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Citation for final published version:

Jones, Phillip 2019. An appetite to lead. Touchstone , pp. 4-5.

Publishers page:

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An appetite to lead

Are we sleepwalking into the future? Why have we left things so late? With a climate emergency upon us, **Phil Jones** reflects on the legacy of the Welsh Government's policies on building performance. A massive step change in action on the ground is required. But who will lead it?

The International Panel on Climate Change Committee has told us that time is running out, if we want to avoid catastrophic global warming owing to greenhouse gas emissions. The built environment is a major cause of emissions and way too little has been done to help mitigate this situation. Buildings now also face the problem of having to adapt to climate changes already in the system, owing to the current level of atmospheric greenhouse gas. The construction industry keeps telling us that there is no market for sustainable

buildings and it's not high on the people's agenda. Moreover, a loophole in the planning system allows pre-registration of sites with many new houses not even being built to current energy regulations. The problem is not just about new buildings. Some 300,000 households in Wales live in fuel poverty, many in substandard houses that they cannot afford to heat. Large scale energy retrofit programmes are essential for people's health and well-being as well as reducing their energy bills. According to a recent *Architects' Journal* with the stark words in red 'Wake Up' on a black front cover, the editorial suggested architects are 'sleepwalking' into the future. The RIBA Ethics and Sustainable Development Commission's recent report lacks any real immediacy, with recommendations such as setting up a 'thought leadership' programme and an encouragement for carbon-neutral buildings by 2030; are we going to sleep on it for another ten years? In April this year, the environmental activist group Extinction Rebellion took to the streets across the UK, calling for immediate action to tackle climate change. At the end of April, the Scottish and Welsh governments suddenly declared a climate emergency. At the beginning of May, the UK parliament approved a motion to declare a climate emergency although, a week later, the UK government was considering a 15% increase in VAT on energy saving measures for the home, such as photovoltaic panels. So, why have we left things so late, and what can we do about it?

The problem is not new! For some four decades, since the oil crises of the 1970s, we have been aware

of the impact that the built environment has on energy use. Initially, our concerns were over fossil fuel running out and security of supply. Added to this was the more serious fear that we were irreversibly destroying the environment, at least in human terms. So, who is going to get us out of this mess? Government has been largely ineffective in delivering its climate change policy on the ground. The construction industry is in denial and the public is not engaged. We have policies, committees, reports and conferences galore, but few solutions built and tested. For some reason, dwelling on the problems appears to be of more interest to people than coming up with solutions.

Stirring things up

This is not to say that we have done nothing. The 1970s oil crises triggered changes to the UK energy building regulations (Part L). Our increasing awareness of environmental issues changed our focus from 'low energy' to 'zero carbon'. In 2007, the Welsh Government famously announced that all new buildings would be carbon neutral by 2011. As Richard Parnaby of the Royal Society of Architects in Wales said at the time 'it is an ambitious target, and it may well be unachievable, but I suppose that's what targets should be'. Well, he was correct about the carbon-neutral target being ambitious. We had not even begun to devolve the Building Regulations to Wales at that point and the construction industry was far from ready. On the positive side, it did stir things up.

The Building Regulations were eventually devolved to Wales in January 2012, and Part L

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subsequently went out to consultation. This included a recommendation for a 40% reduction in carbon dioxide emissions for housing and 20% for other building types. This was a significant step down from the original carbon-neutral target but still a major step forward and, at the time, world-leading.

Outrage and disappointment

There was an outcry from various interested parties, led by the volume house builders. In November 2012, the chairman of Wales's largest house builder, Redrow, said that parts of the country would become 'no-go areas' if tougher building regulations were introduced. He added 'if we get squeezed out of Wales, which I believe will happen, then it's a sad day for Wales.' Persimmon's boss in Wales, Glyn Mabey, said that tougher regulations would add £3,000 to the cost of building a house. He talked of a 'snowline', the point at which nothing grows because of perpetual snow and ice, running across south Wales on a level with Pontypridd. They would not build beyond this! Professor John Punter called them out on BBC Radio Wales by stating 'we know perfectly well that the first place the house builders are going to build in Wales will be in the areas of high demand. They won't be in the northern valleys anyway.'

