

What is it everybody wants and nobody has?

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Energy efficiency

- A bit of history
- BSRIA's role and
- Where is it going?

- Energy has been and still is far too cheap!

A bit of history

- June 1967 – Six day Arab-Israel war
- Suez canal shuts causing major oil shortage
- Sparks the building of Very Large Crude Carrier (VLCC) tankers
- 35% cheaper going around the Cape (90.7p per ton)



A bit more

- September 1973 – oil \$2.90/Barrel
- January 1974 - \$11.65/Barrel
- March 1979 – Three Mile Island incident puts the brakes on nuclear generation



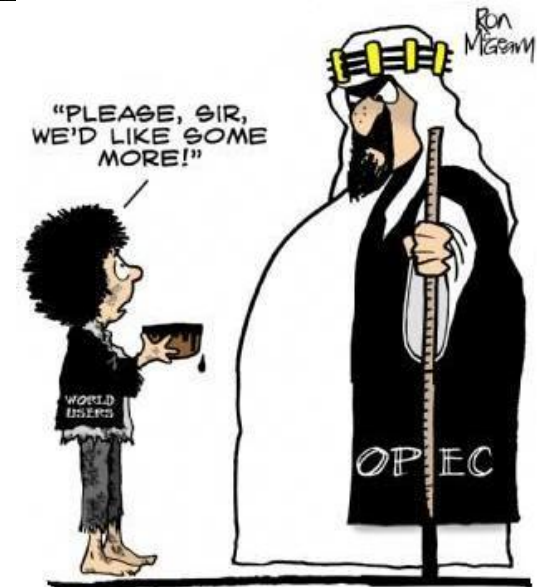
- January 1974 – 3 day week introduced resulting from major strikes (caused by pay restraints)



- 50 MHP limit
- Sparks change over to dual fuel in major power stations

And just a bit more

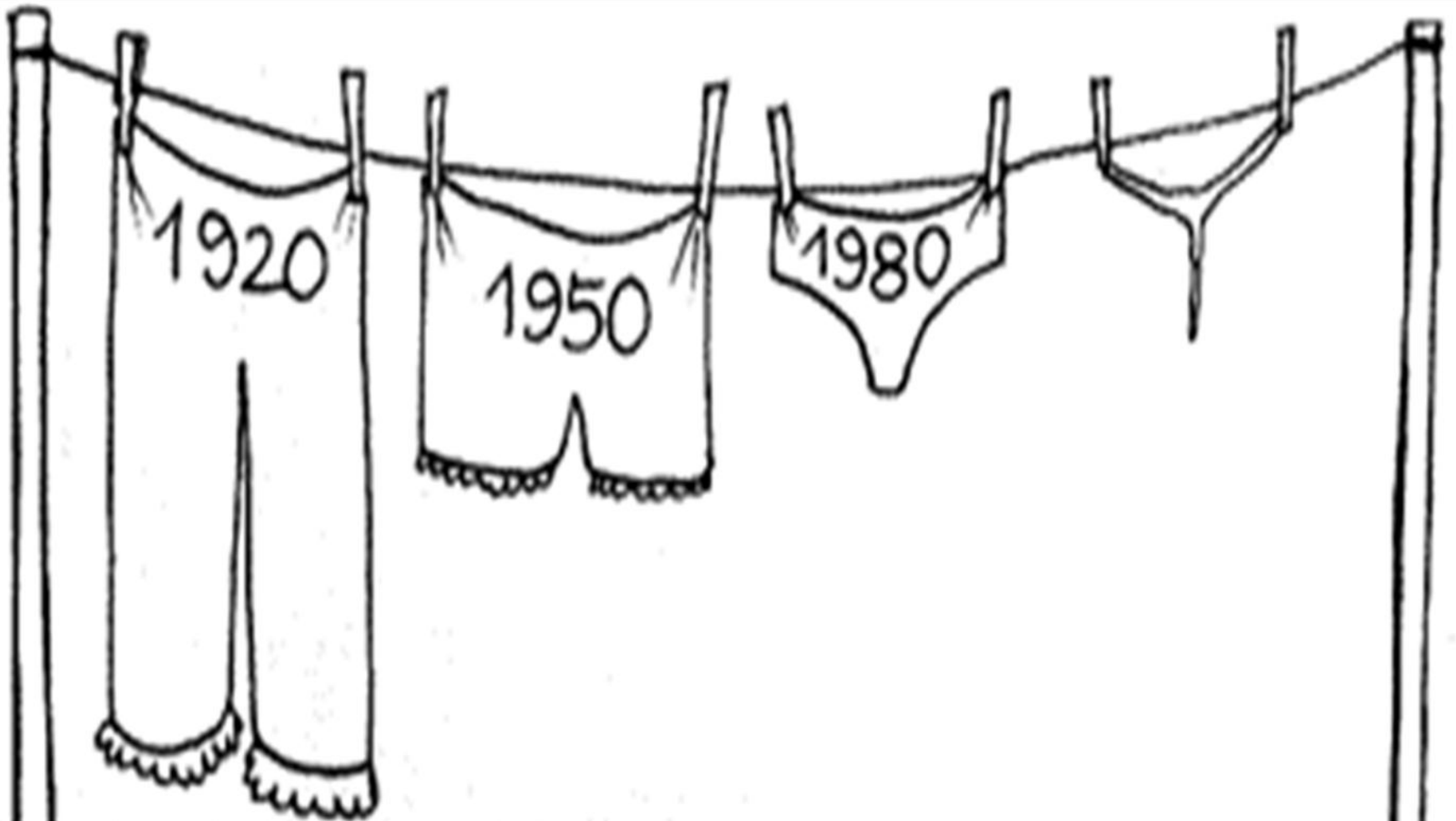
- Dec 1976 – First production of North Sea oil
- Jan 1979 Shar of Iran leaves country
- Jan 1981 - \$37/barrel
- March 1983 OPEC reduces price to \$29 and limits production (44% less than 1979)
- 1986 Gas privatisation
- 1989 Electricity privatisation in UK



