

Future research priorities: A UKERC perspective

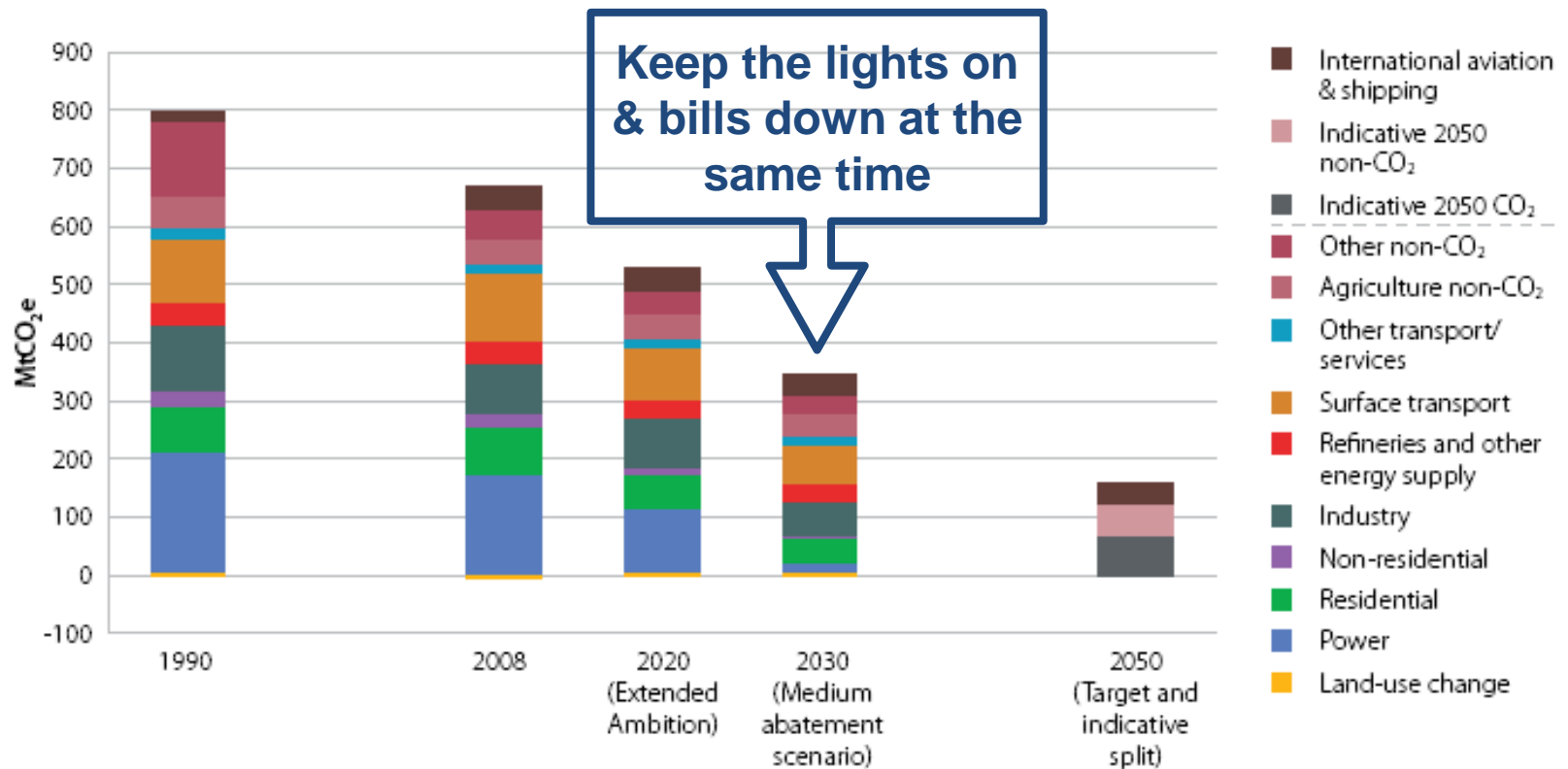
Jim Watson, Research Director

BIEE Academic Conference:
Balancing Competing Energy Policy Goals
Oxford, 17-18 Sept 2014



The UK's low carbon transition

Figure 3.13: UK greenhouse gas emissions (1990-2050)



Source: NAEI 2010, CCC calculations.

