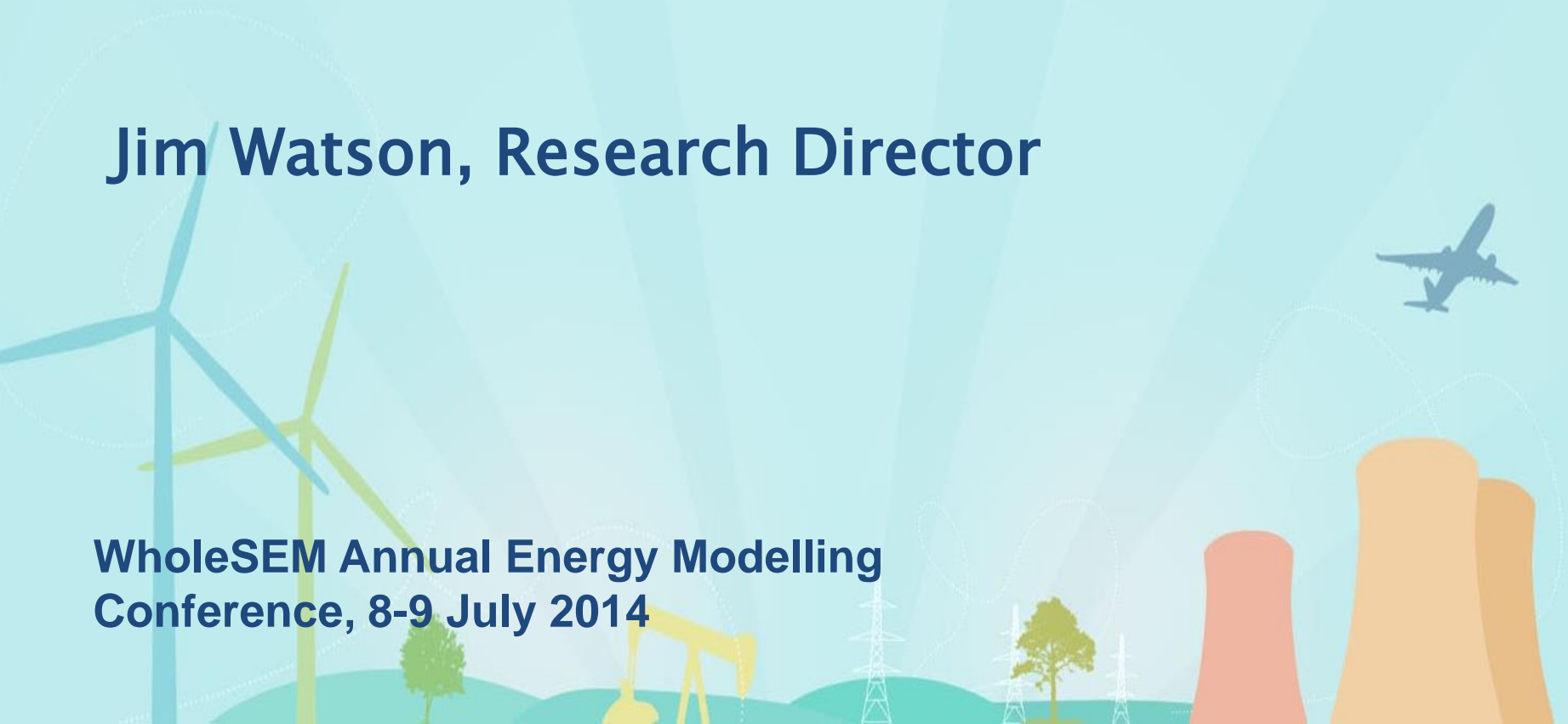


# Energy modelling & UKERC

**Jim Watson, Research Director**

**WholeSEM Annual Energy Modelling  
Conference, 8-9 July 2014**



# The UK Energy Research Centre

The UK Centre for ...

