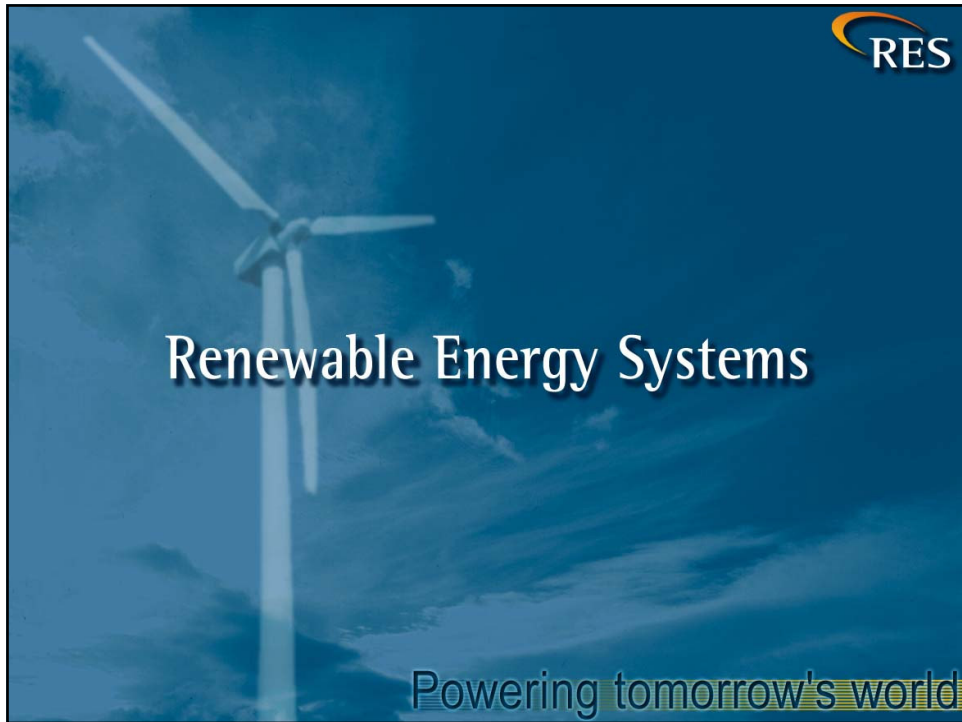


RENEWABLE ENERGY SYSTEMS

Mark Candlish

RES Ltd, UK.

'PowerPoint' Slides from Colloquium Presentation





BEAUFORT COURT - ZERO EMISSIONS HEAD OFFICE

- Incorporates:
 - Low energy requirements
 - Sustainable construction methods
 - Renewable energy sources on-site
- Why have we done it?
 - To provide RES with much-needed new HQ
 - To demonstrate technologies fundamental to our philosophy
 - To show what can be done with an existing historical site





Beaufort Court - Factor 10?

- Commercial enterprise
- Rural location
- Heating & cooling
- Electricity
- Networks

Heating and cooling

- Proven technologies
- Insulation
- Passive solar gain
- Biomass boilers
- Ground source heat pumps
- Solar thermal

