Technology & investment strategy for energy efficiency

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HEAT & SHIFT Conference Expo
Cambridge, 2 December 2010
http://cir-strategy.com/events/

Delivering low carbon energy technologies and supporting economic growth

by .....

Building Partnerships

Delivering Innovation

Sharing risk

Informing Policy

Creating Affordability

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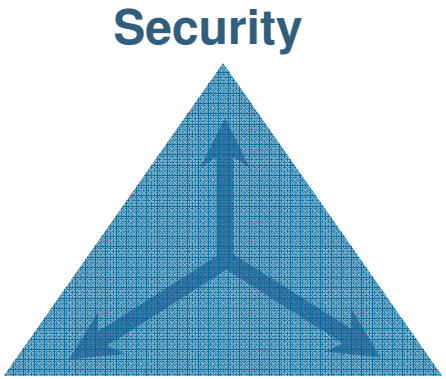
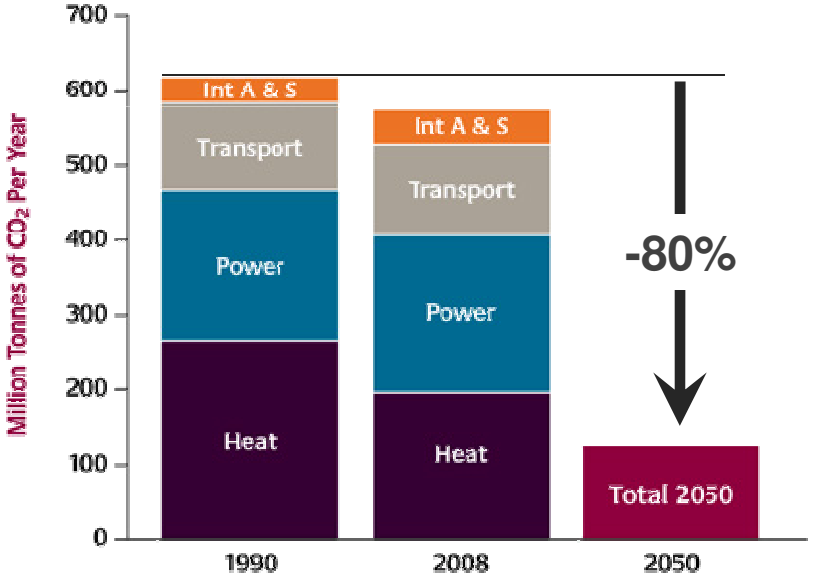
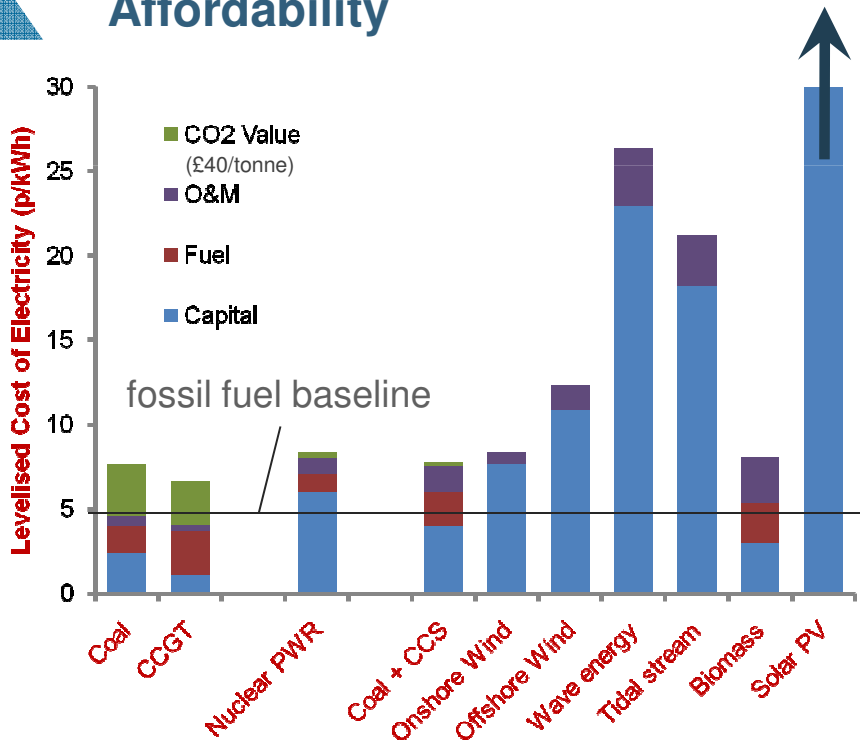
Addressing the UK's energy challenges





Int A & S = International Aviation & Shipping

DUKES data



Addressing the UK's 2020 and 2050 energy challenges requires ....

Setting a strategic direction

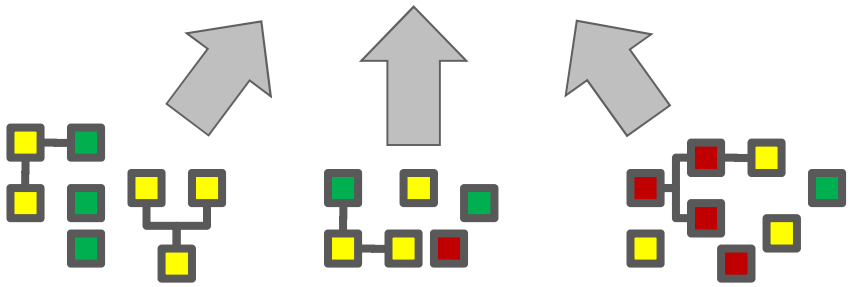
Which energy technologies do we need and when?

