

A Practitioner's Guide to a Low-Carbon Economy: UK Lessons

Power Generation and the Environment Conference
Jackson Hole, Wyoming, October 1-2 2012

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Support by the UK Economic and Social Research Council and
the Grantham Foundation is gratefully acknowledged



Overview

- A legal basis
- Decarbonisation sector by sector
- A policy framework
- Opportunities and concerns

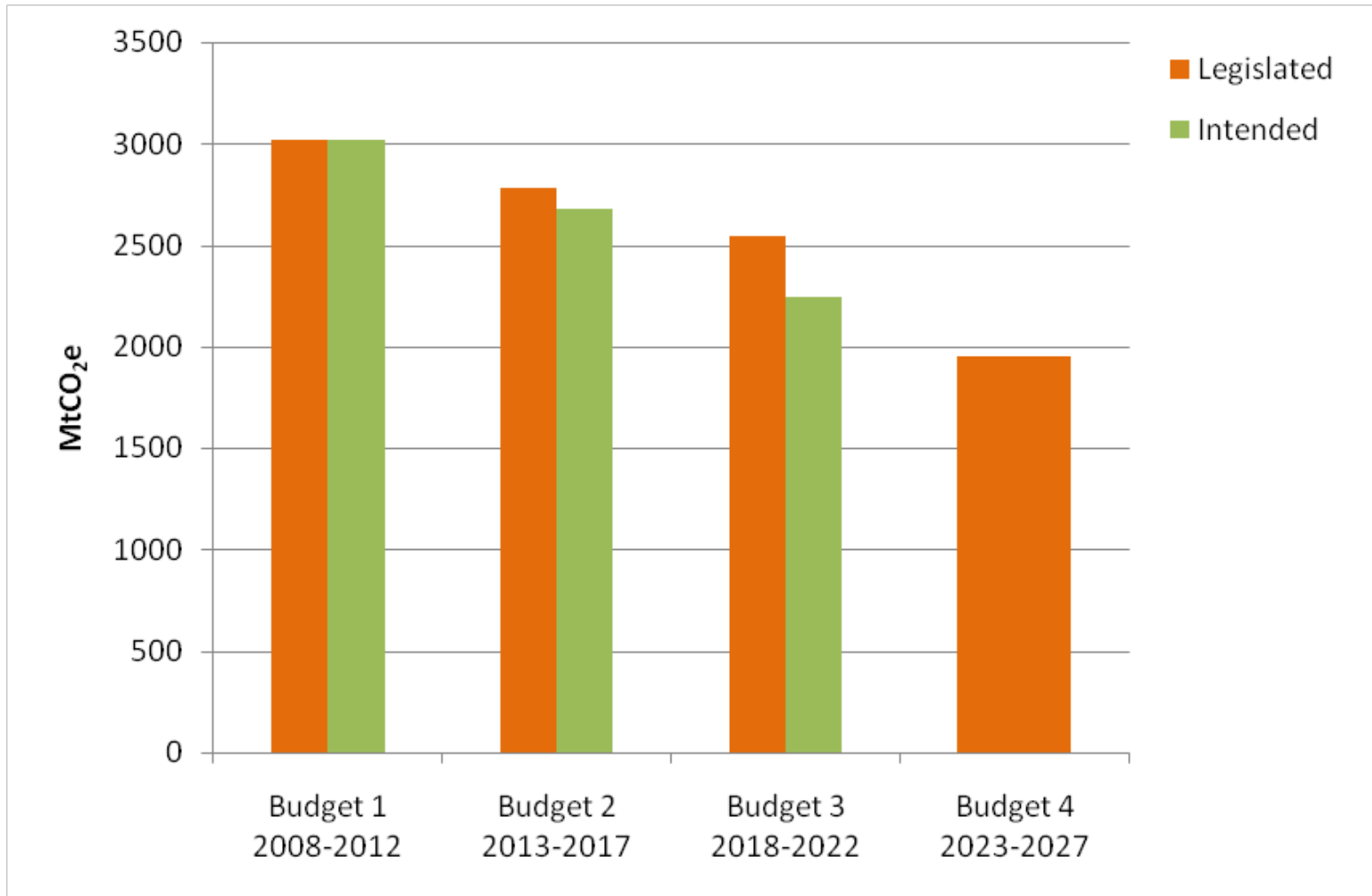
The need for a legal basis

Britain's 2008 Climate Change Act is a good example

- The sets legally binding carbon targets
 - Long-term (2050) target set in the Act
 - Binding 5-year carbon budgets set 12 years ahead
 - First four budgets (2008–27) currently set
- The Act puts in place an institutional framework for delivery
 - Independent Committee on Climate Change recommends budgets and reports on progress

The carbon budgets 2008 - 27

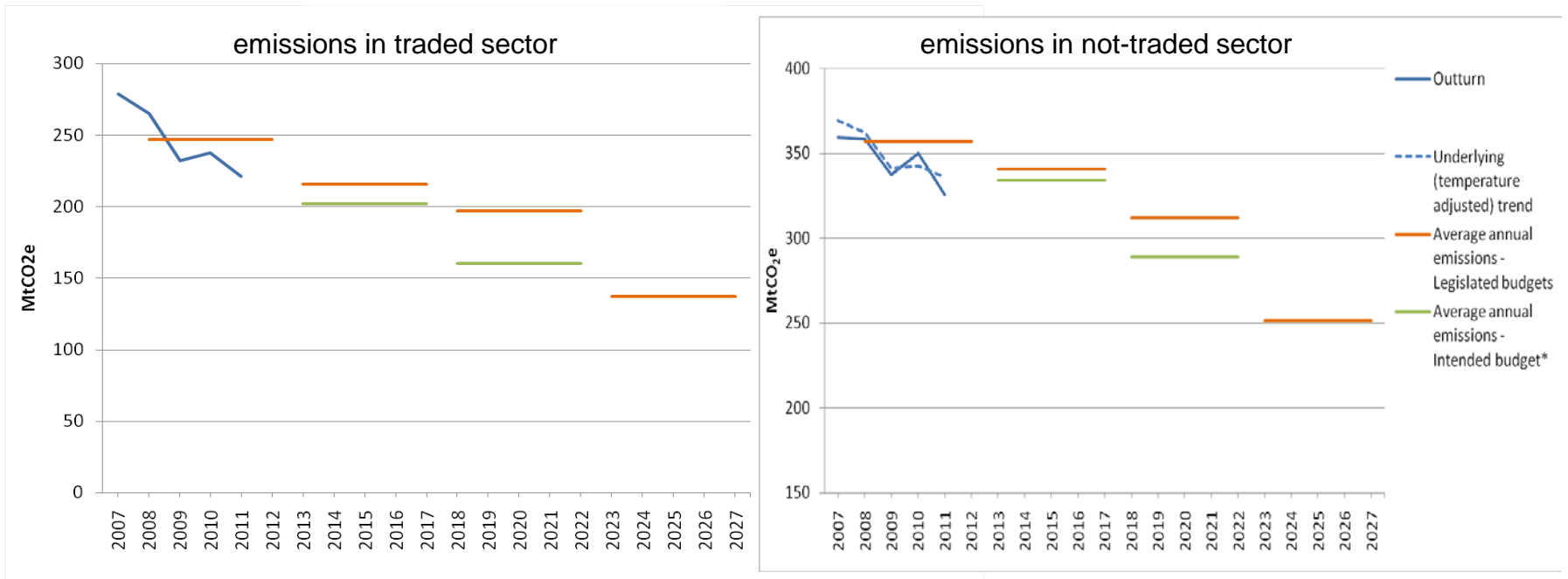
Cutting emissions in half by 2025 (relative to 1990)



Source: Committee on Climate Change (2012)

How are we doing?

