

Can Energy Services Companies deliver Low Carbon New Build Homes ?

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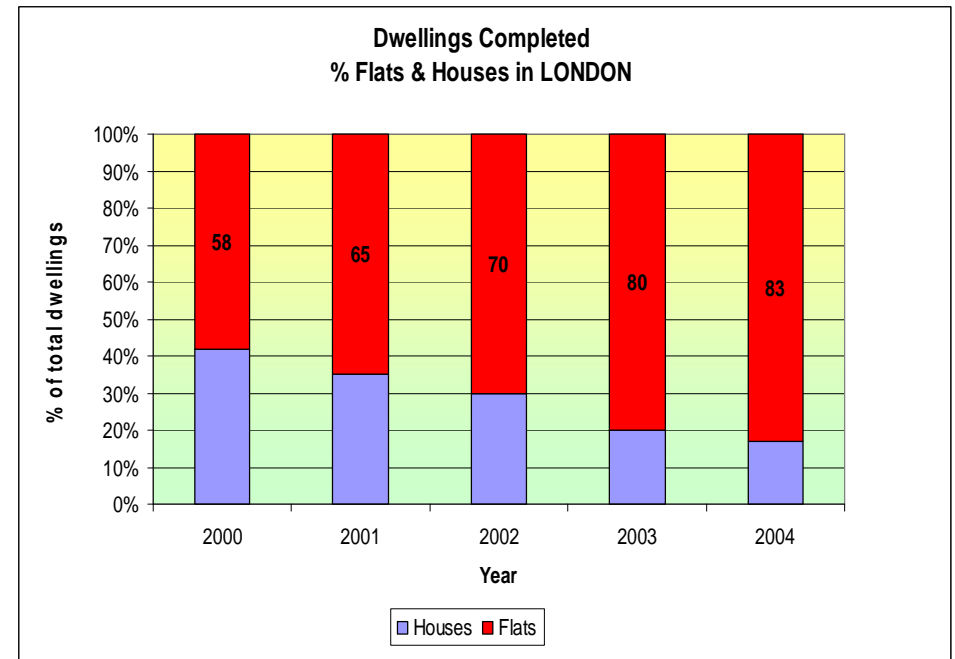
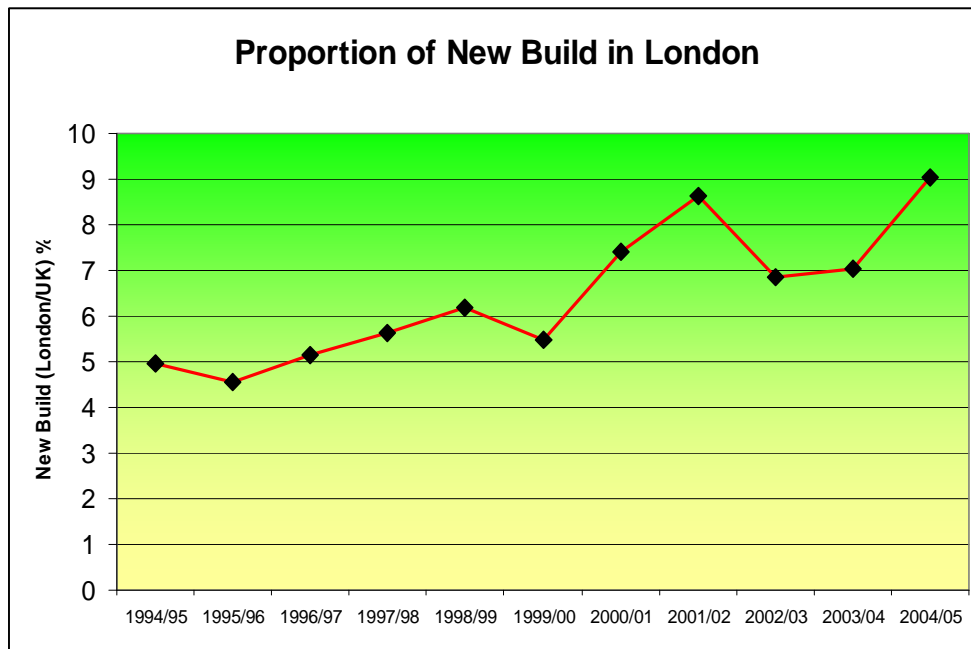
Environmental Change Institute