BSRIA involvement

- TN 3/83 Energy and Maintenance Costs
- TM 3/91 Maintenance and Utility Costs – results of a survey
 - 110 buildings
 - Maintenance (£7/m²) > utilities
 - No such thing as typical costs
- O&M Benchmarking Network – 2001
- Cost in Use – Link Project
- BRECSU publications on best practice

Evidence of global warming!



2001 to 2011

- Shell Real Estates
- South Tyneside Council
- The British Council
- The open University
- University of Hertfordshire
- KPMG
- Interserve
- British American Tobacco
- Canary Wharf
- G4S
- Government Communication Bureau
- Nomura International
- Pricewaterhouse Coopers
- PRUPIM

Events

BMS

Whole life costing

BPE

Fuel Cells

EPC's

LES-TER

F Gas

BS EN 16001

DEC's

LessEn

Airtightness

BREEAM

EPBD

Softlandings

WEEE

LEED

Green Leases

CRC

User Controls

London Green Badge Scheme

Data collection form 2002

Total floor area of facility NUA or GIA m2	
Percentage floor area to which this data applies	
Category of installation data refers to	Statutory / business critical / non-critical
Type of maintenance regime	ppm / condition / breakdown / all
Give basic information about the facility and the key reasons for data collection	
Give outline information about data collection system eg "helpdesk software"	
If you have not already done so, please define your strategic and operational KPI's and benchmarks	
Total cost of providing the service the data applies to	£
Energy consumption in kWh, therms, litres etc, relative to area covered by data. State period: month/year etc	Electricity: Gas: Oil: Water: Other:

Data 2005 to 2009

Operational Data Collection for BSRIA Benchmarking Network

Please select one building or estate and enter annual figures for the year **2006**.
Please select appropriate box(es) or write in your answer where appropriate.

General Information

to be completed by the Benchmarking Member

What is your name?

What company or organisation do you work for?

What is the name of the facility you are providing operational data on?

Q1

Is the operational data you are providing for a single building or an estate?

Single building .

Estate

Q2

Where is your facility located?

Central London.....

Greater London

South East

South West

West Midlands.....

