Green Gown Awards 2014

AWARDING SUSTAINABILITY EXCELLENCE FOR 10 YEARS

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10 YEAR ANNIVERSARY

Dissemination supported by: HIGHER EDUCATION FUNDING COUNCIL FOR ENGLAND hefce

finalist's case study

University of Warwick

Sustainability Champion

Joel Cardinal

Smart Heating

THE UNIVERSITY OF WARWICK

Profile

- HEI
- Over 20,000 students
- Over 5,000 staff
- Campus-based. In a rural location, but close to urban Coventry

Category supported by

TEC POWERING THE PUBLIC SECTOR

Section 1 About the project

Summary

Joel Cardinal, our Head of Energy and Sustainability, identified and successfully introduced this project to implement an innovative new heating system in one of our older buildings. The project represents a big step forward in our work to retrofit older buildings.

Project partners

Our Estates Office, energy researchers from the Warwick Manufacturing Group, our Communications Office, and LightwaveRF, an innovative Midlands SME company with the financial support of Innovate UK, the UK's innovation agency.

Section 2 The results

The problem

The heating system in this building was decidedly inefficient and in need of an upgrade, and many of the rooms aren't always occupied. Funds for this kind of project aren't easy to come by.

The approach

Joel saw an opportunity for our researchers to work with our business partners to develop an innovative new system that they could test in the Social Sciences building. Because it involved the development of a new system we needed to research behaviour change methodologies to ensure user engagement with the project. This meant we could apply for a research grant, which, with Joel's help, we successfully did.

The solution is a system of thermostatic radiator valves, presence detectors, window sensors and a tablet interface, all wirelessly connected to "the cloud". It heats the room while people are present, and switches off when no one's there. While in the room, people can use the interface to monitor and set the temperature from their phones. The tablet provides a user-friendly interface and feedback on usage, creating an incentive to use less heat.

Our goals

Our goals with this project were to provide our building with a better and more flexible heating system at a fraction of the traditional investment costs, to offer our researchers the chance to use campus as a living laboratory, and to develop a marketable energy-saving heating product for our suppliers to sell.

Obstacles and solutions

Technical innovation needed	• Transferring domestic technology to the commercial market. • Managing innovation within a defined time frame with real users. • Retrofitting with existing infrastructure.
Behaviour change needed	• Developing suitable behaviour methods to communicate and engage with users. • Introducing users via friendly and intuitive communication. • Creating an incentive for users to respond and reduce their consumption.
High costs, unavailability of funds	• Developing a cost-efficient technical solution (the project identified the room. thermostat can be replaced by the one built in the TRV saving equipment costs). • Developing algorithms to reduce internet traffic and save power/costs. • Developing algorithms reduce tablet power consumption.
Timing	• A collaborative project management team has been set-up to ensure all actions are implemented within the Innovate UK project time frame. • Flexibility and reactivity are required at all time to leave space for innovation while ensuring progress and availability of heating in rooms.

Performance and results

Joel has successfully gathered this diverse group together and worked with them to guide and shape the project. Thanks to his input we've been able to secure research funding for the project, to identify a location to carry out the research, and to find all of the resource we need to make it a reality. Though we don't yet have the final energy saving figures from the project (due next year), they're bound to be positive.

The solution deployed has already attracted interest from potential customers and led to further developments and innovations. It's been a win-win for our technology partners, our researchers and the University.

Section 3 The future

Lessons learned

It's clear from our work with these innovative companies and researchers that our campus can indeed be used as a living laboratory for developing low-carbon technologies. A University is a great place for this kind of approach – people are very receptive to new ideas here. A project like this can be the inspiration for other ideas, generating more energy-saving projects in the future.

The biggest challenge was managing the complexity of developing a solution that we could implement within the timeframe required.

Sharing our project

A hotel-based trial of our new technology has started in association with CRAVE (another young UK company) to reach a new market.

Our project team will disseminate findings in the press and at conferences such as EAUC, AUE, AUDE, heating industry and other suitable educational and professional venues. Our Internal Communications team will also inform the rest of the University about the project.

What has it meant to your institution to be a Green Gown Award finalist?

It's great to see Joel's hard work and clever, collaborative approach to improving Warwick's environmental performance recognised on a national level. We hope to see him named as winner – it'd be the recognition he deserves, and an encouragement to all of our staff to follow his example.

Further information

You can find more information on the Social Sciences building smart heating project on our website:
warwick.ac.uk/environment/carbon/smartheating

For more information about the other environmental work at Warwick, see:
warwick.ac.uk/environment