Creating commercial confidence

Viable commercial operation

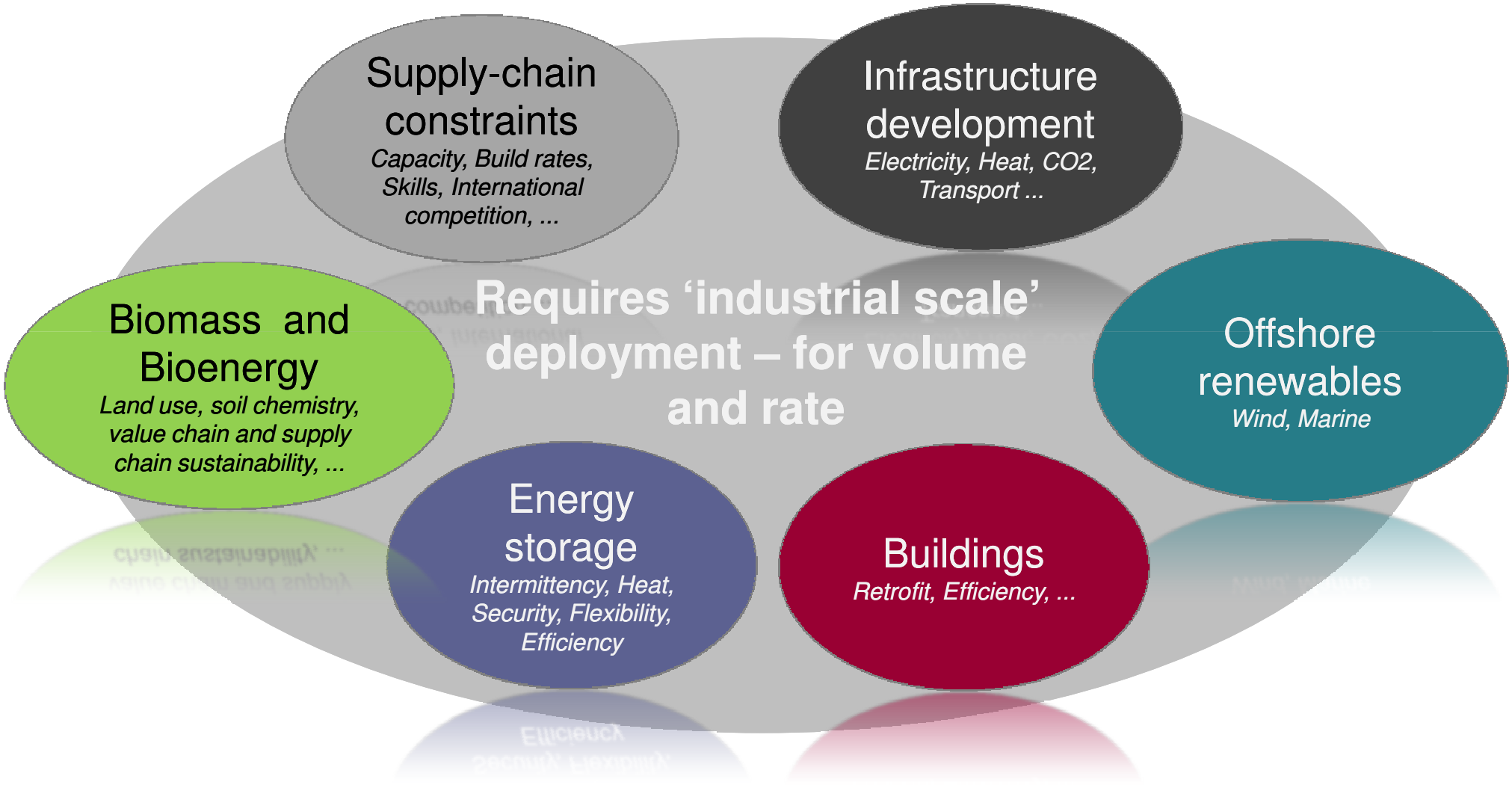
Full system demonstration

- Reducing risk
- Increasing investor confidence
- Bringing together new supply-chains



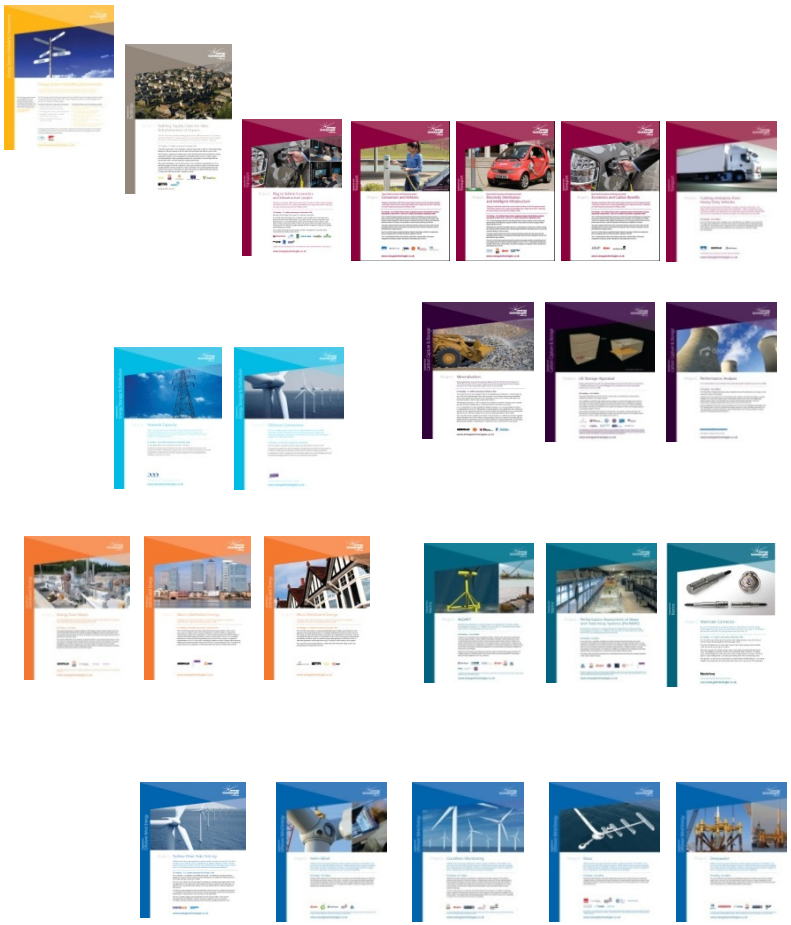
Innovative technologies and sub-systems

Major challenges for the UK energy system 2010-2050



£62m of major projects underway

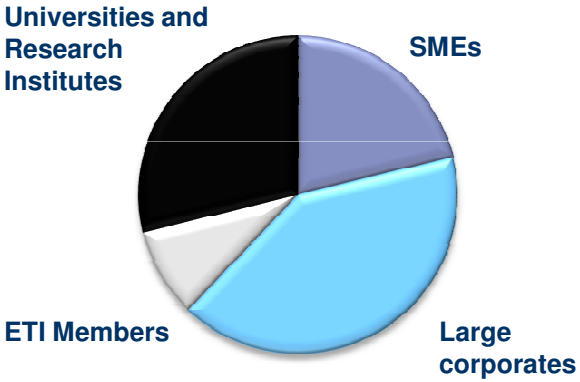
>£100m of further projects in development
CCS, DE, offshore wind, energy storage, smart systems, transport



