

# Building High Energy-Performing New Homes

*Workshop*

4<sup>th</sup> November 2014

# Welcome and Introduction

# HEP Homes project: An overview

- Understanding the opportunities and challenges of building new homes to a high energy performance standard
- Involves extended interaction with major housebuilders, social housebuilders and the businesses which support them, as well as local authorities

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- SEMLEP-funded project, introduced through PDIIDG
- Run by NEF, including a team of energy specialists working on domestic and non-domestic performance (both new build and retrofit)

# HEP homes project: timeframes

- Runs September 2014 to early 2015
- Extended engagement through PDIIDG group, *including*
  - Interim presentation to group at meeting in November
  - Further interaction with developers towards the end of the year
  - Report delivered in early 2015
  - Final presentation to group in early 2015

# The National Energy Foundation

- National charity, operating since 1989
- Focus on '*Improving the use of energy in buildings*' – particular emphasis on reducing the performance gap between 'as-designed' and 'as-built'. This is commonly a difference of around 2.5 times, but it is not unknown for buildings to be 7.5 times as-designed performance.
- Based in Milton Keynes with projects active around the south of England – especially in Buckinghamshire and Oxfordshire

# Benefits for participants

- Shape the issues which the project targets
- Share views on the challenges which are most crucial to the sector – and begin to propose solutions to them
- Achieve the engagement of your organisation as a stakeholder to the process

# The purpose of the workshop

- Input on-the-ground knowledge and expertise from the sector
- Gain preliminary observations on the ways that issues could be tackled
- Identify and prioritise the key issues

# What do we know? Building high energy-performing new buildings



# National context: EU regulation

## EU Energy Performance of Buildings Directive (2010/31/EU)

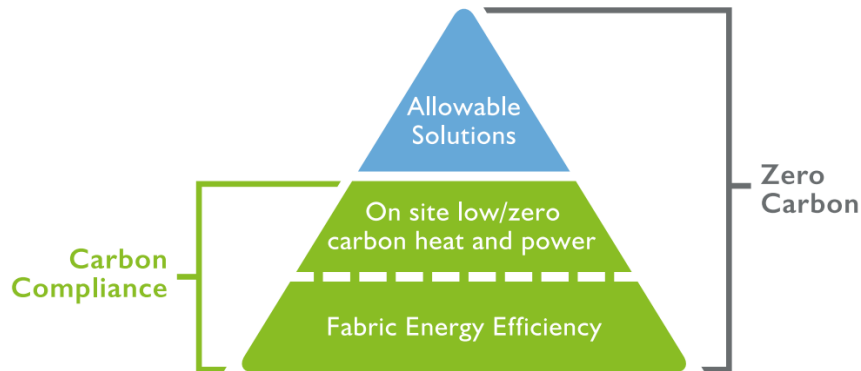
“1. Member States shall ensure that: (a) by 31 December 2020, all new buildings are nearly zero-energy buildings; and (b) after 31 December 2018, new buildings occupied and owned by public authorities are nearly zero-energy buildings.”

“[..]‘nearly zero-energy building’ means 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.[..]”

# National context: regulation

UK 2007 policy: 'from 2016 all new homes must meet Zero Carbon Standard'

Lots of discussion about definition of 'Zero Carbon'



*Proposed Zero Carbon Hub definition*

# National context: regulation

- Anticipate that the 2016 policy will be delayed, although it remains unclear – likely to have more information after the next election
- Allowable Solutions likely to have a big role to play in the delivery of nearly zero carbon buildings
  - Mechanism by which ‘final’ unresolvable emissions from new homes are offset by implementing measures on existing properties which reduce their emissions – therefore leading to a ‘net zero’ outcome

# National context: funding

- Major political pressure on house prices – affordability of both energy and housing is a major cross-departmental issue in government
- The HCA: various funding options provided for new housebuilders, *including*
  - Housing Zones and loan finance £200m
  - Builders Fund
  - Affordable Homes Programme
  - Large Sites Infrastructure Programme

# Housebuilding in SEM: the current picture

- Intention to increase the total number of properties built in the region.  
*Why?*
  - House prices are an average of £215,000
  - An average of 7 times average annual incomes
  - Increase in proportion of renters, particularly amongst younger residents
  - Housing benefit bill is ballooning – 150% increase in 20 years up to 2013/14
- Local Growth Deal
  - £79.3 secured by SEMLEP - £30.6m in 2015/16 and £23.9m in 2016/17, with £40m of additional funding from local partners and the private sector. Aiming through this to support 3,000 new jobs and 4,000 new homes.

