Up, up and away

The government's Building Schools for the Future programme aims to rebuild or renew every secondary school in England within the next 15 years. Carolyn Gilbey visits some of the eco-friendly trailblazers

With its moss covered walls, wildflower roof gardens and solar atrium, it's hard to believe that less than five years ago, the site where the Academy of St Francis of Assisi now stands was a disused council dump in one of the most deprived areas of Liverpool.

When the school's chairman of governors, the Anglican Bishop James Jones, first came up with a brief for the new academy, he topped his wish list with a desire that above all, the school would teach pupils about the environment. His prayers were evidently answered. The academy is not only the first school in the UK to have the environment as its specialism, but the school building is hailed by the government as an example of excellent environmental building and used as a template for other new schools.

Teamwork is the key to building an outstanding sustainable school, claims Richard Woods from Capita Architecture, the design firm behind St Francis. "We only had a small site to work with for the academy and wanted to make as best use of the space as possible, while also minimising our impact on the surrounding area, so we collaborated closely with a team of environmental engineers." The engineers came up with three concepts: building shaded gardens for the younger students; south-facing glazing to harness thermal heat; and planting sedum on the north-facing roofs for thermal mass to enhance cooling and heating. "What we got," says Woods, "is a beautiful building filled with natural light."

Sadly, St Francis is one of only a handful of newly built secondary schools that can truly call itself sustainable. Under its Building Schools for the Future scheme (BSF), the government aims to rebuild or renew every secondary school in England within the next 15 years. All BSF schools must now achieve a "very good" rating, from Breeam, the environmental assessment scheme that gauges the sustainability of buildings. Yet according to Craig White from White Design, whose architectural firm specialises in eco--friendly design, many BSF schools fall short of excellent sustainable practice.

"You can't erect a normal school and simply bolt a wind turbine on at the end. The trick is to build in sustainable thinking from day one so that every part of the school is designed as a learning resource."

The White-designed Kingsmead School, in Cheshire, which opened in 2004, is a case in point. From the outside it looks like an upmarket ski resort, with the school's curved exterior clad in exposed natural timbers. Inside it's a hive of colour and technology. All the school's pipes and cables are colour coded: hot water pipes red, electricity cables green and, in the corridor, clear pipes enable the children to see rainwater, used for flushing toilets, flow into the school's recycling tank. Children are able to monitor the building's complex energy systems using laptops in their classrooms, including the school's "intelligent" windows, which close themselves when it is raining and draw the blinds against the glare of the sun.

White Design's latest project is perhaps the most innovative eco-friendly school to date and, it is hoped, will be Britain's first zero-carbon school. Built almost entirely of wood, the primary school in Dartinginton will be erected like a giant 3D jigsaw puzzle. "Imagine a huge Ikea flat pack," says White. "Because the school will rest on natural rock foundations, it can be quickly erected, with the minimum of building work. In this way we will touch the environment as lightly as possible."