Emissions are down, mostly due to economic factors



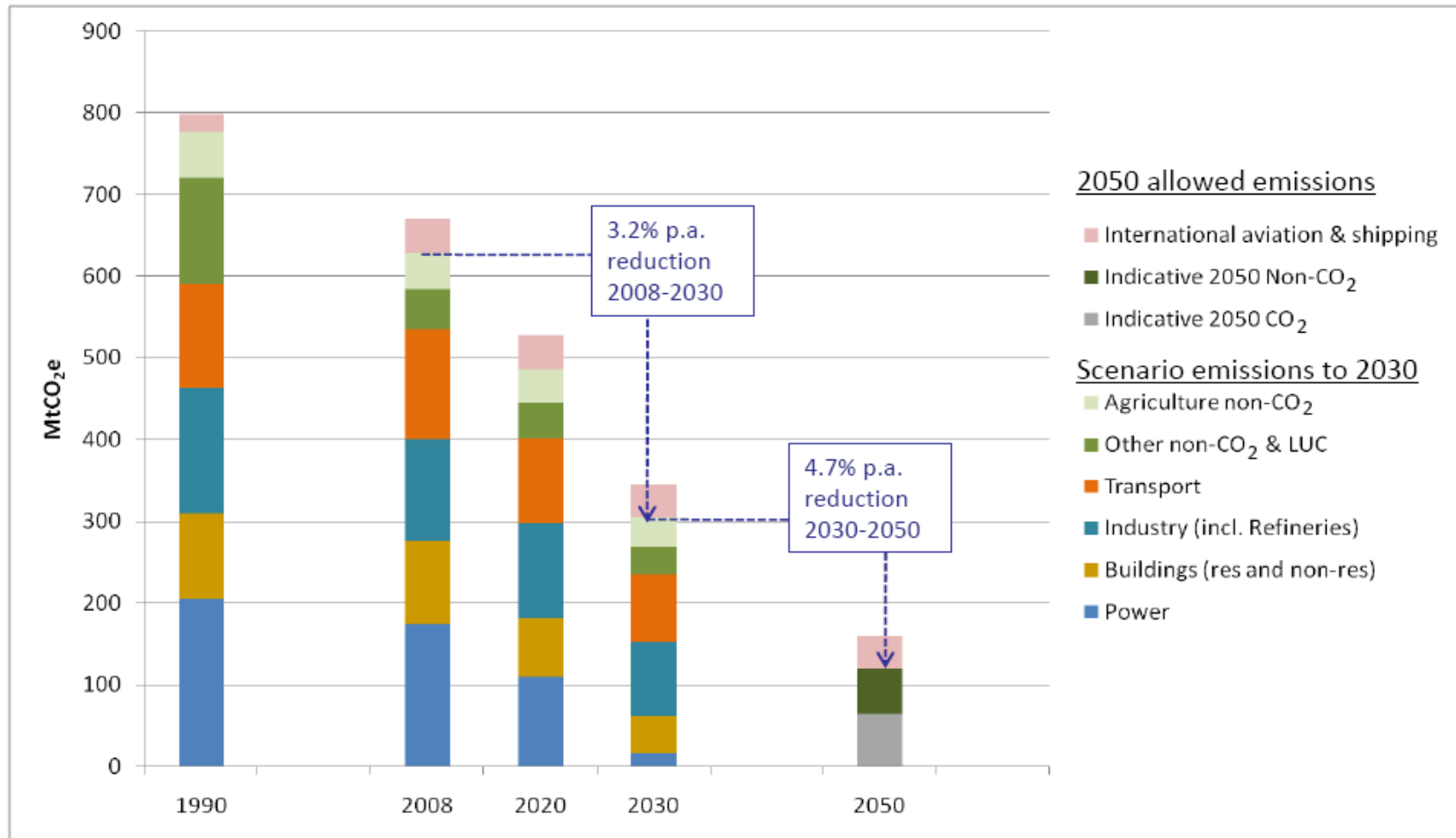
- First carbon budget (2008-12) will be met
- Recommendation not to “bank” possible over-performance
- Step change is needed to meet future budgets

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Indicative emissions trajectories

Different sectors will have different emission reduction paths

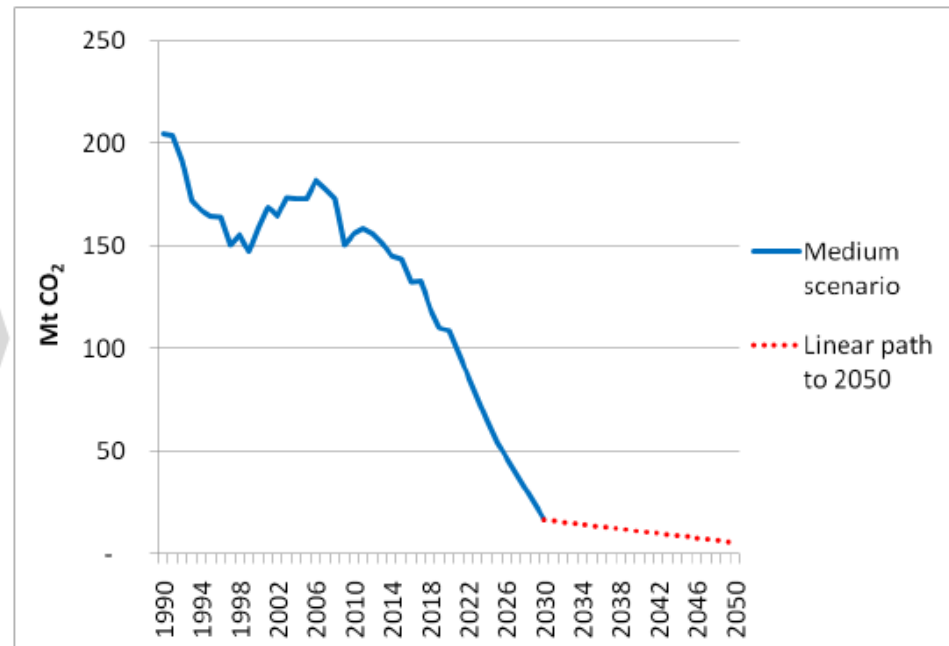
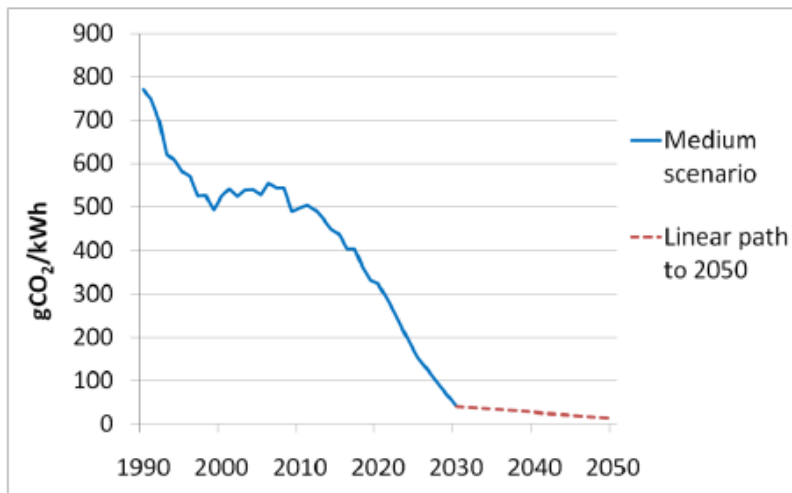
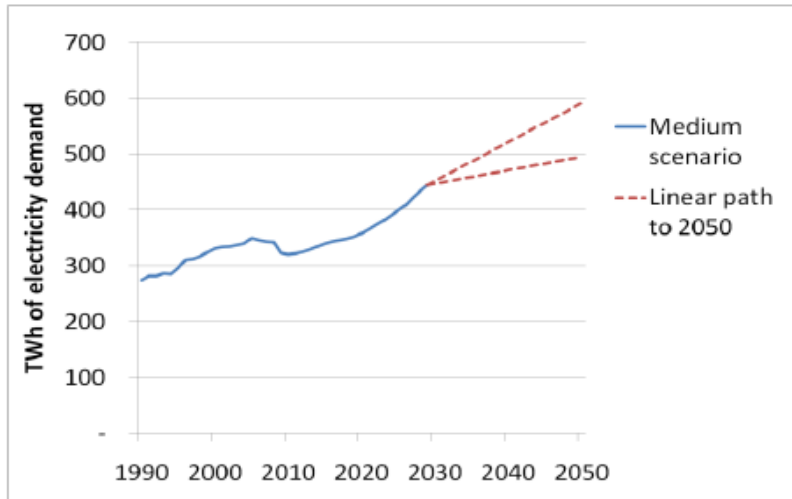


Source: Committee on Climate Change (2010)



