Case studies

North Holmes Road (NHR)

Transformer

A new super amorphous transformer purchased from EDF was installed on NHR during the August 2010. A transformer typically changes the electricity from high voltage to a lower voltage which is easier to use by equipment on site. As part of the install, the voltage was optimised and reduced from 245V to 238V. EDF had guaranteed savings of at least 6%. It was however found by analysis of the Half Hourly Data that these savings had been exceeded running at closer to 10%.

Voltage Optimisation

A dedicated Voltage Optimisation unit was installed by Powerstar during February 2011 in Old Sessions House (TOSH) which reduced the voltage from 245V to 220V. Voltage Optimisation typically makes savings of 8% but coupled with lighting upgrades and controls, savings of 16% in TOSH have been made compared to 2010.

Lighting Upgrade

A large proportion of the lighting at NHR was of an older low efficient type without any form of accurate control. The opportunity to upgrade the lighting from the older T8/T10 fitting to highly energy efficient T5 tubes was initiated and with extra controls, such as the installation of motion and light level sensors significant savings have been made. Several lighting upgrading projects have been completed at TOSH, Erasmus, Laud, Newton, Johnson and Ramsey.

Successful trials of Light Emitting Diode lamps (LED) within the estate have led to the implementation of several schemes within NHR. These have included LED bollards installed between Davidson and TOSH. LED lamps have been installed at the Touchdown Cafe and Thorne and Fynden (F&T) and Davidson, Lang and Temple (DLT). The accommodation blocks have also had LED shaver lamps installed. A survey of the external lighting is to be carried out by Phillips with a view to replace the existing stock with energy efficient LED's.

E-cubes

Industrial freezers, fridges and cold cabinets use electricity to keep the contents at a suitable constant temperature. A typical fridge operates by detecting the change in the air temperature within the unit. Once the fridge/freezer is open warmer air enters the unit, the thermostat detects this and thus the compressor which uses electricity starts to cool the air. An E-cube fitted to the thermostat actually simulates the temperature of the contents of the fridge and not the surrounding air temperature. Savings of 25% can be made as the compressor responds less as a result of the E-cube and these have been fitted in the restaurant and cafe areas of NHR.

Dynamic Burner Management Units

These have been fitted to all the gas boilers throughout the University's estate. Dynamic Burner Management units work by optimising the firing pattern of the boiler through monitoring the

demand of the building. Gas savings have been made although there have been some issues surrounding the units, primarily to do with the aging BMS system.

Building Management Systems

The BMS maintains the environment within the building and controls temperature and in some locations the carbon dioxide levels within a building. An improperly configured or poorly maintained BMS system can lead to considerable energy wastage. The Estates Department are continually monitoring and optimizing the performance of the BMS and this has led to considerable savings. A BMS upgrade is planned and this will allow more information to be collected and analyzed resulting in utility savings.

Insulation

Where applicable, cavity wall and loft insulation has been added to several buildings on the North Holmes Road Campus during August 2010. The installation of these types of insulation typically saves 8-15% on the consumption of gas. Buildings where this technology has been applied include Fisher, Thorne and Fynden, Student Union, Johnson, Erasmus, Somerville, DLT and Laud.

Solar Panels

A recent tender for the costing and installation of Solar Photo Voltaic panels to various properties throughout the University estate has been received. These will generate electricity and also revenue, as the Government has regulated that if electricity is produced from a renewable source, then a Feed in Tariff will apply for each kilowatt generated. This is currently dependant on the size of the array but within the range of 35p-42p/kW, although the Government has just announced a reduction of these feed in tariffs from December 2012. Erasmus and Old sessions House have been identified as suitable sites, but the payback calculations need to be re evaluated to decide whether to adopt this technology.

Staff Involvement

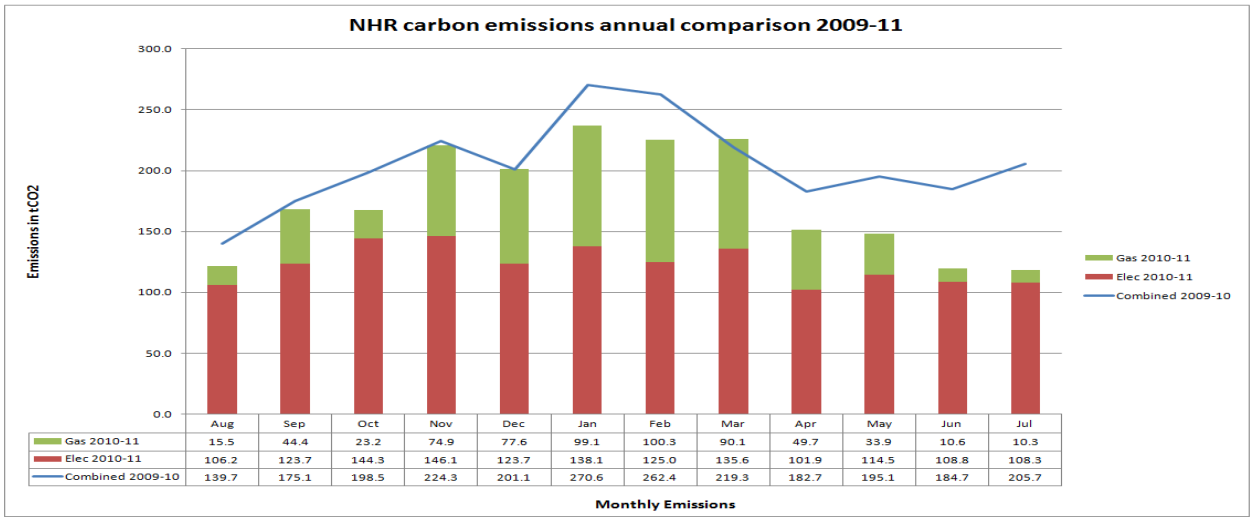
The participation by staff in the savings made on NHR must be appreciated. Involvement by staff as Building Wardens, Environmental Champions and through participation with Green Impact has led to energy efficiencies. The involvement of environmental consultants Futerra in providing a Communication Tool Kit that will enable a more efficient communication of environmental issues and thus raise awareness of energy efficiency throughout the University.

