



When advanced technology
is only one component of
a sustainable school
environment

The Informed Executive discovers that it took passion and dedication to make Howe Dell the first eco-school in the UK

ambitious project to build the first eco-school had to clear a succession of hurdles

The Informed Executive considers the practicalities of creating Howe Dell School as a wholly sustainable environment while pursuing its educational objectives

There is a small collection of words that organisations should not use lightly in their promotional material. They ought to steer well clear of describing themselves or their solutions as ‘the leading’ or ‘the largest’ or the ‘longest established’ in their particular field – unless of course they have good statistical grounds for making such statements. Used inappropriately, these terms diminish the power of the promotion and can discredit the entity.

When a recently completed school in the Home Counties found its operation described as the first eco-school in the UK and the first building in the world to benefit from a new heating process, the critics were ready to dismiss the claims as mere hyperbole. It would be fair to say that there is nothing really new in architecture and building design, just derivatives and improvements on what has gone in the past. Any developments which are held to merit such dogmatic assertions really have to be justified, however. These claims of trail blazing are therefore worth investigating to see how far they withstand scrutiny.

A sense of history

Howe Dell School in Hatfield is the establishment in question. Until it opened on a completely new site on the former De Havilland aircraft manufacturer’s runway at Hatfield in Hertfordshire, the school had occupied probably the oldest site of its kind in the county. This was a Tudor-built Grade II-listed former rectory in Hatfield, where operating conditions were becoming progressively more difficult for the staff and pupils as the projected development stumbled along from one starting date to another.

The school as an institution inevitably suffered in the process. Debra Massey, the head teacher new to Howe Dell two years prior to relocation, highlighted some of the problems that were part of her inheritance. There was a falling school roll, for example; often seen as a sign of uncertainty on the part of parents concerned about sending their children to a school without a clearly-defined future.

There was mounting incredulity that the project would ever go ahead: it was seen in some quarters as being too adventurous and a step too far. And poor ratings by Ofsted before Mrs Massey’s arrival were strong indicators that academic achievement was suffering in the process.

A sense of perspective

But there were practical problems as well. “One was that there was just one toilet for 60 Reception and Year 1 pupils, under the age of 6. And to access the school grounds for key parts of its curriculum, the same group had to use a Tudor staircase from its room on the upper floor of the building. Elsewhere, Year 5 and Year 6 were housed in what was unsatisfactory accommodation, making teaching of this group particularly difficult.”



On the positive side, however, the school was set in exceptional grounds which provided a vital dimension to the school's environmental and ecological studies. Debra Massey was keen that these aspects of the Howe Dell curriculum would continue to feature prominently after the school had transferred to the Runway – whenever that might have been.

Project finally gets underway

The new Howe Dell building was finally given the go-ahead in January 2006 and work started on the £10 million project that was designed from the outset as an ecologically sound, highly sustainable establishment. Though Hertfordshire County Council is responsible directly for the capital cost of such projects, additional funding was available from the property developers under their contractual obligations when they started constructing a complete new housing estate on the disused airfield.

A further contribution, of £250,000, was forthcoming from the Carbon Trust to fund the advanced heat storage system planned for the

site. That commitment reflects the importance being given to carbon-reducing strategies at Howe Dell.

As Mrs Massey noted, "Hertfordshire saw it as an opportunity to do something that was aspirational. It was to be ecologically sound from the outset: it would be energy efficient and the other resources it consumed would be sustainable. The design was evolving continuously while the buildings were being constructed to reflect the changing demand for facilities on the site.

"When the plans were first drawn up, for example, the building was specified for a primary school with an add-on facility for day care. As time moved on, the provisioning of resources for children and families was crystallising out, and the site matured into a primary school with a children's centre for North Hatfield – along with day care to support the community around the school."

There was inevitably an element of compromise on the new site as a result of these changes: Debra Massey would have preferred that the Children's Centre had been located

For the Hertfordshire authorities, Howe Dell was an opportunity to create an ecologically sound establishment that would be energy efficient and consume only sustainable resources in its construction and operation.

From the outset, there was a real danger that the new, showcase Howe Dell School could end up as a case of style over substance: the goal of constructing the most technically advanced building of its kind in the UK might conflict with the overriding purpose for which it was being built – the educational needs of the children.



Above: Work on completing the site continued after the school opened in September 2007 after a thorough risk assessment.

Opposite: Debra Massey, Howe Dell head teacher was relieved to find that she could welcome children to the new school on the first day of term in September 2007

nearer the site entrance so as not to pose a psychological barrier to some of the younger parents who needed to use the facilities, but whose experience of school had been anything but positive. It was too late to take the plans back to square one, however.