Electric power emissions

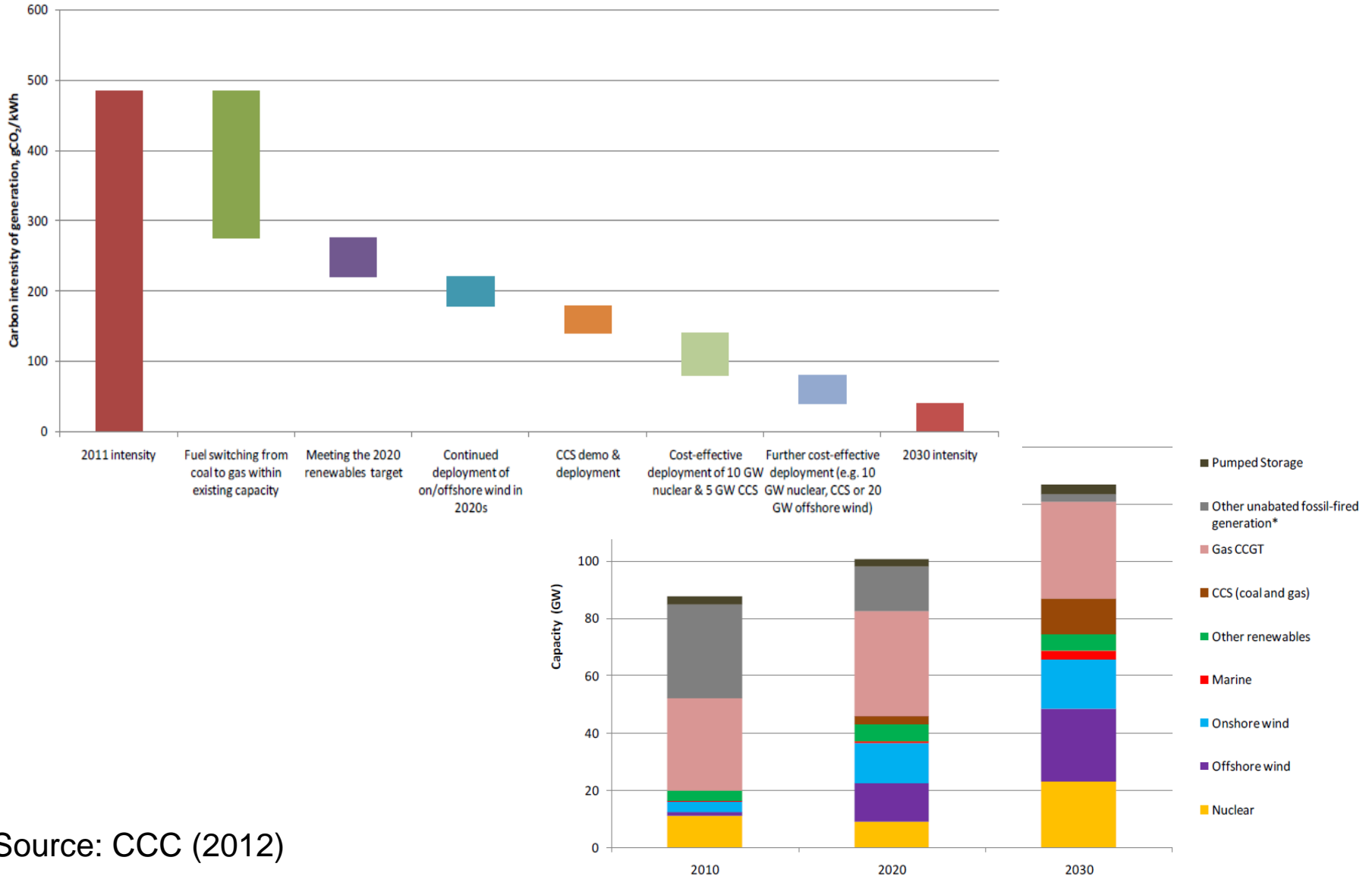
Electricity generation needs to be all but carbon-free in 20 years



Source: Committee on Climate Change (2010)

Wholesale replacement of generating assets

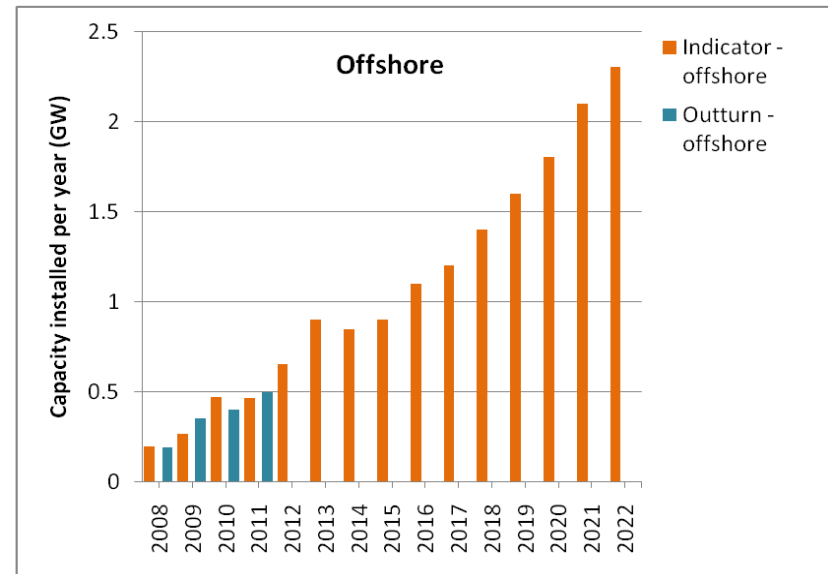
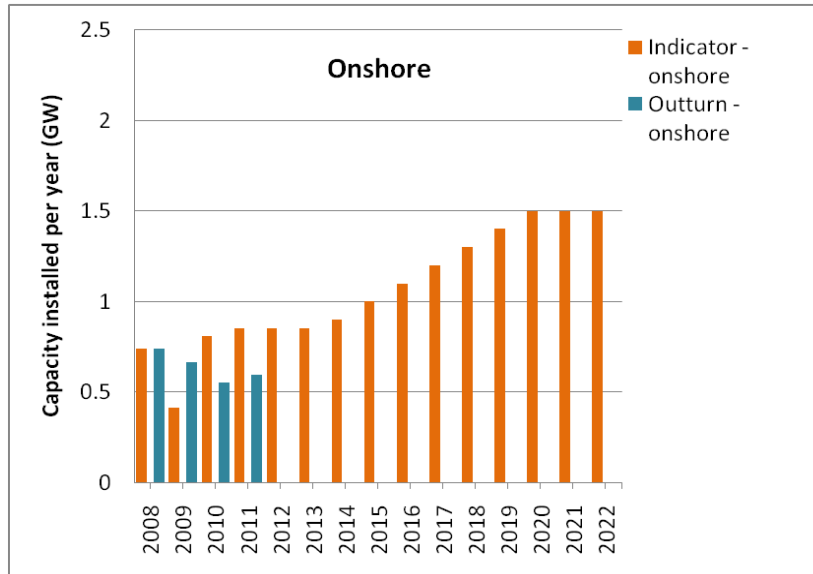
Many power stations due for replacement in the 2020s anyway



Source: CCC (2012)

How are we doing?