Note(s): Other transport/services includes CO₂ emissions from domestic aviation and shipping and agricultural energy use. Other non-CO₂ includes non-CO₂ emissions from waste, buildings, industry, energy supply and transport.

Source: Committee on Climate

Increasing politicisation

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The Goals | 23:43:01

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Back fracking to break free of Russia, says Cameron



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24 September 2013 Last updated at 17:37



Ed Miliband: Labour would freeze energy prices

COMMENTS (2104)

Labour would freeze gas and electricity bills for every home and business in the UK for 20 months if it wins the 2015 election, Ed Miliband has said.

Ed Miliband: "Britain can do better than this"

The big energy firms would be split up and governed by a new tougher regulator to give people "a fairer deal".

Labour says the move will save average households £120 and businesses £1,800 - but cost the energy giants £4.5bn.

But energy companies said the policy could lead to power shortages, and jeopardise investment and jobs.

Labour conference 2013

Landale: Austerity socialism?

Wednesday at the Labour conference

Election Labour's to lose - Ashcroft

The Telegraph

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Energy boss warns of blackouts as competition probe 'stops investment in power plants'

Centrica chief executive says energy giant is unlikely to invest in power plants needed to keep the lights on while under investigation by the top competition watchdog



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Breaking news: BT executive: 'count us out' of Channel 5 bid

Conservatives plan new attack on windfarms



Cameron considering manifesto commitment to curb onshore turbines, senior party source says

284 comments

Get the data: where are the UK's windfarms?

Lawyers speak out Why legal aid cuts are a disaster

Why have lawyers taken to the streets or because they care about the havoc?



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UKERC's research priorities

2004–09: What does a decarbonised the UK energy system in 2050 look like?

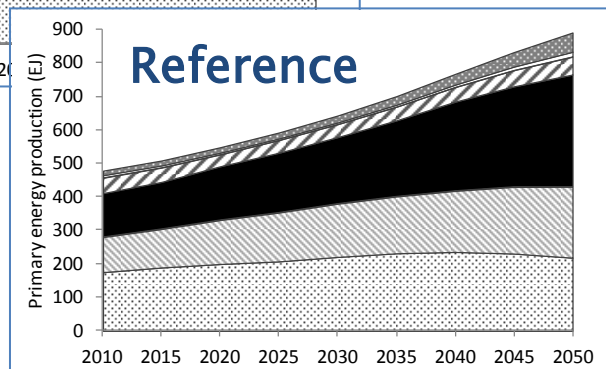
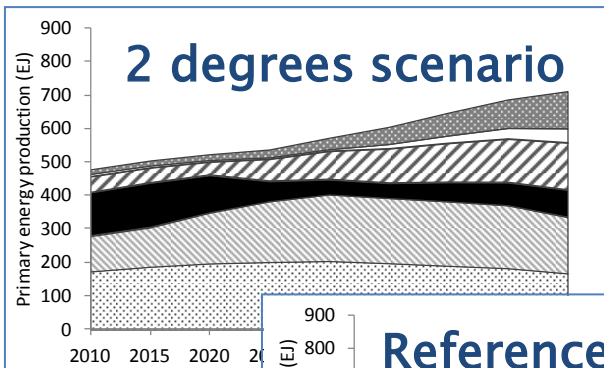
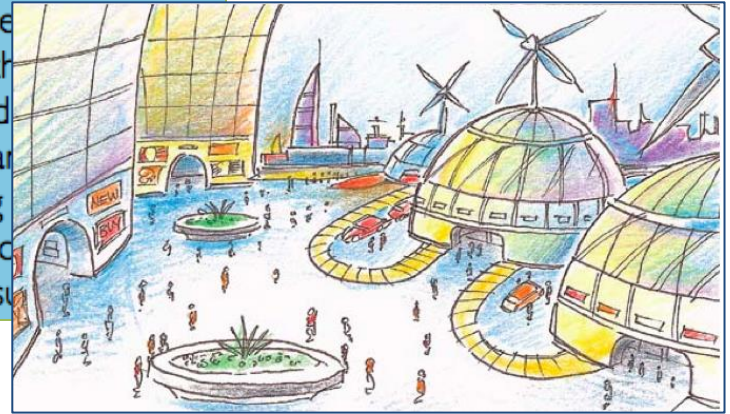
2009–14: Making it happen: how can decarbonisation by 2050 be achieved?

