

# Environmental sustainability

## Creating age-friendly places

Inspired by his overseas study tour, **Guy Luscombe** reports on some environmentally-friendly measures being implemented in European aged care buildings, and considers what Australia can learn from them.

Recently I had the privilege of winning a scholarship to study innovative buildings for the aged in Europe, which resulted in a report, *the NANA project*.

One of the perhaps unsurprising findings was the importance of large windows. They made the buildings more open, and signalled to the outside world that the people inside were not hiding. It was not so much the actual windows that were appreciated, but rather what they were doing, what they represented and how they made the space inside feel for the residents.

Nearly all the buildings I visited had large, often floor-to-ceiling windows and it was the size and extent of these windows that was surprising, not least because this was cooler, grey-skied Europe, and the fact that windows are typically associated with large energy loads arising from heat loss and gain.

How could this be? Australia is a country where the outdoors dominates – for leisure, activity and in the common psyche, but we tend to have smaller windows in our aged care facilities.

### WIN WIN-DOWS

One reason is that all the windows in the buildings I visited were at least double glazed and double glazing, on the whole, has far better thermal performance than single glazing, enabling the use of large windows. It's an over simplification, but Australia's combination of a relatively benign climate and market isolation means that double glazing is more expensive and, if not deemed necessary, usually avoided. While there are different types of single glazing available with different properties where a fit can usually be found to suit most of our climate zones, these options are sometimes inappropriate in a residential setting. High performance insulating glass is often coloured green, grey or black, thereby limiting the outlook and connection to the outdoors and making the buildings less homelike. Double glazing maintains that invisibility.

And there's the rub: how can ecologically sustainable design (ESD) initiatives be implemented without impacting the lives of older people? Indeed, what initiatives can actually improve their lives while also improving the planet and improving the bottom line? What are some of the other initiatives?

### COMFORT UNDERFOOT

Although not as widespread, hydronic (piped liquid) underfloor heating was one that showed promise in an aged care setting, especially combined with a solar hot water system (in Europe, gas-heated water systems are the norm).



Most facilities visited in Europe, such as this facility in Zurich, had large windows.



This building in Zurich was one of many in Europe using under-floor heating.



Facilities in Europe are ahead in usage of solar power.

Again, this ticks boxes across a number of areas for older people and their care. It is more consistent, more efficient, more sustainable and safer than other forms of heating. It is also invisible. The floor essentially acts like a large, low-heat radiator and because the heat is spread out across an entire floor, it is safer than smaller wall-mounted radiators that have to heat up to a much higher, thus more dangerous, temperature to have the same heating effect.

Most floors in buildings for the aged are also concrete, and concrete has high thermal mass so soaks up a lot of heat; standard radiators usually provide this heat to the floor. If the floor is heated already, it doesn't need to be heated up by other means. If it uses solar hot water, the heating is effectively free.

But mostly it is about comfort. Underfloor heating provides a consistent, low-heat over a wide area and takes the edge off a cold room, so much so that even if the room is only a few degrees warmer than outside it is already more comfortable. The obvious downside of taking a bit longer to get to operating temperature and longer to cool down is actually an advantage in environments for the aged, with slower changes in temperature and a 24/7 operation meaning there is less requirement for instant heat.

In-floor hydronic heating is a little more expensive to install so, again, Australia's generally benign climate means there is not a year-round requirement, except perhaps in the very few colder climate zones, and thus not as imperative. However, combining it with a chilled water system for the summer months could make it more flexible.

### INVESTING IN SOLAR

No discussion about ESD in Europe would be complete without mentioning solar. It is almost incredulous that countries with a lower percentage of sun hours adopt solar power stations more readily than in Australia. Economics aside (and they do stack up) one of the main blocks for use is size. Smaller banks are less viable than larger ones, but where there is space for large banks of collectors there is more benefit to be gained.



The Disabilities Organisations House: communal atrium full of natural light from the triple-glazed roof.

A facility in Switzerland – where they "always have grey skies," as one resident told me – couldn't afford to put in solar initially but when sufficient funds were accrued, their first spend was on a bank of solar panels that is enough to power all of the common spaces, thereby reducing the levies. Another place in grey-skied Switzerland fed the generated power back to the grid and bought it back at a reduced rate. The ongoing development of high performance batteries will mean facilities could be off grid altogether and even sell back to the supplier.

### OPTIMISING CLIMATE

So what are we doing in Australia? Technology has huge potential for improving the relationship aged care has with energy consumption. The use of building management systems (BMS) is still in its relative infancy here but has huge potential.

Australia can reduce its dependency on artificially tempering internal environments by determining comfort levels outside the building and 'opening up' or 'closing down' the building with automatic windows and vents. This has the added benefit of purging stale air, removing smells and providing a more natural environment.

In Europe, many of the facilities did not have air conditioning but some were provided with a mechanical (fan driven) natural ventilation system, which was operated by sensors and driven by the solar PV plant on the roof. A few more ticks here.



Healthy transport in Amsterdam: residents and staff alike cycle.

### WHAT WATER?

Water is another area we need to be particularly attuned to. Australia is dry and water shortage is not unusual. Recycling water and smart water use are paramount. In the Disability Organisations House in Copenhagen – the self-proclaimed most accessible office building in the world – ESD was one of its core objectives. Along with the above initiatives – including ensuring everyone had direct access to natural light by stipulating the amount of external glass, resulting in its unique starfish plan – the building collected roof water and recycled its grey water. Denmark has a much higher rainfall than Australia and water is not a problem there. We could be recycling more.

### THE GROUND ABOVE

Green roofs also have potential, especially as we move to an increasingly urbanised world. Green roofs are becoming more common on tall buildings as there a number of benefits. From a sustainability point of view, they insulate the roof, meaning less energy use and they cleanse the air of carbon dioxide. From an ageing perspective, they provide a secure outdoor area and place for activities such as gardening and exercise. Biophilic Design – coming from Biophilia, the theory that humans need nature – is becoming more of a feature on denser, urban environments with green walls and sky gardens. The benefits of a more biophilic approach would accrue with older people.

### RE-BICYCLE

Cycling is far more popular and common in most European countries than it is here. Switzerland, the Netherlands and Denmark especially have very strong cycling cultures so it wasn't really a surprise to see cycles and cycle accommodation in many of the buildings visited. These are used by staff and residents alike. Our cycling culture is not as developed, but one can see that changing.

### THE D WORD

As a big, flat land with lots of space, it jars a bit when we think we need to densify in Australia. We are classed, in fact, as a highly urbanised society with some 80 per cent of our population living in urban centres, although this includes suburbs that are not usually classed as dense.

There are many benefits to living more closely with each other, as studies show people living in denser environments have less of a carbon footprint. The benefits to older people are self-evident; proximity of facilities, services and transport; security; access; ease of care and maintenance; reduction of loneliness and isolation as well as the energy savings, cost of service supply and power generation. We just have to do density better.

### A CALL TO ACTION

It is easy to think that including sustainability is an extra burden to a project, another "non-essential" that has to be done, whereas many of the environmental and sustainable initiatives suggested here have crossover benefits for older people – and for the bottom line. A better approach would be to think about sustainability from the outset, what outcomes are wanted, and how best to achieve those in a sustainable way.

Australia is an advanced country and has many advantages over Europe, one of which is our ability to adopt new ways of doing things. We could become leaders in environmentally and age-friendly places.

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