

## Case Study: Deighton Centre Wind Turbines



### PROJECT SUMMARY

This case study provides information about the two 15 kW Proven wind turbines installed on the edge of the playing fields adjacent to the Deighton Centre in Huddersfield.

The turbines were installed in May 2006 and generate electricity, without emissions of carbon dioxide, for the Deighton Centre. Any surplus energy generated is exported to the National Grid.

### PROJECT AIMS

- Supply the Deighton Centre with energy from the wind, thus reducing consumption of energy generated from fossil fuel sources.
- Contribute to achieving a target of reducing climate change emissions from Council buildings by 30% by 2020, based on 2005 levels.
- Act as a visible statement of Kirklees Council commitment to reducing climate change emissions.
- Contribute to reaching renewable energy targets, currently the EU target is 20% by 2020.
- Increase the Council's capacity to deliver renewable energy initiatives on Council properties and maintain its leadership in the support of renewable energy both locally and in the UK.
- Develop local skills and skills within the Council by providing training to Kirklees Building Services staff.
- Build on the energy efficiency work already undertaken at the Centre.

Project Information	
Installed capacity	30 kWp
Predicted Generation	52,000 kWh p.a
Carbon dioxide avoided	17 tonnes p.a
Average wind speed at site	5.2 m/sec
% of the Centre's electricity generated	17%
Cut-in wind speed	2.5 m/sec
Mast height	15m
Blade diameter	9m

### BACKGROUND INFORMATION

The Deighton Centre is located in one of the most disadvantaged areas in Kirklees. In addition to being the Council's training centre and housing Council staff, the Centre is a valuable community resource. Adult education classes, sporting activities and

community events are held here and the building is often open in the evenings and at weekends.

The Centre is located in an elevated position and the site chosen for the wind turbines takes into account a number of factors: wind resource, minimal disruption to the Centre and surroundings, minimal impact on wildlife, proximity to the Centre to reduce voltage losses, on unused land, away from any pylons or other overhead cables, accessible for maintenance.

### WHO IS INVOLVED?

The project was initiated and managed by Kirklees Council and the turbines were installed by Turbine Services Ltd.

### HOW WAS IT STARTED?

Between January 2003 and March 2005 KMC participated in the European 5<sup>th</sup> Framework project Zero Energy Neighbourhoods (ZEN) which focused on renewable energy demonstration projects on civic buildings. See the case study on Civic Centre 3 in Huddersfield for more details. The concept for the turbines was developed and planning permission for the wind turbines at Deighton was obtained as part of the ZEN project.

### FUNDING AND EXPENDITURE

The project secured funding from the DTi fund for renewable energy, Clear Skies (now the Low Carbon Buildings Programme) and from Kirklees' Energy and Water Conservation Fund.

### MEASURING SUCCESS

- **Environmental:** the installations are predicted to save around 17 tonnes of carbon dioxide every year when fully operational.
- **Technical:** the wind turbines are monitored for their performance via a digital display read-out located in the Centre foyer.
- **Educational:** the wind turbines are a valuable educational resource and schools in the locality will be encouraged to visit when the turbines are fully operational.
- **Sharing experience:** lessons learned have been disseminated through network events and case studies.

### TIME FRAMES

- Dec 2004:** Planning Permission secured.
- Mar 2005:** Kirklees Council engineering team engaged to undertake technical project management.
- June 2005:** Consultation process begins.
- Sept 2005:** Funding secured (Clear Skies and KMC Energy & Water Conservation Fund).
- Sept 2005:** Installer appointed.
- April 2006:** 4 week installation process, including ground work preparations, commence.
- May 2006:** Installation complete.
- June 2006:** Community launch of project at Deighton Carnival.

### WILDLIFE

Kirklees Biodiversity Officer and West Yorkshire Ecology were consulted about the siting of the turbines to ensure minimal impact on wildlife. Although patches of woodland near the turbines are 'ancient woodland' the woodland closest to the turbines is not. There are no rare bat species in the locality. The turbines blades are higher than the trees and the distance between the edge of the tree line and the turbines is sufficient to ensure no impact on wildlife. To achieve this distance between the turbines, the tree line and the edge of the football pitch the football pitch was rotated 90 degrees.