East Midlands.....

East Anglia.....

Yorkshire and Humberside.....

North East

North West

Wales.....

Scotland

Northern Ireland

Q3

Please select which sector represents the organisation?

Education.....

Financial institute.....

Healthcare

Information Technology.....

Insurance

Legal services

Local government

Manufacturer / industrial

Property Management

Retail.....

Telecommunications

Utilities

Other - please specify below

Q4

Please select one answer that best describes the main function of the facility?

Data Centre (go to Q5).....

Factory

Financial institute headoffice

Halls of residence

Lecture rooms / school / college

Lecture Theatre

Leisure Facility with swimming pool

Leisure Facility without swimming pool

Library

Museum / Gallery

Office - standard

Office - prestige.....

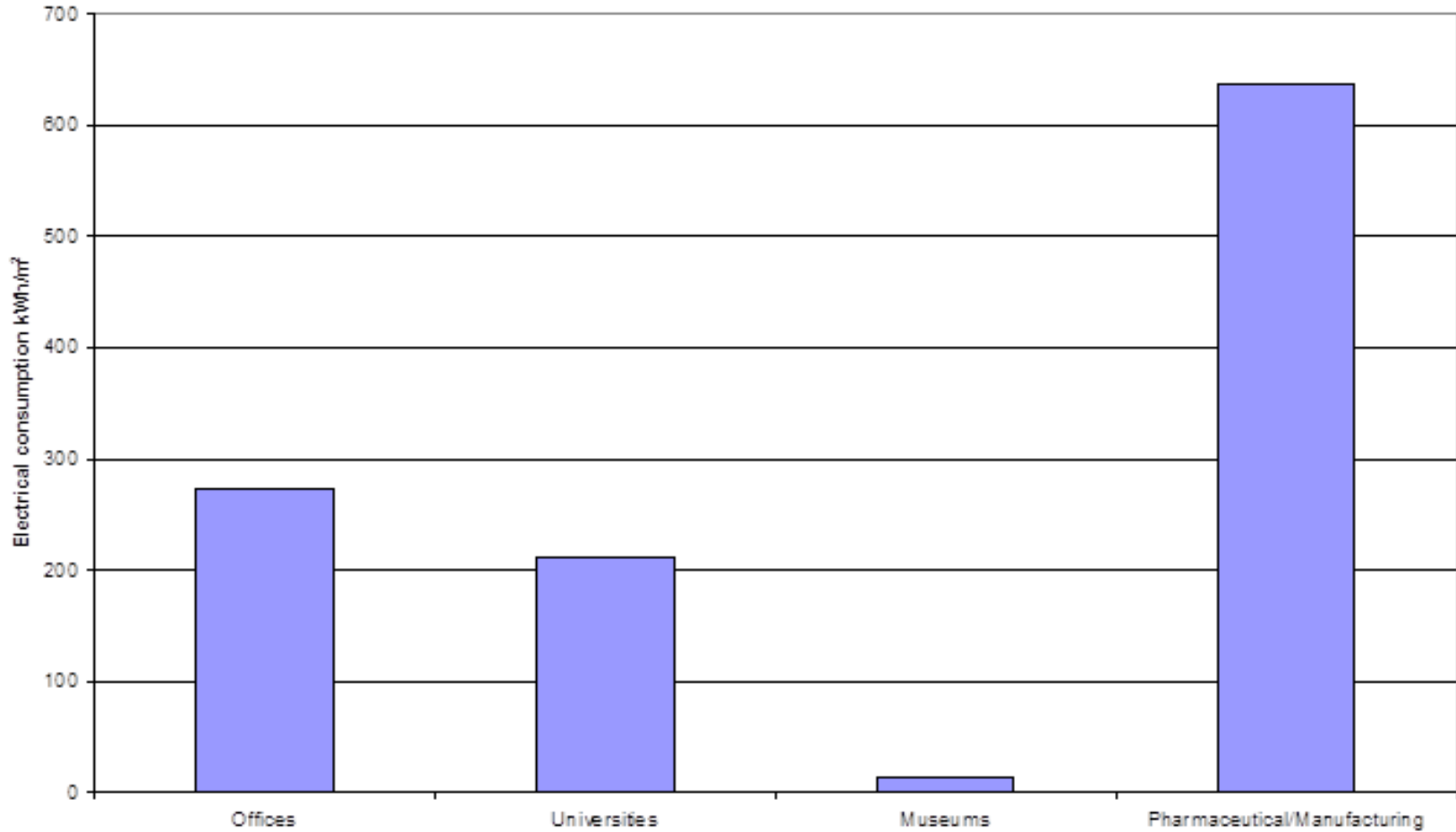
Other - please specify

Data collection form 2010 - 2011

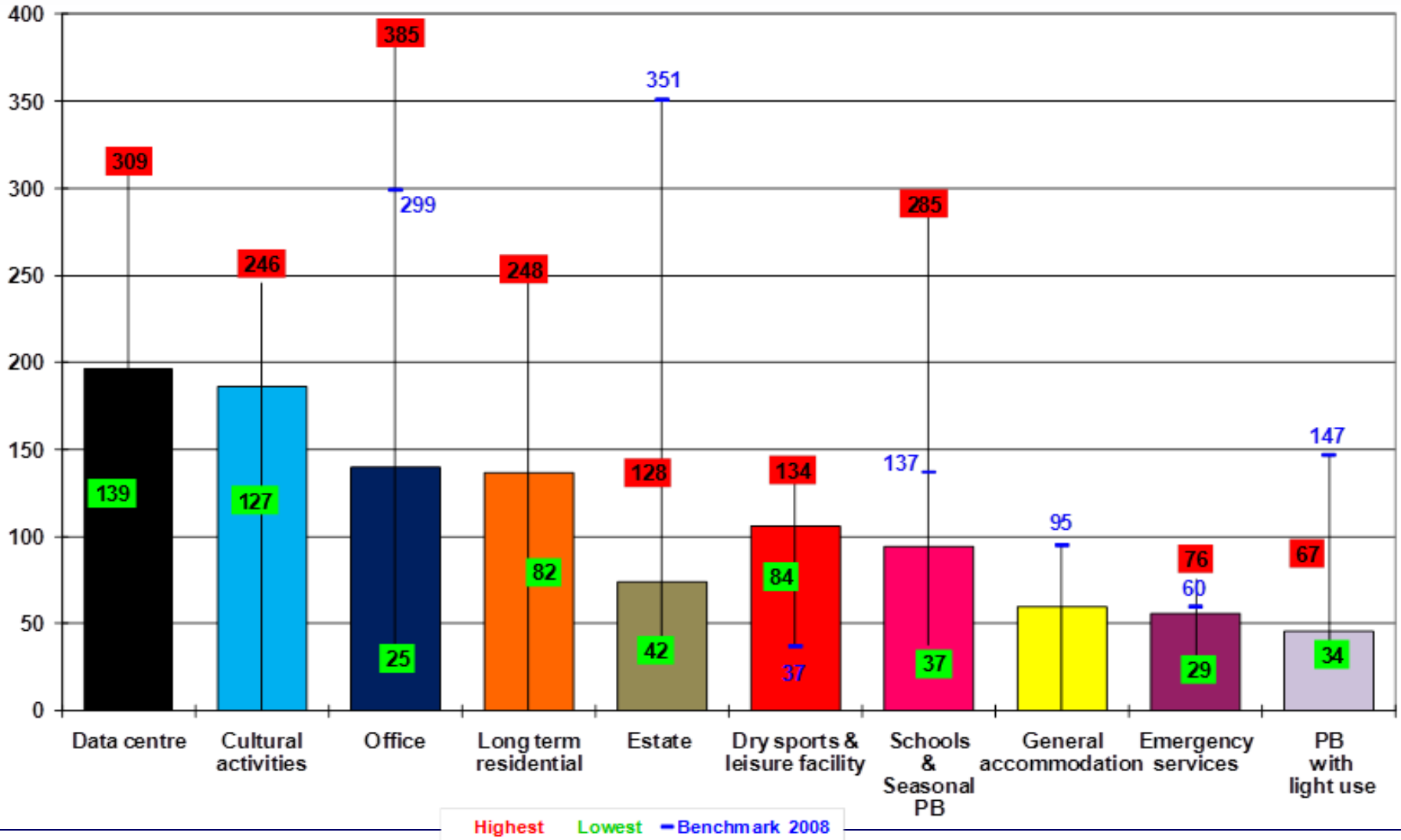
ENERGY		Building 1
<i>Please exclude VAT from all cost data.</i>		<<Building name>>
Q1	What was the electricity consumption in 2010? (kWh)	kWh
Q2	What was the cost of the electricity consumption in 2010? (£)	£
Q3	What was the natural gas consumption in 2010? (kWh)	kWh
Q4	What was the cost of the natural gas consumption in 2010? (£)	£
Q5	What other fuels do you use?	Please select all that apply <input type="checkbox"/> Oil <input type="checkbox"/> Woodchip <input type="checkbox"/> Other
Other please specify		
Q6	What was the consumption of other fuels in 2010? (please include consumption unit kWh)	kWh
Q7	What was the cost of other fuels used in 2010? (£)	£
Q8	How much, if any, on-site energy was generated from renewable technologies? (for example solar or wind based systems if present)	
Q9	Was any surplus energy generated sold back to the grid? If so, how much?	
Q10	What was the water consumption in 2010?	m3
Q11	What was the cost of the water consumption in 2010? (£, including sewage)	£
Q12	Do you have any of these energy reduction technologies in your facility?	Please select all that apply <input type="checkbox"/> BMS system (networked) <input type="checkbox"/> BMS system (stand alone only) <input type="checkbox"/> Combined heat & power plant <input type="checkbox"/> Grey water recycling <input type="checkbox"/> Ground source heat pumps <input type="checkbox"/> Inverter drives on motors <input type="checkbox"/> Lighting control systems <input type="checkbox"/> Low energy office equipment <input type="checkbox"/> Low flush WCs <input type="checkbox"/> Solar shading <input type="checkbox"/> Sub-metering <input type="checkbox"/> Thermal storage <input type="checkbox"/> Other
Other please specify		
Please add any information you think impacts on the energy data you have provided.		