Heating with wood chips

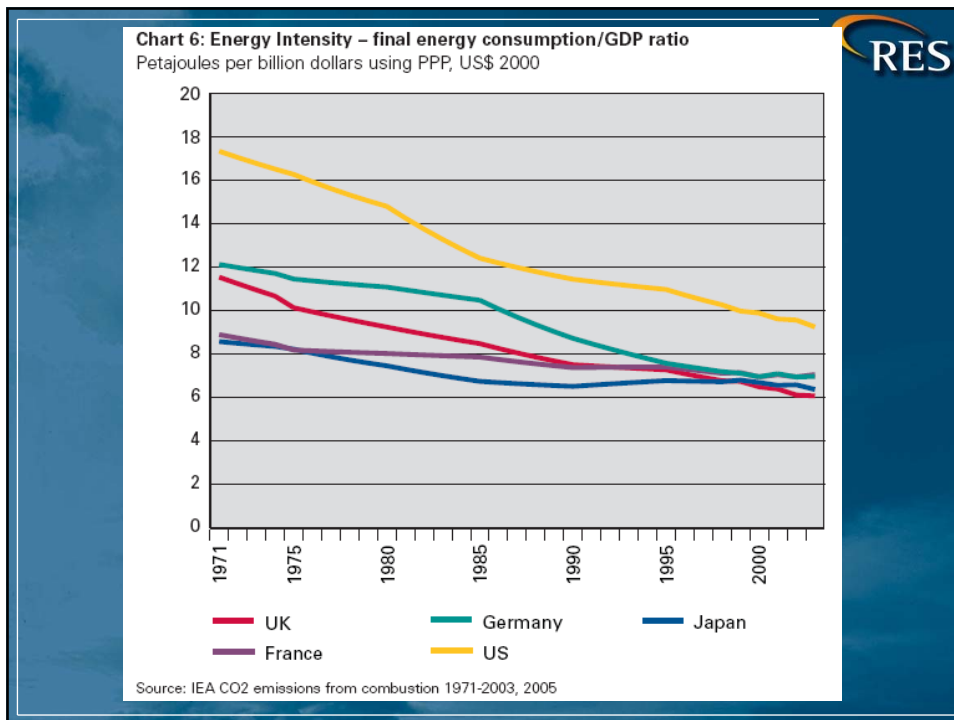
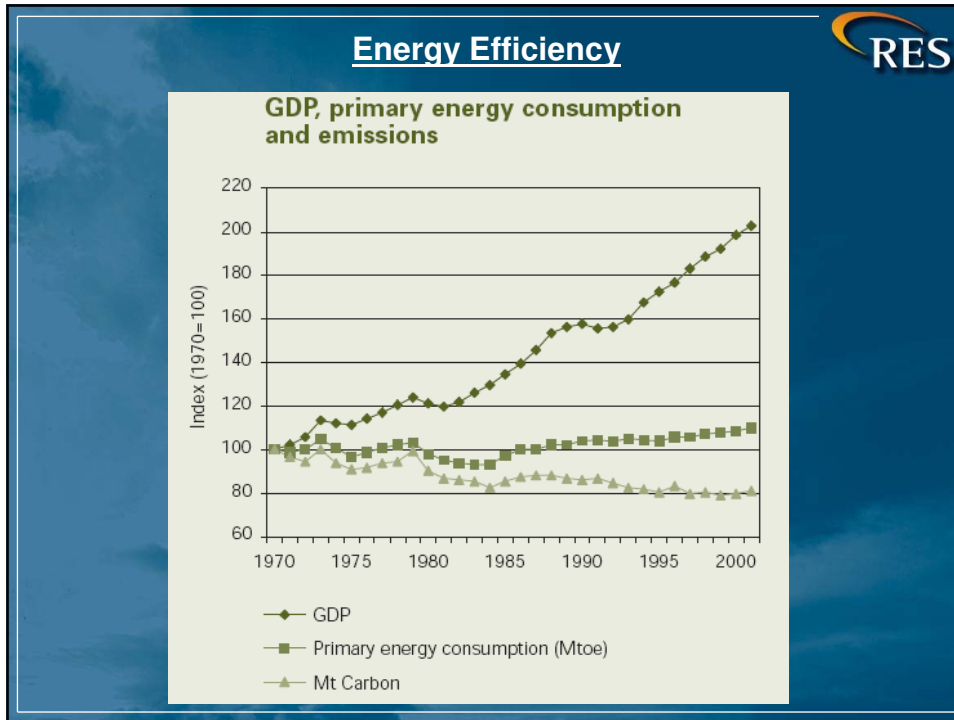



Electricity

- No shortage of energy
- Technological challenges
- Distributable

But ...


- Where do we get the right appliances?





