



Introducing environment

The green pioneers

Trudi Macagnino

Sustainability works. It can be done. It's not just a dream. We're here; we're doing it.

Carolanne Lyme

It's a surprise, literally tucked away in the village of Hockerton - a row of 5 houses that could be a model for a more communal sustainable lifestyle.

Nick Martin

The aim was to produce a small settlement of houses that would have minimal impact, both visually and environmentally, on the surrounding area.

Carolanne Lyme

The project is the brainchild of Nick Martin, the builder for Brenda & Robert Vales' Autonomous House in nearby Southwell.

Nick Martin

As soon as I saw the plans for their house in Southwell I knew that they were gonna be the people who were gonna design these houses. Really, it was the big leap between having some heating and having no heating and I think, probably at the time, the Vales were probably the only people to really seriously make that leap.

Carolanne Lyme

So how do you keep a house warm with no artificial heating? The Hockerton project offers some imaginative and surprisingly low-tech solutions. Take the earth-sheltered design of the houses which offers insulation with a difference.

Nick Martin

The main purpose of the earth on the back is to provide a moderating influence to the inside temperature. Now the earth temperature itself will vary at the upper part between five and fifteen degrees, summer and winter, and in the lower parts towards the bottom of the building will be a constant ten degrees. That means that the external fabric of the building has actually got this very stable environment of only ten degrees difference throughout the year and will never see freezing. This represents the roof that's immediately above the living area, that's a concrete block. Over this there will be a skim of reinforced concrete just to hold the whole thing together. Now once that's down we place on top of that our insulation, which is here polystyrene. And then once the insulation's down we put our waterproof membrane over the top of that.

So the waterproof membrane prevents water going down through to the houses, the insulation's preventing heat loss from the houses to the surface, and on top of this membrane we actually have the earth covering - here - which in reality is about 500 mm deep and this moderates the temperature of the whole house because the temperature of the earth remains reasonably constant throughout the year.

Carolanne Lyme

The south-facing conservatory provides passive solar gain. Together with the porch it also acts as a buffer zone preventing warm air inside the houses from escaping. Since the houses don't use complex technology, they're relatively easy to manage.

Nick White

There's actually very little technology in the house. There's two bits of equipment. There's a heat recovery unit/ventilation unit and what that does, it provides whole-house ventilation but it recovers most of the heat before it exits and pre-warms the incoming air. And the other is a heat pump which we use to transfer the heat from the conservatory to heat our hot water. The hot air that collects in the apex of the conservatory we use to augment the functioning of the heat pump so it works most efficiently at any one time.

Carolanne Lyme

The energy to heat the houses comes from the sun, human body heat and any incidental gains from electrical appliances. The concrete construction allows the houses to act like giant storage heaters – storing and releasing heat as required.

Nick White

On a day like this we've got temperatures of just above zero outside but it's a sunny day and it's heated up the conservatory to over 25 degrees. What we'll do is we'll open up the doors and windows from the main part of the house out into the conservatory, bring that heat in and that's collected by the thermal mass of the house and that will be re-used over the next few days. On a cloudy day we would keep the doors and windows closed and our incidental gains from our own body heat and the appliances are almost enough to offset any losses.

Carolanne Lyme

Super-insulation any heat loss from the houses.

Carolanne Lyme

The choice of materials has also been made with an eye for the environment.

Carolanne Lyme

To make best use of their orientation, the houses are designed so that rooms needing light are towards the front, near the conservatory, while study areas and bathrooms are towards the back.

Trudi Macagnino

The layout is very modular and so you end up with a very long corridor running down the centre of the house, and if I was to design it from scratch I think I'd look for a way of having a more central space with rooms coming off around it. But I think that's a really quite a minor point. What's nice about the house is that it's very spacious it's very light. It's very warm when you want it to be warm and cool when you want it to be cool. There's lots of space for the children and it functions really well. It does what it's supposed to do. It really does fit our needs.

Nick White

The tiles actually add to the thermal mass of the construction which is the important way in which the house keeps itself warm. We don't need carpets - indeed they would actually reduce the effectiveness and the way in which the house operates.

Trudi Macagnino

We do find that sound travels through the house quite a lot so you can usually hear what's going on in other rooms which sometimes is quite useful (laughs) when you've got children and sometimes it's not. It could well be because of the hard surfaces. We don't have carpets on the floor, the ceilings are high and they're made of concrete, so it might well be that.

Carolanne Lyme

With no heating bills, the main energy consumption comes from electrical water heating and use of appliances.

Nick White

We're using at the moment between eight and ten kilowatt hours per day. And if we compare that to what we used to use in terms of all our energy costs including gas as well, then it's somewhere close to ten to fifteen per cent of our original energy consumption.

Carolanne Lyme

Electricity for Hockerton is currently supplied from the National Grid. But in 1999 the project was at last given permission to install a wind turbine.

