

Low Carbon Housing: the Challenge

August 2018



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About the Committee

The Committee was established on 28 June 2016 to examine legislation and hold the Welsh Government to account by scrutinising expenditure, administration and policy matters encompassing (but not restricted to): local government; housing, community regeneration, cohesion and safety; tackling poverty; equality of opportunity and human rights.

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The following Member was also a member of the Committee during this inquiry



Simon Thomas AM

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Overview and recommendations

We are facing significant challenges in meeting our climate change commitments. A reduction in emissions of 80% by 2050 will require bold and decisive long-term action by the Welsh Government.

Making housing in Wales more energy efficient will be one of the main ways of achieving this. The difficulties we face are compounded by the nature of Wales' existing housing stock. It is old – the oldest in Europe.¹

This report demands an ambitious vision from the Welsh Government. The scale and pace of delivering highly energy efficient homes needs to be urgently increased, or it will fail to meet the challenge it faces.

A ten year route map towards zero carbon housing

Recommendation 1. The Welsh Government must prepare and publish a ten year low carbon housing strategy. The strategy must include milestones and targets and must deliver, within its lifetime: Page 13

- The retrofit of all houses in fuel poverty in Wales to zero carbon in operation standards;
- All new build houses in Wales to be built to zero carbon in operation standards;
- A complimentary planning and building system with low carbon and energy efficiency at their centres, and supported by rigorous, independent inspection regimes;
- Financial incentives to encourage buyers and owners to buy low carbon housing and invest in retrofit measures;
- Funding interventions that maximise the impact of Welsh Government investment in low carbon housing; and
- A fully trained workforce, ready to construct and improve homes using the latest technologies. Page 14

¹ <https://beta.gov.wales/sites/default/files/consultations/2018-01/150617-draft-energy-efficiency-strategy-en.pdf>

New build houses

Recommendation 2. The Welsh Government should revise Part L of the building regulations to increase the required energy efficiency of new homes. It should set out a clear timetable to move to zero-carbon in operation, so that house builders, the supply chain and skills providers can prepare for these changes..... Page 21

Recommendation 3. The Welsh Government should ensure that the inspection regime is robust and resourced appropriately to underpin confidence in low carbon housing. The Welsh Government should introduce a quality mark which:

- assesses the performance of energy saving technology “in operation”;
- places an obligation on the installer to ensure the required performance is delivered or repair or replace the technology; and
- will be independently designed, inspected and enforced. Page 22

Retrofit

Recommendation 4. The Welsh Government should undertake and publish within the next 12 months a comprehensive cost and benefit analysis of retrofitting to zero carbon in operation all households that are in fuel poverty.
..... Page 29

Recommendation 5. The Welsh Government should continue to invest in and expand the current retrofitting schemes under Arbed 3. The Advisory Group on the Decarbonisation of Existing Homes should report to the Committee on the feasibility of retrofitting homes under this scheme by “type” of dwelling.
..... Page 29

Recommendation 6. The Advisory Group on the Decarbonisation of Existing Homes should report to the Committee on how it plans to encourage the “able to pay” and low income homeowners to retrofit energy efficiency measures.
..... Page 29

Skills

Recommendation 7. Training and skills should be central to the Welsh Government’s long-term low carbon housing strategy. The Welsh Government must ensure there is sufficient investment in training provision and appropriate equipment needed to undertake the training..... Page 33

Recommendation 8. The Welsh Government should report to the Committee within 12 months on the measures being put in place to ensure the construction sector has the appropriately skilled workforce to deliver its targets for energy efficient homes..... Page 33

Recommendation 9. The Welsh Government should report to the Committee within 12 months with an assessment of the impact of Brexit on skills and labour supply in the construction sector..... Page 33

Funding and finance

Recommendation 10. The Welsh Government should prepare and publish within the next 12 months a report on the options available to it to leverage funding to deliver low carbon housing at scale through both retrofit and new build. Page 37

Recommendation 11. The Welsh Government should work with major mortgage providers in Wales to incentivise preferential lending rates for low carbon homes and report back to this Committee within 12 months on progress. Page 37

Recommendation 12. The Welsh Government should ensure that any funding to stimulate the housebuilding market, such as the Stalled Sites Fund, is contingent on the finished building being zero carbon in operation. Page 38

Recommendation 13. The Welsh Government should reexamine the case for aligning the Land Disposal and Transactions Tax to the energy efficiency of a property and report to the Committee on this within 12 months. Page 38

1. Introduction

Approach

- 1.** The Committee published a call for evidence from 28 September until 23 November 2017. A list of the organisations and individuals who responded is included at Annexe A.
- 2.** The Committee explored issues identified in the written evidence by asking questions from policy makers, academics and those working the in the field. A full list of the witnesses provided oral evidence to the Committee is included at Annexe B.

Committee visit

- 3.** On 18 January 2018, Committee Members visited the SPECIFIC Innovation and Knowledge Centre based at Swansea University, a partnership developing technology to turn buildings into power stations by enabling them to generate, store and release their own energy. We are grateful to colleagues involved in the SPECIFIC programme for hosting the Committee's visit.

Public attitudes to low carbon housing- survey

- 4.** The Committee carried out an online survey and conducted a series of video interviews with people from across Wales to allow them to share their views on low carbon housing. There were 970 responses.

2. What are zero carbon homes and why do we need them?

Housing is responsible for 13% of the UK's greenhouse gas emissions and nearly 8% of Welsh emissions.² Improving the quality of our housing will enable Wales to meet its international and domestic obligations to reduce emissions.

Legal obligations to mitigate climate change

International obligations

5. The UK has signed up to the Paris Accord³ which aims to respond to the global climate change threat by limiting the global temperature rise this century to below 2 degrees Celsius. Each country determines and regularly reports on its contribution to mitigate global warming.

European Legislation

6. The EU Energy Performance in Buildings Directive 2010⁴ requires all new buildings to be built to a “nearly zero energy” standard by the end of 2020. It requires Member States to “draw up national plans for increasing the number of nearly zero-energy buildings”.

7. A nearly zero-energy building is defined in the Directive as:

“...a building that has a very high energy performance. The nearly zero or very low amount of energy required should be covered to a very significant extent by energy from renewable sources, including energy from renewable sources produced on-site or nearby.”

8. Although the UK is leaving the European Union, this legislation will still apply. Through the coming into force of the EU (Withdrawal) Act 2018, all existing directly-applicable EU law has been transposed into UK law.

² <https://gov.wales/topics/environmentcountryside/climatechange/welsh-emissions/?lang=en>

³ https://ec.europa.eu/clima/policies/international/negotiations/paris_en

⁴ <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2010:153:0013:0035:EN:PDF>

Welsh legislation

The Well-being of Future Generations (Wales) Act 2015

9. Improving energy efficiency is a key part of achieving the well-being goals set out in the Well-being of Future Generations (Wales) Act 2015.⁵ The Welsh Government has published a suite of national indicators, which are designed to measure progress towards achievement of seven well-being goals. Several of the goals refer specifically to climate change mitigation. One of the indicators relates to energy efficiency, and measures the percentage of dwellings with adequate energy performance.

