



The
University
Of
Sheffield.

E · S · R · C
ECONOMIC
& SOCIAL
RESEARCH
COUNCIL

Towards 'Zero Carbon' Housing Futures?

An examination of British volume housebuilders' preparations for 2016 zero carbon housing policy and recommendations for future policy development

Author: Dr. Sarah Payne
Department of Urban Studies & Planning
University of Sheffield
@paynesarah s.payne@sheffield.ac.uk



Towards 'Zero Carbon' Housing Futures?

An examination of British volume housebuilders' preparations for 2016 zero carbon housing policy and recommendations for future policy development

Summary Findings

- 1) Policy ambiguity impeded volume housebuilders' perceptions of and preparations for the 2016 policy switch.
- 2) Design solutions favour a fabric-first approach with limited use of renewables/fit-and-forget technologies to achieve carbon compliance. Allowable solutions are an important offset mechanism, enabling housebuilders to focus on producing FEES-compliant standardised house types that support volume output across Britain.
- 3) The extra costs of delivering low or zero carbon homes are not captured elsewhere in the development process as added value, particularly by lenders, valuers and consumers.

Summary Recommendations

- 1) Explore valuation mechanisms for defining and capturing the 'value' of the enhanced energy efficiency performance of new build homes.
- 2) Explore lending options for integrating the energy savings of new build properties into mortgage affordability calculations and lending decisions.
- 3) Develop an effective energy rating system that enables easy comparison between new build and existing homes.
- 4) Require estate agents to advertise home energy ratings in a standardised and clear manner allowing potential purchasers to make easy comparisons between all homes.
- 5) Develop, with cross-party political support, a clear policy road map for housing-related energy efficiency that enables housing of all types to viably contribute to reducing Britain's carbon emissions.

Regulatory Uncertainty



"As a developer, trying to prepare for 2016 when you've got the Coalition at one end and the Labour Party at completely the opposite end of the spectrum has now made it almost ... well we thought we had a path to 2016 but the Labour Manifesto has now just made that very difficult to map out"

"When you lift out all the uncertainties, there are still far more uncertainties than there are certainties at the moment...I think the biggest thing for us is without a doubt policy and timeframes, that is the biggest thing, so the industry can actually start to look at gearing-up. Yeah, until that's certain it's hard to see where we're going and what we should be doing"

"...a progressive approach is definitely the best way forward for the industry overall"



Research Problem

Zero carbon housing (ZCH) is emerging as a key policy priority around the globe, with many Governments developing policies to intervene in conventional market-driven housebuilding practices. These policies often require significant changes to traditional building techniques.

Positive examples of ZCH practice are emerging in some European countries (e.g. Germany & Netherlands) but the British housebuilding industry remains significantly behind in implementing ZCH technologies. Standardised design techniques and efficient construction methods remain a favoured strategy of British housebuilders in securing competitive business returns.

Continuing housing market instability and a chronic shortage of new housebuilding adds a distinct texture to this ZCH challenge and serves as an innovative vehicle for examining the conceptual, industry and policy challenges of green growth.

Research examining ZCH has focused primarily on investigating the technical challenges of material alteration and consumer attitudes / behaviour. Despite recent research highlighting the significance of housebuilders' strategically selective behaviours (Payne 2013) and organisational networks (Henneberry & Parris 2013) in influencing policy responsiveness and deliverability, ZCH research continues to neglect the perspective and understanding of Britain's key delivery agents of new homes.

By evaluating the efficacy of existing ZCH policy interventions within the context of housing market instability and sustained undersupply, this research will provide policy makers with a more nuanced understanding of behavioural change in the British housebuilding industry and in particular, the challenges and opportunities of green growth. In doing so, it will suggest more effective policy interventions for stimulating housebuilders' ZCH outputs.

The cost issue



"And I think I'd have to be honest that at the moment we are looking at the bare minimum to comply in terms of what we're looking to deliver. We still see the problem of that being a cost where you're not going to see any benefit coming back the other way in terms of the purchaser's perception"

"And at the moment, I would say as the Group, we aren't looking at anything beyond the regulation... aspirationally we should be but it does come down to the cost issue"

"We've not got customers that want to pay for it. We did some market research and 95% or something of all of our customers said they wouldn't pay anything more than £2,500 for... an eco-bling energy-efficiency [house]"

"...to get to Code 6 it's sort of £50,000 a plot extra build costs. Well there ain't that much profit in a house, so there's just no point, in our view"



Research Methodology

The aim of the research was to critically examine the British housebuilding industry's capacity to act on 2016 ZCH policy within the context of continuing housing market instability and chronic housing undersupply.