Student Involvement

In September 2010 the University participated in a national energy efficiency scheme called Student Switch Off. Although, not specifically aimed at the students within the NHR accommodation blocks in particular, the campaign targeted all students at CCCU through the various social networking sites. This year CCCU will also be a participant in Student Switch Off and the accommodation blocks on NHR will be future additions to the campaign.

Impact of Energy Efficiency Projects at North Holmes Road

Fig No.1: A graph to show carbon emissions on North Holmes Road 2010-11

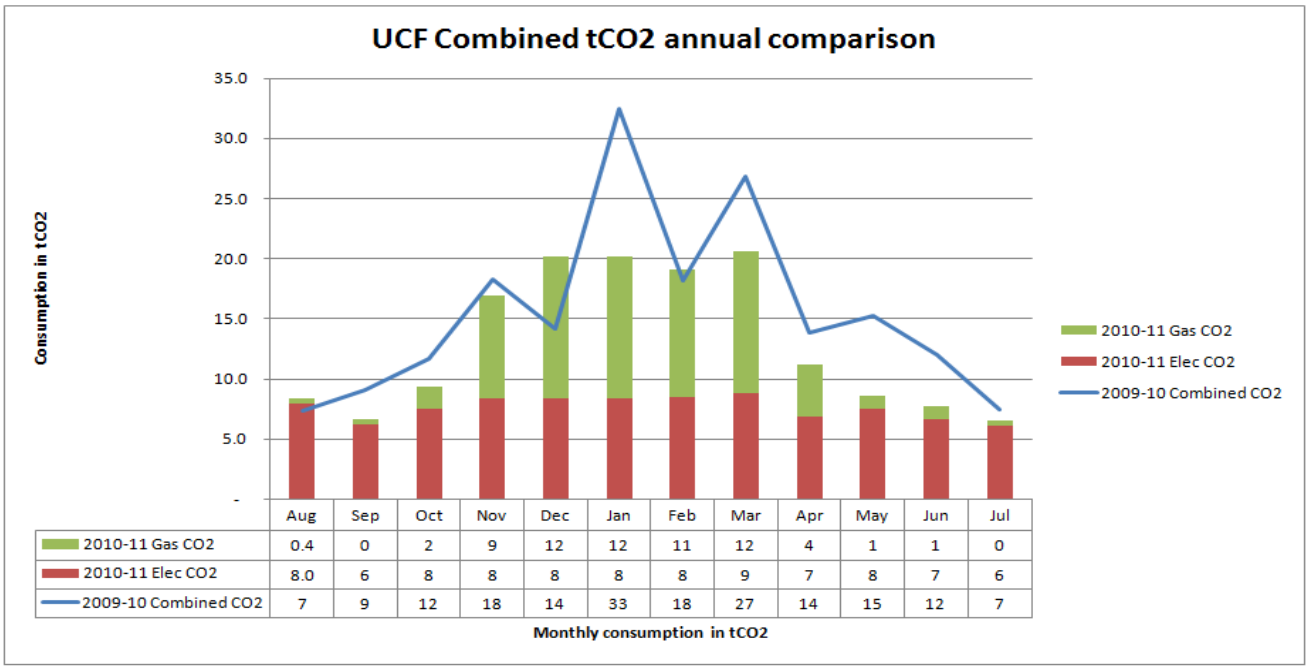


	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul
Gas 2010-11	15.5	44.4	23.2	74.9	77.6	99.1	100.3	90.1	49.7	33.9	10.6	10.3
Elec 2010-11	106.2	123.7	144.3	146.1	123.7	138.1	125.0	135.6	101.9	114.5	108.8	108.3
Combined 2009-10	139.7	175.1	198.5	224.3	201.1	270.6	262.4	219.3	182.7	195.1	184.7	205.7

The impact of all the mentioned actions resulted in a reduction of 15% in electricity consumption and a further 13% reduction in gas across North Holmes Road campus against 2009-10 totals. This translates into 350 tCO2 saved over the year 2010-11, which is the equivalent to driving a car round the world almost 39 times!! This equates to approx 10% of our Carbon Reduction Target as defined in the Carbon Management Plan.

