

The United Kingdom has made good progress in bringing down carbon emissions cost-effectively, cutting UK air pollution and opening up new growth in clean industries.

The current government's legal endorsement of the Fifth Carbon Budget is a welcome milestone on the way to meeting our 2050 emissions reduction obligations under the Climate Change Act.

Whoever runs the country after June 8th should continue with this success, and implement new policy to give investors the confidence to continue to boost clean growth.

The prospect of Brexit also offers an opportunity for the UK to tailor and strengthen environmental regulation for our own particular circumstance and energy market.

About Sandbag

Sandbag is a London and Brussels-based not-for-profit think tank conducting research and campaigning for cost-effective climate policies.

Our research focus includes reforming the EU Emissions Trading System and the Effort Sharing Decision; accelerating the phase-out of old coal in Europe; and deep decarbonisation of industry through technologies including Carbon Capture & Storage.

For more information, visit sandbag.org.uk or email us at info@sandbag.org.uk

Within its first hundred days, the new government should:

1. **Publish the Clean Growth Plan**, setting out how the UK can meet its legal carbon reduction targets for 2028-2032.
2. **Bring forward legislation to complete the phase-out of UK coal generation**, following the recent consultation.
3. **Bring forward a carbon intensity target for the power sector**, to replace EU renewables targets.
4. **Establish a Heat Transformation Group**, to assess hydrogen, Carbon Capture & Storage (CCS), and electrification in the least-cost route to decarbonise heat.
5. **Strengthen the UK price on carbon.**

The background: recent fundamental changes in energy

1. The end of UK coal

A staggering **71% decline in UK coal emissions from 2010-2016**,¹ alongside falling energy use.

- a. 21st April 2017 was the UK's first full day without any coal power generation.²

2. Reduction in the cost of renewables

Unprecedented global **reductions in the costs of renewable electricity generation**, especially offshore & onshore wind, and solar photovoltaics.

- a. 90% reduction in cost of solar PV systems since 2009,³ now approaching subsidy-free installation.
- b. UK continues to lead the world in offshore wind deployment.
- c. Subsidy-free offshore wind auctions in Germany and the Netherlands,⁴ and an expectation of very low prices in the current UK offshore wind Contract For Difference auction.

3. Growth in battery storage

Astonishing **global cost-reductions and growth of lithium-ion battery storage**.⁵

- a. 65% reduction in lithium-ion £/kWh costs since 2010.⁶
- b. In the UK, 500MW of contracts for batteries in the Christmas Capacity Market auctions,⁷ plus 12GW of grid network connection applications for energy storage (almost all batteries) over the last 15 months from January 2017.
- c. Utility-scale battery plants are now operational and growing in size, including the 80MWh at Mira Loma, California, and at Carrickfergus, Northern Ireland.

¹ *European coal emissions plummet by 11% in 2016* (April 2017) Sandbag <https://sandbag.org.uk/project/new-data-eu-ets-emissions-2-7/>

² *UK energy on course for first working day without burning coal* (April 2017) The Financial Times <https://www.ft.com/content/8f65f54a-26a7-11e7-8691-d5f7e0cd0a16>

³ *People Power: How consumer choice is changing the UK energy system* (April 2017) Green Alliance http://www.green-alliance.org.uk/resources/People_power_how_consumer_choice_is_changing_UK_energy_system.pdf

⁴ *Subsidy free green power* (April 2017) Bloomberg <https://www.bloomberg.com/news/articles/2017-04-20/gigantic-wind-turbines-signal-era-of-subsidy-free-green-power>

⁵ *Replacing Coal with an Energy Storage Industry* (March 2017) Sandbag <https://sandbag.org.uk/project/replacing-coal-energy-storage-industry-nic-response/>

⁶ *Future Energy Scenarios* (2016) National Grid <http://fes.nationalgrid.com/fes-document/>

⁷ *UK Capacity Market Analysis* (December 2017) Sandbag <https://sandbag.org.uk/project/uk-capacity-market-analysis-2/>

Recommendations for the new UK government

1. Publish the Clean Growth Plan

One of the first acts of Prime Minister Theresa May's new government in 2016 was to accept the Climate Change Committee's recommendations on the level of the Fifth Carbon Budget. The investor certainty this offers will be further improved by setting out the policy to reach a 57% reduction by 2028-2032, in the Clean Growth Plan.