- Policy-relevant
- Independent
- Excellent
- Interdisciplinary
- Energy systems

... research and engagement



**UKERC**

# UKERC and Energy Modelling

Process models of  
bioenergy crop  
yields

Combined gas &  
electricity model  
(CGen)

Multi-region I/O  
model

UK Transport  
Carbon Model

Energy systems  
models (MARKAL  
and TIMES)

Simulation  
accounting model  
of domestic energy

Water implications  
of energy systems:  
WaterGap model

Ecosystem models  
(e.g. marine  
renewable impacts)

EU Electricity  
model

# UKERC and Energy Modelling

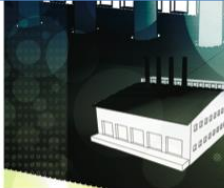
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UK Energy Research Centre

UKERC Research Report



## The UK energy system in 2050: Comparing Low-Carbon, Resilient Scenarios

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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 embodied 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.

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## UK Energy Strategies Under Uncertainty

### Synthesis Report

# UKERC Phase 3: key features

Shift to a ‘hub and challenge’ model

UKERC phase 3 ‘hub’ (£14m) includes:

- Core headquarters (HQ) functions, including activities on behalf of UK energy research community as a whole
- Core ‘whole systems’ research programme, structured into six problem-focused themes
- Flexible research fund (~£4m): open calls for proposals, overseen by independent Research Committee

Additional ‘Research Challenges’ will be commissioned separately. The first Challenge has been announced.

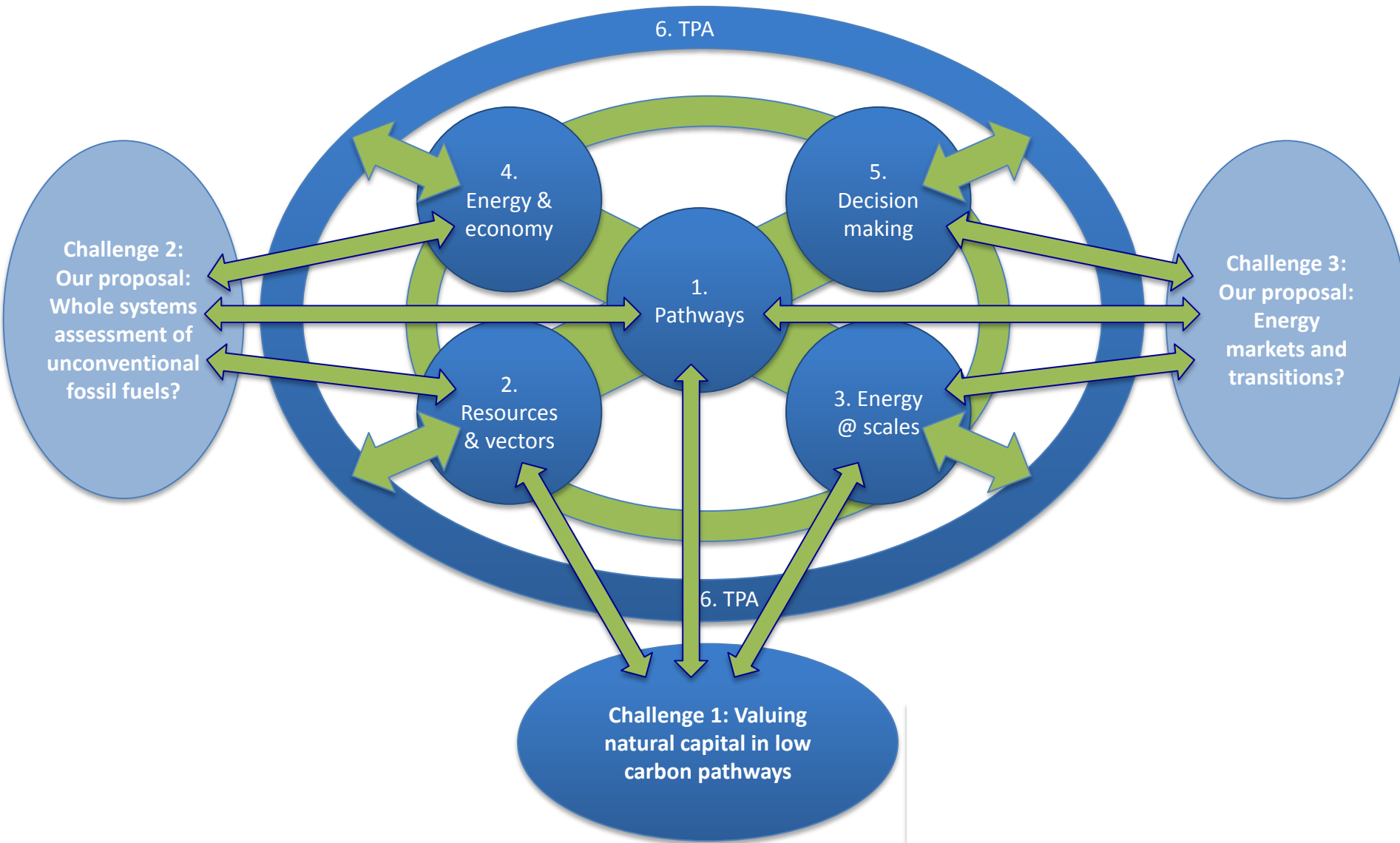
# Building on the last 10 years ...