UK ESM (Energy System Model)

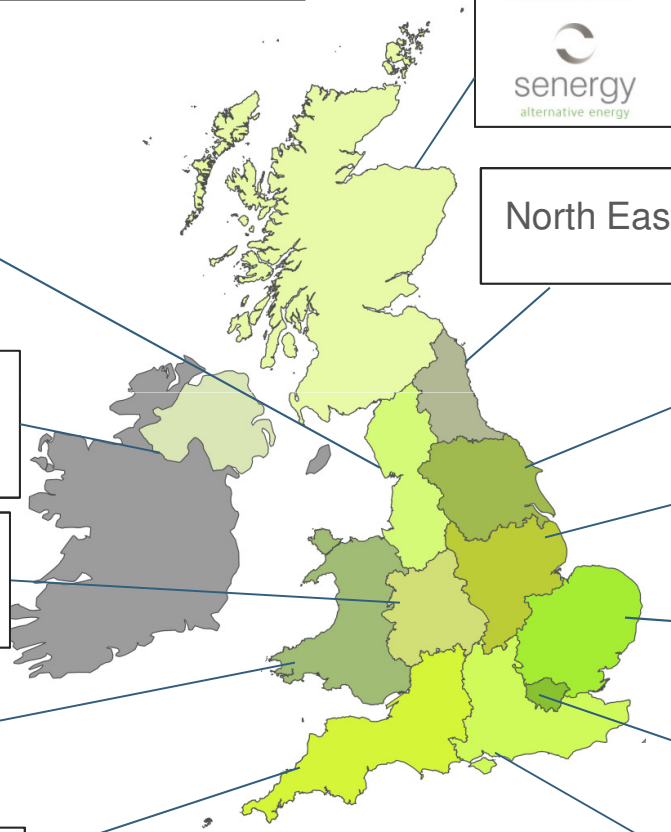
ESD (Energy Storage and Distribution)

Organisations working on ETI projects – October 2010



£62m of projects announced

ETI Project partners



Outside the UK

Blue H
HORIBA
MacArtney

Scotland

EMEC
University of Strathclyde Glasgow
The University of Edinburgh
Heriot Watt University
senergy
seebyte
University of Aberdeen

North West

The University of Manchester
Shell

North East

SKM
Mott MacDonald
Durham University
cpi
GRL
ikon science GeoPressure Technology

Northern Ireland

Queen's University Belfast

Yorkshire

University of Leeds
The University Of Sheffield.

West Midlands

CONVERTEAM
ARUP

East Midlands

Romax Technology
Rolls-Royce
e.on
The University of Nottingham
British Geological Survey

Wales

James Ingram & Associates

East

TotalFlow
Cranfield University
SLP
bre
elementenergy
CATERPILLAR

London

Imperial College London Consultants
bp
EDF ENERGY
CRA International
REDPOINT
IBM
PEABODY
PAFA CONSULTING ENGINEERS
UCL
PRP

