

# Case study summary

## Okehampton College, Devon, UK

2010 Ashden Award

Okehampton College's 2010 Ashden Award recognises its work to cut energy consumption through improvements in energy efficiency and the installation of renewable energy technology.

Okehampton College is situated in the centre of Okehampton, in the northwest corner of Dartmoor National Park. The site comprises a number of separate teaching blocks, some dating back to the early 20th century, which provide many energy challenges. Despite this, the school has made significant progress in improving energy efficiency and cutting CO<sub>2</sub> emissions.

- Pupils in the college's STEM (Science, Technology, Engineering and Maths) Club monitor energy use, and have developed a 'traffic light' system for identifying good and bad behaviour for energy use in classrooms.
- STEM Club pupils regularly deliver presentations on energy in college assemblies and staff have delivered energy presentations to other local schools.
- Since 2006 a range of energy saving measures have been implemented in the college, including the removal of unnecessary light fittings and the replacement of 3,000 fluorescent lights with low energy tubes. An upgrade of the roof and cavity wall insulation is also taking place. Other activities include water conservation, recycling and growing food.
- 30kWp of solar PV has been installed.
- The college is investigating options for more solar PV and solar water heating, two 11 kW wind turbines, a small hydroelectric scheme and a biomass boiler.
- Total CO<sub>2</sub> savings of 70 tonnes/year.
- Electricity consumption has fallen by over 50%, saving £20,000 per year.
- The college encourages and supports sustainable energy activities in its eleven feeder primary schools. It has facilitated energy surveys in all the schools and is assisting with the installation of solar PV in ten of them, four of which have now completed this.
- The college promotes sustainable energy in its community through public events and has distributed 6,000 low energy light bulbs to local householders.

Okehampton College has 1,400 students aged 11-19, drawn from Okehampton and the surrounding rural areas. It has specialist status for technology and applied learning, which underpins the college's sustainable energy activities.

### UK statistics

(IMF 2009, UNFCCC 2006)

GDP: £20,500/year per person

CO<sub>2</sub> emission: 9.2 tonnes/year per person

### Location



**"After we got new insulation at school, we got our home checked and it had no insulation! We've got some now, and it has cut our heating bills."**

Member of the STEM club, Okehampton College



Okehampton College boasts extensive solar PV as well as pupils who are enthusiastic about being more sustainable.

### Contact

Okehampton College  
Keith Webber  
kwebb@okehamptoncollege.devon.sch.uk  
www.okehamptoncollege.devon.sch.uk

# Case study

## Okehampton College, Devon, UK

### Background

Okehampton College is situated in the centre of Okehampton, in the northwest corner of Dartmoor National Park. It is the only secondary school in the area and provides education for 1,400 pupils aged 11-19. The college has specialist status for technology and applied learning, a specialism which has driven its commitment to energy efficiency and micro generation.

The college comprises a number of separate teaching blocks, some dating back to the early 20th century, some recently built and a new Skills Centre due to open in 2010. The range of buildings provides many energy challenges, but the college is committed to energy self sufficiency and carbon neutrality.

The carbon reduction activities are led by a team of senior managers and governors, supported by pupils from the college's STEM Club (Science, Technology, Engineering and Maths) who are actively engaged in monitoring energy usage in the college.

### Integrating sustainable energy in schools

The sustainable energy activities are led by a team of four people – the Principal, the School Business Manager, the Chair of Governors and Keith Webber, the Community Technology Coordinator. Keith is responsible for linking the activities with the school curriculum, engaging pupils in the energy programmes, supporting the eleven feeder primaries with their own energy activities and providing links with the wider community. The management and monitoring of energy is carried out by the School Business Manager, who negotiates supply and maintenance contracts, keeps records of meter readings and administers the finances.

### Installing sustainable energy technology

An energy dashboard (provided by Natural Watt, the PV installer) and weather station on the college's website provides data on electricity generated by the PV panels, as well as electricity consumption. An automated meter reading has recently been installed to monitor gas use, and another will be installed soon to monitor water use as well.

