NewStatesman

Spotlight

ENERGY AND CLIMATE CHANGE: SUSTAINABLE RECOVERY

Ed Davey MP / Caroline Lucas MP / Bim Afolami MP / Karan Bilimoria

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Going for green

Earlier this month, Boris Johnson announced his £12bn climate plan, with measures including a ban on petrol and diesel car sales by 2030, the quadrupling of offshore wind capacity in the next decade, a £525m investment in new nuclear power, and further spending on carbon capture and storage, and hydrogen technology.

The responses were mixed. While many welcomed the measures as a positive first step, others decried the plan's lack of ambition. The former government chief scientist David King, chair of the Centre for Climate Repair at the University of Cambridge, said the plan was "nowhere near enough either to manage the commitment to net zero emissions by 2050 or to provide a safe future". A report by PwC, released the same week, estimated that the net zero transition would require £400bn of spending over the next decade, and a boost to infrastructure.

The chorus of responses also made clear – lest we needed reminding – that the economic recovery from the pandemic and the move to a low-carbon economy are inseparable issues. As Ed Davey, the Liberal Democrat leader put it (see our interview on page 6), the downturn is a moment "to fast-track the transition."

But if there is another lesson to learn from the Covid-19 crisis, it is that ensuring momentum across the UK for moving to a low-carbon economy requires a regional approach. As local leaders face the economic fallout, with businesses shuttered and jobs lost, there may be pressure to opt for short-term wins over long-term sustainability. As unemployment rises and public finances suffer, for many the temptation to allow and encourage any kind of new economic activity may be too great, no matter the environmental cost. Consider that in October, for instance, Cumbria County Council voted in approval of the UK's first deep coal mine in 30 years; the project is expected to create 500 jobs.

The intentions are there, however. The vast majority of councils have declared a climate emergency. Bristol this month approved a £4m package of measures on the climate. But with the downturn set to continue, and the effects of Brexit looming, Westminster must ensure its climate plan comes with the resources and standards to ensure the move to net zero is nationwide.

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News

Report: £400bn is needed for net zero

Alona Ferber

A new report by PwC, on behalf of the Global Infrastructure Investment Association, has warned that if the UK is to meet its target to achieve net zero by 2050, it will need £400bn of investment, particularly in green infrastructure. The report was published as Boris Johnson announced his £12bn ten-point climate plan. The government has confirmed that only £3bn of the £12bn is new spend.

Johnson's plan includes measures such as bringing a ban on petrol and diesel car sales forward a decade to 2030, a pledge to quadruple offshore wind power in the same timeframe, a £525m investment in new nuclear power, and investments in carbon capture and storage and hydrogen. Downing Street said the plans would create an estimated 250,000 jobs, and aims to encourage three times as much green investment from the private sector in the next ten years.

But PwC said a far greater annual investment in low-carbon and digital infrastructure is needed. Reaching the government's ambitious targets "will require huge sums of investment – both in new technologies and accompanying infrastructure", said PwC's infrastructure deals leader Colin Smith.

Scottish firms agree to energy "super-highway"

Rohan Banerjee

What is likely to be the world's longest underwater "super-highway" of power cables will soon transport renewable wind energy from Scotland to England. The so-called Eastern Link is being led by Scottish Power, SSE and the National Grid. The Eastern Link will connect Peterhead and Torness in Scotland to Selby and Hawthorn Point in England.

The companies have claimed that the project will support "hundreds of green jobs" during its construction, which is scheduled to begin in 2024, and operation. The government is aiming to build 40GW of offshore wind capacity in UK waters by 2030, and Nicola Shaw, the National Grid's executive director, is confident that the Eastern Link can "become part of the backbone of the UK's energy system". The east coast of Scotland is already home to approximately 1GW's worth of offshore wind farms, with a further 4.4GW planned.

UK at increased risk of flooding due to climate crisis

Alona Ferber

The climate crisis has increased the risk of major flooding in the UK, a new report by the Red Cross has found. According to the report, climate-related extreme weather, including flooding, storms and heatwaves, caused 83 per cent of natural disasters globally over the past ten years.

The research found that there were 2,850 natural disasters, 2,355 of which were related to the climate and weather, which killed more than 410,000 people

(NET ZERO): GETTY IMAGES/ JEFF J MITCHELL, (MEAT TAX): GETTY IMAGES/ISABELINFANTES, (FOOD WASTE): GETTY IMAGES/JOE REEDLE

and affected 1.7 billion people. The *World Disasters Report* found that there has been a nearly 35 per cent increase in the average number of climate and weather-related disasters every year since the 1990s. Researchers say that Britain could increasingly face flooding of the level that hit communities in south Yorkshire last year.

In its 2019 election manifesto, the Conservative Party pledged to spend £4bn over the next five years on a new flood defence programme. The Environment Agency has said this would require an annual investment of £1bn.

UK health bodies group supports meat tax

Rohan Banerjee

The UK Health Alliance on Climate Change (UKHACC), a coalition of health organisations such as the British Medical Association, the Royal College of Nursing and the *Lancet*, has called for the introduction of a tax on food products that cause high emissions, such as meat, by 2025.

A report by the alliance, titled *All-consuming: Building a Healthier Food System for People and the Planet*, highlighted the need to achieve a "transformation in the way the world produces and consumes food". Food production makes up a quarter (26 per cent) of total global greenhouse gas emissions. Meat and dairy production, the report noted, are particularly energy-intensive.

The report recommended an end to discounted offers on food that is bad for people's health and the environment, and on perishable goods that are "often wasted". The alliance also suggested that the government should invest heavily in public information campaigns to include climate-conscious messages, and for labels on food to reveal their impact on the environment, in a bid to spur behavioural change among consumers.

Nicky Philpott, the director of the UKHACC, said taxes on plastic bags and sugary drinks had already demonstrated that such policies can be effective.

Amendment on pensions schemes voted down

Alona Ferber

A Labour Party amendment to the Pensions Schemes Bill that would have required UK providers to ensure compliance with the 2015 Paris Agreement by 2050 has been voted down by a majority of 100 votes. Some 356 MPs voted against the proposed legislation, while 256 MPs backed it.

The landmark Paris 2015 climate accord aims to limit global warming to 2 degrees Celsius above pre-industrial levels, and to work to limit the temperature increase even further to 1.5 degrees.

"This amendment is not just about where capital is allocated," said the shadow work and pensions secretary, Jonathan Reynolds. "It is about the stewardship that we need to see from all asset managers over the companies they have investments in. This is not a divestment amendment, nor does it limit the choices available to fund managers… It is simply about setting a strategy in place that considers their role in meeting our climate objectives."

Food waste material harvests UV light energy

Rohan Banerjee

A new material derived from rotting fruits and vegetables that absorbs UV light and converts it into electricity has won the James Dyson Award for Sustainability. AuREUS, developed by Carvey Ehren Maigue, a 27-year-old electrical engineering postgraduate based at Mapua University in the Philippines, came out on top from 1,800 entries worldwide, for the design contest. As the winner, Maigue will receive a £30,000 grant to help take his invention to market.

AuREUS is a material comprising un-cycled crop waste that can be latched onto the side of buildings. Unlike traditional solar panels, which require a horizontal structure, AuREUS can be set up both on a flat surface and while standing upright. As UV light can still seep through, even when it is cloudy, the system can convert visible light into electricity in a way that normal panels cannot. The particles in AuREUS take in UV light, causing them to glow. As the particles "rest" they get rid of excess energy. This excess energy bleeds out of the material as visible light, which can then be used to power electrical devices.

“On the climate, we’ve got no time to waste”

Liberal Democrat leader Ed Davey on the ecological crisis, Covid-19, and making the party relevant again. By Alona Ferber

In 2015, when the landmark Paris Agreement climate talks were underway, Ed Davey was no longer serving as energy and climate change secretary in the Conservative-Liberal Democrat coalition cabinet. One of 49 Lib Dem MPs to lose their seat in a brutal general election, Davey was out of parliament for the first time since 1997.

But the now Liberal Democrat leader, who set up as a consultant on energy and climate change in 2016 before being re-elected as an MP the following year, was still "excited about" Paris. So excited, in fact, that he went even though he wasn't supposed to.

Unable to get accreditation – an attempt to tag along with "a bunch of green journalists" failed when the UN realised he had been a minister, not a hack – he found out where the UK delegation was staying and booked a room at their hotel.

"I'm not sure if Amber Rudd was terribly happy to see me," he told *Spotlight* in a recent interview, "but some of the civil servants and I got on like a house on fire and I listened to how negotiations were going in those crucial last 72 hours and it was just wonderful – it surpassed our expectations, Paris."

Davey is clearly keen to come across as a man who is really "passionate" about the environment and "proud" of his record on it. Even his Zoom backdrop in our interview – an image of wind turbines tinged yellow and orange – is on-brand, though he insists that this just happens to be one of his regular backdrops.

"Well I am just very proud of what we achieved in government on offshore wind," he responds without flinching when I point how on-topic it is.

Davey took the helm of the party at a time of unprecedented global crisis. After 20 years as an MP, having served as a minister and in the cabinet of the coalition government, as deputy leader and as acting leader, he was elected in August to head the party six months after the first national lockdown.

Social distancing and virtual working makes doing politics a challenge. "I've done a lot of Zooms," he laughs.

BEN STANSALL/AFP VIA GETTY IMAGES

But he took the helm at a challenging time for the party, too. In 2015, the public punished the Liberal Democrats at the polls for the party's role in Tory austerity and the perceived betrayal over student fees. At the 2019 election the party dropped from 21 MPs (nine of whom had defected from Labour and the Conservatives over Brexit and the anti-Semitism debacle) to 11. An internal review described the election, under then leader Jo Swinson, as a "high-speed car crash", criticising the party's pledge to revoke Article 50 if elected.

"I said on the day I got elected we need to wake up and smell the coffee. We've had three very poor election results in five years, and we need to understand what was going wrong both in terms of the way that voters perceived us and how we were campaigning," he says.

Davey, an economist by training, is convinced that he can restore the party's fortunes and put climate policy front and centre of a Lib Dem revival.

The Nottinghamshire-born MP's commitment to the issue goes back to his gap year, he says, when a friend recommended the book *Seeing Green* by Jonathon Porritt, as well as the influence of a green-minded relative. What followed was him "voraciously reading" other green texts and joining a student environmental group at Oxford University. Aside from his "very liberal instincts on politics, political reform, economic reform, social reform and personal liberty", he joined the Liberal Democrats in 1989 partly because of what he saw as the party's leadership on green issues.

Last year, ahead of December's election, Davey said the party would "decarbonise capitalism", pledging £100bn over five years to do so. Since then, they have gone on to up the amount to £150bn.

The Tories see climate action as a "PR thing"

"The reason we increased that since the election was because of Covid," Davey says. "We are now facing, unlike pre-December 2019, possibly the worst economic recession for 300 years, I mean it's dramatic. So if you are going to respond to that and give people hope, give businesses a reason to invest, [then] use it as a moment to fast-track the transition, because [if] you know there's a climate emergency, then you've got to upgrade your plans."

In June, when Davey was interim leader, the party announced the three-year, £150bn investment, as part of a £350bn coronavirus rescue package. The proposal included a green jobs guarantee and a pledge that 80 per cent of UK energy would come from renewables by 2030. At least half of Bank of England financing would be required to go to green investment programmes, and government "climate bonds" would raise more capital. Tax incentives on investment in green areas for savings and pensions were also mooted.

The calls for green pandemic recovery are now being heard across the spectrum. Labour has urged the government to commit at least £30bn to capital investment in green stimulus over the next year-and-a-half, creating 400,000 jobs.

