

2009 Schools Ashden Awards case study **Ashley Church of England Primary School**

Location: Walton-on-Thames, Surrey
School details: Primary; 4-11 years; 270 pupils, 10 teachers, 20 other staff;
budget £0.8m in 2007 - 08.

Summary

Following an expedition to see the effects of the climate change in the Antarctic, the head teacher of Ashley Primary School initiated an ambitious programme of sustainable energy work in the school, with active support from the governing body. Pupils are actively engaged in efforts to reduce energy consumption at school and at home, and participate in the promotion of the energy activities through film and case study material.

- Pupils monitor electricity consumption in each building using data provided by ecoDriver. The data can be viewed half hourly, daily, weekly and monthly, so that pupils can see the impact of their actions through their use of the system.
- Three school buildings are set weekly electricity consumption targets with a collective target of less than 100 kWh per day. Energy monitors share the data every Friday and the pupils are financially rewarded if targets are met.
- 71 staff, governors' and pupils' families have joined a Carbon Countdown Challenge to use less than 100 kWh of electricity per week in their homes.
- Fluorescent lamps in the old school building are being replaced by more efficient T5 versions, installed in existing fittings using an adaptor. Efficient IT equipment chosen, and wasteful appliances eliminated.
- Light sensors with an over-ride facility have been installed in cloakrooms and toilets of the new building. This building has solar tubes in classrooms, corridors and cloakrooms to bring daylight into dark areas.
- 35 kW biomass boiler installed in the original school building which burns wood pellets sourced locally. Double glazing has reduced heat loss from the building.
- 4.2 kWp photovoltaic array on the roof of the new teaching block, along with a bank of eight solar thermal evacuated tubes (11 kW).
- ecoDriver software system used to monitor electricity consumption and electricity generated by the PV array.
- £154,000 spent on sustainable energy measures, over half from the school's own resources.
- Impressive 51% reduction in electricity use and 18% reduction in gas use between 2007 and 2008, saving about 14 tonnes/year CO₂. Use continues to fall. Similar reductions in some of the Carbon Challenge homes.
- Plans for energy efficiency, passive solar heating, natural lighting, green roof and PV array in a £3 million new school build.

Ashley C of E Primary School

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Document last updated May 2009

The school

Ashley Primary School is in the centre of Walton-on-Thames, a town of 23,000 residents in Surrey. The town is fairly affluent, but with areas of social housing.

The school has 270 pupils, with about 15% from black and minority ethnic groups, and 5% receiving free school meals. There are 10 teachers and 20 other staff. Ashley received an 'Outstanding' Ofsted grading in January 2007, and is heavily oversubscribed, with 180 applications for the 60 places of the Autumn 2009 intake.

The school has three teaching blocks – the original school building, which is over 150 years old, a recently constructed teaching block and a prefabricated building which is used for the youngest pupils and is due to be replaced. At the rear of the school are extensive grounds including an orchard, herb garden, vegetable plots, a pond and chicken run. There are composting facilities and numerous water butts connected to the three teaching blocks.

Behavioural activities to promote sustainable energy use

The behavioural activities involve all members of the school community, including parents. The school has an Eco Committee and pupil members are engaged in monitoring energy use around the school. The Committee measure electricity consumption using the data provided by the school's electronic energy monitoring system, ecoDriver.

Pupils' careful observations of the electricity data can have a very immediate positive effect. For example, on a number of occasions pupils noticed that the original school building used a lot of electricity on Monday mornings. When they investigated this they discovered that this was due to staff using the photocopier, preparing materials for use in the week. They challenged the teachers to find other, paper-free and photocopier-free ways of teaching. Pupils also noticed the electricity demand of the steriliser used to wash plates after lunch and, with staff help, persuaded the catering contractors to use the steriliser more efficiently.

