Department of Energy & Climate Change

LEDS Global Partnership: 2050 Calculator Webinar

Edward Hogg - 27th February 2014

LEDS Global Partnership: 2050 Calculator Webinar

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Why did the United Kingdom build the 2050 Calculator

How to use it

How we are working with other countries to develop their own version

A Global Calculator

Situation in the UK before we built the Calculator

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There was **an ill-informed debate** in the UK about our energy system. We wanted to **answer a number of questions**:

1. How much **energy** can we **supply** from different energy technologies?
2. How much **energy** do different sectors **use** and how can we change this?
3. What is the **cost** of different energy pathways?
4. Which sectors are the one we should **focus** on? Which are **less important**?
5. Can we **achieve our emissions target**?
6. What impact would different pathways have on our **air quality and land area**?
7. What could happen to our **energy dependency and security**?
8. What is **publically acceptable**?

Why 2050? The UK has a Climate Change law that sets targets out to 2050.

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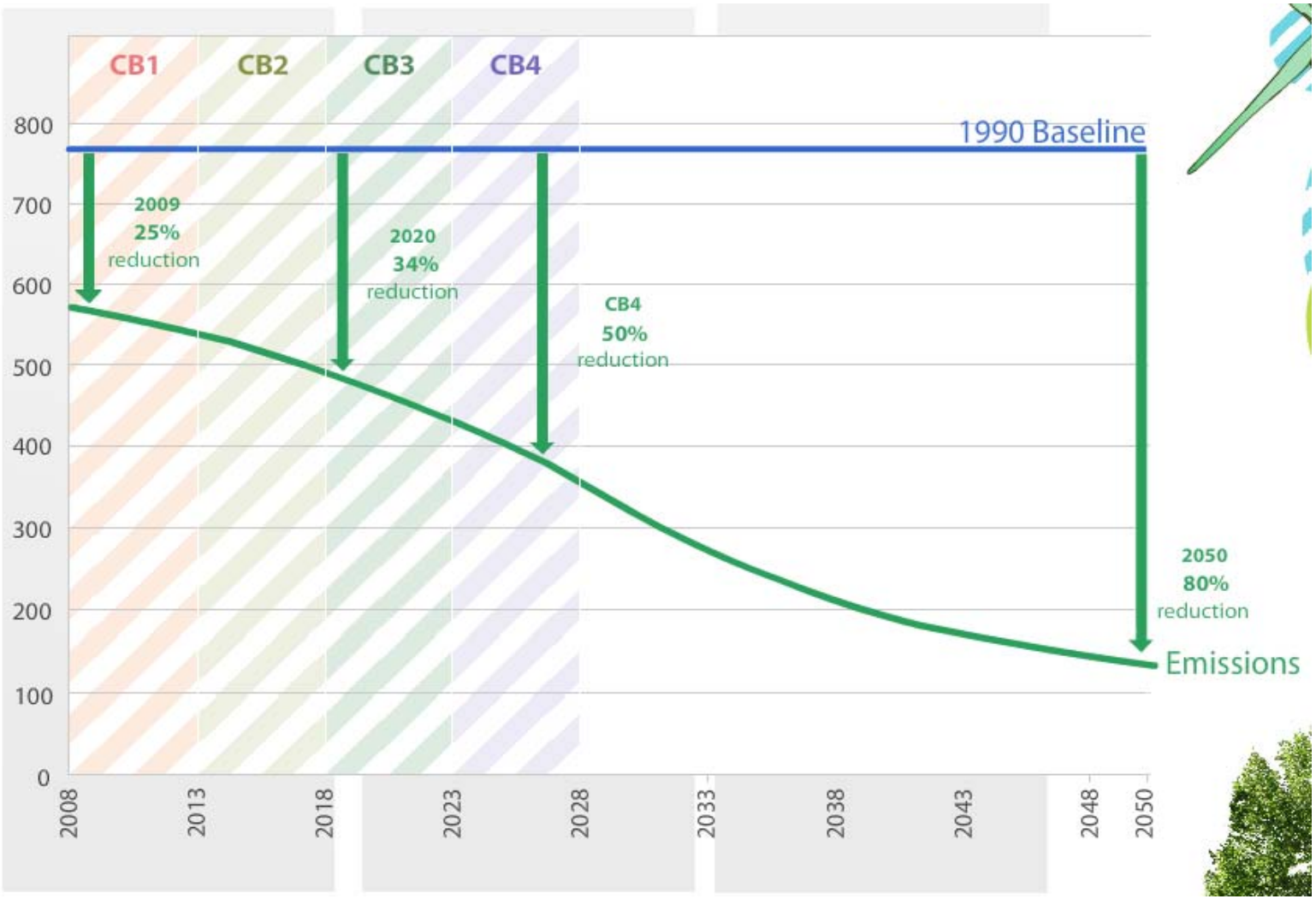

