



Hospitals and Health Care facilities (Clinics, Laboratories, Hospices, Senior Facilities and Medical offices) are the second most energy-intensive building sector in the UK because they are open 24 hours a day and have extra commitment on air filtration, circulation and air cooling. As a result, operating cost savings alone can have a notable impact on the bottom line.

Energy saving is a top priority at The Royal Sussex County Hospital, an acute teaching hospital in Brighton, England. It is administered by the Brighton and Sussex University Hospitals NHS Trust.

The project was to establish the following:

- HVAC heat exchange coils harbour and grow biofilms made up of bacteria & moulds and that these biofilms affect the efficiency of the HVAC system by increasing resistance to airflow reducing heat transfer because biofilms are pushed to the middle of the coil by manual cleaning methods
- UVC (ultra-violet C) kills the biofilms which then fall off the heat exchange plates increasing the energy efficiency of HVAC system

Brighton and Sussex 
University Hospitals
NHS Trust



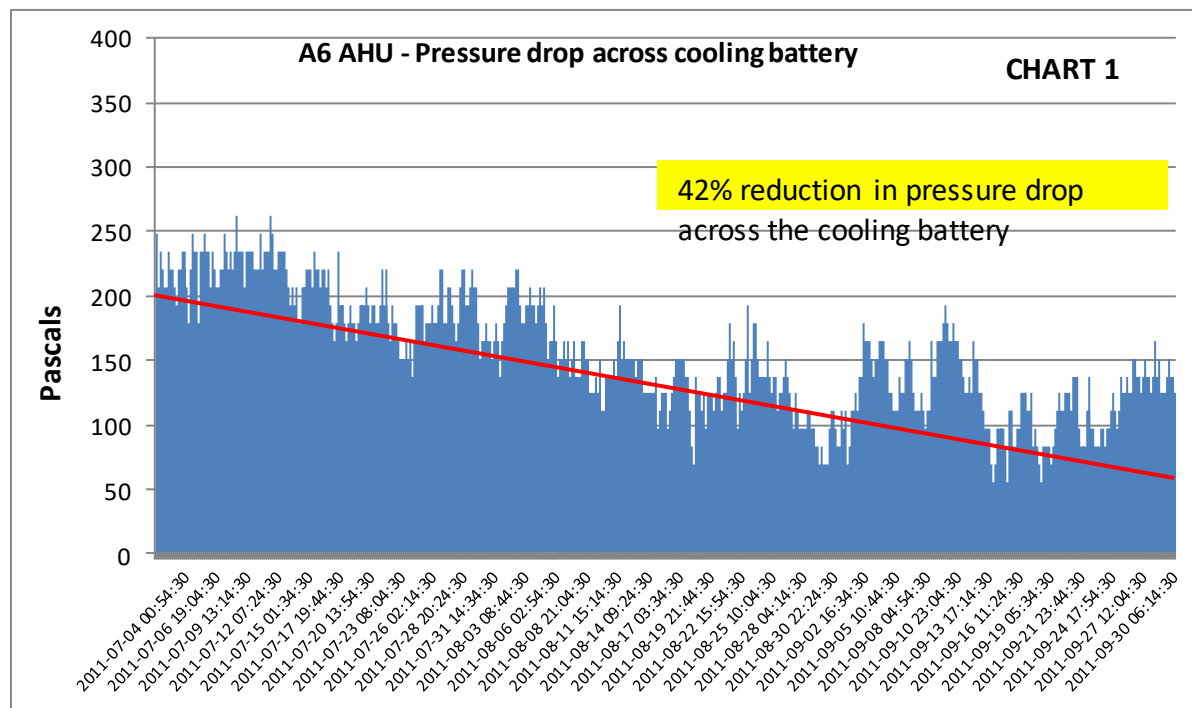
CASE STUDY

Greening HVAC systems

Environmental Impacts

IMPROVE ENERGY EFFICIENCY

- ✓ The UVC trial improved the efficiency of the cooling coil by reducing resistance to airflow by 42%
- ✓ Airflow after the cooling battery increased from an average of an average value of of 5.52 m³/s at the start of the trial to a value of 6.44m³/s on average at the end of the trial.
- ✓ The electricity consumed by air handling unit displayed a saving of around 30kWh per week, a 2.88% reduction.



