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climate change research and policy

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

December 2020 / January 2021

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 policymakers informed of issues relevant to the Scottish Government's Energy and Climate Change policy portfolio.

### International Climate and Energy Research and Policy

#### **US rejoins Paris Agreement**

Joe Biden followed through on his pledge to rejoin the Paris Agreement on his first day in office, also immediately revoking the permit for the controversial Keystone oil pipeline. Later in January, the new US president signed executive orders aimed at freezing new oil and gas leases on public lands and doubling offshore wind energy by 2030. He also announced a climate change summit to be held on Earth day in April, saying the US needed to show global leadership on the issue, and set up an office of Domestic Climate Policy at the White House, led by a National Climate Advisor, the [BBC reported](#). At late January's [Climate Adaptation Summit](#), the first such global meeting of its kind, Mr Biden's Climate Envoy John Kerry said the US would focus on better climate data, more funding for adaptation and resilience, improving adaptation programmes and promoting cooperation between the private sector and affected communities.

#### **EU leaders agree 55% emissions cut**

EU leaders have agreed to reduce greenhouse gas emissions by 55% by 2030, up from an earlier target of 40%, after promising extra funding for coal-reliant Poland's transition to clean energy, the [BBC reported](#). The Commission will now draw up detailed plans for all 27 member states. The European Parliament, yet to debate the new target, had called for a 60% cut.

#### **Biggest ever climate change poll**

Almost two thirds of respondents to the biggest climate change poll conducted said the changing climate was a "global emergency" and urged greater action, its organiser [UNDP said](#). The survey covered more than 1.2m people, including half a million under 18, in 50 countries representing more than half the world's population. Respondents were asked

whether they supported 18 key climate policies across six action areas: economy, energy, transport, food and farms, nature, and protecting people. While under 18s were most likely to say climate change is an emergency, other age groups were not far behind, with 65 per cent aged 18-35; 66 per cent aged 36-59; and 58 per cent over 60, agreeing.

### **Global health and climate change**

Tackling climate change could be this century's biggest global health opportunity, according to the [Lancet Countdown 2020 report](#). The research, an international collaboration involving 35 organisations, says the Covid-19 pandemic and climate change are converging crises, with global warming and infectious diseases sharing common drivers. Aligning recovery from COVID-19 with a response to climate change offers a triple win: improved public health, a sustainable economy, and environmental protection. In the last 20 years, there has been a 54% increase in heat-related mortality in people older than 65 years, reaching 296,000 deaths in 2018, it finds.

### **2020 third hottest year on record**

The year 2020, which saw prolonged heat in the Arctic and the busiest Atlantic hurricane season ever, was among the three hottest on record, according to data from the UN's World Meteorological Organization (WMO), the Independent [reported](#). The analysis, which draws on five global temperature datasets, also finds that the period 2011-2020 was the hottest decade on record, and that the six warmest years have all occurred since 2015. In 2020, average temperatures were around 1.2°C above levels seen before the start of the industrial era.

### **BlackRock in net-zero push**

BlackRock, the world's largest asset manager, is to push companies to commit to achieving net-zero emissions by 2050, in a move the [FT said](#) would have significant repercussions across the corporate sector given the group's significant investment in many big public companies. It has also [vowed](#) to back more shareholder resolutions on climate and social issues at annual meetings. The pledges follow a similar announcement in December from a group of 30 other large global asset managers, including Fidelity, Legal & General, Schroders and UBS. BlackRock [said](#) it had traditionally given companies the benefit of the doubt that they treated issues such as climate change seriously, but that there was now a sense of urgency that businesses must take faster action.

### **UNEP emissions gap report**

Despite a brief dip in CO<sub>2</sub> emissions caused by the COVID-19 pandemic, the world is still heading for a temperature rise in excess of 3°C this century, far beyond the Paris Agreement goals of limiting global warming to below 2°C, UNEP finds in its annual [Emissions Gap report](#). However, a low-carbon pandemic recovery could cut 25% off the greenhouse gas emissions expected in 2030, based on policies in place before COVID-19, putting the world

close to the 2°C pathway, it says. The report analyses low-carbon recovery measures so far and summarises new net-zero emissions pledges by nations.

