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# Power Generation in the UK post 2020

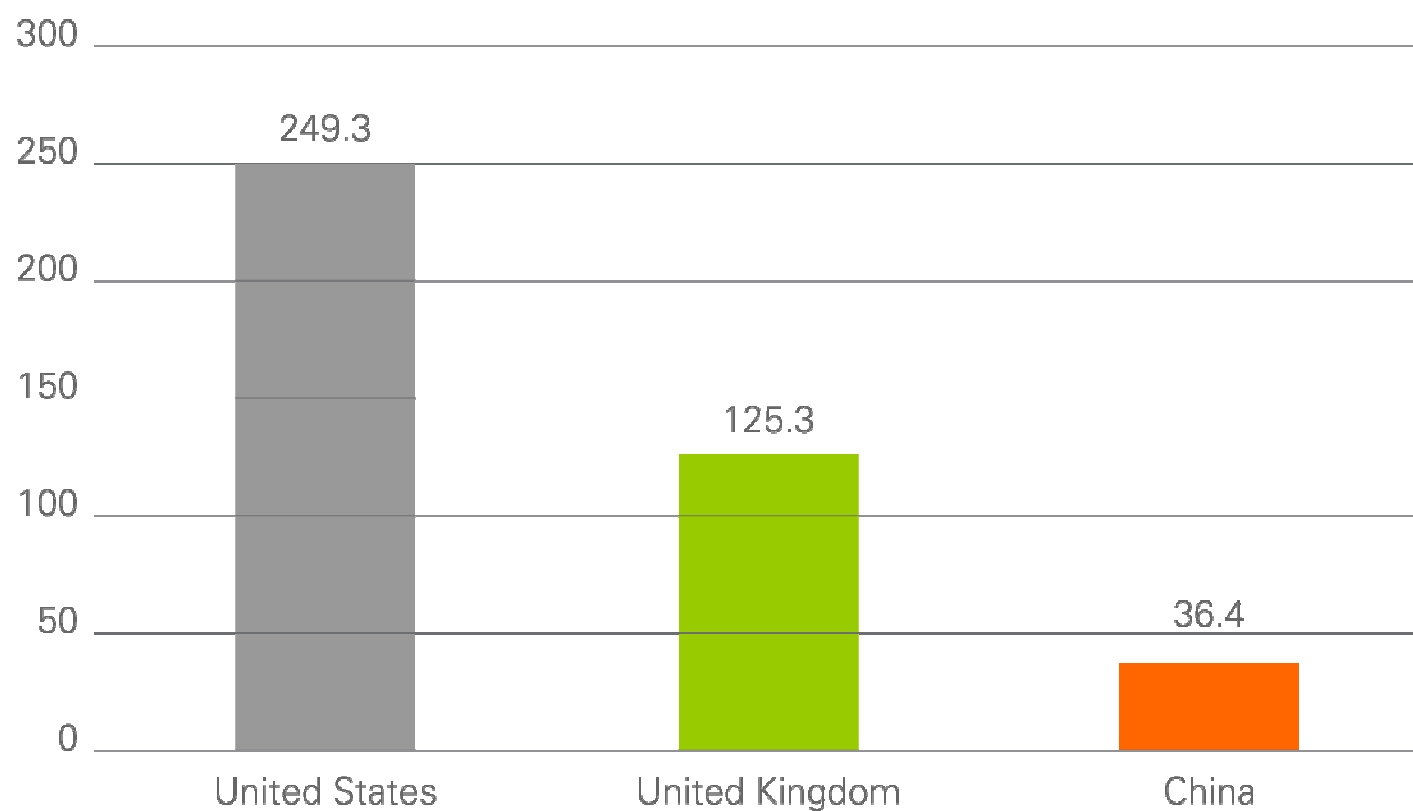
KTN Conference, 15<sup>th</sup> March 2011



