ZERO CARBON HUB

NEIL JEFFERSON

AGENDA

- Definition
- Fabric Energy Efficiency Standard
- Carbon Compliance Standard
- Consumer engagement
- Skills and training

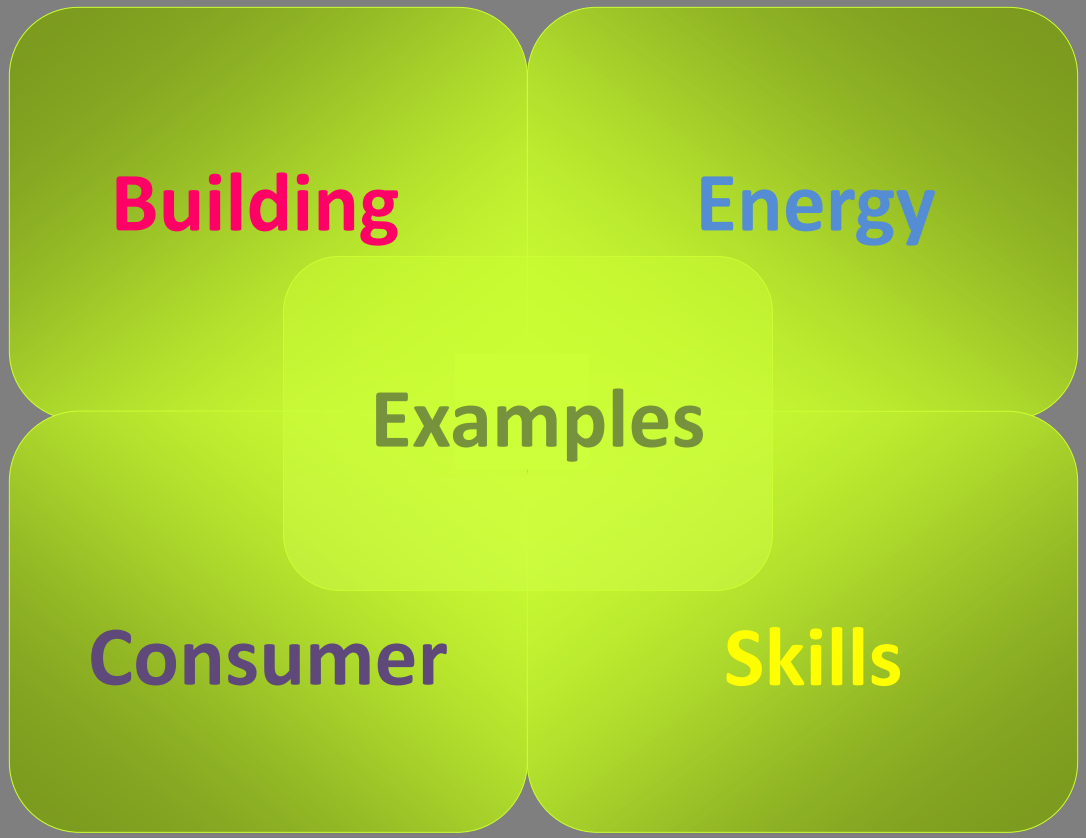
ROLE OF THE ZERO CARBON HUB

PURPOSE AND STRATEGIC OBJECTIVES

Facilitate the mainstream delivery of low and zero carbon homes

- Provide leadership and create confidence
- Reduce risk and clear obstacles
- Disseminate information

FIVE WORKSTREAMS



INTERNATIONAL PERSPECTIVE

CITY PERSPECTIVE

EXAMPLES

The BASF House

Level 4 Code for Sustainable H

CO2 emissions: At least 44% redu
Developer: BASF
Architect: Derek Trowell Arc
Completed: January 2008
Location: University of Nott

LZ CARBON PROFILE
Profile: 009
June 2009

Miller Homes Miller Zero Housing Project

Level 6 Code for Sustainable Homes

CO2 emissions: Targetting 148% reduction over Part L2006
Developer: Miller Homes Ltd
Architect: Fraser Brown MacKenna Architects
Completion: Expected May/June 2009
Location: Basingstoke, Hampshire

The Miller Homes Miller Zero housing project comprises homes complying with Code levels 3, 4, 5 and 6. The development is an R&D project aimed at showcasing how these various code levels dwellings can be produced and the implications for the supply chain.

The level 6 house is a two-storey 4-bedroom house with a floor area of 105m². It uses products that are available on the market and aims to put them into functional use while demonstrating that zero carbon housing can be achieved today.

