

Sandhills Primary School, Oxford

Emma Lacey, Maureen Stephens

Sustainable energy throughout culture and curriculum of a primary school

Summary

Sandhills Primary School is on the outskirts of Oxford and has a new and energy efficient building constructed in 2002. The design of the school, which had input from the governors and headteacher to increase its environmental performance, provides a good deal of natural light, reducing the need for artificial lighting. High levels of insulation and double-glazing mean that the demand for heating from the gas boiler is low. Teaching areas in the school have their own motion sensors for lighting and thermostatic radiator valves to control heating.

The 200 pupils and 16 staff enjoy a great working environment both within the school and outdoors. Outside there are garden areas for growing vegetables for use in the school kitchen, a small, recently-planted woodland, a pond, composting facilities and a wonderful amphitheatre.

Pupils are engaged in monitoring energy consumption in the school through the work of the Energy Team. Members of the team read electricity meters with the caretaker on a monthly basis and chart the results for display on the energy notice board. Graphs allow comparison of consumption with previous years' usage.

Energy Team members have produced energy saving notices and posters for display around the school. They regularly check the energy performance of each class, identifying when lights and appliances have been left on and doors and windows left open unnecessarily. Each week the best performing class is presented with the Light Bulb Trophy at assembly. Occasional 'Energy Free Days' and special energy assemblies also take place.

In February 2008 the school switched on its own 5kW wind turbine, which it is estimated will provide up to 20% of the schools electricity needs. Uniquely pupils were invited to contribute towards the cost of the turbine and from their own pocket money they raised £184. They also raised money from their parents by selling 1,000 low energy light bulbs.

Address: Terret Avenue
Sandhills
Headington
Oxford
OX3 8FN

Telephone: 01865 433000

Email: headteacher.2401@sandhills.oxon.sch.uk

Website: www.sandhills.oxon.sch.uk

The school

Sandhills Primary School is situated on the outskirts of Oxford in an area of mixed housing. The school has 200 pupils and 16 staff. 8% of pupils receive free school meals, 20% are from differing ethnic backgrounds and 36 pupils have special educational needs. It is a typical UK suburban school.

A new school building was constructed in 2002 and the modern design provides generous teaching areas, good levels of natural light and includes a wide range of energy efficient equipment. There are extensive grounds around the school providing space for an amphitheatre, a school garden for growing vegetables, a small, recently-planted woodland area, a pond and a composting facility. It is a haven for biodiversity studies. Environmental activities were well developed in the school before the new building was opened. Through a programme of energy efficiency work, the school was awarded level 1 and level 2 Sustainable Energy Awards from the DFES (DCSF) and in March 2007 was awarded the level 3 certificate, only the fourth school nationally to achieve that award. Their MP, Rt Hon Andrew Smith, joined a school assembly on a special Energy Day to present the award to the Energy Team of eight pupils. In December 2007 the school attained the Eco-Schools Green Flag Award, the thirteenth school in Oxfordshire to achieve the Green Flag.

Behavioural activities to promote sustainable energy use

The school has an Eco-Committee and an Energy Team whose members have produced energy saving posters and stickers for display around the school. Each day they check for energy wastage in classrooms and have produced energy 'spy sheets' to monitor each class's performance. They report results in assembly, awarding the 'Light Bulb Trophy' to the most energy efficient class. Members of the Energy Team regularly present their ideas for saving energy to other pupils and run energy efficiency competitions based on popular television programmes such as the X-Factor and the Weakest Link. These TV-style shows were the ideas of the Energy Team pupils as a way to engage their peers. They are very popular and put the message across quite simply. Initially Atkins helped to benchmark the school against national energy performance statistics for schools, which gave them targets to aim for.

Electricity meters are read by the caretaker and pupils every month, and readings displayed on graphs on the energy board. There is apparently high consumption out of school hours, possibly from the IT server or from lettings. Readings are now being taken at the beginning and end of each school day to try to establish the scale of the problem. Gas meters are read only in the winter, as the heating is off for more than six months of the year.

