



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

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

March 2018

**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

#### Limiting global warming to 1.5°C would have significant economic benefits

A new [paper](#) from the 'Half a degree Additional warming, Prognosis and Project Impacts' (HAPPI) project uses new climate simulations under 1.5°C and 2°C warming, to assess changes in economic growth using empirical estimates of climate impacts in a global panel dataset. It finds that per capita GDP would be 5% higher by 2100 if temperatures are stabilised at 1.5°C above pre-industrial temperatures rather than 2°C. One of the paper's authors has told [Carbon Brief](#) that the negative economic impacts are expected to fall disproportionately on the world's poorest countries, with the disparity larger at 2°C than for 1.5°C.

#### How the world could limit warming to 1.5°C in 2100

A paper in [Nature Climate Change](#) presents results from a new modelling exercise using six different integrated assessment models (IAMs) to limit temperatures in 2100 to below 1.5°C. The results suggest that 1.5°C is achievable if global emissions peak in the next few years and technologies such as bioenergy with carbon capture and storage (BECCS) are used to remove significant amounts of carbon from the atmosphere in the second half of the century.

#### Climate change risk for half of plant and animal species in biodiversity hot-spots

Researchers have examined the impact of climate change on nearly 80,000 plant and animal species in 35 of the world's most diverse and naturally wildlife-rich areas. The [research](#) finds that up to half of plant and animal species in areas such as the Amazon and the Galapagos, could face local extinction by the turn of the century due to climate change. According to the study, even if the Paris Agreement 2°C target is met, these places could lose 25% of their species. The research did not explore limiting warming to within 1.5°C but is expected that this would protect even more wildlife.

March 2018

## UK Climate and Energy Research and Policy

### Ten years of the UK Climate Change Act

The Grantham Institute has published a [report](#) summarising lessons learned from the ten year old UK Climate Change Act on how climate change legislation is best structured to be effective. It explores what procedural, institutional and legislative arrangements have been successful; where expectations have not been met and; whether the Act is still fit for purpose in a post-Paris Agreement world. Key findings from the report include:

- A comprehensive framework law is an essential tool to coordinate and advance climate action with respect to both reducing greenhouse gas emissions and climate resilience.
- A good climate law contains statutory targets, assigns clear duties and responsibilities and provides clarity about the long-term direction of travel.
- Economy-wide, multi-year targets, set well in advance, help to define a clear, yet flexible path towards the long-term climate objective.
- A strong independent body is critically important to ensure consistent policy delivery and evidence-based decision-making.

### The security of UK energy futures

[Research](#) published by the UK Energy Research Centre (UKERC) explores how the security of the UK energy system will change in the coming decades. Using a number of indicators, the report assesses aspects of security such as energy availability, reliability, sustainability and affordability to examine how energy security risks will change over time. The report draws three main conclusions: there is an important role for energy efficiency and energy demand reduction in energy security strategies; the relationship between decarbonisation and energy security is not straightforward and; many of the risks can be mitigated - security of the electricity and gas system can be improved significantly by investing in system flexibility.

### Poorest households hit hardest by UK climate change levy despite using least energy

UKERC [research](#) focusing on levies used to support the transition to a low carbon energy system shows that applying such energy policy costs to household electricity and gas bills equates to £132 or 13% of the average energy bill (in 2016). The research highlights how low-income households are hit the hardest by the current arrangements, as the poorest households spend 10% of their income on heat and power in their homes, whereas the richest households only spend 3%, so any increase in prices hits the poor disproportionately.

### Accelerating green finance: Green Finance Taskforce report

An independent taskforce, looking at accelerating growth of green finance and the UK's low carbon economy has set out a [series of recommendations](#) on how the government and the private sector can work together to make green finance an integral part of financial services. Recommendations include: boosting investment into innovative clean technologies; driving demand and supply for green lending

March 2018

products; setting up Clean Growth Regeneration Zones; improving climate risk management with advanced data; building a green and resilient infrastructure pipeline and; issuing a sovereign green bond.

### **Coal's rapid decline drives carbon emissions down to 1890 levels**

Analysis produced by [Carbon Brief](#), on newly released Department of Business, Energy and Industrial Strategy (BEIS) [energy use figures](#), has shown that in 2017 UK carbon emissions from fossil fuels fell by 2.6% in 2017, driven by a 19% decline in coal use. The UK's total CO<sub>2</sub> emissions are currently 38% below 1990 levels and are now as low as emissions were back in 1890.

## **Climate Science, Impacts and Adaptation**

### **Farmyard manure and slurry management**

[Research](#) by ClimateXChange on farmyard manure and slurry management, and anaerobic digestion has examined the market potential for anaerobic digestion technologies as a tool to manage slurry and farmyard manure arising from Scottish livestock farming, focusing on how greenhouse gas emissions might be reduced. The report finds that without the addition of other feedstocks, the anaerobic digestion of slurry and farmyard manure has a proven poor business case at both farm and centralised facility scales. It also considers that the impact of anaerobic digestion alone on greenhouse gas emissions from slurry and farmyard management in Scotland will be modest.

### **Slurry storage on Scottish farms**

This [work](#), produced for ClimateXChange, assesses the relative value of different slurry management options for reducing greenhouse gas emissions from livestock production. It examines key sectors where there are significant emissions and considers the opportunities for mitigation. Some of the report findings include: good practices that lead to abated emissions of greenhouse gases and ammonia have to some extent already been adopted by farmers; adoption of improved slurry management is driven by practical and commercial advantages and further implementation of good practice, with associated greenhouse gas mitigation, may require incentives or further regulation.