### **UNEP production gap report**

Although fossil fuel production dipped in 2020, countries are still planning to produce far more fossil fuels by 2030 than consistent with limiting global warming to 1.5°C or 2°C, according to UNEP's [2020 Production Gap report](#). To follow a 1.5°C pathway, global production will need to fall by approximately 6% a year between 2020 and 2030, it says. Instead, countries are planning an average annual increase of 2%, which by 2030 would result in more than double the production consistent with the 1.5°C limit. As of November, G20 governments had committed more than \$230bn in Covid-19-related funding to fossil fuel production and consumption, far more than the \$150bn to clean energy.

### **Green hydrogen expansion**

Seven leading energy companies have formed a global coalition that aims to increase green hydrogen production 50-fold in the next six years, helping transform the world's most carbon-intensive industries. The [Green Hydrogen Catapult](#) is targeting deployment of 25 GW of renewables-based hydrogen production by 2026, with a view to halving the current cost of hydrogen to below US\$2 per kg. Analysis suggests a US\$2 price represents a potential tipping point that will make green hydrogen and its derivative fuels the energy source of choice across multiple sectors where sufficient near-term demand exists, including in Europe, it said.

### **Climate Change Performance Index 2021**

While a turning point in global emissions seems to be within reach, no country is on a path compliant with the Paris Agreement goals and, overall, greenhouse gas emissions have increased slightly in the five years since it was signed, according to the [Climate Change Performance Index](#) (CCPI) The index analyses climate protection across 57 countries (and the EU as a whole) accounting for 90% percent of global emissions. Most G20 countries are trailing in the rankings, with the US bottom for the second year in a row, below Saudi Arabia.

## **UK Climate and Energy Research and Policy**

### **Brexit deal and climate change**

The Brexit deal sealed between the UK and EU includes extensive references to the importance of tackling the “existential threat to humanity” posed by climate change and enshrines both sides’ net-zero targets and commitments to the Paris Agreement. However, there are also concerns about weakening environmental regulations due to the UK’s efforts to “water down” the climate language and distance itself from European oversight, Carbon Brief said in a detailed [Q&A](#) on the deal.

### **UK energy white paper**

The UK Government published its first [energy white paper](#) in 13 years, setting out the sector's role in tackling climate change. Many of the key announcements were included in Boris Johnson's [10-point plan](#) in November. Carbon Brief said there remained a significant gap between proposed emissions cuts and those required under the UK's climate targets in a detailed [Q&A](#) on the paper.

### **NAO report on achieving net zero**

Achieving a net-zero economy by 2050 is a "colossal challenge" and significantly more difficult than the UK Government's previous target of reducing emissions by 80%, the National Audit Office says in a [report](#) assessing the main risks to reaching the target. The costs of achieving net zero are highly uncertain but the costs of inaction would be far greater, it finds. Government has yet to set out clearly the roles of public bodies outside central departments in achieving net zero, nor done enough to ensure all public sector organisations take action to reduce their own emissions.

### **Scottish Climate Change Plan update**

The Scottish Government [updated](#) its 2018 Climate Change Plan (CCP) to take into account the emissions reduction targets it strengthened in 2019. The update was delayed from April by the coronavirus pandemic. It said the revised plan now demonstrated not only the pathway to meeting the emissions targets, but was also a strategic document on the green recovery from Covid-19. The next full CCP will be delivered by early 2025. The Scottish Parliament Information Centre has published two helpful briefings: one on the [overall update](#) and the other looking at [key sectors](#).

### **Scottish hydrogen statement**

Scotland could produce enough hydrogen to meet its own demand and also support an export market to Europe, according to the Scottish Government's [Hydrogen Policy Statement](#), published in December. It will focus initially on developing capacity for 5GW of renewable, low-carbon and low-cost hydrogen by 2030, saying that hydrogen was increasingly seen as central to decarbonisation. It will publish a Hydrogen Action Plan this year, to be accompanied by £100m in funding to boost research, innovation development and demonstration production projects between 2021 and 2026.

### **UK to end support for fossil fuel development overseas**

The UK is to end direct government support for the fossil fuel energy sector overseas, as soon as possible and with very limited exceptions. Downing Street [said](#) the move was a significant change given that the UK had supported £21bn of UK oil and gas exports through trade promotion and export finance over the last four years. The prime minister announced the change at December's [Climate Ambition Summit](#), a lead-up event for November's COP26, which the UK co-hosted.