The research targeted elite in-depth interviews with Group Directors of the top 15 British volume housebuilders - who together produce approximately 50% of all new homes annually - to examine, in some detail and depth, how ZCH policy is changing their strategic approaches, business behaviours and product outcomes.

Interviews were secured with Group Directors from 8 of the top 15 British volume housebuilders and were conducted between October 2014 and March 2015, at a time when the 2014 Queen's Speech had confirmed legislation to allow for the creation of an Allowable Solutions scheme. The semi-structured interviews focused on examining:

- Perceptions and preparations for 2016 ZCH policy, including the impact of the recession and regulatory uncertainty.
- The extent to which material alteration will be required.
- The impact of ZCH policy on other aspects the development process including land purchase, construction and marketing.
- The efficacy of ZCH policy and carbon regulation.
- The role of consumer behaviour.

The Abolition of Zero Carbon Housing Policy

In July 2015, after the completion of this research, the Government scrapped ZCH policy, signaling the end of a turbulent 10 year policy journey towards the carbon neutrality of new homes. Britain's housebuilders now face a policy vacuum and action needs to be taken to move forward on this agenda if Government is committed in any way to reducing carbon emissions from Britain's housing stock.

Broader Politics



"But ultimately, now this is for me the crux of the matter, you want me, the government, to deliver a CSH6 home and it's going to cost £40,000. It's not me saying it, it's your advisors saying that. If a home costs me £80,000 to build, for every one that I'm going to build you're going to lose a half for your zero carbon policy. You want 250,000 homes a year, we currently can only deliver 120,000, so actually it's not 120,000, I'm going to give you 90,000 homes a year because your zero carbon policy is expensive... And I think it's that type of discussion"

"Reduced demand. That's the game in town...homes don't use any electricity and they don't use gas, people do. So we're hitting the wrong object here with these policies"

"...one big thing that the zero carbon policy really forgets about is that there are customers at the end of this"



Key Finding 1: Perception & Preparation: policy ambiguity and the recessionary experience

Despite the 2014 Queen's Speech signaling some level of clarity and certainty over the Government's 2016 zero carbon housing policy ambitions, housebuilders reported deep frustrations with the policy ambiguity and regulatory uncertainty they had faced in recent years.

Notably, the Coalition Government's unwillingness to commit to a clear policy framework and timetable for achievable implementation had frustrated housebuilders' business planning around engagement in land markets and the development of technical solutions deliverable on a volume scale. This was further compounded by the divergent political positions adopted by the main parties in the run up to the 2015 general election.

The majority of housebuilders were, at the time of interview, focused on designing house types equivalent to Code for Sustainable Homes (CSH) 4 requirements, with a few exploring CSH5 and CSH6 design solutions in anticipation of further policy clarity after the general election.

Housebuilders noted their recessionary experiences (see Payne 2015) had amplified the prevailing cost issues associated with delivering zero carbon housing to 2016 standards and had 'helped the conversation' around the recent scaling back of the Government's 2016 zero carbon policy ambitions.

Additionally, the ongoing crisis in Britain's housing supply added a further, more political texture to this conversation and highlighted the ongoing tensions with ensuring housing supply and development viability - via consultative events and through the HBF, housebuilders had conveyed to Government their concerns over the impact of the significant cost issues associated with meeting zero carbon standards, particularly on their capacity to deliver increased levels of housing to meet political ambitions.

New Technology



"...we are moving on Code 4 to a pure fabric solution rather than putting PVs or solar panels on. Because customers don't know how to operate them, they need to be maintained and we don't know whether they'll last more than ten years because nobody's tried them for that long yet. So we're a bit wary of new technology"

"So our view is that we do the passive design measures, lock as much benefit as we can into it, into the fabric or infrastructure. And then use Allowable Solutions to offset"

"...our approach to it is to design houses that have got as little technology in them as possible... anything that [is] unintelligible to your grandmother; what's the point in putting them in?"



Key Finding 2: Design Solutions and Technological Efficacy

Despite the prevailing regulatory uncertainty surrounding 2016 zero carbon housing policy, housebuilders had undertaken significant preparatory work to explore a series of CSH4, CSH5 and CSH6 equivalent design solutions which could be deliverable on a volume scale to meet potential policy needs. Emerging from this learning curve were a series of technological and cost constraints that challenged housebuilders' conventional approaches to product design and mass production.

Housebuilders noted their caution over using some of the renewable technologies which, in their view, had been developed quickly to meet policy needs with limited bearing on supply chain capacity and skills, consumer utility or ongoing maintenance / servicing needs.

