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

August 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

Electricity sector inertia

Only one in 10 energy suppliers globally has prioritised renewables over fossil fuels, according to new research published in *Nature Energy.* Even those focusing on renewables are continuing to invest in fossil fuels: 60% are expanding fossil fuel portfolios compared to 15% reducing, it says. The research looks at some 3,000 electricity companies around the world, finding that the boom in green energy has been driven by independent producers.

Electric vehicle uptake

More than two fifths (42%) of new cars sold in Europe by the end of the decade will be fully electric according to research by Deloitte. It predicts that five areas – the UK, Germany, France, the Netherlands and Scandinavia – will lead uptake partly because of investment in charging infrastructure. Polling suggests half of UK motorists would consider purchasing an electric vehicle (EV) as their next model. The study estimates annual worldwide EV sales of 2.5m this year, rising to 11.2m by 2025 and to more than 30m by the end of the decade.

Climate change and Covid-19

Solving the climate crisis will address inequality and racism, strengthen the economy, and promote global health, the World Economic Forum says in an article on the lessons for climate change from Covid-19. Among other things, it says meaningful partnerships and policy work are needed to advance change and that the pandemic has underlined that adversity prompts innovation. Separately, a new report in *Nature Climate Change* finds 0.3° C of global warming could be avoided by 2050 if governments invest in a strong green recovery from coronavirus. Carbon Brief has interviewed the lead author.

Road transport and emissions

Current policies for reducing CO_2 emissions from road transport are not nearly stringent enough, according to a perspective article in *Nature Climate Change*. It says that in most regions there is a need for a stronger, more integrated policy mix led by tougher regulations and complemented by pricing mechanisms if climate mitigation goals are to be met.

Biomass emissions

Net carbon emissions from biomass power stations in the EU should be accounted for and declared under the Emissions Trading System (ETS), according to senior scientists. The European Commission is in the process of reforming the ETS. At present, carbon emissions from biomass are rated at zero. The European Academies' Science Advisory Council (EASAC) said the carbon payback period of biomass facilities and their supply chains needed to be calculated. Much of the biomass used in Europe was not carbon neutral and should not be subsidised, it added.

BECCS and land use

Large-scale implementation of bioenergy with carbon capture and storage (BECCS) has considerable potential to reduce emissions over the course of this century but will require substantial land requirements, according to research published in *Nature Climate Change.* Global implementation to help reach emissions targets could lead to competition with other land uses such as food production and biodiversity protection, it finds.

CCS and power sector

Carbon capture and storage deployment rates in the power sector are far off track, according to a new report from IEAGHG, the International Energy Agency's greenhouse gas research arm. The report looks at the likely role of CCS in the UK, US, Australia and China and says it demonstrates the viability of bioenergy with CCS (BECCS), gas CCS and hydrogen in delivering cost-effective decarbonisation. The two main barriers to deployment are high capital expenditure and insufficient revenue generation from the captured carbon.

US urged to rejoin Paris Agreement

Leading climate economics and policy experts have said the US would reap significant net economic benefits for itself and for the world economy if it recommits to the Paris Agreement. In a policy brief, academics from LSE and Imperial College note the cost of clean energy has fallen since the agreement was signed in 2015, while the risks of climate impacts have increased.

Montreal Protocol

New, unexpected emissions of chlorofluorocarbons (CFCs) and other chemicals are undermining the success of the Montreal Protocol in healing the Antarctic ozone hole, according to a paper published in *Nature Communications*. The authors call on policymakers to toughen compliance with the treaty, boost its effectiveness with additional monitoring,

and add other ozone-depleting substances to it. The protocol was drawn up in 1987 and is credited with avoiding more global warming than any other international treaty.

Green hydrogen costs

The cost of producing green hydrogen will fall by up to 64% by 2040, according to a new study by Wood Mackenzie. The high cost of producing low-carbon hydrogen at present is the most significant barrier to its mass adoption for use across the global energy market, it says. Over the past decade, global demand for hydrogen has only grown by 28%, with the top 10 countries accounting for 70%. However, the project pipeline for green hydrogen has quadrupled from 3.5GW to 15GW in the past 10 months.

Hydrogen and commercial aviation

Hydrogen can significantly reduce aviation emissions in the long term and could be used to fuel airport services within five years, according to a report from CSIRO, Australia's national science agency. In the medium term, hydrogen can be combined with carbon dioxide to produce a 'drop-in' jet fuel that requires no change in existing aircraft infrastructure, it says.

City-level climate targets

More than 60% of the 1,066 European cities that have monitored their performance are on track to meet their climate target, according to new analysis published in *Nature Climate Change*. It finds the cities, on average, have committed to reduce emissions by 24% against their baselines. The authors discuss their findings in a guest post for Carbon Brief.

UK Climate and Energy Research and Policy

Sharp fall in UK renewable costs

Electricity generated from wind and solar in the UK is up to 50% cheaper than previously thought, according to new figures from BEIS. Carbon Brief said the report was likely to be one of the most significant government reports this year because its findings are set to underpin a much-anticipated energy white paper due this autumn. It has produced an in-depth analysis of the new data.

NIC recommendations on renewables

The UK should accelerate the roll-out of renewable energy in light of falling costs for wind and solar, according to a new report published by the National Infrastructure Commission. It says Britain should aim to generate 65% of its electricity from renewables by 2030, up from its previous recommendation of 50% and from present levels of about 40%. It also recommends a refreshed pipeline of 'contracts for difference' auctions – contracts guaranteeing revenue streams - be set out to accelerate more offshore wind, onshore wind and solar power projects. The report says renewables alone cannot create a resilient energy system; further work on new storage technologies, efficient interconnectors, and other

innovations are needed. This could include an increased role for low-carbon hydrogen generation.

