

Energy and Environment

Raising the UK's ambition on climate

Policy: Commit to a net zero greenhouse gas emissions target by 2050, in line with the recent advice of the Committee on Climate Change - subject to further detailed investigation of the costs, technical feasibility, and policies required to meet this target.

Over the last thirty years, the UK has been one of the leading advocates globally for more ambitious action to address climate change by reducing greenhouse gas emissions (GHGs). Margaret Thatcher famously highlighted the risk of climate change in a speech to the UN General Assembly in 1989 – one of the first heads of state to make such a public statement on the issue. She emphasised the need for coordinated international action on climate. The subsequent Rio Earth Summit in 1992 led to the creation of the UN Framework Convention on Climate Change.

Fast forward to 2008 and through the Climate Change Act, the UK set in legislation the most ambitious set of emissions targets of its time – to reduce GHGs emissions by 80% by 2050, relative to 1990 levels. The UK has since made great progress against these targets – reducing GHG emissions by 43% compared to 1990 levels as of 2018. The vast majority of these emissions reductions have come in the power sector, through the phase out of coal and development of renewables. In 2015 the Government committed to phasing out coal completely by 2025 at the latest. In Spring 2019 Britain saw an 18-day stint with no coal generation in the power system at all – the longest period without coal power since 1882.

Global ambition has also ramped up in recent years – with the ratification of the Paris Agreement in 2016, which set a goal to limit global warming to well below 2 degrees above pre-industrial levels, and an aspirational goal to limit warming to 1.5 degrees. Hitting the 2 degree target requires global emissions to fall rapidly and hit net zero by 2075, with developed nations reaching this threshold by around 2050.

In this context, the UK's Committee on Climate Change recently advised the UK Government that based on the Paris Agreement and latest science, the UK should aim for a target of net zero greenhouse gas emissions by 2050. In doing so, the UK would be amongst the first nations to set a net zero target. The CCC undertook a review of the feasibility, costs and benefits of meeting this target – concluding that this is feasible, and the resource costs would be in the order of 1-2% of GDP per annum (this cost is partially or fully offset by co-benefits such as improved air pollution and health). That it not to say that delivering net zero is easy: it will require a concerted and sustained effort to transform our energy system and wider economy, at significant capital cost.

Whilst decarbonising the power sector to date has been relatively straightforward, this is not the case for other major sources of emissions such as transport, heating, and industry.

Our previous report, [Too Hot to Handle](#), highlights the difficulties involved in decarbonising heating – for example switching 80% of households to low carbon heat sources could cost in the region of £200-300 billion in capital costs alone. Our subsequent report, [Driving Down Emissions](#), highlights the challenges of decarbonising road transport – in particular the need for further reductions in the cost of electric vehicles to achieve mass adoption, as well as investment in the necessary charging infrastructure. Decarbonising transport will also create significant fiscal challenges: the UK Treasury currently raises around £30 billion per annum through fuel duty and road taxes, but these receipts will decline rapidly as we move to low carbon forms of transport, leaving a large gap in public finances.

Beyond setting the net zero target itself, there is a need for more detailed investigation of how it can be delivered. Over the next 1-2 years the Government and its advisors (such as the CCC, Ofgem and Energy Systems Catapult) should undertake far more detailed analyses to understand the costs and practicalities of getting to net zero, and the policies required to drive this transition whilst minimising the cost to consumers and taxpayers. The Government needs to develop a plan for how this can be delivered on the basis of conservative, centre-right values. This is about using market-based incentives, well-designed regulation, innovation policy, and joined up institutional frameworks within Government to encourage companies to invest in the energy transition – delivering profits and environmental benefits at the same time. An innovative, pro-growth green narrative.

There is broad public and political support for a net zero target. Recent polling suggests that nearly 60% of people support the idea of setting a net zero target for 2050, with fewer than 10% opposing it.¹ Younger people in particular are demanding more action on climate – as exemplified by the recent school climate change protests. A recent YouGov poll found that the number of people naming climate change among the country's top three issues has recently surged to its highest level in at least a decade. A majority of MPs recently supported a motion for the UK to declare a climate and environmental emergency.²

Richard Howard, former Director of Development and Head of Energy and Environment at policy Exchange commented:

“The next Prime Minister and administration needs to grasp the nettle and commit to bold action on climate – setting a net zero greenhouse gas target for 2050. This should be followed by further investigation of the costs, feasibility and policies required to meet this target at the lowest possible cost to consumers and taxpayers. The centre-right needs to develop and articulate a positive pro-growth climate narrative, and set of market-based approaches and policies to deliver this bold ambition.”