With the possible loss of the Emissions Trading System (ETS) Innovation Fund (depending on how the EU ETS is affected by Brexit), the UK will need to work harder to bring in investment in new technology. The plan must focus on rapidly bringing in smart appliances and flexible charging for electric vehicles. This should be linked closely to a clear Industrial Strategy, ensuring that emissions cuts and clean jobs are delivered across the economy.

The UK will also need to consider how, outside of the EU, it can re-commit to the Paris Agreement.

2. Bring forward legislation on the Coal Phase-out

Following the cross-party commitment to phase out coal by 2025, [Sandbag analysis](#)⁸ has shown that coal power in the UK can be entirely replaced by 2023 at the latest, producing a more reliable, flexible, and cleaner national grid. This includes maintaining the Carbon Price Support at £18 per tonne of CO₂, and ensuring in legislation that no coal can bid into the Capacity Market auctions from October 2023. With this certainty, markets will be released to invest in the new low-carbon capacity the UK needs.

3. Replace EU renewables targets with a carbon intensity target

The UK must continue to invest in renewable electricity technology, especially its offshore wind industry, which is the envy of the world. However, as has been demonstrated in the German Energiewende, high renewables penetration does not equal a reduction in emissions.

Brexit implies the UK will no longer have a 2020 renewables target. Instead, the UK electricity transition can prioritise a distinct way of tackling climate change by establishing carbon intensity targets, in line with the recommendations of the Committee on Climate Change: 50-100 gCO₂/kWh by 2030.⁹ The Energy Act 2013 already gives the Government the power to introduce such a target: this power now needs to be exercised.¹⁰ This would continue to support rapid renewables growth, but also ensure closure of the most polluting energy sources, beginning with coal.

A carbon intensity target can be expressed in two ways, as discussed in a previous Sandbag briefing:¹¹

⁸ *Phasing-out coal by 2023* (February 2017) Sandbag <https://sandbag.org.uk/project/phasing-coal-2023/>

⁹ *Power sector scenarios for the fifth carbon budget* (Oct 2015) Committee on Climate Change <https://www.theccc.org.uk/publication/power-sector-scenarios-for-the-fifth-carbon-budget/>

¹⁰ *The Energy Act* (2013) UK Government <http://www.legislation.gov.uk/ukpga/2013/32/part/1/enacted>

¹¹ *A 2030 decarbonisation target* (March 2014) Sandbag https://sandbag.org.uk/wp-content/uploads/2016/11/A_2030_decarbonisation_target_in_Europe_in_the_context_of_low_carbon_prices.pdf

- A falling Emissions Performance Standard - A maximum total limit of CO₂g/kwh for electricity generated, set at the level of electricity suppliers;
- A Decarbonisation Obligation - A percentage target for the volume of 'zero' carbon technology generated and could be set at the level of either generators entities or suppliers of electricity.

4. Establish a Heat Transformation Group

How to cut emissions from heat is perhaps the hardest decarbonisation problem, with some of the slowest progress to date.¹² Two options have come to the forefront: electrifying heat production; or replacing natural (methane) gas with hydrogen gas, produced by steam methane reformers with Carbon Capture and Storage (CCS). [The Oxburgh Report](#) (2016)¹³ recommends the establishment of a heat to decide which of these to pursue, and then for the Group to guide the transition to this new clean system.

5. Strengthen the UK price on carbon

Brexit means a fundamental reassessment of the UK's place inside the EU Emissions Trading System (ETS). Whatever the outcome, the UK must maintain a carbon price to drive low-carbon investment. As well as putting a carbon price on the power sector, at a similar level to the current Carbon Price Support, the new government must consider how to ensure a carbon price drives emission reductions and clean investment in industry, and other areas.

A strong carbon price reduces the need for energy subsidies and other subsidies, by guiding the free market towards low-carbon investments.

Carbon pricing is the essential tool in cost-effectively meeting the UK's carbon budgets, and the new government can retain the UK's stature as an international leader on climate change by implementing a strong carbon price.

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¹² *Progress report to Parliament* (2016) The Committee on Climate Change <https://www.theccc.org.uk/publication/meeting-carbon-budgets-2016-progress-report-to-parliament/>

¹³ *Lowest Cost Decarbonisation for the UK* (September 2016) The Parliamentary Advisory Group on Carbon Capture and Storage <http://www.ccsassociation.org/news-and-events/reports-and-publications/parliamentary-advisory-group-on-ccs-report/>