



Passive voice heard round the world



In an exclusive interview at

Ecobuild, ROGER HUNT talked to Dr Wolfgang Feist.

Mr Passivhaus is not a moniker that Dr Wolfgang Feist likes. He is far too modest and unassuming to take credit for a standard that has become synonymous with sustainable living. With a twinkle in his eyes and the relaxed authority of someone who is comfortable in his chosen field, he repeatedly gives credit to all those who inspired and pioneered Passivhaus.

It is, though, Feist who has stuck with the concept and has worked long and hard to ensure that the Passivhaus standard is reached and adopted by the world of housebuilding. And I mean the world. There are now a host of organizations supporting and promoting the standard not only in his native Germany, but in China, Japan and the USA; the UK Passivhaus Trust was established last year.

Passivhaus buildings - the standard applies equally to schools and other public buildings and there are some



Wolfgang Feist presenting Lewis Lowe from Octavia Housing with the first certificate for a Passivhaus retrofit in the UK.



Dr Wolfgang Feist

20,000 across the globe - provide a high level of occupant comfort and, importantly, use very little energy for heating and cooling.

As a physicist in the late 1970s, Feist was working on the issue of energy. "Physics is the science of energy so we already knew that there would be a problem in the next decade about CO₂ levels, about climate change, and that there were not infinite sources of fossil fuels, so we were thinking what are the alternatives."

Rather than considering how to produce more energy, Feist and his fellow researchers looked at where the energy was being used and realised that a huge proportion was in heating homes. "It was just nonsense, because to keep buildings

at a comfortable temperature from a physical point of view you don't need any energy, you just need to insulate them well."

The eco building frontrunner during that time was Sweden, so Feist and his colleagues went there on a study trip and experienced a "cultural gap" because, in Sweden, they were already doing things like using 20cm of insulation. "At first I thought it was just in some experimental buildings but they'd done it in all their buildings," explained Feist.

Having made contact with the Swedish building research institutions, they learned many of the lessons that are now taken for granted: the importance of air tightness, the avoidance of thermal

bridging and the need for ventilation. Interestingly, Feist confesses that, at that time, he was completely against ventilation.

According to Feist, the term 'passive house' was coined by his colleague Bo Adamson, a professor at Lund University, Sweden. Working together, Adamson and Feist, who by this time was a scientist at the Institute for Housing and Environment in Darmstadt, Germany, went on to develop the passive house concept theoretically in May 1988. For Adamson this was not enough; he insisted that they should build a 'real' passive house.

"I knew it was not a good idea just to build one family home," said Feist. "You can't prove anything with one house because the behaviour of occupants is very different, so we started to build a row of four houses. This way we had a bit of variation with the different occupants' behaviour."

The project was part funded by the German state of Hessen and resulted in the building of the houses in Darmstadt Kranichstein in 1990. Four families moved in the following year and intensive monitoring began to compare the practical results with the theory. "Interestingly, the measurement results were all very, very near to the first simulation results," said Feist.

On a personal level, Feist had more reason than most to be grateful for this. With his wife Witte and their two small children, his was one of the four families to occupy the homes. Asked whether he had to



The original Darmstadt Kranichstein passive house south elevation.



ECOHOUSE

The original Darmstadt Kranichstein passive house north elevation.



The original Darmstadt Kranichstein passive house Interior.



convince his wife, he said matter-of-factly "No she's a mathematician, she knows that fundamental thermodynamics works".

This was only the start. In 1995 Amory Lovins, the American energy efficiency pioneer, visited the house and pushed Feist to consider the project not just as a scientific experiment but a solution. Lovins was convinced that if costs could be brought down the passive concept would be viable.

Again the state of Hessen provided funding, enabling the creation of a 'working group on economical Passive Houses' in 1996. This group developed the Passive House Planning Package design tool and was instrumental in initiating the production of components such as windows and high-efficiency ventilation systems to

Passivhaus standard. In September of the same year Feist founded the Passivhaus Institut, also in Darmstadt, to promote and control the standard.

At this point the European Union stepped in and, in the process, the Passivhaus cause in the UK was set back some five years. The call from Brussels came during Christmas and while the teams from Sweden, France, Switzerland, Germany and Austria were all contactable and readily agreed to be involved, the British contingent was on holiday. Thus, the resulting CEPHEUS project (Cost Efficient Passive Houses as European Standards) went ahead without them and 221 homes were constructed to Passivhaus standard in the member countries by the end of the project in 2001.

Passivhaus took off. In Frankfurt

today all public building, and all others with which the city is involved, have to be built to Passivhaus standard.

Feist predicts that Belgium will be the first country to make the standard mandatory. He also sees increasing innovation in manufacturing and the supply chain, which will make it much easier to build to the standard and reduce the price.

When it comes to UK housing, Feist is surprised by how long people have tolerated the poor indoor comfort of many buildings. "There are lots that are cold, draughty and uncomfortable, but this does have an advantage. It's easier to sell comfort than energy conservation. In Germany most new buildings are already very comfortable so there's not a lot to gain."

Even so, he concedes that all

countries have a long way to go, Germany included. He believes the UK spent a long time talking about retrofit, but, now the process has started, it is moving quite fast. Indeed, Feist has recently presented the team behind Octavia Housing's Victorian Passivhaus with the first certificate for a Passivhaus retrofit in the UK.

The rigorous, and some would say demanding, nature of the standard is often questioned, but Feist is adamant that this is necessary to ensure the balance between a good indoor climate and energy consumption. The wider issue of green wash in the industry does not worry him much either. "It's the first step to a little bit more environmental consciousness; the companies doing green wash are accepting it's an issue."

So 20 years on, Feist still lives in his original Passivhaus, but spends much of his time in Innsbruck where he is professor for building physics at the university. Bo Adamson is now retired so, as the co-ordinator of the Passivhaus concept, Feist is very much its driving force. One might imagine that he feels that he has given up his life to the cause, but he is characteristically pragmatic: "I don't think of it as giving it up. As long as it is helpful to bring the Passivhaus standard forward I'm not hesitating to do it."

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