2014–19: The UK energy transition in an uncertain world: challenges and trade-offs

Exploring diverse energy pathways

Resourceful Regions

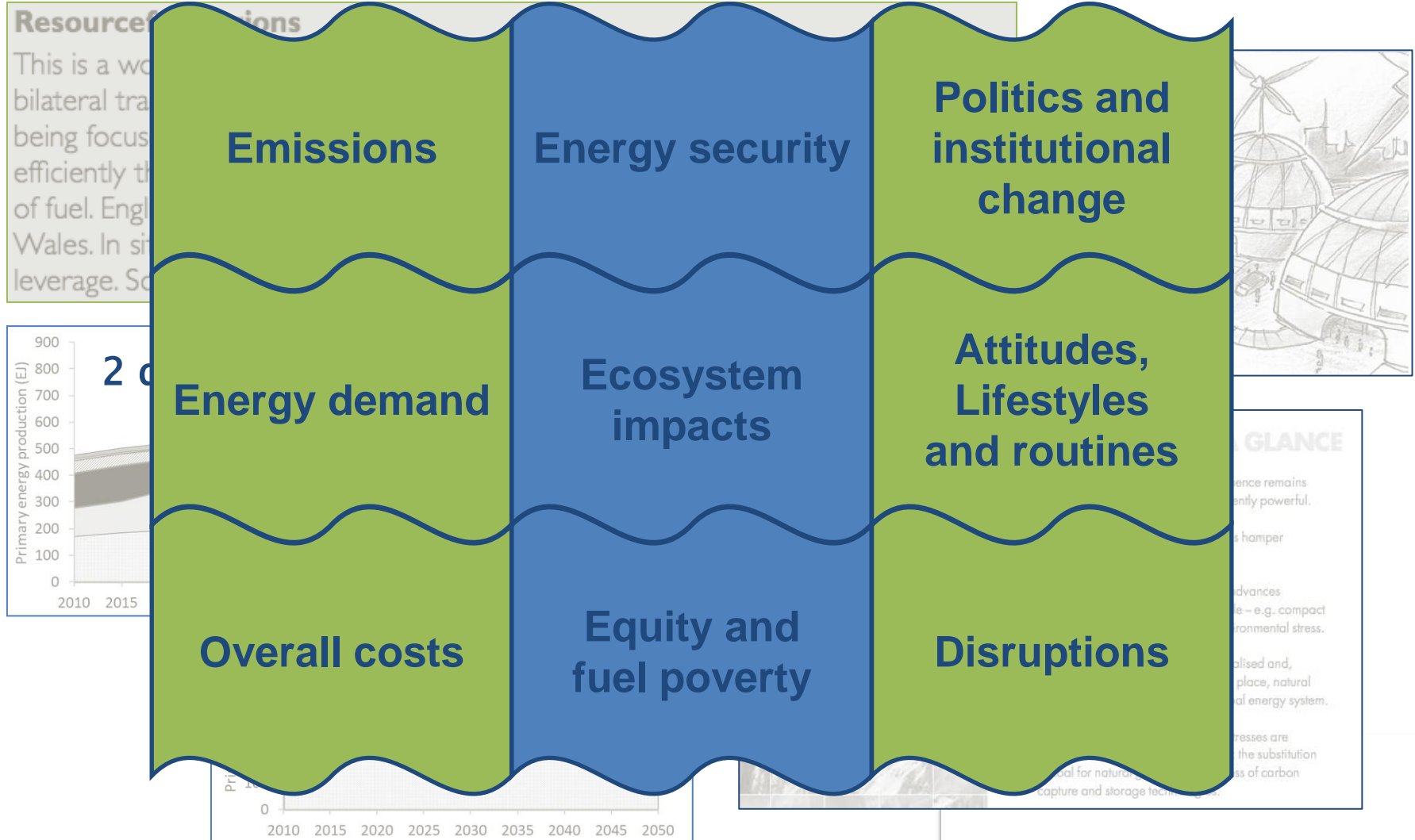
This is a world in which political trust has diminished on a world scale and bilateral trade continues. Most UK energy comes from fossil fuels with a focus on being focused on the optimisation of existing systems. These are used more efficiently than in the past, but the focus is more on energy security and access to fuel. English sub-regions have a high degree of autonomy, matching Wales. In situations of resource scarcity, regional trade in fuel carries considerable leverage. Some regions do deals with overseas countries on energy supply.