There are good links with parents and other members of the local community. 1,000 low energy lamps were sold locally (mainly by children to their parents) to encourage energy efficiency and to raise funds for a wind turbine. The school carried out its own consultation with neighbours regarding its plans for the turbine and invited everyone to the official launch.

In addition to energy work, the school also has a strong focus on the environment. There has been a tree-planting programme, with most pupils donating £1 to plant a tree, and some planting more than one. Sandhills uses living willow structures for fences and a tunnel for the children to play in. There is also a vegetable garden, composting area and pond (kept topped up by harvested rainwater from school roof). Staff from nearby Waterperry Gardens have been in to help with the school garden and have sponsored the tree planting.

The school believes that if it develops an ethos of environmental awareness then pupils will take that message home into their everyday life. Parents are regularly invited to join in with the energy events at the school, and are kept informed of activities through the school bulletin, which goes home to parents and also appears on the school's website.

Sustainable energy technology

As the school building is only five years old it had to meet reasonable standards of energy efficiency. However, environmental awareness at Sandhills pre-dated the new building, and the headteacher and governors were active in achieving a higher standard of efficiency than had originally been planned. There are numerous sky lights and windows, which greatly reduce the need for artificial lighting. Newly installed lighting is very energy efficient and includes motion sensors. The caretaker identified excess lighting in the corridors and personally reduced the number of lamps. He also re-wired fans in the toilets that were running continually.

There is little need for heating in the school because of its design and construction. Each room has its own radiator thermostats for individual control. The school has recently been surveyed to have separate sensors installed, which will monitor electricity, gas and water usage, and it is hoped that this additional information will assist the school in becoming even more energy and water efficient.

A 5kW ISKRA wind turbine was officially commissioned at the end of February 2008. It is estimated that it will provide up to 20% of the school's electricity needs, saving the school about £1,500 per year.

The wind turbine is well situated for capturing optimum wind speed and its position near the busy A40 is an excellent advertisement for the school's commitment to sustainable energy. There is a display panel in the school hall to show the amount of electricity being generated by the turbine. The school is investigating how it can sell surplus electricity at night, weekends and during holiday periods.

Sustainable energy in the curriculum

The teaching of energy is embedded in the curriculum and in addition there are occasional 'one off' projects such as an Energy Free Day when lessons and activities are undertaken without the use of electricity - no lights, computers or computer smartboards.

Work leading up to an Energy Free Day in March 2007 included:

- Year 4 made a power station completed by an annotated drawing.
- Year 6 looked at coal reserves.
- Years 1 and 2 made polar animals and watched a cartoon about global warming and the effect it could have on reindeer.
- Year 3 designed energy superheroes.
- All Key Stage 2 pupils visited a solar vehicle that called at the school and all pupils participated in solar buggy racing in the school playground. Other activities included Year 6 calculating the carbon emissions incurred when travelling to and from school. All work was displayed in the school hall for parents and visitors to see.

A range of activities were developed for the wind turbine project, including:

- Foundation stage – made kites and streamers.
- Year 1 made paper windmills.
- Year 2 made paper windmills – they took them outside to find the windiest part of the school.
- Year 3 learned about weather forecasts and symbols.
- Year 4 discovered how wind turbines work.

- Year 5 investigated wind speed, direction and strength (Beaufort scale) and fossil fuels versus natural fuels.
- Year 6 carried out a feasibility study on five potential sites for the school's wind turbine.
- Year 6 in three persuasive language groups were asked to carry out the roles of campaigners 'for the turbine', 'against the turbine' and 'local authority planning officers'.

Each year, in the curriculum, the children cover a whole range of environmental topics ranging from composting to what happens to our rubbish, the life cycle of a can and rivers and the water cycle in Year 6.

