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

September 2020

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

China's net-zero pledge

Chinese president Xi Jingping stunned the international community by announcing China, the world's biggest emitter of greenhouse gases, would achieve 'carbon neutrality' by 2060. Commentators said the move, announced in a speech to the UN General Assembly, was a 'game-changer' and one of the most significant climate change developments in recent years. Carbon Brief published modelling by Cambridge Econometrics showing that, if delivered, the pledge could cut global warming by as much as 0.25° C this century. The massive investment required would raise China's GDP by up to 5% later this decade and could even be positive for global GDP.

Green recovery index

Few countries are living up to their promises of a 'green recovery' from the coronavirus crisis, according to research by Vivid Economics as part of the Finance for Biodiversity initiative. Of the total US stimulus spending of nearly $3tn, less than $40bn is going towards green projects, its index finds. Among the G20, only the UK, Germany and France and the EU are on track to achieve a net beneficial impact on climate and nature from recovery spending, it says.

Big rise in climate tech investment

Early stage funding for climate tech companies climbed from $418m in 2013 to $16.1bn last year, a faster rate of growth than investment into AI, according to a new PwC report, the first of its kind. Funding is from many sources including traditional venture capital, government-backed asset managers, and companies such as oil majors, it says. The pandemic has not slowed investment activity with recent initiatives including Amazon's $2bn 'Climate Pledge' venture fund and Microsoft's $1bn Climate Innovation Fund.

Renewables and metal mining

The increase in the production of many metals to support renewable energy technologies and infrastructure will create new mining threats for biodiversity, according to research published in *Nature Communications*. The production of renewable energies is material-intensive, much more so than fossil fuels, meaning that their expected further growth will escalate demand for many metals. Global conservation efforts are often naive to the threats posed by significant growth in renewable energies and, without strategic planning, the threats to biodiversity may surpass those averted by climate change mitigation, it says.

BP renewables shift

BP is to acquire 50% stakes in two US offshore wind power projects from Equinor as part of its goal to increase investment in low-carbon assets 10-fold to about $5bn a year. The deal would be its first offshore wind ventures and would also involve developing four other offshore US projects with Equinor. BP plans to increase renewable power development from 2.5GW in 2019 to about 50GW by 2030.

Unilever in fossil fuel phase out

Unilever is to spend €1bn changing the composition of its laundry and cleaning products to cut out ingredients made from fossil fuels over the next decade. The FT said the move was the first large-scale initiative of its kind and comes as the consumer goods group seeks to halve its overall GHG emissions by 2030. Unilever said fossil fuel-based chemicals were a neglected source of emissions, accounting for about half of its laundry products' carbon impact. Replacing them would enable it to cut 1m tonnes a year of fossil fuels from its supply chain.

Industrial heat pumps

Greater uptake of industrial heat pumps in Europe could have far-reaching benefits beyond energy and emission savings, according to a white paper published by TNO and seven other European research organisations. Deployment would increase the competitiveness of EU industry and drive technical innovations and job creation, it finds. However, to unlock the full potential of the technology, a supporting policy and regulatory framework is needed.

IEA CCUS report

A sharp rise in the deployment of carbon capture, utilisation and storage (CCUS) technology is needed globally if countries are to meet their net-zero emissions targets, the International Energy Agency has warned. In a new flagship report, the agency says meeting climate goals will be 'virtually impossible' without CCUS and that the amount of CO_2 captured must rise to 800m tonnes a year by 2030 from around 40m tonnes at present.

Aircraft emissions higher than thought

Aircraft emissions are causing more harm to the environment than previously thought, accounting for about 3.5% of the warming impact on the climate, according to new research published in *Atmospheric Environment.* It finds that two thirds of the emissions' impact is

from non-carbon dioxide sources, such as nitrogen oxide, and the rest from CO_2. The analysis is the most comprehensive to date and the first of its kind since 2009. Carbon Brief published a guest post by two of the authors.

ECHR climate lawsuit

Six young people from Portugal have initiated an unprecedented lawsuit accusing 33 countries of violating their rights by not doing enough to tackle the climate crisis, Climate Home News reported. The move, from four children and two young adults, is the first climate change case to be filed with the European Court of Human Rights and, if admissible, could pave the way for other such lawsuits, it said. The plaintiffs are asking for binding orders on the 33 states, including the EU and UK, to prevent discrimination against the young and protect their rights to exercise outdoors and live without anxiety.

UK Climate and Energy Research and Policy

Scottish Government programme

The Scottish Government has pledged to invest £1.6bn over the next parliament to decarbonise heating and improve energy efficiency , as part of its 2020-21 programme. It also said it would spend £60m to support industrial decarbonisation and increase annual infrastructure investment until it is £1.5bn higher by the end of the next parliament than in 2019-20. It is setting up a £62m Energy Transition Fund to support diversification in the oil, gas and energy sectors.