## How much energy do we use?

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kWh per day

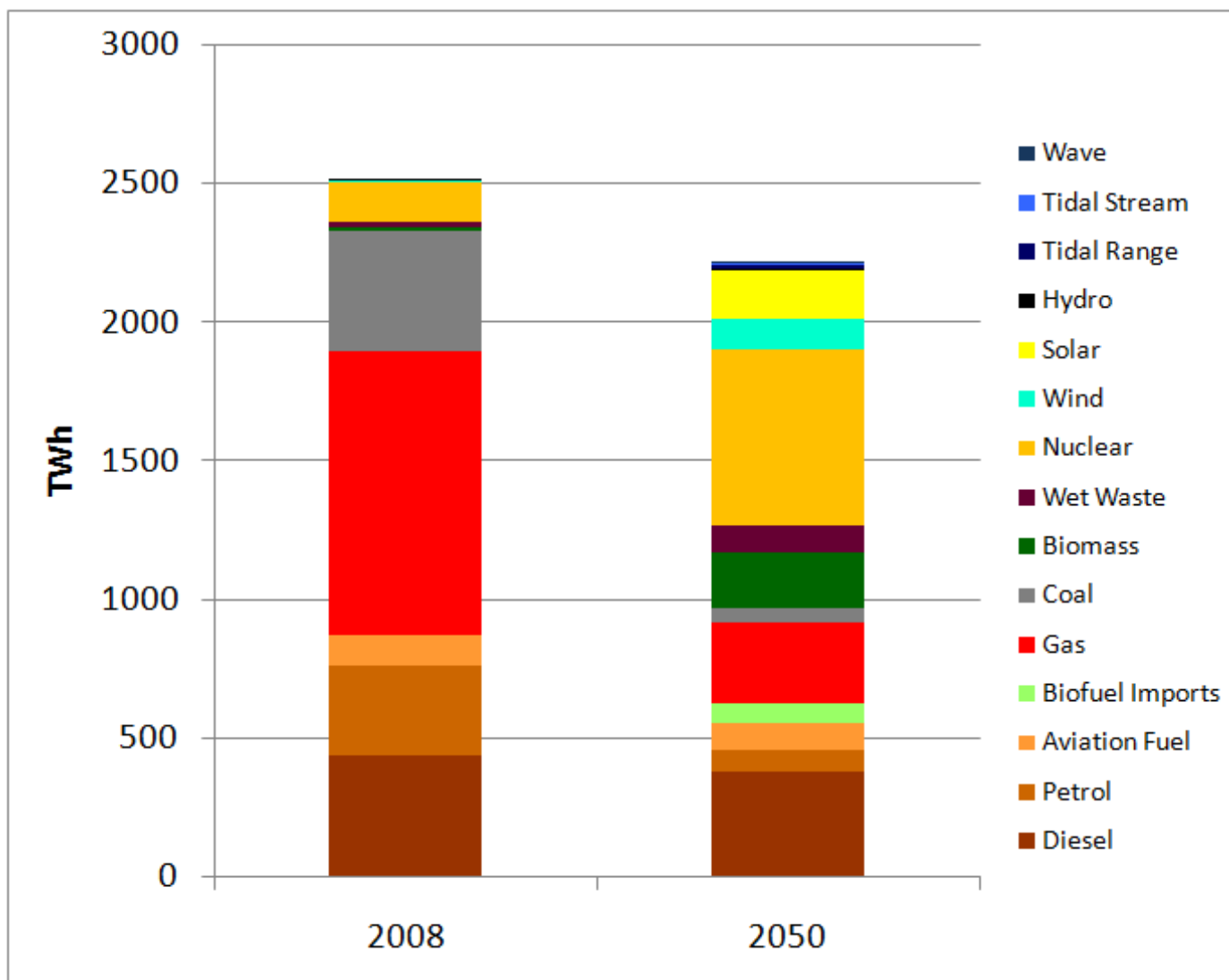