The Calculator explores what is possible, not what you think will happen

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Level 1	Level 2	Level 3	Level 4
• No effort (not business as usual)	• Effort described by most stakeholders as achievable	• Effort needing significant change – hard but deliverable	• The maximum possible due to physical/ practical constraints only • (similar to 'technical potential')

And it provides different levels of detail depending on the audience

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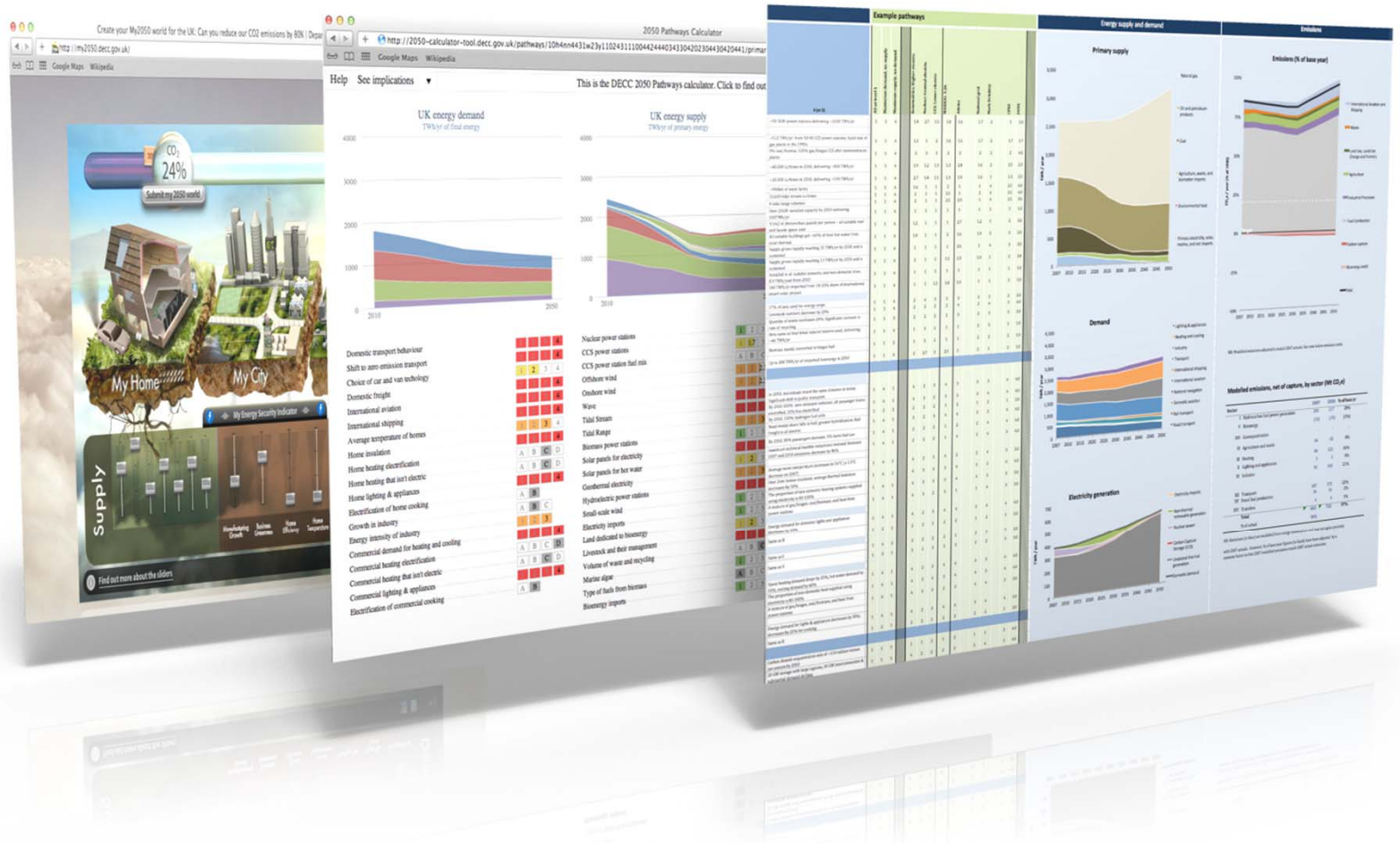

Even one for the Queen……

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We were awarded the Science, Engineering and Technology **award a**t the Civil Service Awards, **Buckingham Palace**. And have been recently acknowledged for our work with other countries.