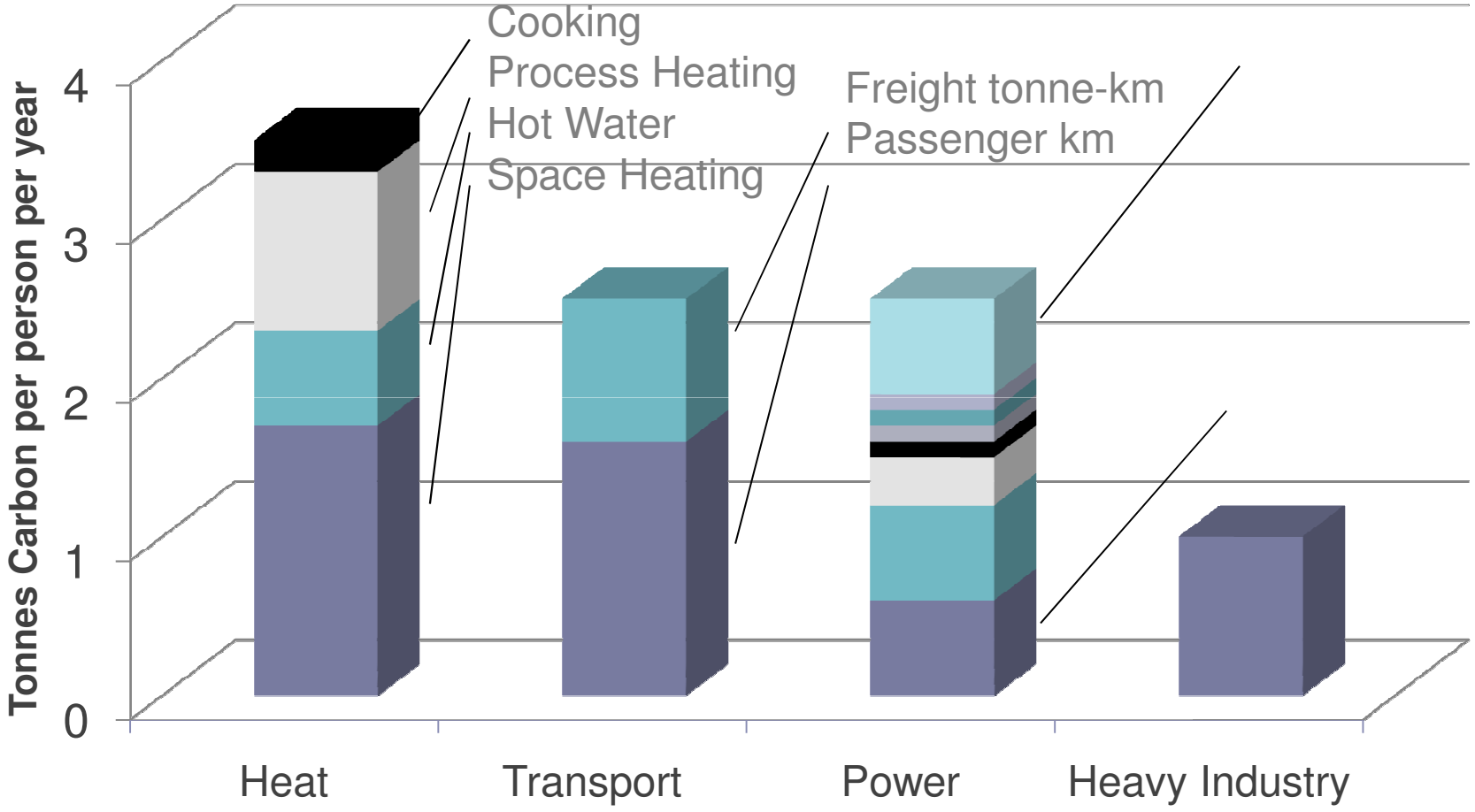
South West

GARRAD HASSAN
Tidal Generation
PML Plymouth Marine Laboratory

South East

insensys
otm
RICARDO
wates
University of Oxford
Wind Power
Cefas
TRL
shanks. waste solutions.
QinetiQ
BAE SYSTEMS
RPS Energy
FOSTER WHEELER
passivSYSTEMS
University of Sussex

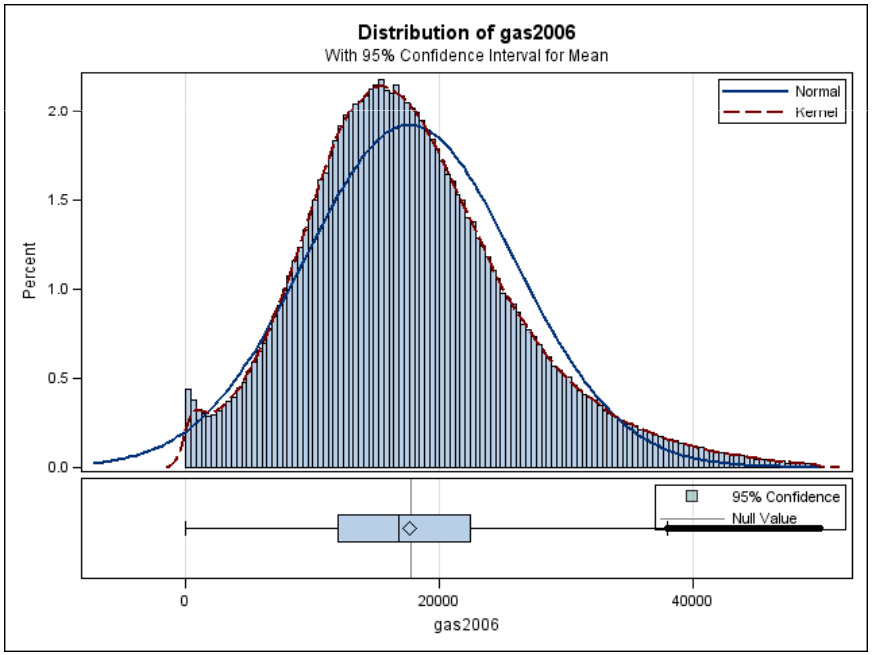
Baseline – the UK average carbon footprint