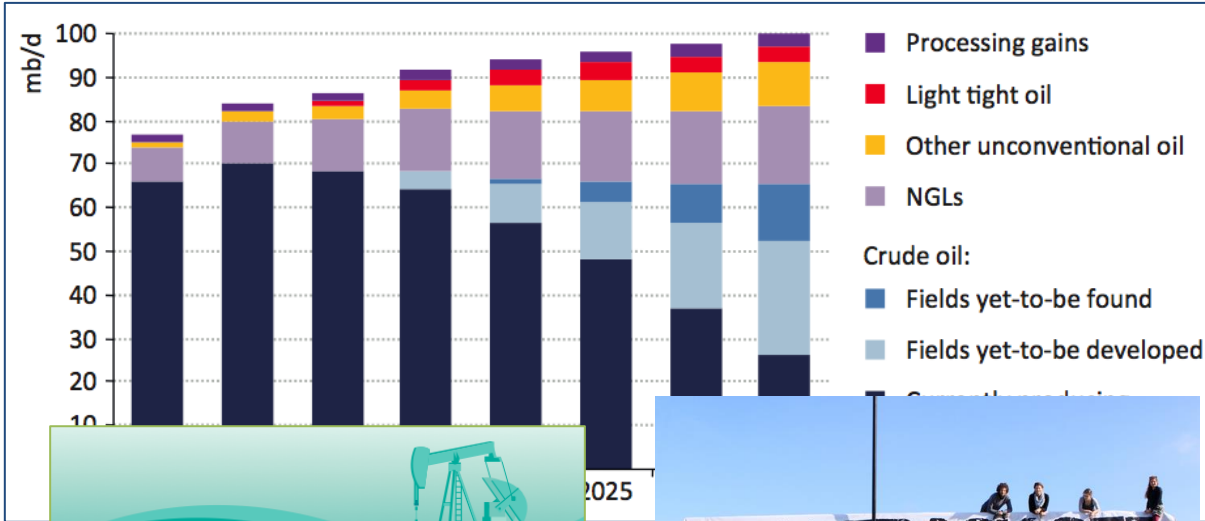
MOUNTAINS AT A GLANCE

- Advantage creates advantage – influence remains concentrated in the hands of the currently powerful.
- Rigid power structures and institutions hamper economic development.
- With fewer power-brokers, positive advances in secondary policy areas are feasible – e.g. compact urban development, energy and environmental stress.
- Positive resource expectations are realised and, with supportive policy frameworks in place, natural gas becomes a backbone of the global energy system.
- Increasing CO₂ and environmental stresses are moderated by slower overall growth; the substitution of coal for natural gas, and the success of carbon capture and storage technologies.

