

Behaviour change and office energy use – lessons from an experiment by Carbon Smart to better capture the low hanging fruit of energy savings

September 2013

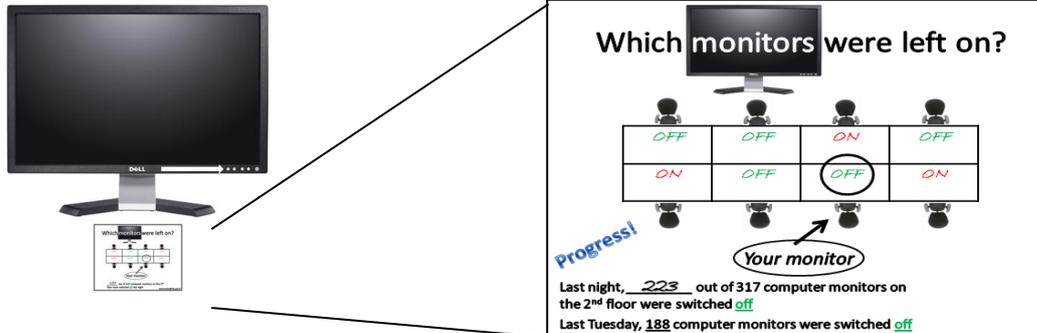
There are many potential sources of energy savings in office buildings. One such source involves employee behaviour, namely in regards to lighting, temperature controls, and office equipment use. When lights and office equipment are left on unnecessarily, or temperature controls are poorly managed – especially during non-work hours – this means that energy costs and greenhouse gas emissions are greater than they should be.

Seemingly small, simple actions can lead to drastic change in energy related behavior in the workplace. Carbon Smart conducted a behaviour change field experiment from July to August 2013 in collaboration with Imperial College London. We hosted a master's student from Imperial College to run this experiment with supervision by professors in Imperial College's Centre for Environmental Policy (CEP) and Imperial College Business School. The experiment involved over 1,100 participants across four London office buildings, of which 2 were local council town halls, 1 privately owned, and 1 university owned. It was a controlled experiment: the measures implemented on one or more floors in a given building were compared in relation to one or more 'control' floors in the same building that operated normally (no behaviour change measures were implemented).

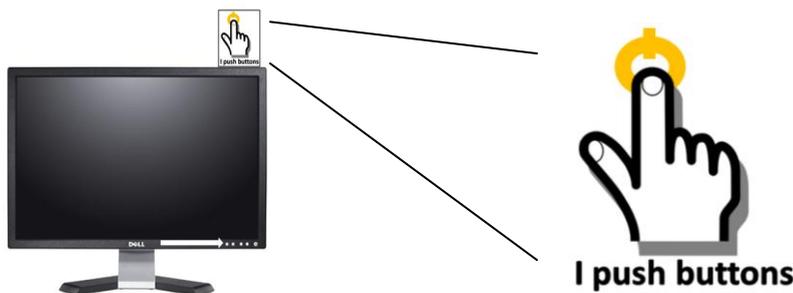
The targeted behaviour in the experiment revolved around computer monitors, as the objective was to increase the number of monitors turned off when people left the office for the evening. Although a relatively small source of energy use, monitors were a common, visible source of wasted energy use across all participating buildings and enabled inter-building and inter-organisational comparisons to be conducted in experimental analyses.

One of two behavioural interventions were used at each site, both seeking to facilitate an enabling choice context – albeit in different ways – by creating new expectations and workplace norms among employees regarding monitor use behaviour. The intervention used in one of the town hall buildings provided feedback cards to employees in the form of social comparison, while the intervention used in the university, private, and the other town hall building involved a public commitment device being installed on each monitor. Example images are provided below. Both strategies were paired with a reminder placed next to the monitor's power button saying 'The power is still on until you push the button'. Data was collected in-person on the power status of computer monitors and electricity readings were collected by sub-meters installed at each site.

Social comparison



Public commitment



By capturing the energy savings associated just with computer monitors, for every 100 computer monitors in an office it can be expected for our services to lead to about £30 annual cost savings as well as over 100 kg in CO₂ emission reductions. These services are potentially applicable to other, larger sources of energy in offices. Follow the seven key lessons we learned from our experiment:

- 1. Non-working hours present many opportunities for offices to reduce unnecessary energy use, operating costs and greenhouse gas emissions**

Office buildings continue to consume energy at night while no one is at work. In fact, many buildings use just as much energy during the night as during the day. Ensuring that lights and

office equipment are shut off, for example, provides an easy way to save energy. Efforts should be made to better capture this glaring opportunity.

- 2. Make workplace norms on energy use visible to employees to create an enabling choice environment and facilitate behaviour change**

Small interventions that modify the workplace choice environment by highlighting workplace norms can have a large impact. A key finding was that the behaviour change measures yielded a reduction in monitors left on overnight by 40-50%. These reductions took place while control floors experienced an *increase* of 2.4% in

monitors left on. The model used to evaluate the experimental results confirmed that the interventions were the source of the significant change in behaviour. Furthermore, both of these norm focused interventions were equally effective in bringing about drastic behaviour change. We also found that there was no significant difference in results across private, public, and university buildings, therein suggesting the cross-industry impact of norm focused behavioural strategies.

3. Install reminders near the points of action for behaviour change measures

Using reminders to complement approaches that make social norms more visible increases the salience of energy saving behaviours in the office and makes widespread adoption by employees more likely.

4. There is no need to sell behaviour change on its green attributes

Employees most likely already know that saving energy has environmental benefits. As such, behaviour change efforts can be successful without referring to them. During the experiment there was no mention to employees of the environmental benefits of adopting the targeted behavior change. The interventions simply highlighted for employees – albeit in two different ways – workplace norms on energy use.

5. Behaviour change can occur without direct efforts to change employee attitudes

No direct effort is needed to change the attitudes of employees on the importance of reducing energy use and greenhouse gas emissions. Existing research suggests that too much emphasis is placed on changing attitudes rather than the context of choice. The findings from our experiment further indicate that significant behaviour change results from measures that create a new, enabling choice environment wherein unnecessary energy use is more salient.

6. Manpower is needed to develop and implement behaviour change measures

It takes time and effort to make behaviour change happen. In practice an office's *green team* may be in the best position to lead these efforts. Nevertheless, it is important to involve and engage employees other than just those on the green team throughout this process.

7. Energy sub-meters should be installed and monitored to improve environmental and cost management

In order to better evaluate the impact of measures to save energy, sub-meters should be put in place. Many organizations are unaware of their energy use because they do not keep track of it. Sub-meters should be installed and monitored because an organization can only value what it measures.



SmartPaper Series

For inquiries about our behaviour change experiment, please contact us:

Jack Shepherd

jack.shepherd@carbonsmart.co.uk

020 7940 0013