Delivering thermal comfort is #1 use of energy

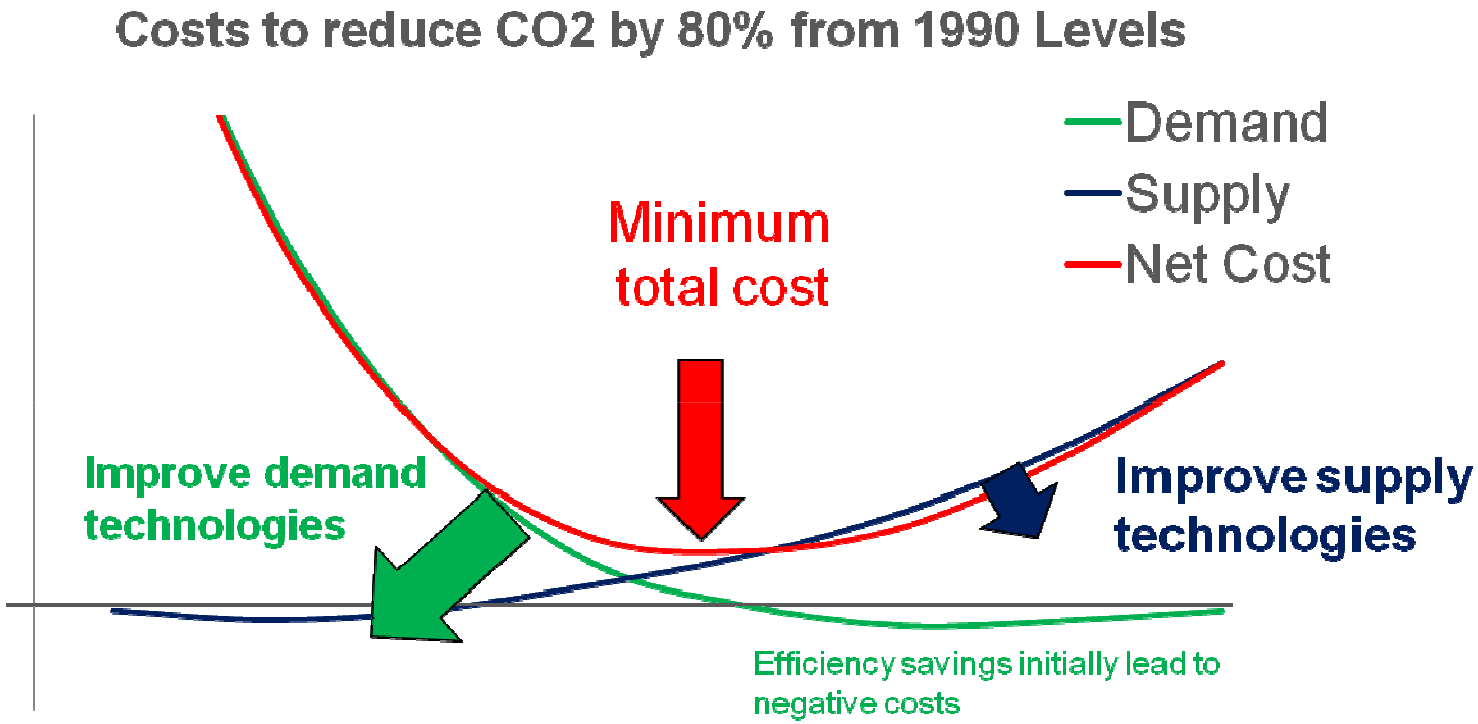
Achieving 80% reduction

- There have been many examples of how individuals can achieve very dramatic reductions, but the challenge is how to shift an entire population. Some specific issues are:
  - Deployment rates
  - Resource constraints
  - Quality (achieving what was planned)
  - Delivering value



Domestic Gas consumption of 8 million homes
Source: EST HEED Database

Balance of Supply and Demand



100% Demand Measures
No Supply Measures

e.g. Completely seal and Insulate 30million & offices

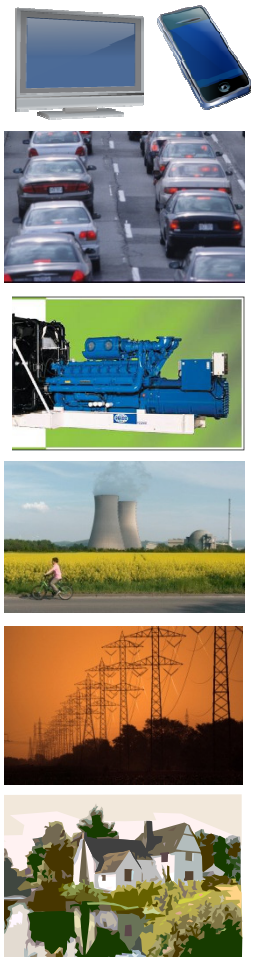
No Demand Measures
100% Supply Measures

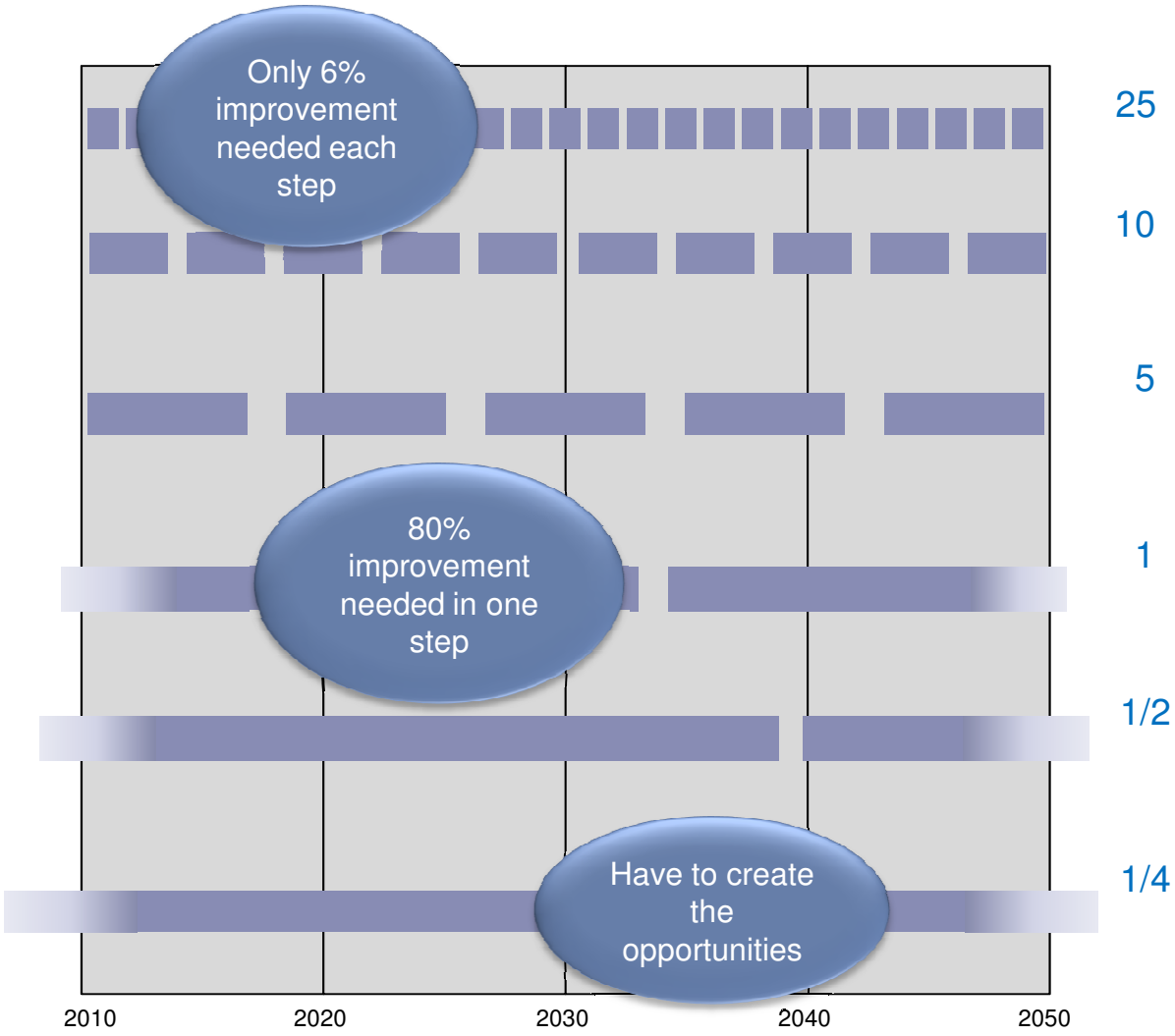
e.g. Build 180 nuclear power stations

Scale of the Challenge – UK Buildings

GB		Per Dwelling
21 ex 26 M	No of dwellings that will still be here in 2050	Which?
7 M	HMG target for whole house refurbishment by 2020 and all by 2030	Where?
£4.1bn	EEC/CERT spend since 2002	£160
£9.2bn / £17.0bn	Recent annual spend on repairs and improvements for social / private housing	£2,100 / £790
£32.5bn	2008 domestic energy spend	£1,250
£480bn	Generation Homes project for 60% reduction	£22,750
110GW	Typical heat pump electrical sizing for GH project	4kW
£2500bn	Like for like rebuild	£120,000
£3150bn	TSB *Retrofit for the Future* spend limit for 80% reduction target	£150,000
£95bn	Electricity distribution system like for like rebuild	£4,500
£1300bn	UK GDP	£50,000

