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Of engineers and occupants- the greening of the Hutch

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As a publicly-funded organisation (the MRC Cancer Unit receives its core funding from the [Medical Research Council](#)), we are always looking for ways to leverage the best value from our budgets in order to maximise support for our scientists' research, and ultimately deliver health benefits for patients. And as a building (the Hutchison/MRC Research Centre where the Unit is located), we've always had a strong sense of responsibility when it's come to environmental issues too. But recently these two areas have, perhaps unexpectedly, overlapped. Research Centre Manager, Brian Richardson, explains more in this post.



Eighteen months ago the Hutchison/MRC Research Centre began a green crusade on all fronts to lower its energy consumption, its environmental impact, and hopefully its utility bills.

Driven by the core management team, the Research Centre has always been good at recycling everything from paper and cardboard, printer cartridges, aluminium foil, cans, glass, and plastic cups, to ice packs, pipette tip racks, batteries, and polystyrene (quite uniquely in a laboratory environment). We have signs asking folk to switch off lights and equipment, we use PIR sensors on lighting, have hand driers and water efficient taps in washrooms, all our core printers default to black and white and duplex printing, we have installed economical 'point of use' purified water systems, we consider energy efficiency and whole life costs when purchasing equipment, and we provide guidance to users on how best to operate heating and ventilation systems. We thought we were doing pretty well!

But with the continual, and alarming, rate of increase in utility costs, coupled to the static (at best) nature of our budgets, we needed to do more. **There was a real concern that utility bills could only be met if funds were diverted from the science budgets- not a palatable option for any of us.**

So we formed a 'Green Team' made up of volunteers from the scientific staff along with key staff from laboratory management, IT, and senior management. This was a team that had the desire to act, was able to influence, and had authority to implement.



The Green Team: front row (l-r) Asta Bjork Jonsdottir, Greta Skrupskelyte, Karen Hébert, back row (l-r) Max Fries, Brian Richardson

We looked at what more the occupants of the building could do, surveyed what equipment was being left on unnecessarily, and how much the real cost of that was. We informed occupants of current and desired behaviour, and the disturbing reality of our utility bills. We promoted energy-saving in emails, posters, quizzes and even offered free coffee and cakes for the best performing lab. This resulted in enhancing the culture of environmental awareness and improved ‘switching off’ behaviour.

Beyond the occupants we also looked at the ‘behaviour’ of the building itself; its lighting, heating and ventilation. Could we improve how our current systems functioned? Or could we replace them with something better? In consultation with the MRC Estates team (specifically David Robinson based at the MRC LMB) several improvements to existing plant equipment were identified which would decrease our environmental impact and energy consumption. Our heating and ventilation contractor, Critical Airflow, was also consulted. They proposed the installation of ‘Aircuity’, a demand ventilation control system, in our eleven large laboratories, which after full analysis of our building could potentially result in a 49% reduction in energy consumption and a financial payback in less than 2 years!

But how could we fund these initiatives? We were able to fund the smaller changes to the current systems, including a trial of LED lighting, with existing resources. But Aircuity was a capital project, and equivalent funding would need to be provided by the MRC and University of Cambridge. To cut a long struggle short, funding was eventually secured, so it was full steam ahead with implementation in April 2013. This would turn out to be the first such installation in the UK.

So, has it worked? The results at this stage are very encouraging. Since implementation we have had an overall 9% reduction in electricity consumption (saving around £11k), most significantly in recent months, and at this recent rate savings should be even greater in the future. The fall in gas consumption has shown an even more dramatic fall, 37% since implementation (saving around £31k). We hope to save around £60k in total utilities costs per annum.



This graph shows the drop in gas usage (kWh) since implementation of the Aircuity system.

The Research Centre was ‘designed’ to operate with the maximum number of air changes possible 24/7. Fans were working at full capacity whether at 2pm on a working day or 2am on a Sunday morning, effecting their longevity and operating costs. Lab workers became used to working in a noisy and draughty environment. Ventilation is now provided ‘on demand’; the system samples air from each laboratory every few minutes detecting carbon dioxide, carbon monoxide, total volatile organic compounds, and airborne particulates. This results in ventilation rates at a baseline level, rising only during occupation, and if any these contaminants are detected. And while not specifically a safety system, this component is present. Maintaining a safe and comfortable environment for occupants round the clock, as well as having a ‘quieter’ building is no doubt also pleasing our neighbours.



Engineer, David Robinson, and one (of many) building occupants, Brian Richardson.

The success of our actions, especially regarding the impact of the demand ventilation control system has created a lot of interest in the laboratory design and management sector. We shall be putting the Research Centre forward for green impact awards within the University, and it has also been put forward for an award for environmental improvement with [S-Labs](#), watch this space to see if we are successful!

We have had significant success in taking a multi-faceted approach involving engineers and occupants- and we hope we can go from strength to strength, be more environmentally aware, lower our carbon footprint, and of course be able to pay our bills, all without impacting on the science!

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