In the beginning

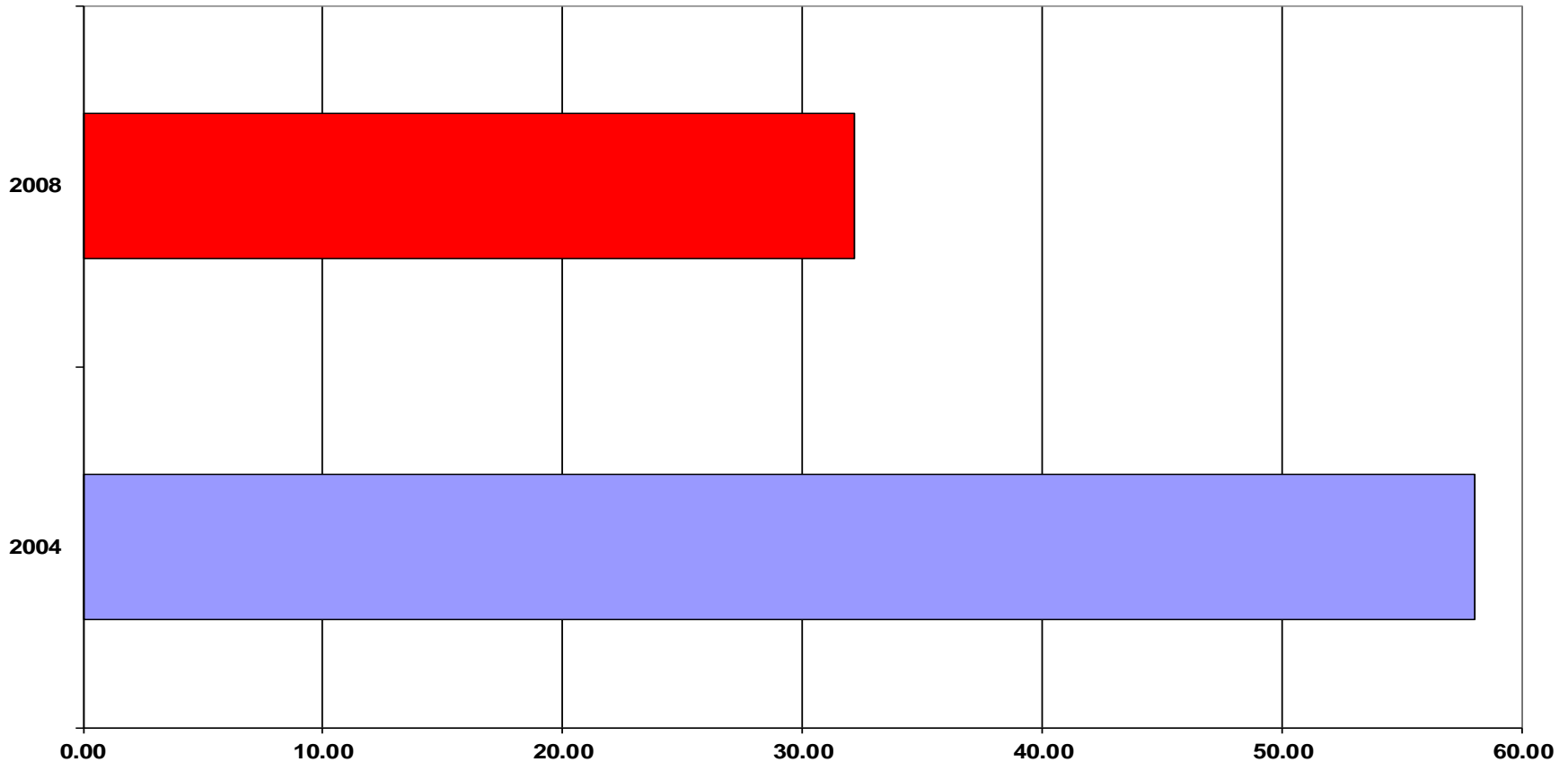
Electricity consumption kWh/m²



This year



Gas reduction 2004 to 2008



Where are we now?

- “Greenest Government ever!” D Cameron 14 May 2010
- 31 Oct 2011 – Solar PV FITs payments cut by over 50% because it has been 3 times more successful than predicted and installation prices have dropped by 30%.

Part L

- Initially insulation limits introduced in 1962 for anti-condensation (not energy)
- 1972 Provision for the conservation of fuel and energy in dwellings – Non dwellings in 1974
- 1985 Recast with Guidance on some ways of complying – “Approved Document L”
- Revised 1990, 1995, 2002, 2006, 2008 and 2010
- 2013 consultation document due next month – will it be a giant leap or a tiny step forward??

Soft landings



- Getting buildings to work efficiently for the occupants and their activities – an implicit assumption that the designer can't get it right first time.
