CARBON CULTURE.

DEPARTMENT OF ENERGY & CLIMATE CHANGE

supported by
Technology Strategy Board
Driving Innovation

CarbonCulture at DECC

Can user engagement save energy and carbon at work?

An exploration of behavioural economics at the Department of Energy and Climate Change

"It was a massive talking point across the office"

40% voluntary sign ups: DECC's Headquarters at 3-8 Whitehall Place houses about 1000 staff. 410 DECC staff voluntarily signed up to CarbonCulture becoming our 'user-base', this represents 40% of the population, and also includes some DECC staff from other offices around the country who discovered the project and signed themselves up!

"I enjoyed using it"

"It was nice to think that someone cared how I was feeling"

"It's not a boring filling out of timesheets"

"I've been watching what I eat – it's been helpful"

"It generated its own momentum"

39.5% engagement: Over 160 DECC staff used at least one Game on more than one occasion! (nearly 40% of the user base, or 16% of the whole population).

"It's extremely easy to use and fun"

Over 9,000 individual actions: Actions were small, achievable, rewarding and quick to carry out.

"Addictive and habitual"

"Prizes are challenging but not completely out of reach"

377,975 points won! And points mean (sustainable) prizes.

"It has changed my behaviour, I am car-pooling to work with a colleague" **xx tonnes of carbon saved:** Why the xxs? At this stage we can't say how much carbon was saved. This pilot has tested how well innovative tools engage people in behaviours that we know can save carbon. The focus was on testing the feasibility of this approach, rather than measuring the amount of carbon saved at this stage. Moving forward we will measure the energy and carbon saved (see the full report to find out more).

Foreword

Paul van Heyningen
Head of Sustainability and Estates
Department of Energy and Climate Change

This report tells the story of a project we have been hosting at DECC that seeks to unlock energy and carbon savings in workplaces through staff engagement and behaviour change. DECC partnered with design-for-behaviour-change specialists CarbonCulture, supported by the Technology Strategy Board, to pilot an innovative, user-centred digital platform, intended to engage staff on sustainability issues.

CarbonCulture at DECC created an online space that can deliver behaviour change through developing and reinforcing community, and encouraging user engagement with fun and easy to use tools that appeal to wide audiences. The aim of this pilot has been to test the ability of this method to deliver user engagement, and to develop tools and approaches that could be taken up by large populations of building users across the UK at low cost.

There is still a lot of work to be done to meet the ambitious carbon reduction targets set by the UK Government – both for its own operations, and for the country as a whole. Adding high-performance behaviour change to our portfolio of approaches provides an opportunity for government and businesses alike to cut their energy bills. Through public engagement we can help create energy and carbon literacy, a key step in making further savings.

In this project we have made substantial progress in this fast emerging field of behaviour change. We have gained valuable insights, and revealed good practices that invite more investigation and show the path forward. This summary sets out the highlights, and the full story been captured in a web-based interactive report which you can access now and comment on at www.carbonculture.net/research/decc.