The Environment (Wales) Act 2016

10. The Environment (Wales) Act 2016 (the Act) requires the Welsh Government to reduce greenhouse gas emissions by at least 80%, from 1990 levels, by 2050.

11. The Welsh Government commissioned advice from the UK Committee on Climate Change (the UKCCC) on how to meet these commitments.⁶ The UKCCC made key policy recommendations, including that:

“Wales should use Building Standards regulations to ensure new buildings have a high standard of energy efficiency and are designed for low-carbon heating systems. This will avoid costly retrofit in future and ensure household energy bills are no higher than needed. This is an area in which Wales can play a leading role in UK action to reduce emissions.

There is a lot the Welsh Government can do to join up and support the chain of decision makers (e.g. householders, social landlords, installers and suppliers) for energy efficiency and low carbon heating systems. The public can be engaged through face-to face contact, street champions and engaging parents through schools.”

Legal obligations to reduce fuel poverty

12. The Welsh Government definition of “fuel poverty” is a household that spends 10% or more of its income on energy costs. The Welsh Government has a statutory obligation to eradicate fuel poverty, as far as is reasonably practicable, in all

⁵ <https://gov.wales/topics/people-and-communities/people/future-generations-act/?lang=en>

⁶ www.theccc.org.uk/publication/advice-on-the-design-of-welsh-carbon-targets-2/

households in Wales by 2018. This is a requirement of the Warm Homes and Energy Conservation Act 2000.⁷

13. The Welsh Government published its Fuel Poverty Strategy⁸ in July 2010 which sets out the actions it is taking to address fuel poverty. Nevertheless, a report published in 2016⁹ estimates that just under a quarter of households in Wales are still in fuel poverty.

14. The Welsh Government has acknowledged the scale of the challenge to reduce fuel poverty. In November 2017,¹⁰ the then Cabinet Secretary for Environment and Rural Affairs (the Cabinet Secretary) told the Climate Change, Environment and Rural Affairs Committee (the Committee) that Wales is not currently on track to meet its fuel poverty elimination target.

Which standard should we be aiming for?

15. In order to deliver low carbon housing, policy makers and those working in the supply chain need to know what is classed as a low carbon home. Definitions of low carbon housing vary. For instance:

- A **nearly zero-energy** building is defined in Article 2 of the EU Directive 2010/31/EU (EPBD recast) as “a building that has a very high energy performance. The nearly zero or very low amount of energy required should be covered to a very significant extent by energy from renewable sources, including energy from renewable sources produced on-site or nearby”.
- A **zero carbon** house is not just carbon neutral – it is carbon negative. Over the course of a year, the house generates more electricity than it uses, so it cuts CO2 being produced elsewhere.¹¹
- A **Passivhaus** is “a building in which thermal comfort can be achieved solely by post-heating or post-cooling the fresh air flow required for a

⁷ www.legislation.gov.uk/ukpga/2000/31/contents

⁸ <https://gov.wales/topics/environmentcountryside/energy/fuelpoverty/strategy/?lang=en>

⁹ <https://gov.wales/docs/caecd/research/2016/160711-production-estimated-levels-fuel-poverty-wales-2012-2016-en.pdf>

¹⁰ CCERA Committee, 22 November 2017, para 56 <http://record.assembly.wales/Committee/4329>

¹¹ <http://zerocarbonhousebirmingham.org.uk/about/what-is-a-zero-carbon-house/>

good indoor air quality, without the need for additional recirculation of air”.¹²

16. The Committee heard a variety of opinions about the standard Wales should be aiming to achieve. The UKCCC stated that Wales should only be building to Passivhaus standard.¹³ However, most of the evidence argued that “zero carbon, in operation”, is an appropriate minimum standard. Chris Jofeh said this standard is:

“a reasonable and achievable goal. It may, in certain circumstances – depending on location, orientation and surrounding buildings and so on- be possible to be energy positive and that should be encouraged, but I don’t think that should be required.”¹⁴

17. The Energy Saving Trust believed that standards should be voluntary rather than mandatory and suggested that building regulations should set a minimum standard. It suggested that the baseline should be broadly defined as near-zero standard, taking into account the possibilities and limitations offered by existing Welsh housing stock.¹⁵

Evidence from the Welsh Government on standards of low carbon housing

18. The Welsh Government told us they are awaiting the results of trials run by its Innovative Housing Programme (IHP) before deciding on a recommended energy efficiency level for housing:

“The Innovative Housing Programme will evaluate the new approaches being tried, and will find out what works and equally importantly, what doesn’t work. This information will shape the Welsh Government’s approach to the type of social and affordable homes that will be funded in future. By March 2019, we expect to have a clearer vision of the type of models it wants to support through its funding regime.”¹⁶

19. In oral evidence, the Minister for Housing told the Committee that as well as the data from the IHP, the Government is awaiting the results of the Housing

¹² <http://www.passivehouse.com/>

¹³ CCERA meeting, 26 April 2018, para 9

¹⁴ CCERA meeting, 24 January 2018, para 48

¹⁵ CCERA meeting, 24 January 2018, para 211

¹⁶ Welsh Government written evidence

Review and the housing condition survey in order to ‘start to narrow it down’ to projects which can be supported at scale.¹⁷

OUR VIEW

There are many reasons why we should improve the energy efficiency of our housing stock. The most pressing is the need to deliver on legal obligations to eliminate fuel poverty and reduce the emission of greenhouse gases.

The Welsh Government is required to reduce emissions by 80% by 2050. Challenging targets need challenging solutions. Reducing the amount of energy we use in our homes will substantially accelerate progress towards these goals.

Achieving the targets will require a considerable ramping up of ambition and must span the whole of Wales’ policy levers. We are calling on the Welsh Government to bring forward a ten-year low-carbon housing strategy, including milestones and targets.

In terms of what standard Wales should adopt to bring in low carbon housing, we believe that “perfection should not be the enemy of good”. It is encouraging to hear that expertise has been committed to assessing the various options for low carbon standards, but this is a continually evolving field, with new, emerging technologies that are redefining what can be achieved. We advise the Welsh Government to decide on a standard of “zero carbon in operation” as a starting point, and seek to deliver it as soon as is practically possible.

