

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

August 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 Policy

Paris agreement likely to come into force in 2016

China and the United States [formally joined the Paris climate change agreement](#) at the September G20 summit in Hangzhou, China. Ratification by these two countries, which together account for 40% of global emissions, indicates that the agreement may be brought into force by the end of this year. It must be ratified by countries representing 55% of global emissions, and with support from at least 55 nations before it comes into force. Countries [accounting for 54 percent](#) of greenhouse gas emissions have signaled intent to ratify in 2016. Brazil's Senate [approved ratification of the agreement](#) in August, including a 37% emissions cut from 2005 levels. Brazil's commitment, combined with the US (17.89% of global emissions) and China (20.09%), accounts for 41.54% of global emissions, according to [official UN figures](#).

Investors and insurers urge G20 climate action

A group of 130 institutions managing US\$13 trillion of investment [called on G20 nations to ratify the Paris agreement](#) this year in order to provide investment security and accelerate clean energy development. The group also called for tightened rules regarding the disclosure of climate-related financial risks, the development of carbon pricing and the phase out of fossil fuel subsidies. A separate group of insurers with US\$1.2 trillion under management urged the G20 to set a timeline for the [phase-out of fossil fuel subsidies by 2020](#). This follows commitment by the G7 in June this year to eliminate fossil fuel subsidies by 2025. G20 countries together represent 75% of global emissions. [Climate Transparency](#) released [a scorecard of G20 nations'](#) progress in implementing climate policy. It found a wide spectrum of performance and identified a need for further action if commitments made in Paris are to be met.

California to set ambitious climate targets

The Californian State Legislature passed bills mandating an [emissions cut to 40% below 1990 levels](#) by 2030. The State Governor committed to signing the bills, which will put California on a par with the EU's emissions targets and well ahead of US national targets, which are equivalent to a 12-19% emissions reduction on 1990 levels. California emitted 353mt of CO₂ in 2013, which would put it in the top 20 emitters globally if it were a country.

International Energy Policy

Pro-nuclear European countries have made less progress on climate targets: study

[Analysis by researchers at the University of Sussex](#) and the Vienna School of International Studies found that European countries with a commitment to nuclear energy have made less progress in reducing emissions than their counterparts. The study compared EU states' progress against EU 2020 Strategy targets. It divided states between those with no nuclear energy, those with existing nuclear commitments but with plans to decommission, and those with plans to maintain or expand nuclear capacity. It found that states in the first two categories reduced their emissions by an average of 6% and 11% respectively from 2005, while those with plans to maintain or expand nuclear capacity increased their emissions by an average of 3%. Countries without nuclear grew renewable energy's share of generation capacity to 26%, compared to 16% in countries with plans to maintain or expand nuclear energy. While the authors stressed that it is difficult to show a causal link, they suggested that the results cast significant doubts on nuclear energy as the answer to combating climate change. Entrenched commitments to nuclear power, they suggested, may suppress other means of reducing carbon emissions, such as renewable technologies. The study found mixed results for the UK, which achieved significantly greater emissions reductions (16%) than other pro-nuclear countries, but generates only 5% of its energy from renewables.

Australian state bans unconventional gas

The Australian state of Victoria announced a [permanent ban on the exploration and development of onshore unconventional gas](#), including hydraulic fracturing. Victoria established a moratorium on unconventional gas in 2012. This ban follows a 2015 Environment and Planning Committee [inquiry into unconventional gas](#), which saw committee members split over whether to implement a full ban or extend the moratorium. The Victorian Government cited risks to the state's farming industries, as well as community opposition to unconventional gas as key considerations in its decision. The government also committed to legislating the extension of a current moratorium on the exploration and development of conventional onshore gas until 2020. [The Conversation](#) carried analysis of the decision and its potential impacts.

Emissions from biofuels significantly underestimated: study

A [study by the University of Michigan](#) found that the production and use of biofuels such as ethanol and biodiesel produces significantly more greenhouse gas emissions than previously estimated. The findings, published in the journal *Climatic Change*, contradict assumptions commonly made in lifecycle assessments that carbon emissions from the combustion of biofuels are offset by the uptake of crops grown to produce them. The study monitored direct carbon emissions from US biofuel crops, finding that their uptake of carbon dioxide was only enough to offset 37% of emissions from combustion of the biofuels they produced. The study's authors called on policymakers to reconsider support for biofuels in response to their findings.

UK climate and energy policy

Scotland's emissions reductions ranked second largest in Western Europe

Scotland achieved the [second largest emissions reductions](#) in Western Europe, according to data [released by the Scottish Government](#). Scotland reduced its emissions by 39.5% between 1990 and 2014, second only to Sweden, which achieved a 54.5% reduction in the same period. England's emissions reduced by 34%, while the UK as a whole achieved a 33% reduction. WWF Scotland welcomed the achievement, but cautioned that progress in sectors other than electricity and waste has been too slow to-date.

Scottish Renewables identify potential 20% cost savings for onshore wind

A [report commissioned by Scottish Renewables](#) estimated that the cost of onshore wind could be reduced by 20% in Scotland. The analysis of industry costs and revenues identified a range of opportunities and interventions which could reduce the levelised cost of onshore wind power, saving £150 million a year. These include overcoming planning constraints to enable the installation of larger wind turbines, and extending the life of existing ones. The study also found that costs could be reduced by introducing more flexible ways of connecting onshore wind projects to the grid, and reducing the amount developers have to pay to connect.

