

# LOW-CARBON COOLING FOR TELECOMMUNICATION BASE STATIONS

## LEAD ORGANISATION

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## COST AND DURATION

The Carbon Trust contribution towards this project is £199,162. The project started in July 2007 and is due for completion in October 2008.

## PROJECT REFERENCE NUMBER

064-139

## OBJECTIVES

The primary aim of this project is to develop low-carbon cooling equipment for installation in new and existing unattended telecommunication base stations.

A secondary aim is to develop the road map for extending these technologies to provide breakthrough cooling solutions for computer server rooms estimated to be up to 15% of the carbon footprint of industrial buildings in the UK.

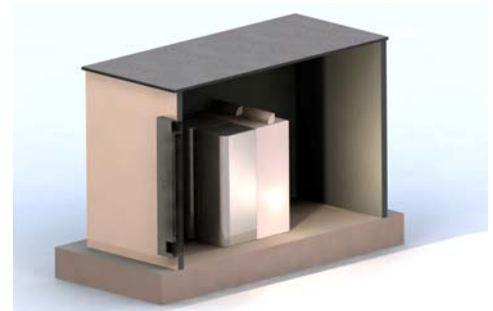
## SUMMARY

Electronic and electrical equipment used in base stations is affected by thermal stress from increasing waste heat that is generated by higher power loads as functionality, speed and coverage are stretched. The accepted industry solution is to use vapour compression air-conditioning from the building services sectors.

To run cooling systems, extensive testing indicates that each base station emits upwards of 7.5 tonnes of CO<sub>2</sub> equivalent per year.

The project target will be a minimum of 30% reduction (about 2.5 tonnes CO<sub>2</sub> equivalent per year) for retrofit equipment and a payback of less than 2 years.

For new base stations, the target carbon reductions will be upwards of 60% (about 5 tonnes CO<sub>2</sub> equivalent per year).



A typical mobile telecommunication base station

These carbon reductions will be achieved through:

- Pinpoint, low-carbon cooling of the most thermally sensitive equipment
- Directed air flows
- Filtering systems that do not require servicing and enable the installation of low-power fans
- Reduction in the embedded energy used during construction
- Recycled insulation materials
- Smaller fans that move significantly less air
- Reduced room volume.

A strong relationship at all stages of this project with telecommunication operators is vital to provide end-user input into the developments. Major UK-based operators are involved in the project and their applications will be used to provide the development and on-line testing opportunities.