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climate change research and policy

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

February 2022

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

IPCC report

Many of the impacts of global warming are now irreversible but there is still a brief window of time to avoid the worst, the IPCC warns in its [Impacts, Adaptation and Vulnerability report](#), the [BBC reported](#). Carbon Brief described the report as "harrowing and sobering" and published [an in-depth Q&A](#). The Conversation published a [commentary](#) from three of the authors; two Grantham Institute researchers involved in the report also published [comments](#); and the Science Media Centre [collated expert responses](#).

Ukraine invasion impacts

Germany cancelled the controversial \$11bn Nord Stream 2 Baltic Sea gas pipeline project following Russia's invasion of Ukraine. It will also build its first LNG terminals and has floated the possibility of extending the lifespans of coal, and even nuclear plants, to cut dependency on Russian gas, [Reuters reported](#). It is also planning to accelerate the shift to renewable power, bringing forward a target for 100% renewable electricity to 2035, according to another [Reuters article](#). [Carbon Brief](#) has produced an in-depth summary of what Russia's invasion of Ukraine means for climate and energy, which is being regularly updated.

IEA on methane emissions

Methane emissions from the global energy sector are 70% higher than officially reported according to the International Energy Agency (IEA), [Reuters reported](#). For the first time, the 2022 update of the agency's [Global Methane Tracker](#) includes the coal sector, the biggest single source. A rapid and sustained reduction of methane emissions is both achievable and essential to limit global warming, the IEA said, noting that methane is responsible for around 30% of observed warming to date. Russian, Turkmenistan and Texas are among the

leading sources of leaks, it finds. Plugging methane from leaky oil and gas facilities would be free of cost almost everywhere in the world, and in many cases would produce a significant profit, at today's high gas prices, the IEA finds, the [Guardian reported](#).

Oil majors greenwashing

Four of the world's largest oil-and-gas companies are failing to back their words and pledges on climate change with genuine action and investment, according to a [paper published in PLOS One](#) and [covered by the Guardian](#). It finds that despite making more climate pledges, oil and gas production by Shell, BP, Chevron and ExxonMobil has remained consistently high, whereas less than 1% of their capital investment went into low-carbon technologies between 2010 and 2018. Carbon Brief published a [commentary](#) on the paper.

Subsidies for polluting industries

Government subsidies for heavily polluting industries led by coal, oil, gas and agriculture, have reached at least \$1.8tn a year, some 2% of global GDP, according to [research, reported by Reuters](#). The authors, leading subsidies' experts commissioned by the B Team and Business for Nature, say a significant portion of the \$1.8tn could be repurposed to support policies that are beneficial for nature and for the net-zero transition. The report calls for governments to agree a target to eradicate environmentally harmful subsidies by the end of the decade at the biodiversity COP15 gathering in China later this year, where it is hoped a 'Paris agreement for nature' will be signed, the [Guardian reported](#).

French energy policy

French president Emmanuel Macron has put nuclear power at the centre of France's transition to net zero, outlining plans to build at least six new nuclear reactors in the coming decades and to extend the lives of existing reactors where possible, [Reuters reported](#). EDF, the state-controlled power group, will build and operate the new reactors, which will be advanced versions of the European Pressurised Reactor (EPR) and will cost an estimated €50bn. Macron also announced plans to multiply solar energy production capacities roughly 10-fold to more than 100GW by 2050, [Reuters reported](#).

German climate envoy

Germany has followed the US in appointing a climate envoy, appointing US-born campaigner Jennifer Morgan, head of Greenpeace International, to the new role, [Deutsche Welle reported](#). The move was announced by German foreign minister Annalena Baerbock, a member of the Green Party, part of the country's new coalition government, to whom Morgan will report, the [New York Times reported](#).