Recommendation 1. The Welsh Government must prepare and publish a ten year low carbon housing strategy. The strategy must include milestones and targets and must deliver, within its lifetime:

- The retrofit of all houses in fuel poverty in Wales to zero carbon in operation standards;
- All new build houses in Wales to be built to zero carbon in operation standards;
- A complimentary planning and building system with low carbon and energy efficiency at their centres, and supported by rigorous, independent inspection regimes;

¹⁷ CCERA meeting, 4 July 2018, para 98

- Financial incentives to encourage buyers and owners to buy low carbon housing and invest in retrofit measures;
- Funding interventions that maximise the impact of Welsh Government investment in low carbon housing; and
- A fully trained workforce, ready to construct and improve homes using the latest technologies.



There are a number of areas where low carbon housing can have a really positive impact on wellbeing. So If we have more energy efficient housing ... that has the potential to put back into the pockets of Welsh householders, and particularly some of the most deprived communities then we can see how that can have a really positive impact. Of course it's also got a positive impact on our environment because making homes low carbon, more energy efficient means that we're not contributing to the overall carbon emissions that we really need to be tackling.

Sophie Howe, the Future Generations Commissioner for Wales

3. Building zero carbon homes for the next generation

This chapter sets out how planning, building regulations, and an effective inspection system can be used to deliver low carbon homes at scale.

Planning for a low carbon future

20. The Committee heard evidence of the need to ensure that low carbon solutions are embedded at the design and planning stage of housing developments, for instance by planning for reduced reliance on car travel.

21. Roisin Willmott of the Royal Town Planning Institute (RTPI) emphasized that “it is about how you design a site, and that is very much at the planning stage... rather than trying to adjust it later on in the development”.¹⁸ She supported a holistic approach to development. She said:

“we shouldn’t just focus on the building itself—we need to look at the design of sites ... So, we need to look at where we put houses and whether they’re accessible by active travel, by public transport, and reduce that kind of carbon as well.”¹⁹

22. The Welsh Government has issued a draft Planning Policy Wales (Edition 10) which states:

“The Welsh Government expects all new development to mitigate the causes of climate change, in accordance with the energy hierarchy for planning. Reducing energy demand and increasing energy efficiency will assist in meeting this demand with renewable and low carbon sources of energy.”²⁰

23. However, the Committee was told that planning decisions can sometimes undermine low carbon housing developments. Community Housing Cymru told us that:

¹⁸ CCERA meeting, 15 February 2018, para 84

¹⁹ CCERA meeting, 15 February 2018, para 72

²⁰ Planning Policy Wales (Edition 10)

“we have been told about homes, designed to be optimally positioned to generate maximum solar energy which have been ordered to be re-orientated for aesthetic reasons, reducing the effectiveness of their photo-voltaic panels.”²¹

Evidence from the Welsh Government on planning and design

24. In its evidence paper submitted to the inquiry, the Welsh Government wrote:

“The planning system plays a key role in ensuring that development is designed and constructed in a way which is energy efficient and promotes low carbon energy generation. National planning policy is set out in Planning Policy Wales (PPW) and seeks to promote the principles of sustainable development which includes energy efficiency and low carbon development... PPW has a clear policy framework to integrate land use aspects to promote active travel and thus reduce the need for car-borne journeys in particular.”²²

Building regulations and standards

25. The Committee heard a range of views about the extent to which changes to building regulations can facilitate a shift to low carbon house building. Concerns were expressed that raising standards in Wales may discourage housebuilders from building in Wales, whilst others feel that an ambitious new standard is necessary to drive change.

26. At the time of writing this report, the Welsh Government was undertaking a review of building regulations, which govern carbon dioxide emissions and energy ratings for homes. In 2014, the regulations were updated to achieve an 8% improvement in performance on pre-1990 levels.

27. The housebuilding market in Wales is dominated by a small number of large operators. 80% of all new homes in Wales are built by five companies.²³ The Committee was told there is a risk they will choose not to build in Wales if the requirements of building standards make it less profitable than, for example, England.

28. Mark Harris, from the Home Builders Federation warned that decisions that result in it being more expensive to build new homes in Wales could result in

²¹ Community Housing Cymru written evidence

²² Welsh Government written evidence

²³ CCERA meeting, 8 March 2018, para 12

homebuilders moving resource to England. He said the market would need time to adapt to significant changes to building standards:

“A sudden change like that could have the effect that we claim it would, potentially. But I agree, if it’s brought in over time, and understood, it’s far less likely to have the impact that is being suggested in terms of reducing house building.”²⁴

29. Ifan Glyn, from the Federation of Master Builders, also emphasised that changes to building regulations could add risk for SMEs in the construction industry, which could, in turn, affect profitability.²⁵ He argued the sector would need a phased approach to changes in regulations:

“if you were to take a cliff-edge approach where tighter regulations were implemented overnight, that would have a massive impact on the number of SMEs being able to enter the house building industry, and there are a wide variety of barriers already in place to SMEs.”²⁶

30. The Committee heard evidence from Lord Deben, Chair of the UKCCC²⁷ that to achieve the Welsh Government’s carbon emissions reductions targets, building regulations will need to require new builds to be far more energy efficient.

31. Chris Jofeh called for policy consistency on building regulations and supported a phased approach. He said:

“we’ve suffered in recent years with ambitions being stated to raise standards faster than England and then being dropped again under threat from the housebuilders that say, ‘Oh, well, we won’t build in Wales, we’ll build in England.’ But Wales has got control of planning as well as control of building regs. So, what I’d like to see is a trajectory for building regs out to 2050 to give industry some confidence that they know what’s happening.”²⁸

32. The RTPI reiterated their view that planning and building regulations should complement each other:

²⁴ CCERA meeting, 8 March 2018, para 67

²⁵ CCERA meeting 8 March 2018, para 34

²⁶ CCERA meeting 8 March 2018, para 9

²⁷ CCERA meeting, 26 April 2018, para 7

²⁸ CCERA meeting, 24 January 2018, para 16

“Building Regulations is the route for sustainable building standards but issues such as siting and orientation etc. are best dealt with through the planning system. Both systems need to work together, ensuring roles are clearly defined to avoid uncertainty and duplication.”²⁹

Evidence from the Welsh Government on changes to building regulations and increasing the pace of building in Wales

33. The Welsh Government’s written evidence sets out the intention to consult on a review of Part L (Conservation of fuel and power) of the building regulations in Spring/Summer 2019:

“The last time we reviewed Part L of the building regulations, the decision was taken to hold back on our initial intention to significantly improve the energy performance of new housing as the market was still in a slump following the 2008 crash. The time is right to look again at what a step change in energy performance for new housing would mean ... It is intended that this Part L review will meet the...requirement to set ‘Nearly Zero Energy’ (NZE) standards at a cost optimal level or better...”³⁰

34. When questioned on the issue, in oral evidence, the Cabinet Secretary said there is no intention to dilute or delay the planned review of Part L of the building regulations.³¹

Building inspection and a quality mark for Wales

35. Builders have a choice of using a Local Authority Building Control Officer or a privately appointed approved inspector to oversee their building works compliance. The Committee was told that a lack of rigour in the inspection regime has meant that often, homes are not performing to the required standard.