Since 2006 the college has invested in a number of measures to reduce energy consumption. Following a Carbon Trust survey, unnecessary lights and radiators have been removed and an upgrade of the roof and cavity wall insulation has been commissioned, with 1,000 m<sup>2</sup> of cavity wall insulation already completed. 30kWp of solar PV has also been installed. A local lighting company has provided 3,000 low energy fluorescent tubes to the college as a promotional exercise, replacing T8 and T12 lights with more efficient T5 ones. This conversion has reduced the estimated lighting load from 130 kW to 65 kW. Motion sensors are also being trialled in some of the corridors. A Big Hanna Composter has been installed to deal with bio degradable waste from the college kitchen, as a trial by the local authority. Food waste is mixed with small wood chips and converted into compost for use on the college garden. The process uses mechanical agitation and ventilation, and takes up to six weeks.

All these energy efficiency and renewable energy measures have been funded from a range of grants together with contributions from the local authority, including Devon Council's Green Challenge Fund for Schools and Colleges. £95,000 in grants helped fund the 30 kWp solar PV and accompanying website dashboard. Eventually, the college intends to invest around £75,000 of its own money out of the total budget of £304,000.

### Generating energy on site: future plans

Plans to erect two 11 kW wind turbines on a hill behind the school are well advanced, with a grant offer of £30,000 already in place. In addition, the college is proposing to install a solar thermal system for hot water in the school kitchen and additional solar PV. At the same time, it is investigating options for a biomass boiler, with an offer from a local woodland owner to supply the school with up to 500 tonnes of woodchip per year.

The college also plans to refurbish an old mill next to the college for use by the community and students. The design for the refurbishment accommodates passive heating and lighting and solar PV and/or solar thermal panels. The mill has hydroelectric potential, as the stream has a head of 5 metres and a flow of 100 litres per second. The hydroelectric scheme would be able to generate all of the building's electricity requirements and more besides, for the benefit of the college and other buildings.

**"People do turn off the lights, because they've seen that it can make a difference to our energy use."**

Sixth form pupil.

### Behaviour change

All staff and pupils are involved in promoting sustainable energy behaviour. Senior staff deal with the technical and financial aspects of the sustainable energy work, whilst pupils from the college's STEM Club monitor energy use in the college buildings. They have designed a 'traffic light' system for identifying good and bad behaviour. Classrooms are checked to see if lights and equipment have been left on. If everything has been turned off a green face is left on the teacher's desk. If something is left switched on a red face is left. After a series of green faces a smiling yellow face is provided. For consistently poor behaviour red warning triangles are placed on classroom doors.

Since the system was introduced pupils have noticed a definite change in behaviour, with an increase in the number of green faces awarded. Some teachers display their awards and now there is staff competition for the most green and yellow faces. The pupils have also designed and placed 'switch off' notices next to light switches in corridors around the college. The school has energy efficiency notice boards to keep staff and fellow pupils informed of the college's energy activities and achievements.

In addition to energy activities, the college has reduced its water use and recycles paper and other materials. The STEM Club pupils have produced notebooks from scrap paper which they sell for 25p each and have made paper 'logs' for use in wood burners. The college is developing a gardening project - 'Growing our Futures' - which focuses on the issues of peak oil, climate change and food security. Pupils grow and harvest fruit and vegetables to be used in the school kitchen. Pupils from Year 7 work on the garden with Year 6 pupils from the feeder primary schools. This helps the transition from primary to secondary school as the younger pupils are already familiar with the college and some its pupils before they transfer.

Sustainable energy activities stretch well beyond the college gates: the college supports eleven feeder primary schools with their own energy programmes. Together with DARE (Devon Association For Renewable Energy) and the Oxenham Building Consultancy, all schools have had an energy survey and ten of them have planning permission for solar PV, with installation completed at four. The college has also distributed 6,000 low energy light bulbs to local householders, and members of the STEM Club have given energy saving presentations to community groups.

### Integrating sustainable energy into the curriculum

As in all secondary schools, the curriculum is determined by national requirements for GCSE and A Level qualifications. Energy is taught mainly in science, technology, geography and maths. The college's specialist status for technology, together with the sustainable energy technology it has installed, provides pupils with excellent opportunities for learning. The college has held themed curriculum days where the timetable has been shelved, allowing pupils to attend workshops on renewable energy.

