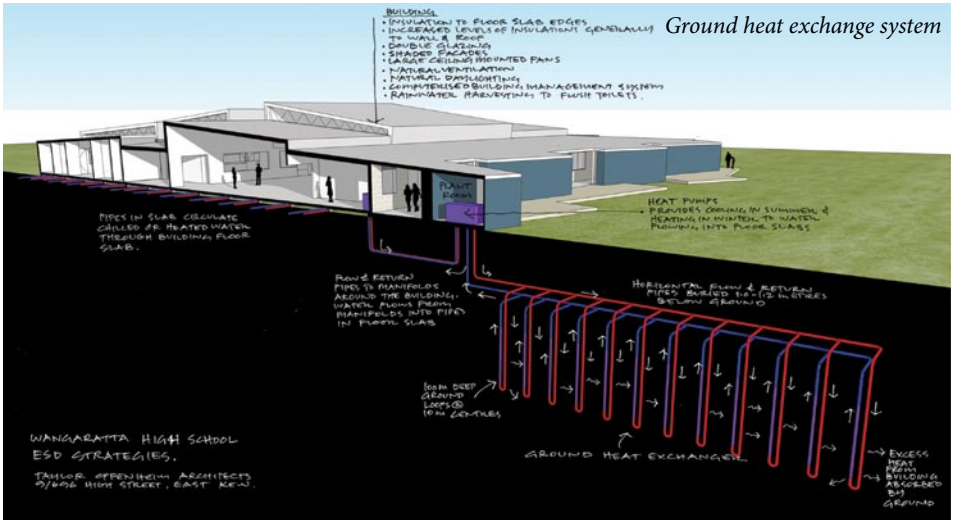
Wangaratta High is Australia's greenest school

When architects Taylor Oppenheim first met with Wangaratta High School and representatives of the Victorian Department of Education and Early Childhood Development to discuss redevelopment of the school, the initial brief was based on the concept of gutting the existing structure as the basis of the new school masterplan. But as the brief firmed, it became clear that a better approach would be to start afresh and develop the campus as a new school, with the new Senior School as Stage 1 of the three-stage project worth $25 million.

The school wanted state of the art facilities for teaching and learning that would be a model for educational excellence – a design that would create a performance and development culture that would encourage the adoption of new teaching and learning practices throughout the school community.

A key requirement was an energy efficient campus that would incorporate environmentally sustainable facilities to minimise its environmental impact over the life of the buildings. This involved the architects addressing issues of insulation, daylighting, glazing, thermal mass, natural ventilation and heating and cooling.



Ground heat exchange system

A $500,000 grant from the Department of Innovation, Industry and Regional Development made possible the inclusion of the project's innovative ground heat exchange system as the heart of the school's heating and cooling strategy.

The ground heat exchanger comprises a grid of 42 ground loops that extend 100 m into the ground, circulating water via heat pumps through hydronic pipes in the building's floor slab. It uses the renewable energy source that lies below the earth's surface to provide a very high operating efficiency and reduce overall

Principal Heather Sarau with Emma MacPhee head girl prefect and Joe Grech head boy prefect

electricity use. This elegantly simple system maintains a very steady temperature in the range of 20–26°C through extremes of summer heat and winter cold, requiring little in the way of supplemental heating and cooling. When Stages 2 and 3 are constructed, these buildings will be connected to the system.

The 2,500 m^2 Senior School building, which is fitted with metal halide lighting in the main learning common spaces, low energy lights in the enclosed smaller study/tutorial spaces, high efficiency fans and an air delivery system controlled by an automated building management system, has already shown impressive energy savings. Electricity consumption is around 25% of the amount a conventional structure of the same size would require. During last February's 14 days of extremely hot weather, the temperature never exceeded 25°C.

The campus site is roughly a trapezoid, with one side facing northeast to prominent Edwards Street, Phillipson Street on the western side, and One Mile Creek to the south. School buses deliver and pick up students at the Phillipson Street entrance. The Senior School faces onto Edwards Street, creating a visually strong presence for the school, in keeping with its place in the rural city's community.

The ground heat exchange loop field is set in a coppice of newly planted Ironbarks to the east of the Senior School. The trees will grow to around 20 m to provide an inviting green space. The campus slopes north and south from a slight rise and drains rainwater to the Ironbarks and later on to the new oval on the south end of the campus, when it is constructed.

The Senior School is a single level brick structure. External cladding is recycled brick interspersed with Colorbond panels that back the student locker areas. Harvested rainwater is used for toilet flushing.

The striking form of the building, with its overlapping roof 'shells' allows for very good penetration of natural daylighting into the building. It sits comfortably into the site waiting only for the new plantings to mature to become completely at home. The interior layout is diametrically opposite to the traditional school concept of school hall, classrooms, and separate teachers and administration.

The staff rooms and meeting area are in the centre of the building and have half height glass walls so that students in the surrounding large learning commons can see their teachers and teachers can see their students.

The learning commons can be divided into smaller areas by sliding panels, or opened up to accommodate groups of up to 800 people seated. Study/tutorial rooms are located around the commons and can be opened up to the commons or locked off as needed.