36. The Royal Society of Architects in Wales (RSAW) told the Committee:

“the planning system can set the bar, and then the building regulation system can check the bar. And what we’re not doing at the moment is

²⁹ RTPI written evidence

³⁰ Welsh Government written evidence

³¹ CCERA meeting, 4 July 2018, para 154

necessarily getting that integration right, and we're certainly not resourcing our local authorities to be able to do the checks."³²

37. Both the RSAW and the WLGA highlighted the lack of testing or inspection of "in-use" performance of energy efficiency measures.³³ Jon Bootland from the Passivhaus Trust referred to an "in-use" performance gap:

"The figures on the energy in-use performance gap—so, the amount of heating energy needed compared to your target—are shocking, so 60 per cent to 80 per cent more energy required to run your home than you expect for a new home."³⁴

38. Lord Deben, Chair of the UKCCC, said:

"Very rarely is the house that is actually built tested again... So, it's not just a question of raising the standard. It's a question of enforcement, and enforcement means random testing and it means real punishment."³⁵

39. It was suggested that a quality standard or mark would be an effective mechanism to address some of these issues and instil confidence in buyers and lenders. The WLGA said:

"Any quality mark needs to encourage good practice and recognition... clearly, if an energy efficiency quality mark would enhance the opportunity for buyers to get mortgages, improving it in terms of the buying market, then that is what a quality mark should be used for."³⁶

40. The RSAW told the Committee:

"a quality mark needs to actually be trusted by the people living in the home so that it does what it says, and that involves a level of checking and oversight to ensure that it has been done correctly and that it was the correct thing to do."³⁷

³² CCERA meeting, 15 February 2018, para 85

³³ CCERA meeting, 15 February 2018, para 94

³⁴ CCERA meeting, 15 February 2018, para 129

³⁵ CCERA meeting, 26 April 2018, para 12

³⁶ CCERA meeting, 15 February 2018, para 128

³⁷ CCERA meeting, 15 February 2018, para 129

Evidence from the Welsh Government on quality control

41. The Welsh Government stated in written evidence:

“The independent review following the Grenfell tragedy will lead to major changes to buildings regulations and the building control systems which will take time to complete. The way we manage competing priorities is going to be critical to the delivery of, in this case climate change and life safety, improvements to the building regulations.”³⁸

42. The Welsh government has commissioned an independent review of affordable housing which is due to report on its recommendations in April 2019. It will “examine whether more can be done to increase the supply of affordable housing in Wales”. As part of the terms of reference, it will also:

“consider the implications of moving to deliver zero carbon homes by 2020, including the role of off-site manufacture and modern methods of construction;

review the standards governing affordable housing and advise on whether they require updating.”³⁹

OUR VIEW

The recent publication of Planning Policy Wales (Edition 10) for consultation indicates that the Welsh Government has recognised the need to ensure low carbon development starts at the design stage. The document emphasises the principles of integrating employment, housing and transport policies to reduce the need to travel and to promote active travel.

However, to meet the challenge of delivering zero carbon housing at scale, the Welsh Government must address the failure of the housing market to provide sufficient energy efficient, affordable homes.

There are few large-scale housebuilders and there is little incentive to offer more than the minimum standard required by building regulations. We were told that housebuilders will respond to customer demand, and the lack of energy efficient housing is evidence of a lack of demand.

³⁸ Welsh Government written evidence

³⁹ <https://gov.wales/newsroom/housing-and-regeneration/2018/180423-review-of-affordable-housing-supply-in-wales-announced-by-minister/?lang=en>

However, this misrepresents how the housing market works. There is, in effect, little or no choice for most consumers in terms of energy efficiency.

The Committee heard concerns from housebuilders that changes to building regulations will lead to fewer houses being built in Wales. However, providing low carbon homes is crucial to delivering the Government's own climate change reduction targets. Delivering low carbon homes for all needs a step change in leadership from Government. The Government must not shy away from using building regulations to deliver a much higher standard of energy efficiency.

Housing Associations and Local Authorities in Wales are responsible for building social housing stock. The Welsh Government has the levers at its disposal to make sure these houses are highly energy efficient, and should be supporting housing associations and local authorities to set an example in the housing they provide.

As part of our proposed ten-year low carbon housing strategy, the Welsh Government should set milestones and targets to transition to all new housing being built to zero carbon in operation standards.

A quality mark for Wales

We are very concerned at the weight of evidence we heard that existing building standards are not being enforced. Clearly, the system is not functioning. The inspection system needs to be far more rigorous and independent. Introducing a "quality mark" for construction and installation of energy saving measures would remove risk and encourage best practice. It would also ensure the anticipated gains for climate change mitigation are actually realised.

We are calling on the Government to introduce a quality mark for energy saving measures in new builds and retrofit technology to increase consumer confidence in low carbon homes. The inspection and enforcement of this quality mark must be independent and rigorously enforced.

Recommendation 2. The Welsh Government should revise Part L of the building regulations to increase the required energy efficiency of new homes. It should set out a clear timetable to move to zero-carbon in operation, so that house builders, the supply chain and skills providers can prepare for these changes.

Recommendation 3. The Welsh Government should ensure that the inspection regime is robust and resourced appropriately to underpin confidence in low carbon housing. The Welsh Government should introduce a quality mark which:

- assesses the performance of energy saving technology “in operation”;
- places an obligation on the installer to ensure the required performance is delivered or repair or replace the technology; and
- will be independently designed, inspected and enforced.



As part of my decision I did consider whether the property was environmentally friendly, partly from an energy efficiency perspective, because I was taking on a mortgage and wanted to make sure that my heating bills weren't going to be really huge. I think at the time there was an energy performance certificate and I remember that I looked at that and it was a pretty good outcome so it was a positive for me. It wasn't the most important factor though, the location, the size and those kind of things were more important but it was something I considered as part of my overall decision as to whether to go ahead with that particular property.

Tom Bedford, first time buyer, Newport

4. Bringing existing homes up to zero carbon standards

The problems of poor energy efficiency in homes in Wales is most acute in our existing housing stock. Wales has more older, colder, homes than in the rest of the UK which makes them more expensive to heat.⁴⁰

43. The Welsh Government has made a commitment to become carbon neutral by 2050, but 80% of the houses we will be living in then have already been built. New housing accounts for only 6% of our housing stock. Chis Jofeh told the Committee about the scale of the challenge:

“We’ve got 1.3 million homes in Wales. Over a quarter of all Welsh energy consumption is in homes, so we need to do something substantial. If we’re to hit our 2050 targets, Wales has got to retrofit 40,000 homes a year until 2050.”⁴¹

44. The Welsh Government’s Warm Homes Programme,⁴² which includes the Nest⁴³ and Arbed⁴⁴ schemes, provides funding for energy efficiency improvements to low income households and those living in deprived communities across Wales.