Last week, Boris Johnson unveiled a £12bn, ten-point climate plan. The government has confirmed that £3bn of this is new spend. Measures include a ban on the sale of petrol and diesel cars from 2030, investment in nuclear power, hydrogen, and carbon capture and storage, and a pledge – already made by Boris Johnson at party conference – to quadruple offshore wind power by 2030. The government has estimated this would create 250,000 jobs and boost the Conservatives' "levelling up" agenda. Earlier this year the Chancellor, Rishi Sunak, announced £3bn to decarbonise public buildings and private homes.

Davey is one of a chorus of voices warning the plan falls short. "I'll believe

it when I see it actually operating. I mean we've had five years of waste, massively wasted opportunity and indeed in some areas a massive backwards action," he says. "They've wasted five years, and we have got no time to waste… my fear is that what they are going to do is going to be nowhere near ambitious enough."

Compared to countries such as France, Germany, and Japan, "they are very slow", he says, adding that he is concerned the Conservatives see this as "more of a PR thing. They see it as a clever political strategy, where some of us actually believe it is really important, in and of itself."

Davey has few kind words for the Conservative record on this issue. He slams them for scrapping – "with no consultation"– the zero-carbon homes standard, set out by the last Labour government, after the 2015 election. "There's probably a million homes now being built which are going to have to be retrofitted, he says.

But the list goes on. He slams them for cancelling the £1bn carbon capture and storage (CCS) pilot, news of which broke just days before the Paris climate talks – again "no consultation" (the UK's Climate Change Committee and the IPCC have said that CCS has a key role in achieving net zero), for having "damaged the solar industry" and "having damaged community energy". And on Boris Johnson himself? – "I mean, where do I start?"

Yet his criticism is not reserved for what the Tories did after he sat round the cabinet table with them. On offshore wind power, a focus of his time as energy secretary, he and Chris Huhne, his predecessor in the role, "went at it… all guns blazing in the teeth of opposition," he says, "not from all the Tories let me be fair, there were some Conservatives who bought into it, people like Oliver Letwin, for example, but some of the others, they were so, so hostile."

As secretary, Davey also liberalised energy markets, increasing competition among gas and electricity suppliers. And he saw a role for competition in increasing the share of renewables in the sector. In 2014, he told *Prospect*, "It's got to be a low-carbon mix and ultimately I don't want the government – the secretary of state – to decide what that low-carbon mix is… I want the markets and technology development and innovation to decide what that mix is."

Ed Davey (third from right) when energy secretary in the coalition government

Given the urgency of the climate crisis, Britain being on track to miss the Independent Committee on Climate Change's interim 2030 goal, and the push for public investment in coronavirus recovery and green stimulus, does he still think this is something to leave to the market?

"What I used to say as secretary of state" was about "partnership", he says. "It wasn't just 'leave it to the market', it was absolutely a 'never leave it to the market'; it was very, very strong state-shaping." Davey is at pains to make clear his economic philosophy is neither statist nor a "red in tooth and claw neoliberal capitalism – which is absolutely not me." His is a "liberal state-enabling type model."

"What we achieved to get this stuff built", he says, pointing not for the first or last time to his Zoom backdrop, "was very much that, it was very state directed with new legislation, new auctions, new forms of subsidy, but bringing the power of the market to innovate and compete."

"It was never just 'leave it to the market'"

GETTY IMAGES/DAN KITWOOD - WPA POOL

He points out that, when he was secretary, he was told that the price of a megawatt hour for wind turbines was going to be £160, and that it would take a decade to get it below £100. "But through the auctions we brought in, the price has tumbled even faster than I thought. And the Tories were telling me: 'It's hopeless, this will never work', and now they are having to admit that these things are the cheapest things going – large-scale, low-carbon electricity." At the last government auction in 2019, the price had dropped to £39.65 per megawatt hour, almost a third lower than the previous auction in 2017.

And partnership also means working with the oil and gas sector, giving them the "confidence" to take the leap to net zero. "They probably see it more urgently for themselves than they might have done a few years ago, he says, "because I think oil and gas executives across the world are beginning to realise that… the game might be up in a few years' time".

Davey's approach in office was praised by some and criticised by others. His approval of the Hinkley Point C power station was controversial, and there was backlash when, in 2013, he said that fracking is "not the evil thing that some people try to make it out to be".

Now he does not see the same place for fracking and nuclear in the no-carbon energy mix. "Time and evidence have moved on. It's always difficult for people to see things in their historical context. It's not just the fact that we were in coalition with the Tories who wanted to frack everywhere".

And of course his criticism is not reserved for Conservative climate policy. On coronavirus, the government has been "really incompetent on almost every level". A carer throughout his life – first for his mother, who died of cancer when he was a child, for his grandmother, and now for his disabled son – he thinks the government has "showed complete lack of understanding of the linkage between the NHS and care". The "care homes error" was "almost criminally negligent".

On Brexit, the committed Remainer describes the ongoing negotiations over a Brexit trade deal as "frankly chaotic and incompetent". In November, he wrote to Boris Johnson urging him to negotiate a three to six-month adjustment period for businesses as part of a deal with the EU.

An early supporter, along with Keir Starmer, of a circuit-breaker second lockdown, he thinks he has a key role to play in holding the government to account. But despite his belief that he can "transform" the party into a "powerful, distinctive, principled voice", Davey is "not going to suddenly make lurid predictions about how we are going to come to power, except, I'll tell you this, we will be in power in local government, we are in power in local government". It is locally, in communities, that he thinks he can rebuild the party.

His sense of optimism has been boosted by the outcome of the US election: "The best thing that's happened to the climate is Joe Biden getting elected."

But his rose-tinted glasses of hindsight do change the hue on the Liberal Democrats' time in coalition, casting them in the role of moderator of Tory voraciousness – from budget cuts to a cavalier attitude on the environment. What, if anything does he regret about his period in coalition?

"I regret that people didn't realise we had 306 people trying to stop us every day. There were 306 Tory MPs trying to stop us, and we had to take them on. And I think despite the fact there were 306 of them and 57 of us, we won a lot more battles than we lost. I'd have liked to have won a lot more."

The planet needs a plastics revolution

Caroline Meech and **Brad Collis** on the University of Portsmouth's cutting-edge research to transform the plastics industry

We have become addicted to plastic. Approximately 300 million tonnes of plastic waste is generated each year. Microplastics have been found in every location surveyed worldwide, even inside human tissue. In developing countries, up to one million people die as a result of mismanaged plastic waste each year.

And plastic has another, less visible, environmental impact — climate change. Seventeen million barrels of oil are used for plastic production each year. With the anticipated growth in the plastics sector, by 2050 production and disposal will be responsible for up to 13 per cent of the world's total "carbon budget" of greenhouse gas emissions. That is equivalent to 615 coal-fired power plants, warns the Center for International Environmental Law.

We need radical action to halt this trend and limit the damaging consequences of plastic pollution on our health and the environment.

That is why the University of Portsmouth is assembling teams of scientists, business-leaders, campaigners and citizens to lead a revolution in the manufacture, use and disposability of this convenient but polluting material.

The initiative, called Revolution Plastics, sets out to create a new plastics economy based on improved recyclability, policy support from all tiers of government, and community engagement to achieve behavioural change in the use of plastics.

Professor Steve Fletcher, who is director of the University of Portsmouth's sustainability and the environment research theme and an adviser to the United Nations on ocean resources, says the Revolution Plastics initiative seeks to achieve a transition away from polluting practices to a future in which sustainable plastics manufacturing and consumption is the norm.

"Transitioning to a sustainable plastics future creates an opportunity to engage with multiple disciplines – biology, psychology, marine sciences, geosciences, fashion, food and urban design – and industry and community sectors, at different scales and intensities," he says.

This ambition is consistent with global initiatives, such as the UN Sustainable Development Goals, the Paris Climate Agreement, principles of the circular economy, and living within the planet's safe operating space, as championed by the UN International Resource Panel and World Economic Forum.

Revolution Plastics builds on the momentum created by the University's globally acclaimed engineering of an enzyme that can digest some of the most commonly polluting plastics, such as plastic bottles made of polyethylene terephthalate (PET). This is a plastic which would otherwise persist for hundreds of years in the environment.

Our scientists have worked with the US Department of Energy's National Renewable Energy Laboratory to engineer a novel "enzyme cocktail" that can quickly break down plastic to its polymer building blocks. This allows plastics to be made and reused endlessly, with real potential to revolutionise industrial recycling of plastics and reduce our reliance on fossil fuels.

The ongoing research is supported by the University's Centre for Enzyme Innovation (CEI), which, in partnership

Plastic pollution floating on the Buriganga River in Dhaka, Bangladesh

GETTY IMAGES/MUNIR UZ ZAMAN

with industry, will have the capacity to take on the global plastics challenge.

Professor John McGeehan, director of CEI, says, "we can all play a significant part in dealing with this problem, but the scientific community which created these 'wonder materials', must now use all the technology at its disposal to develop real solutions".

The university has been awarded £5.8m through the UK government's Research England Expanding Excellence Fund. Coupled with significant investment by the university itself and the Solent Local Enterprise Partnership, hopes are high for finding a solution to one of the world's greatest environmental challenges.

We must transform our relationship with plastics

We are also leading by example, showing what is possible through our procurement, use and disposal of resources (materials, water, energy and services). This will work hand in glove with the formation of community and industry partnerships to transform the city of Portsmouth into a global civic leader in sustainability transition: a community-supported "sustainability hub" that will accumulate knowledge, experience and data to become a global model.

Professor Fletcher believes if the Portsmouth community can revolutionise the use and end-use of plastics as part of a larger sustainability platform, then any community in the world can. "We see this as a pilot programme for the planet . . . an incubator for similar programmes in other cities and countries," he says.

It is this momentum that makes the city's civic administration confident that significant changes will happen and that the council has a central role. Councillor Dave Ashmore, cabinet member for environment and climate change, says that addressing environmental concerns is a top priority and, like many other municipalities around the world, the city of Portsmouth has declared a climate emergency.

"It is by working with the university that we actually believe we can turn the challenges we face into opportunities. . . investigate ways to move into renewable fuels, alternative materials, new industries and new jobs", he explains.

There is also rising environmental awareness through local organisations and groups advocating sustainability and plastic waste reduction. This is the community foundation the university intends to support and build upon. In partnership with the Environment Agency, it will provide advice and resources to local groups, such as guidance on behaviour change methods.

World leading research and practice does not happen in isolation. For this reason, the University of Portsmouth is looking for more partners in business, government, the not-for-profit sector and academia around the world, to work together to tackle the plastics crisis.

This article was based on a report by Brad Collis and updated by Caroline Meech.

Join the revolution at www.port.ac.uk/revolution-plastics

Energy and optimism after Covid-19

Transition to net zero is key to the UK's post-pandemic recovery, says Bim Afolami, chair of the All-Party Parliamentary Group for Renewable and Sustainable Energy

The scale of Covid-19's impact – the loss of tens of thousands of lives, profound social and economic consequences and the disruption of our freedoms and democratic processes – can dilute the enormous turbulence of the years preceding it. Political and constitutional turmoil, shadowed by the economic uncertainty and risk associated with leaving the European Union, almost seem normal in comparison. We have become accustomed to crisis.

Crisis is exhausting, and it has sapped our national optimism. We have become a more polarised and pessimistic country, torn by social class, geography and Brexit. The last Britain Thinks survey found that less than a quarter of people under 34 are optimistic about the future, and less than half the population feel we play a positive role in the world. The only unity was frustration with politics, with only 6 per cent of people feeling that politicians understand their lives and three-quarters judging politics to be unfit for purpose.

What does this mean for my work as a politician? The All-Party Parliamentary Group for Renewable and Sustainable Energy (PRASEG) is the primary cross-party parliamentary vehicle for working on and dealing with the full range of issues relating to phasing out fossil fuels and transitioning to renewables. This work intersects with many of the big questions thrown up by our national challenges: how can we build back better from Covid-19 in a way that tackles the social and economic insecurity in politics and prevents us leaping from the pandemic into a deeper, long-term environmental crisis? How can we re-energise politics to bridge divides and move us forward, not widen them and stall us? How can we realise a fresh, active, unifying role for the UK in the world after Brexit?