The Welsh version of Part L changes came into force in July 2014 with the Welsh Government announcing a major relaxation. Emission reductions were now to be only 8% for housing instead of the 40% on which the consultation was based. This turned out, unsurprisingly, to be the same as England and, conveniently, what could be achieved without renewables. The reason given was that the industry was still suffering from the 2008 crash. However, for non-domestic buildings a 20% improvement was delivered in Wales, with England opting for only 9%. But, overall it was a big disappointment, since Wales was poised to lead the UK in a transition to zero-carbon buildings. A further setback came in July 2015 when George Osborne axed the UK 2016 zero-carbon homes target, as part of his 'creating a more prosperous nation' policy, implying that zero-carbon performance meant poverty!

Seizing the initiative

Fortunately, some were not waiting for state regulation to act. The Welsh School of Architecture's SOLCER house, which was completed in July 2015, showed those targets could be met affordably and with existing technology. SOLCER attracted considerable interest then, and

still does. It moved the goalpost from 'zero carbon' to 'energy positive', combining innovative design for reducing energy demand and employing renewable energy generation and storage. So, SOLCER generates more energy than it uses over a year. It's all-electric approach and modular construction represented a major rethink in how we address building energy performance. The house received thousands of visitors and the usual comment from the general public is 'why isn't every house energy positive?' (see p.55)

There is now a renewed interest. The Committee on Climate Change's *UK housing fit for future* report (February 2019) calls for improvement in insulation, an increase in timber construction, integrating heating and ventilation design (current Building Regulations separate them), and avoiding overheating. It also radically calls for no gas connection to new houses from 2025 (existing homes have until 2050 to rid themselves of gas-dependent appliances). It draws attention to planning loopholes that allow new buildings to be built that are non-compliant with current building regulations. The UK government's Accelerated Construction Programme and the Home Builders Fund aim to stimulate the growth of modular construction methods, to potentially improve quality and reduce costs although this is not yet proven! (see also p.7 for *Wales's Innovative Housing Programme*).

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The post-Grenfell 2018 Hackitt review identified deficiencies in current Building Regulations, pinpointing weak compliance and the need for quality checks and clarity over roles and responsibilities. The EU's Energy Performance of Building Directive requires member states, by 31 December 2020, to ensure that new buildings are 'nearly zero energy'. This means 'a very high energy performance with the nearly zero or very low amount of energy required covered to a very significant extent by energy from renewable sources including energy from renewable sources produced on-site or nearby'. This will be implemented through Wales's Part L, which is currently under review for the first time since 2014, and due to be out for consultation later this year.

Of course, our move to zero carbon is not just about new buildings. Clearly, the retrofit of our existing buildings will play a crucial role. Achieving this is far more difficult, disruptive and costly. Erratic funding has led to an unstable retrofit industry, expanding and contracting as government-led subsidies come and go. The Green Deal failed in 2015 and has not been replaced. We need to develop whole-house retrofit solutions with viable cost models. The Swansea Bay City Deal housing programme, led by Neath Port Talbot, aims to retrofit some 7,000 houses as well as constructing some 3,000 new houses. This project will potentially pioneer the scaling up of low-carbon whole-house retrofit, and energy-positive new-build solutions.

So much to do and so little time

So, are we any nearer to achieving a zero-carbon built environment? Since the Welsh Government's statement in 2007, the situation has changed: industry is more prepared, there is more innovation in building design and technology, costs and cost benefits are better understood, and politicians, industry and the public are more aware of what is possible. There are still challenges to produce design solutions that combine 'passive' architecture and 'active' technologies. We need buildings that are robust to occupant use and not reliant on 'behaviour change' to achieve our goals. We need to adapt as well as mitigate. In future, our homes may require cooling to reduce overheating, which will also require a combination of passive and active design solutions. Off-site modular construction should lead to an improvement in quality, minimizing any performance gap between design and operation.

What was perhaps considered unachievable in 2007 is now achievable. This time we must grab the opportunity – it may well be our last chance! Every project that is not zero carbon or energy positive is a future liability and another nail in the coffin. We do not have time for more committees, reports and demonstrations, all of which push the problem into the future. No time to point the finger of blame, we are all guilty. Now is the time for us to 'just do it!' Does the architectural profession have the appetite and imagination to lead this revolution?

Professor Phillip Jones is chair of architectural science at the Welsh School of Architecture, Cardiff University. He was head of school between 2002 and 2013, and he currently co-directs the Energy Systems University Research Institute (URI). He chairs the Welsh Building Regulations Advisory Committee and is chairman of the board of directors of Warm Wales, a community interest company set up to help reduce fuel poverty in Wales. He is a partner in Zenergy, a newly established design company specialising in zero-carbon, energy-positive buildings.