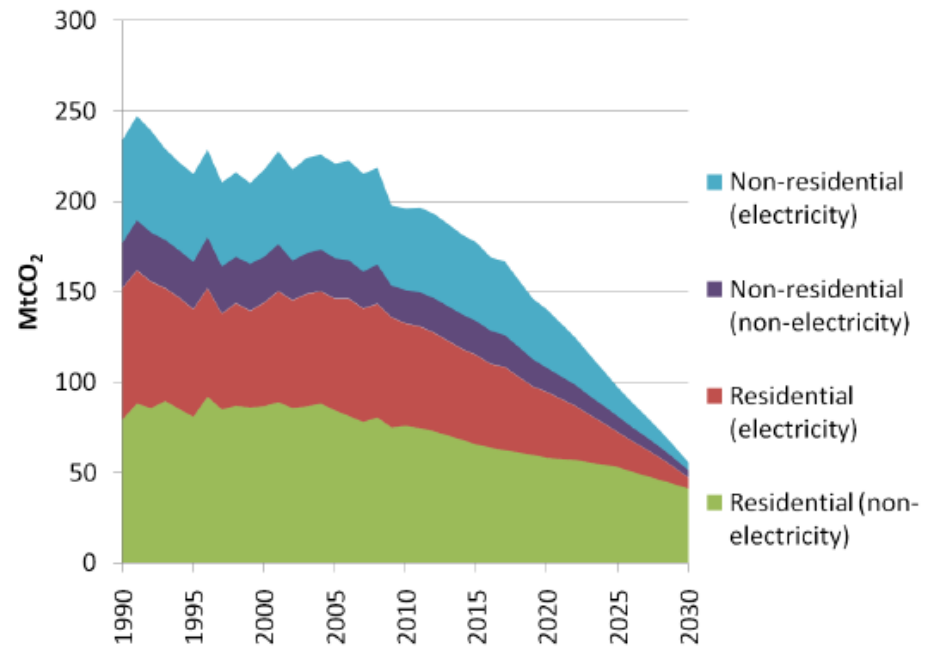
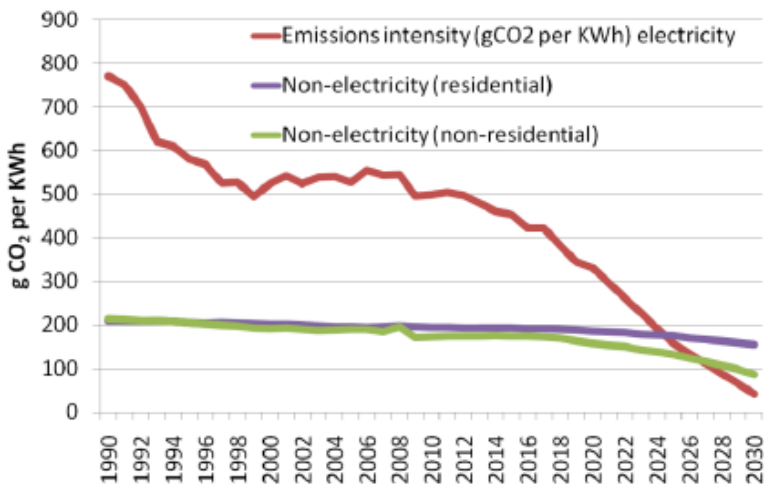
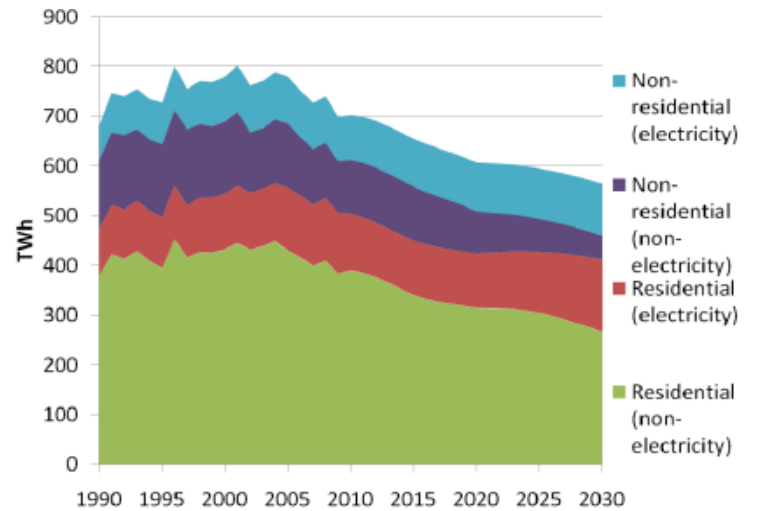
Renewables broadly on track, nuclear and CCS probably behind



- Healthy renewables pipeline (11GW), but planning bottlenecks persist
- CCS and nuclear are harder to develop than hoped
- Policy uncertainty related to new energy bill and interest in shale gas

Emissions from buildings

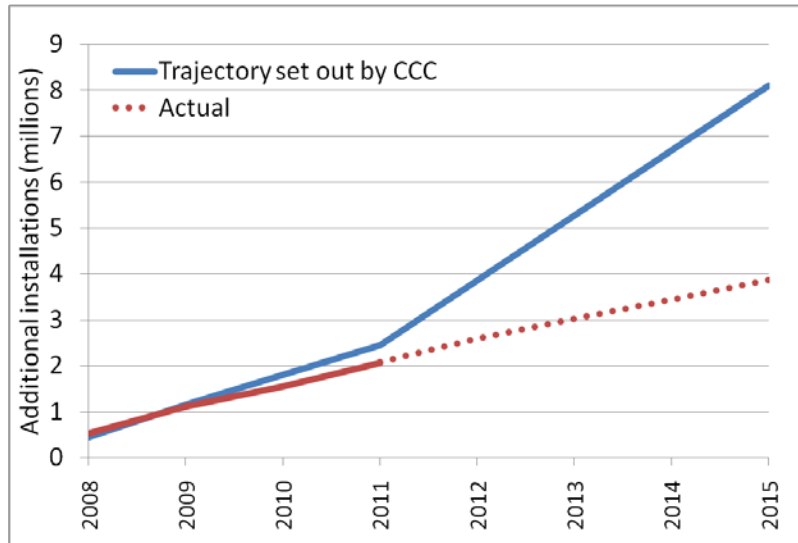
Push in energy efficiency and gradual introduction of renewable heat



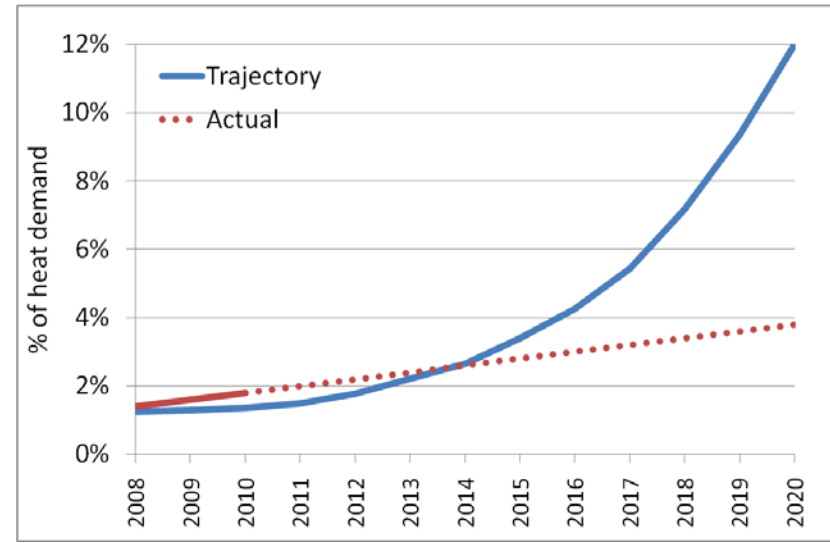
How are we doing?

Some progress, but more effort needed to unlock “difficult” options

Cavity wall insulation



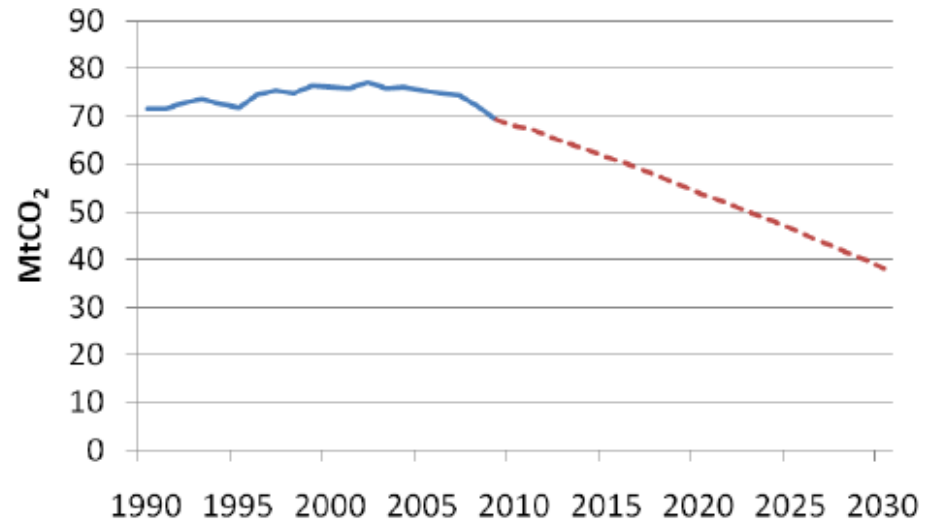
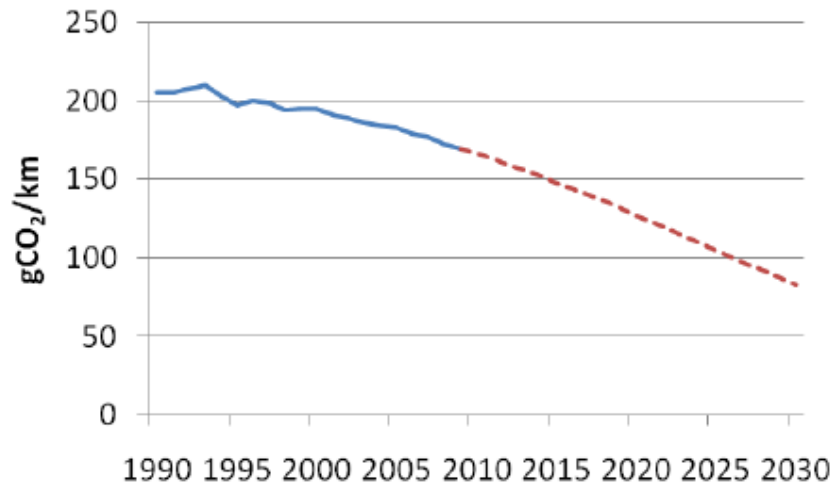
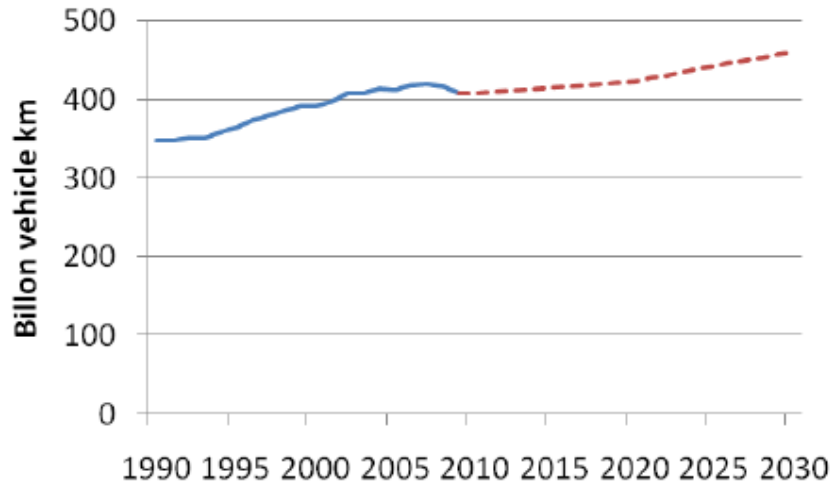
Renewable heat