The answers to these questions can be found in our core work – the energy transition. That transition is well underway. The UK's power sector has already reduced emissions by nearly 70 per cent, taking it further is the key to our recovery.

The Prime Minister's announcement that offshore wind will provide 40GW of electricity by 2030 – enough clean energy to power every home in the country – is the kind of long-term, consistent policy

GETTY IMAGES/OLI SCARFF

We are already clean energy leaders

signal that builds investor confidence and can underpin entire industries. That flagship commitment needs to be backed by a fleet of strong policies in industry and housing, as well as by the government putting its full weight behind nuclear power at Sizewell C.

Accelerating the development of low-carbon transport and industrial clusters – especially focused on electrification, carbon capture and storage, and hydrogen – will further reduce emissions, build supply chains and offer a resilient, dynamic basis for modern manufacturing.

A national housing upgrade – the highest standards for new builds combined with smart retrofit prioritising fuel-poor households – can boost the housing market, tackle emissions and help to eradicate fuel poverty.

These plans are ambitious – ambition with the right focus is a good thing – but the experience of PRASEG's industry supporters, from Energy UK and ESC to Octopus and Cenergist, shows that it is well within the UK's capability. The opportunities to chart this course are in the hands of ministers – not least in the Energy White Paper, the National Infrastructure Strategy, the Transport Decarbonisation Plan and the Heat and Buildings Strategy, all of which have been earmarked for publication before the year ends.

The kind of national net zero effort these policies would stimulate offers a political prize beyond that which comes with a stronger, fairer more resilient economy – it can start to bring us back together, as the shift to clean energy is something we all agree on. Polling for PRASEG by Savanta ComRes uncovered not only a strong connection between the views of the public and parliamentarians, but genuine cross-party agreement in parliament. The parliamentary consensus that passed the world's first Climate Change Act and net zero law remains as strong as ever. It gives government the political foundation to think and act at scale.

A recovery programme underpinned by the energy transition can create hundreds of thousands of meaningful jobs – including in communities that have, since deindustrialisation, felt left out of our national story – bind us together in common purpose, and drive the country forward. These new jobs can help us "level up".

It can also renew the UK's international position. As the world's largest offshore wind market, we are already clean energy leaders. To see net zero through we will need to overcome the challenges associated with renewables: dealing with intermittent supply; developing large-scale storage solutions; pioneering new innovations in wind and solar design.

This offers immense trade potential. Global net zero commitments will open huge new energy markets, not least in the US and China. Our knowledge and innovation will be invaluable. We will have the answers to questions that most countries are not even asking yet.

This all adds up to a strong diplomatic hand – and we should go all in. The UK's presidency of COP 26 next November, the most important milestone in climate diplomacy since the Paris Agreement, comes in the same year we chair the G7. They are solemn responsibilities and success is imperative to safeguard against the spiralling threats of climate change.

For us, they should spark a commitment that goes well beyond the big moments. Climate change will become the central issue in international affairs during this decade – a prescient risk to the global economy, and fuel for the causes of conflict. Energetic, consistent UK leadership on the central strategic challenge of our time – rooted in the example and potential of our own domestic policy – can help both to rise to that challenge, and offer the basis for our global purpose, power, influence, alliances and reputation.

The horrors of 2020 will stay with us. The grief, the damage and the cost will be hard to overcome. But with the right approach we can emerge from it stronger, more united and more purposeful. If we do, history might look back on this darkest of years as a key turning point.

The clean transport transition

Jo Coleman, energy transition manager for Shell UK, on how the company is developing more climate-friendly choices

Can you tell me a bit about yourself and your background?

Jo Coleman: I am an engineer by background. My role at Shell is to both drive the energy transition-related activities that are happening in our various businesses in the UK, and to integrate them into a coherent country strategy.

What do you feel is the role of electric vehicles in meeting the 2050 net zero target?

JC: The net zero target is technically possible and economically achievable as well. But it is hugely challenging, and it requires a massive scale-up across the entire energy system. We know that we need to stop using fossil fuels in light-duty vehicles to achieve the target, and electric vehicles (EVs) will be the route to take for many of our journeys in the future.

But they have a really long way to go. We need to make sure that there is a coherent package of policy and incentives that supports drivers in making that transition and provides the energy infrastructure to ensure that charging can happen, where and when people want it.

Does Shell support bringing forward the ban on new petrol and diesel cars from 2040?

JC: Yes. We support the UK's net zero ambition and the Paris Agreement. To meet these goals, we need to be ending the sale of new internal combustion engines by about 2030. It requires a real commitment from the government in supporting consumers and fuel retailers to deliver the infrastructure to be able to achieve that. As a business we are always looking for clarity around what is the ambition, what is the target and what is going to drive the transition towards it, and then we can work within it to bring it about.

We need to end the sale of petrol engine cars by 2030

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What should the policies and drivers be?

JC: The two biggest things that hold people back from buying an EV are the up-front capital cost and concerns about whether and where they'll be able to charge the car. So, we need to increase the rollout of EV infrastructure such as charging points and grid upgrades, and continue to support the purchase of EVs. It has to be an easy choice for consumers to make.

Is Shell investing in the electric vehicle revolution?

JC: Shell want to be able to offer consumers choice, so we are expanding charging options for homes and businesses, as well as providing fast high-power charging. We now have over 80 rapid charge posts operating in the UK. We were aiming for 200 by the end of the year, but due to Covid-19 that has now slipped into 2021. All of our charge posts at the forecourts are supplied with 100 per cent certified renewable power. We are aiming to have the first fully electric station, where we take the petrol and diesel pumps off and replace it entirely with a full EV forecourt.

A few years ago, we also bought one of Europe's largest providers of EV charging, a company called New Motion. They have a network of over 165,000 public charge points across Europe, 2,500 charge points at homes and workplaces in the UK, and a similar number in the UK roaming network. Even during Covid-19, we have been expanding this network and have recently signed deals with Mazda, Aldi and Alphabet, three different types of companies we are look to work with. Mazda is a provider of EVs, Aldi is one of the major supermarkets and Alphabet is a provider of business mobility solutions. So, there is a fair amount of partnering involved in this, but it is really about expanding from home and business and rapid charging into destination charging as well.

What is the role for hydrogen in transport?

JC: Typically, we think of hydrogen as what to do when you have reached the end of where you can electrify. In transport, there are customers where hydrogen fuel cell EVs potentially make more sense, particularly for people who do not want to stop or go on long journeys with multiple refuels in the day, so think people like taxi drivers or fleet drivers. Probably the place where hydrogen will have the biggest role is in heavy-duty vehicles, which carry heavier loads and need a more powerful fuel.

Shell has three hydrogen refuelling stations in the UK and I think the shift to net zero has really changed the narrative and the story around heavy duty vehicles. Now we need to see the same level of action for them that we have in terms of support for customers and the infrastructure for light-duty vehicles.

What is Shell's carbon-neutral driving initiative and how is that going?

JC: We have set out to provide our customers with choices of lower-carbon products. For some that is around electric vehicles and the choice of where they can charge them. But not everyone is ready for, or can afford, an EV and driving is an essential part of how they run their lives. So we have given people the option of being able to offset their emissions when they refuel at Shell. We calculate for them the lifecycle and the carbon emissions generated through that fuel, and we are able to tell them how much that is. Then we buy carbon credits to compensate for those emissions. This month, we have reached a total of two million credits bought for customers through this system, which is the equivalent to taking about 750,000 cars off the road. This is not the end game but it is empowering customers to do something today while they are not yet in a position to buy an EV.

Alexandria Ocasio-Cortez holds a news conference on her Green New Deal proposals

CHIP SOMODEVILLA / GETTY IMAGES

Green stimulus packages are being proposed worldwide for a post-Covid recovery. But how will it all be paid for? By Jonny Ball

The art of the Green New Deal

Not even in the wildest dreams of Extinction Rebellion protesters would 2020 have yielded such dramatic boons to their cause. The UK's first nationwide Covid-19 lockdown led to major reductions in personal consumption, and a dramatic 31 per cent fall in greenhouse gas emissions in April was accompanied by vast improvements in London's notoriously poor air quality.

But lockdown also led to a record drop in GDP, and an economic crisis that will likely lead to unemployment not seen since the 1980s. This year's second suspension of economic life, due to end in December, could yet provoke another "lost decade", making the austerity era of the 2010s look like a time of plenty.

What's more, when lockdown restrictions were eased in the summer, carbon emissions quickly recovered. Despite the biggest drop in demand for fossil fuels in almost three decades, and despite weeks of lockdown in countries worldwide, the year-on-year carbon reductions witnessed in 2020 would not be enough to fulfil the cuts written into the 2015 Paris Agreement, which aims to limit global warming to below 2 degrees centigrade.

The climate crisis, coupled with the need for a major economic stimulus in the wake of Covid-19, has amplified calls for investment-led green recoveries across the world. In their most ambitious form, these projects are referred to as Green New Deals (GND).

"The Green New Deal encompasses both the economy and the ecosystem," Ann Pettifor, director of the PRIME economics think tank, a fellow of the New Economics Foundation, and author of *The Case for a Green New Deal*, told *Spotlight*. For her, GNDs don't just offer a chance to rebalance the economy away from financial services and restore public accountability over rapacious markets. They would also help move away from the low-wage, low-productivity, gig economy employment model, providing high-skilled jobs that, crucially, would help avert climate disaster.

"It is not just about the ecosystem. Before, lots of greens were prepared to leave the economy to others... They didn't think it was their patch. That was a mistake."

The pandemic has altered perceptions of what is economically and politically possible, from liberal democracies imposing unprecedented limits on the free movement of citizens, to spending-averse fiscal conservatives presiding over levels of public spending not seen in decades. Enthusiasm for green recovery is evident on the right and left.

At the end of June, in a speech in the West Midlands town of Dudley, Boris Johnson promised a "New Deal" and "a prodigious amount of government intervention" to "build back greener".

"There are plenty on the right that want to co-opt the idea", says Pettifor, "but not actually undertake the transformation that's necessary."

The idea of the GND isn't new. After the collapse of Lehman Brothers in 2008, former prime minister Gordon Brown proposed his own package of green stimulus measures designed to lift the country out of recession.

A little over ten years later, the idea has been popularised by US Democratic congresswoman Alexandria Ocasio-Cortez. Her Green New Deal Resolution promises "national, social, industrial, and economic mobilisation on a scale not seen since the Second World War", to provide "prosperity and economic security for all people of the United States".

Transportation would be overhauled. Buildings would be refitted to maximise energy efficiency. A rapid transition away

from fossil fuels would be accompanied by massive investment in clean energy production, carbon capture, and research and development into green technologies.

Republicans have derided Ocasio-Cortez's GND, and the populist right has weaponised the issue, presenting supporters as effete coastal liberals, more concerned about rainforests than the livelihoods of blue collar America (particularly the ten million who work in the oil and gas industry). Last year, Donald Trump mocked the GND on Twitter, claiming it would "eliminate Planes, Cars, Cows, Oil, Gas & the Military [sic]".

But their protestations didn't prevent president-elect Joe Biden from including a $2trn green stimulus package in his election pledges. In Europe, the president of the European Commission, Ursula von der Leyen, has set out a less ambitious plan to achieve EU-wide carbon-neutrality by 2050, the so-called European Green Deal. This £900bn package will be the cornerstone of the EU's Covid-19 economic recovery.

Von de Leyen, Pettifor says, is "trying really hard" to get her plan through "that very cumbersome institution that is the European Union". And China, the world's largest emitter, is "doing more than we think" – partly because the ruling Communist Party fears internal unrest as a result of climate migration. The Chinese government, which has already established itself as the world's premier investor in renewables, has now pledged to become carbon-neutral by 2060.