45. Nest is a demand led scheme that provides both advice and funding to improve energy efficiency and reduce fuel poverty. The Nest scheme is managed by British Gas and some services are delivered by the Energy Saving Trust. The types of improvements that can be delivered under Arbed include solid wall insulation and boiler and heating system upgrades.

46. The Committee was told that the scale of the task of retrofitting homes in Wales is considerable. Chris Jofeh said:

“If Wales were to eliminate fuel poverty in 12 years... that would cost £150 million a year. So, the level of investment needs to be ramped right up,

⁴⁰ UK CCC “Building a Low Carbon Economy for Wales”, p 32

⁴¹ CCERA meeting, 24 January 2018, para 20

⁴² <https://gov.wales/topics/environmentcountryside/energy/efficiency/warm-homes/?lang=en>

⁴³ <https://www.nestwales.org.uk/>

⁴⁴ <https://gov.wales/topics/environmentcountryside/energy/efficiency/arbed/?lang=en>

and that's a big difficult political decision... But it's very important ... because it starts to create the demand at scale of the retrofit industry, which begins to encourage people to think it's serious and to invest in new developments."⁴⁵

47. Since 2011, the Welsh Government has spent £217m to improve the energy efficiency of more than 39,000 homes via the Warm Homes scheme. In January 2017 the Welsh Government announced a further £40m investment in 25,000 more homes and green growth measures.⁴⁶

Incentivising retrofitting by private householders

48. Given that 84% of homes in Wales are owner-occupied or privately rented, the ambition in Wales should be to upgrade existing owner-occupied homes to achieve the maximum benefit.

49. Over the years, householders have experienced energy saving interventions, such as damp proofing and solid wall insulation, which have not delivered the benefits that were promised. This has eroded householders' confidence in such activities. Mark Harris from the Homebuilders' Federation gave the Committee an example of the historical problems:

"I was working at Bridgend council delivering Arbed schemes, and we were merrily cladding buildings and filling cavities full of insulation. Five years later, we've got companies setting up now to take cladding off and to take insulation out because we've realised that, actually, either it wasn't the right thing to do or the skill set that delivered it wasn't properly skilled and it was done in a rush."⁴⁷

50. He went on to call for a longer lead in time for any changes to housing requirements so that new technology can be properly tested.

51. The Committee heard more information for householders is necessary to address concerns about the effectiveness of retrofitting measures. Chris Jofeh told the Committee:

"it's also about making it the socially normal thing to do. If you're a member of the middle classes, then having a new kitchen put in is a

⁴⁵ CCERA meeting 24 January 2018, para 20

⁴⁶ <https://gov.wales/newsroom/environmentandcountryside/2017/170109-extra-40m-for-warm-homes-and-green-growth-in-wales/?lang=en>

⁴⁷ CCERA Meeting, 8 March 2018, para 20

socially normal thing to do... But when it's retrofit, it's very difficult; the outcome is very uncertain; it's likely to cost twice what you think; and it's, justifiably in many cases, got a bad reputation."⁴⁸

52. Dr Jo Patterson also said that more frequent inspection of the performance of energy efficient retrofit measures would also benefit existing householders:

“there is a role, particularly with retrofits, for the Energy Performance Certificate to provide an MOT-type system for houses. And that would... overcome some of the maintenance problems... in that if there is a document that stays within the building so that people are aware of the technologies, aware of what the condition of the building is, then it would help the maintenance in the long term to be correct for that particular building.”⁴⁹

Taking stock

53. The Committee heard that retrofitting needs to be addressed holistically. That is, gaining a detailed level of knowledge of the limited types of houses in Wales and conducting appropriate retrofit of the whole house on a street by street basis, rather than taking an inefficient, “pepper pot”, approach to individual houses in terraces.⁵⁰

54. Taking a large-scale whole house approach in Wales would be feasible because there are a limited number of property types, allowing for cost-savings in mass producing the technologies need for retrofitting. For housing in Wales, “there is a huge population of very similar archetypes”.⁵¹

55. Given this, there was a call to develop a “route map” which set out a model approach according to housing “types”.⁵² This focus on housing “types” could enable large scale solutions and bring costs down.

Building the supply chain

56. The Committee heard that a long-term commitment to increasing energy efficiency would support the supply chain, something which Wales has failed to deliver so far: Dr Jo Patterson said:

⁴⁸ CCERA meeting, 24 January 2018, para 104

⁴⁹ CCERA meeting, 24 January 2018, para 200

⁵⁰ CCERA meeting, 24 January 2018, para 60

⁵¹ CCERA meeting, 15 February 2018, para 135

⁵² CCERA meeting, 15 February 2018, para 97

“I think, if Arbed had continued to roll rather than having a stop-start situation, the people in the supply chain would have realised why they were doing what they were doing and then started to expand their knowledge to other areas within the technologies as well.”⁵³

57. A consistent approach to policy is necessary to stimulate the supply chain. Alex Rathmell from the NEF UK said:

“the point of this is to say that by getting that forward commitment, we hope that that will give the supply chain confidence and part of that is both giving confidence to legislators and regulators, but also getting confidence from them that there is commitment to this low-carbon housing agenda over the medium and long term.”⁵⁴

Evidence from the Welsh Government on retrofitting of homes

58. The Welsh Government told the Committee about funding that had been allocated to retrofitting:

“The Warm Homes Arbed 3 project will spend approximately £55m in the next three years. Warm Homes Nest, our demand led scheme will invest a further £72m over the period from 2017 to 2021. As an area based scheme, Arbed 3 will specifically target reduction in fuel poverty in Wales, year on year, utilising a range of local and national data to target communities for action.”⁵⁵

59. In response to questions about incentivising the private rented sector, the Minister for Housing told the Committee:

“the Welsh Government has put in place a £40 million fund that is available to local authorities, which can then provide that funding to the private rented sector in order to either bring empty properties back into use or to bring homes that are substandard... up to standard in order to enable them to be rented.”⁵⁶

60. On the subject of the need to incentivise private homeowners to retrofit, the Minister for Housing said that the Welsh School of Architecture at Cardiff University, is undertaking research on what is appropriate for different types of

⁵³ CCERA meeting, 24 January 2018, para 98

⁵⁴ CCERA meeting, 15 February 2018, para 234

⁵⁵ Welsh Government written evidence

⁵⁶ CCERA meeting, 4 July 2018, para 59

houses. This research will be used by the Advisory Group on the Decarbonisation of Existing Homes to provide a programme of actions that can be taken by owner-occupiers as well as by Government.⁵⁷

Welsh Housing Quality Standard

61. Social housing in Wales is due to meet the Welsh Housing Quality Standard (WHQS) by 2020.

62. The WLGA emphasised the importance of social housing stock continuing to be brought in line with the Welsh Housing Quality Standards (WHQS).⁵⁸ Dr Jo Patterson suggested that the private rented sector should also be subject to the WHQS.⁵⁹

Evidence from the Welsh Government on Welsh Housing Quality Standards

63. In response to the suggestion that the WHQS should be extended to the private rented sector, the Minister for Housing said that the Welsh Government recognises that the majority of landlords in Wales let one or two properties and might have difficulty funding upgrades. She told the Committee:

“Certainly, I think there is more to do in terms of the private rented sector, and we’re fortunate there because we do have levers with that sector in a way that perhaps we don’t so directly with the owner-occupiers.”⁶⁰

OUR VIEW

Tackling the existing housing stock will deliver the greatest return on investment. 80% of the homes we will be living in in 2050 have already been built. We have the oldest housing stock in Europe⁶¹ and only by ensuring that these colder, older homes are fit for purpose for the transition to low carbon living can we meet our climate change mitigation targets.