Housebuilders revealed a strong preference for fabric-based solutions to achieve CSH4 equivalent requirements, which would 'lock in' enhanced efficiency measures to their standardised product - through enhanced insulation and window types - enabling their conventional approach to design and production, together with delivery on a volume scale, to be maintained. Where necessary, the limited use of 'fit and forget' dumb technologies and renewables would be used to achieve a balance between carbon compliance and consumer utility.

The announcement of Allowable Solutions in the 2014 Queen's Speech was generally well received by housebuilders and viewed as a crucial element to any policy requiring enhanced energy efficiency measures in new homes produced at mass scale. Indeed, the ability to offset carbon by monetary means, in place of designing truly zero carbon homes, reduced the technical and cost challenges housebuilders had experienced to date. However, caution remained over the cost impact of Allowable Solutions - yet to be defined at the time of interview - and of the administration of such a scheme through the planning system, where viability issues and local authority discretion could lead to further uncertainty and risk.

ZCH Business Strategy



"Because the thing about it is if they're going to keep changing things every couple of years, we're making decisions that we might buy a piece of land today that we might be on for ten years. And how do you then build in costs to that if they're going to move the goalposts every two years?"

"And I suppose our kind of interest in Allowable Solutions is that we want it to be a kind of robust, simple process that's not going to hold up anything what we currently do on-site"

"...it's about the cost and the practicality... we need something we can manage easily on-site bearing in mind the volumes that we're doing as a business, we don't want to create something which is too difficult for ourselves"



Key Finding 3: The Role of the Consumer

Whereas the preference of volume housebuilders in adopting fabric-based solutions to achieve policy compliance, with the limited use of 'eco-bling' renewables, was largely down to maintaining standardised approaches to product and process, another important element of this preference was the role of the consumer.

Indeed, for housebuilders, consumer behaviour had been an important part of the debate concerning the energy efficiency of new homes, particularly during the early days of the 2016 zero carbon housing target where unregulated energy was included. Housebuilders, of course, welcomed the policy shift towards regulated energy.

Housebuilders revealed their customers did not consider the energy efficiency of their products as a significant factor when choosing a new build home - in some cases, it added unnecessary confusion and contestation to housebuilders' marketing practices.

Indeed, where housebuilders were building and selling CSH4 and CSH5 homes, they were unable to accurately quantify the energy savings that customers could expect to achieve - through reduced energy bills - from the technologies and efficiency measures they had installed and were unwilling to do so in case of litigious claims over misselling.

Importantly, housebuilders revealed that their customers simply didn't 'value' energy efficiency and would not be willing to pay more than the standard market rate for a house boasting enhanced energy efficiency measures.

Planning



"...planning is critically important... So zero carbon, Allowable Solutions, £46 a tonne, that's great but you don't have your art contribution. But if you want to charge Allowable Solutions at £20 a tonne, then you can have your art contribution as well as education and schools. So it's very much understanding this is the balanced scorecard...you've got 20 different priorities; you can't have 20 priorities. What's priority one? What's priority 20? And as we work through them and attribute costs through viability you then understand what is realistic and what's not... If there's not policy in place you have a kind of negotiation. And what we think is right and what they think is right, it's then a case of agreeing"

"Code is one of the only two things you can negotiate on, that and affordable housing"



Key Finding 4: All Cost, No Value

Volume housebuilders reported that the significant additional costs of delivering 'zero carbon' homes, be it to CSH4, CSH5 or CSH6 equivalent specifications, were not captured elsewhere in the development process as added value. This led them to be sceptical of the benefits of pioneering products designed significantly beyond regulatory compliance.

Though examples of such pioneering practice were evident in exemplar zero carbon schemes, housebuilders' recessionary experiences (Payne 2015) together with the prevailing policy ambiguity and regulatory uncertainty surrounding the 2015 general election, had largely toned down such behaviour. Housebuilders reported being focused on delivering a product to meet Part L 2013 building regulations and considering the impact of Allowable Solutions on development viability.

Housebuilders reported the following 3 key issues preventing cost being converted to value in the speculative residential development process:

- Valuers do not take sufficient regard of the energy efficiency of new build homes. Despite housebuilders being able to demonstrate their new homes are more energy efficient than the existing stock, the savings new build customers make on energy bills remain immaterial in the valuation process.
- Lenders do not recognize the additional value because consumers as yet will not value it. *"So we find it very difficult to see how if lenders and valuers do not recognise that additional value, then I don't see how we can"*.
- There is no strategic advantage to be gained over competitor housebuilders by building homes significantly beyond regulatory compliance. *"...If I can sell a home for more money than you I will do it and if that means because I can sell it at zero carbon, I'd already be doing it"*.