Deployment rate and the “Clockspeed” of different sectors





25	Consumer Appliances
10	Cars
5	Distributed Generators
1	Power station
1/2	Major Network
1/4	House

Deployment rates at household level

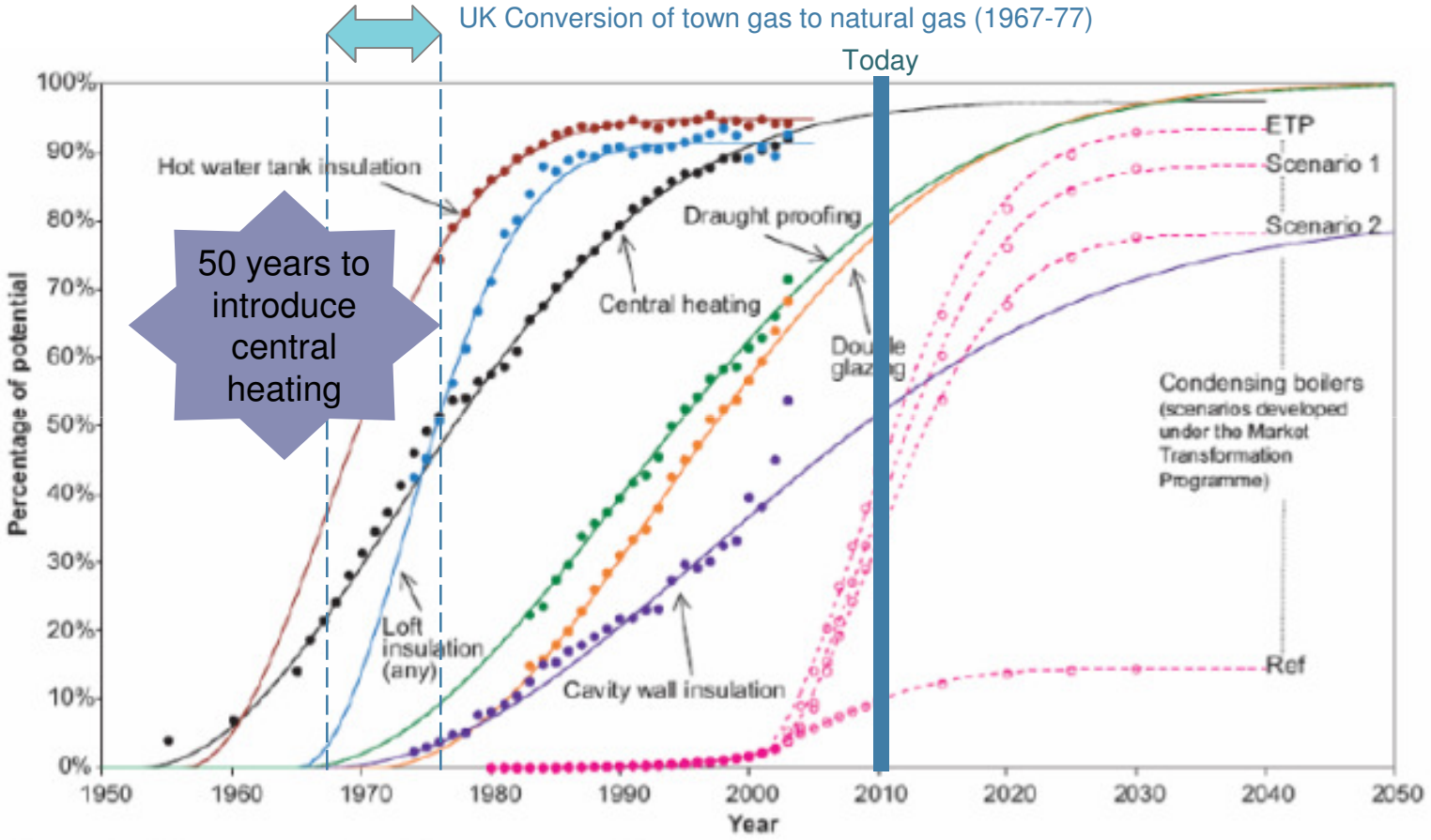
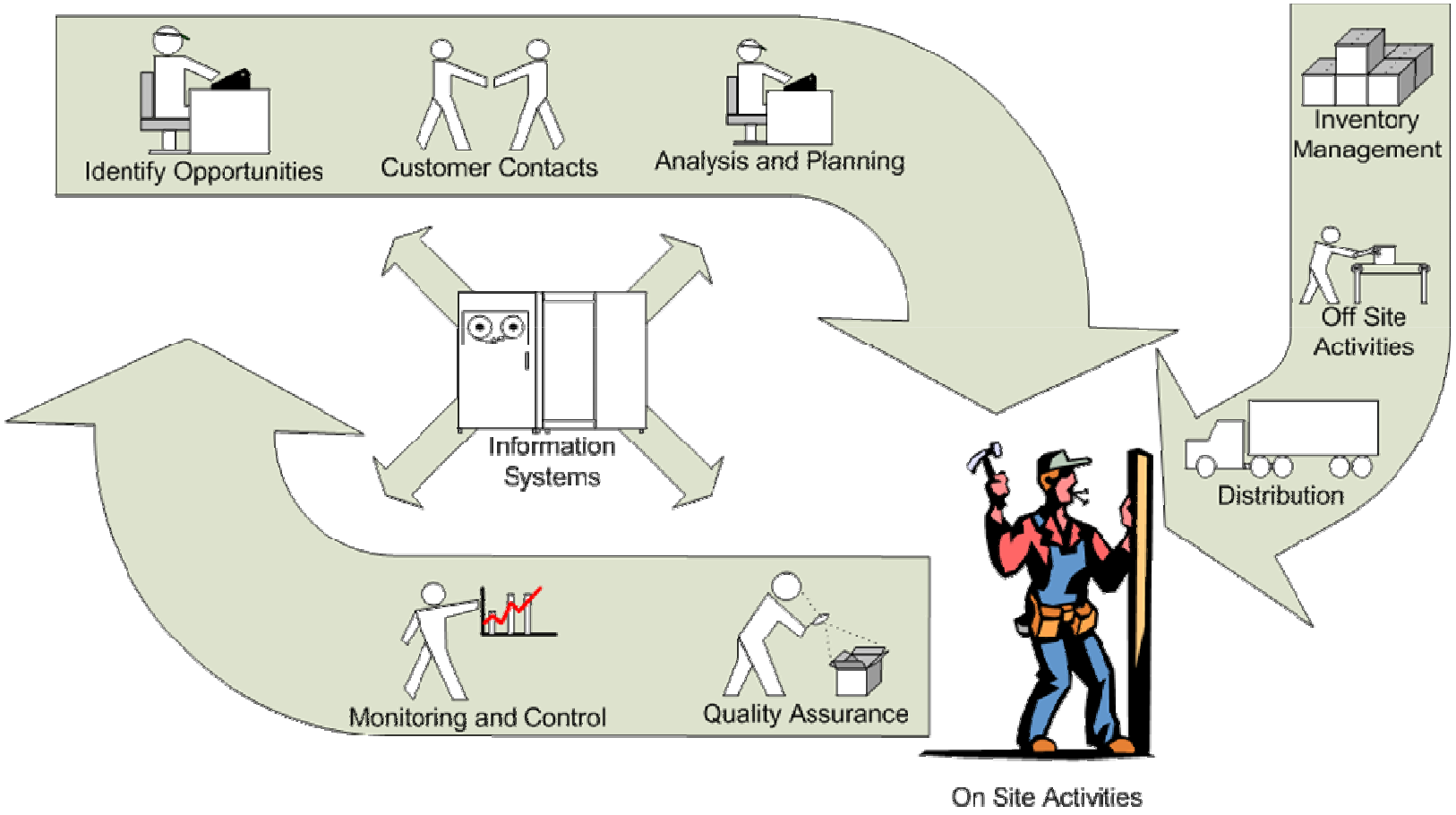