Since 2007, the Welsh Government has spent considerable funding on schemes targeted at the most vulnerable householders to alleviate fuel poverty. This

⁵⁷ CCERA meeting, 4 July 2018, para 52

⁵⁸ <https://gov.wales/topics/housing-and-regeneration/housing-quality/welsh-standard/?lang=en>

⁵⁹ CCERA meeting or written evidence?

⁶⁰ CCERA meeting, 4 July 2018, para 58

⁶¹ <https://beta.gov.wales/sites/default/files/consultations/2018-01/150617-draft-energy-efficiency-strategy-en.pdf>

spending has not only reduced fuel poverty but has demonstrated wider benefits. The Nest Scheme has resulted in positive health benefits⁶² and the Committee heard that the Arbed 2 programme created 400 jobs.⁶³ While we commend the NEST and Arbed schemes, it is the case that, unfortunately, the fuel poverty target has not been met. The estimated need to retrofit 40,000 homes a year to meet that target shows the scale of the problem.

We commend the current efforts to reduce fuel poverty through the current Arbed retrofitting programme. However, we are way off where we need to be, Wales needs to significantly increase retrofitting efforts to deliver the vision of zero carbon housing for all by 2030.

To have the necessary impact, retrofitting must be done at scale. The Welsh Government should explore the feasibility of retrofitting 'types' of houses. This approach to whole house retrofitting is ultimately cheaper, it eliminates the need to return to a property or street more than once.

The Welsh Government must make it appealing for the 84% of owner-occupiers to invest in energy saving technology in the same way that they might update a kitchen or bathroom before putting their house on the market. As one of our witnesses said, Wales should be the leader in achieving a 'green premium'; currently, all we can offer is a 'brown discount'.

This should involve financial incentives, which the Welsh Government has assured us have been discussed, but should start with a promotion campaign to educate homeowners on the benefits of retrofitting energy efficiency. This is a recommendation from the UK Committee on Climate Change which can be taken forward in Wales at once. This could also involve promoting energy efficiency measures which are manufactured in Wales, such as third generation radiators. Buying items manufactured closer to home will have the added benefit of reducing the carbon impact of retrofitting.

We believe that private rented accommodation should be no less energy efficient for tenants than social housing in Wales. We believe there should be a long-term objective to bring standards in the private rented sector in line with those applying to social housing.

⁶² <https://gov.wales/docs/caecd/research/2016/161003-fuel-poverty-data-linking-project-emerging-findings-en.pdf>

⁶³ Welsh Government written evidence

Recommendation 4. The Welsh Government should undertake and publish within the next 12 months a comprehensive cost and benefit analysis of retrofitting to zero carbon in operation all households that are in fuel poverty.

Recommendation 5. The Welsh Government should continue to invest in and expand the current retrofitting schemes under Arbed 3. The Advisory Group on the Decarbonisation of Existing Homes should report to the Committee on the feasibility of retrofitting homes under this scheme by “type” of dwelling.

Recommendation 6. The Advisory Group on the Decarbonisation of Existing Homes should report to the Committee on how it plans to encourage the “able to pay” and low income homeowners to retrofit energy efficiency measures.

“

The factors that most concern clients that we deal with when renting or buying a home is very simple – location, price, size and general condition. With regard to environmentally friendly properties, it’s certainly a criteria that certain people would look for, but in terms of detail or going beyond a question of an energy rating or cost to run - unless it’s extremely high it doesn’t really have much of an affect for people we deal with.

Jon Hooper Nash, estate agent, Cardiff

”

5. Skills

A robust supply chain and the skilled workforce to install the new technology are crucial to delivering the zero carbon housing Wales needs.

64. The view of the majority of participants in the inquiry was that there is a lack of appropriate skills in Wales to deliver low carbon housing at scale. The Qualifications Wales Review “Building the Future”, raised concerns about the provision of training on new technology. It said that “learners are not developing an understanding of renewable energy and smart meters”. It also said:

“Employers and learning providers told us that qualifications have not kept up to date with the use of new technologies, including the requirements for low-energy homes.”⁶⁴

65. The Home Builders Federation (HBF) expressed concern over the availability of skilled workers to build new types of homes, saying:

“there will be a lead in period of at least 3 years to allow for people to be upskilled either through college courses or apprenticeships... however if we are building differently in Wales then we will potentially no longer be able to rely on movement across the border to help fill any skills gap.”⁶⁵

66. Community Housing Cymru, said

“CHC members have noted some concern as to a lack of appropriately skilled professionals working in the building industry in Wales.”⁶⁶

67. However, the RSAW told the Committee there is currently no shortage of “on site” skilled workers and they could be upskilled or trained in new skills in a short period of time.⁶⁷

68. Skills providers believed that in order to meet the demand for skills in new housing technology the sector would need confidence that government policy is

⁶⁴ www.qualificationswales.org/media/3176/building-the-future.pdf

⁶⁵ Home Builders’ Federation written evidence

⁶⁶ CHC written evidence

⁶⁷ CCERA meeting, 15 February 2018, para 112

likely to be consistent in this area, particularly when it comes to investments decisions by SMEs. The Federation of Master Builders Cymru said:

“From an SME point of view, at this moment in time, to build to a higher spec just means added cost. There are two main reasons for that: the technology costs more and also the skills are not there.”⁶⁸

69. Owain Jones of Cyfle Building Skills spoke of the need to provide consistency for SMEs, saying:

“the biggest barrier in their place is the certainty of workload moving forward, and if they had that certainty, they would be prepared for long-term investment.”⁶⁹

70. The CITB agreed, saying: “it needs to have long-term investment and long-term thought because the industry does need to plan for the future, and by having some of that certainty of pipeline, it would be able to invest in skills for the future”.⁷⁰

Evidence from the Welsh Government on skills provision

71. The Welsh Government outlined the measures it is taking to attract new entrants into the construction sector and ensure Wales will have the skills needed to deliver energy efficient housing. These include Regional Skills Partnerships to take forward the training and:

“The construction sector has come together to develop ‘Go Construct’, the first industry-wide interactive careers portal showcasing the wide variety of jobs in construction and the best routes into the industry.