Phase 1: What does a decarbonised the UK energy system in 2050 look like? [UKERC 2050]

Phase 2: Making it happen: how can decarbonisation by 2050 be achieved? [Uncertainties / Global projects]

Phase 3: The UK energy transition in an uncertain world: challenges and trade-offs [Pathways]

# UKERC Phase 3 research programme



# Modelling and UKERC phase 3

Continue model diversity, with integration where appropriate

Integrating models & areas of quantitative analysis, e.g.

- Developing links between energy systems and macro-economic models (themes 2 and 4)
- Improving the spatial and temporal detail in national energy systems models (themes 2 and 3)

Bridging disciplinary and methodological divides, e.g.

- Development of qualitative and quantitative UK energy pathways
- Further research on unconventional fossil fuels, combining modelling and geopolitical analysis from economic geography
- Using detailed qualitative research on Local Authorities and energy to inform energy systems modelling
- Bridging (and integrating?) perspectives on energy demand



# UK energy pathways: exploring uncertainty

THE  TIMES  
**Europe**

News | Opinion | Business | Money | Sport | Life | Arts | Puzzles | Papers

 The Goals | 23:43:01

Welcome to your preview of The Times

## Back fracking to break free of Russia, says Cameron



**NEWS** POLITICS

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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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Earth News | Environment | Climate Change | Wildlife | Outdoors | Picture Galleries | Earth Video

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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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News | UK | World | Development | US | Politics | Media | Education | Science