- Cavity wall and loft insulation on track but solid walls well behind
- Renewable heat only now taking off based on new policies
- Weather factors (warm/cold winters) affect annual emissions picture

Transport emissions

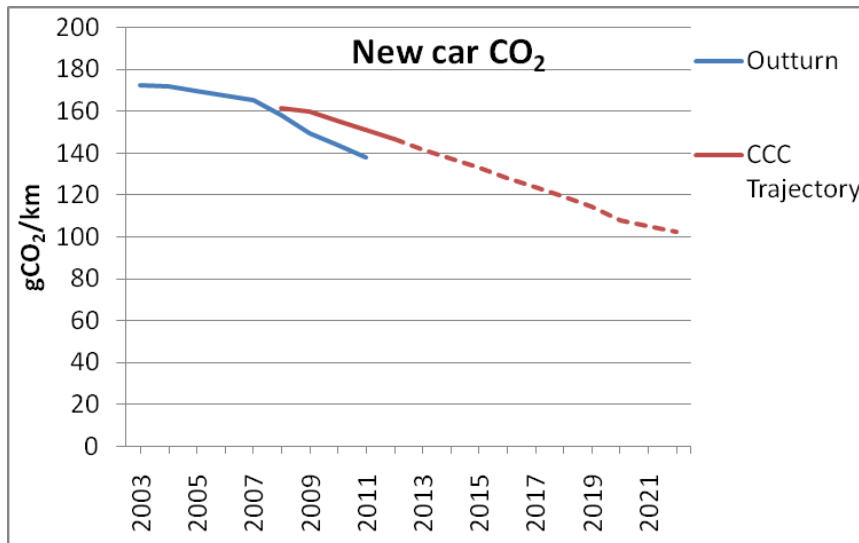
Technological change dominates demand management



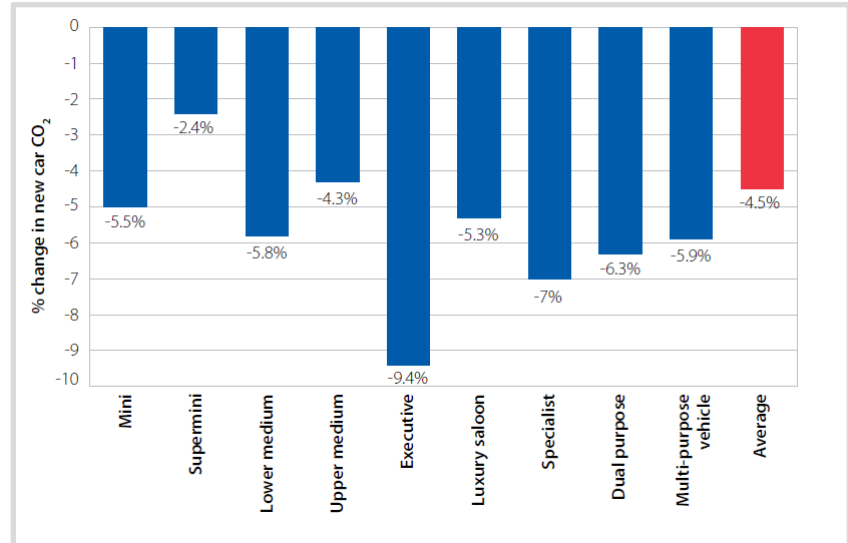
How are we doing?

Carbon efficiency of new cars is improving rapidly

Carbon intensity over time



Carbon intensity by car segment (2011)



- Better fuel efficiency overall and switch to best-in-class
- Slow uptake of electric (hybrid or battery) cars, but new models are brought to market
- Limited success of behavioural measures (eco-driving, speed limits)

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The key elements of climate policy

**Put a price
on carbon**



Address climate
change externality

**Support low-carbon
technology**



Address market failures
related to RDD&D

**Remove barriers to
energy efficiency**



Address market and behaviour
issues related to energy use

A complex landscape: price measures

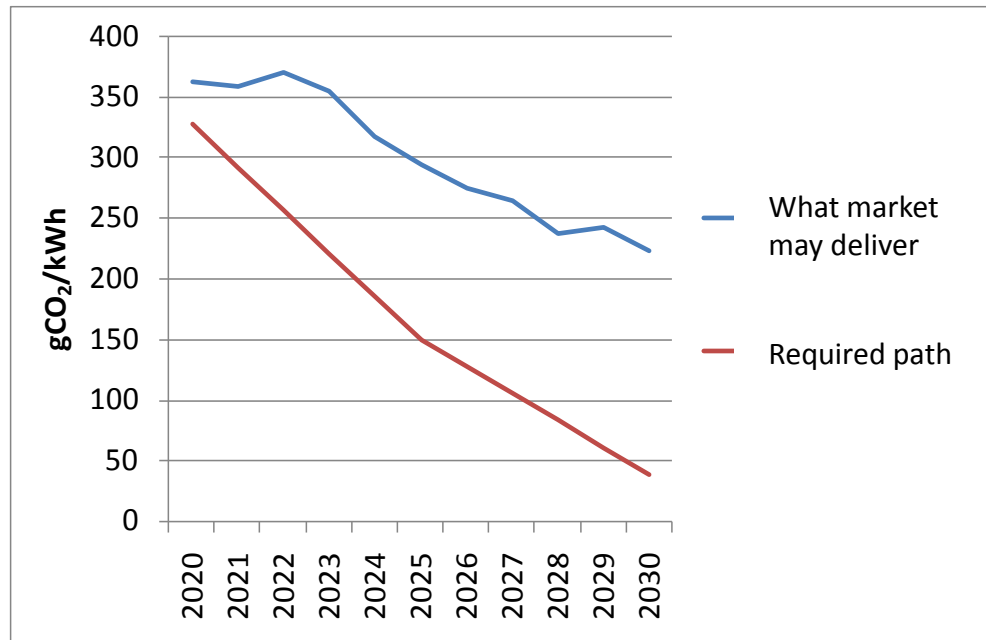
- Cap and trade schemes
 - EU Emissions Trading Scheme
- Carbon taxes
 - Climate Change Levy (diluted through Climate Change Agreements)
- Renewable energy incentives
 - Renewable obligation / Contract for Difference (large scale)
 - Feed-in tariff (up to 5MW)
 - Renewable heat incentive
- “Accidental” price measures
 - Fuel duty: primary purpose is fiscal
 - Landfill tax: primary duty is waste management

A complex landscape: non-price measures

- Supplier obligations
 - Carbon Emission Reduction Target (CERT)
- Financial assistance
 - “Green Deal” (for building efficiency)
 - Green Investment Bank (for large investments)
- Information and technical assistance
 - Carbon Trust, Energy Savings Trust
- Reputation and management incentives
 - CRC Energy Efficiency Scheme

