



housing

The magazine for housing professionals

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A breath of fresh air

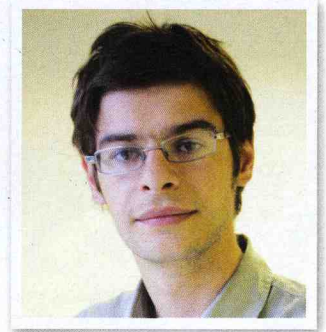
Delivering homes with no central heating p4



WELCOME

Sustainability has long been seen as one of those all-purpose catchphrases being constantly churned out by politicians and businesses in just about every single context imaginable.

And while its principles can be stretched to society, the environment and even the economy, the best definition of the word I came across was posted on an internet message board. It simply read: "Sustainability means that you will have enough of something for the future."



Which is why the word is so powerful in housing right now. The fact that 50 per cent of our gas is imported; that we are looking at going down the nuclear route for electricity generation is only further evidence that we must start being cleverer about the homes we build. If we ignore it, the problem will get worse. High demand and uncertain energy sources equates to what we've seen already – price hikes.

Which is why I take great delight in flagging up our cover feature on Search Architects and its managing director Dr Jerry Harrall – a man who has been designing schemes free of central heating for the last 10 years. Instead, the homes are kept warm and cool by the sun and natural ventilation.

To the man on the street that's a saving of between £1-2,000 a year.

While there are some very big challenges for housing associations moving forward – the impact of direct housing benefit payments to tenants being a key concern – investing time and resources designing out energy bills, would increase the likelihood of tenants paying their rent, and, on time.

The other concern is letting out homes at near market rents. What if all new homes let at the new Affordable Rents were designed in such a way that there was no reliance on a central heating system – where bills were reduced or even negligible. Wouldn't that then justify paying a higher rent?

In our feature on page 4 Dr Harrall offers up a challenge to housing associations to become the first in delivering homes at volume that are free of heating bills for their tenants.

Elsewhere, our sustainability supplement offers social landlords the opportunity to share new ideas and best practice as well as showcasing the latest products and services available to help them operate more efficiently.

Best wishes,

A handwritten signature in black ink that reads "Ross".

Ross Macmillan
DEPUTY EDITOR, 24HOUSING

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The Unity Gardens development in Lincolnshire

A breath of fresh air

An architect is offering up a challenge to housing associations to become the first in delivering homes requiring no central heating. Having spent a decade proving it can be done, he's just waiting for an offer, writes Ross Macmillan.

When temperatures plummeted to -18c degrees in the UK last winter, parts of the UK were colder than European ski resorts.

There are 4.5 million people in fuel poverty just flashing their oil or gas heating on for an hour or two a day in the fear that anymore will bust their budget.

While energy suppliers impose a second wave of price hikes in less than a year, tales of the elderly struggling in their homes, people installing unchecked gas fires and putting heat before food, has supposedly put the issue near the top of the Government's agenda.

And when you consider average dual fuel bills are anywhere between £1,000 to £2,000 a year, wouldn't you snap off the hand – the whole arm, in fact – of somebody who said they could build you a warm and comfortable home that required no central heating, generated no energy bills and actually made you money.

It might sound a utopia, but it's a reality, says Search Architects founder Dr Jerry Harrall – a man who has been building these 'dream' homes – for the last 10 years.

Now, Harrall is looking to housing associations to lead the industry in providing homes at volume that are free of heating bills for their tenants.

Homes with no central heating

I travelled the width of the country to see for myself arriving at his spherical offices in Long Sutton, Lincolnshire, with more than a hint of self-interest.

I have dreamt of building a home with no central heating for years so I can finally wave goodbye to profiteering energy suppliers making people choose between debt and keeping warm at night.

When we meet, Harrall – a tall, slim and confident-looking figure – embodies the freshness he's trying to bring to the industry. He's dressed in a pink shirt, cream jeans and pointy buckled shoes. He would, however, balk at any suggestions that he, or his designs, are "eccentric" or "radical".