Folkestone Case Study:

Fig No.2: Carbon Emissions from University of Folkestone 2010-11

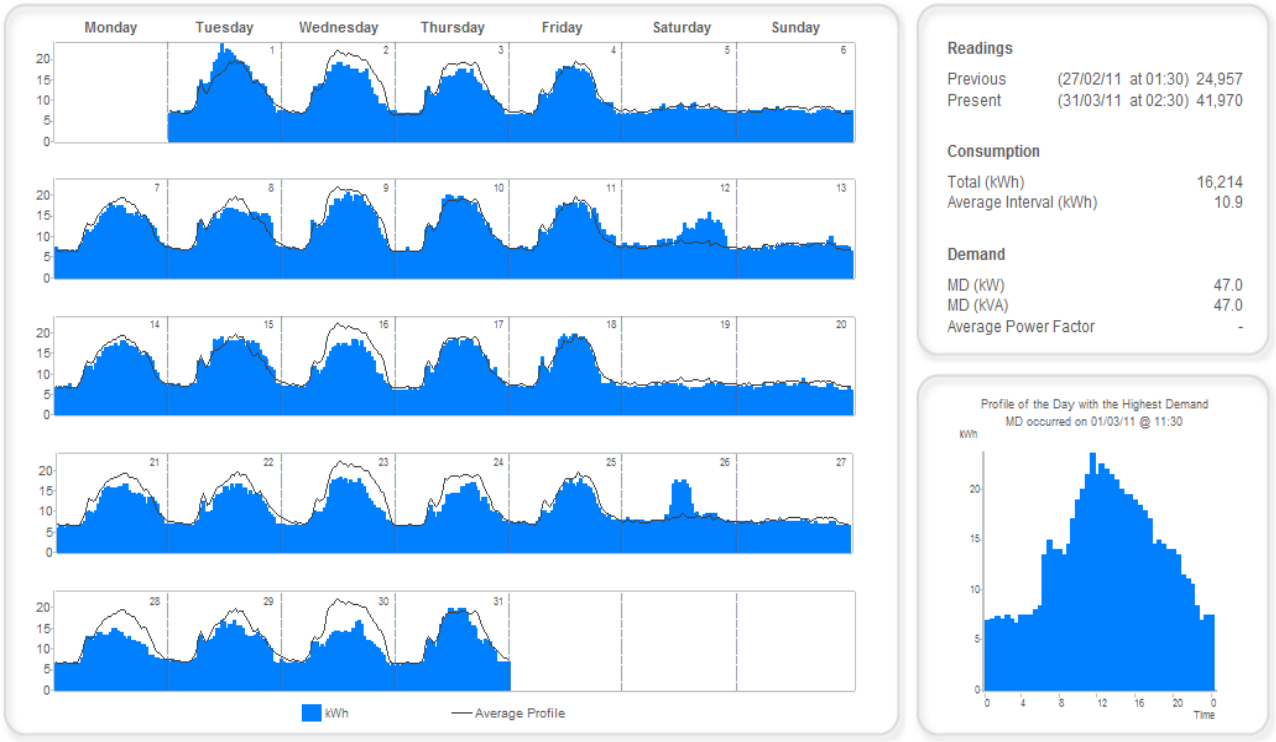


	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul
2010-11 Gas CO2	0.4	0	2	9	12	12	11	12	4	1	1	0
2010-11 Elec CO2	8.0	6	8	8	8	8	8	9	7	8	7	6
2009-10 Combined CO2	7	9	12	18	14	33	18	27	14	15	12	7

The graph above shows that with the exception of the cold snap in December, Folkestone campus regularly showed reductions in carbon emissions in comparison to the 2009-10 baseline. This was achieved without having received much assistance from the energy team up until the beginning of March and was solely down to Claire Kennett and her team actively going around the campus and switching things off. Through their own initiative and the Green Impact programme they implemented several energy saving ideas such as signs, reminding people to switch off lights, to take the stairs instead of the lift and making sure their computers and monitors are switched off before leaving at night.

Automatic Meter Readers were installed in February 2010 on both the gas and electricity supplies by the energy team, which provides half hourly readings on how much energy the Folkestone campus uses. This has been an invaluable tool because it has enabled analysis of the consumption, to identify unusual occurrences and excessive use during low levels of occupancy. Fig No.3 shows the output trace from the AMRs, which are used in quarterly Operation and Optimisation meetings.

Fig No.3: A Typical Monthly Electrical Consumption Report for UCF



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During these meetings we meet with the heads of the campus and dissect the trace to locate areas that could be managed more efficiently or switched off completely when the building is unoccupied, such as; putting timers on vending machines and hot water tanks to switch off at night.

As a result of the actions taken by the staff at Folkestone and by the impact of the operation and optimisation meetings, 2010-11's annual energy figures were reduced by 23% for electricity and 6% for gas! The subsequent carbon emissions saved equates to approximately driving a car around the world 3 and a half times.