Key new policies: electricity market reform

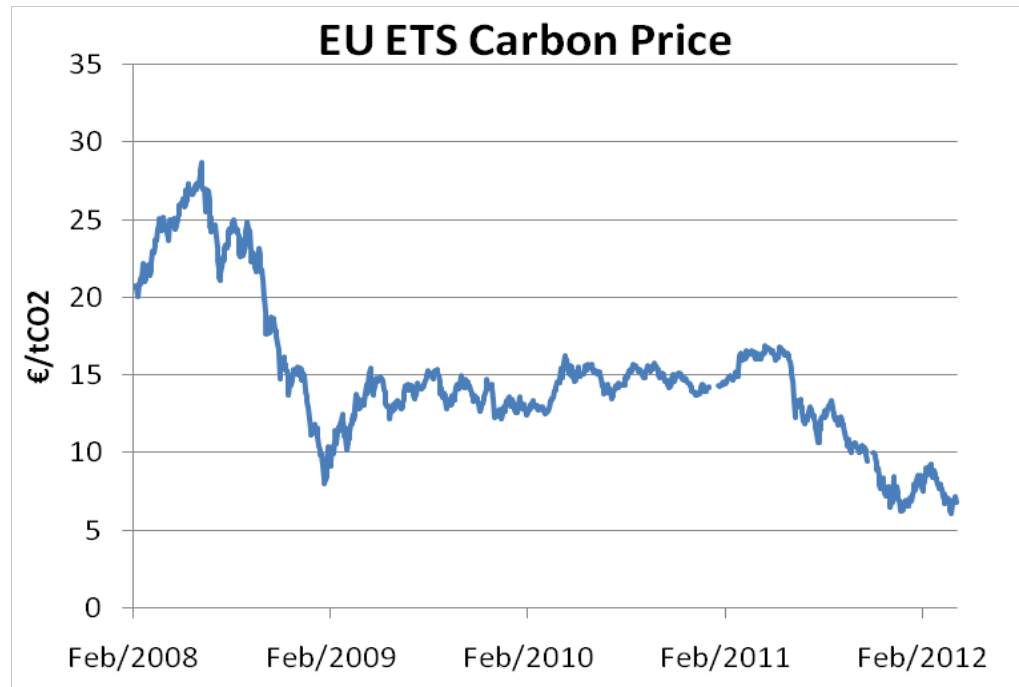
Current arrangements do not deliver the required emission cuts



- Low-carbon support through long-term Contracts for Difference (replacing renewable energy obligation)
- New capacity market to address intermittency issues of wind
- Emission Performance Standard (gCO₂ / kWh)

Key new policies: carbon price floor

EU Emissions Trading Scheme provides insufficient price signal

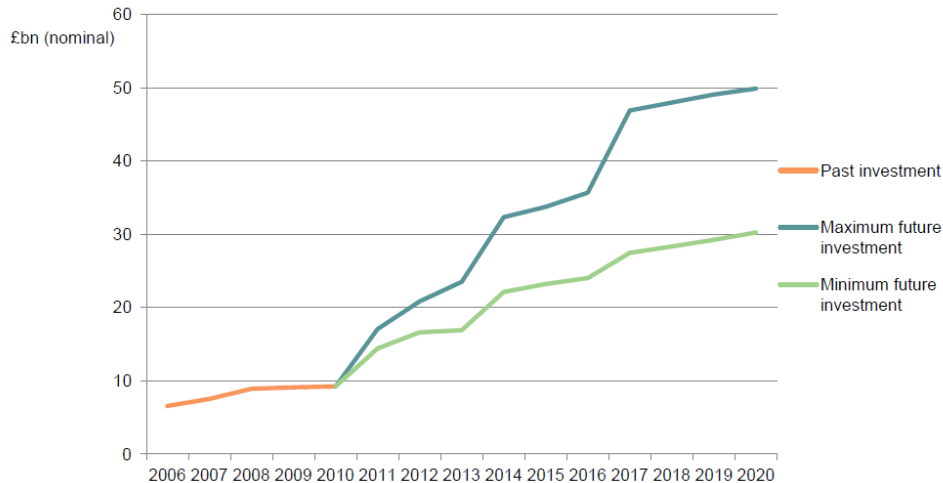


- Recession means EU ETS cap is increasingly loose
- Unilateral floor price rising from GBP16 in 2013 to GBP 30 by 2020
- EU-wide effect is constant emissions, lower prices, higher compliance costs

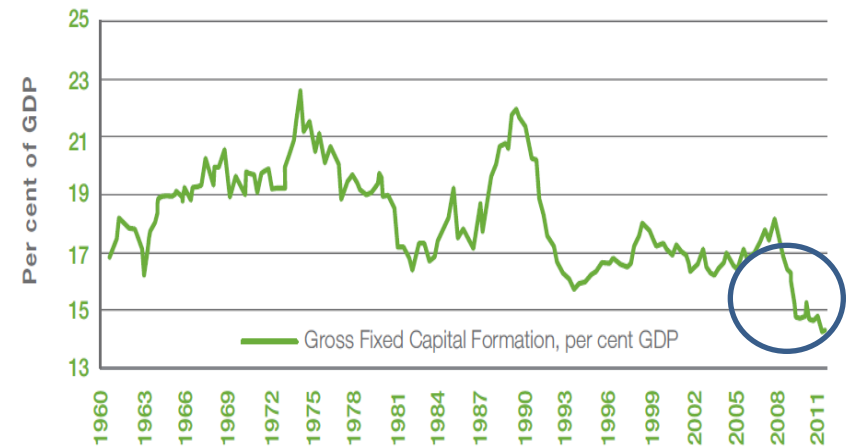
Key new policies: green investment bank

New institution to overcome problems in accessing finance

Growing investment needs



Historically low aggregate investment



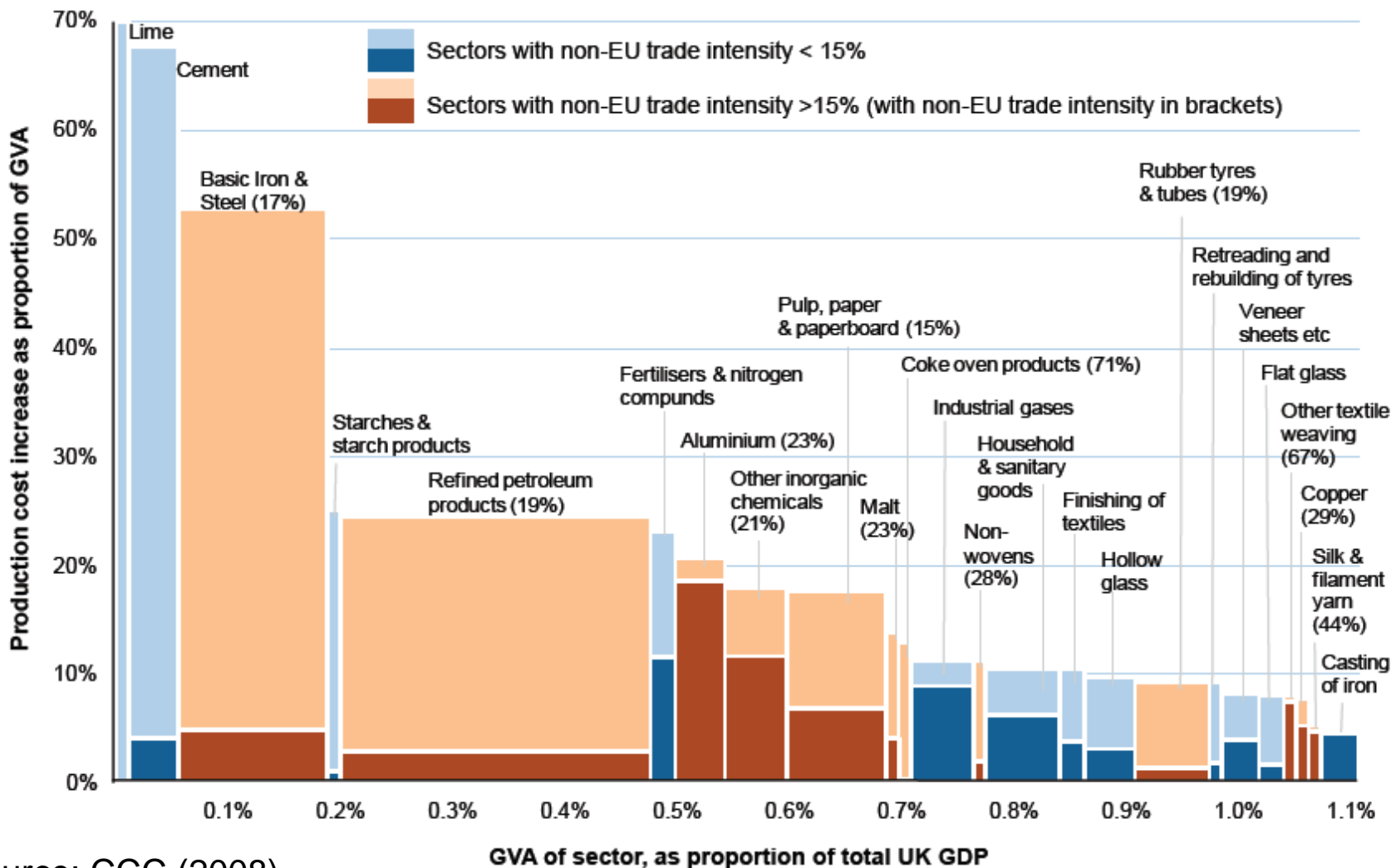
- Initial equity of GBP 3 billion, no commercial borrowing until 2015
- Focus on off-shore wind, non-domestic industrial energy efficiency, waste
- Offering both commercial and (eventually) state aided products

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Concern: Competitiveness

Limited to a few industries, but are there better tools than free permits?