Shetland connects world's first tidal array

An [array of tidal power turbines in Shetland](#) was the first in the world to produce electricity on a commercial scale. Nova Innovation this month switched on its second of five 100kW turbines to be installed in the Bluemull Sound. The scheme is the first to link a chain of separate turbines, marking a milestone in achieving commercial-scale tidal electricity. It is intended that the turbines, which were co-funded by the Belgian renewables company ELSA, will be sold worldwide now that they have been commercially proven.

UK energy imports reach highest levels since 1970s

Data [from the Office of National Statistics](#) (ONS) revealed that the UK is importing energy at rates not reached since the late 1970s. All EU countries imported more energy than they produced in 2014, with the UK ranked as the twelfth most dependent on foreign imports. The UK is now consuming less energy than it did in 1998, down 17%. Significantly more energy is also now produced domestically from renewable sources, up from 1% of total consumption in 1998 to 9% in 2014. However, downturn in North Sea oil and gas production in recent years has led to greater reliance on imported crude oil (representing one third of energy imports in 2015) and natural gas (29% of imports).

National Grid awards frequency balancing contracts

The UK's transmission system operator, National Grid, [awarded enhanced frequency contracts](#) (EFCs) worth £66 million to seven companies. The contracts will establish a new frequency response service, requiring providers to assist in balancing the power grid in under one second. The service is intended to respond to increasing grid frequency volatility, driven in part by the growth of renewable generation. It will include 64 sites, totalling 201MW of capacity. National Grid set a cap of 50MW capacity for each site. 61 of those selected are battery assets, [marking a significant step forward for the UK energy storage market](#). Two are demand reduction. EDF's West Barton natural gas-fired

power plant is the only thermal site selected, however it will contribute 49MW of capacity. Contracts have been awarded on a four year term. National Grid estimated that the contracts will reduce frequency management costs by approximately £200 million.

Demand Side Balancing Reserve dropped

National Grid also [announced in August](#) that it will not be procuring last resort Demand Side Balancing Reserve (DSBR) for the winter of 2016/17. DSBR was introduced in 2014 to assist in balancing the system in the unlikely event that there is insufficient capacity in the market to meet demand. It was targeted at commercial and industrial energy consumers who could volunteer to reduce demand between 4pm and 8pm on winter weekday evenings in return for payment. Demand reduction could be delivered by reducing or shifting load, by running on-site backup generation or by running small embedded generators. The tender process for 2016/17, which closed in June, failed to deliver sufficient reserve capacity, attracting only 30MW of the required 177MW. The [Telegraph reported](#) a statement from a National Grid spokesman that the extra capacity required had already been procured through the [Supplementary Balancing Reserve](#) (SBR) service. This service is targeted at keeping power stations in reserve that would otherwise be closed or mothballed. Demand-side reserve was expected to be cheaper and less carbon intensive than capacity supplied via SBR. National Grid last year committed to procuring 30-50% of balancing services from demand-side responses. [The Energyst provided analysis](#) of whether this target is achievable. The Director of the UK Energy Research Centre, Jim Watson [provided analysis](#) of the National Grid [Future Energy Scenarios](#), which were released in July.

Climate Impacts and Adaptation

Current warming unprecedented in 1000 years: NASA

July 2016 was the warmest month globally since records began in 1880, according to data from [NASA's Goddard Institute for Space Studies](#) (GISS). NASA's analysis of ice cores samples reveals that the warming that has occurred in the last 30 years is unprecedented during the last millennium. GISS Director, Gavin Schmidt, reiterated his previous prediction that there is a [99% chance 2016 will be the hottest year on record](#). He also warned that emissions cuts required to limit warming to 2°C are not being delivered. [Temperature reconstructions by Nasa](#) found that global temperature typically rose by between 4-7°C over a period of 5,000 years as the world moved out of ice ages. The earth warmed at ten times this rate over the past century.

Climate change intensifying North American storms

The east coast of the US was hit by hurricanes and severe storms during August and the beginning of September. The state of Louisiana experienced severe flooding as a result of record breaking rain. The Baton Rouge area received 30cm in a single day on August 12th. Other parts of the state received 75cm over the course of a week. At least 13 people were killed and thousands were evacuated from their homes, leading the Red Cross to declare it the worst natural disaster in the US since Superstore Sandy in 2012. The extreme rainfall was linked to unusually warm waters in the Gulf of Mexico, which allowed the slow-moving storm to absorb large quantities of moisture. Analysis by the World Weather Attribution (WWA) project and the US National Oceanic and Atmospheric Administration (NOAA) concluded that the extreme rainfall event was [made twice as likely by climate change](#). Florida, Georgia, South Carolina and North Carolina were also hit by severe flooding

following [Hurricane Hermine](#), which made landfall on September 2nd. Research [published by the American Meteorological Society](#) found that climate change may cause hurricanes to intensify more rapidly just before striking land, making hurricane forecasting more difficult.

Louisianan, Alaskan communities to become first US climate refugees

A community in Louisiana will receive a [federal grant worth £48 million](#) to resettle as their land subsides into the ocean. The Isle de Jean Charles is located on sediment, which naturally compacts and sinks over time. However, this process has been exacerbated by oil and gas extraction, as well as rising sea levels. 98% of the island's land has been lost since 1955. The Alaskan village of Shishmaref this month also voted to [move its entire population](#) of around 600 residents to a new location. The island has lost 3,000 feet of coastline in the past 35 years, primarily as a result of melting permafrost and storm surges.