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

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

September 2016

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 Policy

Paris Agreement to enter force this year

The European Union ratified the Paris Agreement on 4 October, enabling it to come into force before the next round of climate talks in Marrakech on 7 November and the US election on 8 November. EU ratification took the participation level past that required to trigger the Agreement - at least 55 nations representing 55% of global emissions. It will become legally binding on 4 November, impelling nations who have ratified to action their Nationally Determined Contributions and to establish processes for providing financial and technical support to developing countries. Countries cannot withdraw from the agreement for three years following its entry into force. EU Member States will ratify the Paris Agreement individually, in parallel with the European Commission. Slovakia, France, Hungary, Germany, Malta, Austria and Portugal have already formally joined. UK Prime Minister, Theresa May announced in her maiden speech to the UN in September that the UK will complete its ratification process before the end of 2016. India, the world's fourth largest emitter of greenhouse gases (GHGs), ratified the Agreement in September. The largest remaining emitters that have yet to formally join the agreement include Russia (7.5% of emissions), Japan (3.79 percent), Canada (1.95%), South Korea (1.85%), Mexico (1.7%), Indonesia (1.49%), South Africa (1.46%) and Australia (1.46%).

Aviation industry agrees plan to manage greenhouse gas emissions

The International Civil Aviation Organisation (ICAO) agreed a deal to limit the industry's greenhouse gas emissions from 2020. International aviation and shipping are not included under the Paris Agreement and the aviation industry has struggled to agree on plans to reduce emissions to-date. Emissions will be allowed to grow to 2020 under the plan, after which they will need to be offset through measures such as alternative energy installation and forest conservation. ICAO has yet to set rules for how such offsets will be achieved. The deal may also motivate carriers to cut emissions through fleet and route efficiency measures. It will be voluntary to 2026 but most major nations are expected to take part. Aviation currently represents around 2% of global emissions, however the industry is expected to grow by 5% each year over the next two decades. Analysis by Carbon Brief found that its contribution could increase to 27% if targets are not met, potentially consuming one quarter of the world's 1.5°C carbon budget by 2050.

Canada to price carbon by 2018

Canadian Prime Minister, Justin Trudeau, told the Canadian Parliament that his Government will impose a carbon price on provinces that have not introduced either a cap-and-trade system or a direct carbon price by 2018. Provinces will be required to introduce carbon pricing schemes that comply with a floor price set by the federal government. Trudeau suggested that the price should start at a minimum of CAD$10 (£6) a tonne in 2018, rising by $10 each year to CAD$50 (£30) a tonne by 2022. He also proposed during parliamentary debate on the country's ratification of the Paris Agreement that Canada should cut its greenhouse gas emissions by 30 per cent from 2005 levels by 2030.

Netherlands to close remaining coal fired power stations

The Dutch Parliament voted to cut the country's GHG emissions by 55% by 2030. The target is one of the most ambitious Europe and will bring the Netherlands into line with the ambitions of the Paris Agreement. Achieving the cut will require closure of the country's five remaining coal-fired power stations, three of which came online just last year. A Dutch court last year ruled that the government must cut emissions by a quarter by 2020 in response to the threats posed by climate change.

City of Oslo sets climate budget

Oslo's city government has set annual GHG emissions targets through the adoption of a 'climate budget'. The plan will integrate the accounting of GHG emissions with financial budgeting, setting a pathway to halve the city's emissions by 2020 and to reach carbon neutrality by 2030. Oslo has set plans to achieve these targets by limiting access for cars with new tolls and fewer parking spaces, powering the bus fleet with renewable energy, increasing cycle use and eliminate heating with fossil fuels in homes and offices. Parts of Oslo's plan will depend on funds from the national government, including support for the development of carbon capture and storage for emissions from municipal waste. The Norwegian Government announced that it will invest 360m NKR (£35m) in its 2017 budget to investigate the feasibility of a number of potential carbon capture and storage projects.

UK Climate and Energy Policy

CCS essential to UK decarbonisation: Parliamentary Advisory Group

The UK Parliamentary Advisory Group on CCS delivered its report to the Secretary of State for Energy on the potential contribution of carbon capture and storage (CCS) in decarbonising the UK economy. It found CCS to be an essential component in delivering lowest cost decarbonisation across the whole UK economy, agreeing with the Committee on Climate Change's recent assertion that further delay to deployment will add to the cost of meeting the UK's climate targets. The Group concluded that CCS would have implications for all four of the major fossil fuel consuming sectors – industry, power, transport and heating. It found that existing CCS technology is ready to be installed at scale and called for immediate policy decisions to enable deployment. Offshore UK territorial waters offer the least cost form of storage and are available at the scale required. However, the state will need to take an enhanced role in managing storage risk if costs are to be minimised. The report recommended the creation of an initially state-owned CCS Delivery Company to manage construction and risk for initial projects. This would create transport and storage infrastructure, which can be privatised when properly established. The report's findings were welcomed by Scottish

Carbon Capture and Storage.

UKERC study finds gas can play limited role in meeting UK climate targets

Research by the UK Energy Research Centre found that natural gas can play only a limited role as a 'bridge' to a low carbon UK energy system, whether carbon capture and storage is deployed or not. The authors suggest this is because much of the UK's transition from coal to gas has already occurred, for heating and cooking in homes during the 1970s, and for industry in the 1980s when electricity replaced much direct use of coal for heat. The study found that there will be a role for natural gas in the UK in the 2020s and 2030s, but the consumption of natural gas will fall from 2020 if the UK is to meet its carbon targets in a cost-effective way.

