David Adams Zero Carbon Hub

The direction of travel to Zero Carbon new homes from 2016

ZERO

HUB

CARBON

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Trajectory

- Avoiding cul-de-sacs
- Dates and time line
- What about the exiting stock?



Trajectory





ZC Energy Efficiency



Principles

- Backstop performance
- •EST Advanced standard
- •Passiv Haus







Example – High Fabric Performance



Wall = $0.15 \text{ W/m}^2\text{K}$



Carbon compliance



Principles

- Minimum energy efficiency & onsite LZC
- Directly connected LZC heat from offsite
- But not directly connected power from offsite





some dates.....

Summer 08 Renewables consultation Autumn 08 Definition of Zero Carbon Autumn 08 Zero Carbon Non Domestic buildings consultation Autumn 08 Heat consultation Beta version of SAP 2009 Spring 09 Summer 09 Consultation on Part L 2010 (25%) Summer 09 Feed In Tariff consultation Spring 2010 FIT introduced Summer 2010 Renewable Heat Incentive consultation Spring 2010 **RHI** introduced 2010 Part | 25% 2012 review of allowable solutions Part L: 44% 2013 2012-15 Detailed regulations / procedures

2016 New homes to be zero carbon (transitional arrangements TBD)



More dates.....

- Wales target changed recently, now zero carbon (Level 5) by 2011. Climate Change Commission being established to drive towards this target
- Scotland Sullivan Report recommends phased approach to net zero carbon (Level 5) by 2016/2017, if practicable
- Northern Ireland Code Level 3 for social housing from April 2008



What does 2016 mean?





ZC Hub – Time line

Zero carbon homes delivery time line



| Apr 09 ir | nitial update | | | | | | | | | | | | | | | | | | | | |
|-----------|---|------|-------------|-------------------|------------------|--------------------|-----------|-----------|--------------|-----------|------------|-------------------|------------------------|--------------|-------------|------|------|-----------|----------------|------|----------------|
| ltem | Description | 2007 | 2008 | | 20 | 09 | | | 2010 | | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 |
| | | | | Q1 | Q2 | Q3 | Q4 | Q1 | <u>q2 q3</u> | 3 Q4 | <u> </u> | İ | | i | İ. | | | i I | | | I |
| 1 | Micro-gen performance modelling tools and validation | | | | | | | | | | | | | | | | | | | | |
| 2a | Definition of zero carbon | | | | | | | | | | | | | | | | | | | | |
| 2b | Definition of minimum Energy Efficiency | | | | | | | | | | | | | | | | | | | | |
| 3a | SAP 2009 Development / validation / iteration | | | | | | | | | | | | | | | | | | | | |
| 3b | SAP 2009 coding and public release | | | | | | 3a | | | | | | | | | | | | | | |
| 3c | Indicative SAP 2016 dev / coding / public release | | | | | | | | | | | | | | | | | | | | |
| 4 | LZ Carbon Prototypes (SAP 2005) | | | | | | | | | | | | | | | | | | | | |
| 5 | LZC Pre-production build - (SAP 2005) | | | | | | | 4 | | | | ļ | | | | | | | ¦ | | ¦ |
| 6 | Firm design / systems integration (SAP 2009) | | | | | | | 1, | 2b, 3b | | | | | | | | | | | | |
| 7 | LZ Carbon Prototypes (SAP 2009) | | | | | | | | | 4 | | | | | | | | | | | |
| 8 | Planning (due to SAP 2009 / Min Energy Efficiency changing house design) | | | | | | | | | | 6 | | | | | | | | | | |
| 9 | ZC Pre-production build (SAP 2009) | | | | | | | | | | | | 7 | | | | | | | | |
| 10 | Monitoring / validation | | | | | | | | | | | | | | | | | | | | |
| 11 | Integrating learning from monitoring | | | | | | | | | | | - | | | | 9 | | | | | |
| 40 | Discomination of loans's a | İ | | | | | | | | | j | : | | : | i | | | : | Des desti | | : |
| 12 | Dissemination of learning | i i | | | | | | Pre-prodS | AP05 / Pro | ototvo SA | | 1 | P | re-productio | on (SAP 200 | 9) | | 1 | Production | | 1 |
| 13 | Build consumer demand | EPCs | CfSH rating | | | | | | | | | | 7 | | | | | | | | |
| 14 | ZC Production building (Zero Carbon) | | | Public Private | funde e level | d 44%re 25% ree | edn dn | | | | | Public Private | funded Z0 level 44% | ? redn | | | | | | | |
| MS | Building regulations - Zero net carbon | | | | | | | | | | ļ | ļ | | | | | | İ | ļ | | ļ |
| | | | Critical | Path | | Slippag | je | | Overun | 1 | Significar | nt activity | | Moderate a | activity | | 1 | | | | |