Benefits

The graphs and charts displayed on the energy notice board illustrate how electricity consumption has been declining over the past two years due to the reduction in the number of lamps in the school corridors, the rewiring of the fans in the toilets and general improvement in the management of energy. In 2007 this resulted in the school using 74,976 kWh, compared to 80,272 kWh the previous year – a reduction of over 6%. This is in addition to up to 20% of the school's electricity needs which will in future met by the wind turbine. The turbine was installed on 31 January 2008 and commissioned a week later. The official inauguration of the turbine took place on 29 February 2008, with the local MP, Rt Hon Andrew Smith cutting the ribbon. Also attending were many other invited guests from people who had helped with the project with advice or sponsorship. There was a reception afterwards with a special cake provided by Oxfordshire County Council.

Sandhills has also made significant reductions in the use of gas for heating, cutting consumption from 380 MWh in 2005/06 to 250 MWh in 2007/8 - a reduction of 34%.

The sale of 1,000 low energy lamps by pupils to parents has helped to raise the profile of energy efficiency in homes, possibly leading to greater energy saving activity.

Potential for replication

Being a relatively new building Sandhills is already fairly energy efficient. Its heating requirements are small and lighting is highly energy efficient and controlled by motion sensors. However, rather than rely on the building design and construction to keep the energy consumption low, staff and pupils have recognised that there is still the opportunity to make greater savings and avoid wastage. For instance, although air conditioning equipment is available in the IT room, everyone knows that they should rely on opening windows as far as possible, and use the air conditioning only as a last resort. They also identified the potential for the wind turbine and monitoring equipment.

The UK Government is committed to refurbishing or rebuilding all its secondary schools and half of its primary schools. Often schools feel that they have little say in the type of building that they get. Sandhills demonstrates that it is possible to lobby successfully for a building which goes beyond the actual requirements for efficiency. Also, even when a school has a good building, there is no room for complacency, and there will always be opportunities to optimise its use.

Management, finance and partnerships

Although in recent years the sustainable energy activities were led by Maureen Stephens, a part-time teacher, they are now coordinated by Emma Lacey, a newly qualified teacher who specialises in English and drama. She is able to bring a refreshing dimension to energy and environmental activities, illustrated by her work with the drama club on a production called,

New Beginnings. Through music and drama the pupils will explore how, if we had a new beginning, we could make our world a better place – more sustainable and carbon free. The pupils will perform New Beginnings to parents and members of the community, hopefully in the school's outdoor amphitheatre in the summer of 2008.

Emma is still supported by Maureen and also Hannah Mortimer who runs the gardening club. All have additional help from the Assistant Deputy Head Teacher and the caretaker (both governors of the school) and complete backing from the Head Teacher. This is a real team effort developing a whole school approach to sustainable energy. The process is very much 'bottom up' with the headteacher providing staff with freedom to experiment, develop and deliver. There is no specific policy on energy but the need to manage and teach energy effectively is embedded in other broader policies.

Thames Valley Energy undertook the initial feasibility study for the 5kW wind turbine. It cost £28,500 with funding coming from the Low Carbon Building Programme (£10.5k), Oxfordshire County Council (£5k), Oxford City Council (£5k) and Eco-Schools (£5k). The pupils provided £184 from their own pocket money and sold 1,000 low energy light bulbs to their parents to raise additional funds. Also friends and parents of the school were invited to make personal donations to the turbine fund which totalled £450. The developer who built the new school and the adjacent houses underwrote the shortfall and one of the installation contractors (ELM Ltd) also 'donated' some of his groundwork to the project which helped the overall finances. The school commissioned a five metre banner, displayed at the front of the building, to thank and acknowledge the support of all the major sponsors. Being a new school, there has been no other sustainable energy investment.

During 2006 and 2007 the school received on-site support from Atkins, an energy contractor to Oxfordshire County Council. This has helped to enhance the sustainable energy activities, which are now embedded in the school culture and continually being built upon. Although the Atkins involvement has now ceased the school will maintain its sustainable energy programme and develop it further.

This report is based on information provided to the Ashden Awards judges by Sandhills Primary School, and findings from a visit by two members of the judging team to see their work.

Dr Anne Wheldon, Technical Director, Ashden Awards

Mike Wolfe, CREATE

May 2008

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.