- In our climate-challenged world, we have to deliver on our environmental promises. New buildings have to be manageable, maintainable and usable – and they have to hit their resource-use targets. Failure is not an option.
- Also, maximum energy efficiency may not be the best solution for best building operation – chilly people moan and are unproductive

EPCs and all that

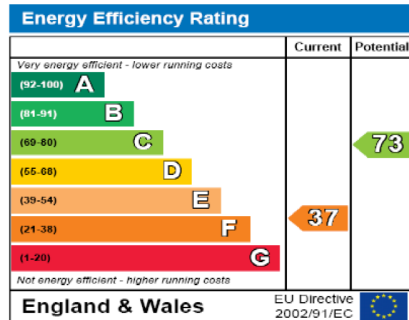
Energy Performance Certificate



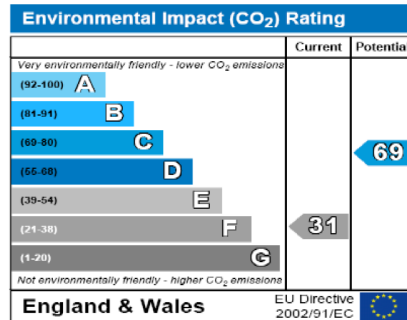
17 Any Street,
Any Town,
County,
YY3 5XX

Dwelling type: Detached house
Date of assessment: 02 February 2007
Date of certificate: [dd mmmm yyyy]
Reference number: 0000-0000-0000-0000-0000
Total floor area: 166 m²

This home's performance is rated in terms of the energy use per square metre of floor area, energy efficiency based on fuel costs and environmental impact based on carbon dioxide (CO₂) emissions.