University of Oxford

Introduction

- Objective: Reduce CO₂ emissions by 60% by 2050
- The domestic sector is responsible for 27% of emissions
- An additional 10 million homes need to be built by 2050
- Need for a different business model to ensure these are low carbon
- ESCOs one possible solution

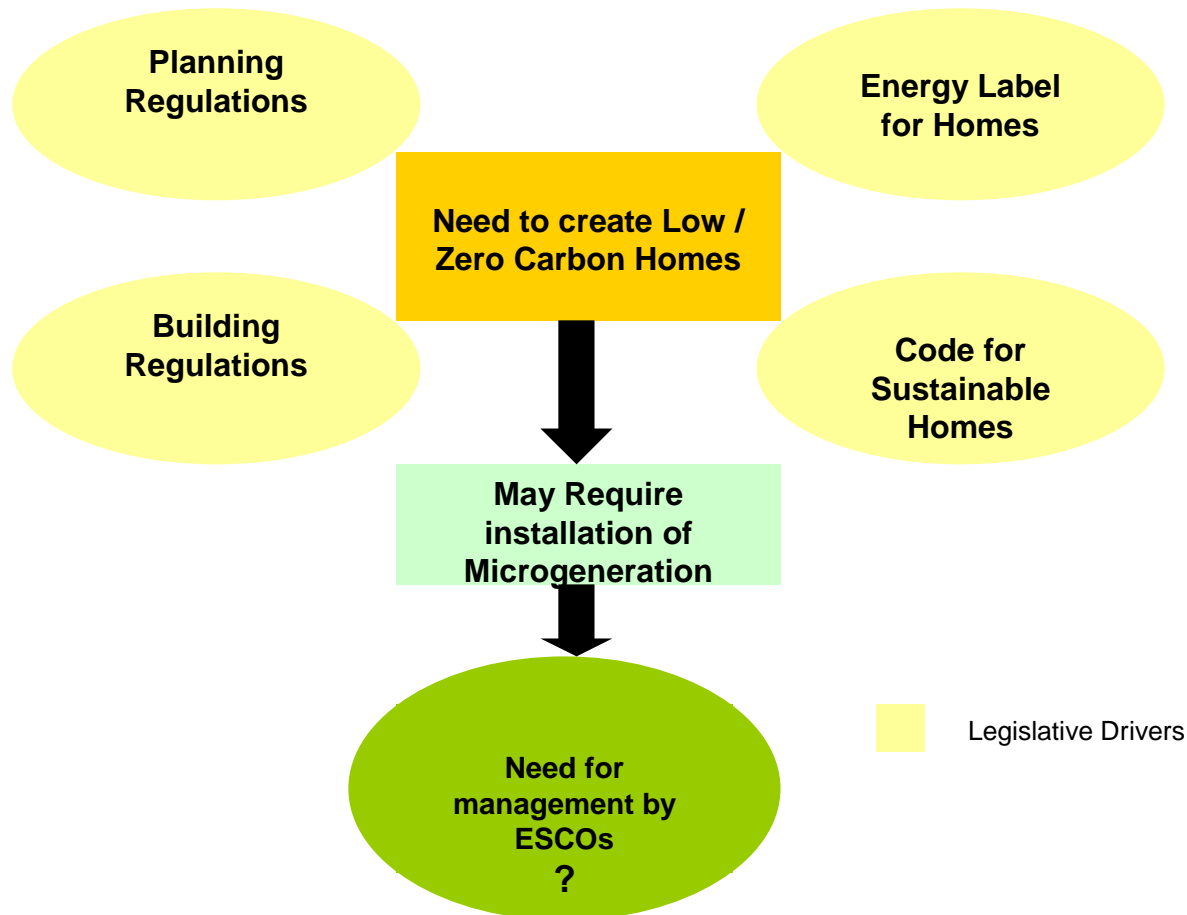
New Build – Opportunity in London



Source: DCLG

- *London has a higher proportion of New Build*
- *83% of new build in London is in the form of flats*

