

BRE Resource 05

CO2 Emissions from Housing
The Challenges

- Research oriented
 - New research department
- Sustainability
 - Students curriculum
 - Award
 - Campaigning issue



RIBA British Architectural Library Photographs Collection

Déjà vu?

- 1970's oil crisis
- Solar houses
- Friends of the Earth
- Vast oil finds
 - fizzle



This time its real

- A CO₂ not only an energy crisis
 - Currently at 380ppm and rising (+3ppm in 2003 alone)
 - + 400ppm is critical (IPPR)*
- +2degC may lead to abrupt climate change
- Global energy usage set to double in 21c
- Massive change is needed

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It is bust, we do need to fix it

- Housing accounts for c28% of UK CO2 emissions
- This could be much worse if some trends persist
 - Domestic air conditioning
 - External heating and lighting
- Government 2003 white paper target of 60% reduction by 2050
- Along with:
 - No fuel poverty
 - so using the price mechanism for controlling demand is not acceptable
 - Security of supply
 - This has implications



The 40% (CO₂) House by 2050

White paper and March 05 conference

From the report's Executive Summary:

- 33% more households by 2050
 - Each warmer, using more hot water and with more appliances
- 2 generations of power stations by 2050
- 3 generations of domestic heaters (boilers etc)
- But no reliance in our planning on “trick science”



Existing Housing

- 2/3rds already exist
- Upgrade to consume only 6500KWHrspa
 - 33% more efficient than now
- Highly insulate:
 - 90% cavity walls
 - 30% solid walls
 - 100% lofts
 - 100% new HP doors and windows (to 22m homes)
- Demolish 80,000 houses pa (4m houses!)



New Housing

- 220,000 HP homes pa
 - 10 million new homes!
- 3000KWHrspa consumption, max



Lights Appliances and Heating

- Technology led savings very possible:
 - Led lights
 - Using 1/6th of current energy
 - VIP fridges
 - Highly efficient
- Low to Zero Carbon heating:
 - CHP for 19 million houses
 - Community and individual (Micro)
 - Heat pumps, biomass, PVs on 30% of homes, Solar collectors on 60% of homes, wind etc



This is massive change. Can it be done?

- Maybe
 - 50 years ago there was no CH, now we have universal CH
 - In the past 30 years:
 - Heat loss per dwelling has reduced by 30%
 - Boiler efficiency has gone up from 40-70%
- Maybe not
 - Homes use 30% more energy than in 1970
 - Trend to cooling, outdoor heating and lighting

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Bed Zed

- Zero energy / CO₂ development (not just 40%)
- Super insulated and triple glazed
- Heat sources
 - Sunshine, lights, appliances, hot water, people, cooking etc
- Heat exchangers in natural vent system
- Tree powered CHP for electricity and HW
- PV's
- Low energy lights



What's the Alternative?

- Huge challenge –
 - Do people understand how much we have to do?
 - Sustainability fatigue?
- Do we have the leadership or the will power?
- Bill Gething: (Feilden Clegg Bradley) BD article 26 08 05
 - “the longer part L (building regs) is delayed the more watered down it becomes”
 - “progress in upgrading existing homes has been painfully slow”

A Nuclear Dawn

- Powerful
- Clean (CO₂-wise)
- Deliverable
- Terrifying
 - Waste
 - Arms proliferation



Conclusion

We have to have the will to:

- focus on the problem,
- communicate its importance,
- legislate and innovate
- to avoid “sleepwalking” to a nuclear energy dominated future