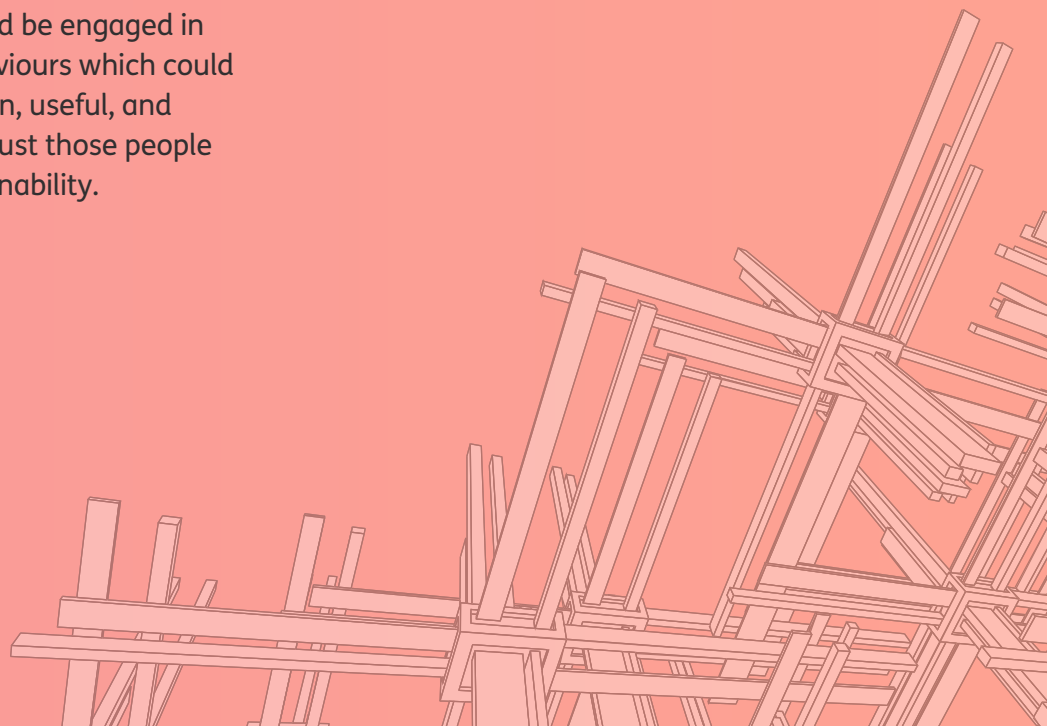
Start here

Non-domestic buildings account for 18% of the energy used in the UK[1], these include offices, schools, hospitals, and airports. The utility bills – and carbon emissions – of workplaces can be reduced very effectively with the support of the people working in them. The amount of energy used in these buildings is affected not only by the things people use but also by the way that they use them. It is well known that if people change their behaviour in certain everyday actions, they can make substantial energy savings[2] – successful workplace behaviour change campaigns claim savings of over 10% of total energy demand – but no-one has found a way to reliably bring about workplace behaviour change across diverse audiences at low cost. **CarbonCulture at DECC** set out to find if we can help change that.

We looked at how people could be engaged in voluntary carbon-saving behaviours which could attract more users by being fun, useful, and rewarding – reaching beyond just those people that already care about sustainability.

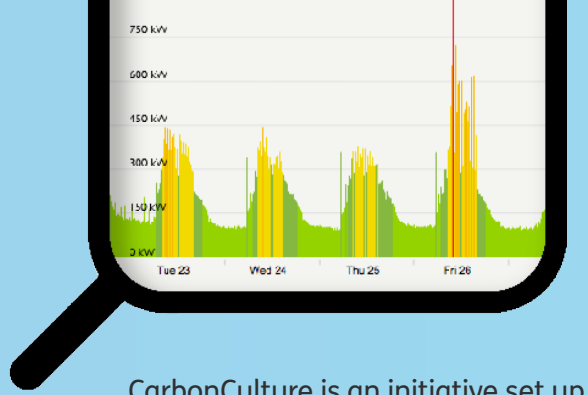
If we could demonstrate in one building that it is possible to engage large numbers of people in carbon saving behaviours with tools that we know can be delivered at scale for a low cost, then we unlock an opportunity to deliver massive additional energy and carbon savings in buildings and organisations across the UK and beyond.

We worked with staff at the Department of Energy and Climate Change (DECC) to identify and develop tools addressing a small collection of carbon saving behaviours to get started with. Together we looked at a number of behaviours and possible tools, developing three full tools that focus on behaviours around what people eat for lunch, how they get to work, and late night working spaces.



1 Technology Strategy Board (2009). User-centred design for energy efficiency in buildings: Competition for sandpit participants. Technology Strategy Board, Swindon.
2 Dietz, T. et al. (2009). Household actions can provide a behavioral wedge to rapidly reduce US carbon emissions. Proceedings of the National Academy of Sciences.

Behavioural Economics Gamification & Energy



The science behind behaviour change has been the subject of many academic papers, government publications, and recently, popular science and economics books reaching the tops of the bestsellers lists.

Behaviour change theory explores what drives people to make particular decisions. It suggests that if you can identify the various influences that impact decisions, you can adjust, or rearrange, them in order to affect the choices people make. For example when new employees join a company, making pension membership the easy option giving employees the choice of opting out, rather than opting in.[3] This 'choice architecture'[4] is just one of an exciting and topical set of behavioural economic approaches that can complement the traditional tools governments use to influence behaviour, such as introducing legislation or adjusting prices.