To promote energy efficiency around the school the pupils have produced stickers and posters. These have encouraged staff and pupils to regularly turn off appliances at the socket to minimise wastage. In addition, the site manager checks that appliances are switched off at the socket during his end-of-day lock-up. To further encourage energy efficiency at school and at home pupils have displayed their own energy pledges on the Eco-Committee's notice board. For example:

"I pledge to get as many energy-saving products in my home as possible."

"I pledge not to leave things on standby."

In 2008, Ashley school started the '100 Club', as a challenge to reduce electricity consumption. The three teaching blocks have weekly consumption targets, and collectively the challenge is to keep the school's consumption below 100 kWh per day (with allowances for wet play times and evening meetings). If the school manages to do this over a whole week, pupils are rewarded with £10 from the headteacher, with a further £10 for each day below 50 kWh. The School Council decides how the money is spent. For example, on one occasion it was decided to spend £200 on games for wet play times. Twice in 2008 the school ran 'Carbon Free Fridays' to see how little electricity could be used in a single day. Staff took learning out of the classroom, asked the kitchen staff to provide cold lunches, organised a community picnic on the school field and enjoyed fruit juices and water instead of their customary coffee. The result was that, electricity consumption was reduced to just 31 kWh and 25 kWh for the two 24-hour periods. Two more days are planned for this summer.

The school has extended its efforts to reduce electricity use and carbon emissions to the wider community. One third of the families with pupils of the school (71 families) are now engaged in the school's Carbon Countdown Challenge and 100 Club, which encourages energy consumption of less than 100 kWh per week in each home. Results are recorded on the school's website (<http://www.ashleyschool.org.uk/ecoZone.php>). Several teachers and some of the support staff are also participating in the Carbon Countdown Challenge. Ashley recently worked on a sustainable energy project with eight other local schools. One school, through working closely with the site manager to change electricity management practices, reduced its electricity consumption by nearly a third in a few weeks.

Sustainable energy technology

Since September 2007 there has been significant investment in a range of sustainable energy technologies in the school. Funding for the measures has come from public and private sector grants, the school's own budget and parental support.

The first installation was a 35 kW biomass boiler, installed in the original school building. It uses wood pellets sourced from local woodland. There were some initial problems with integrating the biomass boiler with the existing old heating system, but these are gradually being resolved. Since installation, a thermostatic valve has been added to control water temperature and reduce pellet consumption. In addition, double glazed windows and doors have been installed in the building to reduce heat loss. Gas is still used in the other two buildings for heating and hot water. The improved heating system has also eliminated the need for using electric heaters.

At about the same time the school installed an array of 26 solar photovoltaic (PV) modules (4.2 kWp) on the roof of the new teaching block, along with a bank of eight solar thermal evacuated tubes (11 kW). The solar thermal array was designed to heat water for the school's outdoor swimming pool and to provide hot water for the three classrooms in the teaching block. However the swimming pool will shortly be replaced with a new classroom block and there are plans to move some of the solar thermal panels to another part of the school to provide hot water for a new community kitchen.

Solar tubes have been installed in the classrooms, corridors and cloakrooms of the newest teaching area, to channel daylight into dark areas. The new cloakrooms also benefit from large skylight windows, which were installed at the suggestion of pupils. There is some disappointment with some of the solar tubes because the amount of light is lower than expected. The school is investigating how they can be improved, and have found that a different design, with greater use of reflective coatings, gives much more light than the originals.

Nearly all the fluorescent lamps in the old school building have been replaced with T5 versions. To reduce costs, they have been installed in existing luminaires using an adaptor. In addition, light sensors with an over-ride facility have been installed in cloakrooms and toilets of the new building, at the suggestion of pupils. Efficiency has also been considered when buying IT equipment. High efficiency desktop computers and 15 W laptops are now used.