Style over substance?

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Massey illustrated that point. There had been a clear understanding on the part of the teaching staff that provisioning for the early years in the school should include covered

areas in the school grounds - essentially outdoor classrooms where children could experience ecology and sustainability first hand.

"The architect explained that covering even part of the playground would impact on the amount of sunlight reaching the ground and hence the interseasonal heat transfer system. Capturing sunlight as a source of heat 'out of season' was fundamental to our sustainability goals.

"But not to have had the benefit of the sheltered areas would have been a retrograde step and run counter to the culture we had established on the Old Rectory Drive site."

As Debra Massey was quick to observe, the new Howe Dell might be an outstanding building but it was not an appropriate place for learning if these very crucial objectives could not be achieved. This was non-negotiable from her perspective and she won the day on that point.

There were more conceptual aspects of the design which were set to create problems for the development. The new school was being designed with clear-cut barriers between the Children's Centre, (which includes the Day Care unit and Nursery class), and the Foundation classes.

This compartmentalisation acted against the free flow between the sections, which reflected sound educational principles. "The objection to our having doors between the sections was that they could impact upon the 'acoustic excellence' of the building. Our view prevailed as the needs of the children come first."

Major obstacle on course

Considering that there were few role models for the design of Howe Dell, it is perhaps surprising that there were not more difficulties encountered along the way. There was one problem, however, which could have thrown the timescale for the Runway site right back into the melting pot. The developers ceased to trade during the building phase, and Hertfordshire County Council was suddenly faced with having to find another operation to complete the task to an acceptable schedule.

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The Mace Group was appointed as project manager, drawing together all of the loose ends and ensuring that the school could be ready to accept pupils at the beginning of September 2007.

In practice, that opening date had to be rather more than a pencilled milestone on a planning chart. There could have been no deviation from that opening date, as literally days before the end of the previous term, the roof fell in at the Old Rectory and the building was declared unsafe.

Opened on time

Opening the school with a two-form entry (60 children) for each of the Nursery and the Reception classes, and single form entry (30) in each of the years above that, the school was well on its way to achieve critical mass on Day 1. The 400 target capacity for the site will be achieved in due course as the expanded entry groups roll up through the school. The site includes a 56 place Day Care service through the Children’s Centre.

Everyone reporting to the Runway site on its opening day found rather more than a conventional school building. To achieve the goal of being the first eco-school in the UK meant that many new environmental technologies had to be implemented at Howe Dell even though they had not previously been tried out in a school situation.

There was indeed the possibility, admittedly remote, that some of the heating and lighting features would not work quite as intended, and the staff and children could have found themselves by the end of November, perhaps, huddled round their Primus stoves with a torch as the only lighting.

Firmly committed to creating the ultimate sustainable school, Debra Massey is a realist who is prepared to meet any of the challenges head on. Given the problems over the contractor,

one such challenge was opening the ‘new’ Howe Dell with the minimum of support services. Though it had satisfied a thorough risk assessment, the Runway site had no staff room, no staff toilets (the disabled facilities found an extra role), no library and no office.

“The prospect of working in the first fully eco-school in the country was a huge stimulus. That goes for all of the fifty staff who span the full range of activities from the Children’s Centre and Day Care Centre to those handling Year 6. The project is working well today because we have ‘grown’ leaders who share my ideals and are passionate about what Howe Dell represents. They are strong teachers with a belief in what they are doing.

“This commitment has been reflected in the results. From Ofsted viewing the school as being ‘satisfactory with some unsatisfactory elements’ at its last inspection at Old Rectory Drive, we turned the situation round so that the curriculum was subsequently rated by Ofsted as ‘good with some outstanding features’ immediately after we moved here. Significantly, this inspection was made within the first week on the new site, despite the



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Howe Dell has a catalogue of sustainability features to justify its eco-school status



The solar heat collector pipework for the ICAX Interseasonal Heat Transfer system is shown above being installed before the playground is laid. In addition to this system, the wind turbine, solar panels and the TermoDeck building 'mass' ventilation system, the new school features . . .