In the UK, Boris Johnson has announced a "green industrial revolution", but the £12bn price tag has been denounced as inadequate, and many fear the measures don't come close to what's needed. What's more, the government's green investments are somewhat offset by their £27bn commitment for new roads.

Nevertheless, state-funded capital investment, industrial strategy, and public intervention in the market are firmly on the agenda. Johnson's adoption of these policies repudiates four decades of the Conservatives' laissez-faire orthodoxy, lifting key aspects of Labour's programme (the opposition's 2019 manifesto promised a green industrial revolution funded by a £250bn National Investment Bank).

Earlier this month, Labour called on the government to bring forward £30bn of capital spending as part of shadow chancellor Anneliese Dodds' Green Economic Recovery. Dodds claimed that investment in the energy sector will support 400,000 high-skilled, low-carbon jobs at a time when dole queues are growing across the country.

Those proposals, however, have provoked splits within Labour. Members of the internal pressure group, Labour for a Green New Deal, claim they are a retreat from the more full-blooded policies put forward at the last conference. "We welcome Labour's plan for 400,000 green jobs," a spokesperson told *Spotlight*, "but call on the party to be braver and go further".

The government's own plans for a green post-Covid economy don't compare favourably with European equivalents. France, for example, has allocated £27bn to green investment, and Rishi Sunak has recently shown a reluctance to spend as freely as a more profligate Number 10 might have hoped.

And yet the government has, until now, shown a willingness to use unconventional monetary policy in the service of higher public spending and sustainable recovery. The Chancellor has announced that the government will release the UK's first "green gilts" or "green sovereign bonds", which will be sold on the markets to fund green infrastructure projects. A relatively new financial innovation, green sovereign bonds have already been issued by the

By 2050, the EU aims to be carbon neutral

Swedish and Danish governments, poster children of Scandinavian social democracy, and also by Germany, the home of the social market economy.

In the outset of the most severe economic crisis in living memory, three years after Theresa May told a struggling NHS nurse that "there is no magic money tree", the Conservatives, says Pettifor, "have overnight discovered that there is in fact a magic money tree". In April, the UK became the first country to embrace so-called "monetary financing", in which the Bank of England electronically creates new money to meet the Treasury's spending needs.

This was the first time the Bank, (which is wholly owned by the government), had directly purchased government debt. The move was cautiously billed as a temporary measure to help weather the recession. Some, however, such as the pressure group Positive Money, have called on the Bank to adopt this radical policy more permanently, even by creating money to purchase the new green gilts in a version of what some have labelled "People's Quantitative Easing" (QE).

Since the 2008 financial crisis, central

La Rance tidal power station, Brittany, France

banks have engaged in multiple bouts of QE, a vast monetary experiment that has pumped huge amounts of new money into the financial system via the indirect purchase of government bonds from private investors. But never before has this money creation funded public infrastructure or green investment. It has been used to provide much-needed liquidity to creaking financial systems.

In conventional economics, money printing conjures images of hyperinflation, of wheelbarrows full of worthless banknotes in the Weimar Republic. But inflation since the financial crisis has remained low, in no small part due to low wage growth. After the 2008 crisis, the UK became the only advanced economy in the world to see wages decrease while the economy expanded. Now, in 2020, plummeting demand will likely suppress inflationary pressures, at least in the short term.

Since 2009, £895bn of new money has been created by the Bank of England through QE, roughly equivalent to nine years spending on the NHS, or 18 years spending on schools. The lion's share (£450bn) of this new money has been created in the last nine months.

"It just goes to show that when it comes to the crunch, the Tories will do this stuff", Pettifor says. "In a crisis, ideology goes out the window."

Left-wing supporters of GNDs want the multi-billion pound programmes to be funded by a mix of traditional borrowing, some form of QE, and taxation on the wealthy and big polluters. In August, the Office for National Statistics claimed that the government's debt had topped £2trn, 100 per cent of GDP. The alarming headlines, however, disguised the fact that over a third of this public debt was owned by the Bank of England. It is, in effect, money we owe to ourselves. A further chunk of the debt is owned by domestic private investors, while less than a third is held by investors based overseas.

The ONS claims UK debt has topped £2trn

According to supporters of GNDs, governments with their own central banks and the ability to issue new currency backed by millions of relatively wealthy taxpayers, do have the leeway to finance big infrastructure projects with unconventional monetary policy.

But not everyone is convinced. Philip Booth, a senior academic fellow at the Institute of Economic Affairs, a free market think tank, says that proponents of activist government policy on the climate often "ignore fundamental principles of economics".

Many think that loose fiscal and monetary policy will eventually lead to serious inflation, and could even cause a run on the currency as the government finds itself unable to pay its debts.

"If you're going to decarbonise the economy", says Booth, "we can't pretend it isn't going to cost money. Saying that you're going to print money to do it, or that we're going to somehow transform the economy and create lots of green jobs, doesn't answer that basic point. Jobs are a cost of producing something, they're not a benefit."

But as we continue through this new period of social and economic disruption, a new orthodoxy is slowly emerging. The International Monetary Fund and the German government, both formerly known for their fiscal conservatism, now advocate for higher levels of borrowing to "protect lives and livelihoods". BlackRock, the world's largest asset manager, makes a "strong case for spending on infrastructure, education and renewable energy", predicting an age of "fiscal and monetary coordination", with governments and central banks "going direct", and working in unison to provide successive rounds of stimulus through the downturn.

Higher spending, higher taxation, higher levels of government debt, and a larger, more interventionist state, are fast becoming part of a new normal. And, as we emerge from second waves of Covid-19 and further lockdowns, Green New Deals in various forms look set to be part of the policy mix to combat our economic and ecological crises.

A sustainable mission

Net zero is this century's biggest challenge. But what can we learn from the scientists of the past? **Mark Neate**, environment, safety, and security director at Sellafield Ltd explains

The world's first low-carbon power station sounds like a science fiction writer's fantasy. But it was a reality of postwar Britain.

Calder Hall, at what is now Sellafield, opened in 1956. The world's first commercial scale nuclear power station was famously predicted to produce electricity that would be, "too cheap to meter". That dream never came true. But Calder Hall's contribution to low-carbon energy production cannot be underestimated.

The distinctive four reactor Magnox design gave birth to Britain's first generation of nuclear power stations. The 11-station fleet provided 10 per cent of the UK's energy in the second half of the 20th century.

But they left behind a legacy.

The spent fuel, radioactive waste, and buildings associated with the early nuclear industry are now being decommissioned. With that comes a huge sustainability challenge.

Decommissioning does not mean simply wiping away the past. It involves construction and engineering projects on a grand scale. All of which create another legacy for the environment and future generations.

Despite our heritage of carbon-free technologies, the modern-day Sellafield site has a large carbon footprint. A gas-fired power plant provides our energy these days, our 17 major projects are significant consumers of materials, and our aging buildings are not as environmentally friendly as we expect modern facilities to be.

So, what are we doing about it?

As a subsidiary of the Nuclear Decommissioning Authority (NDA), we are committed to developing a sustainable approach to our work at the site. It starts with our goal to do our work safely. Keeping the site and its materials safe and secure and protecting the environment from harm are our overriding priorities.

One of the ways we are making Sellafield more safe and secure is by removing nuclear risks and hazards, including those posed by our oldest waste storage facilities. In the past, the

Our value is in creating a clean and safe environment

The Whitehaven Harbour Youth Project has installed Seabins to capture plastics from the water with the support of Sellafield Ltd

SELLAFIELD LTD

value of Sellafield has been judged on the quantities of plutonium developed for the country's atomic defence programme and then the amount of electricity produced to help keep lights on across the nation.

More recently our value was judged in revenue generated for UK plc through the reprocessing of used nuclear fuel. Today, our value at Sellafield is in creating a clean and safe environment for future generations.

As we move into a clean-up mission we need to increase the importance we place on sustainability and the environment, and we have committed to working to a set of sustainability principles to help guide our transition.

We recognise that our mission is intergenerational and all our decision-making considers how best to avoid placing additional burden on future generations. We take into account longer-term factors when making our business decisions. These include optimising the environmental, economic and social value of the solutions we deploy to reduce hazard and risk.

We also want to minimise our life cycle consumption of environmental resources by stimulating and supporting a lower carbon economy.

This year, the NDA group, including Sellafield Ltd, are collaborating on a project to establish a carbon reduction roadmap which supports our collective clean-up and waste management mission. For Sellafield Ltd, this means understanding what carbon reduction interventions we need to optimise our mission of hazard retirement while minimising detriment to the environment.

By undertaking our existing operations more efficiently and procuring lower-carbon materials in delivering our future missions, we can play our part in helping the UK to achieve its zero carbon ambition.

Creating a positive social impact means helping to create a diversified local economy, enabling thriving communities, encouraging access to sustainable incomes, and promoting a culture of value throughout our supply chain. From introducing social impact obligations into our procurements to making strategic investments to help tackle the root cause of issues faced in our communities, we are already making great strides towards these goals.

We are helping solve environmental challenges across the globe too. Beyond our site and our communities, we are keen to focus on the positive influence our work – and our supply chain – can have in addressing environmental remediation projects around the world.

We often find that the technology developed by our supply chain for our challenges at Sellafield has the potential for wider application.

By changing our approach to Intellectual Property, whereby it stays with the organisation that has developed innovative and technological solutions, we have helped them to sell their skills and expertise beyond Sellafield.

Helping businesses – from large corporations to small and medium sized enterprises – to access the growing multi-billion pound global decommissioning industry will, in turn, help to diversify local economies.

Our business, and the context we operate in, has changed considerably over recent years, most notably by the completion of reprocessing in the Thermal Oxide Reprocessing Plant in November 2018.

In this context, and driven by our ultimate mission of environmental remediation, it is the right time to refresh our corporate strategy and embed a sustainable approach.

Defining our approach and creating measurable sustainability targets will be done in line with the United Nation's Sustainable Development Goals.

Government needs to drive the EV dream

Rohan Banerjee

In February, the government said it intended to bring forward a ban on the sale of new petrol or diesel cars from 2040 to 2035, pending a consultation. Now, with Boris Johnson announcing his 10-Point Climate Plan to kick-start a "green industrial revolution", the timetable for achieving mass adoption of electric vehicles (EVs) has been accelerated further, with the ban moved to 2030. The new rules will allow some hybrid models to remain on sale until 2035.

While the fresh urgency injected into the UK's EV transition has drawn praise from environmentalists, Mike Hawes, the chief executive of the Society of Motor Manufacturers and Traders (SMMT), which represents the UK car industry, has warned that it will take more than "an arbitrary date" to turn aspiration into reality.

Car makers are fully aligned to decarbonisation goals, he said in a statement. In fact, they are "leading the charge" with billions of pounds invested in "new models, fuelling growing consumer interest". Hawes pointed out, however, that they "can't do it alone". He said it would require a "Herculean" effort from government, "including a truly world-beating package of incentives to encourage uptake of battery-electric and essential hybrid stepping-stone vehicles – and the mandating of massive investment in charging infrastructure". In February, Hawes had described the UK's EV public charging network as "woefully inadequate".

SMMT figures from October show that EVs' overall market share (including hybrids) in the UK has risen from 4.4 per cent in August 2019 to 12.1 per cent. According to the Department for Transport, there are 19,487 public EV charging points in the UK, each with a number of individual ports – with numbers of public charging devices growing by 18 per cent in the year to date. In contrast, the UK has more than 8,000 petrol stations. Charging an EV takes significantly longer than filling up a car's petrol tank – from 30 minutes to an overnight charge, depending on the type of battery or charger being used.