Electricity consumption and electricity generated by the PV array are monitored by the ecoDriver system. This is a commercial software package for monitoring energy and water use. The school is pioneering the product and has worked with the supplier to produce a video on behalf of Microsoft Global to demonstrate its benefit to schools (<http://www.ecodriver.co.uk/ecosc.html>), both for monitoring energy consumption and

production, and as a teaching aid for maths and IT activities. Staff, parents and visitors can view the school's electricity data on a flat screen monitor in the entrance area of the school. The data can also be accessed from the home page of the school's website (<http://www.ashleyschool.org.uk/Default.php>).

Sustainable energy in the curriculum

The sustainable energy curriculum activities were inspired by the head teacher's expedition to Antarctica in March 2007. Richard Dunne was invited to lead an education team to learn about the impact of climate change on the uninhabited wilderness. The team set up an education base run on renewable energy and developed ideas for a values-based Antarctic curriculum that would inform, educate and inspire young people to find more sustainable ways of living. (<http://www.education.2041.com/>).

Influenced by the expedition, and the school's own sustainable energy practice, all teachers plan sustainability learning questions for termly topics which cover the full spectrum of the 'eight doorways to sustainability' curriculum. For example, the ecoDriver system is used in 'Numeracy for a real life application' of handling and interpreting data, and in Art and Design pupils have designed stickers and posters to encourage energy efficiency and water conservation. Pupils have also appeared in energy saving videos for EDF Energy, BP and the suppliers of the ecoDriver software. The school runs termly Funky Fridays and themed weeks that include projects to explore sustainable practices. On one such occasion pupils worked at BP headquarters on solar energy projects.

The curriculum activities reach beyond the school gates. Pupils whose families are participating in the Carbon Countdown Challenge and 100 Club are actively involved in reading meters at home and encouraging energy efficiency. At the end of every term pupils lead a 'Care and Concern' assembly which often includes activities on sustainable living. The pupils now share the school's best practice with pupils from other local schools and links have also been made with schools in Poland and Italy. Each June, Year 6 pupils travel by train to Chamonix for a 'Leadership on the Edge' experience focused on the meaning of well-being at an individual, team and global level. Whilst there the pupils visit the shrinking glacier of La Mer de Glace which provides a first-hand experience of the impact of climate change and reinforces their understanding of the need for sustainable energy. Last year the pupils' ideas about how to become more sustainable in the Chamonix Valley were sent to and integrated into the Mayor of Chamonix's 30 year sustainability plan. (<http://chamonixgoesgreen.org> Page 9)

Energy and Carbon

Mains electricity consumption fell from 50.3 MWh in 2007 to 24.7 MWh in 2008, a remarkable reduction of 51%. During the first four months of 2009, it fell a further 28% compared with the equivalent period in 2008. These impressive reductions have been achieved at a time when the number of pupils was increasing, and demonstrate how much can be achieved through the integrated efforts of a school, in particular:

- Changing to high efficiency equipment wherever possible and eliminating high-consumption equipment.
- Commitment by pupils and the whole school community to eliminate waste and switch equipment off when not needed.
- Generating electricity from the PV system.

The equivalent greenhouse gas saving is about 11 tonnes/year CO₂.

Gas consumption fell by 18% from 100 MWh/year to 82 MWh/year over the same period, and will continue to decrease now that the biomass boiler is fully operational. The equivalent reduction in greenhouse gas emissions is about 3.4 tonnes/year CO₂.

Families participating in the Carbon Challenge and 100 Club are reporting reductions in electricity consumption. For example, the school's chair of governors, Andrew Klimaytys, claims to have reduced his family's consumption by nearly 50%.

Although it is difficult to directly measure the impact of the behavioural activities in the school, it is evident that sustainable energy is in the pupils' consciousness. The energy work has provided them with opportunities to promote ideas for caring for their environment and sustainable living through videos, giving presentations and guiding visitors around the buildings to demonstrate the sustainable energy measures that are used in the school. They are really becoming energy literate.

Potential for growth and replication

What more can Ashley do?

