

Speech: Michael Gove Speech on UK Climate Change Projections

WHAT WE OWE TO SCIENTISTS

I want to begin on a personal note. I am fortunate as Secretary of State for the Department of the Environment, Food and Rural Affairs to work alongside some of the most gifted, dedicated and impressive public servants in the country.

Given the strength in depth of the departmental team, and their willingness to work so hard for the common good, it is invidious to single any one out.

But there is one individual, and one team, to whom I, and we all in this country, owe a special debt.

And that is to Professor Ian Boyd, Defra's Chief Scientific Adviser, and his team.

Everything we do at Defra has to be rooted in science. Whether it is reflecting on the future of food, farming or the marine environment, considering what our approach should be to the chemicals we use in agriculture, revising how we should manage our water resources, reviewing how we enhance biodiversity, assessing where the greatest productivity gains from new technologies might accrue or in a countless number of other different areas, policy must be shaped above all by evidence, reason and rigour. And there are few people more adept at assessing the evidence, deploying reason to make sense of it and applying the lessons for public policy with real rigour than Ian and his team. I want to take this opportunity today to put on record how profoundly grateful I am for his leadership.

And there is perhaps no area of public policy where scientific rigour is required in shaping policy making than in dealing with the challenge of climate change.

THE EVIDENCE ALL AROUND US

Today, as we launch the fourth generation of our UK Climate Projections, it is clear that the planet and its weather patterns are changing before our eyes.

Sea levels, for example – which we are becoming more accurate at measuring, thanks to advances in instruments and monitoring systems. In the 20th century the oceans rose around 15cm and the rate of increase has since quickened. Just since 2000, levels have risen around six centimetres, based on a global-average rise of 3.2mm a year. Our seas are storing increasing amounts of heat: around half of all ocean warming has occurred since 1997. Even as we take action to slow carbon dioxide pollution now, physics dictates that the climate will keep heating up for decades to come.

Peer-reviewed scientific research states that the rapid warming is substantially due to the methane, nitrous oxide, and fossil fuel emissions we produce.

The great ice sheets of Greenland and some parts of Antarctica are increasingly unstable. Rising seas are rendering the storm surges not only of hurricanes but also regular high tides more of a threat.

THE IMPACT ON THE EVERYDAY

Food and water security are affected, as is national security. Across the planet, people, plants, animals and also diseases are on the move, searching for habitats in which to thrive, escaping erratic and extreme weather events which deliver too much rain, too little rain, searing summer temperatures, colder winters.

Science is clear that there will be changes in ecosystems caused by the climate. WWF's recent Living Planet report revealed a 60% fall in global wildlife populations in just over 40 years. One of the main causes of this devastating decline is climate change.

We cannot predict the net effects to ecosystems, but the likelihood is that many will be negative. Some native flora and fauna will struggle. Marine ecosystems will experience warmer and more acidic seas. New pests and diseases could thrive. Deteriorating soil quality and moisture, coupled with less reliable water supply, will reduce agricultural yields, as we have already seen this summer.

Around the world, fears are growing for the existence of some low-lying countries – most of the 1,000 or so Marshall Islands, covering 29 slender coral atolls in the South Pacific, are less than six feet above sea level – and the future of a great number of coastal cities, including Miami, New York and Venice.

And while climate change cannot be blamed for growing wealth inequality, it is the case that it disproportionately affects nations with the least resources to cope – nations which have also contributed least to emissions in the first place. In the coming years, they will expect the developed world to deliver what Mary Robinson, the former Irish president and environmental campaigner, calls 'climate justice' – sharing fairly the burdens and benefits of climate change and its impacts.

Still Time to Act

In all, 91 authors from 40 countries, including the UK, spent two years developing the recent report by the Intergovernmental Panel for Climate Change into the impact it is having on the natural world. They assessed over 6,000 scientific papers and received 42,000 expert comments.

The final report – an impressive display of international collaboration – makes clear that the 1.5°C warming limit is still within reach – if nations can act together. Panel members argue that in order to stay within the limit, global net greenhouse gas emissions produced by human activity need to be

zero by the middle of the century.

By 2050, we are committed to reducing greenhouse gas emissions by at least 80%, compared to 1990 levels. Since 1990 we have cut emissions by 42% – faster than any other G7 nation – and our economy has grown by two-thirds. Tackling climate change is not a binary process which requires us to champion the planet over national prosperity. Indeed market mechanisms, like reverse auctions for new clean energy capacity and the carbon price on electricity generation, have been hugely successful in delivering these cuts in emissions.