### **Covid-19, travel behaviours and business recovery in Scotland**

A significant shift to home working occurred during the first pandemic lockdown with more than three quarters of staff working at home at half of Scottish businesses, according to a [survey of employers](#) commissioned by ClimateXChange. The research finds that 71% of respondents either already support home working or plan to do so in the future while 80% expect to attend more meetings and events online than before in the longer term. Distance was the most frequently cited barrier to the use of more sustainable modes for journeys to work (68%).

### **Economic impact of ULEVs in Scotland**

The overall economic impacts of increased uptake of ultra-low emission vehicles (ULEVs) are positive over the long term, using a scenario which achieves Scotland's 2040 and 2045 climate change targets, according to [research](#) published by ClimateXChange. It finds that overall economy-wide employment (on a full-time equivalent basis) would be higher by 2043, with the potential for 3,000 new jobs in ULEV production, but suggests that more than 10,000 internal combustion engine maintenance jobs could be at risk by 2050.

### **Net-zero North Sea**

The UK and Scottish Governments need to work together on a managed transition away from reliance on fossil fuels and from oil and gas extraction in the North Sea, according to a [report](#) from the Institute for Public Policy Research (IPPR). It says any plan should be based on three dimensions – place, people and sector – and be co-funded, but with the UK assuming the great majority of the costs of transition because it has received the overwhelming majority of oil and gas revenues.

### **Greenhouse gas emissions in planning decisions**

[Research](#) published by ClimateXChange reviews current practice in considering greenhouse gas emissions as part of a wider assessment under the Strategic Environmental Assessment (SEA) and Environmental Impact Assessment (EIA) regimes used in planning decisions. Achieving Scotland's emissions reductions targets will require a sound understanding of likely emissions arising from national, strategic and project level decision-making, it says.

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

### **Forests and climate mitigation**

Forests are critical for stabilising climate, but the costs of mitigation over space, time, and stakeholder groups remain uncertain. New research, published in [Nature Communications](#), investigates the cost of reducing global greenhouse gas emissions in 16 global regions via forest sector abatement activities using the Global Timber Model (GTM), a dynamic economic model of the global forest sector. It builds on previous empirical research to consider not just potential net returns from alternative land uses (such as avoided deforestation, reforestation) but also the changing marginal user costs of forest

management (increasing harvest rotations, changing fertilizer application, species selection, or seedling density).

### **Global peatland research**

The carbon balance of peatlands is predicted to shift from a sink to a source this century. However, peatland ecosystems are still omitted from the main Earth system models that are used for future climate change projections. New [research](#), published in *Nature Climate Change*, defines and quantifies the leading drivers of change that have impacted peatland carbon stocks during the Holocene and predict their effect this century and beyond. It also identifies uncertainties and knowledge gaps, highlighting that peatland science is a critical research area.

### **Climate abatement in Scottish agriculture**

[Research](#) published by ClimateXChange has updated estimates of the mitigation potential and cost-effectiveness of 14 farms technologies and practices which can reduce greenhouse gas emissions in Scotland. These will be used in modelling the pathway to net zero. It finds that the single most effective measure would be to increase cultivation of grain legumes (peas and beans), followed by variable rate nitrogen and lime application (precision farming) and soil pH management.

### **Leguminous crops in Scotland**

Scotland has a large area of land, much of it in the east and in the lowlands, which is theoretically suitable for an increase in legume crops, a policy approach identified as having potential to reduce nitrogen fertiliser use, according to [research](#) published by ClimateXChange. However, Scotland's climate can pose issues for cultivation, leading to a perception among some farmers of poor crop performance, it finds.

### **Perennial energy crops in Scotland**

The theoretically suitable total land area identified for three perennial energy crops across all land types in Scotland is more than 900,000 ha, suggesting that Scotland could make a substantial contribution to the area of UK energy crops, according to [research](#) published by ClimateXChange. The research examines the potential for sustainable expansion of perennial bioenergy crops production on low-grade agricultural land or underutilised land, focusing on short rotation coppice (SRC), *Miscanthus* and short rotation forestry (SRF).