The energy efficiency rating is a measure of the overall efficiency of a home. The higher the rating the more energy efficient the home is and the lower the fuel bills will be.



The environmental impact rating is a measure of a home's impact on the environment in terms of carbon dioxide (CO₂) emissions. The higher the rating the less impact it has on the environment.

Estimated energy use, carbon dioxide (CO₂) emissions and fuel costs of this home

	Current	Potential
Energy Use	453 kWh/m ² per year	178 kWh/m ² per year
Carbon dioxide emissions	13 tonnes per year	4.9 tonnes per year
Lighting	£81 per year	£65 per year
Heating	£1173 per year	£457 per year
Hot water	£219 per year	£104 per year

Based on standardised assumptions about occupancy, heating patterns and geographical location, the above table provides an indication of how much it will cost to provide lighting, heating and hot water to this home. The fuel costs only take into account the cost of fuel and not any associated service, maintenance or safety inspection. This certificate has been provided for comparative purposes only and enables one home to be compared with another. Always check the date the certificate was issued, because fuel prices can increase over time and energy saving recommendations will evolve.

To see how this home can achieve its potential rating please see the recommended measures.

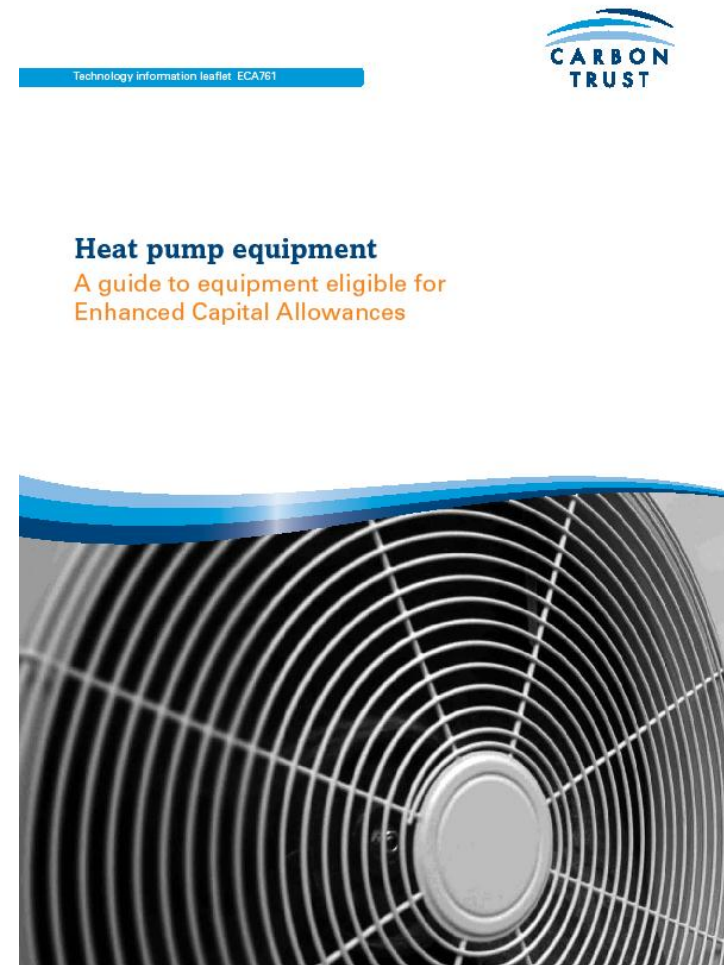


Remember to look for the energy saving recommended logo when buying energy-efficient products. It's a quick and easy way to identify the most energy-efficient products on the market. For advice on how to take action and to find out about offers available to help make your home more energy efficient, call 0800 512 012 or visit www.energysavingtrust.org.uk/myhome