CITB and a consortium led by the University of Wales Trinity Saint David is establishing the Construction Wales Innovation Centre (CWIC) to offer state-of-the-art facilities and world-class training for individuals and construction companies.”⁷¹

72. The Government addressed the issues raised in the Qualifications Wales Review on the range and quality of qualifications in the construction sector:

⁶⁸ CCERA Meeting 8 March 2018, para 32

⁶⁹ CCERA meeting, 8 March 2018, para 142

⁷⁰ CCERA meeting, 8 March 2018, para 128

⁷¹ Welsh Government written evidence

“Qualifications Wales review team have developed proposals for actions. Issues for consideration include ensuring that qualifications and underpinning national occupational standards, which describe occupational competence, reflect up-to-date technologies, tools materials and processes.”⁷²

73. Members of the Committee expressed concern that there may be a shortage of skilled workers after the UK leaves the European Union. The Cabinet Secretary responded:

“in relation to readiness, that’s a huge piece of work right across Government... we’re always speaking to our counterparts around the workforce to make sure that we’ve got that free movement of people that are going to be needed in so many areas of work in Wales.”⁷³

OUR VIEW

The availability of skilled workers is essential for the delivery of our future low carbon housing.

There are serious concerns that there are currently insufficient workers with the right skills to deliver low carbon housing.

There has been considerable investment made by the Welsh Government in the Construction Wales Innovation Centre, and the investment made by the Construction Industry Training Board in its education and engagement programme.

However. The “Building the Future” report highlighted that qualifications have not matched progress, particularly around the development of energy efficient housing.

Our proposed ten-year strategy should include a particular focus on investing in workers in Wales to ensure they are highly skilled and able to grasp the opportunities offered by retrofitting at scale and building new energy efficient homes. Two thirds of all construction workers are trained and retained by SMEs in Wales. 97% of apprenticeships are in the SME sector. The importance of this sector must be reflected in an approach to develop skills.

⁷² Welsh Government written evidence

⁷³ CCERA meeting, 4 July 2018, para 139

Investment in training provision, and the equipment necessary to carry out this training effectively, is an important investment in the “Foundational Economy”.⁷⁴ The foundational economy is a term for the businesses and services we use everyday which are a crucial part of our economy.

Training providers told us of that certainty of policy direction will result in increased demand for specific skills and increased investment in their acquisition. Our recommendation for a ten-year strategy provides this certainty.

The Committee would also like to see a clearer picture of the extent to which the construction sector relies on European labour. The danger of a skills shortage as a result of Brexit is something the Welsh Government says it is aware of, but all those in the supply chain, as well as the Committee, would benefit from seeing an assessment of the impact of this.

Recommendation 7. Training and skills should be central to the Welsh Government’s long-term low carbon housing strategy. The Welsh Government must ensure there is sufficient investment in training provision and appropriate equipment needed to undertake the training.

Recommendation 8. The Welsh Government should report to the Committee within 12 months on the measures being put in place to ensure the construction sector has the appropriately skilled workforce to deliver its targets for energy efficient homes.

Recommendation 9. The Welsh Government should report to the Committee within 12 months with an assessment of the impact of Brexit on skills and labour supply in the construction sector.

⁷⁴ www.bevanfoundation.org/commentary/wales_foundational_economy/

6. Financial interventions and incentives

There are many ways to maximise available funding to deliver low carbon housing and potential financial incentives to support consumers to choose low carbon housing.

Incentives for buying homes

74. The Committee heard that financial incentives could be used to encourage take up of low carbon housing. For example, there have been attempts to reflect energy efficiency in mortgage lending. Chris Jofeh told the Committee:

“Mortgage companies are starting to look at what they can do to favour low-energy homes. ... There’s good evidence that ...other things being equal, an energy-efficient home is more valuable per square metre... than the same home.”⁷⁵

75. RSAW gave the example of the LENDERS tool, which allows buyers to predict householder fuel bills based on the property’s Energy Performance Certificate. In this way, better performing homes are more attractive to both lenders and buyers.⁷⁶

Financing retrofit measures

76. The Committee heard that 20% of the funding for the Nest and Arbed schemes comes from European funding, which will not be available post-Brexit.⁷⁷ The Cabinet Secretary accepted that although the funding in this area is already significant, it needed to be increased to meet the targets the Welsh Government has set itself.⁷⁸ She also said that the Welsh Government is looking into how to bring in greater financial incentives for private landlords to improve energy efficiency.

77. The Committee heard support for low cost or interest-free loans⁷⁹ for retrofitting energy saving measures.

⁷⁵ CCERA meeting, 24 January 2018, para 105

⁷⁶ <http://www.epcmortgage.org.uk/>

⁷⁷ CCERA meeting, 4 July 2018, para 15

⁷⁸ CCERA meeting, 4 July 2018, para 45

⁷⁹ CCERA meeting, 8 March 2018, para 72

78. David Thorpe suggested that waiving the VAT on retrofit measures would incentivise retrofitting by homeowners:

“We need full value added tax relief on decarbonisation measures applied to new and existing housing stock – that’s insulation materials and appliances, using renewable energy, doors, windows, and so on.”⁸⁰

79. However, Chris Jofeh argued that a policy which would result in less income for the Treasury was unlikely to be introduced.⁸¹ He suggested several schemes in Europe which could be used as a model, including in the Picardy region in France and in Gothenburg, in Sweden. He went on:

“I think Wales can learn a lot of lessons by discussions with those groups on how you win money for public funding schemes, and also how you make it easier for private home owners to do the work that’s necessary.”⁸²

80. The Committee also heard of the financing model for the Energiesprong initiative. The homeowner pays for energy efficiency improvements over a period of 30 years in the form of a performance warranty which guarantees the energy savings over that time period.⁸³

Evidence from the Welsh Government on financial incentives

81. The Minister for Housing referred to work being undertaken with mortgage companies to stimulate consumer demand for energy efficient housing, saying:

“I recently launched LENDERS, which is a new and very exciting way of people looking in terms of how to secure their mortgage... where people can look at what they think they can afford, but then take into account the energy performance of that home. So, by going for a home that has a better energy performance certificate, they’re able to have a larger mortgage.”⁸⁴

82. She said that the Welsh Government holds regular discussions with mortgage providers on how to provide access to mortgages for timber-framed

⁸⁰ CCERA meeting, 24 January 2018, para 12

⁸¹ CCERA meeting, 24 January 2018, para 12

⁸² CCERA meeting, 24 January 2018, para 24

⁸³ CCERA meeting, 28 February 2018, para 136

⁸⁴ CCERA meeting, 4 July 2018, para 77

and off-site manufactured homes. There had been a positive response to this in the social housing sector.⁸⁵

