

Smart technology needs smart users

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Credit: Andrea Piacquadio from Pexels

What's the point of smart assistants and intelligent electricity meters if people don't use them correctly? In order to cope with the energy transition, we need a combination of digital technologies and smart user behaviour – and the social sciences can help.

A quarter of [energy consumption](#) worldwide occurs in the home, and this percentage is increasing, even in OECD countries, despite more efficient fridges and better insulation. The amount of energy a household requires is strongly dependent on the behaviour and purchase decisions of the inhabitants – and both are rarely based on well-informed assessments.

On the one hand, households often invest considerably less in economical appliances and energy efficiency than would be financially advisable. On the other, people who do try to save energy often concentrate their efforts in areas with little impact: they'll be fastidious about turning off the lights when leaving a room, but will leave the window open, while underestimating how much energy heating and hot water require – over 80 percent of the household total.

Information technology – our salvation?

Numerous companies, organisations and politicians are therefore hoping for digital progress. Intelligent electricity meters and clever apps are supposed to show people where they can most effectively save energy. The results thus far haven't been particularly encouraging: in large-scale studies on smart electricity meters, the realized savings came to around two percent of a household's total electricity consumption (or 0.5 percent of its total energy consumption).

This isn't a huge surprise: during the development of these kinds of systems, the focus is generally on technical and legal questions rather than the issue of how to create designs that will encourage people to actively engage with them. Many system developers assume a user who weighs up and optimises information on the basis of rational economic considerations.

Smart technology can benefit from the social sciences

However, our behaviour is anything but rational. It is subject to numerous cognitive biases and misconceptions. Factors such as social norms (how other people think and act) and defaults (predefined settings) shape our thoughts and actions far more than most of us realise.

Whether we decide in favour of [green energy](#), for example, isn't just a matter of price: A German power company managed to increase the proportion of new customers choosing green energy ten times over, simply by placing green energy as the default selection in the dropdown menu. And it wasn't that this change was leading customers to choose green energy by accident. In fact, a study carried out alongside this experiment showed that most people care about the environment – which makes it harder for us to actively refuse green power when the box is already ticked for us.

Decades of work in the social sciences have yielded insights into how information can influence human behaviour, and how we can present information in such a way that [people](#) will notice it and react accordingly. Using these insights, systems that provide feedback on energy consumption can be designed far more cheaply and effectively than is currently the case.

Energy providers already have years of experience with data analysis and customer segmentation, and they can now systematically test measures for practicality. However, in order to effectively convince a majority of customers to engage with their own [energy](#) consumption, insights into [human behaviour](#) are essential.

Social sciences can benefit from smart technology

Smartphones, intelligent gadgets and sophisticated sensors are gathering more and more data in many areas of our lives. They enable the provision of timely and situationally relevant information. Now, for the

first time in human history, it's possible – and cheap – to collect behavioural data "in the wild" and over long periods of time. This provides a valuable addition to the controlled, yet usually artificial, conditions of laboratory studies, which are often associated with high costs. Digital technology also makes it possible to tailor measures to an individual and to continually improve them.

Empowering people – not patronising them

Of course, the goal of this must be the development of systems that support us, but don't manipulate us. As researchers, we need to ensure that data protection, individual privacy and scientific integrity are maintained. We all need to be aware of the responsibility implicit in working with personal data. In light of this, the combination of [digital technologies](#) and social sciences offers major opportunities for the [energy transition](#) – and beyond.

More information: Bring behaviour into the digital transformation. *Nature Energy*. www.nature.com/articles/nenergy201785

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