Green Gown Awards 2014

AWARDING SUSTAINABILITY EXCELLENCE FOR 10 YEARS

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10 YEAR ANNIVERSARY

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finalist's case study

# Lancaster University

## Carbon Reduction

# Using Lancaster's best free resource – Lancaster University Wind Turbine

Lancaster University

**Profile**

- HEI
- 12,500 FTE students
- 2,250 staff
- Urban edge campus University

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SALIX SOLVING ENERGY EFFICIENCY FINANCE IN THE PUBLIC SECTOR

## Section 1 About the project

### Summary

Implementing a large scale wind turbine has been an exceptionally challenging project. Operational from November 2012 the turbine generates 15% of University consumption, reducing carbon emissions by 2,000tCO2e p/a and contributing to a 28% reduction in carbon emissions since the 2005 baseline.

### Project partners

The project was delivered under the direction of Lancaster University Facilities Projects team. Specialist wind turbine engineering assistance was provided by AECOM and the turbine was supplied by Enercon.

## Section 2 The results

### The problem

Lancaster University 2008 Masterplan, identified major new developments for implementation up to 2020. Major improvements in the University infrastructure, in particular electricity and heat supply were required, but with reduced carbon emission in line with sector and CMP requirements.

### The approach

A Sustainable Energy Infrastructure Plan was developed to support the University Masterplan. This identified the low carbon electricity and heat generation technologies listed below. All of which have now been implemented.

- Wind Turbines
- Gas Combined Heat and Power engine
- Biomass boiler and new high efficiency conventional gas boilers

### Our goals

- Provide the required electricity and gas to the campus to enable its growth up to 2020.
- Provide these utilities whilst reducing carbon emissions by 43% compared to our 2005-06 baseline emissions of 25,899t$CO_2$e

## Obstacles and solutions

| | |
|---|---|
| • Funding | • Repayable grant won from HEFCE Transformational Fund (originally £5 million). |
| • Grid Connection | • Obtained from Electricity North West, but turbine supply connects directly to campus HV system. |
| • Site constraints | • Over 95% of site ruled out by constraints such as proximity to roads, woods, streams, houses, telecoms. However clever siting and mitigation work identified the 5% that was available. |
| • Planning permission | • A major challenge. Initial application for two turbines rejected, on basis of visual impact. Second application for single turbine approved. |
| • Wind data | • Long term wind data available for site, 60m (hub height) temporary met mast installed for one year to obtain high resolution site specific wind data. |

## Performance and results

The wind turbine has performed substantially better than budgeted. In its first full year of operation 2013-14 it generated 5,042MWh, 40% higher than budget. Carbon emissions have been reduced by 2,000tCO2e p/a by the wind turbine alone. Total University Scope 1&2 carbon emissions have fallen by 28% since the baseline year of 2005-06 to 18,700tCO2e in 2013-14.

## Lessons learned

- Installing a wind turbine takes time. Lancaster University's took 5 years and we are advised this was exceptionally fast. So be prepared for the long haul, particularly in senior management support.
- Obtaining planning permission is the hardest part. You will need [Council] officer's recommending approval, support from councilors and to maximize support from the local community and your institution.

# Section 3 The future

## Sharing our project

The University has actively showcased the project to disseminate the lessons learnt and aid replication. This has included technical presentations at the EAUC and AUDE conferences and other HE/FE establishments, hosting site tours/talks for specialist staff from other HE/FE institutions. Information advice and guidance has been provided covering project teams, site identification, the planning, EIA and public/council consultation process, funding, key barriers and constraints and development issues. Other institutions have greatly appreciated this, taking account of our approach and lessons learnt.

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

Lancaster University is delighted to have been shortlisted for the 2014 Green Gown awards. It's a testament to the hard work by the Facilities Wind Turbine project team and management and HEFCE for the funding.

## Further information

For further information please contact: Jonathan Mills, Environment & Sustainability Manager

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http://www.lancaster.ac.uk/sustainability/low-carbon-technologies/wind-turbine/