UK Government on track to miss 2020 renewables targets: Committee

A report by the Westminster Energy and Climate Change Committee warned that the UK will miss its 2020 renewable energy targets if its current course is maintained. The UK Government has committed to meeting 15% of energy demand from renewable sources by 2020. This includes three sub targets: 30% in electricity, 12% in heat and 10% in transport. Three-quarters of the target for electricity has been achieved and it is expected that the 30% aim will be exceeded by 2020. However, the UK is not yet halfway towards its target for heat, and the proportion of renewable energy used in transport fell between 2014 and 2015. The Committee found that the Government's proposed reforms to the Renewable Heat Incentive (RHI) are not the optimal pathway to the 2020 renewable heat target, citing underperformance of heat pumps and recommending the prioritisation of financial support for bio-methane. It also recommended that the Government raise the Renewable Transport Fuel Obligation without delay to increase the use of renewable fuels to 2020.

Call for a more balanced UK heat strategy

The think tank Policy Exchange called on the UK Government to develop a new heat strategy based on a more balanced set of priorities and technologies, following its assessment of existing policies. It found that an approach incorporating substantial improvements in energy efficiency, more efficient gas appliances, greener forms of gas, and alternative heat technologies could deliver upwards of an 80% reduction in emissions by 2050. This could be delivered at substantially less cost to consumers than the Government's existing policies. In common with the Energy and Climate Change Committee (see above), the authors identified particular weaknesses in the Government's existing focus on electric heat pumps, which they found to be an extremely costly way to decarbonise heating. ClimateXChange and UKERC co-hosted a Heat Summit in Edinburgh on 15 September, bringing together invited participants from research, policy and practice. A summary of this discussion, which identified priority areas for research-policy-practice engagement on low carbon heat, can be found on the ClimateXChange website.

Climate Science, Impacts and Adaptation

Independent assessment of the Scottish Climate Change Adaptation Programme

The Adaptation Sub Committee (ASC) of the UK Committee on Climate Change released a statutory report on its independent assessment of the Scottish Climate Change Adaptation Programme. The report provided an interim evaluation of the progress being made to prepare for climate change, two years after the Scottish Government published its first Scottish Climate Change Adaptation Programme. The ASC suggested that lack of evidence is making it difficult to judge whether Scotland's vulnerability to climate impacts is increasing, remaining constant, or decreasing. The ASC recommended that Scottish Government set clearer policies for adapting to climate change and monitor their implementation. Where the ASC was able to assess progress, it found that a range of adaptation policies and plans are currently in place and that actions are on track. The report is the first of its kind and the assessments were largely based on baseline data for climate change risks, impacts and actions from a set of climate change indicators developed by ClimateXChange. The set of 105 indicators identified trends where possible, provided baseline data and identified data gaps. The set is the most comprehensive source of information about the state of climate change in Scotland to date.

Atmospheric carbon dioxide concentration passes 400ppm threshold

The concentration of CO_2 in the Earth's atmosphere failed to drop below 400 parts per million (ppm) during September, indicating that it may have irreversibly surpassed this threshold. The concentration of CO_2 typically reduces during the Northern Hemisphere's summer months, when the gas is absorbed by growing plants. However, it did not decrease below 400ppm by the end of September this year. This led climate experts, including NASA's chief climate scientist, to predict that monthly averages will not drop below 400ppm again. The Washington Post reported on a study published in Science, which found that the ability of the Earth's soils to absorb carbon during this century may have been significantly overestimated in climate models. A separate study found that reservoirs, including hydroelectric dams, may be emitting significantly more GHGs than assumed, potentially accounting for up to 1.3% of global total emissions.

Arctic sea ice extent nears record minimum

The US National Snow and Ice Data Centre reported that Arctic sea-ice extent was at its second lowest level since satellite measurements began in 1978. The extent of Arctic sea ice at the peak of the summer melt season now typically covers 40 percent less area than it did in the late 1970s and early 1980s, according to the World Meteorological Organisation (WMO). This summer's low ice levels follow the record low levels of winter Arctic ice during 2015-16. The WMO stated that dramatic and unprecedented warming in the Arctic is driving sea level rise, affecting weather patterns around the world and may trigger even more changes in the climate system. It warned that the rate of change is challenging the current scientific capacity to monitor and predict what is becoming a journey into uncharted territory. The National Oceanic and Atmospheric Administration reported that August this year was the 16th month in a row to break global temperature records. It reported that global temperatures over the entire year so far have been the highest on record.

Climate change to significantly impact global crop production by 2050

A University of Birmingham study found that the global distribution of staple crop production is likely to change significantly by 2050 as a result of climate change. The study combined standard climate change models with maximum land productivity data to predict how the potential productivity of cropland is likely to change over the next 50-100 years as a result of climate change. It found that nearly half of all maize produced in the world (43%), and a third of all wheat and rice (33% and 37% respectively), is grown in areas vulnerable to the effects of climate change. Croplands in tropical areas, including Sub-Saharan Africa, South America and the Eastern US, are likely to experience the most drastic reductions in their potential to grow these crops. However, croplands in temperate areas including western and central Russia and central Canada are likely to experience an increase in yield potential, presenting new opportunities for agriculture. While the effects of climate change are commonly expected to be greatest in the world's poorest areas, the authors suggested that developed countries may be equally affected.