You will know that reducing emissions in order to mitigate climate change in the UK is the responsibility of the Department for Business, Energy and Industrial Strategy, under the excellent leadership of my colleagues Greg Clark, the Secretary of State, and Claire Perry, the cabinet minister with responsibility for climate change. Their Clean Growth Strategy, published last year, set out a comprehensive suite of policies to meet our climate targets and to capture the industrial opportunities from clean growth. I also welcomed Claire's letter to the Committee on Climate Change last month requesting advice on a net zero emissions target.

Defra's particular brief is to help adapt to a warming planet, supporting the developing world to do the same, and contributing to global diplomatic and scientific initiatives to understand climate change's effects.

But because we are also responsible for sectors of our waste policy, agriculture, landscapes and f-gases – Defra necessarily has a significant role in mitigation as well.

In a moment, I will go into greater detail about the opportunities we have identified – within domestic agriculture and wider land use, our approach to storing and managing water, our reforms of resources and waste cycles plus international action to support other countries cope with climate change – to ensure that we are even better placed to manage future risks, adapt to threats and increase resilience and preparedness.

First, however, I want to look at how climate change is reshaping our environment in slightly greater detail.

FACTS ON THE GROUND

Insurance data shows that between 1980 and 2016, the number of climate-related natural catastrophes, like flooding, rose several times faster than disasters with a geological source: erupting volcanoes, tsunamis, or severe earthquakes.

In Africa, the Sahara Desert has grown in size by 10 per cent since 1920. Scientists believe that about two-thirds of the change might be down to natural cycles, and the rest to climate change. The Desert's edges – defined by rainfall, or the lack of it – have crept northward and southward, reducing some countries' ability to grow food. The Sahara has encroached 500 miles into Libya for example, in winter months.

Just recently in America, Hurricane Michael made landfall in the Florida panhandle in October with winds of around 155mph, making this the strongest storm to hit the continental United States since Hurricane Andrew in 1992. At least 32 people died as the hurricane tore through Georgia, North Carolina and Virginia, and more than a million people were left without power. Barely a month later and California's wildfires are the deadliest in the history of the state, which in the past five years has experienced four of the five warmest summers on record. Towering 'firenadoes' engulfed brush, trees and scrub which was bone-dry because autumn rainfall again arrived late – and there has been up to 30% less rain than average. Tragically, for those who lost their lives and homes, the season of strong offshore winds began on schedule – fanning flames that would have spread less easily in damper conditions.

It's not only in typically hot, dry countries where extremes of weather are felt. Climate change is warming polar regions twice as fast as other parts of the world. In July this year, wildfires spread across Arctic regions in Sweden. While not unprecedented, the fires have become bigger over the past 15 years as boreal forests, tundra and peatlands dry up, meaning the fires are harder to put out.

In the UK, we have experienced our own share of extremes. Nine of the 10 warmest years have occurred since 2002 and the mean sea level around the UK, corrected for land movement, has risen by about 16cm since the start of the 20th century.

Already, the winter of 2013-2014 was the wettest on record for the UK. And then, between November 2015 and January 2016, we experienced the most rain ever in that period, saturating the ground and causing some of the most severe floods in a century.

It will take a long time for people in Northumberland, Cumbria, Lancashire and Yorkshire to forget the devastation caused by Storms Desmond and Eva. Around 16,000 houses were inundated and some river levels were up to a metre higher than previous records. Communities were devastated, infrastructure was damaged, and for many families and businesses the financial hardship and emotional distress lasted long after the floodwaters had receded.

As for 2018, during a six-week spell in summer, daytime temperatures consistently topped 30C. Wildfires burned for weeks on Saddleworth Moor and Winter Hill as well as other areas, damaging precious peat bogs and harming nesting birds such as curlews, the golden plover and lapwings. Crops wilted in parched fields and farmers had to dig into their winter silage to feed livestock struggling in poor grazing conditions.

Now it is, of course, impossible for anyone to predict the future with absolute certainty. But we are in the UK fortunate to have climate scientists whose knowledge and experience are world-leading. In producing this first major update of climate projections for nearly 10 years, they have given governments, local authorities, land managers, national infrastructure bodies and other businesses an invaluable set of tools with which to assess the nature and scale of challenges, and take decisions accordingly. The

projections – based on a range of emissions scenarios – will enable them to make sensible, practical choices based on scientific evidence that will save time, hardship and money when the storms do come.

For the first time, there are international projections as well as regional projections. This means other nations will be able to use the data – to gauge the risks for food supply chains, perhaps, or check rainfall projections for the likelihood of localised flooding.

The projections show quite clearly the benefit of limiting emissions.

Under the highest emission scenario, warming by 2070 is in the range 0.9°C to 5.4°C in summer, compared to the recent past (1981-2000).