Policy Clarity



"I don't think it's the wrong policy, what I think we need is the correct stepping-stones to it. So it's just crazy that we've been talking about it for the last six/seven years and we still don't have a roadmap that's actually properly defined, that all parties are signed up to ... if they said okay, in 2016 you're going to go to full fabric energy efficiency standards, that is it, that's what's coming in you know, SAP's yet to come out but that's the policy. Then 2019 we're going to go to carbon compliance and then 2022 we're going to be at zero carbon or something, which would be more in line with what Europe's proposals are, then I think people would be happy with that because then we'd have a roadmap that we could actually work with our supply chain"



Research Reflections

With the initial policy announcement in 2006 of a zero carbon housing (ZCH) standard for new build homes, housebuilders became used to the idea of shifting towards a more energy efficient product and began exploring technological solutions. Just two years later, with the onset of the global financial crisis and subsequent change in political regime, Britain's biggest housebuilders began to experience a wicked combination of regulatory, economic and political uncertainty that muddied the waters of state-market relations and altered the industry's preparations for 2016's policy switch. This experience shaped housebuilders' perceptions of Government's ability to effectively regulate the market or design deliverable housing policy that chimed with the broader institutional struggles they faced.

For British housebuilders, ZCH policy has become an exemplar of regulatory risk, where policy ambiguity has prevented the significant gearing up required by the industry and its supply chains to meet the design, technology and efficiency challenges laid out. Regulatory consistency beyond party politics and an effective balance between state aspiration and market deliverability is arguably necessary of any future return to ZCH policy. Such an approach, in taking account for the long-term nature of British speculative housebuilding, would enable housebuilders to bear more risk in developing innovate products and in taking that self-directed leap forward in design, where the cost benefits of mass producing new technologies would be revealed over time.

ZCH policy has also highlighted the tendency for housebuilders to monitor the impact of new policies on their traditional ways of doing business and has revealed a distinct tension between technological advancements and the cost base in the short, medium and long term. Housebuilders argue there is yet no market signal for low or zero carbon homes - the extra cost of delivery is not recoupable. This market signal, they argue, needs to be generated by other means, such as through regulation or by incentives that motivate changes in consumer behaviour. Whilst such an approach focuses on driving demand rather

The Recession



"I think the recession definitely had an impact and that's why it was delayed because people were not building and the Government wanted to get houses built. So I think they had to relax some of the rules. But at the same time, they've not covered themselves in glory by getting things out on time"

The Performance Gap



"There is not the skills in the UK to double the housing output and improve the quality to the level it would be needed to close the performance gap and deliver 2016 spec homes"

"...I worry about things like passive houses because there's plenty of stuff to do with indoor air quality that bothers me because the ventilation is so low, you know"



than forcing supply, one might ask where the 'tipping point' is when the monetised cost of policy begins to affect delivery.

ZCH policy has also drawn attention to the debate between consumer responsibility and market responsibility in reducing energy demand. The production of low or zero carbon homes in and of themselves will not lower energy demand, only make energy use more efficient. Changing consumer behaviour around energy use is an important part of achieving ZCH policy ambitions. However, housebuilders continue to face significant problems in monetising and selling the benefits of enhanced energy efficiency measures to a consumer market that demands clarity and certainty over reduced energy bills. The risk of housebuilders guaranteeing performance, which isn't likely deliverable because it's based on consumer behaviour, is one they are currently unwilling to take.

The introduction of Allowable Solutions legislation in the 2014 Queen's Speech was a welcome development for housebuilders for a number of reasons. First, it enabled them to focus on developing house types in accordance with FEES and maintain standardised approaches to product design and construction processes. Second, Allowable Solutions – a one-off monetised cost – fitted within the framework builders use to appraise abnormal costs and thus worked with prevailing industry processes. Third, Allowable Solutions shone the spotlight on the existing housing stock and enabled housebuilders to argue that their developments could potentially contribute to the upgrade of nearby housing to similar energy efficient standards. Indeed for housebuilders, aside from consumer behaviour, the comparatively inefficient existing housing stock had been an important missing part of the political debate around energy efficiency in housing.

The Conservative Government's recent decision to scrap zero carbon housing policy for new build homes represents the final nail in the coffin of 2006's ambitious programme. However, all is not lost. The introduction of 2013 Part L building regulations represents a 6% aggregate reduction in carbon emissions from new build homes over Part L 2010 homes, building on the 25% aggregate reduction achieved over Part L 2006 homes, which itself is a 40% improvement over Part L 2002 homes. Through this, housebuilders have demonstrated that energy efficiency can be achieved through gradual regulatory change, where technological solutions and supply chain capacity are developed at a pace suited to the long term nature of speculative housebuilding.