Low-carbon approach

Fabric The walls are fabricated from storey high aircrete concrete planks. An advantage of using this system is that due to the large size of the planks and the thin joint mortar, there are fewer smaller joints through which air can leak, thus creating a more airtight envelope. Another advantage is their high thermal mass, which provides passive heating and cooling throughout the seasons. Exterior insulation minimises heat losses through the building envelope and through reduced thermal bridging.

Heat and power generation All heat and power generation comes from renewable resources. These include a biomass boiler connected to under floor heating and a hot water cylinder for maximum efficiency. A large photovoltaic array on the roof provides power.

Ventilation The house uses a mechanical ventilation system with an in-built heat recovery unit and summer by-pass option.

Southdale H

Level 3 Code fo

CO2 emissions: A
Developer: S
Architect: N
Completed: J
Location: W

LZ CARBON PROFILE
Profile: 011
June 2009

Adelaide Wharf

Ecohomes Excellent

Developer: First Base
Architect: Allford Hall Monaghan Morris
Completed: October 2007
Location: Shoreditch, East London

Adelaide Wharf is a development of 147 mixed tenure apartments in one 6-storey block, ranging between one and four bedroom flats, and 700 m² of office space. There are 73 flats for private market, 41 shared ownership for key workers, and 33 social rented.

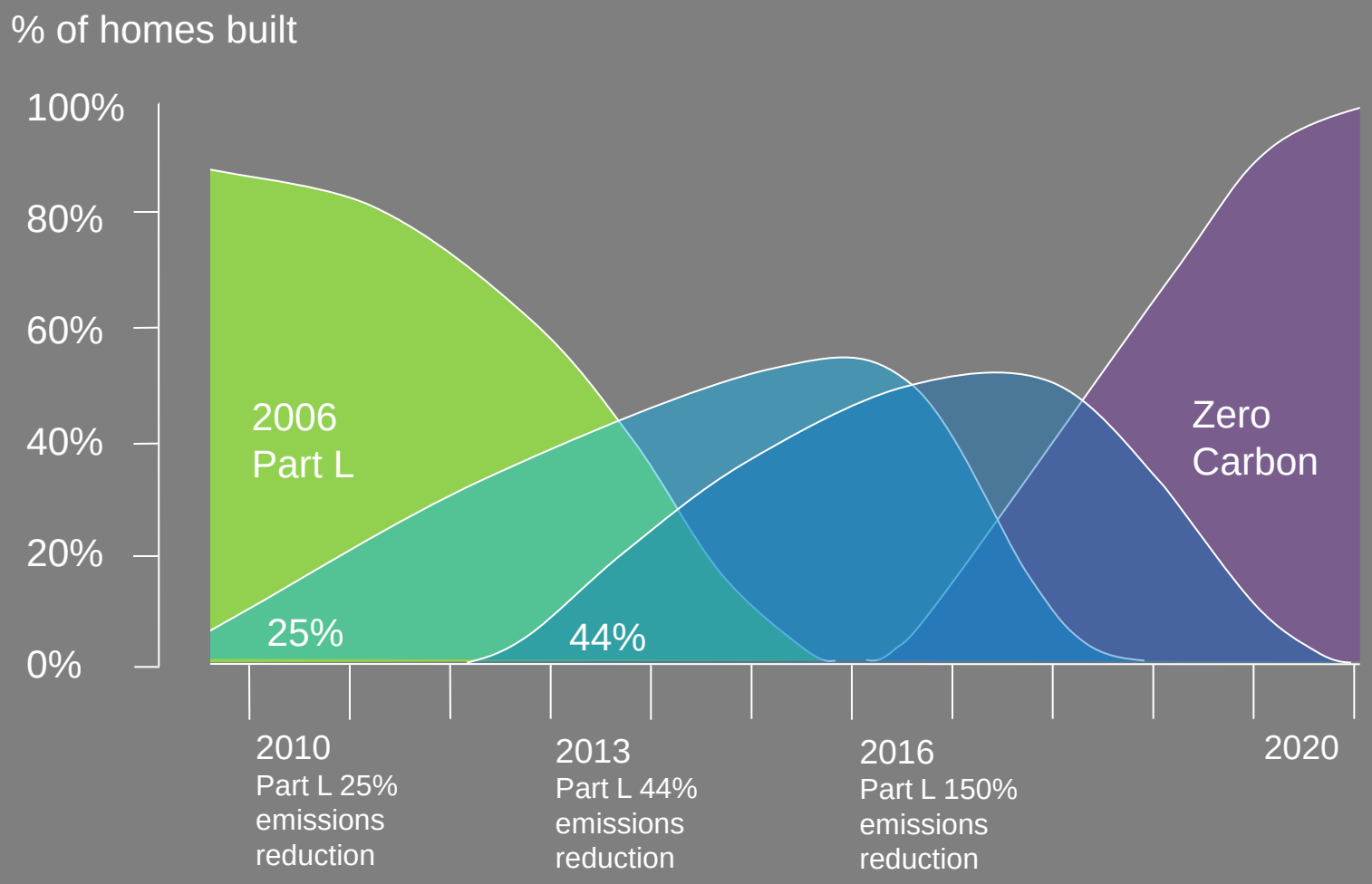
Typical office building technologies have been utilised with a concrete frame clad with a unitised cladding system, which was craned from delivery trucks directly on to the building without the need for scaffolding. Pre-fabricated bathroom pods, plant rooms, balconies and dry lined internal partitions were also used. The developer calculates the project's design efficiency saved six months of construction time.

