

Making wind in the Elephant and Castle

Next time you're waiting at Elephant & Castle train station, look behind you and you'll notice two wind turbines whirring away. The 9-metre tall, 6 kW, horizontal axis turbine was installed on an 11 storey housing block in the Heygate estate in June 2007. A new vertical axis turbine, surrounded by a helix of blades, was installed in June 2008. London South Bank University experts have been monitoring the turbine to ascertain the feasibility of central London housing using wind as a reliable source of energy. The work has been carried out in collaboration with London Borough of Southwark, Elephant and Castle Regeneration Team, Brian Dunlop Associates and Gas Dynamics Ltd.

The majority of wind energy generating capacity in the UK is large-scale turbines located at coastal locations, inland areas of open terrain and near large bodies of water. The potential for small-scale production in urban environments is less well utilised and understood. It is hoped that the turbines will move in 2009 over to the University's new sustainable energy centre, CEREB (See other insert), to provide access for researchers and students to study the potential impact of urban wind power on our future energy supply.

Energy capture by small-scale wind turbines is highly dependent upon the local wind regime. The data collected will be shared with developers to make sure that wind technology can be used to its full potential. This feasibility study captures the real energy outputs and carbon savings that can be expected from urban wind turbines. Research areas include:

- actual energy generated
- wind speed frequency for an urban location
- compare with current prediction methods and manufacturer's data
- 3 dimensional wind flow patterns on an urban rooftop
- turbine noise against urban background noise
- vibration transmitted into the structure
- identify impacts of constraints e.g. size, weight, maintenance requirements etc
- gauge community reaction to deployment of wind turbines on buildings e.g. visual impact

Cooler Commute

In 2007 academics at London South Bank University received a green gong for their efforts to cool down the underground using one of the capital's natural resources. The Carbon Trust's Innovation Award for Academic Institutions and R&D Facilities was awarded to Dr Felix Ampofo, Professor Graeme Maidment and Prof John Missenden for developing the eco-friendly air conditioning system trialled at Victoria Station.

Professor Maidment and his team are working with London Underground to develop a revolutionary cooling system to reduce stifling temperatures on the Tube. The cooling system takes advantage of the Underground's existing pumps, which prevent the capital's rising water table from flooding the network.

By harnessing the 12°C rising groundwater to cool the underground station, the team reduced the need for energy intensive cooling systems by pumping the water through pipes on the concourse area between Victoria line platforms. Fans then draw in warm station air and feed the groundwater-cooled air to the concourse area. The trains' movement then spreads the cooled air to the platforms.

Professor Maidment, who helped devise the scheme, says the system is ideally suited to the Underground because groundwater is most readily available in the deepest parts of the network. "The water has to be pumped out of the system anyway and it might as well take some of the heat with it," he says. "Potentially it could cut cases of people suffering heat exhaustion on overcrowded trains." Tube engineers have struggled for decades to find a way of introducing air conditioning into the tunnels, many of which were built in the Victorian and Edwardian periods. Traditional air conditioning poses problems since it produces heat, which must have an exit route, and there is little room for ventilation systems in the narrow tunnels.

London Underground is now currently planning to install similar installations at up to 30 stations. The system has huge potential to be introduced to other underground systems across the world.

For further details contact:

Prof Tony Day, tony.day@lsbu.ac.uk

Prof Graeme Maidment, maidmegg@lsbu.ac.uk



**Installation of the
new wind turbines**