

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

December 2018 and January 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

COP24 key outcomes

COP24 was the deadline for agreeing the rulebook for implementing the Paris Agreement which enters into force in 2020. The rulebook was mostly agreed, starting a new international climate regime under which all countries will have to report their emissions and progress in cutting them every two years from 2024. The deal contains a single set of rules for all countries but with space for those that lack the capacity to meet them.

There was tension at the talks about how to recognise the IPCC special report on 1.5°C (which was requested by countries at the 2015 talks in Paris) and whether to signal the need for greater ambition to stay below this limit. The US, Saudi Arabia, Russia and Kuwait refused to welcome the report, and the final COP decision text only welcomes its 'timely completion' and 'invited' countries to make use of the report.

Coinciding with the talks, researchers at the Global Carbon Project published data showing that [fossil fuel and industry outputs will grow by around 2.7% in 2018](#) – the largest increase in seven years.

Deeper analysis of COP24 outcomes has been published by [Carbon Brief](#).

Immediate fossil-fuel phase out could help limit global warming to 1.5°C

[Recent research](#) published in Nature Communications shows that if carbon-intensive infrastructure is phased out at the end of its design lifetime from the end of 2018, there is a 64% chance that peak global mean temperature rise will remain below 1.5°C. The research shows that 1.5°C remains possible and is attainable with ambitious and immediate emission reduction across all sectors.

The state of global temperatures in 2018

[Analysis](#) by Carbon Brief shows how global surface temperatures in 2018 were the fourth warmest on record since 1850, with temperatures in 2018 between 0.9°C and 1.1°C warmer than they were in the late 19th century. The same report shows that last year was the warmest on record for the heat content of the world's oceans.

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Faster CO₂ rise expected 2019

Scientists at the Met Office expect in 2019 to see one of the [largest rises in atmospheric CO₂ concentrations](#) in 62 years of measurements. The forecast is based on a combination of factors including rising emissions and a relative reduction in the uptake of CO₂ by ecosystems due to tropical climate variability.

Germany agrees to end reliance on coal

Germany has agreed to [end its reliance on coal power stations by 2038](#). Coal still provides nearly 40% of Germany's power, compared with 5% in the UK which plans to phase it out by 2025. A group including industry, politicians and NGOs has worked on the deal (which will be formally published in February) and will review in 2032 in the deadline can be brought forward to 2035.

UK Climate and Energy Research and Policy

UKERC 2018 review of energy policy

In its [2018 review of UK energy policy](#), UKERC calls on the government to note ten recommendations in order to ensure that the UK continues to meet statutory emissions reduction targets, goes further to achieve net zero emissions, and fills an increasing number of policy gaps and uncertainties:

- A heat and energy efficiency White Paper, and recommend that the Industrial Strategy mission to reduce building energy use is extended to existing buildings.
- A better, more targeted approach to the energy needs of low-income households is required. Energy efficiency investment for these households should be funded via general taxation.
- Urgent large-scale trials of heat decarbonisation using hydrogen are required to understand whether it could be technically, economically and socially viable.
- A dashboard of indicators is needed to monitor gas security during the energy transition. The current one dimensional approach is not sufficient.
- Future electricity policy should build on the Electricity Market Reform policies that have worked well, and adapt them in the light of changes in technologies and costs.
- Changes in incentives for 'black start' and other ancillary services are necessary to ensure that the electricity system remains resilient as it changes.
- The target for phasing out conventionally fuelled vehicles is inadequate and does not fit with our emissions targets. The 2040 date should be brought forward and linked to accelerated investment in networks and charging.
- The Industrial Strategy needs to be strongly linked to market creation policies for low carbon technologies. Carbon capture and storage is in particular need of such policies to progress beyond its current holding pattern.
- To ensure widespread support for the energy transition, there needs to be more focus on equity and justice. The UK government should consider setting up a process similar to Scotland's Just Transitions Commission to achieve this.
- Continued vigilance is required to mitigate any negative impacts of Brexit, particularly those that could affect integration with European energy markets.

UK-EU electricity interconnection post- Brexit

[E3G is calling on the government](#) to prioritise supporting existing and new interconnectors with the EU in future relationship negotiations, including them within discussion on energy and climate cooperation and access to the internal energy market. Interconnectors can play a crucial role in the UK's climate and energy policies, helping to ensure it takes the least-cost path to decarbonisation while meeting its climate targets.

Net zero by 2045 possible for Scotland

A [report by Vivid Economics](#) for WWF Scotland sets out new pathways for Scotland to achieve net zero emissions. The report proposes pathways that would enable Scotland to achieve net zero emissions before 2045 through rapidly increasing carbon sinks and deeper emission cuts in all sectors. The report builds on key evidence sources which include the [CCC's advice to the Scottish Government in 2017](#), and [academic work on greenhouse gas removal potential in Scotland](#) produced in collaboration with ClimateXChange researchers.

Climate Science, Impacts and Adaptation

Influence of soil moisture on long-term terrestrial carbon uptake

[Researchers have analysed](#) data from four earth system models, and the responses of terrestrial net biome productivity to soil-moisture changes and found that soil-moisture variability and trends induce large CO₂ fluxes through the 21st century. Results show the capacity of continents to act as carbon sinks depends on the response of carbon fluxes to soil moisture and on land-atmosphere interactions, suggesting the increasing trend in carbon uptake rate may not be sustained, and could result in accelerated atmospheric CO₂ growth.

Diet and food production must change to save the planet

[Research from the Lancet](#) provides the first scientific targets for a healthy diet from a sustainable food production system that operate within planetary boundaries for food. The report promotes diets consisting of a variety of plant-based foods with low amounts of animal-based foods, refined grains, highly processed foods, and added sugars, and with unsaturated rather than saturated fats. The authors highlight that evidence about diet, human health, and environmental sustainability is continually evolving, and that although some may warn of unintended consequences, the evidence is sufficient to warrant action and that delays will increase the likelihood of not achieving crucial health and climate goals.

Extreme heat threatens human health and hospitals

A [report by the Lancet](#) states that twin pressures of rising temperatures, which could cause influxes in patients suffering from heat-related illnesses, and extreme weather, which may damage infrastructure could overwhelm health services.