¹ <https://www.independent.co.uk/news/uk/politics/climate-change-greenhouse-gasses-public-support-poll-greta-thunberg-a8909641.html>

² <https://www.theguardian.com/environment/2019/may/01/declare-formal-climate-emergency-before-its-too-late-corbyn-warns>

Reducing carbon in the economy - Implementing an independent carbon tariff with dividends in the UK

Policy: To reduce carbon emission, level the playing field for British industry and protect low-income households, the UK should examine the introduction of a carbon tariff at the UK border and distribute the proceeds the UK citizens on a progressive basis.

A economy-wide carbon tax paid by both domestic and international producers would prevent carbon leakage, level the playing field for Britain's heavy industry, fund a dividend to be paid to taxpayers and tackle climate change, as set out in Policy Exchange's report, [*The Future of Carbon Pricing: Implementing an independent carbon tax with dividends in the UK*](#). A better approach would reduce the cost of decarbonisation, prevent the offshoring of emissions and make carbon pricing more popular.

The UK is already a world leader in climate action and should build on our track record to implement a system of carbon pricing that really works, overcoming a market failure that does great harm to the environment. Although Brexit makes it likely the UK will leave initiatives overseen by the ECJ such as the EU's Emissions Trading Scheme, the UK should remain a member of the ETS until the end of the third trading period at the start of 2021. At this point, Policy Exchange recommends that the UK should take the opportunity to innovate in carbon pricing with an independent carbon tax which would:

- Be steadily rising and economy-wide, paid by companies that sell fossil fuels in the UK (though ordinary citizens will be protected from price rises through the recycling of tax revenue back into their pockets). The tax would initially continue at the level at which the UK leaves the EU ETS in 2021, and steadily rise at a rate set by an independent body such as the Climate Change Committee to give the policy institutional certainty and bankability.
- Be structured around border carbon adjustments, to create a level playing field for domestic and international producers so that companies which export carbon intensive products into the UK will be subject to the same level of carbon tax as domestic producers, helping industries like the British steel sector. The Climate Change Committee recently said this concept should be examined as part of measures for the UK to reach 'Net Zero' by 2050 and is one of the options outlined in the live Government consultation 'The future of carbon pricing'.
- Fund dividends from carbon taxation that are returned directly to the public in an annual lump sum, to lock in political and public support for fighting climate change. People would be able to borrow against their future dividend payments for investments in energy efficiency.

- Allow a rationalisation of environment regulations without reducing environmental protection, as an economy-wide carbon tax will make a number of existing carbon taxes and policies redundant. Eventually at least 10 direct carbon taxes would be rationalised into a single unified price paid for emitting carbon dioxide and other greenhouse gases in the UK. For example, we would no longer need the Climate Change Levy, but we should continue with energy efficiency standards and energy labelling.

Text box – Darling and Hague

“The UK has consistently led the world in responding to the threat of dangerous global warming. By signing into law the Climate Change Act in 2008, with cross-party support, we were the first country to set legally binding targets for reductions in greenhouse gas emissions.

“However many challenges remain, most notably that of carbon leakage whereby energy intensive industries move abroad to avoid environmental taxes. Cleaning up our own energy system will mean little if we simply outsource our emissions. In the absence of a unified global carbon tax, border carbon adjustments are essential to ensure that British businesses are operating on a level playing field with those that are foreign-based. This is a clear plan for how this would work in practice.

“In our drive to decarbonise the economy, it is important that we take people with us. If carbon taxes are seen to unduly punish that average citizen, they will fail. That is why Policy Exchange’s idea of recycling the revenue from carbon taxation back to the people in the form of a ‘carbon dividend’ is worth exploring. It would make a carbon tax both progressive and popular.”

Hydrogen – encouraging cleaner energies while supporting regional economies

Policy: The Government should coordinate the funding of R&D to reduce the cost of producing hydrogen-based fuel and focus on Scotland and the North East of England as the places best placed to realise the gains of hydrogen-based fuels.

Scotland and North East England offer the best opportunities for successful hydrogen production hubs, while investment in cost-effective hydrogen production technologies – such as electrolysis – would open up export opportunities and address both the Industrial and Clean Growth strategies, according to Policy Exchange’s [Fuelling the Future](#).

- The hydrogen economy offers big opportunities to decarbonise (as noted by the recent report of the Climate Change Committee), but without coordinated leadership from industry and central government (targeted at lowering the cost of sustainable production) we will not benefit as we should.

- As part of the Industrial Strategy Challenge Fund, investment should be focused on R&D to lower the cost of hydrogen production via methods like electrolysis, which has the potential to provide flexible services to help balance intermittent renewable energy.
- In the short term, long distance freight offers the best opportunities for implementing hydrogen use at scale, and national and local government should work with the private sector to invest in the necessary refuelling network as well as innovation grants for pilot programmes.
- Hydrogen production using electrolysers and ‘spare’ curtailed wind can replace less than 1% of the gas used in domestic heating, while production using fossil fuels is incompatible with domestic decarbonisation targets without carbon capture and storage (CCS). Scotland and the North East of England are the best places in the country for decarbonised hydrogen production hubs using renewable energy and/or CCS so the Government should consider targeting investment there.