Indeed the methods underpinning his work – which sees the walls and floors of the homes absorb and release heat and achieve ventilation through fresh air – can be found in medieval and Roman architecture.

On the other hand – clothed in a grey suit, white shirt and co-ordinated tie – embody everything he is fighting against to get his projects off the ground: the comfort of convention, social acceptance and lack of imagination. I've since binned the suit and replaced it with a wardrobe of Hawaiian shirts I wear to the office.

“ THE PRINCIPLE REASON WHY THESE METHODS HAVEN'T BEEN ADOPTED BY THE INDUSTRY AT LARGE IS BECAUSE THE SOLUTIONS RUN CONTRARY TO THE PREVAILING WISDOM OF THE CONSTRUCTION INDUSTRY. ”
Dr Jerry Harrall

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Unity Gardens

The six bungalows at Unity Gardens for Lincolnshire Rural Housing Association have been occupied for more than two years.

When we arrive on what must be the hottest day of the year, the grounds of Unity Gardens could be mistaken for a holiday park in the South of France.

Clive (pictured) – one of the tenants – greets us in shorts and a T-shirt and is stood outside the house in the only shaded part of the property.

It's hot inside, but the windows are shut on either side – stopping the cool air forcing the warm air up and out.

When the windows on both sides of the house are open, there is a gush of air, and the temperature inside cools instantly.

In their previous home, the pair were paying some £140 a month in electricity bills. They now no longer have bills.

"It's one less thing to worry about," says Clive pragmatically. "There's plenty of other things to worry about in life, but fortunately, we no longer have to worry about that."

For back-up there is underfloor heating, but there are subtle touches to achieving optimum performance – like for example – leaving it on all year round, and using the thermostat to turn it on and off.

Outside Dr Harrall tells me he's happy that the windows were shut when I entered and the house was warmer than it should have been. "We can design and build the most energy efficient, simple-to-run buildings, but it doesn't guarantee an exceptional performance out of the household," he says. "It's going to take a little while to train and develop the skills of those households to manage those resources to deliver that high performance they're capable of."

passive ventilation – breezes through windows – and glazing modified to capture sunlight and encourage solar gain – are also items in Dr Harrall's 'Greening The Box' armoury.

The results are impressive – tenants at the Unity Gardens development near his office don't have heating bills, which has allowed them to gain a financial footing from the savings.

In the Flagship scheme at Norwich residents are using just 21 litres of water per person per day. To put that into perspective, level six of the Code for Sustainable Homes allows up to 80 litres.

So why, despite the success, is he not already designing schemes for larger housing associations?

He takes a deep breath. "The principle reason why these methods haven't been adopted by the industry at large is because the solutions run contrary to the prevailing wisdom of the construction industry," he says.

"We at Search, are designing with the benefit of evidence-based research, experienced firsthand. Our office's SBEM EPC certificate displays an A+ rating. It's naturally heated and naturally ventilated.

"In contrast the standards set by the Building Research Establishment (BRE) on behalf of the Government through the building regulations are being encouraged to pursue short-term construction solutions that rely on mechanical intervention for heating and ventilation e.g. ground-source/air source heat pumps, whole house ventilation, gas condensing boilers. It appears the optimum building performance proffered uses gas condensing boilers. How perverse is that?"