Sea levels are projected to continue to rise around the UK to the year 2100 – and reach higher levels than were forecast in the 2009 data. For London, under the high emissions scenario, levels are likely to be at least 53cm higher, and could be as much as 1.15m. That was not unexpected, however, and I can confirm that it has already been factored into our flooding adaptation planning.

It is because we know further climate changes are inevitable – notwithstanding strenuous international efforts to limit their extent – that we are planning for a wide range of possible futures. It would be irresponsible in the circumstances to do otherwise. This is why we are aiming to limit warming to well below 2 degrees – but the environment agency is preparing for 4 degrees when planning flood defences. We know that every half a degree makes an enormous difference to outcomes. Keeping warming to 1.5°C rather than 2°C, as the Paris Agreement urges us to attempt, spares up to 10million people from being exposed to the risks of rising seas, according to the IPCC.

CLARITY BEGINS AT HOME

So what is Defra doing to meet this global challenge?

Climate change will manifest itself most acutely in our hydrologic system: the intense rainfall of the winter, the arid heat of the summer, and rising sea levels will be how we experience climate change most immediately in our everyday lives. Using the best scientific evidence from our projections, we are taking action to improve our resilience.

Flooding and coastal change

Successive Governments have made good progress on mitigating flood risk, protecting lives and reducing the damage to our homes and businesses. Between 2015 and 2021, this Government is investing a record £2.6 billion in flood defences, maintained by colleagues from the Environment Agency. And we are on track to meet our manifesto commitment of better protecting 300,000 homes from flooding by 2021.

We are also pioneering ‘natural flood defences’, which support biodiversity and sequester carbon while lowering the risk of flooding. In Pickering, in

North Yorkshire, we have slowed the water flow from the uplands by planting trees, restoring heathland, and installing leaky dams. And in Medmerry, in West Sussex, the EA has actually realigned the coast, by allowing the water to breach the sea walls (creating new wetland habitats for wigeons and snipes): a new defence has been built to protect individual homes.

But as the risk of flooding and coastal erosion increases, we need a new long-term approach. Government will publish a long term policy statement next year, and the Environment Agency will issue a new 50-year strategy, also next year. I believe these should explore new philosophies around flood and coast management.

First, the need to achieve a balance between limiting the likelihood of flooding and upgrading our resilience to it when it happens. In other words, exploring how much to spend on reducing the risks that homes and businesses will flood, and how much to spend on helping people to cope if and when they are flooded. It will not always be possible to prevent every flood. We cannot build defences to protect every single building or reinforce every retreating coast line. We will be looking at ways we can encourage every local area to strive for greater overall resilience that takes into account all the different levers from land use planning to better water storage upstream, and tackles both flood prevention and response. We need our communities and infrastructure to be better prepared for floods and coastal change, so that they recover more quickly from the damage and disruption and, where necessary, to help people and communities move out of harm's way.

Second, the need for communities and businesses to work alongside government to reduce their own flood risk. We want to see more businesses designing in resilience when they invest in new buildings. The climate projections provide high-quality data about the nature of the risks to help steer these new flood investments.

Droughts

In the UK, we take for granted a plentiful supply of clean water. Yet our high population density means the available water per person is actually less than in many Mediterranean countries. And the experience of this summer, and the evidence of the projections, underscore the need to make our water supplies more resilient to a warmer climate in the future.

We have a twin-track approach. On the supply side, we need to capture and store more rainwater. And on the demand side, we must conserve and use the water more efficiently once we have caught it.

Since privatisation, water companies have invested around £140 billion in our water infrastructure. Earlier this year, I challenged them to focus more on investing in improved performance than on shareholder dividends. I am pleased to see that their latest business plans for the next spending period indicate good progress, with proposals for more than £50 billion of investment between 2020 and 2025. Ofwat will now scrutinise water companies' business plans to make sure they have responded adequately to this challenge.

Climate change, coupled with a rising population, will require new water supply infrastructure. In part because of company behaviour, in part because of regulatory barriers, we have not built any major new reservoirs in this country since the industry was privatised. So this week we are laying before Parliament a new draft National Policy Statement, setting out how we will expedite the construction of new infrastructure, like water transfers and reservoirs.

Relying solely on new water infrastructure would prove expensive for bill payers and create pressures on the natural environment. So we will also tackle waste and excessive consumption of water. Since privatisation, leakage has fallen by a third. But we still lose three billion litres of water to leaks every day. That's why I am setting water companies a stretching new target to halve leakage by 2050.