There is also significant regional disparity in the concentration of these devices. In London, where the majority of UK EVs are registered, there are 63 charging points per 100,000 people. In Yorkshire and the Humber, meanwhile, there are just 18 per 100,000. Across the whole UK, there are 29 charging points

GETTY IMAGES/ADRIAN DENNIS

Newly manufactured Tesla electric cars are pictured in a storage area at The Western Docks in Southampton

CAR COST INDEX

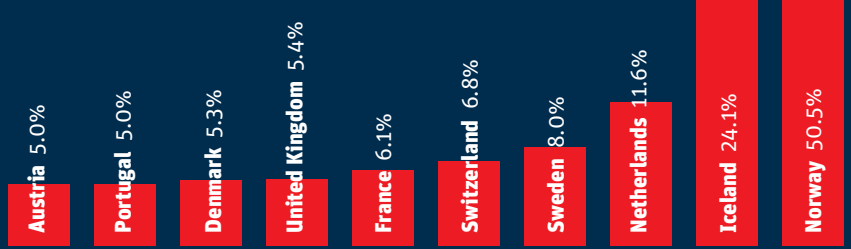
Market research firm LeasePlan has compiled its latest Car Cost Index, which analyses the average monthly cost of owning a car – comprising fuel, depreciation, taxes, insurance and maintenance – in 18 European countries. *Source: LeasePlan, 2020*

COUNTRY	PETROL (€)	DIESEL (€)	ELECTRIC (€)
Greece	547	534 ↓	594 ↓
Hungary	537	538	642
Sweden	643	655	646
France	598	633	654
Portugal	651	672	686
Ireland	640	613	695
Austria	685	672	718
Netherlands	711	806	721
Spain	603	609	730
Germany	704	720	730
Italy	807	763	742
United Kingdom	727	731	744
Norway	851	913	750
Belgium	686	709	797
Denmark	765	716	797
Czech Republic	541	570	793
Finland	767	794	944
Switzerland	960 ↑	925 ↑	949 ↑

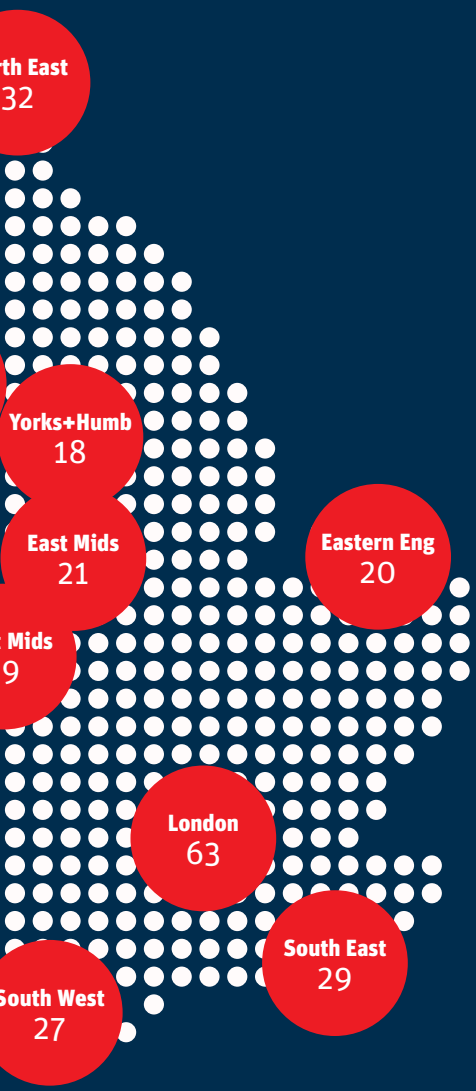
↓ lowest value ↑ highest value

MARKET SHARE OF TOTALLY ELECTRIC VEHICLES IN EUROPE (2019-20)

Source: European Automobile Manufacturers Association, 2019-20



REGIONAL DISTRIBUTION OF EV CHARGING DEVICES PER 100,000 PEOPLE
Source: Department for Transport and Zap-Map, 2020



per 100,000 people.

While some EV users will have home-charging units, many won't. Professor Liana Cipcigan, director of Cardiff University's Electric Vehicle Centre of Excellence, explains, "Not everyone has access to personal or off-street parking, and so they are reliant on their local authorities putting infrastructure in place", and a charging point being free when they need it.

Nevertheless, public enthusiasm for climate-conscious technologies on the whole, appears to be growing. In April, a survey carried out by Venson Automotive Solutions found nearly half (45 per cent) of UK drivers appreciated the environmental benefits of reduced car usage during the coronavirus pandemic. Nearly one in five (19 per cent) respondents said that their next car will be electric, and over a quarter (26 per cent) said that they will consider switching to an EV within five years.

When Venson conducted a similar survey a year earlier, nearly a third (31 per cent) said they would consider buying an EV, but not for ten to 15 years. The pandemic, Cipcigan tells *Spotlight*, has had "positive impacts on consumer perception towards sustainable transport", while people are relishing "improving air quality".

While the public may be more open to driving an EV than before, reassurances about vehicle performance and, crucially, price, are still needed. Range anxiety – a term for drivers' fears about an EV having enough charge to reach its intended destination – remains a major barrier to mass adoption. According to a study by the insurance firm Nimble Fins, the average range for the EVs available in the UK is 193 miles. Couple this with the regional disparity in charging infrastructure and it would appear there is still some way to go before cross-country drives in EVs become more commonplace.

The average UK EV range is 193 miles

While some luxury EVs do have higher ranges, such as the Tesla Model S Long Range (323 miles) or the Porsche Taycan 4S Plus (265 miles), many of these models retail at over £60,000, meaning they are probably not a realistic option for the average car buyer. At the cheaper end of the EV spectrum, the Renault Zoe (200 miles) and Peugeot e-208 (210 miles) retail at around £30,000 each, still significantly higher than a similar petrol-powered car.

As of March 2020, a government grant for 35 per cent of the purchase price of a brand new EV – up to a maximum value of £3,000 – has been available to buyers. Until March 2019, that grant was worth up to a maximum of £4,500. The discount is applied to the EV price by the car dealer, meaning that the person buying the car doesn't have to do anything to secure it, and many EVs are advertised with the discount having already been factored in.

A government subsidy of up to £350 is also available on the installation cost of a home charging unit, which, depending on the model, retail at between £100 and £1,000. In 2019, the government announced plans for all new-build houses to be fitted with EV charging points, but this does nothing for existing office buildings, apartment blocks and residential areas with no private parking.

The UK's EV dream depends ultimately on the government. Bringing the ban on new petrol cars forward is an important step towards mass adoption, but that is all it can afford to be. Bold ideas need to be backed up with bold policies, investment, and incentives for both car manufacturers and buyers.

Though Cipcigan considers the public mood towards EVs "promising", she says mass adoption can only be achieved if the government makes it a "priority", and if infrastructure is more "uniformly distributed".

A helping hand to net zero

Finance has a vital role in greening the economy says, **Fiona Cannon**, group responsible business, sustainability and inclusion director at Lloyds Banking Group

While the politics of the last year have been, understandably, dominated by coronavirus, climate change is one of the single biggest issues facing society today.

At Lloyds Banking Group, we believe that making the recovery from the effects of the pandemic a green one is critical to helping the UK achieve both its economic and environmental goals.

This country has an ambitious target to reach net zero, achieving a balance between the emissions we produce and take out of the atmosphere, by 2050. As the UK's largest financial services group, we set our own ambitious goal, to accelerate working with customers, government and the market to help reduce the carbon emissions we finance by more than 50 per cent by 2030. Achieving this will be, frankly, challenging, involving sustained efforts with those businesses we support to help them reduce their carbon footprint. However, publicly setting out our aim means we have a yardstick against which we can be judged. What gets measured, gets done.

However, this is not all about us. Helping to facilitate a green recovery is not just the right thing to do, it is a practical and powerful way of helping the UK recover from the economic and societal damaged caused by the pandemic.

It is also about partnerships; working together to help the country, communities and individuals face the coming years with confidence.

Over the summer, Lloyds Banking Group launched a listening project; "The Big Conversation: Helping Britain Recover". Its aim was to convene meetings in all of the UK's nations and regions to discuss the challenges raised by the pandemic. It brought together businesses, national and local political leaders, academics and expert voices to help chart a course out of crisis and towards a brighter future.

We will share our findings shortly, but one of the recurring themes was that a strong recovery should be a green and sustainable one.

In the north west, we were joined by Steve Rotheram, metro mayor of the Liverpool City Region, for a fascinating discussion about how increasing the use of electric vehicles could be part of the recovery in his area. He said, "The climate change emergency is an existential crisis and it needs to be factored into our planning processes right now."

At our meeting for the south west, participants focused on how the recovery could be a green one. Although the pandemic has been traumatic in the region, there have also been opportunities to change behaviours – more cycling, greater use of local businesses – putting momentum behind

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changing the way we live.

The conversation in the south west also mirrored another theme which was borne out in regions as diverse as London and Yorkshire and the Humber, the need to make our housing more sustainable.

Buildings are responsible for 40 per cent of annual global carbon emissions. Whether it is retrofitting existing stock, making it more energy and economically efficient for homeowners, or incentivising housebuilders to be as sustainable as they can be, this is a sector where a green outlook will not only help the environment, but also provide jobs and growth.

For the UK's future to be bright, it also must be green

As part of this, Lloyds Banking Group has launched a Green Buildings Tool which allows all of our commercial banking customers to access the business case for making green upgrades to their properties.

We have also launched an Energy Savings Tool which allows homeowners to perform an online "health check" to find ways of making their homes more carbon efficient. Both can be found online and are easy to use.

We have provided more than £6bn in green finance for businesses since 2016 to help our customers invest in tackling climate change, lowered our own carbon footprint by 63 per cent since 2009 and launched a partnership with the Woodland Trust, committing to plant ten million trees over the next ten years. Through our vehicle finance arm, we have developed the UK's largest low-emission fleet, with more than 21,000 ultra-low emission cars.

While we are proud to have done these things, we know that on their own they will not be enough. There is more we must do, and we must do it in partnership with others.

We want to work with policy makers on the transition to net zero and will continue to look for opportunities where we can offer our expertise and insights to support the development and delivery of progressive climate policies which support the green recovery.

We will also support the small businesses that are the backbone of the UK economy. Lloyds Banking Group has commissioned a study to understand how best to increase SME energy efficiency. We expect it to include recommendations on how a combination of innovative lending and policy solutions could be used to encourage considerable private sector investment in energy efficiency.

Agriculture too can be helped to achieve its climate goals. The National Farmers Union has set the sector a target of achieving net zero by 2040.

As the UK's leading lender to that sector, we are supporting farmers and growers to achieve this. Our report, *Shaping agriculture's transition to a net zero future*, found that measures such as planting trees and hedgerows to sequester carbon, improving farm productivity and energy efficiency and investing in low carbon agritechnology could all help agricultural businesses transition to net zero.

To help with this, we have introduced several initiatives, including making our Green Lending Fund more flexible, helping our customers measure their carbon emissions and training our relationship managers in sustainability to help them better understand the specific challenges and opportunities faced by the sector. As part of our partnership with the Woodland Trust, we are also subsidising tree and hedge planting for farmers by 75 per cent.

As the UK recovers from the economic crisis caused by coronavirus, Lloyds Banking Group recognises the role that financial services have to play in promoting green finance and growing the green economy.

We stand ready to work with all who believe that for the future of this country to be bright, it also needs to be green.

Energy-guzzling data centres and supply chains mean our online lives leave a heavy environmental footprint. By Laurie Clarke

Big Tech's carbon problem

Flygskam is the Swedish term for "flight shame". But it could easily be adapted to fit other carbon-heavy pursuits like eating meat, buying fast fashion, or driving a car, which have all come under scrutiny for their role in the climate crisis. Somehow, our digital lives have so far evaded the same treatment. Scrolling on iPhones, browsing on laptops and binging on Netflix – how polluting is the web and what are companies doing about it?