Exploring diverse UK energy pathways



Resources for energy systems



Global Oil Depletion

An assessment of the evidence for a near-term peak in global oil production



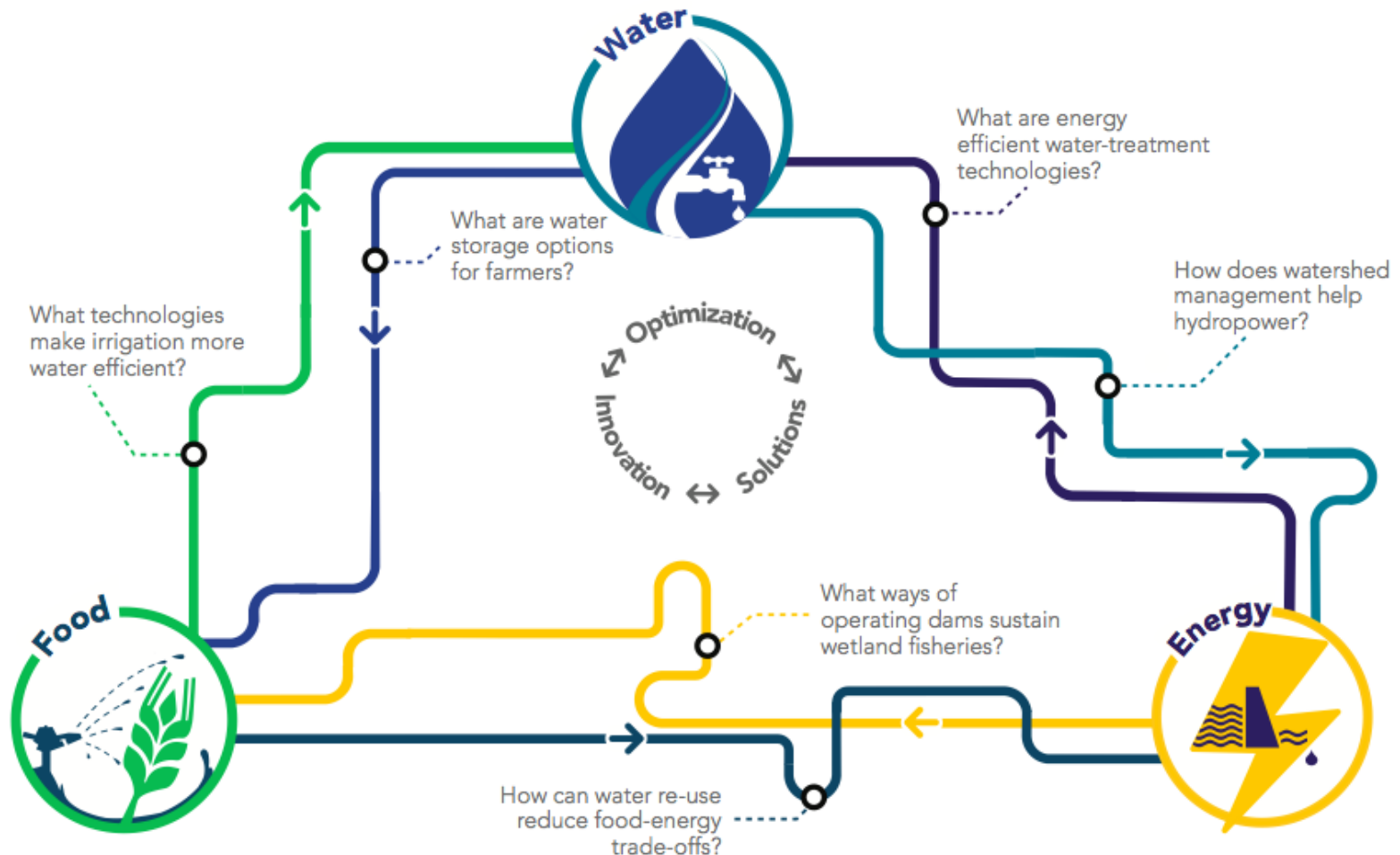
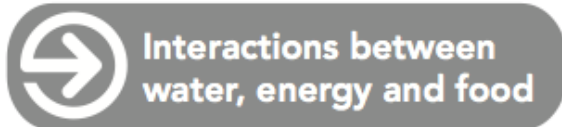
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A report for UKERC by
UKERC Technology & Policy Assessment Function



Materials availability for
low-carbon technologies:
An assessment of the evidence

