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, willow roof gardens and solar array, 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 built 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 (BSF) programme, 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 the environmental engineers at Capita have 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.

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 zero-carbon school. Built almost entirely of wood, the primary school in Dartington 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."

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