- A simple rectangular shape that enables the teaching areas – all south facing – to have dedicated external classrooms, allowing pupils direct access to the extensive and bio-diverse grounds (including a wetlands area).
- Strategically placed roof lights allowing natural daylight to flood into the centre of the building, minimising the need for artificial lighting of deep plan spaces and allowing natural daylight to flow into the ground floor corridors.
- High performance windows to reduce heat loss and help control solar gain.
- Sustainably sourced sprung timber floor in the main hall and a bamboo floor in the dining room.
- Sustainably sourced timber play equipment.
- Classroom sink tops and splash backs made from recycled yoghurt pots.
- 'Living' sedum green roof areas to help manage water run off, insulate the building and promote bio-diversity.
- Rainwater collected from the roof is used for toilet flushing, for the irrigation system and to top up the bio-diverse wetlands within the school grounds.
- A software system that allows pupils to monitor the various environmental systems.

drawbacks. In terms of the children's achievements, 47.5% have reached Level 5 in English writing, up from 5% at the old site. That is a fantastic achievement on their part and that of the highly dedicated teaching staff that we have recruited."

Leadership model rolled out

In a school which has attracted complementary talents across the teaching and support staff, it would be invidious to attribute the dramatically improved ratings to a single person or set of circumstances. Mrs Massey must nonetheless take credit for instilling a leadership model which has brought out the very best of her team under what can only be described as challenging circumstances.

Significantly, not everything at the new site is fresh out of the manufacturers' box: despite the above-average budget for building Howe Dell at the Runway, ICT equipment (including laptops, wireless networking and interactive whiteboards) which had been purchased out of the normal formula-based allocation of funds and installed at the Old Rectory Drive site was transferred across when the site was closed.

Data generated from the building management system in the new building complex will provide source material for a broad spectrum of curriculum applications including maths, English, science and geography, that will use the ICT system to process the material further, and display it. "The children will discover some really challenging data. They will explore the feedback and understand what it really means to be pursuing sustainability."

While these aspects of the curriculum are evolving, the prominent visual features of the site, such as use of the wind turbine, recycled mobile phones and yoghurt pots for surfaces in the building, all prompt further enquiry.

Ofsted recognition of curriculum

In rating the Howe Dell curriculum at the Runway site as positively as it did, the Ofsted inspection team was recognising that the

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teaching there was set to leverage from the portfolio of resources which had come together in the design and building of the new school.

But Howe Dell is not unique amongst Hertfordshire schools in having adopted sound sustainable principles. The construction of a 30 metre wind turbine in May 2008, for example, follows two similar installations across the County. It will generate most of the school's electricity and have a surplus available for selling on to The National Grid, providing a source of additional revenue to the school.

Another established technology is the bank of solar-thermal (solar) cells on the building: at Howe Dell this is the ‘first call’ in the provision of domestic hot water in the building.

Those technologies form just part, however, of Howe Dell's strategy for pursuing sustainable operation and achieving the minimal carbon footprint possible. That package as a whole is where Howe Dell differentiates itself from other schools in the UK and – in the case of Interseasonal Heating – at a global level.

Distinctive features include the sustainability audit on materials used in the construction of the new building and the furniture it employs. Then there is a Tarmac TermoDeck ventilation system that makes use of the hollow cores in the floor and roof concrete planks to moderate the fresh air drawn into the building through air handling units. It is possible to cool the mass of the building during the Summer to keep the building within acceptable temperature ranges, along with sufficient fresh air flows to create a healthy internal environment.

Where Howe Dell has advanced from the ‘different’ to the ‘extraordinary’ is in its Interseasonal Heat Transfer system; a name that accurately describes its function. Developed by ICAX Ltd, it works by capturing heat energy from the summer sun through a series of collection pipes just beneath the surface of the school playground. It stores the energy in computer-controlled thermal banks in the ground under the school, and releases it to heat the buildings in winter through a series of heat exchangers linked to the underfloor heating and ventilation systems.



The IHT system is also able to capture the frost of cold winter nights, store it, and use it to keep the building cool in the summer. That Howe Dell has the first Interseasonal Heat Transfer system in a building anywhere in the world is probably not in doubt: the fact is confirmed by the manufacturers.

Under the magnifying glass

The Runway site has become something of a goldfish bowl in its short life. It has had a Royal Visit (from the Duke of Gloucester), while teachers, architects, environmentalists and educational analysts have been over the building and the school's strategies with a fine-tooth comb.

That the establishment is the first eco-school in the UK may leave some grounds for contention amongst other schools that have gone at least part of the way down that route. In terms of the total commitment to sustainability, however, it would be reasonable to accept the premise that Howe Dell is probably nearer the goal of a wholly sustainable educational environment than any other school to date.

It explains why Debra Massey speaks so passionately about the project and the excitement it continues to generate. “There is no single Monday morning when I have not looked forward to seeing my staff. ”

That is entirely believable. §

Above: Since opening its doors in September 2007, Howe Dell has played host to a broad array of visitors, including royalty, teachers, architects and environmentalists.