Resources for energy systems



Energy systems at different scales

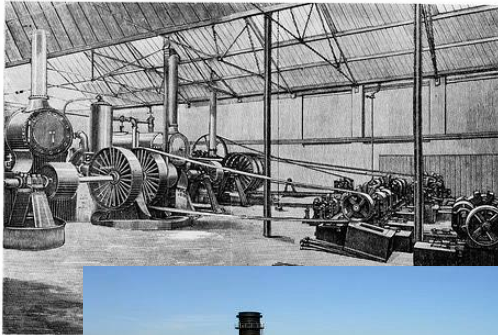
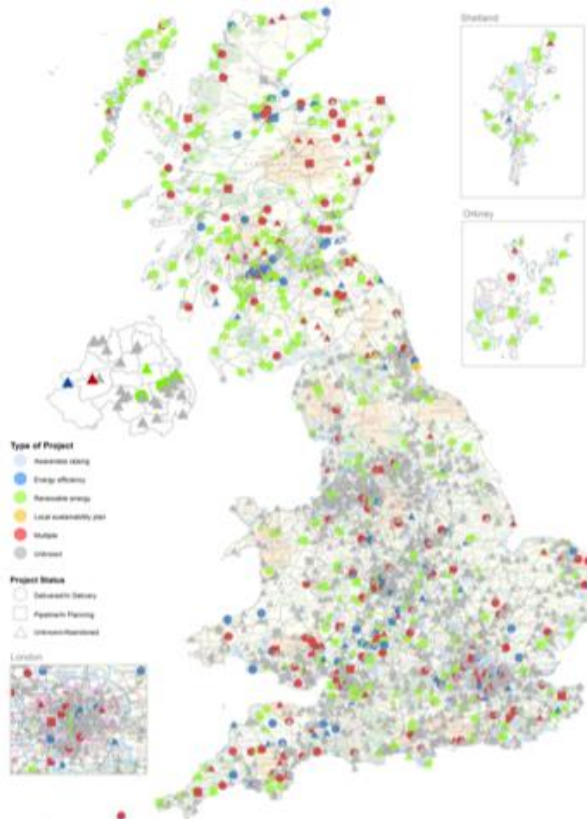
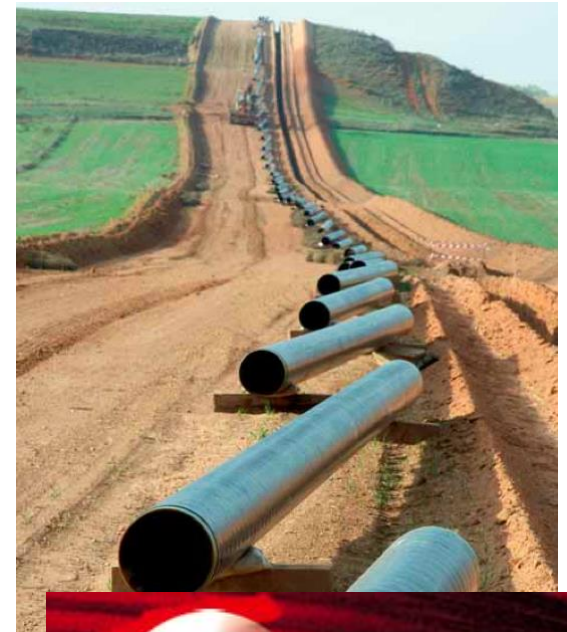


FIG. 9. An early power station dynamo, driven by a Horndley



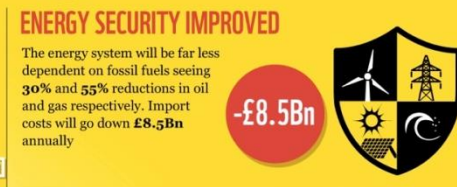
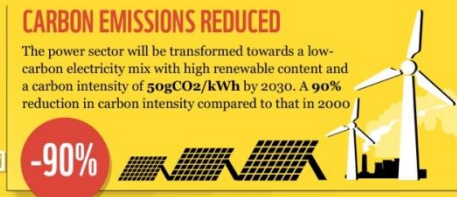
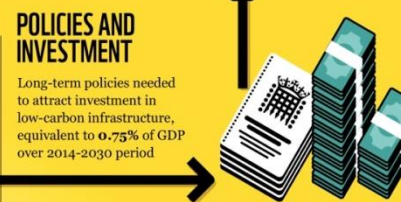
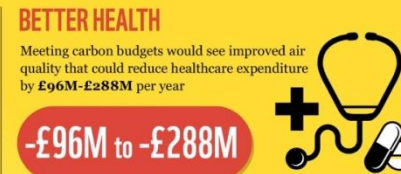
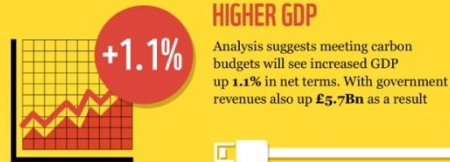
UK community energy projects (DECC)



Energy systems and the economy

THE IMPACTS OF CLIMATE CHANGE POLICIES ON THE UK ECONOMY BY 2030

Results are relative to a 'low ambition scenario' where the UK does very little to reduce its emissions and misses the 2nd, 3rd and 4th carbon budgets. Findings expressed in real 2013 prices.