**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?

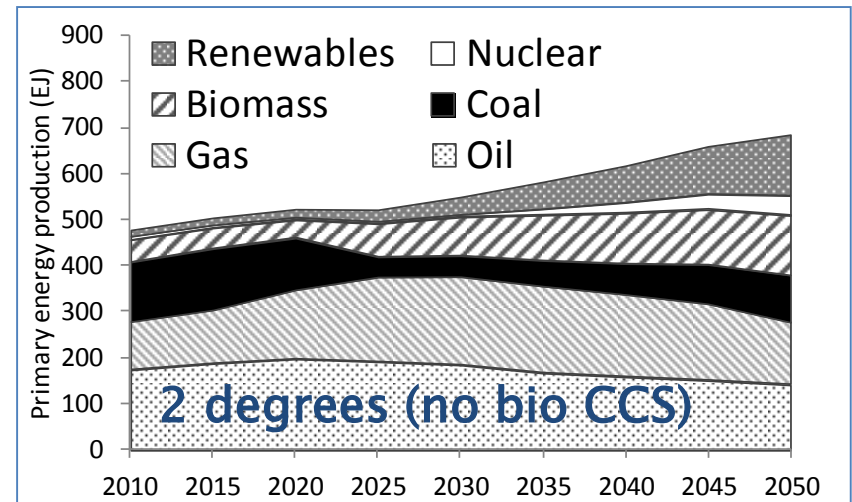
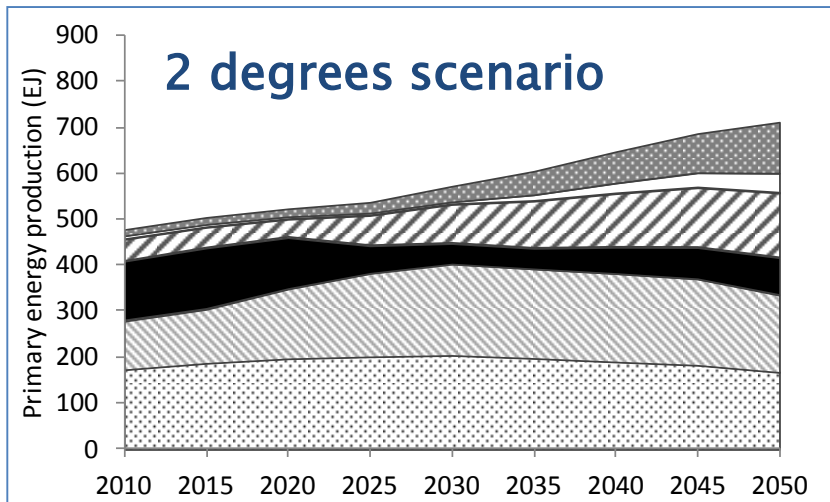
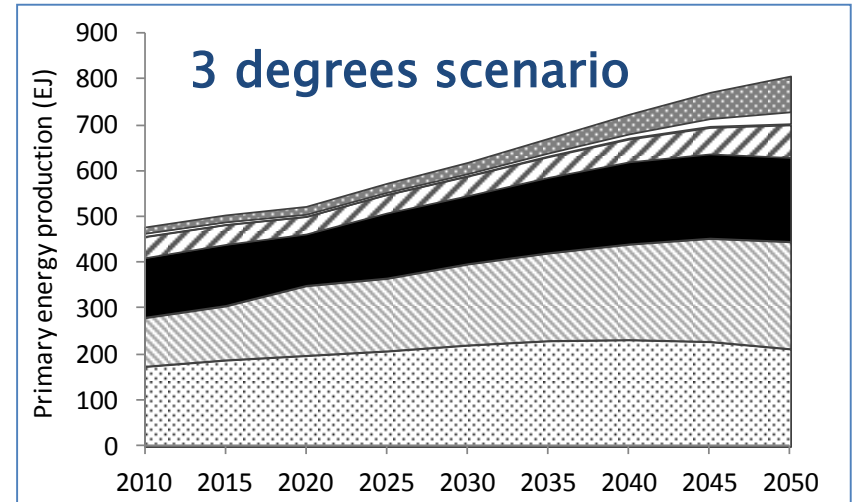
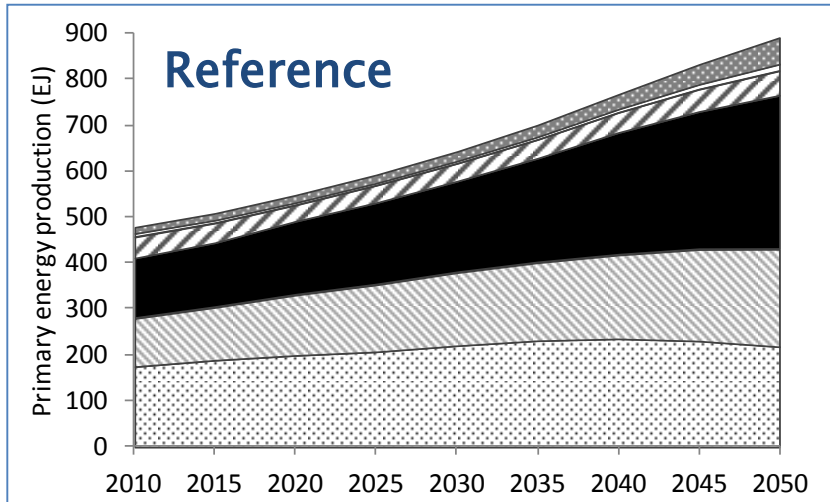
## Lawyers speak out Why legal aid cuts are a disaster

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



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# UK energy pathways: building on UKERC phase 2



# UK energy pathways

Some key features and challenges:

- Exploring UK implications of global energy pathways with different climate impacts
- Developing narratives and qualitative analysis alongside quantitative modelling of global / UK energy pathways
- Drawing on / integrating research from across UKERC phase 3 research programme (and beyond)
- Exploring the 'whole system', including social, environmental and political dimensions of change

Thanks

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

<https://twitter.com/watsonjim2>