Text box: Ben Houchen, Mayor of Tees Valley

“Hydrogen has been used industrially for generations, but a new era presents us with new opportunities. It can play a leading role in heating and powering our lives and can reduce the environmental impact of doing so.

“Tees Valley currently produces 50% of the UK’s hydrogen. We have a strong base from which we can do more. As policy develops we need informed debate. It is important to understand the wide range of opportunities, from home heating to fuel cell vehicles, and to carefully consider how best to pursue them.

“The UK is well placed to be a world leader. We have strong clusters of relevant industry and production. We have a significant domestic demand and the potential to meet it. We should grasp the opportunities that the hydrogen economy represents.

“I want the UK, and Tees Valley, to lead the way in developing the hydrogen economy, creating jobs and reducing environmental impact. Informed debate is needed as we set off down this path. It seems likely hydrogen will be an even larger part of our future than it has our past. It is right that we plan for it now.”

Nuclear – an important low carbon technology which the UK must continue to back alongside renewables and Carbon Capture and Storage (CCS) if the UK is to meet the net zero target

Policy: The Government should ensure any continued support of nuclear in the UK includes a ‘twin track’ approach of deploying third and fourth generation technologies alongside large-scale reactors. In the near term at least one Small Modular Reactor (SMR), based on well-known light water reactor technology, should be deployed with an aim to demonstrate the technology and reduce cost, whilst more advanced designs should be supported through R&D funding. Government should work towards a nuclear sector deal with investments made to maximise exports of British skills and IP.

The electrification of our energy system, in particular the switch to electric vehicles and heating, means we need to significantly expand low carbon sources of electricity to replace existing capacity and meet rising future demands for power. The variable nature of solar and wind means that we cannot rely on them to meet our power needs 100% of the time – even with significant volumes of storage.

Buying electricity through interconnectors from other Western European nations will be increasingly challenging as our neighbours also turn to renewables which may be correlated with our own. Renewables can be backed up with storage technologies such as batteries and hydro, but only at present for periods of hours, not days. We do not yet have the low carbon technologies to back up renewables over longer periods such as inter-seasonally. Our previous report [*Small Modular Reactors: The next big thing in energy? suggests that nuclear should continue to play a role as part of our low carbon mix. In particular it recommends:*](#)

- Use SMRs as part of our energy mix to reduce the system costs of decarbonisation, thereby reducing consumer bills in the long term.
- The Government should proceed swiftly with the development of at least one third generation (Gen III) small modular reactor design
- Develop the technology to create hydrogen using nuclear power – such that this hydrogen can be used to decarbonise heating and transport.
- Commission polling of populations closest to potential sites for SMRs to inform decisions on where they are located.

Text box – Dr Matt Rooney

“In the next decades, we are going to need previously unthinkable levels of new low carbon electricity capacity for charging electric vehicles and to replace coal and gas. Whilst the cost reductions of solar and wind power have been impressive, their very nature means we can’t rely on them 100% of the time without investing huge amounts in storage technology.

“There is no other low carbon energy which can match nuclear power for scale and reliability, as well as the potential to use it for other services like district heating and hydrogen production. The development of nuclear, including small modular reactors, should

continue to be a key pillar of government energy policy.”

Environment – A range of environmental principles need to be ingrained in a new institutional system if we are going to reverse natural decline in the UK

Policy: a commission should be created with the responsibility of creating natural capital improvement strategies for each river basin. These strategies should become the framework within which ‘net gain’ and payments for ecosystem services (PES) are made.

Shifting from the EU’s CAP presents a major opportunity to reward improvements in our natural environment. DEFRA’s adoption of the ‘net gain’ principle reflects Policy Exchange’s recommendations in its 2012 *Nurturing Nature* report. The report also highlighted a lack of transparency in offsetting mechanisms and a need for market-based approaches that achieve better ecological outcomes through the CAP’s Pillar II. Our *Farming Tomorrow* report highlighted the many opportunities for Payments for Environmental Services in a post-Brexit British Agricultural Policy.

To bring these policies together:

- Government should create a new commissioning body, a Natural Capital Commission, with the remit of creating a natural capital improvement strategy for each major river basin, similar to a local authority’s Local Plan. These strategies would provide a more transparent framework for implementing and monitoring ‘net gain’ offsetting projects under the NPPF, a new home for a streamlined afforestation grants system and a mechanism for making Payments for Ecosystem services.
- Funding from various sources (e.g. carbon taxes, pollution penalties, ‘net gain’ developer payments) could be paid out in an auction system that reflects the strategic objectives in each river basin. This would allow a wide range of stakeholders, from farmers to wildlife charities, to receive payments for natural capital improvements through a cost-effective, market-based mechanism.
- DEFRA’s proposed ‘Office for Environment Protection’ could then hold the Natural Capital Commission to account for its delivery of these strategies.