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Relationship between energy demand and economic growth

Relationship between the State, finance and innovation

Who pays for energy transitions?
Fairness and justice issues



HOUSEHOLDS BETTER OFF

Real income of average household up by **£565** by 2030 due to the combination of energy savings, lower running cost of cars, lower food prices, increase in wages and net job creation

+£565



CLIMATE CHANGE ACT

UK must cut emissions of greenhouse gases (GHG) by at least **80%** by 2050 (Against a 1990 baseline)

-80%

BETTER HEALTH

Meeting carbon budgets would see improved air quality that could reduce healthcare expenditure by **£288M** per year

-£288M



MACROECONOMIC IMPACT
2030

LOW-CARBON SECTOR

Generated **£128bn** turnover in 2011 and employs **4%** of workforce



ENERGY SECURITY IMPROVED

The energy system will be far less dependent on fossil fuels seeing **30%** and **55%** reductions in oil and gas respectively. Import costs will go down **£8.5bn** annually

-£8.5bn



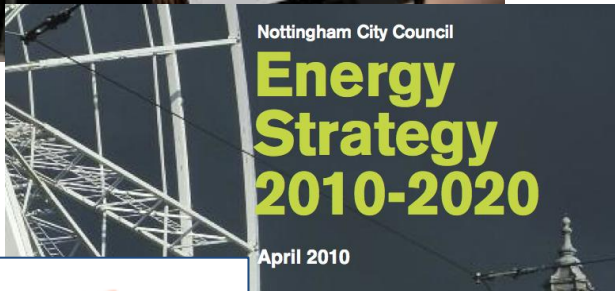
MEETING CARBON BUDGETS

The first four carbon budgets require cuts of around **60%** by 2030 and entail a reduction in cumulative GHG emissions of **2,580 MtCO₂** over the period 2014-2030

-60%



Decision-making in energy systems



Evidence



Presenting the Future

An assessment of future costs estimation methodologies in the electricity generation sector

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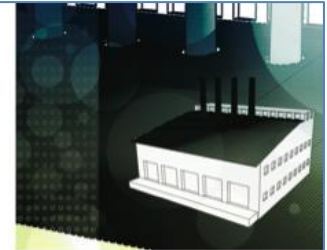
insight

An energy briefing paper

Feed-in Tariffs: the energy saving option



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An Energy Insight briefing paper

Carbon Emission Accounting – Balancing the books for the UK

Summary

- Nearly 20 years of climate change policy has failed to reduce greenhouse gas (GHG) emissions linked to economic activity in the UK.
- Although the UK has met its Kyoto obligations, this has been achieved largely by outsourcing production and relying on importing consumer products from abroad to meet growing consumer demand. As UK consumer demand has continued to grow, so have the GHG emissions embedded in imported goods.
- If the UK is to measure its overall contribution to changes in global GHG emissions, consumer emission accounting offers a sound method for attributing GHG emissions.
- Increased transfer of low-carbon technologies to producer countries, even when technology transfer does not form part of any international GHG emissions reduction agreement, will help those countries to reduce their emissions and thereby contribute to a true global reduction.
- "Framework conditions" to encourage sustainable consumption might involve government intervention in areas such as prices, providing infrastructure for a sustainable lifestyle, and public engagement.

Greenhouse gas emissions: is hitting the targets enough?

As the UK has already met its Kyoto obligations, it appears to be a leader in the effort to curb greenhouse gas (GHG) emissions. But all is not what it seems. The Kyoto Protocol reductions only take into account "territorial emissions", or GHG emissions generated within a country. Emissions related to international shipping, aviation and the embedded emissions in imported goods and services are excluded from the calculations.

This accounting procedure hides the fact that the reduction in UK GHG emissions has been achieved mainly by outsourcing production and meeting the

increasing demand for consumer products by imports from abroad. It also reveals that the UK has failed to decouple economic growth from GHG emissions. As a result increasing UK demand for consumer goods and services means GHG "imports" will also increase. There are no binding agreements to regulate this growth. Following the 2010 UN Climate Change Conference in Cancun, Mexico, this UKERC Energy Insights paper, based on research by Professor John Barrett (University of Leeds) and his research team, summarises the situation and suggests ways for the UK to achieve a "real" reduction in GHG emissions.

Thanks

<http://www.ukerc.ac.uk>

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