Land

The need to address climate change means we must also change how we use and manage our land, and do more to protect and restore our carbon-rich natural habitats and the wildlife they support.

Agriculture

On our agricultural land, more extreme weather will harm crop yields and make market prices more volatile. Some parts of the world will cease to be able to produce food because of rising sea levels or a lack of rainfall. UK farmers have the opportunity to play an even more important role in global food production as a result.

And at the same time as managing these impacts, farmers must also be supported as we move towards a carbon neutral economy.

We will use the powers in the Agriculture Bill to reward farmers who mitigate and adapt to climate change on their land through our new Environmental Land Management scheme. There are a range of potential measures which we can support farmers to implement that tackle climate change and improve productivity.

Planting cover crops reduces carbon emissions from soil, improves soil health, and reduces runoff into watercourses. Agroforestry provides shelter for livestock from harsh weather, while improving soil and water quality and storing carbon. And since 2010, Defra has supported the industry-led greenhouse gas action plan for agriculture. This voluntary action has made an important start to emission reduction in agriculture. As our emissions targets become more stringent, we have to support farmers in their efforts to ensure emissions fall further.

We are exploring how to reform fertiliser use, which will reduce climate-warming greenhouse gas emissions as well as biodiversity-harming ammonia emissions. And next year, we will start developing a new emissions reduction plan for agriculture, in which we will set out our long-term vision for a more productive, low-carbon farming sector.

New technology will play a critical role in enabling the farming industry to meet these challenges. Precision farming will enable farmers to cut back on expensive, energy-intensive, and environmentally-harmful inputs, such as fertilisers. Vertical farming will effectively eliminate emissions from soil, while making more efficient use of land and increasing the resilience of crops to extreme weather.

Land use

Peatlands are our largest terrestrial carbon store and a precious habitat for wildlife. Yet despite some successful rewetting projects in recent years, just 13% of England's peatland is in near natural condition. Next year, we will publish a new England Peat Strategy. This will explain how, over the next 25 years, we will improve the condition of our peatlands, so that they function better for the climate, wildlife, and people.

Through this strategy, we want to restore our blanket bogs in the uplands. And for the first time we will aim to improve the condition of agricultural peat in the lowlands. These peatlands, which were drained centuries ago to enable productive agriculture, produce the highest emissions of all our peatlands. The East Anglian Fens are estimated to have between 30 and 60 harvests left before the peat is gone. Their degraded condition is bad both for the climate and for farmers who rely on these fertile soils.

Universal restoration will not be possible given the importance of the land for food production. So I am today announcing a new task force, to generate new solutions for repairing lowland peat and build consensus among farmers, conservationists, and academics.

Woodland is another critical natural asset for our response to climate change.

Protecting our ancient woodlands and bringing more woodland into active management will help to improve the resilience to climate change of the wildlife that inhabits our forests. And planting more trees is a highly cost-effective method for storing additional carbon from the atmosphere.

Through Countryside Stewardship and the Woodland Carbon Fund, we are making progress towards our target to plant 11 million new trees in this parliament. And we have supported the planting of over 15 million trees since 2010. But to meet future carbon budgets and our long-term target to increase woodland cover from 10% to 12% in England by 2060, we will need to significantly increase planting rates. That's why next year, we will consult on a new English Tree Strategy in which we set out what benefits we value from trees and how we will accelerate woodland creation.

We are also improving our package of incentives for forestry. In the Budget, the Chancellor announced a £50 million Woodland Carbon Guarantee scheme. This will pump prime the woodland carbon offset market, helping to stimulate private sector demand for offset units and driving more investment into forestry.

We are looking at the opportunities to increase demand for domestic carbon offsets from compliance markets. We also announced a new £10 million fund for urban and street trees, which will sequester carbon emissions and bring these wondrous natural assets closer to people. And from 2024 our new Environmental Land Management scheme will reward land managers for the benefits provided by woodland creation and management.

Resources

As well as working with water companies, farmers and land managers to help meet the challenges of climate change we are also developing a new Resources and Waste Strategy.

We will set out measures to improve resource productivity, maximising the value of products by increasing reuse and recycling, and minimising waste. We are determined to create a more circular economy.

I have made it a particular priority of my department to end the environmental, economic, and moral scandal of food waste.

Sent to landfill, food decomposes producing methane, a potent greenhouse gas. So we want to ensure more councils collect food waste separately and send it to anaerobic digestion plants to create green biogas for heating our homes and fertiliser to improve the soil.

We should also try to prevent nutritious and healthy food being thrown away in the first place. That's why, last month, I announced a new £15 million fund to redistribute surplus food that would otherwise have been wasted to go charities who help those most in need.