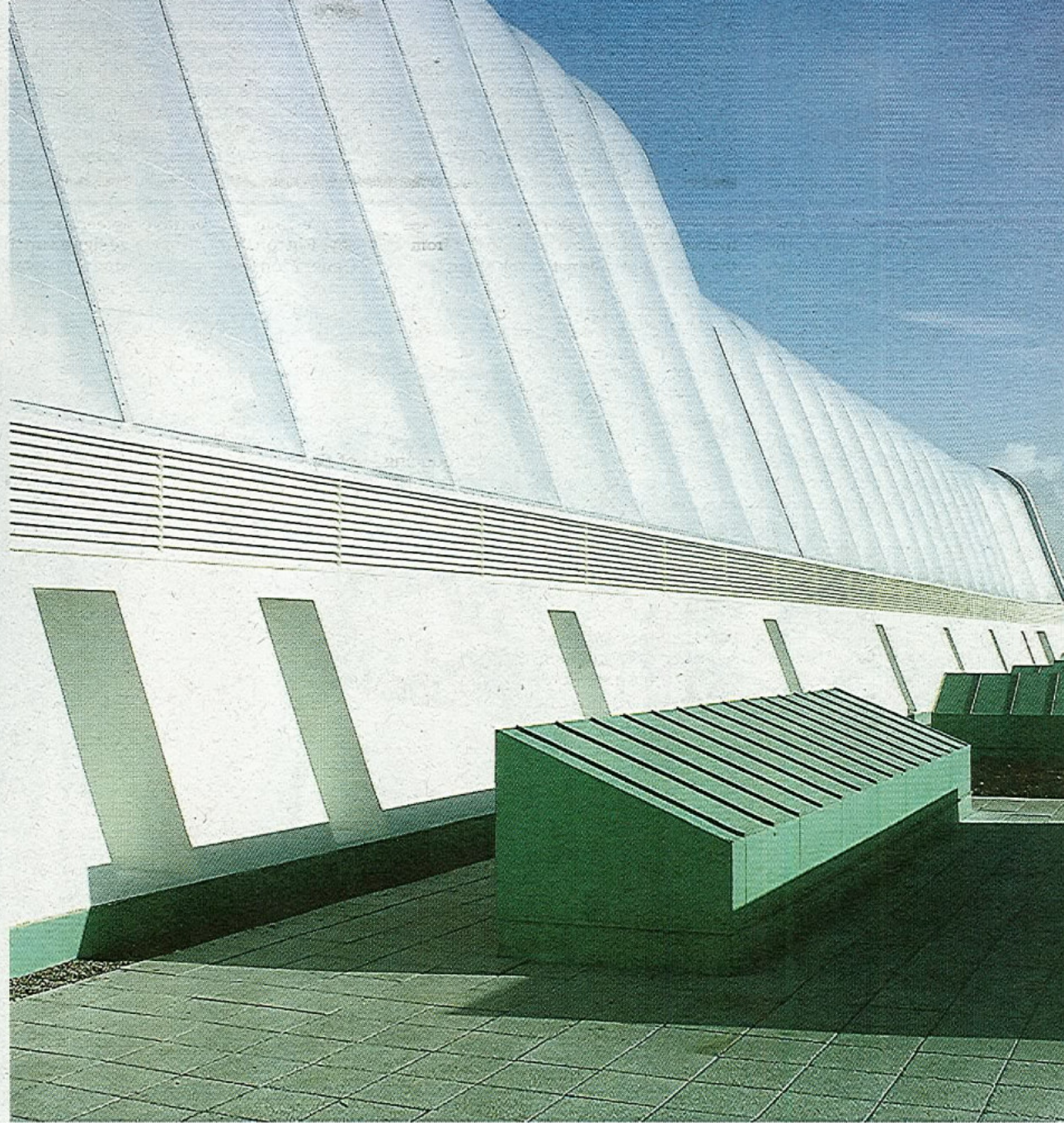
Working in harmony

Sustainable schools are where the hi-tech world and natural world meet and find a way to work together in harmony. No more so than at the multi -million pound Howe Dell School in Hatfield, Hertfordshire. The super-insulated school boasts a low-energy use building and a host of renewable energy technologies.

The *pièce de résistance* though, is the school's heating system, which captures energy from the sun via a network of pipes just beneath the surface of the school's playground. Energy, collected from the hot playground in summer, is stored in a computer-controlled Thermal Bank underneath the school and is released back when needed during winter. The system, called Interseasonal Heat Transfer (IHT), was funded by a £244,000 grant from the Carbon Trust as part of its mission to fund commercially viable new technologies. Howe Dell is the first building in the world to benefit from this innovative system, which saves more than 50% of carbon emissions compared with conventional school boilers.

The system was created by the renewable energy design company ICAX as a way to store solar energy for months at a time. "Because heat moves so slowly underground, there is no need to install special subterranean tanks," says Edward Thompson of ICAX. "All that is needed is mother earth herself acting as a huge storage heater. It's a very natural and straight forward system — just applied commonsense at work with the environment."

There is no doubt that a holistic school environment has a powerful impact on the lives of its pupils and staff. The predecessor to the Academy of St Francis of Assisi in Liverpool was in special measures, deemed to be one of the worst schools in the country. Now it has achieved the number one spot in the national value-added league table and, last year, parents were queuing to get their kids a place at the school. For the school's architect, Richard Woods, building a school for the future was more about building a future for the children it serves. "To see the transformation in these pupils has been amazing," he says.



Howe Dell School in Hatfield. Hertfordshire (below) and Liverpool's Academy of St Francis of Assisi (right) Peter Durant