US army climate strategy

The US army has released its [first climate strategy](#), aiming to halve its greenhouse gas emissions by 2030 and reach net-zero emissions by 2050, [Reuters reported](#). Planned

initiatives include developing an all-electric, non-tactical vehicle fleet by 2035, and the placement of a microgrid, an independent energy system that can use many sources of power including renewables at every installation by 2035. [Defence News noted](#) that the US army already has 950 renewable energy projects supplying 480MW of power.

Airbus to test hydrogen-powered jet engines

Airbus is to use a superjumbo A380 to test hydrogen-powered jet engines under plans to bring a zero-emissions aircraft into service by 2035, the [FT reported](#) (paywall). The [European aviation group said](#) it would work with CFM International to develop an engine that can run on hydrogen with a view to holding airborne tests by the end of 2026. The modified aircraft will keep its four conventional turbines, while a fifth engine, adapted for hydrogen, will be mounted on the rear fuselage.

UK Climate and Energy Research and Policy

CCC on oil and gas exploration

The Climate Change Committee has said “stringent tests” must be applied to any new exploration licences for oil and gas in the North Sea but stopped short of saying they could not be issued, the [Guardian reported](#). New drilling would not reduce energy bills for UK consumers, a new [CCC report finds](#). Chair Lord Deben said he would favour a moratorium on North Sea exploration and that refusing new licences would “send a clear signal to investors and consumers that the UK is committed” to its climate goals, and help to “strengthen climate ambition internationally”. Carbon Brief published a [fact check article](#) on whether new UK oil and gas licences could be climate compatible.

Annual renewables auctions

The UK Government is to hold Contracts for Difference (CfD) auctions for renewable energy projects annually rather than every two years as part of efforts to accelerate the transition away from fossil fuels, [BEIS said](#). The change will come into effect from March 2023, the [BBC reported](#).

Offshore wind

A centre to help develop floating offshore windfarms, the first of its kind, has been launched in Aberdeen, the [Independent reported](#). The £9m [National Floating Wind Innovation Centre](#) will simulate and then test components of floating structures, including moorings and anchors, dynamic cables and electrical systems that can be used for floating offshore wind turbines. The centre is being funded by Energy Transition Zone and the Offshore Renewable Energy (ORE) Catapult with the aim of increasing the commercial viability of offshore wind.

Tax shortfalls from shift to EVs

Motorists will have to pay by the mile to make up a £35bn tax shortfall that will arise from the shift to electric vehicles, MPs have warned, calling on the government to act urgently to www.climatexchange.org.uk

bring in a national road pricing scheme, the [Guardian reported](#). In a new [report](#), the House of Commons Transport Select Committee, says it sees “no viable alternative” to road pricing and that work should start immediately on creating a replacement for fuel duty before it dwindles away with the transition. The ban on sales of new petrol and diesel vehicles from 2030 is set to cost the Treasury roughly £28bn in fuel duty and £7bn in vehicle excise duty, under current tax rules. Separately, the Resolution Foundation published a [report on looming fiscal pressures](#) in which it says the UK could lose £8bn in tax revenues by 2030 if electric vehicle uptake is faster than expected.

Home heating

A [RIBA report](#) calculates that insulation, double- or triple-glazing and gas boiler replacement in 3.3m interwar homes in England could cut the country’s CO₂ emissions by 4%, the [Guardian reported](#). The architects’ professional body is calling for a national programme that it says would cost £38bn, well above current government subsidies. However, it also foresees savings of more than £500 a year in household energy bills in many cases. A [report by Nesta](#), the innovation agency, meanwhile, finds that heat pumps could soon be cheaper than gas boilers. The total cost of a pump over an average 15-year lifetime, including the system, installation and running costs, could save households £60-£110 per year, when compared to a gas boiler, the study finds, the [i newspaper reported](#). Separately, Chris Stark, head of the Climate Change Committee, said government policy on insulation was “very poor” and that insulation, together with renewable power, were the way out of the current energy crisis, the [BBC reported](#).