One individual browsing the internet uses minimal energy resources. For example, in 2015, Facebook estimated its average user's annual impact at 269g of CO_2, roughly the carbon footprint of a cup of coffee. But cumulatively, the world's internet consumption adds up. Internet companies' main source of pollution is data centres – vast warehouses harbouring energy intensive computing systems.

Data centres account for 2% of all US electricity use

Data centres account for 2 per cent of all electricity usage in the US, but this is projected to rise to 8 per cent of the global total by 2030. At present, this contributes to 0.3 per cent of all global carbon emissions.

This might sound insignificant, but the largest internet companies are substantial polluters. Google released 4.9 million tons of greenhouse gases in 2018 alone, roughly the equivalent of that emitted by more than one million passenger vehicles in a year.

Greening internet companies is really about greening data centres. "On the supply side, looking at renewable energy purchases, or renewable energy development, and then on the demand side, reducing the energy use and increasing the efficiency," says Dale Sartor, an engineer at the Lawrence

A Facebook server hall in Lulea, Sweden

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Berkeley National Laboratory, where he specialises in the energy efficiency of data centres.

"The first place you start is with the IT equipment itself," says Sartor. "The energy efficiency of that equipment doubles about every couple of years." He believes this is one of the reasons the tech sector has managed to avert catastrophic predictions that at one point suggested data centres would use as much as three quarters of the world's energy within the next 20 years.

The big players – the Amazons, Googles and Facebooks of the world – lead the pack in terms of minimising data centre energy usage, according to Sartor. They are maximising the use of their equipment and moving their energy needs around not just within the data centre itself, but between different geographic locations, too.

Electronic devices have a heavy carbon price tag

Most important for calculating the energy efficiency of the data centre is a measure called Power Usage Effectiveness (PUE). A typical small enterprise data centre, as opposed to a cloud or hyperscale data centre, might have a PUE of 2.0. "That means for every kilowatt going to a piece of IT equipment, there'll be another kilowatt [used by] the infrastructure, i.e. overhead," says Sartor, whose group focuses on how to reduce this overhead energy.

The ideal data centre would have a PUE of 1.0, because the centre's overall energy use would be the same as that used to power the IT equipment. The best data centres in the world now have a PUE of under 1.1, but it is difficult to get as close as that – one of the reasons being the small matter of cooling. With their energy intensive equipment, data centres get fiendishly hot. Generally speaking, almost 20 per cent of energy used by a data centre is to cool it through air conditioning units or other means.

Typically, servers in the data centre are air cooled. As air is not a very efficient heat transfer mechanism, there are "a lot of fans", says Sartor. At a site with poor air cooling methods, the thermostat will be very low. "If you go into a cold data centre, you know they're not doing a good job with their air management," says Sartor, who adds that liquid cooling techniques keep temperatures down much more effectively.

Even more out-of-the-box approaches have been trialled. Data centres have been sealed in containers and dropped onto the ocean floor, partly to address the cooling issue. In 2015 Microsoft experimented by dropping a data centre (containing 864 servers and 27.6 petabytes of disk) in a steel cylinder and filled with dry nitrogen, into the North Sea. The data centre was retrieved after two years, and the experiment tentatively announced a success. The cold watery depths kept the unit cool, and it had only an eighth of the failure rate typical of data centres on dry land.

The desire for clean data centres has stoked demand for locations with plentiful renewable energy and low

A factory worker assembles a mobile phone in Noida, India

temperatures. As a result, Nordic locales including Iceland, Sweden and Denmark have become popular spots.

In Iceland, renewable energy provides almost 100 per cent of electricity production – about 73 per cent from hydropower and 27 per cent from geothermal power. So many blockchain and Bitcoin data centre companies (which are particularly energy intensive) have set up there that conservationists and some members of the government have begun to complain about the phenomenon.

Outside Scandinavia, explains Sator, "the percentage of data centers that run on on-site renewable is pretty low." Because data centres are so energy intensive, he says that the ability to build renewable energy power sources big enough to keep them going on site can be tricky. "Data centre operators are really forced to go off site for renewable power."

Big tech companies mostly use power purchase agreements (PPAs) to offset their carbon usage. Google claims that it has purchased enough carbon offsets to cancel out all the carbon dioxide emissions the company has released since it was founded in 1998. Because of this practice, tech companies are big investors in renewable energy. The amount of clean energy from renewable energy developers bought by companies has tripled in the past two years, led by tech giants including Facebook, Amazon, Google and Microsoft.

Whether carbon offsets are enough to qualify an industry as environmentally friendly remains a topic of debate. If Google is buying the renewable energy from an off-site producer, does that qualify its data centres as green? "A lot of people are pretty doubtful of that," suggests Sartor.

The production process of our devices also contributes to tech sector emissions. According to Greenpeace, more than 70-80 per cent of a personal computing device's carbon footprint occurs during manufacturing, thanks to supply chains that are heavily reliant on dirty energy. This problem is currently receiving less attention than the issue of dirty data centres. Apple is the only big tech company thus far that has committed to using 100 per cent renewable power in its supply chain and products by 2030.

Planned obsolescence and the upcycling of electronic devices has a heavy carbon price tag, too. Extending the lifespan of smartphones and other electronics by just one year would save the equivalent amount of EU carbon emissions as taking two million cars off the roads every year, according to the European Environmental Bureau.

Mining the materials needed to create electronic devices is also environmentally costly. An estimated 320 tons of gold are used in the production of digital electronics every year, along with other rare earth materials. In addition to being associated with human rights abuses, mining these resources creates a huge amount of waste material that can be poisonous to ecosystems, including releasing toxins that can pollute water sources.

But momentum from employees and the climate movement might push the sector to be more ambitious. Workers from Amazon, Microsoft and Google have joined climate strikes,upping the pressure. In September, Google announced it intends to run operations solely on carbon-free energy by 2030. This is likely in part due to its employees – 2,000 of whom called on the company to make such a commitment.

Laurie Clarke is a senior reporter at Tech Monitor

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Technological optimism will not deliver our climate commitments

Professor **Carly McLachlan**, director of Tyndall Manchester at The University of Manchester, says we need to look to the solutions that are ready now

As co-hosts of COP26 in Glasgow in 2021, the world is watching the UK to see how we will show our commitment to the Paris Climate Agreement. It may be tempting to talk about new technologies that demonstrate our engineering prowess. But the scale and urgency of the challenge means it is technologies we already understand well that can make us "world-leading" on climate action. Where will world leaders be taken to see row upon row of deep retrofit terraced houses, car-free cities where walking and cycling dominate, new onshore wind farms delivering cheap electricity?

The Climate Change Committee shows that most changes needed to get us to net zero require active engagement of citizens. Surveys of UK public attitudes by the Centre for Climate Change and Social Transformation show over 70 per cent think climate change needs addressing with an "extremely high" or "high" level of urgency. That has remained the case during the Covid pandemic. Results from the UK's Climate Assembly show support for changes across our lives, such as a frequent flyer levy and changes in diets.

Because carbon dioxide accumulates in the atmosphere, our path to zero carbon matters more than the date we hit zero. Immediate emissions reductions are essential. Let us not look only to technologies that may provide elegant solutions in the future ("jet zero", zero carbon hydrogen for home heating, direct air capture, small modular reactors) but to low carbon solutions we have ready for mass deployment now. We know old houses need retrofitting to reduce heat demand, this creates jobs and can address fuel poverty. Onshore wind energy is among the cheapest forms of new electricity. We know capturing the carbon and health benefits of a shift to walking and cycling needs new infrastructure and approaches to urban design. If the UK wants to lead the way to a net zero future, we have to embrace the ways there right now.

We stand at a point with high levels of public support for action, enforced disruption to our lives and previously unthinkable government investment to create jobs and address "levelling up". The evidence is clear that green stimulus policies outperform traditional approaches. The scale of the challenge means decarbonisation must be central to all that we do, not just a few shiny initiatives. Government of all levels, business and organisational leaders, should be asking how does every activity, every investment, assist the transition to net zero, and how do our processes ensure this? If we get this right in the coming months, that field trip for leaders in Glasgow next year could be quite something.

For more information, please visit: www.tyndall.manchester.ac.uk

Is there promise in a global plastics pact?

We need to transform the plastics economy, says **Steve Fletcher**, professor of ocean policy and economy at the University of Portsmouth

An estimated 11 million metric tonnes of plastic enter the ocean each year. It is predicted that without meaningful action over the next 20 years, this number is set to almost triple to 29 million metric tonnes.

Meanwhile, combined current government and industry commitments will only reduce ocean plastic by 7 per cent by 2040 compared to business as usual. That is the conclusion of the recent Breaking the Plastic Wave report published by the Pew Charitable Trusts and Systemiq.

The Covid-19 pandemic has exacerbated the issue as plastic personal protective equipment (PPE) has proven to be invaluable, but fears are growing about the environmental impact of our reliance on single-use plastics amid the health crisis.

Clearly, current commitments on plastic do not match the scale of the worsening global plastic problem. We urgently need a stronger policy response to better reflect the level of action required. There is room for optimism, though.

Recent modelling suggests that ocean plastic pollution could be reduced by more than 80 per cent using existing technology and solutions, if a range of measures are introduced ambitiously, globally and immediately.

The critical challenge is that systemic change within the plastics economy is required on a global scale. Piecemeal policies and actions are insufficient to create the necessary changes in how plastics are produced, used and disposed. But is urgent and collective action on plastics possible?

There have been many calls for a global agreement on plastics, including most recently the Business Case for a UN Treaty on Plastic Pollution report, published in October 2020 by WWF, the Ellen MacArthur Foundation and the Boston Consulting Group. This received support from influential conglomerates including PepsiCo, the Coca-Cola Company, Nestlé and Unilever, who are among the world's biggest plastic users.

Furthermore, it is anticipated that several countries will push for a global agreement on plastics at the forthcoming UN Environment Assembly in 2021. While a global agreement may sound enticing, how can we ensure that a global treaty results in necessary changes and measurable impact across all nations?

A global plastics agreement requires national commitment, both to develop the agreement and in due course to implement it. Yet at present, despite the global public outcry about plastic pollution, national level plastics policies are rare and those that do exist tend to focus on banning or taxing individual plastic items rather than focusing on systemic change in the plastics economy.

More positively, changes to the international transport of plastic waste have been agreed through the Basel Convention Plastic Waste Amendments, due to enter into force in January 2021. Importantly, there are no global agreements related to the sustainable consumption and production of plastic. Nor are there agreements on important

Covid-19 has exacerbated plastic pollution

Crushed bottle caps are prepared for recycling

GETTY IMAGES/EZEQUIEL BERRECCA

issues such as limiting the use of plastics in products; reducing the range of plastic types used in everyday products to create improved conditions for recycling; supporting the universal separation and collection of plastic waste; nor for creating minimum specifications for recycled plastic content in new products.

In short, a global agreement should tackle plastic pollution at its source and promote a transition to a circular plastic economy. It should take plastic into account throughout its life cycle, rather than focusing on "downstream" solutions only. Ultimately, agreements that only cover waste management will never be an effective solution. The current policy mix will not "turn off the plastic tap".

Agreeing the terms and focus of a global agreement on plastics will be a major diplomatic and scientific undertaking which may take many years, particularly in the current context of fragmented international relations. Even once agreed, it will take longer still for change on the ground to materialise. The success of existing environmentally focused global agreements has been mixed, which raises concerns that a future global agreement on plastics may not be as effective as hoped, and may direct political energy and resources from other more effective approaches.

Every year, 11m tonnes of plastic goes into the ocean

Yet the underlying reality is that the challenges associated with unsustainable consumption and production of plastics are interconnected and global, requiring systemic transformation of the plastics economy. The extent to which this can be achieved without a global agreement is uncertain, but as a minimum, coordinated efforts are needed to start a global sustainable plastics transition. Behind any global approach is the need for high-quality evidence to inform national and private sector action.