- Introduced in 2007
- 14 Schemes registering 1000/s of Energy Assessors
- Now working under Standard Operations Requirements
- Millions of Certificates lodged
- Quality improving
- Unrealised potential from recommendations reports

Enhanced Capital Allowances

- ECA concept – more efficient plant costs more
- Tax break for corporation tax payers worth 5 – 6% on purchase price
- Must be on the (Carbon Trust) Energy Technology List
- <http://etl.decc.gov.uk>



Eco Design Directive 2009/125/EC –

- Framework for Energy using/related Products EuP/ErP
- Labelling and seeking to drive poor efficiency products off the market
- Targeting products with high volumes (>200,000), have high environmental impact and potential for improvement
- Heating systems – Lot 1
<http://www.ecoboiler.org/>
- Air conditioning and ventilation systems - Lot 6
website
http://www.eceee.org/Eco_design/products/airco_ventilation
- Small AC – Lot 10
- Solid fuel – Lot 15
- Room heaters - Lot 20
- Central heating products - Lot 21

Fuel prices across Europe

Figures for 2008 – 10 from Energy.EU

Member State	Electricity prices [Euros/kWh]			Member State	Natural gas prices [Euros/GJ]		
Latvia	0.09	0.11	0.10	Netherlands	20.2	20.9	19.5
Lithuania	0.09	0.09	0.12	Poland	12.9	11.8	11.8
Luxembourg	0.16	0.19	0.17	Portugal	17.4	16.6	16.5
Malta	0.13	0.16		Romania	9.3	7.8	7.6
Netherlands	0.18	0.19	0.17	Slovakia	12.2	13.0	12.1
Poland	0.13	0.12	0.13	Slovenia	17.6	16.6	16.0
Portugal	0.15	0.16	0.16	Spain	17.1	15.9	14.8
Romania	0.11	0.10	0.10	Sweden	27.7	25.8	28.7
Slovenia	0.12	0.13	0.14	United Kingdom	12.1	11.8	11.3
Slovakia	0.14	0.16	0.15	EU-27 average	16.3	15.4	14.5
Spain	0.15	0.16	0.17		Slovenia	538	
Sweden	0.17	0.16	0.18		Slovakia	543	
United Kingdom	0.15	0.14	0.14		Spain	536	
Average EU-27	0.16	0.16	0.17		Sweden	890	
					United Kingdom	479	
					TOTAL EU-27	611	

<http://www.energy.eu/>

Green deal and RHI

- Green Deal consultation document due end of October
- Eagerly awaited as said to contain a lot of detail as to how this will work
- Watch this space
 - http://www.decc.gov.uk/en/content/cms/tackling/green_deal/green_deal.aspx
- Renewable Heat Initiative
- Payment from heat generated from renewables
- Retrospective to plant and systems installed after July 2009
- Secure payments – Non-domestic start delayed by EU – row over biomass tariff – now cut from 2.7 to 1.0p/kWH – new Regulation by end of Nov?
- Generally MCS approved – heat pumps better than 2.9 COP

Energy resources

- Fracking – are the assumptions real?
- Can extraction be achieved without major environmental damage?
- If it is realisable, will we just waste it?
- Imports from volatile (Middle East) or hostile (Deep Ocean) parts of the world
- Renewables
- Have we enough?
 - Land
 - Sea
 - Resources to build
 - Planning permissions
 - Maintenance and installation capability
 - Operational expertise

www.withouthotair.com/

Life cycle analysis

- CILECTTA - Software development of LCCA for determination and costing of sustainable project options
- Importance of an holistic view – energy efficiency is all about the economic argument
- To account for the full life of plant and equipment requires commitment beyond financial expediency



What is it that everybody wants but nobody has?

- Everybody wants their children and children's children to enjoy the same or better quality of life that we do.
- Which requires a massive shift of attitude to energy use (regardless of source)
- And it is still too cheap!

Questions?

Answer 2.5 p in 1966, now 45p – 18 times increase

Thank you