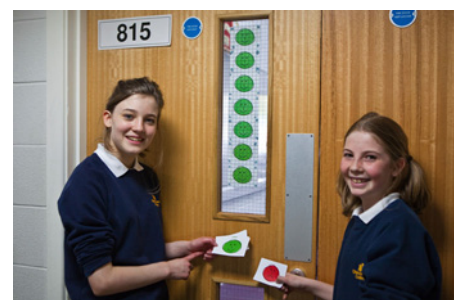
The energy dashboard on the school's website provides very useful information for use in science and maths lessons. In geography, the pupils held a mock summit in the run-up to Copenhagen in 2009. Citizenship lessons have included an exercise on writing letters for and against the wind turbines planned for the college.



Even the college Principal doesn't escape the attention of the energy monitors.



**"Once a week we check all the classrooms, and leave a 'green face' if the teacher is saving energy, or a 'red face' if they've left stuff switched on."**  
Pupil, member of the STEM club.



## Benefits

### Environmental benefits

The solar PV and lighting conversions are saving around 70 tonnes of CO<sub>2</sub> per year. Lighting conversions coupled with better energy awareness and energy management have helped the college to achieve a Display Energy Certificate 'C' rating across its buildings. The college's energy work has had a direct benefit for sustainable energy in its eleven feeder primary schools. The energy surveys organised by the college and carried out in these schools were given to the local council to help them plan upgrades, improve energy performance and reduce emissions.

The Big Hanna Composter reduces the volume of kitchen waste that has to be removed from the premises, as well as providing a valuable source of compost for the college's fruit and vegetable garden. Produce from the garden is grown organically and is used in the college kitchen, reducing food costs and food miles.

### Social benefits

As well as supporting its feeder primary schools the college has been able to showcase its sustainable energy activities to the local community. Pupils have taken the energy saving message home and have reported changes in energy use amongst family members. The college keeps the community regularly informed of its energy activities and consults widely when planning for renewable energy installations. Local citizens are encouraged to participate in energy events and the college invites them to environmental films and quizzes.

In 2009 the college received the Chairman's Award from the Specialist Schools and Academies Trust for its contribution to sustainable education.

### Economic benefits

Although the sustainable energy measures installed have generated only a small drop in gas consumption, electricity consumption has fallen by over 50%. By entering into its own contract for energy supply rather than buying energy through the local authority, the college has reduced its unit price for electricity by 4p per kWh. The energy efficiency measures and solar PV, combined with the reduced contract price, have resulted in cost savings of £20,000 per year. Water saving measures have reduced water costs by £19,000 per year.

The recent introduction of automated meter reading (AMR) for the gas supply has immediately highlighted some simple measures that will reduce gas consumption, for example ensuring heating is only on when and where it is needed. Unnecessary and unexpected surges are readily identified in the daily graphs the AMR produces.

### Potential for growth and replication

The college's current and future plans (see 'Future plans' box) are ambitious, but its ultimate aim is to become a centre of excellence for renewable energy and to move towards energy self-sufficiency. It even hopes to export surplus power to local businesses.

The most replicable aspect of the activities at Okehampton College is the school's support for its feeder primary schools. In general, secondary schools have the expertise and are able to allocate more staff time to develop sustainable energy activities than is possible in most primary schools. The college receives extra funding for its technology specialism and is expected to use some of the money to establish links with local primary schools. Over 3,000 schools and colleges in England have a specialist status and schools with specialism in science, technology or engineering are ideally placed to support primary schools with energy activities.

## Contact details

Keith Webber  
Community Technology Coordinator  
Okehampton College  
Mill Road  
Okehampton  
Devon  
EX20 1PW  
kwebb@okehamptoncollege.devon.sch.uk  
www.okehamptoncollege.devon.sch.uk



Pupils from Okehampton's STEM club visit local primary schools to talk to them about sustainability.



Keith Webber Community Technology Coordinator at Okehampton College

**"To show that you believe in using renewable energy, you have to put some of your own money in."**

Keith Webber, the driving force behind Okehampton's commitment to go green.

#### Disclaimer

This report is based on information provided to the Ashden Awards judges by Okehampton College, and findings from visits by members of the judging team to see its work.

The Ashden Awards have taken all reasonable care to ensure that the information contained in this report is full and accurate. However, no warranty or representation is given by The Ashden Awards that the information contained in this report is free from errors or inaccuracies. To the extent permitted by applicable laws, The Ashden Awards accept no liability for any direct, indirect or consequential damages however caused resulting from reliance on the information contained in this report.

Last updated: May 2010