The UK Government has been leading the way in applying aspects of behaviour change theory to public policy problems. The work of the Cabinet Office Behavioural Insights Unit, Defra's Centre of Expertise on Influencing Behaviours, and recently the Energy Efficiency Deployment Office at DECC, are well worth a look for more on this.

'Choice architecture' and wider behavioural economics can help people think differently, and make different decisions in the things that they already do. But in order to stimulate thinking about new things and the adoption of new behaviours, we need to make these behaviours more attractive, and design them so that people will enjoy repeating them.

Games make behaviours enjoyable by arranging activities into structures of rules and stories, providing their users with learning, challenges, and rewards. These activities may not be too interesting in themselves (for example, just kicking a ball), but when structured into a game (such as football), can become fascinating to millions of people. Gamification is the process of applying game-design to everyday non-game activities in order to drive uptake or increase their impact[5].

One of the most pressing public policy issues facing the world is the need to cut our energy costs and reduce carbon emissions. Behavioural economics and gamification can be powerful instruments for tackling this.

CarbonCulture is an initiative set up to investigate how digital media, gamification, and behaviour change theory can make it easier and cheaper to help people and companies save energy and carbon. Our ambition is to investigate and test whether modern design-for-behaviour-change approaches and digital delivery techniques can produce savings at higher speed and lower cost than is currently possible.

This approach, if successful, would help people and businesses cut their energy bills. The tools used in this approach have huge potential to reach wide audiences at minimal costs. Unlike the linear cost of scale associated with most carbon saving measures, the cost of scale associated with delivering behaviour change through digital tools and online spaces could be near to zero – engaging a million people only costs marginally more than engaging ten thousand people.

Delivering savings on this kind of scale can play a significant role in not only helping the individual users and businesses save money and carbon, but can help to meet the UK's national carbon reduction targets.

3 Johnson, E.J., Bellman, S. & Lohse, G.L. (2002) Defaults, Framing and Privacy: Why Opting In-Opting Out. Marketing Letters 13:1, 5-15. Kluwer Academic Publishers, Amsterdam.
4 Thaler, R. H., Sunstein, C. R. & Balz, J. P. (2010) Choice Architecture. Available at SSRN: http://ssrn.com/abstract=1583509.
5 Deterding, S. et al. (2011) Gamification: Using Game Design Elements in Non-Gaming Contexts. CHI, Vancouver.

The Project

The UK Department of Energy and Climate Change (DECC) saw the potential of this approach to provide value for the UK, and procured the **CarbonCulture at DECC** pilot as a proof of concept, offering a testbed of 1,000 civil servants at DECC's Headquarters in Whitehall.

We began with **simple conversations** about energy and carbon, asking staff what they **thought and felt** about saving energy, and inviting their **ideas and pledges**. Using simple, low-cost methods (like specially designed postcards), the **input of hundreds of DECC staff** was collected.

CarbonCulture at DECC was presented as a **staff, or 'user' driven project** through friendly and welcoming **branding** that was carried across all the communication **touchpoints** introduced to the building. These encouraged continued feedback from DECC staff throughout the process, which was integral to our **user-centered design** process.

We helped DECC staff to **tell their stories** about their own energy use. Together we identified the elements of their stories that drove their behaviour, so that together we could reconstruct them into fun and easy online tools that help people to behave differently, and think differently about their behaviours.

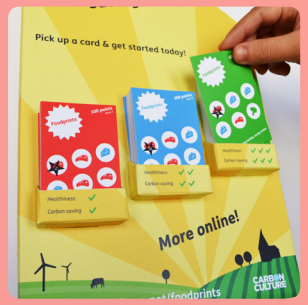
The user-facing side of the **CarbonCulture Platform** delivered carbon-saving behaviours as **games** and **utilities** that were **designed to attract** people through their **inherent usefulness, funness, and ease of use**, supported by incentivisation through awarding **points** and (sustainable) **prizes**.

For example, **Scrunch** used points and interaction to encourage users working late to move to one area of the building, reducing the energy consumption in other areas. **Foodprints** visualised users' lunchtime eating habits and motivated them towards a lower carbon and healthier diet.

We used the platform to present **social proof** about the community – showing the actions of others is a strong driver in getting more people involved in new actions, and helped us to communicate everyone's progress.

Behind the scenes, the technical side of the platform simultaneously collected **detailed empirical data**. In a full deployment, this will enable close analysis of the **sustainability and cost impacts of behaviour change**.