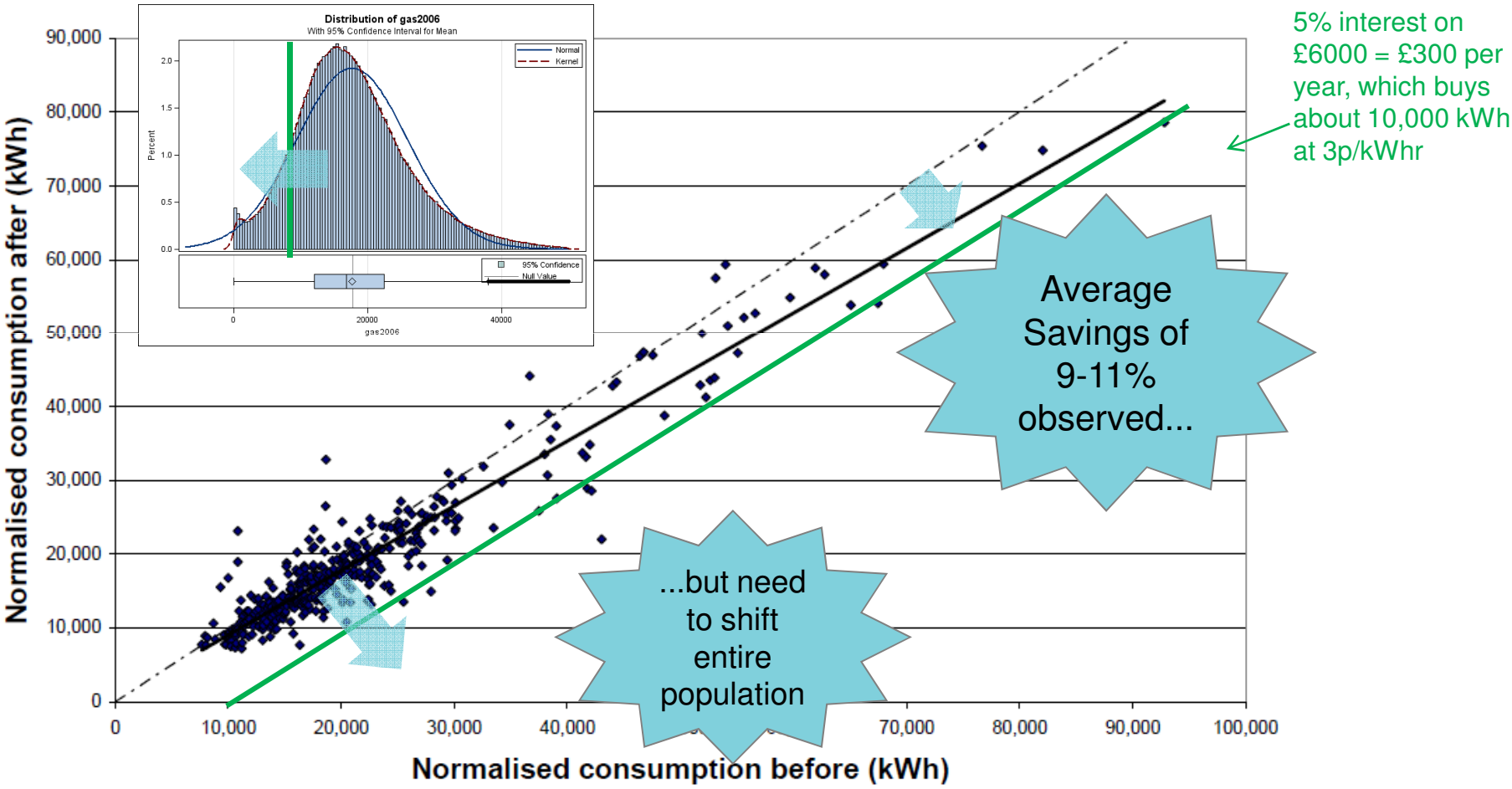
Figure 1 Market penetration of home energy-efficiency related measures