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The UK has used the Calculator to find common messages about our world in 2050

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1	Ambitious per capita energy demand reduction is needed – but is not sufficient
2	Substantial electrification of heating, transport and industry is needed
3	Electricity supply needs to be almost totally decarbonised, while supply may also need to double
4	A growing level of variable renewable generation increases the challenge of balancing the electricity grid
5	Sustainable bioenergy is a vital part of a low carbon energy system
6	Reduction in emissions from agriculture, waste, industrial processes and international transport will be necessary by 2050
7	Fossil fuels will continue to play an important role

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Because all our work is online it was very easy to share with other countries

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https://www.gov.uk/international-outreach-work-of-the-2050-calculator

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International outreach work of the 2050 Calculator

The 2050 Calculator approach is being adapted and developed further by teams outside of the UK

Contents

See more like this

2050 Calculator Overview

To support the UK 2050 Pathways Analysis DECC developed a 2050 Energy and Emissions Calculator model. The Calculator is a tool that helps strengthen the level of debate on energy issues in the UK.

What is the 2050 Calculator?

The Calculator is an open source energy and emissions model. It allows the user to explore all high-level energy and emission pathway options the country faces. For each possible 2050 pathways the user can further investigate impacts on land-use, electricity, energy security, energy flows, costs etc.

The UK 2050 Calculator exists in three formats:

China's Energy Research Institute (ERI) have built their own version

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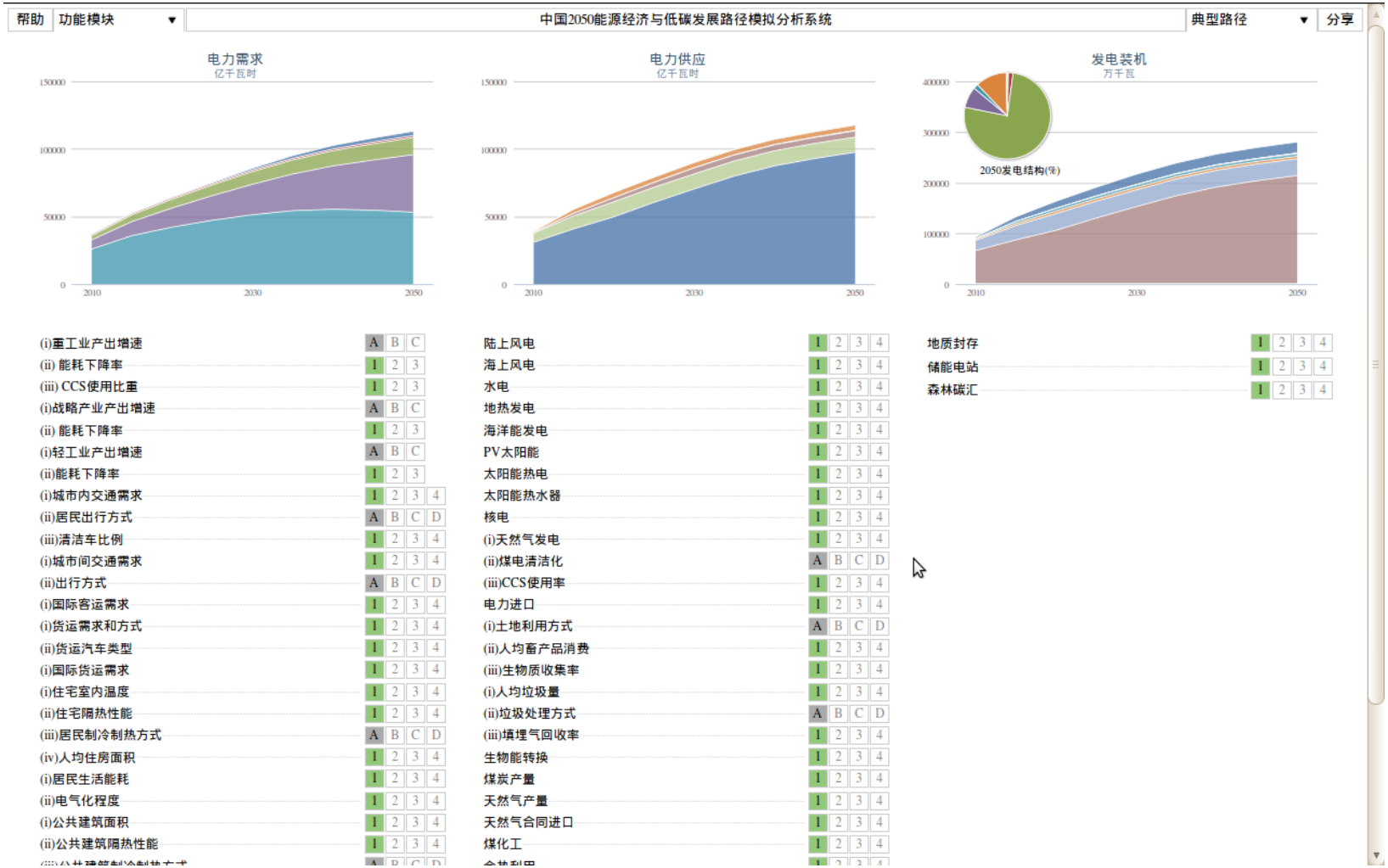