Through our Revolution Plastics initiative, the University of Portsmouth is contributing to the sustainable plastics transition. Our world-leading research into plastic-digesting enzymes was recognised as the *Times Higher Education* STEM project of the year in 2019.

We are also contributing to the evidence base to inform policies and decisions across the plastics life cycle, for governments, scientists and businesses.

For example, we are working with the G20 group of nations to identify policy options to reach net zero plastics entering the ocean by 2050. This is part of the G20 Osaka Blue Ocean Vision, endorsed by around 80 countries.

We are working with the food industry to develop more sustainable alternatives to plastic packaging; with cities in Europe, Africa and Asia to support enhanced plastic recycling capability; with the fashion industry to reduce its reliance on plastics; with citizens to map and tackle urban plastic pollution, and we are examining the effects of exposure to plastics on human health. We are dedicated to making our science matter and contribute to tackling some of the world's most pressing problems. Only together can we take the action that will create a healthier world.

For more information, please visit: port.ac.uk/revolution-plastics

Covid-19 has underscored the urgency of the climate crisis, says Caroline Lucas, former leader of the Green Party and MP for Brighton Pavilion

Building back better, greener and fairer

Last December, Boris Johnson stood up in front of triumphant Conservative Party staff and vowed to make Britain the "cleanest, greenest country on Earth with the most far-reaching environmental programme". Waking up that dark winter's day, it was hard to find any cheer. But the prime minister's speech suggested that he may at least have recognised an important truth: the general election wasn't only about Brexit, it was also the climate election.

In 2018, scientists at the IPCC told us we had just 12 years left to almost halve global greenhouse gas emissions if we were to have even a 50 per cent chance of limiting the rise in global average temperature to 1.5˚C. And achieving this would require "rapid, far-reaching and unprecedented changes in all aspects of society".

The extreme weather events of this year have shown us the terrifying consequences of not achieving that: California has been on fire for most of the summer, as Australia was at the start of the year. Britain saw heavy flooding in February, torrential rains left a quarter of

Bangladesh submerged, and Greenland's ice cap is melting faster than at any time in the past 12,000 years.

As Greta Thunberg has said, we must act as if our house is on fire, because it is. It is not enough to dial 999 and ask for the fire service to come in 30 years' time. So the first step to achieving net zero in time is honesty about the scale of the challenge, and what has been achieved to date.

The government often claims to have reduced greenhouse gas emissions by 42 per cent compared to 1990 levels. What it doesn't say is that this is only because we have outsourced our emissions to other countries through our supply chains. If we factor in consumption emissions, the true reduction is closer to 10 per cent. Emissions from aviation and shipping are still missing from our climate targets. The UK Export Finance scheme continues to support fossil fuel projects overseas.

The coronavirus crisis has, rightly, grabbed most ministers' attention this year. It has also given us some valuable lessons about responding to emergencies, including the heavy price of being unprepared, or acting too late.

We have also seen what government can do when it needs to, and how people are willing to come together to protect communities and those most vulnerable. The response to both the public health emergency and the economic fallout has been unprecedented and has surely laid to rest all that Tory dogma about "no such thing as society".

People's appreciation of nature has grown, and so has concern about climate change – which has actually gone up

Extinction Rebellion protestors have held a series of "mass rebellions" for climate justice across the country

GETTY IMAGES/NICKLAS HALLEN/AFP

during the pandemic, according to a recent study by the Climate Change and Social Transformations Centre. Local and regional leaders have also found their voice, standing up to the centralising and controlling instincts of Downing Street. Most importantly, a majority of people want the government to prioritise health, wellbeing and the environment over economic growth – even when the coronavirus pandemic is over.

We need to build on this. We must use this disruption as an opportunity to reimagine our society. We have a huge opportunity to reset our economic system, turning away from the relentless pursuit of endless GDP growth and the global ecological destruction it is causing.

After a drip-drip of announcements over the year, we finally got Johnson's much-trumpeted major "speech" on the environment in mid-November – downgraded to a late night press release. Frankly, that was about all it was worth. A shopping list of initiatives from bringing forward the phase-out date for petrol and diesel to investing in hydrogen – with barely more than £3bn in extra spend. Compare that to the £27bn earmarked for roadbuilding.

The plan for nature amounts merely to a commitment to plant a lot of trees. There wasn't even a ban on the burning of peatlands, a huge store of carbon. This "green industrial revolution" will not close the yawning gap between our climate targets and our chance of achieving them, and there was little detail on how any of it would be achieved.

In the meantime, the government is pressing ahead with programmes which will take us in the wrong direction. As well as roadbuilding, the proposed changes to planning rules, too, are likely to see countryside being built on, with no requirements for developments to focus on walking, cycling or good public transport access. The current "garden communities" programme is already leading to housing developments that are dependent on, or creating the need for, increased road capacity.

"We must act as if our house is on fire"

We need policies which will deliver the scale of change needed to address these crises and funding to match. In other words, the "global leadership on climate" that Johnson so often boasts of, but has yet to deliver.

In September, I tabled the Climate and Ecological Emergency Bill, which provides a framework for the UK to meet its global climate commitments. It requires the UK to rapidly reduce our carbon footprint to keep use close to the 1.5˚C target we signed up to in the Paris agreement, and provides for the protection of biodiversity. More than 40 per cent of species in the UK are in decline because of the way we farm, urban expansion and climate change – 15 per cent are at risk of extinction. The Early Day Motion in support of the Bill has cross-party support, but we have yet to see the strong backing from both sides of the House that we saw in the run-up to the Climate Change Act in 2008.

Over the summer, the All-Party Parliamentary Group on the Green New Deal gathered the views of more than 55,000 people via opinion surveys, workshops and in-depth interviews, on the kind of future they want. Our Reset initiative showed the public is way ahead of the government on the scale of change they'd like to see, with ambitious ideas about the future of work, public services, community and the environment.

Some sections of the business community are also showing real leadership on climate, calling on governments to be more ambitious in their policy response. And other governments are showing the way. The Wellbeing Economy Governments partnership, which already includes Scotland and Wales, recognises that "development" in the 21st century means delivering human and ecological wellbeing rather than GDP growth. ●

A new law designed to stop deforestation and tackle climate change may not be ambitious enough. By Samir Jeraj.

A precious resource

In August 2019, the Brazilian Amazon ominously glowed with over 30,000 fires. The blazes engulfed Sao Paulo in thick black smoke, visible from space. In 2018, an estimated 30 football pitches of forest were lost every minute in the tropics alone.

With many environmentalists and scientists claiming Amazonian fires are started deliberately to clear land to produce crops and livestock to meet global demand, the UK is looking to take a stand on illegal deforestation.

Ahead of the delayed COP 26 climate negotiations in Glasgow, now set for November 2021, the government is proposing a new law to clean up the supply chains of products grown on forest land that has been cleared illegally.

Announcing a law to prevent businesses from using commodities linked to deforestation, Zac Goldsmith, the international environment minister, said the government intends to build a "global alliance of countries" that will work together to protect forests globally. The legislation, which is part of the Environment Bill, means large firms sourcing products such as cocoa, beef, soy, palm oil and rubber, would have to prove they had been grown in line with local laws. Those sourcing illegally grown products will face fines.

Deforestation is estimated to contribute 11 per cent of greenhouse gases. Forests are a "carbon sink", absorbing emissions that could tip the Earth towards catastrophic climate change. When forests are felled or burned that carbon is released back into the atmosphere. Once cleared, the land becomes the site of yet more greenhouse gas emissions as it is used for producing meat, dairy and crops.

Forests are also on the frontline of another environmental challenge. Around 80 per cent of the world's biodiversity is in its forests, rainforests in particular. A UN report published last year found that nature was in "unprecedented" decline, placing ecosystems and economies at great risk. An estimated one million animal and plant species are threatened with extinction within "decades", the report said.

The proposed deforestation law, while broadly welcomed as a step in the right direction, has been criticised for lacking ambition. In October, 21 large private companies, including McDonalds, Unilever and Tesco, called for the law to be extended to all deforested land, rather than just illegally deforested land. In a joint letter they urged the government to apply the law to medium-sized companies, currently outside the scope of the proposed legislation. The government responded by changing its definition of large companies to one based on turnover rather than the number of employees, which Tesco CEO Jason Tarry called "an important first step to creating a level playing field in the UK".

But some feel there are still improvements to be made. "What the government has proposed is really lacking and doesn't go nearly far enough," Emily Armistead, Greenpeace's deputy campaigns director, told *Spotlight*. The NGO has been calling for due diligence mechanisms that look at the specific plantation a product comes from, as well as the company, or companies, that UK firms are buying from. At the moment, there are many ways for companies to skirt local laws or conceal illegal activities.

"If a company wants to procure sustainable palm oil, they will take it from a particular plantation that was deforested five, ten, 15 years ago. Meanwhile, over somewhere else, they are chopping down virgin forests," Armistead says.

Tackling demand for products like meat and dairy, which are disproportionately responsible for deforestation, is another factor. Armistead points out that around 90 per cent of the soy that comes into the UK is used as animal feed. "We need to massively also reduce the demand for soy by cutting out meat and dairy consumption," she says. The production of meat and dairy contributes 14.5 per cent of global greenhouse gas emissions according to UN figures, compounding the environmental impact of losing forests. One of the reasons that larger corporations are supporting this, says Armistead, is that it allows them to dodge the issue of demand.

Deforestation in th Amazon

The government says targeting illegally deforested land would cover 50 per cent of all deforestation and up to 90 per cent in key ecosystems, and that it is part of a broader package of measures under the recently announced 10-point climate plan. A Defra spokesperson said: "There is a hugely important connection between the products we buy and their wider environmental footprint, which is why the government has consulted on new measures that would make it illegal for businesses in the UK to use commodities that are not grown in accordance with local laws."

More than 63,000 people and organisations responded to the law's consultation. Of these, the World Wide Fund for Nature (WWF), Traidcraft and Global Witness (GW), claim responsibility for 62,000 responses, following their campaigning. These organisations are in favour of the law applying to legal and illegal deforestation.

"It's a really important initiative, and it has the potential to be genuinely ground-breaking and transformative if it goes as far as we as we would like," says Mike Barrett, executive director of conservation and Science at WWF-UK. WWF contends that the law should extend to the destruction of other important habitats, not just deforestation.

The emphasis on adhering to "local laws" is also concerning, as some allow for deforestation to happen legally, Barrett explains. In Brazil, under its right-wing populist president, Jair Bolsonaro, the government is attempting to legalise land grabs and deforestation. The number of fines issued for deforestation offences in Brazil fell by 38 per cent in his first eight months in office, the lowest rate in 20 years.

The WWF wants to see a system where no commodities on land, converted or deforested, is allowed into the supply chain after a cut-off date. "It's perfectly possible to enforce that because we've got excellent satellite imagery," Barrett says. Combined with a duty on importers to demonstrate where their products come from, this could be "game changing" in his opinion.

Global Witness is advocating a "deforestation-free standard" and a due diligence regime similar to the government's approach to tackling bribery and corruption. Jo Blackman, GW's head of forests policy and advocacy, explains that "the proposed UK legislation should lay out a single, clear definition of deforestation and state that UK businesses cannot be complicit in forest destruction, irrespective of what local rules may allow". That way, the onus would be on companies to demonstrate their due diligence on specific harms, such as forced evictions. As indigenous peoples bear the greatest personal risk in protecting forests, their right to prevent, or allow, companies from operating in their local area should also be included, GW says.

Blackman adds that the NGO wants to see the law applied to those who finance companies involved in deforestation too. The UK is one of the leading suppliers of credit to such companies. Britain's banks and investors provided £5bn to six of the agribusiness companies with strongest links to the destruction of "climate critical forests" between 2013 and 2019, according to a report published by the organisation. "Without binding rules for finance, there is no incentive for UK-based banks to stop bankrolling global deforestation," Blackman says.