Source: World Resources Institute



# What's the challenge for the UK

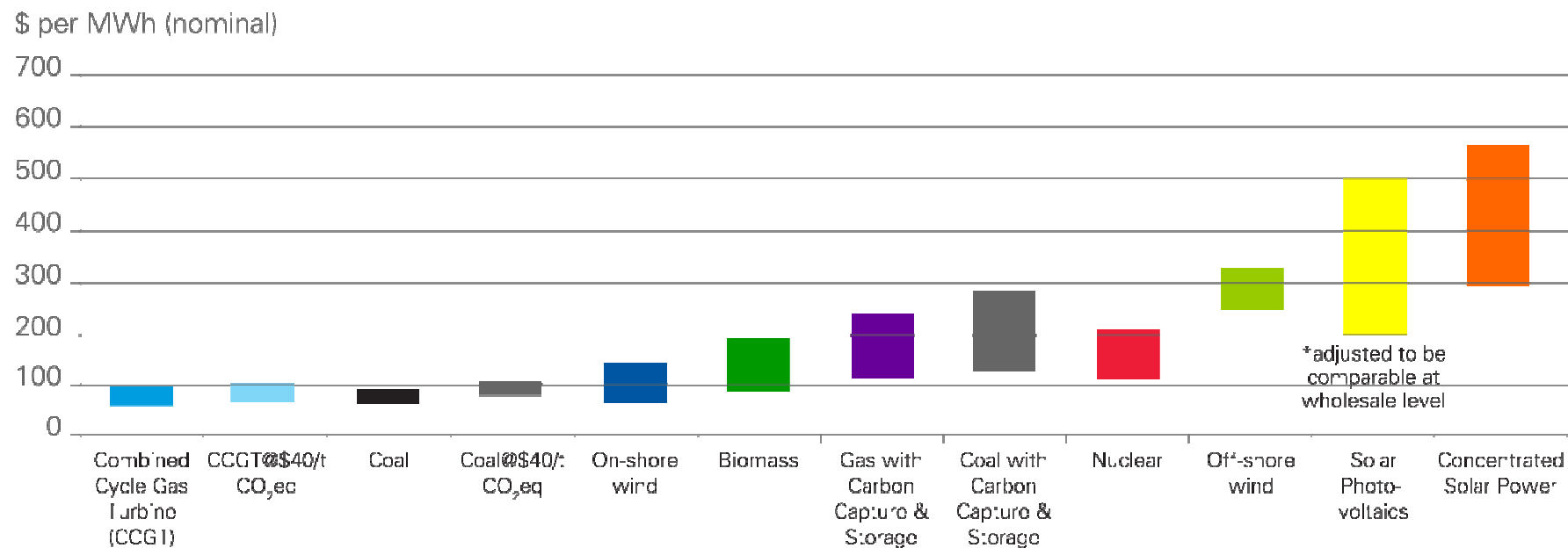
## UK primary energy supply:





# How much will it cost?

2010 US levelised break-even costs of generation: new build and retrofit

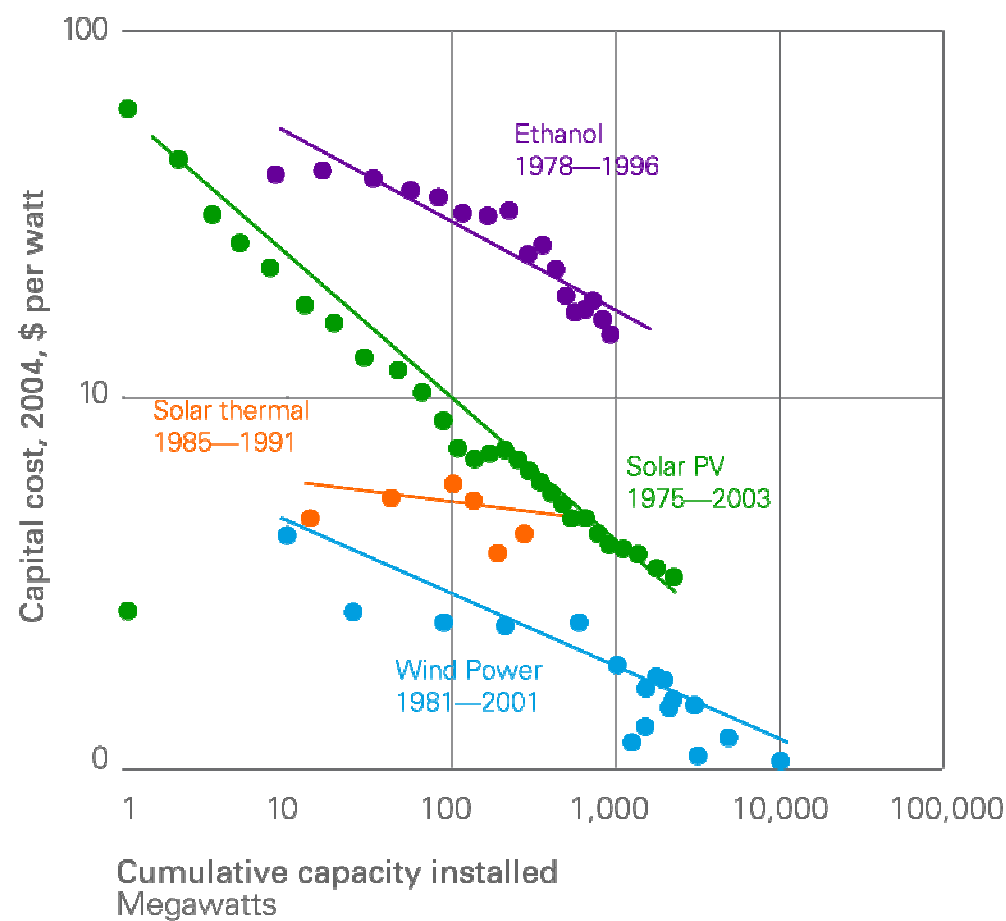


Source: external data and proprietary analysis



# What is the role of technology?

## Cost evolution and learning rates for selected power technologies



Historical learning rates (i.e., cost decreases) per doubled cumulative capacity

- 23% for solar PV
- 13% for wind power
- 15% for ethanol
- 3% for solar thermal

Sources: UC Berkeley Energy Resource Group, Navigant Consulting, quoted in McKinsey "The carbon productivity challenge"

# How can we achieve this transformation?

## National

| Category                                                                                           | Representative technologies                                                                                                                                        | Representative policy measures                                                                                                  |
|----------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|
| Technology proven and <b>with potential</b> for commercial deployment in a competitive environment | <ul style="list-style-type: none"> <li>• End use efficiency</li> <li>• Onshore wind</li> <li>• Enhanced oil recovery</li> <li>• 1st generation biofuels</li> </ul> | <ul style="list-style-type: none"> <li>• Mandates</li> <li>• Permitting support</li> <li>• Stable long term measures</li> </ul> |
| Technology proven but <b>not yet</b> commercially competitive                                      | <ul style="list-style-type: none"> <li>• Carbon capture and storage</li> <li>• Solar</li> <li>• Offshore wind</li> <li>• 2nd generation biofuels</li> </ul>        | <ul style="list-style-type: none"> <li>• Demonstration funding</li> <li>• Transitional incentives</li> </ul>                    |
| Technology <b>not yet</b> proven and <b>not yet</b> commercially competitive                       | <ul style="list-style-type: none"> <li>• Energy storage</li> <li>• Gen IV nuclear</li> <li>• Tidal and wave power</li> <li>• Geothermal</li> </ul>                 | <ul style="list-style-type: none"> <li>• R&amp;D support for underpinning science</li> </ul>                                    |

## Global



Kyoto Protocol conference on climate change 1997