# Housebuilding in SEM: Aims for coming years

- 86,000 new homes by 2021
  - Equates to 11,000 per annum
  - Recent numbers have been around half of this, but gradual improvement: predicted to be closer to 30% short of target in 2014/15

# Housebuilding in SEM: funding

- HCA supported projects: 'Large Sites Infrastructure Funding' across the country, including 7 shortlisted schemes within SEM and 2 schemes in reserve
- Help to Buy: £197m delivered across SEM region (5,000 properties) in FY13-14 with anticipated numbers significantly higher in FY14-15 – early comparisons suggest this will occur

# Housebuilding in SEM: who is building?

- Local authorities
  - SEMLEP contains 11 local authorities
- Private sector developers
  - 12 of the biggest 33 developers have a central or regional office in SEM
- Housing associations
  - 52 ‘major’ social housing providers are registered as based in the region
- Private individuals/v. small scale housebuilders



# Housebuilding in SEM: the role of the LEP

- Catalyse and support the development of a greater number of new properties, including working with LAs and developers. Realising benefits for the region, *including*
  - More jobs in building industry
  - Increased skills base
  - More capacity to accept population growth: rebalancing supply and demand which encourages potential population to base itself in the region
  - Employment opportunities for incoming and expanding population can be filled
  - Positive impact on quality of life, families and communities

# The housebuilding process: cross-cutting themes

Taken from Zero Carbon Homes project

- Knowledge and skills
- Responsibility
- Communication

# Issues: major observations (1)

Taken from Zero Carbon Homes project

- Homes currently being built to a standard which involves, typically, 2.5 times more energy when completed compared to the building as-designed. It is not uncommon for buildings to require 7.5 times their planned energy use
- The biggest issues are often process-related, arising from outside effects on projects during development – i.e. changes are made without considering the potential negative impact on efficiency performance
  - E.g. Window or insulation specifications are changed whilst on-site and this has an effect on the overall building envelope when complete
- Approach to building and testing does not take in to account dynamic effects of new buildings
- Lack of independence amongst assessors – ‘cosy relationship’ identified with builders and on-site teams

# Issues: major observations (2)

Taken from Zero Carbon Homes project

- Questions about the quality of verification processes: ‘as-built’ should be meaning *actual* performance, not *indicative* performance. The consistency and accuracy of data and its analysis is also an issue.
  - Additional concerns about knowledge of assessors
- Poorly integrated design: materials, processes and methods are not synchronised to maximise potential
- Interactions between specialists on-site (handovers, changes to teams, etc) are not sufficient to ensure performance
- Quality of fabric installation is below needs required, or the commissioning of the service is poor, including a poor handover
  - Limited interactions between builder and resident is meaning that best practice and optimisation is not being handed over

# Issues: major observations (3)

Taken from Zero Carbon Homes project

- SAP calculations too simplistic and not capturing ‘whole building’ performance, but just aspects of it. No overall end-of-line energy performance quality and outcome test, recognised by industry and public

## *Broader issues*

- Slow culture of change amongst building sector: ‘watch and wait’ attitude
- Perceived limit to demand amongst the public for better performing homes
- Market is obsessed with margins, creating a stifling of innovation or differentiation
- Limit to knowledge and skills throughout the process
  - Training and development within building trade amongst the lowest of any profession

# Opportunities: initial observations

- Lots of opportunities to host and develop the industries which will support the development of better homes – and especially homes built in new ways
- Energy planning is now a major issue for many local authorities as well as the central government: any methods which reduce demand or make the use smarter – e.g. more even demand spread over time, less likely to surprise in as-built against as-designed, etc
- A premium put on homes which perform better: ‘zero carbon homes’ ring bells with some buyers

# Summary

- Performance (designed vs. built) difference is very significant
- Regulation is slipping, although trajectory is gradual improvement

# Introduction to workshop



# The workshop: stages (1)

1. Write up to 4 'big challenges' which you perceive as the biggest barriers to building high energy-performing new homes
2. Feed back the challenges – facilitators cluster these in to identifiable groupings
3. The 4 of the most prevalent clusterings are identified by the group
4. Select one of the 4 to discuss in one of the small groups
5. Within your group, list all the main issues associated with that clustering (be as extensive as you'd like)

## The workshop: stages (2)

6. Pick 4-8 of what your group considers the biggest issues
7. Rank those (from 1-to-x) depending on their significance (1 being most significant)
8. List the 'need to have' actions from any relevant stakeholders in order to improve performance
9. Prioritise 3 to 5 of these and rank also
10. Very briefly, give feedback to group – particularly the priority 'need to have' – explain why these have been chosen

# Outcomes from today

- Identify what key members of the housing development community think are the most crucial issues to tackle in this area
- Begin understanding the processes which will be required to improve the situation
- Input initial learning to inform our feedback to the PDIIDG group – and in the final report to be delivered

Break

# Workshop

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## Next steps



# HEP homes: next steps

- Feedback findings to the PDIIDG group at its meeting on the 20<sup>th</sup> November
- Conduct further research through in-depth interactions with relevant stakeholders over the next couple of months
- Allow all stakeholders the opportunity to provide comment and participate throughout – contact NEF
- Continue preparation of the report in time for publication in early 2015

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