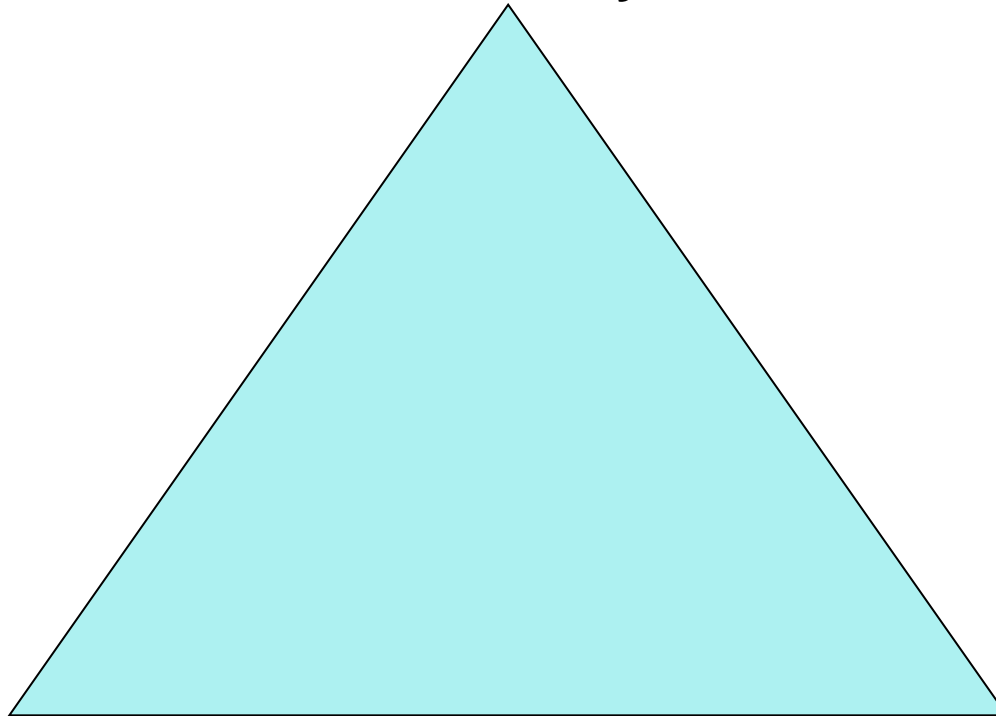


Source: CCC (2008)

Concern: Impact on fuel poverty

Energy efficiency could offset the effect of higher energy prices

**Targeted energy
efficiency**



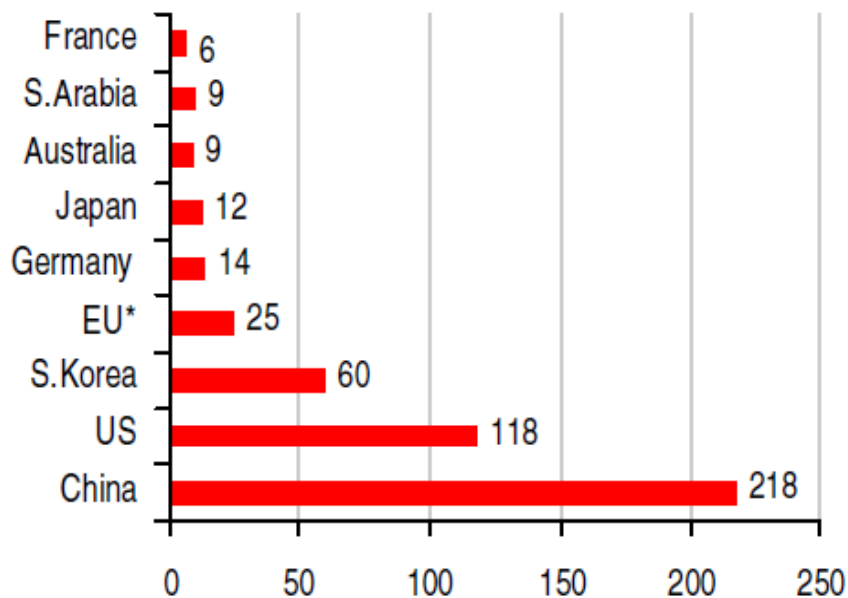
Income support
(e.g. winter fuel payments)

Tariff structure
(e.g. block tariffs)

Concern: Effect on economic recovery

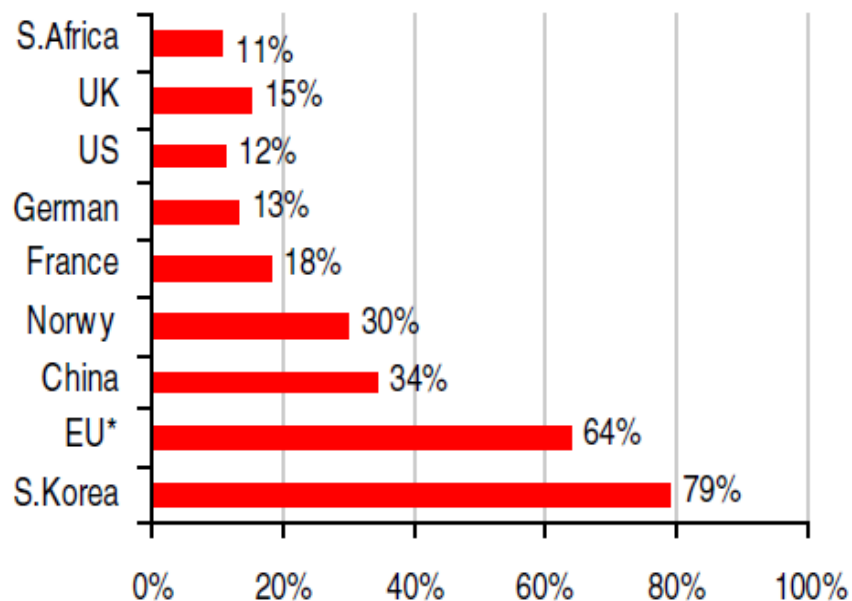
Green policies may kick-start recovery, can be revenue-positive or negative

Green stimulus ranking (USDbn)



Source: HSBC, government announcements (*Includes on EU's central recovery plan, member states listed separately)