Low Carbon Approach

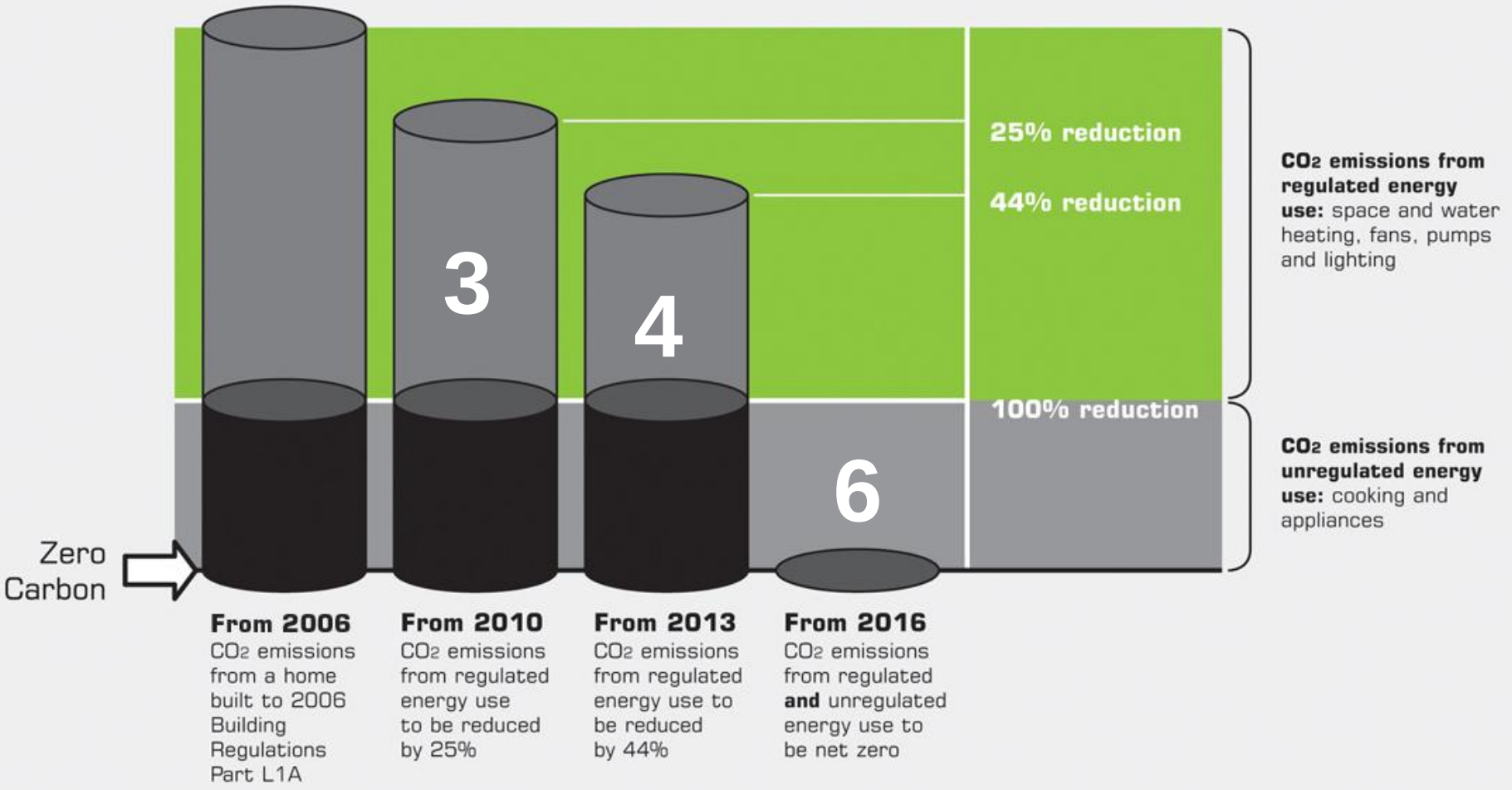
Fabric A concrete frame construction was used with insulated unitised cladding panels interlocked to provide a high level of thermal performance, reducing energy consumption.