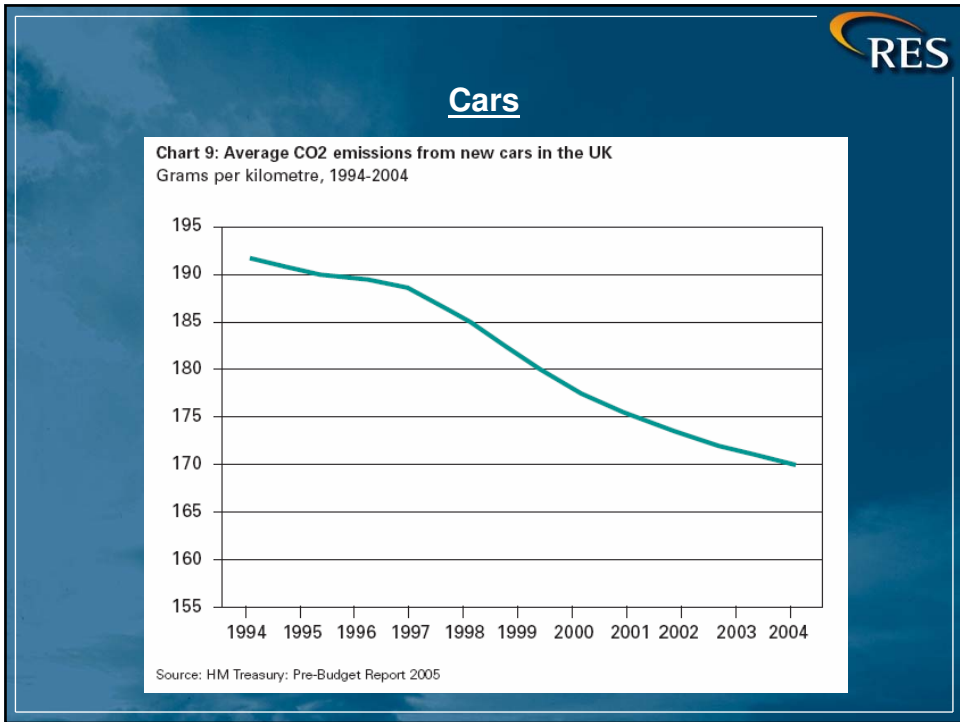
Efficiency vs effectiveness

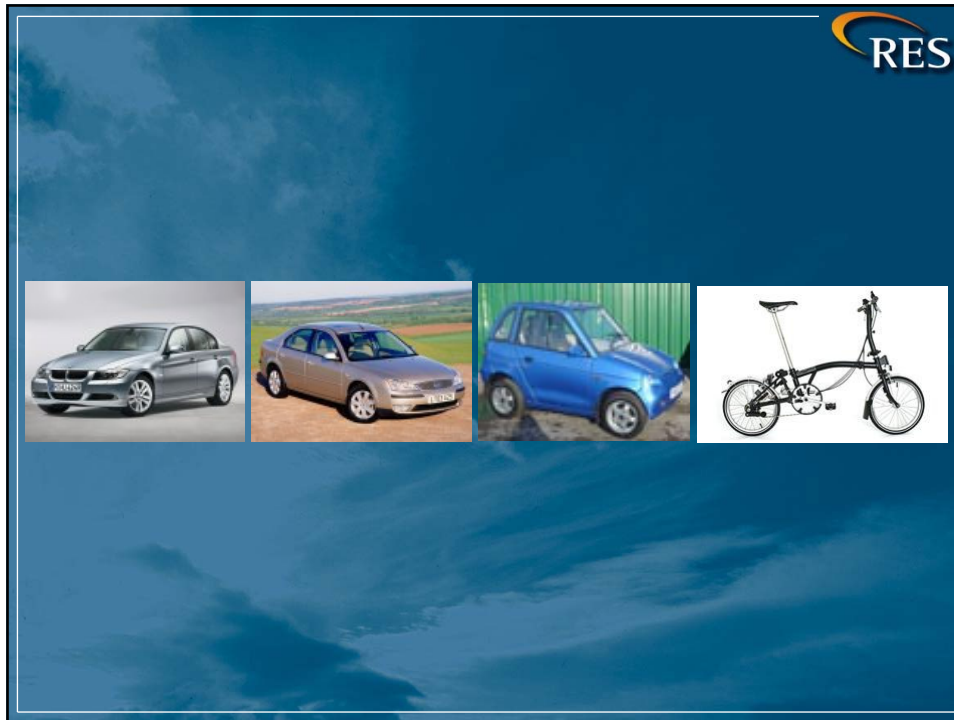
Are we trying to solve the wrong problem?



Energy efficiency

- Benchmarked against norms
- Not against the job to be done



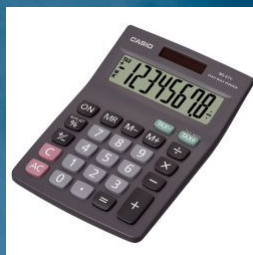


Standby power

- Won't be an issue in 10 years' time
- devices use 10W instead of 1W
- 10% of household consumption
- £7 a year
- to save 50p in manufacturing costs?
- 10% could be over 30% in an efficient building

Mobile devices

- Energy efficiency
- Battery storage
- Renewables



What is the future for centralised networks?