And launched this at a conference of international observers

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China has used its 2050 Calculator to look at a range of different issues

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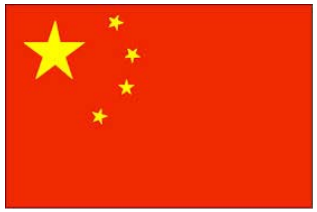

1	To show how China meets *Xiaokang* Society (a term introduced by Deng Xiaoping in 1979 as the eventual goal of Chinese modernization) by 2020
2	What needs to happen if China energy consumption is to peak by 2030;
3	China 2050 pathways for low carbon development and the associated Emission Reduction Policy and Commitment
4	China 2050 non-fossil fuel energy development pathways
5	China 2030/2050 Energy Independent Development Pathways (less reliance on imports)
6	They are using it for China's 2050 energy development strategy

And this has now led to a range of other countries developing their own version

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State of work

Published


UK


Belgium


China


South Korea

Excel complete – waiting to publish


South Africa


India

Team's working on the Excel


Mexico


Colombia


Brazil


Bangladesh


Algeria


Vietnam


Thailand


Indonesia


Nigeria

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The Global Calculator will complement the work of the Country Calculators

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The Global Calculator will make the case for tackling climate change and show how the global system adds up…

… the Country Calculators illustrate solutions at the country level

UK, Belgium, China, South Korea

Japan, South Africa, Bangladesh, Brazil

India, Indonesia, Mexico, Taiwan

Hungary, Serbia and SEE, Colombia, Vietnam

Thailand, Algeria

In discussion:

Poland, Russia, France, USA, Philippines, Ethiopia, Nigeria

Key target audiences will be multinational businesses, NGOs and governments

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User	Questions answered
Key decision makers within multinational businesses	Scenario analysis tool for showing how global energy, land and food system "adds up" and showing the business opportunities that could arise from decarbonisation.
NGOs and some parts of governments	Show at a glance how pathways from other models compare (e.g. IEA 2, 4 and 6D pathways).
All users	To make the case for tackling climate change by: • Showing detrimental impacts • Illustrating aspirational low emission pathways.

... but it will not be designed to answer more complex price impact and burden sharing questions

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It will not be designed to answer questions such as:

- **Price impacts**: what is the impact of a global carbon tax of $x/tCO2?
- **Burden sharing**: if the US did X and China did Y, how would other countries respond and what would happen to global emissions and climate impacts?

But it will be able to illustrate pathways from other models exploring these questions.

We will build it in partnership with a range of international experts

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<u>Funding</u>:
£550K DECC ICF funds
£480K Climate-KIC.

<u>Support from:</u>

- World Resources Institute, USA
- Utrecht University, Netherlands
- Potsdam Institute, Germany
- Walker Institute, UK
- Rothamsted Research, UK
- University of Versailles Saint-Quentin-en-Yvelines, France
- Met Office, UK
- Tyndall Centre, UK.