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CharloT on course to deliver healthier homes and lower energy bills

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Press Release

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Successful trials of CharloT, a unique new system that simultaneously records temperature, humidity and energy use in the home, have opened the way for low-income households to save money while reducing risks to their health.

Harnessing Internet of Things technology, the system generates easy-to-use data that can help local authorities, housing associations, energy suppliers, health authorities and others to target and tailor the energy advice they give to vulnerable people.

As well as revealing under- or over-heated parts of a home, CharloT enables energy advisors to pinpoint where and why damp or mould may pose a problem. They can then suggest, for example, ways of using heaters more efficiently and cost-effectively, blocking draughts and eliminating dampness through better ventilation.

The Engineering and Physical Sciences Research Council (EPSRC) has funded the development of CharloT by Southampton and Nottingham universities and the Centre for Sustainable Energy (CSE).

Each of the 20 homes has a computer server, connected via the internet (which is stored in the cloud), and a tablet/monitor that is used by energy advisors to access the data and control the system. The system is accessed via a tablet or computer using a simple-to-use web-based interface.

CharloT has now been trialled in over 20 low-income homes. A user guide helps energy advisors to make the most of the graphs and tables that the system generates and to provide tips geared to individual households' needs - including measures as simple as fitting thicker curtains or loft insulation, or improving air circulation. Of potential value to all households and not just low-income ones, CharloT is now being promoted to potential user organisations across the UK and the team are exploring ways of adding further functionality.

Cold or damp can exacerbate medical conditions ranging from colds, flu, arthritis and asthma to chronic obstructive pulmonary disease (COPD), circulatory diseases and mental illness. In total, nearly one million people in the UK suffer from COPD, for example, while cardio-vascular disease causes 42,000 premature deaths a year. People in the coldest houses can be most at risk.

Dr Enrico Costanza, who led the research while at the University of Southampton, says: "CharloT is the only system of its kind that collects data on temperature, humidity and energy use (and therefore CO2 emissions) all at the same time. It makes it easy for advisors to understand what's going on energy-wise in a house, to make the householder aware of what the problems are and ultimately to get their buy-in to make the necessary beneficial changes."

Dr Nick Banks of the [CSE](#) says: "It's not just a question of cutting energy use and greenhouse emissions. By giving energy advisors a tool that allows them to inform themselves and then sit down with a householder and talk through problems and solutions, it offers a very practical route to making wiser energy choices and therefore improving quality of life and enhancing health among vulnerable and low-income groups, who often suffer serious health impacts due to cold and damp homes."

Dr Joel Fischer, from the School of Computer Science at the University of Nottingham, says: "The development of the CharloT system was only possible due to the close collaboration with [CSE](#) energy advisors and their clients, for which we are very grateful. The advisors provided us with insight into their working practice, which enabled us to co-develop a system that responds to their needs, and their clients kindly let us into their homes to trial the system in real use contexts. It is this collaborative approach that made the project a success."

Notes for Editors:

The 18-month [CharloT project](#) began in October 2014 and ended in March 2016, receiving a total of just over £277,000 in [EPSRC](#) funding.

Internet of Things

The Internet of Things (IoT) involves the use of internet-connected devices to collect and exchange data.

The 'cloud'

The 'cloud' refers to storing and accessing data and programs over the internet, rather than on a computing device's hard drive.

COPD statistics

- > [Information on COPD \(Age UK\)](#)
- > [Cardio-vascular disease statistics \(2012 figures\) \(PDF\)](#)

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The [University of Southampton](#) is in the top 1% of universities worldwide and is a global centre for excellence in research and education. As a research-intensive university and a founding member of the [Russell Group](#) , it has gained prestigious recognition for its successes and history of world-changing achievements, and is ranked in the top twenty by the three main UK university league tables.

The [University of Nottingham](#) is ranked in the UK and European top thirty universities and in the top one per cent of all universities worldwide. Research-led and recruiting top students and staff from around the world, it is committed to internationalising all of its core activities so its students can have a valuable and enjoyable experience that prepares them well for the rest of their intellectual, professional and personal lives.

The [Centre for Sustainable Energy](#) is an independent national charity founded in 1979. Its vision is a world where sustainability is second nature, carbon emissions have been cut to safe levels and fuel poverty has been replaced by energy justice; its mission is to share its knowledge and practical experience to empower people to change the way they think and act about energy. The [CSE](#) does this by giving advice, managing innovative energy projects, training and supporting others to act, and undertaking research and policy analysis.

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