Heat and power generation A centralised gas-powered heating system, using gas condensing boilers, provides energy-efficient heating and hot water for each apartment through localised heat exchangers.

THE JOURNEY TO ZERO CARBON



THE JOURNEY TO ZERO CARBON



DEFINITION

The Zero Carbon Hierarchy - a workable definition.

ZERO CARBON DEFINITION

WHERE ARE WE NOW?

Summary:

- A Hub-led Task Group has developed a minimum Fabric Energy Efficiency Standard (FEES), now included in the Code for Sustainable Homes.
- Carbon Compliance (energy efficiency + on-site renewables) being investigated by two Hub-led Task Groups this year.
- Allowable Solutions - awaiting further Government announcement on policy.

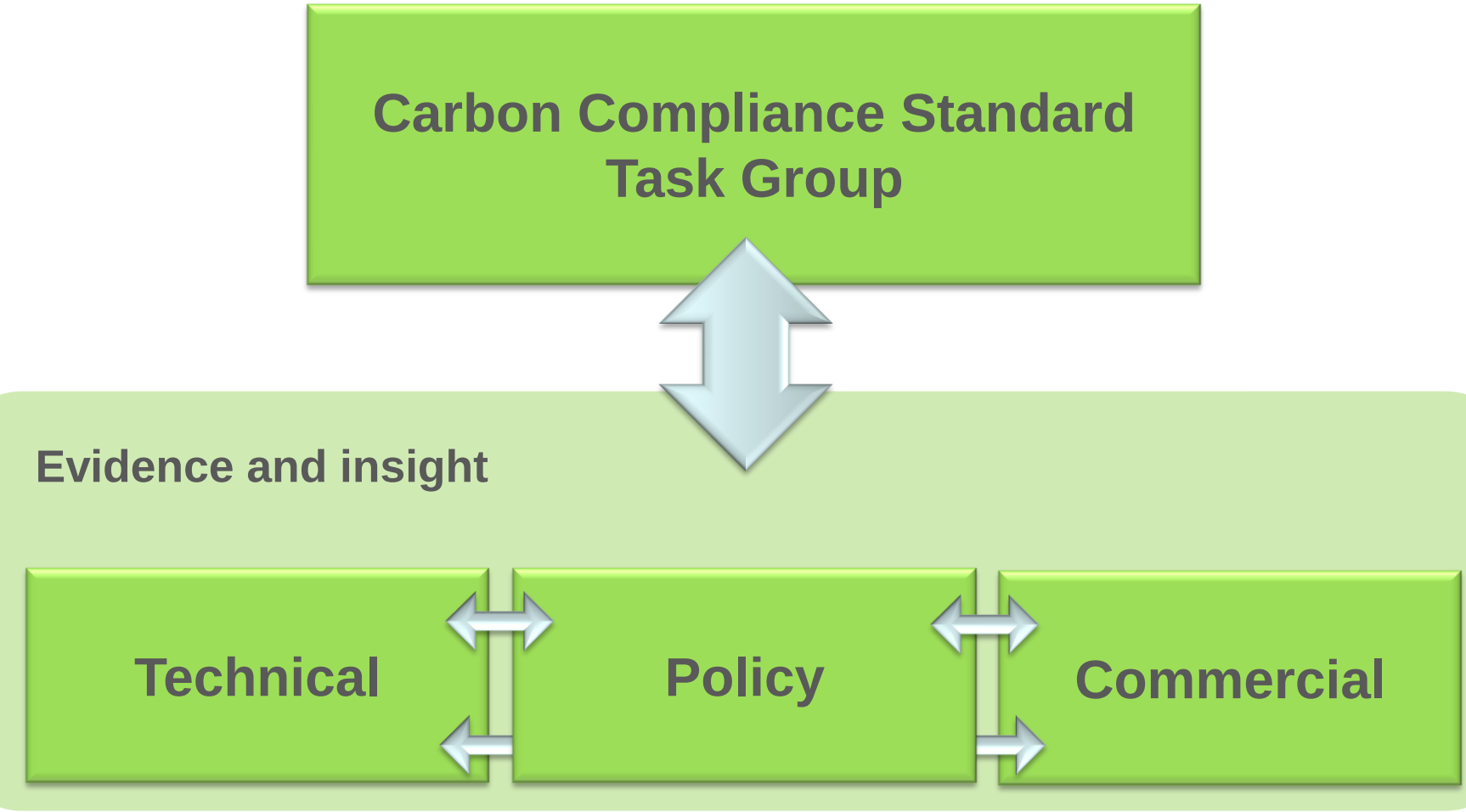
CARBON COMPLIANCE STANDARD

TASK GROUP STRUCTURE

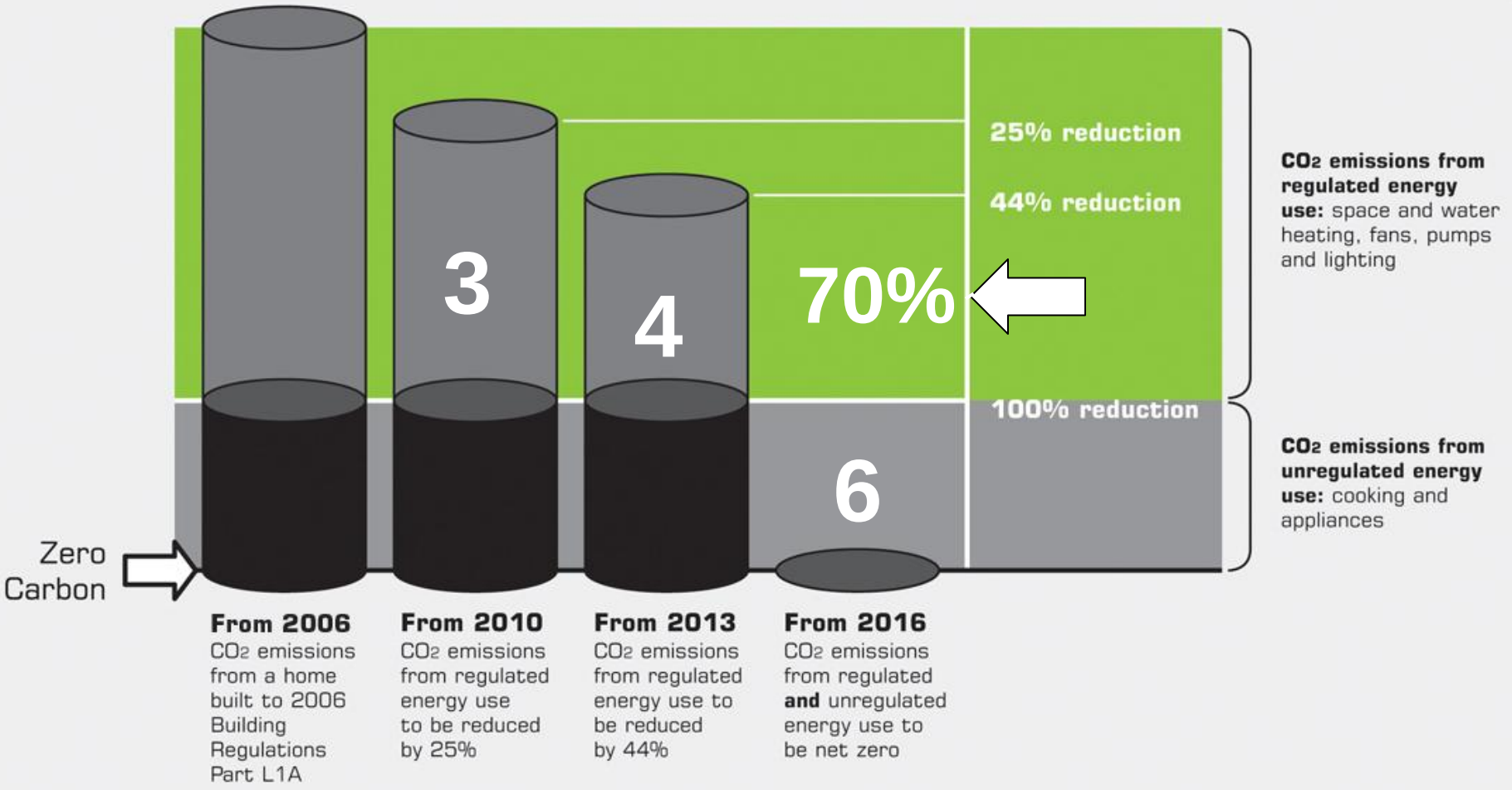
Carbon Compliance Standard Task Group

HBF	WWF	REA	LGA
RIBA	UKBCSE	CPA	HBA
AECB	UKGBC	EST	FMB
LDA	LABC	NHBC	GHA
CHPA	HCA	CF	Consultants
Observers:	DCLG	DECC	BIS
HMT	SG	WAG	

TASK GROUP STRUCTURE



THE JOURNEY TO ZERO CARBON



TASK GROUP JOURNEY