Energy usage timing

[Octopus Energy](#) and the [National Grid](#) have launched a pilot scheme under which UK households are being offered financial incentives to limit their electricity use by 40% to 60% during periods of peak demand, [the Guardian reported](#). The 100,000 participating households are being asked to meet energy usage targets during set two-hour windows when demand is high and will receive free electricity during this window if they achieve their target. Convincing households to become more flexible about when they use electricity is expected to be crucial in the UK’s ambition to become a net-zero carbon economy by 2050, National Grid said. The trial is expected to run until end-March.

Nuclear power

[UK regulators have approved](#) a Chinese-designed nuclear plant for use in the UK, [Bloomberg reported](#). China General Nuclear Group and EDF, had planned to use the reactor design, known as HPR1000, at Bradwell B in Essex. However, since the regulatory process was started in 2017, concerns have grown over China’s involvement in Britain’s nuclear industry, [Reuters reported](#). The UK Government is now seeking to remove CGN from UK projects, including Sizewell C, the [FT said](#). Separately, the [New Scientist reported](#) that the cost of a proposed underground storage facility to safely house the UK’s nuclear waste has risen to up to £53bn – more than double the previous estimate made just four years ago, new

[government figures](#) show. The increase is due to a wider scope of costs and incorporating large uncertainties in where the facility could be sited, including factors such as transport, flooding and geology.

Energy storage needs

The UK needs to invest in up to 24GW of Long Duration Electricity Storage (LDES) – including pumped storage hydro – to integrate wind power into a secure net-zero electricity system, according to a new report covered by [renews.biz](#). This is equivalent to eight times the current installed capacity. The UK's net-zero strategy to decarbonise the power system fully by 2035 is subject to security of supply being maintained, notes the [report, written by Aurora Energy](#) and commissioned by SSE Renewables. With gas-fired generation currently the main flexible resources available to balance intermittent solar and wind, the study says this target is unachievable without urgent investment in low-carbon alternatives.

UK farming

British farmers must reduce their production of meat and dairy by a third in the next 10 years, [WWF-UK has warned](#). In a new report, it says the UK is one of the most 'nature-depleted' places in the world and that farming and nature must be at the forefront of government plans to achieve net-zero emissions and tackle the climate and biodiversity crises, the [Guardian reported](#). Introducing measures such as eliminating artificial fertiliser and boosting hedgerows would save even more emissions than previously estimated by the Climate Change Committee, the report says. Separately, the president of the National Farmers' Union said the UK Government was pursuing "completely contradictory" policies that show a "total lack of understanding of how food production works", the [FT reported](#). [Minette Batters also said](#) the government was "raising the bar for environmental standards at home but pursuing trade deals that support lower standards overseas".

Climate Science, Impacts and Adaptation

Renewables and protected land

Expanding green energy production sites will not necessarily be a threat to protected areas of land, according to a [study led by UKERC](#) academics [published in PNAS](#). The researchers examined whether expanding land use requirements for wind and solar infrastructure would impact the ability to preserve biodiversity. They used global databases covering more than 24,500 land-based renewable energy installations in 153 countries to examine overlaps with areas identified as important for biodiversity conservation. They found that only 15% of onshore wind and solar energy installations occur in important conservation areas, including protected areas and wilderness. Only three European countries and three others, including the US and Brazil, show a higher than expected overlap of green infrastructure and conservation areas. Carbon Brief published a [guest post](#) by the authors.

Insufficient peatland restoration

Scotland's natural capital advantage could be lost unless more ambitious peatland restoration targets are set, according to [new research](#) from the University of Stirling, covered by the [Herald](#). Despite carbon-rich peatlands covering 25% of Scotland, they contribute just 2 per cent to its natural capital, while emissions from damaged peatlands increase Scotland's ecological deficit by 40%, the research finds. Peatland restoration at the rate currently planned by Scottish Government will only reduce that deficit by 7 per cent by 2050.