Source: Efficiency Direct

The result of the 3 month trial indicates that a conservative estimate of £4,170/year could be saved in consumed electricity assuming a unit rate of .14£/kWh

Site: Royal Sussex County Hospital, Brighton System: AHU 6 Millennium Block
Date: August-September 2011 Customer: Mr R Mills

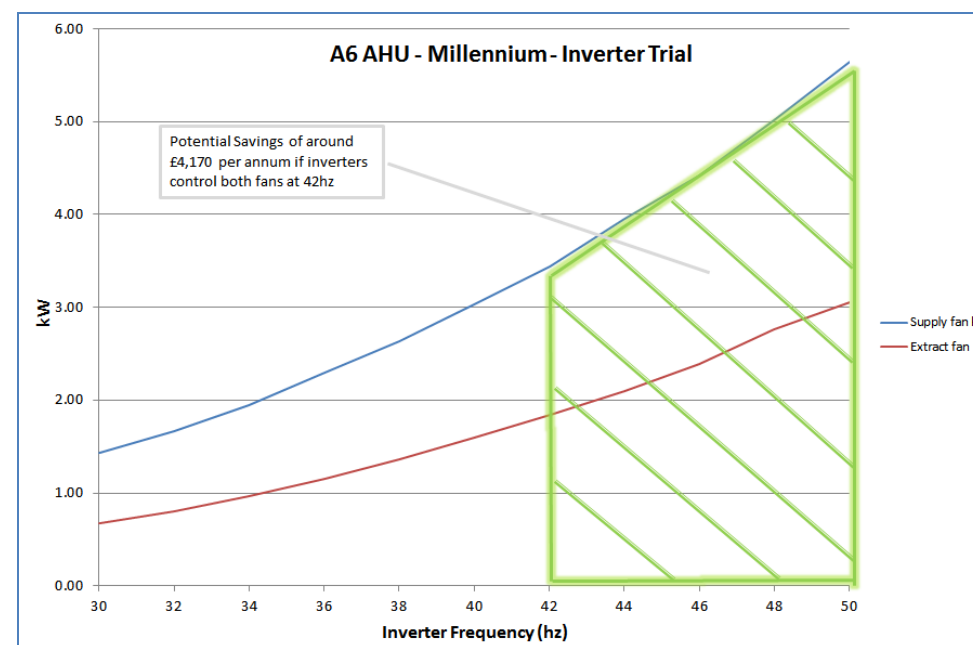
ROYAL SUSSEX COUNTY HOSPITAL - AHU 6 UV Light disinfection Surface Samples

COLONY	DATE	LOCATION	RESULTS
COLONY	4/08/2011	AHU 6 C Coil face	Fungal Penicillium spp Mucor spp Bacteria
	10/08/2011	AHU 6 C Coil face	No Growth
	17/08/2011	AHU 6 C Coil face	No Growth
	24/08/2011	AHU 6 C Coil face	Bacteria Unidentified spp
	1/09/2011	AHU 6 C Coil face	No Growth
	1/09/2011	AHU 6 C Coil Opp uv	Fungal Mucor spp Penicillium spp Fusarium spp Bacteria
	9/9/2011	AHU 6 C Coil face	No Growth
	16/09/2011	AHU 6 C Coil face	No Growth
	23/09/2011	AHU 6 C Coil face	No Growth
	23/09/2011	AHU 6 C Coil Opp uv	Fungal Bacteria

88 Garsington Road, Oxford, OX4 2DQ, UK
Tel: 01865 810077 Fax: 01865 810078
Email: admin@absolute-air.co.uk Web: www.absolute-air.co.uk
Registered in England No 4756878

IMPROVE INDOOR AIR QUALITY

- ✓ Air from outside of the building plus any re-circulated air from the hospital is treated and airborne pathogens and mould spores are destroyed before they are circulated around the office.
- ✓ Air samples taken and recorded no growth on 7 out of 10 occasions. See our other case studies documenting the success rates of UVC ability to kill MRSA, C Diff, Pneumonia, influenza.



Source: Efficiency Direct



ENERGY EFFICIENCY ANALYSIS by THIRD PARTY

Efficiency Direct analysed the effectiveness of UV lighting in reducing the population of biofilms on the cooling battery and associated ductwork and calculate associated energy savings due to increased efficiency.

To do so, they installed equipment to monitor airflows, duct pressure, duct temperature and thermal output from the chilled water battery. They also routinely checked, inspected and uploaded data from monitoring equipment and collated and stored data.

MICROBIOLOGICAL SAMPLES & ANALYSIS by THIRD PARTY

Absolute Air Ltd were instructed by Mr R. Mills of the Brighton and Sussex University Hospitals NHS Trust to undertake the taking of microbiological growth samples for the UV treated cooling coil within AHU6 of the millennium block.

Absolute Air Ltd attended site once a week to take one fungal and one bacterial surface contact plate from the UV light facing up stream surface of the air handling unit cooling coil over a 7 week period.

Dynamco Laboratories analyzed the microbiological samples (A copy of the report can be obtained)

TRIAL IMPORTANT DATES
C was installed on AHU 6 on July
at the Royal Sussex County
spital (Millennium Building)