Legislative Drivers in New Build



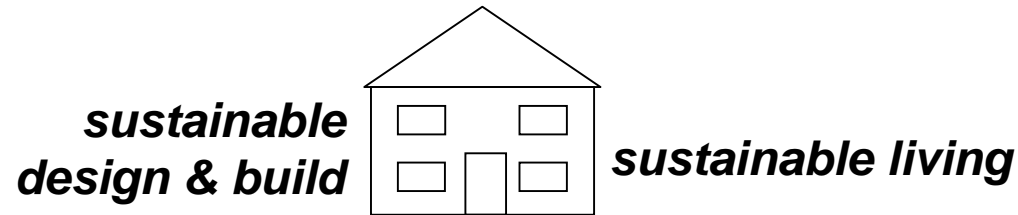
Energy Services Companies (ESCOs)

A company which
designs, builds, finances, operates and maintains
all energy saving equipment and energy generation systems
of the Housing Development
on
long term contractual basis.

Owners/Occupiers of the property are customers of the ESCo

The ESCo meters, bills, and collects revenue from the customers.

ESCOs - Value Offering



Delivered Value

Developers

- Eases planning permission
- Planning Concessions
- Enhanced value of property



Home Buyers

- Feel Good Factor
- Minimise hassle
- Expert guidance

Social Issues: Is there a market for Low/Zero Carbon Homes

Energy Savings Trust, 2006

- Half of respondents ***willing to pay an additional £5,000 to £10,000*** for a green home built to high environmental standards.

Wolseley Study – Done by TNS

- ***63% people would be willing to pay out more*** for improved energy efficiency.
- 24% of adults ***would pay around £1,000 to £5,000 more***
- 11% would be ***happy to pay an additional £10,000***

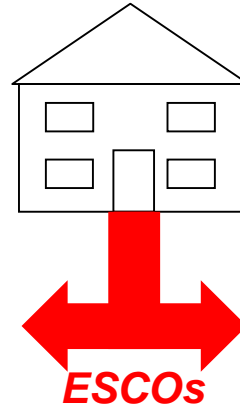
BedZED Apartments

- Commanded a premium of 15% over similar properties in the area - FPDSavills

Technology Offering

Energy Efficiency

- Efficient Appliances
- Thermal Efficiency



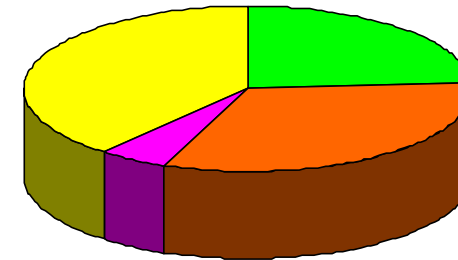
Microgen

- CHP
- Microgeneration technologies viz. PV

- Economies of scale can be attained by buying in bulk

Financials: Capital Expenditure

Capital Investment Assumptions	Cost as per BedZED Toolkit (2001) Average per flat
Combined Heat & Power Plant **	£4,279
Enhanced Energy Efficiency	£3,201
Efficient Appliances	£715
Photovoltaics	£5,266
Total per flat	£13,462
** This includes the infrastructure cost of creating a service building for housing the CHP	