10 Sept

Meeting - 1

TG Scope and Structure

5 Oct

Meeting - 2

Process and Evidence Gathering Review

21 Oct

Meeting - 3

Initial Evidence Review

02 Nov

Meeting - 4

Further Evidence Review

18 Nov

Meeting - 5

Refining the Range for Consultation

9 Dec

Meeting - 6

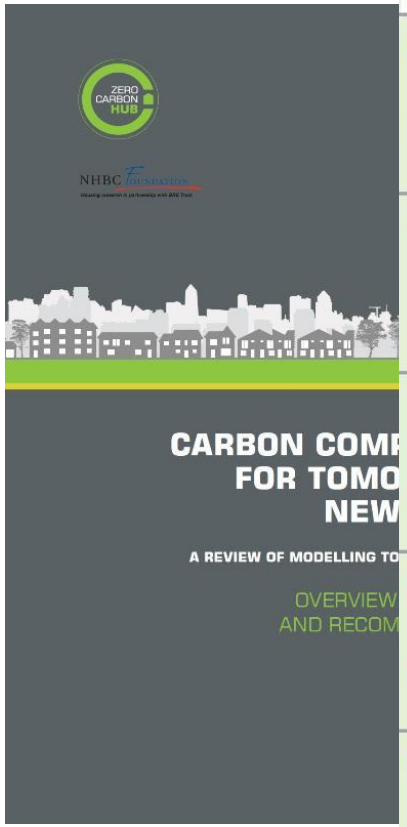
Determining the Recommendations

‘HAVE YOUR SAY’ CONSULTATION EVENTS

www.zerocarbonhub.org

- 30 November – Manchester
- 1 December – London
- 2 December – Milton Keynes

CARBON COMPLIANCE ASSUMPTIONS



OVERVIEW

Overview of findings and recommendations

The Task Group's summary of the Topic Work Group reports

TOPIC 1

Carbon compliance tools considerations

Looking at modelling tools currently available both here and abroad and considering key characteristics, what they assess and the trade off between accuracy and ease of use.

TOPIC 2

Carbon intensity of fuels

Considering the implications of, and an appropriate response to, the changing carbon intensity of electricity and other fuels.

TOPIC 3

Future climate change

Setting out how projected national and local climate changes could affect energy demand. Exploring for example how the compliance tool should embrace overheating risk.

TOPIC 4

Closing the gap between designed and built performance

How the compliance tool should accommodate (and help reduce) any performance gap between design performance and what is achieved on site.

TOPIC 5

How the performance standard should be expressed

This looks at whether carbon compliance should be expressed as an improvement versus a notional building (as now) or in absolute terms (kg CO_2 emissions per unit area).

TECHNICAL: MODELLING OUTPUTS

CARBON TARGET = 14 $kgCO_{2(e)}/m^2/yr$

Target = 14	Mid Terrace House						
	Inst. Electric (i)	Gas combi boiler (i)	Gas boiler (i)	ASHP (i)	GSHP (c.)	Biomass boiler (c.)	Gas CHP (c.)
FEES - Borders							
FEES - East Pennines							
FEES - Thames							
FEES - South West							
Spec C - Borders							
Spec C - East Pennines							
Spec C - Thames							
Spec C - South West							

Individual solutions

Communal solutions

Key

Area of PV required, as percentage of Ground Floor area:

None	0% - 25%	25% - 40%	40% - 60%	60% - 80%	> 80%

TECHNICAL/COMMERCIAL
FEASIBILITY MATRIX

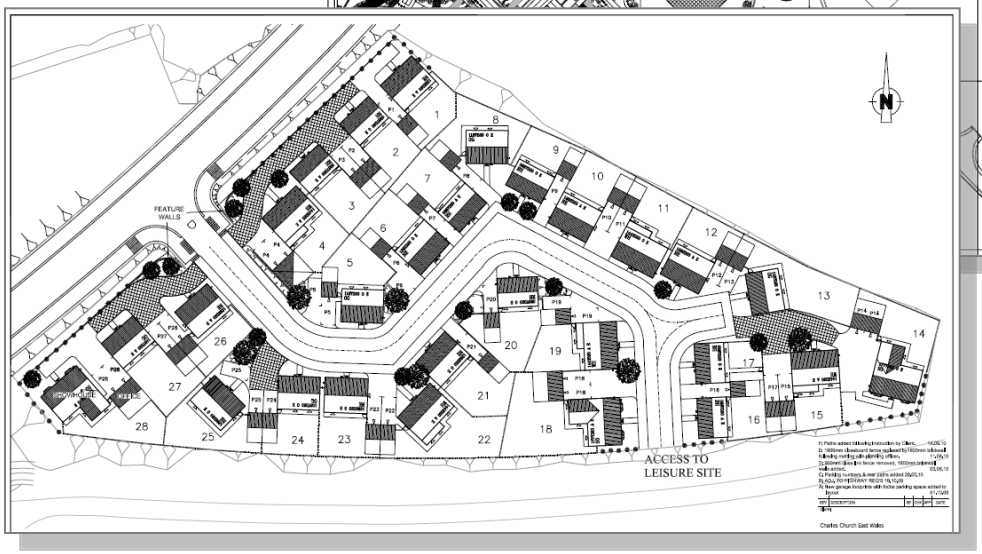
COMMERCIAL
DEVELOPMENT SCENARIOS

- **Dwelling versus development**

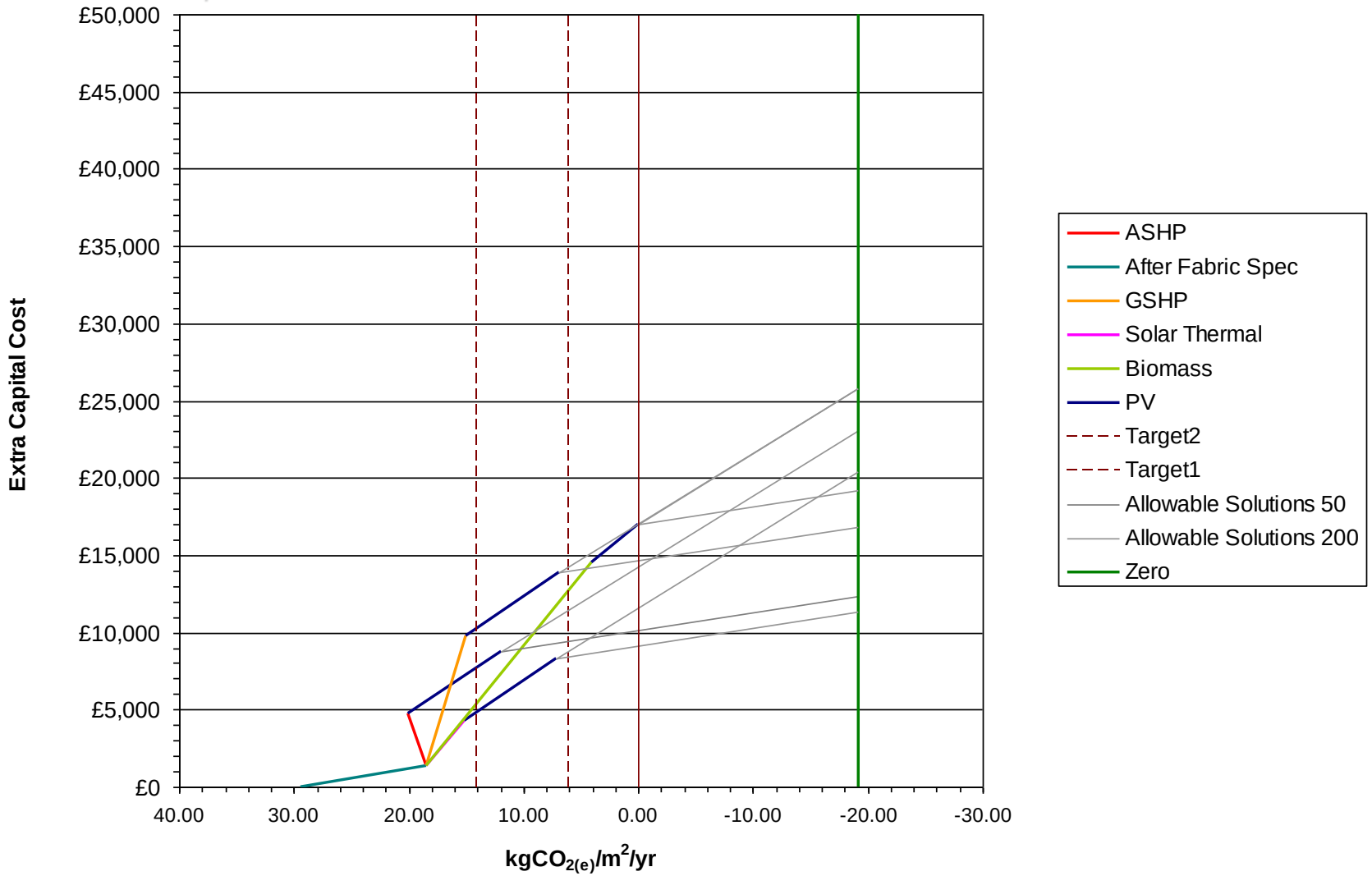
  Single dwelling provides limited understanding
  Greater context at development level
  Illustrative examples from industry
  Each with typical constraints and challenges