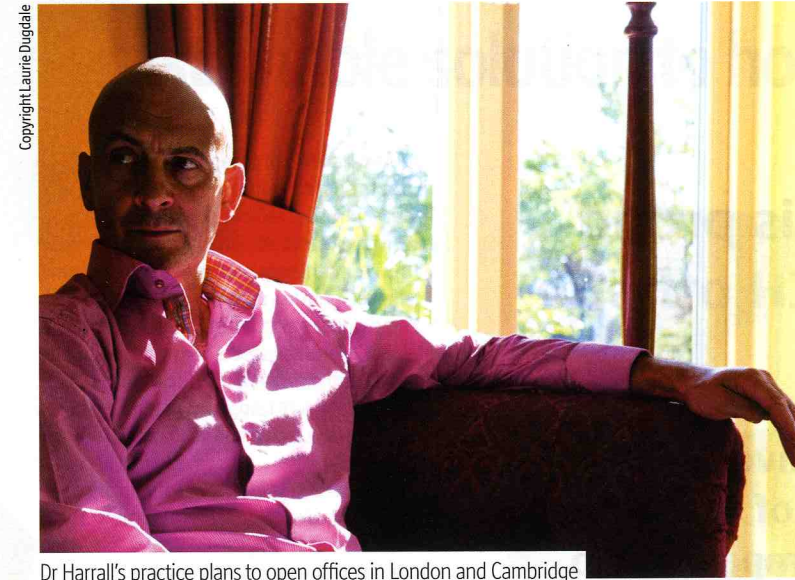
In construction, cost and trust are often cited as reasons for housing associations sticking to what they know.

"The plain fact is Unity Gardens did cost more than conventional buildings but the performance is extraordinary – whether or not in time one can justify that expense, I surely hope so, but having said that, the buildings can be delivered a lot cheaper with higher performance and that we hope to do," Harrall explains.

In the first year of occupancy at Unity Gardens the average energy consumption of each of the households was around 5,000kwh a year. The national average for a two-bed bungalow, according to the Energy Saving Trust, is around 22,000kwh a year. "That's a darn good start," says Harrall.

The lowest energy consumption figures for one of the households at Honingham – which was designed to a lower specification than Unity Gardens – has incrementally dropped each year to a little over 1,200kwh a year.

Each of Harrall's schemes goes beyond just energy-saving principles, and promote and entice sustainable living. His key signatures include allotments and wetland areas and demand a



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Dr Harrall's practice plans to open offices in London and Cambridge

shift in behavioural patterns away from flicking the TV on in the morning for background noise.

"Our energy usage results at Honingham and Unity Gardens demonstrate that behavioural patterns – the mindset to resource management – modifies with each year," says Harrall.

"As those residents become empowered with managing their own resources, they are naturally incentivised to modify consumption rates of essential resources such as energy and water while enhancing their lifestyles."

But he admits in the early stages of bringing 'Greening The Box' principles to the masses, he need champions.

At Flagship, the development director in place at that time – a champion of Greening the Box principles – left the association. "He took a leap of faith and was a champion of the scheme," says Harrall. "It's individuals, entrepreneurial individuals, that are few and far between in housing associations. And when you're breaking new ground like we were at Honingham you need forward thinking individuals."

Incidentally, the cost of the Honingham development in Norwich was inline with conventional building.

Harrall is keen to stress, however, that Search is designing and retrofitting more conventional buildings – utilising data derived from the earth-sheltered buildings – as a way of bringing Greening The Box to the mainstream.

But what about concerns that the principles come at a premium cost?

"It isn't more costly and if the perception were that it was to cost more, that would be because somebody is not understanding the principles," says Harrall.

"They wouldn't be understanding that by not installing the central heating boiler and thus relying more on passive solar heat gains, backed up by a very low-grade and very cheap and affordable electric underfloor heating system, instead of the installation of a £2,000-£3,000 central heating system it could only cost £400-£600."

Green Deal retrofits

The Greening The Box tool kit is so varied, Harrall insists, that it can be tailored to a budget and in advance of committing to a scheme, you can "very easily work out the return on investment over a number of years".

A project to adapt a three-bed hard to heat/hard to treat home for Wherry Housing Association in Norfolk actually saw energy usage fall by over 50% each year utilising Greening-The-Box principles.

By using super-insulation and 'passive solar' heating, the 16-

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Dr Jerry Harrall

week project resulted in a home with better energy performance than a typical new dwelling built to the minimum current Building Regulations standards.

And all this without using methods currently being financially incentivised by the Government.

"Mechanical ventilation equipment, whole house ventilation equipment, gas condensing boilers, ground-source heat pumps, air-source heat pumps require annual servicing and maintenance and eventual replacement," says Harrall. "This equipment provides an ongoing expense and liability for the householders and landlords.