Heather Sarau took over as principal at the start of this year, following a 12-month stint with the Hume Regional Office. She says that the change from living and working in Melbourne, where she had been assistant principal of Mentone Girls Secondary College, to Wangaratta has proved to be right for her career and family life.

"I love living in northeast Victoria and I love working in Wangaratta, a strong community school," she told *Education Today*.

For Mrs Sarau, it's an exciting time to be principal, with the new Senior School to settle in, and the design and development of Stages 2 and 3 to look forward to.

Years 11 and 12 moved into the Senor School building at the start of this year. The building caters for a student population of around 320 at any given time. Like all radical changes, there was apprehension among both staff and students, but this dissipated as adults and adolescents discovered how well the building works as a place to teach and learn.

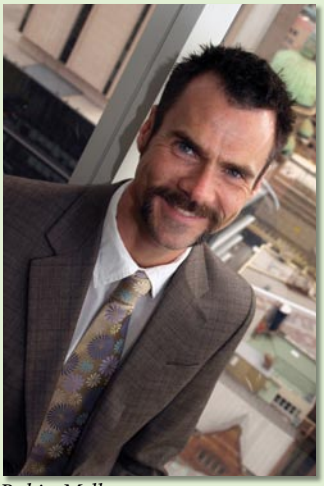
As an example, Mrs Sarau says that the Year 12s were concerned that they would not have their own common room, "but they now love it and are very possessive. In fact, they like it so much they're reluctant to walk over to the canteen to get their lunches.

"The building and surrounds are spotless and there's no graffiti anywhere. The students tell me that they feel obliged to work harder in such an adult environment.

"The whole purpose of the new Senior School is to be an open, flexible learning space, with access to high level ICT and teachers who are accessible and not invisible.

"The end objective is team teaching, with teachers planning lessons together and sharing their expertise. Already, I can see teachers out in the commons working with their students. I think that this is the future of secondary education."

Earning four Green Stars



Robin Mellon

Like Kermit said: "It's not easy being green" – but it's certainly becoming easier. To earn the first Four Star Green Star rating for an Australian school building took a great deal of thought and effort on the part of the school's architects Taylor Oppenheim and their specialist consultants.

Robin Mellon, Green Star Executive Director at the Green Building Council of Australia (GBCA) said that for a relatively small building, Wangaratta High's Senior School Green Star rating is "an outstanding achievement".

After weighting, the Senior School building achieved 54 out of a possible 100 points. The benchmark for the Four Star Green Star 'Best practice' rating is 45 points, meaning that this project is a shining example of best practice.

"It's an example of what can be achieved simply and proves that green buildings are not necessarily more expensive," Mellon said.

"I would be immensely pleased to have my child attend a Four Star Green Star school."

How the Green Star rating system works

Green Star rating tool categories

A Green Star rating is calculated under nine categories, with credits allocated for each of: Management, Energy, Water, Land use and ecology, Innovation, IEQ, Transport, Materials and Emmissions.

The Green Star rating tool categories and explanations are online at:

www.gbca.org.au/green-star/what-is-green-star/green-star-rating-tool-categories/2141.htm

Green Star rating calculation

Green Star rating tools award points for achievement of specific credits in each rating category, as defined in the applicable Green Star Technical Manual.

The single (overall) score of a project is determined by:

1 Calculating each category score

2 Applying an environmental weighting to each category

3 Adding all weighted category scores together

4 Adding any innovation points that may have been achieved

The Green Star rating calculation and explanations are online at:

www.gbca.org.au/green-star/what-is-green-star/green-star-rating-calculation/1542.htm

Green Star – Education v1

The Green Star – Education v1 rating tool assesses the environmental attributes of new and refurbished education facilities in Australia. It can be applied from the design phase of a project and up to two years from practical completion. The release of the tool represents a milestone in the assessment of environmental attributes of education facilities, and is expected to guide the industry towards more sustainable design practices.

The Green Start – Education v1 tool and explanations are online at:

http://www.gbca.org.au/green-star/what-is-green-star/green-star-rating-calculation/1542.htm

Correction In *Education Today* Term 3 2009 Vol 9 (3) pg 29, the Wangaratta High School's Senior School was stated to be Five Star Green Star, this is incorrect. The error was made during the editing process.

Big, slow fans keep crowds cool

The challenge of keeping people cool when it's hot in big spaces like halls and gyms has traditionally been handled with high energy cost air conditioning or just put into the too hard basket.

An alternative gaining support in Australia and overseas is to bring a summer breeze indoors using large diameter low speed fans. MacroAir fans produce low disruption, quiet air movement in volumes of up to 108,000 Litres per second.

What makes them so green? It's all a matter of size and blade design – working on the simple principle that big, high efficiency fans use fewer watts per litre of air moved than small fans. Even without any change in temperature, air moving at a breeze speed of just 3–4 km/h has a cooling effect of 4–6°C making this technology an attractive way of bridging the gap between energy intensive air conditioning or no cooling at all.

In big spaces where lots of people need to be kept comfortable, no alternative can match these big fans for lowest installed cost or energy efficiency. Detailed information including free site assessments and quotations are available throughout Australia and New Zealand from Fans Direct.

www.fansdirect.com.au or 1300 733 833