Funding		Cost Breakdown	
ClearSkies	30,000	Equipment	65,000
Energy & Water Conservation Fund	110,000	Installation	50,000
<b>Total Cost</b>	<b>140,000</b>	Project Management	25,000

## NOISE & FLICKER EFFECT

The wind turbines are situated more than 110m away from the Centre and the nearest residential dwelling is more than 100m away down steep banking. When the turbines are fully operational noise disturbance should not be experienced. The wind turbines have been switched off for periods of time because of unacceptable noise levels caused by a faulty damper pad. This also affected performance of the turbines. Kirklees Council has continued to support the installer and manufacturer whilst this has been rectified. The turbines were restored to full capacity in 2009 and noise and performance are being closely monitored.

Flicker or shadow effect can be caused when turning turbine blades cast a moving shadow and cause a flickering effect. This is not a common effect and is dependant on many factors. Flicker effect has not been experienced at the Deighton Centre.



Noise radius of wind turbines

## CONSULTATION PROCESS

One of the most important aspects of any wind turbine project is consulting the people who will be affected by the project early on. A programme of awareness raising activities was developed and implemented, this included issuing letters to local residents, press releases, displaying posters in local community buildings, shops and pubs, meetings were held with local sports centre, school and building user group. An open day was held at the centre to give local residents and building users the opportunity to learn more about the project and raise any concerns they may have.

Shortly before the turbines were due to be installed a further round of awareness raising was conducted to ensure residents and building users were kept up to date with progress. Every year the centre hosts the Deighton Carnival, the event was used to launch the project to the local community.



## ACHIEVEMENTS

- The turbines were installed in May 2006.
- The turbines have been used as an educational resource by a local school.
- There has been a positive response from the local community.
- Skills within the council have increased, in both the project team and in Building Services who undertook training during the installation.
- Kirklees now has a strategic maintenance plan which will address the maintenance requirements of all of the Council's renewable energy installations.
- Experience and confidence gained from delivery of high profile demonstration projects, has lead to the delivery of more renewable energy projects.



## Raising one of the wind turbines

### LESSONS LEARNED

- Maintenance: a corporate maintenance strategy has been developed for all Kirklees renewable energy projects in order to reduce maintenance costs in the long term. As part of this strategy, Kirklees Building Services undertook maintenance training when the turbines were installed.
- The wind turbines have been switched off for periods of time due to a part failure which caused unacceptable noise levels. The turbines have operated at reduced capacity for periods of time, whilst this was rectified. In 2009 the turbines were restored to full capacity and are now being closely monitored for their performance. This affected all Proven 15kW models across the country.
- Consultation: consultation in addition to that required by the planning process resulted in a high level of acceptance of this project, as demonstrated by the low number of complaints and positive feedback received.
- Sale of surplus electricity and obtaining Renewables Obligation Certificates (ROCs): Kirklees is not able to sell back the electricity generated or obtain ROCs under its current energy supply contract. This is reviewed from time to time.

### KIRKLEES RENEWABLE ENERGY PROGRAMME

Kirklees is one of the leading local authorities in the UK regarding renewable energy. This is demonstrated by:

- Kirklees' Renewable Energy Fund - a capital programme funded from the Council's lower National Insurance contributions arising from the introduction of the Climate Change Levy in 2000. The fund has enabled the attraction of around £4 million of additional funding into Kirklees from the EU, UK Government and private investment. Projects and policies resulting from this fund include:
- Installation of nearly 5% of the total installed domestic solar photovoltaic capacity on social housing in 2006, through the award-winning EU funded SunCities project.
- Installations of the first roof mounted wind turbines on a local authority building.
- Launch of the RE-Charge scheme offering interest-free loans to home owners in the district to install small scale renewables.

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