Zero carbon homes delivery time line

Apr 09 initial update

| Item | Description | 2007 | 2008 | 2009 | | | | | 2011 | | | |
|------|--|------------------|-----------------|----------------------|----|----|----|---------|----------|------------|--------|----------------|
| | | | 1 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | 1 |
| 1 | Micro-gen performance modelling tools | | | | | | | | | | | i İ |
| | and validation | | | | | | | | | | | |
| 2a | Definition of zero carbon | | | | | | | | | | | i I |
| 2b | Definition of minimum Energy Efficiency | | | | | | | | | | | |
| 3a | SAP 2009 Development / validation / iteration | | | | | | | | | | | |
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| 3с | Indicative SAP 2016 dev / coding / public release | I I I I | ! | | | | | | | | | ! |
| 4 | LZ Carbon Prototypes (SAP 2005) | | | | | | | | | | | |
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| 6 | Firm design / systems integration (SAP 2009) | | | | | | | | 1, 2b, 3 | b | | |
| 7 | LZ Carbon Prototypes (SAP 2009) | | | | | | | | | | 4 | |
| 8 | Planning (due to SAP 2009 / Min Energy Efficiency changing house design) | | - | 1 | | | | | | | | 6 |
| 9 | ZC Pre-production build (SAP 2009) | | | | | | | | | | | |
| 10 | Monitoring / validation | | | | I | | | | | | | |
| 11 | Integrating learning from monitoring (SAP 2009) | ı | | | | | | | | | | |
| 12 | 12 Dissemination of learning | | | | l | | | Pre-pro | odSAP05 | o / Protot | VD SAP | |
| 13 | Build consumer demand | EPCs | CfSH rating | ļ | | | | | | | | |



ZC Hub – Work groups

Include:

- Costs of zero carbon Homes
- Time line to zero carbon
- Carbon compliance assumptions (SAP)
- Post Occupancy Evaluation Protocol
- Allowable solutions verification
- Minimum Energy Efficiency
- Distributed energy

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Existing homes.....



UK CO2 emissions by sector

Figure 1.2: UK CO $_2$ emissions by sector to 2050 on an 80% emissions reduction path⁹





Heat and Energy Saving Strategy (HESS)

Box 1.2: Indicative pathway to 2050

- **2015** All lofts and cavity walls will be insulated, where it is practical to do so and the householder wants it. Capacity to deliver more substantial measures in volume is developed and proven.
- **2020** Up to 7 million homes will have had the opportunity to take up more substantial 'whole-house' changes. These packages will go beyond the simple loft and cavity wall insulation measures to include things like solid wall insulation or small-scale renewable energy generation.

All homes to have smart meters.

- **2030** Our aim is that all homes and other buildings will have received a package that covers all of the cost-effective measures available for that property at the time.
- **2050** Emissions from buildings are as close to zero as possible.



What it means to housebuilders?

- New build will become increasingly differentiated from existing
- Find ways of marketing benefits to homebuyers
- Find ways of making zero carbon pay
- Technically more difficult
 - New detail designs / designs
 - Construction practice becomes critical
 - New applications of old products
 - New products
- Selling 'an easier option' for homeowners than existing...?



What it means to suppliers?

- New construction techniques
 - Detail design
 - Product selection
 - Whole house design
- Relative competitive performance of products
 - SAP
 - Actual performance
- Understanding the "whole house implications"
- Supporting house builder learning
- Developing the supply chains
- business opportunity and risk



Thank you

David Adams