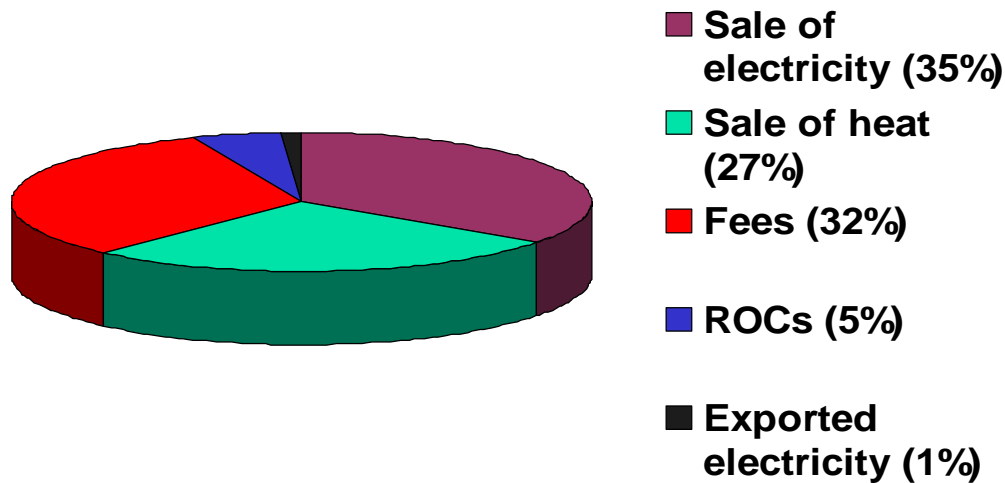


- Energy Efficiency (24%)
- CHP Plant (32%)
- Appliances (5%)
- Solar PV (39%)

Year - 2005	UK	London
Avg. Price of New Build	£ 211,666	£ 314,214
Investment proposed as a % of price	6%	4%

Financials: Cash Flows (Revenue-Operating Expenses)

Revenue Streams



Operating Expenses

- Fuel Costs
- Maintenance Costs
- Metering and Billing
- Admin & Site Management
- Marketing & Legal Expenses

$$\text{Initial Investment} = \sum_{t=1}^N \frac{C_t}{(1 + IRR)^t}$$

Financials: Fee

		New Build (kWh)	Improved Standard (kWh)	Savings (£) over <u>standard new build</u>
1	Space Heating	8000	1360	£266
2	Water Heating	5000	5000	Nil
3	Electricity	3000	2700	£36
Total Annual Savings				£302

Environmental Gains (CO₂ reductions)

		<i>New Build (kWh)</i>	<i>Improved Standard (kWh)</i>	<i>CO₂ Savings over standard new build (Kgs)</i>
Space Heating (Efficiency improvement)		8000	1360	1262
CHP (Space Heating & Hot Water)		0	(6360)	1208
Electricity		3000	2700	129
PV		0	(1080)	464
Total CO₂ Savings (Tonnes per home per year)				3.0

Average UK domestic heat and hot water generation results in 0.19 Kg CO₂ per kWh
 Average UK electricity generation results in 0.43 Kg CO₂ per kWh (Source: BRE, 2005)

Project Viability (IRR > WACC)

Weighted Average Cost of Capital = 6.37%

(assuming 90% debt at 6%)

		ESCO's Capital Contribution			
		100%	75%	50%	25%
# houses in the development	200	1.4	3.96	8.04	17.1
	300	3.47	6.29	10.88	21.5
	400	4.42	7.36	12.2	23.64
	500	4.96	7.98	12.97	24.91
	600	5.32	8.38	13.48	25.75

Assumptions:

IRR > WACC

- All residents sign up
- Savings over new build (£300) are given to ESCO as a fee

Project Viability (IRR > WACC)

Weighted Average Cost of Capital = 6.37%

(assuming 90% debt at 6%)

		<i>ESCO's Capital Contribution</i>			
		100%	75%	50%	25%
<i># houses in the development</i>	200	-5.8	-3.8	-0.9	4.8
	300	-2.2	0.0	3.5	10.7
	400	-0.8	1.6	5.3	13.3
	500	0.0	2.4	6.3	14.8
	600	0.5	3.0	7.0	15.7

Assumptions:

- No Fee is charged – All savings accrue to the residents
- £6000 on the mortgage (@5% interest rate)= £300 =savings

IRR > WACC

The Final Word

A combination of
information, incentives & regulation
can help ESCOs deliver
Low Carbon New Build Homes.



Thank You