"One has to wonder, regarding the agenda behind the building specifications currently being promoted to the industry."

So what next?

So what next for Dr Jerry Harrall – a self-confessed "carrot cruncher" – a man at home with his black sketchbook of ideas; not locked in meetings and steering groups. Is he ready to break into the mainstream?

His forward order book gives some clue – as do his expansion plans.

He is onsite next year to refurbish 17 units for the Papworth Trust and Cambridge City Council.

Search also plans to open offices in both London and Cambridge in a bid to promote 'Greening The Box' to a wider audience.

"He's not a showman," says Richard Collins – a client and friend, who has seen his home transformed through Harrall's work. "It's possibly a good thing he's stayed quiet for 10 years because now he's got the evidence." ■

What's in the box?

Key 'Greening The Box' principles

No central heating

Solar gains and human occupancy provide most of the heating, with back-up when necessary.

Thermal mass

Concrete and masonry for floors and walls – which optimise thermal mass. Meaning it stores and release heat naturally.

Cross and stack ventilation

The premise that warmer, stale air rises and can be replaced by fresh air from 'trickle vents - small openings in windows or other building envelope components. Removes the need for any mechanical ventilation, cutting the building's energy demands even more.

Solar panels

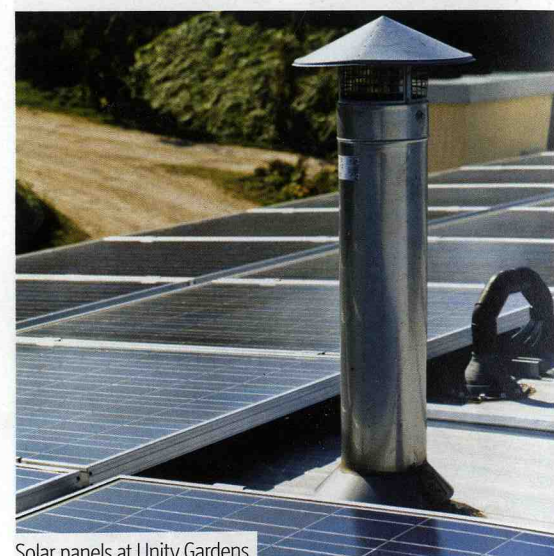
Solar PV (heating) and solar thermal (hot water). The reality is that solar panels generate an awful lot of electricity in the winter months and – while not as much as in the summer – the sunshine hours within the winter are sufficient at times to produce quite significant quantities of electricity. The panels at Unity Gardens have been seen operating at nearly full capacity in February and March.

Glazing

Modified to capture sunlight and encourage solar gain – bigger windows to the south, smaller to the north.

Super-insulation

Wrapping the building envelope – far exceeding Building Regulations' minimum standards.



Solar panels at Unity Gardens

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“I HAVE DREAMT OF BUILDING A HOME WITH NO CENTRAL HEATING FOR YEARS SO I CAN FINALLY WAVE GOODBYE TO PROFITEERING ENERGY SUPPLIERS MAKING PEOPLE CHOOSE BETWEEN DEBT AND KEEPING WARM AT NIGHT.”

cont» To date, Search has completed only a handful of schemes for housing associations.

One near his office of six bungalows for Lincolnshire Rural Housing Association – completed more than two years ago and another similar scheme in Norwich for Flagship Housing Association, which delivered four "earth-sheltered" bungalows (those integrated into the landscape), completed more than seven years ago.

Each of the schemes, which have no mechanical central heating, use Harrall's 'Greening the Box' principles – a blueprint he says that is just as replicable for new build as it is adaptable for existing homes.

At their core, the schemes combine heavy mass floors and walls (concrete and masonry) to provide a 'heat sink' – that is – it stores and releases heat naturally; super insulation that wraps the envelope of the buildings and solar panels to generate electricity, which can, via the Government's Feed in Tariff, generate an income.

Orientating the buildings around the path of the sun, built in