- **Scenarios at present**

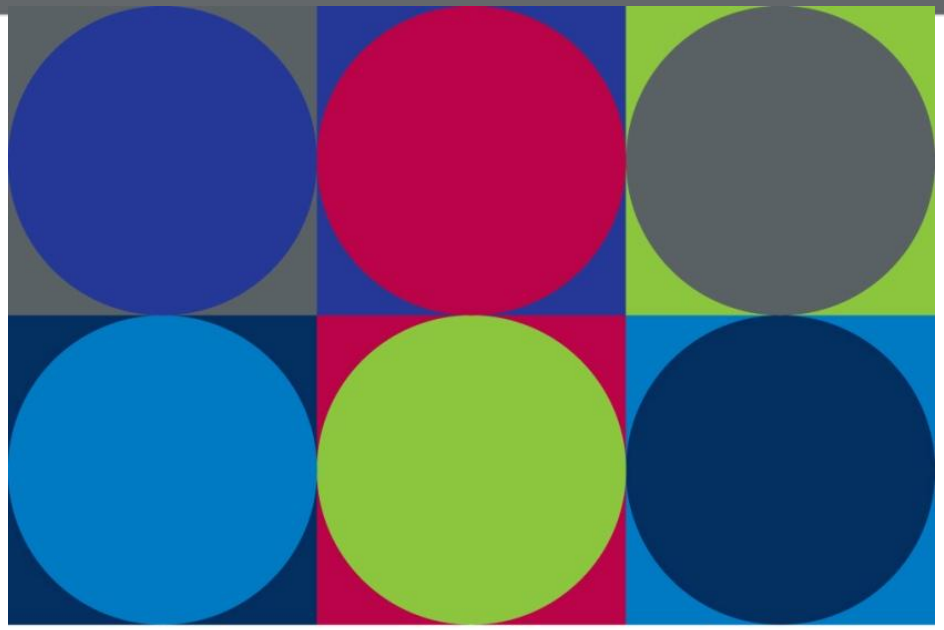
  Low density and high density
  Small (1 – 10)
  Medium (50 - 250)
  Large (500 +)



COST - £/tCO$_2$


Mid Terrace House East Pennines FEES 0.25PV
Extra Capital Cost
£50,000
£45,000
£40,000
£35,000
£30,000
£25,000
£20,000
£15,000
£10,000
£5,000
£0
40.00
30.00
20.00
10.00
0.00
-10.00
-20.00
-30.00
kgCO2(e)/m2/yr
ASHP
After Fabric Spec
GSHP
Solar Thermal
Biomass
PV
Target2
Target1
Allowable Solutions 50
Allowable Solutions 200
Zero

ZERO CARBON HUB



Home Building Skills

an action plan to 2020

homebuilding-skills.com

SKILLS AND TRAINING

FIRST EVENT AIMED AT PLANNERS AND BUILDERS

- 24 November 2010
- HG Wells, Woking
- £35+VAT
- SOLD OUT

Nearer to zero

Planning for zero carbon homes from 2016

ZERO CARBON HUB

NEIL JEFFERSON