Further development is to take place on the Ashley school site to replace the prefabricated building and accommodate additional intakes of pupils. The head teacher and governors are preparing designs for energy efficient classrooms that use passive solar energy, a green roof, and natural lighting to best effect. Sections of the roof will incorporate solar PV modules.

Richard Dunne and Andrew Klimaytys are already sharing their experiences with primary and secondary schools and universities, especially through the school's work with the National College of School Leadership on Sustainable Schools, and they actively encourage replication. The school has just started a project with the NGO ActionAid that will replicate its best practice through hub schools around the country. Richard Dunne will be sharing the schools practice at the NCSL Leadership Conference in June and he is also starting to work with initial teacher training institutions so that newly qualified teachers will have the skills and knowledge to implement sustainable energy activities once they are in post.

The school is always looking to find ways to promote the advice and support it can provide to other schools and organisations. Governors and members of staff have a great deal of information and experience in managing sustainable energy projects and developing a complementary curriculum, which many schools can benefit from. There are plans to develop guidance material entitled 'The Five Point Plan for Sustainable Energy' that can support existing and future activities in the school and assist other schools seeking to achieve similar levels of energy performance.

What could other schools do?

One key factor which has enabled Ashley to achieve such success with sustainable energy is the commitment of the governing body. The governors redefined the responsibilities of the head teacher, deputy head teacher and administrative staff, so that the head teacher has the time to implement the school's sustainable development action plan and share it with other schools, both regionally and nationally. Other governors could adopt a similar approach.

The financing of the sustainable energy measures through the school's own devolved capital budget, support from local businesses and energy grants can be followed by other schools.

Richard Dunne emphasises the importance of measuring energy consumption, so that the effect of changes can be clear. Measurement of electricity use is backed up by the '100

Club' challenge to make reductions. Energy monitoring and weekly reporting of energy use are included in the school's energy policy and have been key to the successes so far.

Management, finance and partnerships

Ashley School demonstrates what can be achieved when a governing body, head teacher, staff, parents and pupils work together to make a school more sustainable. Richard Dunne's expedition to Antarctica was a defining moment for the school, inspiring a profound commitment to reducing the carbon footprint of the school, within a values-based learning environment. In addition, the business and project management support provided by the chair of governors Andrew Klimayts has been crucial to what has been achieved to date and is planned for in the future.

The school has accessed renewable energy grants from its energy supplier and from government funded programmes. Over £154,000 has been spent on the sustainable energy measures since the autumn of 2007, half of which came from school resources including its devolved capital budget.

The school has worked with the Energy Centre for Sustainable Communities (ECSC), which provided invaluable guidance on renewable energy technologies and funding applications. Ashley also has a strong relationship with its energy supplier, EDF Energy. It is one of the company's case study schools for green energy and features on its greener schools website. And it has recently completed an educational video for BP on energy efficiency.

Early in 2008 Microsoft Global visited the school to film its use of the ecoDriver software system, which won the top Microsoft Global Platinum Award for Software Ingenuity. The film has been promoted around the world.

Ashley School has also worked with ActionAid, a charity working to tackle the effects of poverty. As one of three global case study schools it has helped to produce PowerDown, a toolkit that helps young people to make sense of climate change and seek solutions to its cause. The toolkit comes with a DVD, 20 photo cards and activity booklet and has been distributed to thousands of UK schools (http://www.actionaid.org.uk/101018/free_toolkit.html).

At the end of last year the school worked on a film for the Sustainable Building Awards 2008 when 500 of the top architects and builders from across the country attended an awards ceremony in London. The film can be seen on the school website (<http://www.ashleyschool.org.uk>).

More recently the school features significantly in the latest Qualifications and Curriculum Authority publication Sustainable Development in Action (QCA Ref: QCA/08/4039).

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This report is based on information provided to the Ashden Awards judges by Ashley Primary School, and findings from a visit by one of the judging team to see its work.

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May 2009

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