International leadership

Alongside the domestic action we are taking, we can also help other nations be more ambitious.

We are a world-leader in supporting international development, both financially and through technical assistance. The UK is the third largest aid donor in the world, after the United States and Germany, and one of a handful of countries committed to, and also achieving, spending 0.7% of gross national income on official development assistance.

Climate change and other interrelated environmental impacts are exacerbating poverty and erasing – or increasing the fragility of – development gains. And the crisis facing our natural world is growing.

Protecting and restoring nature is essential for securing genuinely sustainable development. That is why we need to ensure that our funding for international development supports work to deal with climate change and biodiversity loss.

The government has committed nearly £6 billion of funding between 2016 and 2020 to help developing countries both reduce emissions and build resilience to the impacts of climate change. Defra is spending part of this and my

department, working with DFID, BEIS and the FCO, is prioritising projects and activities that can deliver benefits for sustainable development, poverty alleviation, and biodiversity, as well as climate mitigation and climate adaptation.

An example of this is mangrove conservation and restoration. Mangroves are important habitats for a variety of important species. They are vital nurseries for many key commercial fisheries thereby supporting livelihoods. They sequester carbon emissions contributing to climate mitigation and do so up to six times as much as some tropical forests. And they reduce the impacts of climate change, by absorbing the energy of storms, hurricanes, and typhoons that will increase in frequency and severity as a result of climate change. This is essential for managing climate impacts facing coastal communities across the tropics.

Many of these mangroves have been degraded and do not provide the full range of potential benefits. That is why I am today announcing an additional £13 million to fund mangroves restoration. This will support projects in small island developing states like Jamaica and those with high rates of deforestation like Colombia. We plan to scale funding to mangrove and other win-win nature-based solutions in the future.

We need to make societies around the world much more resilient to climate change. The UK is leading international efforts on climate resilience for the UN Secretary General's Climate Summit in 2019. We are also helping gather evidence on the actions needed to adapt to climate change ahead of the 2019 summit by co-convening the new Global Commission on Adaptation, co-Chaired by Ban Ki-moon, the former UN Secretary General; Bill Gates; and Kristalina Georgieva, CEO of the World Bank. Emma Howard Boyd, Chair of the Environment Agency – and our de facto climate resilience ambassador – is one of the commissioners.

The 2019 summit is important and is intended to help build momentum in advance of the UN Framework Convention on Climate Change (UNFCCC) Conference of the Parties (COP26) in 2020.

This will be five years after the Paris Agreement on Climate Change and levels of climate ambition will be reviewed and revised with the aim of closing the gap between current climate commitments and the well below 2°C objective. Key to securing these commitments will be significantly improving the availability of finance for climate adaptation in developing countries. That is one of the reasons why the UK has decided to prioritise climate resilience in 2019.

Between now and 2020 it is also critical that we better connect the international climate negotiations with those focused on nature and biodiversity. It is impossible to meet climate mitigation and climate adaptation objectives without the natural environment, and we can't save nature without tackling climate change.

In 2020 China is hosting the Convention on Biological Diversity Conference Of Parties 15. This is an opportunity to push for a new international agreement,

similar in scale and scope as the Paris Agreement on climate change, but focused on halting and then reversing the crisis facing the natural world. We will work closely with international partners and allies to secure the highest possible ambition agreement at CBD COP15.

The UK has also been at the forefront of international efforts to control F-gases, a greenhouse gas found in some refrigeration and heating appliances. In 2016, we supported the Kigali amendment to the Montreal Protocol, which will introduce controls on the use of hydrofluorocarbons, a type of F-gas, from the start of next year. Estimates suggest this could avoid up to 0.5 degrees of warming by the end of the century.

However, as countries develop economically, the growth of air conditioning is a major challenge for reducing emissions. So, as well as taking action domestically to implement the amendment, we're supporting higher ambition internationally by making available an additional voluntary contribution of \$2m to incentivise energy efficiency improvements alongside reductions in hydrofluorocarbons

Conclusion

Collectively, collaboratively, we have the potential to protect and enhance our environment.

The answers lie in support for greater scientific investment and innovation.

Throughout history, the endeavour and imagination of scientists has redefined the limits of what is possible, and it is only by heeding scientific warnings more keenly than ever before and supporting scientific research more strongly than ever before that we can safeguard our planet and our species' survival.

Scientific knowledge is, always, a good in itself. In that sense, there can never be too much information. The more we know, the greater our ability to shape events for the better. But also the heavier the responsibility to act. When it comes to climate change we now, thanks to the efforts of the UK's scientists know more than ever before the urgency of acting. Which is why not just I, but future generations, are so much in their debt.