Simon Tilley

What we want to do is supply all our electrical energy needs from renewable sources and really that's important to us to complete the circle of sustainability. And that will supply us enough energy over the year for all the houses.

Carolanne Lyme

That final piece of the jigsaw will make Hockerton largely independent of mains supplies since they already collect and treat their own rainwater. Rain from the roof of the conservatories is stored in tanks, filtered and pumped to the houses for drinking. Rainwater run-off from the road and surrounding fields is collected in a small reservoir and used for bathing. Conserving water ensures there's no shortage.

Simon Tilley

We've got some water efficient devices in the houses - the low flush toilets which have a dual flush so you can have one and a half or three litres per flush, and the other one is excluding soap from the washing machines by using these wash balls. So if you don't put soap in you don't have to do so much rinsing to get it out and that can save me forty litres a wash.

Carolanne Lyme

The families manage & treat much of their own waste on site. Organic waste is used for compost. After the solids have settled out in a septic tank, liquid waste from the house is treated in a floating reed bed system.

Simon Tilley

The floating reed bed works by treating the sewage with the bacteria that live on the roots of the reeds. So we're using a naturally occurring ecosystem to treat the sewage. By having several different types of reeds you can manage to treat the whole spectrum of things in the sewage. We're using the lake for not just as part of the sewage system but also because of its position it helps keeps the houses warm, reflecting light into the houses. It's also part of the economic side of the sustainability because we're hoping to use it to farm fish. So it's a kind of a wonderful facility for the houses.

Carolanne Lyme

For sustainable living, transport issues can't be ignored.

Trudi Macagnino

One of the conditions of the leases on the house is that each family can only have one fossil fuel car and even then you question each journey that you make in that fossil fuel car. Does it have to be done at all? Could you do it in another way? Could you cycle in? Could you get public transport? Could you share transport with somebody else?

Carolanne Lyme

Though two-car families are out, multi-cycle families are in. Car-sharing is also an option.

Simon Tilley

We actually share a car with our neighbours and so although that means you have to organise it and say when you want to go and so on, which is the downside and the challenging bit, it also gives you a very positive social side because it means you have to talk together and arrange things and get on. So it has its ups and its downs.

Nick White

Bye Trudi (Bye then). Before I joined the project I spent a lot of time on the north circular and travelling around the UK and travelling abroad, I'm now spend most of my income earning time actually here close to the home, just a couple of hundred yards away at most. I used to spend about three hours in dead time travelling. I can get to work in one minute or ten seconds if I jump on a bike.

Carolanne Lyme

Each household has to commit itself to the project for 16 hours a week. It's needed to manage the site in a sustainable way.

Trudi Macagnino

One of the things we're very conscious about are food miles and what it has taken to bring that food to your table. That's why we grow as much as we possibly can but we're not self sufficient yet and so we do have to buy food from the shop. But when we buy that we're very discerning about where it's come from and, you know, what's gone into actually producing that food. If you've got friends round for dinner, and you go up to the allotment and the only thing you can find to eat is a green cabbage and you know (laughs), you know that's not gonna go very far, there's not a lot you can do with it so you find yourself going into the shop and buying things which are perhaps imported, or certainly out of season, and that feels, you know, slightly wrong.

Carolanne Lyme

There are also the practical challenges of living out a shared vision.

Trudi Macagnino

Making a consensus decision takes a lot longer than going for something which, you know, only involves yourself, and that communication process takes effort.

Nick White

If one particular individual, let's say, isn't quite so disciplined about it. That can create a bit of friction if you're working very hard to sort of meet some fairly strict criteria. There has to be a certain amount of allowance for compromise and understanding.

Trudi Macagnino

I think the thing about Hockerton is that the lifestyle encompasses so many different aspects of sustainability. We have to think about how we manage the twenty six acre site in an environmentally friendly way. We have to think about how we grow enough food for the five families. We also have to think about trying to derive an income from the project which will cover everybody's needs and I think the fact that it's so broad means that there's always a lot to do.

Carolanne Lyme

But for the families at Hockerton the advantages far outweigh the effort required.

Nick White

It's, it's not about huge self sacrifice necessarily it's not about sandals and only allowed to eat beans and so on. What it is about is making definite choices about having a less of a negative footprint on the Earth and it, it's, at times it is harder work to actually find those alternatives but when you find them it's not necessarily a greater hardship...

Child

Please may I have some?

Child

That's my fork! ...

David Pickles

The Hockerton housing project is a physical representation of all aspects of sustainable development. They operate as a social cohesive unit. This is not everyone's cup of tea. But the value of Hockerton is a clear demonstration of what can be achieved if people are of a mind to do it.

Nick White

It's 80% cultural and 20% technical. We don't need huge amounts of innovation and research, they're there. What we need is a change of thinking in terms of politics and culture and, as always, those are the biggest challenges.