Climate and Ecological Emergency Bill

Caroline Lucas, the Green MP, has introduced a new Climate and Ecological Emergency Bill that calls on the government to take immediate and radical action to address climate change. Drafted by scientists, lawyers and academics, it is a private member's bill with co-sponsors in several other parties including the SNP and Labour. Among other things, it calls for the establishment of an emergency Climate Assembly to guide the government's actions and ensure a just transition and for the government to take account of the UK's full carbon footprint, both its domestic and international emissions.

Fuel poverty and emissions

Fuel poverty in the UK could make reduction of carbon emissions more difficult to achieve than previously thought, according to a new paper in the *Journal of Energy Policy*. The researchers looked at energy demand in homes across Britain to evaluate the use of heat pumps in reducing emissions. They found that financially challenged households use much less energy to heat their homes. If given access to lower cost heating, demand could rebound. The report says that if the high capital cost of low-carbon heating could be addressed and help provided with home insulation, there would be an opportunity to tackle fuel poverty and heating-related carbon emissions in tandem.

Decarbonising distilleries

The UK government has launched a £10m Green Distilleries fund to help the sector decarbonise. In the first phase it is providing £500,000 in funding for feasibility studies into technologies to enable low-carbon fuels in the sector including electrification, hydrogen, biomass or waste.

Phasing out fossil fuel vehicles

Phasing out the sale of new petrol, diesel and hybrid cars and vans by 2035 might not be enough to help the UK meet its climate goals according to UKERC and CREDS. In their response to a UK government consultation, the research bodies say moving the date to 2030 would be largely non-disruptive. They also urge the government to take measures to reduce the number of existing high-emitting vehicles and say the incumbent industries, the original equipment manufacturers, will be the biggest barrier to change.

Offshore energy integration

The integration of offshore energy systems, including oil and gas, renewables, hydrogen and carbon capture and storage, could help deliver approximately 30% of the total carbon reduction requirements needed to meet the UK's 2050 net-zero target, according to government agency Oil and Gas Authority (OGA). Additional offshore renewables (wind, wave and tidal) could contribute a further 30% towards the target, the OGA says in a new

report. Oil and gas platform electrification is essential to cutting emissions while reusing reservoirs can accelerate CCS, it says.

Heat decarbonisation in Northern Ireland

Northern Ireland has achieved its 2020 targets in the electricity sector ahead of time with 46.8% of its electricity demand supplied by renewable generators, according to a new UKERC-funded report on the barriers and opportunities for heat decarbonisation in NI. However, there has been less progress on heat, with 68% of domestic heating provided by oil, while more than a fifth (22%) of consumers live in fuel poverty. It says clear leadership, consumer motivation and education, local demonstration programmes, financial support, and unlocking demand-side flexibility are among the measures needed to help get heat decarbonisation onto the right track. A lack of independent information about current impacts and possible solutions was also highlighted by consumers.

Biowaste opportunities

Increasing biowaste treatment provides a unique opportunity for expansion of the anaerobic digestion (AD) and composting industries in the UK, according to a review published in Resource magazine. With 5m tonnes of biowaste a year still being disposed of in landfill, it is urgent that biowaste is treated both for GHG abatement and for the resources biowaste can provide, it says. The current focus is heavily skewed to the energy produced from AD plants, even though there is a need to replenish soils which could be met through transforming biowaste.

E-scooter deployment

Local authorities in the UK need to take an active role in the deployment of e-scooters within cities to maximise their benefits, according to a report from Cenex, the transport research organisation. E-scooters are a low-emission solution that can help reduce congestion and CO_2 emissions compared to alternative modes of transport but concerns can arise over safety if implementation is poorly planned, it says. It estimates that e-scooter journeys can reduce emissions by between 66-90% when they replace car travel in cities.

Climate Science, Impacts and Adaptation

Soil loss and water runoff

Soil loss due to water runoff could increase greatly around the world over the next 50 years due to climate change and intensive land cultivation, according to a new study published in *PNAS*. The researchers modelled three scenarios by the year 2070. All predict persistent water erosion irrespective of climate conditions in the 200 countries included. However, climate change was the primary factor behind increased soil erosion which was estimated to rise by 30% to 66%, compared with 2015, depending on the scenario.

Climate change and mortality rates

Climate change's warming effect could raise global mortality rates by 73 deaths per 100,000 people by 2100 under a continued high emissions scenario, compared to a world with no warming, a level roughly equal to the current death rate for all infectious diseases combined, according to a new paper from the Climate Impact Lab, the US research organisation. In poor hot countries, heat may be more of a health threat than cancer or heart disease today, it says. Age and income are significant predictors of the mortality risk associated with climate change: more frequent hot days are most dangerous for elderly populations, but this is offset for those living in wealthier areas.

Public engagement and climate change

Public engagement on climate change can take many different forms, and there is no single "best" approach, according to new research published by ClimateXChange aimed at helping the Scottish Government develop a new strategy in this area. In the design and facilitation of public engagement it is worth considering carefully the different 'starting points' that different groups may have in terms of understanding and engagement on climate change. Considering evidence up until the Covid-19 pandemic, it draws together what we know about Scots' attitudes to climate change and the merits of different ways to engage them.

Eatwell diet reduces emissions

Following UK government diet advice cuts premature deaths and reduces CO_2 emissions according to a new study, the first in-depth analysis of the Eatwell guidelines. It finds that following five or more of the guidelines reduces mortality risk by 7% and is associated with a 30% reduction in CO_2.