Green stimulus ranking as % of total stimulus

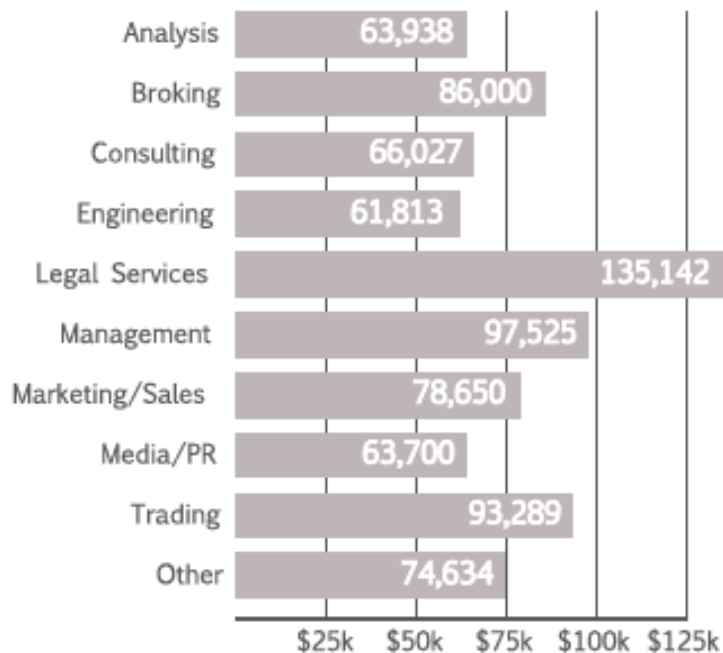


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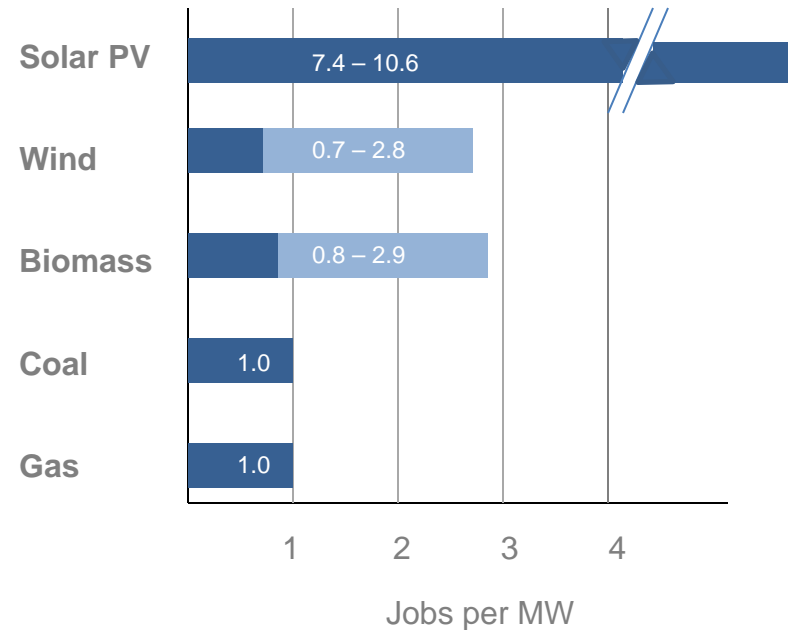
Opportunity: Job creation?

Quality of jobs (productivity) is more important than quantity

Salaries in carbon trading (2008)



Labour intensity of energy

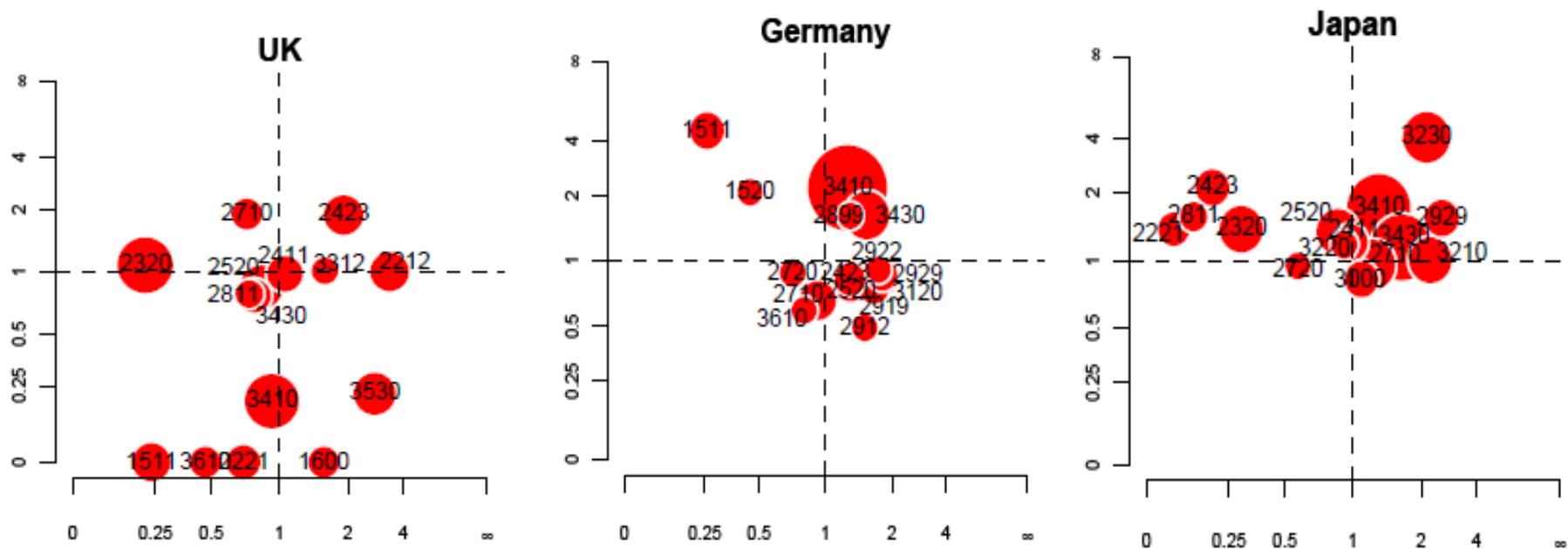


Sources: Carbon Salary Survey 2009; Kammen et al (2006)



Opportunity: Green growth?

Japan and Germany (not the UK) lead the green race

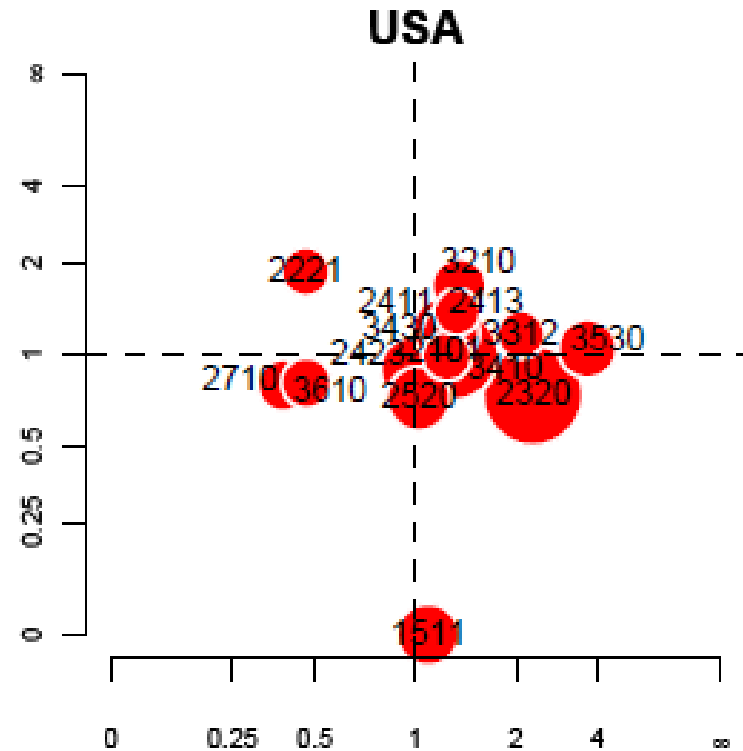
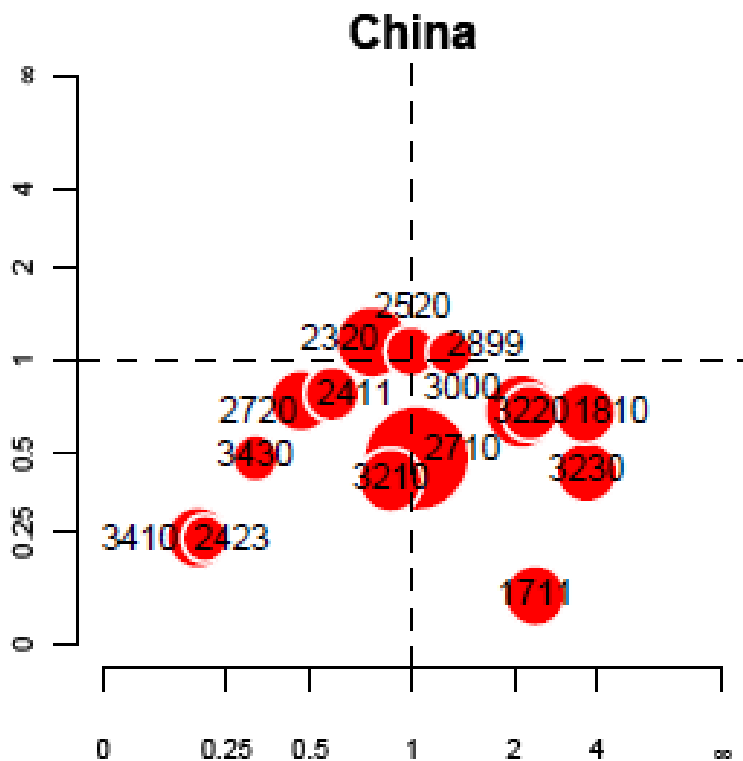


Green innovation (y-axis) and comparative advantage (x-axis) in manufacturing

Source: Fankhauser et al., forthcoming



How about some other important countries?



Green innovation (y-axis) and comparative advantage (x-axis) in manufacturing

Source: Fankhauser et al., forthcoming

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