New Build & Existing Stock



"...the difference in energy bills between a Victorian house and one of our houses you could buy today is spectacular. The difference between one of our houses you could buy today and a zero carbon home is not spectacular. It just isn't. So you're in that law of diminishing returns side of things, which is again a reason why I don't think it particularly adds value to go that extra mile"

"The price per square foot is the price per square foot, whether it's Code 3, Code 4 or it's an old draughty 60s house down the road"

"...we could do with a Go Compare type website that says how much your running costs are. But...I don't really think people take that into account, it's not within the top 5 things on choosing a house"



Recommendations

Without additional action, the costs of delivering zero carbon homes are unlikely to be shared between consumers and housebuilders, making the mass production of truly zero carbon homes unfeasible and unviable.

The following recommendations seek to overcome these barriers to viable action by volume housebuilders. They reflect the need to develop a meaningful framework that is consistent with the aim of increasing the supply of new homes.

These recommendations should be considered by policy makers when developing future energy efficiency policies relating to new and existing homes:

- ✓ **Explore valuation mechanisms for defining and capturing the 'value' of the enhanced energy efficiency performance of new build homes.**
- ✓ **Explore lending options for integrating the energy savings of new build properties into mortgage affordability calculations and lending decisions.**
- ✓ **Develop an effective energy rating system that enables easy comparison between new build and existing homes.**
- ✓ **Require estate agents to advertise home energy ratings in a standardised and clear manner allowing potential purchasers to make easy comparisons between all homes.**
- ✓ **Develop, with cross-party political support, a clear policy road map for housing-related energy efficiency that enables housing of all types to viably contribute to reducing Britain's carbon emissions.**

Customer Marketing



"...I'm going to sell you a zero carbon home', 'What does that mean?' 'Let me explain it to you; have you got a week?' 'Yeah, yeah'.

'Do you understand thermodynamics?' 'Yeah, yeah'. 'Fine. Do you understand engineering?' 'Yeah'. 'That's great, we can have a really good conversation about that'.

But most people just go 'No. How much does it save me?', 'Can't tell you'. 'What do you mean you can't tell me?', 'Well I'm not allowed to'. 'What do you mean you're not allowed to? And then you're then having a discussion not around truths but about untruths. And it's a really difficult sell. So I'm not going to sell you zero carbon, I'm now going to sell you a sustainable home', 'Well what does that mean?' 'Oh it's water efficient', 'What, I can't have a proper shower? Can't have a big bath?'"



Acknowledgements

This research was funded by the ESRC Impact Acceleration Account via the University of Sheffield, with a contribution from the Royal Institution of Chartered Surveyors. The author would like to express sincere thanks to the funders and to all participants involved in the research. All quotes used in this report are non-attributable to ensure full anonymity of research participants.

References

Payne, S. (2015) 'Exploring the Impact of the Recession on British Volume Housebuilders: a behavioural analysis', *Built Environment*, 41(2), pp. 271-288.

Henneberry, J. and Parris, S. (2013) 'The Embedded Developer: Using Project Ecologies to Analyse Local Property Development Networks', *Town Planning Review*, 84(2), pp. 227-249.

Payne, S. (2013) 'Pioneers, Pragmatists & Sceptics: Speculative Housebuilders and Brownfield Development in the Early 21st Century', *Town Planning Review*, 84(1), pp. 37- 62.

About the Author

Dr. Sarah Payne is an early career academic based in the Department of Urban Studies and Planning at the University of Sheffield. Prior to joining academia in 2012, Sarah worked in private practice as a Land Buyer for a volume housebuilder and a Property Consultant. Her academic research investigates the causes and consequences of institutional change in the real estate development process. Her current research examines housebuilder motivations and behaviour towards housing market recovery, zero carbon homes and green infrastructure. Sarah has received funding from British Academy, ESRC, RICS and Rotherham MBC and she has undertaken commissioned research for DCLG.

Report published in December 2015

Role of the Consumer



"And there's also that moral obligation of homeowners, why should a developer deal with the unregulated energy that people choose to use? It's kind of saying well okay, you can actually waste what you want because we'll try and build it in. So it's a very odd policy to include unregulated energy"

"I know a CSH4 house will cost me £8,000 to deliver and it saves my customer £200 a year. Hold on, £8,000 to deliver and you're saving £200? I'm not paying you £8,000 for that. Okay, fine. But I need the money because policy's said I have to do it so they're getting a great home"

"...you build a Code Level 6 house and put a Code Level 1 person in it you know ..."