Source: Prof Dennis Loveday, Loughborough University

Need to look at the whole supply chain

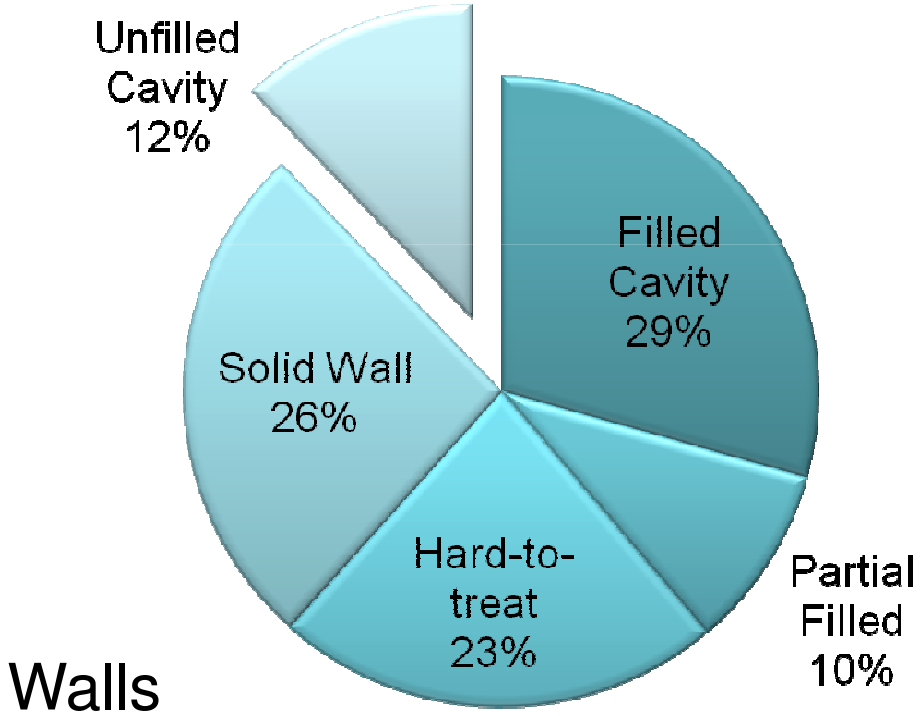


Quality,
- delivered performance across whole populations



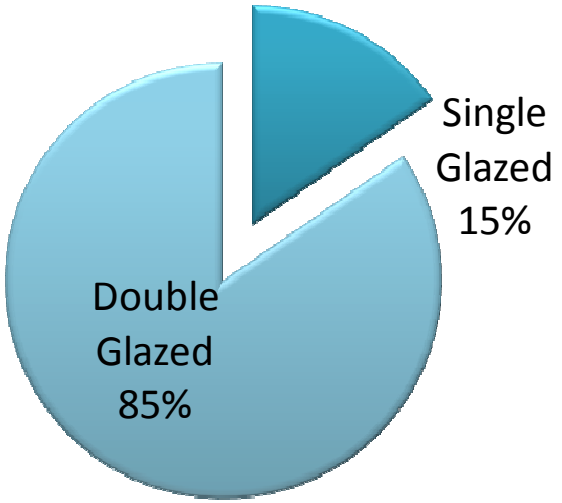
British Gas survey of 1710 household before and after energy saving measures (EST/DECC 2004)

Remaining Opportunities for Efficiency Improvements in Domestic Buildings

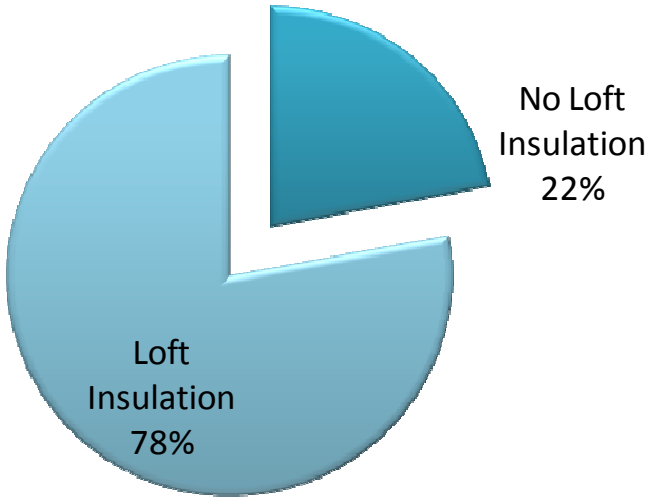


Walls

Windows



Roofs



Influence of Scale

National

City

Community

Building

Individual

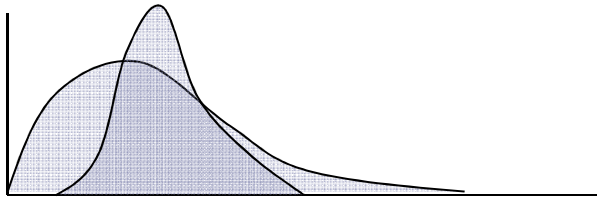
Operating Effectiveness

Capital Efficiency

Transactional issues

Future Flexibility

Finance availability



Summary

- There are infinite technically feasible solutions to reduce carbon by 80%
- Understanding “sustained value” and “affordability” is critical
  - Identifying the key decision makers and their values is first step
- Finding the optimal point between supply and demand side interventions has a huge impact on overall costs and effectiveness.
- Need to understand the whole supply chain to identify the limiting factor to delivery rates and quality
- Scale has a differing impact on different key aspects
  - Millions of small things doesn’t always add up to few big things.

Thank you

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Informing Policy

Demonstrating Affordable systems

for Secure, Low Carbon Energy

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