the workshop contributors are developing platforms using smart monitoring for safeguarding purposes. The first, the SPHERE project at Bristol University, is analysing the relationships between the health of building occupants, the conditions of their home and their activities as revealed by their energy consumption patterns. The Switchee and Howz platforms both monitor housing conditions using sensors that can alert social housing landlords, carers or others if people are living in dangerously cold or damp homes.

These technologies illustrate some of what can be achieved at the individual household level but there are further benefits for vulnerable groups when smart

systems are embedded across multiple households and communities. Matt Jones and Lorna Edwards of Bristol City Council described the REPLICATE project which is seeking to create a smart neighbourhood in Bristol.

Households in the Ashley, Easton and Lawrence hill area will be equipped with a smart energy management system, retrofitted homes with smart appliances and the opportunity to connect to a district heating system. In addition, travel habits will be smartened through encouraging electric vehicles, car clubs and travel planning apps. The neighbourhood will also have sensing and monitoring of temperature and humidity and energy consumption embedded within it.

Critically, the applications are created by citizens themselves rather than created by experts imagining what might be beneficial. This bottom up process is being developed by Knowle West Media Centre and has been named the "Bristol" approach. The area has particularly high levels of fuel poverty, poor quality housing and other social challenges. It is hoped that by taking a neighbourhood approach which actively involves the residents in the creation of solutions and by creating collective systems of provision, many synergies will be created. For example, solutions that are engaging and meet real local needs, or sufficient users of an electric charging point within an area to make it worthwhile building the infrastructure or to make a heat network viable (a technology that can offer significant benefits to vulnerable households with large heat demands).

The workshop also considered the technical, cultural, economic and organisational obstacles that prevent more widespread deployment. Eric Taylor of SLS outlined how the administrative complexity of connecting devices to the smart meter Home Area Network could act as brake on development of services built around sending energy consumption data to the internet. The current arrangements with the Data Communications Company were considered sufficiently onerous that third party providers of smart energy platforms may develop their own monitoring kit to sit alongside the energy monitoring capabilities already integral to existing smart meter infrastructure.

The workshop also identified how the availability of data which reveals a person's lifestyle, habits, wellbeing and health in real time, poses all sort of questions around privacy and safeguarding. For example, the insurance industry is hungry for data of this kind in order to better assess risk but this type of assessment may effectively discriminate against those with vulnerabilities. The stigma of being labelled as "vulnerable" and therefore in need of smart energy monitoring kit was also thought to be a barrier to wider acceptance.

A number of key themes were highlighted throughout the workshop:

- 1 Smarter energy technology cannot enable wiser energy choices or stimulate behavioural change by itself. But it certainly has a role to play within a wider package of support.
- 2 There is much work to be done in developing the analytics that can make sense of the mass of data that is now becoming available. It is not enough to put in place real time monitoring: the capacity to interpret that data by different stakeholders (including the householder) on different platforms is key.
- 3 Presentation of smart energy information and the structure of support to enable its interpretation and use should pay careful attention to the nature of vulnerability but also be flexible - many of the benefits of smart systems are applicable to everyone. Co-design with users of smart energy technology systems and platforms is critical.
- 4 Barriers to vulnerable groups benefiting from smart energy technologies include digital exclusion and issues related to numeracy, literacy and language. The inability to act on the information is also a fundamental barrier.
- 5 Smart energy technologies must be designed to align with the attitudes, needs, capacities and culture of the users, otherwise they will be ignored, abandoned and put away in a drawer. The use case must be apparent and easily communicated.
- 6 Energy suppliers are unlikely to develop smart energy technologies (around the smart meter platform) which are targeted at meeting the needs of vulnerable households unless there is a business case or a regulatory requirement.