ERP/ RAE/ ETI Heat Workshop
22nd January 2009

Setting the context: policy

Dr Nick Eyre
Environmental Change Institute, University of Oxford
Co-Director for Energy Demand, UK Energy Research Centre
Energy policy objectives for heat

• Objectives
  – Energy security
  – Carbon emissions reduction
  – Business competitiveness
  – Affordability

• Implications of high gas dependence
  – Security and carbon goals can only be delivered by using less energy and/or a shift to renewables
  – Competitiveness and affordability goals could be damaged by a shift to more expensive options
What are the costs of change?

At current costs, demand reduction is mostly cheap, renewables mostly expensive

Source: CCC, 2008
What’s different about heat?

• Scale
  – Most of UK final energy use

• Location
  – Heat is expensive and difficult to transport
  – Local conversion of fuel→heat generally preferred
Scale options for low carbon heat

- Large scale
  - Decarbonised electricity plus electric heating (or hydrogen network)
- Medium scale
  - District heating system
- Micro scale
  - Point of use technologies – lower demand, efficiency and micro-heat
Short and medium term conclusion: Heat pumps and CHP can both play a useful role in reducing carbon emissions, direct electric heating cannot.
Should policy encourage District Heating?

- Only low carbon if fuelled by biomass or if CHP (most existing systems aren’t!)
- Traditionally a neglected option in the UK compared to much of northern Europe
- Some clear opportunities
  - High heat load industries and buildings
  - Mixed use development
  - Industrial waste heat availability
  - Off gas grid (using biomass)
  - New low carbon developments?
- Not a general panacea
What does this mean for the overall policy framework

• Grid electricity and district heating are (large) niche opportunities in the short term
• Focus on heat at the point of use through
  – Pricing - incentives for efficient use and low carbon
  – Innovation – develop and deploy technologies using renewables and high efficiency
  – Reduce the need for heat – change the behaviour, buildings and processes that use heat
• Heat strategy **must** cover supply and demand
The Stern Review and heat policy

- Stern’s conclusions on policy instruments for carbon abatement were:
  - Key role of carbon pricing
  - Encouraging innovation
  - Changing behaviour

- Does current policy do this for heat?
## Carbon prices for heat

<table>
<thead>
<tr>
<th>Sector</th>
<th>Carbon price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy intensive industry – EUETS</td>
<td>~£12/tCO₂</td>
</tr>
<tr>
<td>Other large organisations – CRC</td>
<td>£12/tCO₂</td>
</tr>
<tr>
<td>All business and public sector – CCL</td>
<td>~£8/tCO₂</td>
</tr>
<tr>
<td>Household suppliers – CERT</td>
<td>~£16/tCO₂</td>
</tr>
</tbody>
</table>

Cf. gas market price of £100 - £200/tCO₂ depending on sector
Innovation support through the Low Carbon Building Programme 2006-2008

May-06: Launched - £12m government funding
Dec-06: Monthly rationing imposed
20-Dec-06: Monthly allocation gone in 20 days
01-Feb-07: Monthly allocation gone in 2 hours
21-Mar-07: Budget: Funding increased to £18m
22-Mar-07: Programme suspended
May-07: Re-launched with lower grant levels

Consumers and industry lose interest
Mar-08: Extended – no increase in grants
Changing the demand for heat - behaviour and buildings

• Building regulations
  – Very effective for boilers and glazing
  – New build performance poorly enforced

• Building labelling
  – Early stages of implementation

• Tax incentives
  – Very limited

• Energy Supplier programmes
  – Effective for low cost measures
  – Restricted to households

• Information and advice programmes
  – Well established EST and CT programmes
  – Commitment to better metering and billing
  – Very limited technical support
Conclusions for policy

• Top short term priority is to use less heat
  – Educate, incentivise and regulate
• Incentivise more efficient equipment
  – Deploy 2\textsuperscript{nd} law technologies
• Begin to use more renewable fuel
  – Incentivise and develop the supply chains for solar and biomass