climateXchange

Scotland's centre of expertise connecting climate change research and policy

Monthly Report on Research and Policy Developments - Energy and Climate Change

May 2019

Purpose: This document provides a summary of recent key developments in policy and research relating to energy and climate change. It has been prepared by the ClimateXChange Secretariat and is intended to keep Scottish policymakers informed of issues relevant to the Scottish Government's Energy and Climate Change policy portfolio.

International Climate and Energy Research and Policy

New Zealand zero carbon bill

New Zealand's new zero carbon bill sets out plans to cut net emissions for GHGs, except methane, by 2050. The Climate Change Response (Zero Carbon) Amendment Bill provides a 'framework by which New Zealand can develop and implement clear and stable climate change policies that contribute to the global effort under the Paris Agreement to limit the global average temperature increase to 1.5° Celsius above pre-industrial levels'. As a result of a compromise with farmers, the New Zealand government has proposed a 10% cut in methane by 2030, and 24-47% by 2050 (against 2017 levels). Mirroring the UK's climate legislation, the bill also outlines plans to establish an independent climate change commission to set and review emissions budgets. Further discussion around the separate targets for agriculture has been published by The Conversation.

IPCC updates methodology for GHG inventories

The IPCC has released an update to its methodology used by government to estimate their GHG emissions and removals. The *2019 Refinement to the 2006 IPCC Guidelines on National Greenhouse Gas Inventories* has been produced to ensure that the methodology used to determine GHG inventories is based on the latest science. It provides supplementary methodologies to estimate GHG sources and sinks, addresses gaps in science that had previously been identified, new technologies and production methods that have emerged, or for sources and sinks that were not included in the 2006 IPCC Guidelines.

How electric vehicles help to tackle climate change

While EVs don't emit any GHGs directly, they run on electricity that is still in part produced from fossil fuels in many parts of the world. And energy is used to manufacture them. A Carbon Brief fact check looks at the climate impacts of EVs and finds:

- EVs are responsible for considerably lower emissions over their lifetime than conventional vehicles across Europe as a whole.
- In countries with coal-intensive electricity generation, the benefits of EVs are smaller and they have similar lifetime emissions to the most efficient conventional vehicles – such as hybrid-electric models.

- However, as countries decarbonise electricity generation to meet their climate targets, driving emissions will fall for existing EVs and manufacturing emissions will fall for new EVs.
- Comparisons between electric vehicles and conventional vehicles are complex. They depend on the size of the vehicles, the accuracy of the fuel-economy estimates used, how electricity emissions are calculated, what driving patterns are assumed, and even the weather in regions where the vehicles are used. There is no single estimate that applies everywhere.

UK Climate and Energy Research and Policy

Are the public ready for net zero?

Climate Outreach has analysed the existing public-facing communication around net zero, and engaged with members of the UK public who hold centre-right political values and views (chosen as the focus of the research as historically they have been the least supportive of climate change policies). One of the key recommendations emerging from the analysis is around the need to 'make net zero here and now'. This means presenting net zero as a domestic challenge about taking steps now to safeguard our future, and speaking to the present day (not 2050). Other recommendations include using familiar faces as trusted messengers, and communicating net zero using examples that will be seen as realistic and feasible.

A future hydrogen economy

A new report from Arup, and supported by UKERC, highlights the progress that's been made in demonstrating the use of hydrogen for transport and heat, and calls for more action on policy and collaboration across key stakeholder groups to help shape future demand, change consumer perception and create the strong supply chains needed to facilitate the development of the hydrogen economy. The report outlines the steps needed for the UK to full embrace hydrogen including:

- Stronger collaborative efforts between government and private organisations - there is a requirement for the industry to be clear with the government about what is needed to create a unified approach to policy.
- Sufficient engagement with consumers - at the heart of the hydrogen economy are consumers. It is essential to build their confidence, addressing safety concerns and explaining benefits over time, in a planned and strategic way.
- Incrementally increasing network capacity - this should be demand led, with production planned to keep pace.
- A focus on delivering high-profile projects quickly - such as hydrogen use in transport, to build confidence, experience and a supply chain needed to tackle more complex challenges.
- A joined-up system approach with a balance of hydrogen and renewable electricity - hydrogen and renewables are required to decarbonise the energy system, and they complement each other well.

Climate Science, Impacts and Adaptation

The potential contribution of bioenergy to Scotland's energy system

This ClimateXChange study was commissioned by the Scottish Government to inform theirbioenergy action plan (as outlined in the Scottish Energy Strategy), setting out an evidence base on the nature and quantities of biological resources within Scotland that could be used for bioenergy, and the conversion technologies that could be deployed to utilise them. The main findings are:

- Bioresources equivalent to 6.7 TWh per year (in primary energy terms) are currently used for bioenergy purposes. Just over three-quarters of this is wood.
- Increasing the contribution that bioenergy makes by 2030 would require additional bioenergy plant to be built and deployed within the next decade.
- Based on typical capital, operating and feedstock costs, all of the bioenergy conversion technologies considered produce energy or fuel at a price that is higher than that produced by conventional technologies, based on current fossil fuel prices.
- Estimates of domestic bioresources suggest that several additional anaerobic digestion plant are technically feasible, but utilising the resource fully is likely to require the use of a mixture of feedstocks in some plant.
- By 2030, further bioresources equivalent to 2 TWh per year (of primary energy) could be available.

Natural cycles and global warming

Researchers exploring the internal variability of the climate system and changes in radiative forcing have demonstrated that multidecadal ocean variability was unlikely to be the driver of observed changes in global mean surface temperature after 1850. Instead, they say, that virtually all (97-98%) of the global low-frequency variability can be explained by external forcing (such as human-caused GHG emissions, volcanic eruptions and variability in the sun's output).