We got people's attention and started talking to them about their energy use, turning it from something abstract into something tangible and understandable through **real-time energy displays** driven by **live data**. These sparked further conversation about how energy was being used, and introduced a sense of **ownership** over the peaks and troughs in the graphs that represent energy use. These real-time energy displays also enabled the DECC Sustainability and Estates team to optimise the building's heating and cooling systems, for example identifying changes to water heating, that helped to achieve **savings of 10% of gas use in less than a fortnight**.



Read the report online now at www.carbonculture.net/research/decc

Conclusion

CarbonCulture at DECC was designed to test one central hypothesis: that it is possible to deliver high performance sustainability engagement that can scale to large populations at low cost.

Existing 'high-performance' engagement programmes achieve high uptake, but can come at a high cost-per-user – particularly in large complex organisations – conversely, 'low-cost' engagement programmes can be delivered with less resource but normally have low impact.

The technical architecture of the CarbonCulture platform allows for deployment at a large scale, and achieved comparable uptake to conventional 'high-performance' programmes, with projected cost-per-user close to the level of conventional 'low-cost' programmes.

With uptake of 40%, the levels of engagement achieved in the CarbonCulture at DECC pilot were very high, whether measured against existing sustainability engagement programmes, wider user engagement programmes, or less specific web based social applications.

The pilot identified levels of user engagement as different users were attracted or incentivised by different tools. These 'segmentations' illustrated that certain tools can be used to pull additional groups of users in at different points during the deployment. The order in which this is done can make a difference, helping to reduce costs, and to maximise overall engagement and use of all tools (see the full report to find out how).

The technique of adding further options over time led in each case to an uplift in participation numbers, and we believe that this provides a sustainable mechanism to attract and retain users over a long period of time by keeping them interested in fresh new tools, as well as attracting new staff to the platform.

The pilot has proven a valuable new way of driving engagement and adoption of behaviour change with sustainability outcomes. Modelling of the impact of these behaviour changes suggest that the platform could deliver 'hard to reach' carbon savings for communities at lower cost than is possible using conventional approaches.

While the user-facing cultural side of the CarbonCulture platform has demonstrated its benefits in achieving user-engagement, the physical savings unlocked by the real-time data collection and visualisation (by identifying unnecessary or reducible energy consumption) were also high.

The technical side of the platform has proved invaluable for allowing users to visualise energy use, and to facilitate communication between building users and the facilities managers and other experts.

Next Steps

Within this pilot, the hypothesis that it is possible to deliver high performance sustainability engagement that can scale to large populations at low cost has been proven. We are now planning future developments, and we would love your input and involvement in these plans.

From the outset, we had hoped that CarbonCulture at DECC would create opportunities to apply our learning to wider audiences, and for further development and collaborations. Some new projects are already underway, and others are in development with corporate and government partners.

There have already been significant outcomes. The real-time energy displays and accompanying public engagement tools that we used to run the initial engagement with DECC staff have already been deployed across eight Whitehall departments including Number 10 Downing Street, and we are now making them available to corporate leaders. At DECC, these tools alone helped facilities managers to identify efficiencies that delivered 20% daytime gas savings, and we expect comparable savings to be unlocked elsewhere.

These tools will help organisations identify specific opportunities to access the maximum energy and cost savings within their businesses. They will also provide valuable input to our ongoing research on how to get maximum impact across a range of cultural and physical contexts. The next stage of our research will be to build on the successes of the pilot by deploying the CarbonCulture platform on a larger scale and translating user behaviour changes into measurable impacts on carbon emissions. We plan to run a series of development projects that will build on the work already done in the pilot to improve the performance of the CarbonCulture platform and tools. In collaboration with partner organisations, we will extend the tools already developed, as well as developing new ones.

In order to maximise the impact of this work, we have started a new social enterprise to host these collaborations and disseminate the benefits as widely as possible. CarbonCulture will provide large organisations – who are willing and able to pay for energy savings – with tools that will save them millions of pounds per year. The revenues from this will enable us to make these world-class tools available today to people and organisations who would otherwise not invest in carbon savings for many years to come.

The project lives at www.carbonculture.net.
We'd love you to join in!

Thanks!

Read the full report online at:
www.carbonculture.net/research/decc

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