83. In terms of the suggestion that the Land Disposal and Transaction Tax should be used to incentivise energy efficiency via the housing market, the Cabinet Secretary told the Committee that consideration of this issue concluded that there was a likely case for action. However, she went on to say:

“we’ve decided that we need to have more targeted grants in the first place rather than changes to the land transaction tax. ... if further evidence does come forward that supports changes to taxation being a much more productive way to drive energy efficiency forward, then we would undertake a piece of work then.”⁸⁶

84. In response to the Committee’s calls for the Welsh Government to increase the scale and pace of new housebuilding in Wales, the Minister for Housing said the Welsh Government had pledged “to work alongside councils to get local authorities building again at scale and pace” and:

“one way in which we could do that is through work on the borrowing cap, and we’re in discussion with the Treasury in terms of raising the borrowing cap... for local authorities in Wales... we have, around £17 million unallocated in that borrowing cap ...so we’re looking to see how we can fairly distribute that in a way that does allow local authorities who are ready, willing and able to build to carry on doing so.”⁸⁷

85. The Welsh Government referred to the £40 million Stalled Sites Fund:

“There are already a number of measures we have in place to help assist SMEs in areas such as access to finance, innovation and collaboration. Our Wales Property Development and Stalled Sites Funds administered on our behalf by the Development Bank of Wales, are assisting developers with access to development finance across Wales ensuring that sites are being brought forward and delivered.”⁸⁸

⁸⁵ CCERA meeting, 4 July 2018, para 89

⁸⁶ CCERA meeting, 4 July 2018, para 182

⁸⁷ CCERA meeting, 4 July 2018, para 108

⁸⁸ Welsh Government written evidence

86. The Minister for Housing told the Committee of work done by Rhondda Cynon Taf and Welsh Government officials to develop “plot shops” for house building to support the self-build and custom build sectors.⁸⁹

OUR VIEW

Investing in low carbon housing saves money as well as energy. In order to increase the number of low carbon homes available, there has to be a financial gain for the purchaser – for instance, a better mortgage rate or reduced stamp duty. The Welsh Government should work with mortgage providers to incentivise better lending rates on more energy efficient homes. The Welsh Government should also re-examine the case for aligning the Land Disposal and Transaction Tax to the energy efficiency of a property. We now have a fiscal tool to potentially increase energy efficiency and reduce carbon emissions. We would like to see our powers in this area being fully utilised.

Investing in retrofitting measures must be made attractive for private homeowners and landlords. The Committee notes that much can be learnt from successful schemes, such as Energiesprong, and also from unsuccessful schemes such as the Green Deal.

Leveraging funding for energy efficient housebuilding is essential to make sure owners do not have to pay for expensive retrofit measures in years to come. The Committee believes there is merit in exploring the funding models that have already proven to be successful in Europe.

We heard of the Stalled Sites Fund and the Plot Shop to help SMEs bring forward sites to completion. However, there is no evidence to show that energy efficiency measures are taken into account in the allocation of funding for these projects. Unless this funding is contingent on the house reaching a minimum energy efficient standard then it will be a missed opportunity.

Recommendation 10. The Welsh Government should prepare and publish within the next 12 months a report on the options available to it to leverage funding to deliver low carbon housing at scale through both retrofit and new build.

Recommendation 11. The Welsh Government should work with major mortgage providers in Wales to incentivise preferential lending rates for low carbon homes and report back to this Committee within 12 months on progress.

⁸⁹ CCERA meeting, 4 July 2018, para 129

Recommendation 12. The Welsh Government should ensure that any funding to stimulate the housebuilding market, such as the Stalled Sites Fund, is contingent on the finished building being zero carbon in operation.

Recommendation 13. The Welsh Government should reexamine the case for aligning the Land Disposal and Transactions Tax to the energy efficiency of a property and report to the Committee on this within 12 months.

Key statistics from the Committee's survey of members of the public

When thinking about the type of home they'd like to live in 9 in 10 respondents to our survey felt that the affordability to rent or buy, and the running costs of the property were the most important factors.

67% felt that the environmental credentials of the property were important or very important, higher than the 64% who felt that the visual appeal of the property was important or very important.

“Warm and comfortable” (54.6%); **“Practical”** (49.5%); **“Cheap to run”** (43.9%)

These were the most common words chosen by respondents to our survey to describe their opinion of low carbon homes.

However, half of our respondents weren't sure if they felt that low carbon or zero carbon homes were attractive and 42% weren't sure if low carbon or zero carbon homes are affordable to buy or rent.

Annex: Evidence

Written evidence

This report is based on evidence presented to the Committee between Autumn 2017 and Spring 2018. The Committee published a call for evidence from 28 September until 23 November 2017. The written responses to the Committee's call for evidence can be found on our website:

<http://senedd.assembly.wales/mgConsultationDisplay.aspx?id=275>

Written responses were received from:

- ARUP
- Caerphilly County Borough Council
- Calon Cymru Network
- Calor
- Welsh School of Architecture, Cardiff University
- Centrica
- Community Housing Cymru
- Clive Coopey
- Elwy Working Woods
- Energy Saving Trust
- Federation of Master Builders
- Future Generations Commissioner for Wales
- Home Builders Federation Wales
- Modern Masonry Alliance
- Ofgem
- Passivhaus Trust
- Royal Society of Architects in Wales and Design Circle
- Sero Homes Limited
- SPECIFIC
- David Thorpe
- Welsh Local Government Association
- Woodknowledge Wales

Oral evidence

The Committee followed up issues identified in the written evidence by asking questions from policy makers, academics and those working the in the field. The following witnesses provided oral evidence to the Committee on the dates noted below.

A transcript of all Committee meetings is at:

<http://record.assembly.wales/Search/?type=2&meetingtype=444>

Date	Name and organisation
24 January 2018	Chris Jofeh, ARUP Joanne Patterson, Cardiff University David Thorpe Hugh Russell, Community Housing Cymru David Bolton, Melin Homes David Weatherall, Energy Saving Trust
15 February 2018	Roisin Willmott, Royal Town Planning Institute Andrew Sutton, Royal Society of Architects in Wales Neville Rookes, Welsh Local Government Association
28 February 2018	James Williams, Sero Homes Jon Bootland, Passivhaus Kerry Mashford, National Energy Foundation Alex Rathmell, National Energy Foundation

Date	Name and organisation
8 March 2018	Mark Harris, Home Builders Federation Ifan Glyn, Federation of Master Builders Cymru Donna Griffiths, Construction Industry Training Board Anthony Rees, Cyfle Building Skills Owen Jones, Cyfle Building Skills
26 April 2018	Lord Deben, UK Committee on Climate Change
4 July 2018	Lesley Griffiths AM, Cabinet Secretary for Energy, Planning and Rural Affairs, Welsh Government Rebecca Evans AM, Minister for Housing, Welsh Government