- World Wide Web
- Cellular network
- Private transport

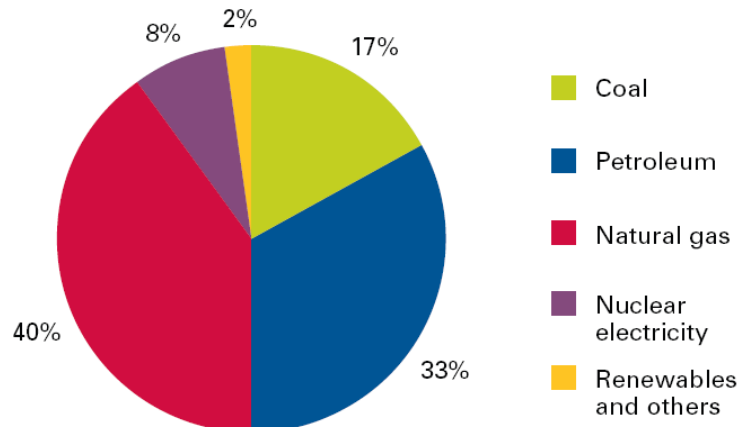
Gas networks

- Not a lot of gas left!
- Biogas more valuable as transport fuel?
- Future planning regulations

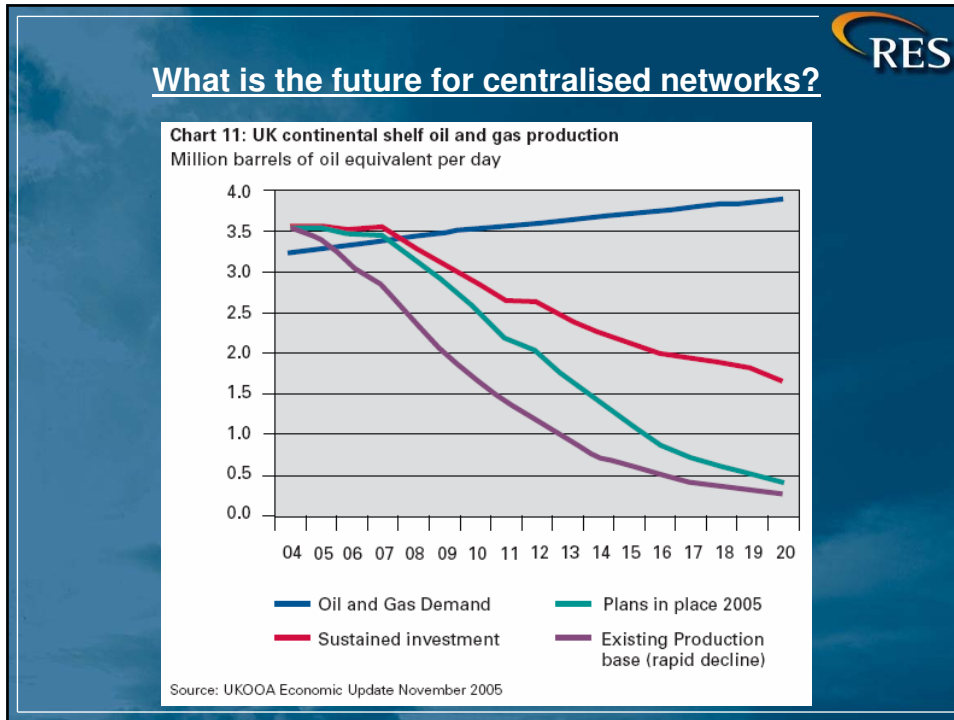
What is the future for centralised networks?


Chart 2: Breakdown of UK energy supply

Mtoe, %, 2005



Source: DTI, DUKES 2005



- ### What future for electricity networks?
- 
- AGAINST**
- Battery technology
 - Terrorism
 - Fuel crises
- FOR**
- Well lobbied for
 - Economics of grid vs distributed renewable power
 - Broadcast capability
 - WiFi health concerns?

Beaufort Court - Factor 10?

- Convergence of renewables and energy efficiency
- Opportunities of decentralised energy
- 10% (20%) renewables mandatory now
- Most appliances less than 20% efficient