Hydrogen and offshore wind potential

Development of an indigenous green hydrogen industry could generate up to £320bn for the UK economy and sustain up to 120,000 jobs mainly outside south-east England by 2050 according to a report from the Offshore Wind Industry Council (OWIC) and the Offshore Renewable Energy (ORE) Catapult. The study examines the viability, and economic opportunities, of combining offshore wind with hydrogen via electrolysis. The UK will need at least 75GW of offshore wind generation to achieve net-zero emissions by 2050, with hydrogen set to play a significant role in integrating the power into the energy system, it says.

Green hydrogen partnership

A strategic partnership has been formed to create new green hydrogen production facilities and a cluster of refuelling stations across Scotland. The 'Green Hydrogen for Scotland' partnership's first project is planned for Glasgow, which hopes to become the UK's first net-zero city. It would involve building a hydrogen production facility on the outskirts, to be operated by BOC, using wind and solar power produced by ScottishPower Renewables to operate a 10MW electrolyser. It aims to supply hydrogen to the commercial market within two years.

Floating offshore hydrogen for Aberdeen

Aberdeen has been selected as the home for the world's first offshore floating facility to produce green hydrogen. The Dolphyn wind-to-hydrogen project plans to deploy a 2MW prototype system, producing renewable hydrogen that will be pumped back to the city, Energy Voice reported. The city was chosen ahead of Orkney and Cornwall partly because of its other hydrogen initiatives. Led by consultancy ERM, Dolphyn was awarded £3m in UK government funding earlier this year.

North Sea flaring and venting emissions

The Oil and Gas Authority is considering tougher measures to eliminate the flaring and venting of greenhouse gases within the sector. The regulator said it had expanded its benchmarking of the practice to offshore operations for the first time, finding that flaring accounted for about a quarter of direct CO_2 emissions from North Sea oil and gas fields. While some flaring and venting was unavoidable, more could be done to reduce emissions, it said.

UK coal mining

Construction of the UK's first coal mine in more than 30 years is on hold after the UK government came under pressure to block it because of its commitments to tackling climate change, the FT reported. Robert Jenrick, the housing secretary, said he reserved the right to veto planning permission for the £160m Woodhouse Colliery after Cumbria county council approved it. West Cumbria Mining, the developer, said the coking coal would be used in the steel and chemical industries and displace imports, not add to emissions.

UK climate assembly

It is imperative that government provides strong and clear leadership on climate change, according to the first UK-wide citizens' assembly on the issue. The assembly's 108 members were asked to consider how the UK should meet its net-zero greenhouse gas target by 2050. In its report, it said education and information about global warming, and the steps needed to tackle it, were needed to help build support for change. Members also called for fairness, freedom and choice, and said there could be many co-benefits to tackling climate change. They said they strongly supported measures with a positive impact on biodiversity and wildlife whilst also helping achieve net zero.

Grid-scale batteries

Grid-scale battery storage is likely to be an important part of the evolution of the UK's electricity system, with capacity in Scotland estimated to rise to up to 2,700MWh by 2030 and up to 10,500MWh by 2045, according to new research published by ClimateXChange. It finds that, in Scotland, battery storage is likely to be particularly useful in remote areas with a high proportion of renewable energy.

Scottish infrastructure investment

The Scottish Government has published a draft £24bn Infrastructure Investment Plan which it says will support 45,000 jobs, develop Scotland's resilience and enable an inclusive, net-zero emissions society. The draft plan, which is open for consultation, draws on new ClimateXChange research on aligning infrastructure investment with climate goals.

Climate Science, Impacts and Adaptation

Oceans and carbon absorption

Global oceans absorb significantly more carbon than most scientific models suggest, according to new research published in *Nature Communications*. Previous estimates of the movement of carbon, known as "flux", between the atmosphere and oceans have not accounted for temperature differences at the water's surface and the few metres below. It finds significantly higher net flux of carbon into the oceans at some locations and times, sometimes twice as much as estimated in many models. The researchers said the difference in carbon uptake they calculated was equivalent to about 10% of global fossil fuel emissions.

Maerl bed threat

Scotland's significant maerl beds could shrink by as much as 84% if global emissions and warming stick to their current trajectory and by 38% in the best-case scenario, according to new research published in *Frontiers in Marine Science*. Maerl beds, which are similar to coral reefs, are among the world's most biodiverse habitats. In a briefing published by the World Economic Forum, the researchers say the decline would be devastating for the habitat's flora and fauna, including commercially important species such as juvenile pollack, hake and scallops.

Bird fatalities and wind turbines

Painting a single blade on a wind turbine black can make wind farms more visible to birds and reduce fatalities by 72%, according to a Norwegian study published in *Ecology and Evolution*. The modification is especially effective in preventing collision deaths of birds of prey, it finds. The researchers call for further trials, suggesting they take place in southern Spain where many wind farms overlap with the flight paths of large numbers of migrating birds.