The UK hopes other nations will follow suit

The question of scope and scale will no doubt resurface as the law makes it way through parliament. Bram Büscher, of Wageningen University in the Netherlands, acknowledges that the new law is encouraging, but says it does little to address "an economy that keeps putting more and more pressure on our natural resources".

Reducing the problem in one area, such as deforestation, does not necessarily do anything to tackle the "interlocking issues" of deforestation, biodiversity, climate, the health of oceans and the pressure on freshwater.

The ambition to reduce deforestation may be there, but the proposed law in its current form is just one step towards doing so. The UK is also just one country. The hope, however, is that others will follow suit. The EU and China are reportedly enacting measures to clean up their supply chains. A global effort could may mean fewer summers of fires, fewer extinct species, and lower greenhouse gas emissions. The larger challenge of a transition to an economy that depends less on natural resources and generates fewer greenhouse gases is much greater, however.

Fair to middling: What Biden's win means for net zero

Environmentalists are cheered by the US election result, but Joe Biden is no Greta Thunberg, says Philippa Nuttall Jones

Climate campaigners breathed a massive sigh of relief when Joe Biden was projected to win the US election. Donald Trump has spent the past four years rolling back environmental legislation, denying climate change and championing the coal industry.

Biden campaigned with a $2trn climate plan and, even before he was voted in, had promised to bring the US back into the Paris climate agreement, which the country exited the day after the election.

But despite Trump's efforts to the contrary, clean energy surged in the US under his tenure. This growth was in no small part thanks to pure economics – new utility-scale onshore wind is now the cheapest source of power that can be added to the grid in America. Coal-fired power in the country is in terminal decline.

Biden is ready to speed up the transition from fossil fuels to renewables with his climate plan, pitched as a green economic stimulus package, and he wants the US to join the ranks of those countries, such as the UK, China, Japan and those in the EU, which are aiming for net zero emissions by 2050, or in Beijing's case, 2060.

He is no Greta Thunberg, however.

The US remained at the table for three years after announcing it would leave the Paris Agreement, not least to ensure the accord's rulebook would not stymie American plans for exporting surplus shale gas in the form of liquified natural gas. Biden is unlikely to do much, certainly not at first, to change this. Greater US engagement in international climate talks could increase consideration of gas as a transition fuel.

The argument that natural gas should first replace the most polluting fossil fuels of oil and coal before greener gases and renewables are brought fully online is an old and increasingly outdated one, given the competitiveness of wind and solar power globally.

A clear example of this changing mindset is the decision by BP to reinvent itself as an "integrated energy company", reducing oil and gas production by 40 per cent and multiplying renewables investment ten-fold over the next decade.

Such plans make climatic sense and, in a world attempting to recover from the impacts of Covid-19, economic and societal sense. Numerous studies show clean energy creates more jobs and growth than gas and other fossil fuels.

Recent research demonstrates that, by the end of 2019, 3.3 million Americans worked in clean energy jobs, three times more than in fossil fuel jobs. Last year, nearly five times more jobs were added in clean energy in the US than in fossil fuels.

While Biden will continue to promote gas, renewables make the most sense for a global recovery, especially one aimed at creating a net zero emissions world. If the US and other major economies prove they are serious about getting to net zero by mid-century, the geopolitical pressure on countries such as Russia, Turkey and Brazil, whose current mantra is to ignore or largely deny climate change, should intensify.

With Biden at the helm of the world's second largest emitter of carbon dioxide, the chance of keeping global warming below 2 degrees celsius, as agreed under the Paris Agreement, increases. But success is far from given and the hard work must start now.

Philippa Nuttall Jones is editor-in-chief of Energy Monitor

A bright future for hydrogen

The UK could be a leader in clean hydrogen technology, say **Eugene McKenna** and **Andy Walker** from Johnson Matthey

What is hydrogen and how exactly is it a low-carbon energy source?

Eugene McKenna: What do you want from an energy source? Well, you want high energy density and you want something you can put into your car and transport easily. In that sense, petrol is a great fuel. The problem is carbon dioxide and other pollutants are emitted from the exhaust when used, which massively contributes to global warming. With clean hydrogen, that does not happen.

There are a couple of types of clean hydrogen or "colours". Green hydrogen is produced by the electrolysis of water, with the electricity used coming from renewable sources. Blue hydrogen is generated from natural gas. Although carbon dioxide is produced in the process, it is captured and safely stored in geological features. In the North Sea, you can put carbon dioxide back into the same geological structures that oil and gas have come from for five decades, and it will stay there permanently. Clean hydrogen is going to be essential when it comes to meeting the UK's zero-carbon commitments, and Johnson Matthey is really leading the way.

Blue hydrogen currently is more "ready to go" because you can use a lot of the current energy infrastructure. That is why there are already some projects up and running in the UK to demonstrate the technology. For instance, at the Stanlow Refinery in the north west of England, natural gas will arrive at the site, blue hydrogen will be made, then the carbon dioxide will be removed and it will produce large amounts of hydrogen to be used in local industry, put into the grid and distributed to houses. This project, which is in the first phase, will eventually produce the same amount of clean energy as the world's largest offshore wind farm, and is all done using our technology.

What opportunities does hydrogen present for the UK?

EM: The first industrial revolution was driven by technological innovation here in the UK. But it was fuelled by coal. We are now on the cusp of a similar transformation in technology that is going to be far greener than the first, but it, too, can put Britain at its centre. We have the leading technology in clean hydrogen production and that is something that is going to take off around the world for use in homes and in formerly carbon-intensive industries. There is an opportunity for the UK to become a centre of excellence and this will have a huge impact on people at the local level.

Right now, Johnson Matthey is deploying hydrogen technology in the north west, with the HyNet facility near Chester, we are involved with the Acorn project up in Scotland, and there are projects in the pipeline for the Humber, all for hydrogen energy and carbon

JOHNSON MATTHEY

capture, usage and storage. So what we are doing is very much in line with the levelling up strategy. We are creating highly skilled, high-productivity jobs in areas that need them most. Those jobs are simultaneously contributing to the UK's net zero carbon ambitions. We are also developing technology for making green hydrogen, drawing on our technical and market expertise to improve the performance and the economics for our customers.

What can hydrogen be used for?

EM: Clean hydrogen can be used in different ways. We will be able to heat our houses and cook our food guilt-free because with hydrogen technology we will no longer be contributing to global emissions in the same way. It has been shown that a blend of 20 per cent hydrogen in natural gas requires no change to domestic appliances.

But hydrogen also presents huge opportunities for uses in non-domestic settings, in energy-intensive sectors where switching immediately to renewable electricity simply is not possible. In the manufacture of steel, glass or cement, for example, where a huge amount of natural gas is burnt in the production process. If hydrogen were used instead, we would not see that massive carbon impact.

Andy Walker: Hydrogen is incredibly flexible. It enables us to decarbonise sectors that are difficult to electrify. Eugene has mentioned heavy industry, but there are also trains and heavy lorries, where batteries are too large, expensive and need recharging too often. You can replace the engine or battery with a fuel cell which runs off hydrogen. The first trials of hydrogen fuel cell-powered trains are starting in the UK, which means rail lines that currently run on diesel could switch over to a clean fuel faster, and cheaper, than through electrification. There are hydrogen fuel cell buses on our roads already, so the technology is ready.

We also see opportunities in aviation, where instead of using the kerosene, you can make similar fuels in a sustainable way, using a synthesis of hydrogen and municipal solid waste or rubbish. This kind of fuel can be used with the same planes we use today, but with a much lower carbon footprint.

What are the wider benefits of using hydrogen?

AW: Hydrogen can become the fuel of choice as part of the next wave of technological innovation. That, in turn, will lead to sustainable, clean growth that will help us meet net zero carbon obligations as a country and secure a cleaner, healthier future. That will also provide opportunities for levelling up, with jobs and productivity gains across all regions of the UK. Hydrogen is going to be front and centre in a clean energy transition that is both socially fair, and that does not have to sacrifice the economic viability of UK plc.

What would a future hydrogen world look like?

AW: The picture I would paint is of clean hydrogen fuelling the delivery trucks that come to our door, the bus we travel on, maybe even the long-haul flight we take, or the train. It is going to be in a lot of houses, keeping us warm and heating our food. In many ways, it will replace natural gas in industrial processes, too.

But for that to become a reality , there needs to be consistent and far-reaching policy so people can invest with confidence. There needs to be assistance in the same way there are grants available for electric vehicle charging stations and investment models for offshore wind. With incentives, with tax breaks and infrastructure support, clean hydrogen can start to take off. These will then become more attractive than carbon-intensive fuels.

In the aftermath of coronavirus, the UK now has the opportunity to – and must – build back better. That means building back in a fair and socially just way, which hydrogen can really facilitate. But that will require a joined-up strategy that takes in all the affected sectors and links them holistically. Hydrogen will undoubtedly play a key part in the growth industries of the future and in future energy provision. The UK can lead that future, and Johnson Matthey is ready to be a part of it.

In combatting global warming the UK must lead by example, says Karan Bilimoria, president of the Confederation of British Industry (CBI)

Industry and environment need the same strategies

The UK is facing a number of significant challenges at present – the ongoing response to the coronavirus pandemic, redefining its place in the world post-Brexit, and perhaps the most significant challenge of our lifetime: tackling climate change. It would be a mistake to look at these as separate, distinct priorities, when there are in fact commonalities that offer us the chance to respond to all three at once.

The phrase "Build Back Better" has been coined not just by the CBI, but prime minister Boris Johnson, and the US president-elect, Joe Biden. This need for recovery and renewal comes at a time when a range of technology solutions are giving us the tools we need to re-shape our economies and societies for the better. The challenge for us all is whether we can maximise the opportunities at hand and pivot to a sustainable future.

Since the start of 2020 we have seen fundamental shifts in work patterns, travel, and the level of government intervention in our lives. Lockdowns have given some people the opportunity to reconnect with nature, and make us think harder about the relationship we have with the natural world.

Meanwhile, the very clear impacts of climate change have continued to be felt, with record numbers of hurricanes and wildfires setting all too familiar headlines in recent months. All this emphasises the importance of the UK's net zero emissions target, set last year, and the hugely important COP26 climate conference, that we will host in Glasgow in 2021.

As we continue to battle against the coronavirus pandemic, a major concern is that the health crisis could lead to a jobs crisis. So we have asked whether accelerating the action needed to achieve our net zero target, such as building wind farms, or retrofitting homes to be more energy efficient, can help tackle falling employment. We believe the answer is yes. The CBI's *Green Recovery Roadmap*, published in September, highlighted some of the priorities. Much has been made of progress in decarbonising the electricity sector, but far more renewable and nuclear output must be built, alongside developing a more flexible energy system to support increase in renewable power generation.

The 40-gigawatt target for offshore wind capacity will support up to 60,000 jobs, while 25,000 construction jobs would be created from building the proposed Sizewell C nuclear power station. Developing a programme of small modular reactors could lead to employment of 40,000 people by 2040.

We have also highlighted development of Carbon Capture, Usage and Storage (CCUS) technology and a hydrogen economy as priorities for government action through financial support where needed, and the creation of business models and clear policy frameworks. These technologies could help support the government's "levelling up" agenda,

David Attenborough and Boris Johnson at the launch of the postponed COP 26 summit

GETTY IMAGES/JEREMY SELWYN

Cleaner transport must be prioritised

creating up to 6,000 new highly skilled jobs in industrial clusters planned for Teesside, Humberside, Merseyside and Aberdeenshire.

With transport now the largest source of emissions in the UK, and a new 2030 date for ending the sale of new petrol and diesel cars, this decade must deliver progress. Building out our electric vehicle infrastructure must be prioritised, if we are to deliver the ramp up in low-emissions vehicle sales needed. Other transport technologies, like the first hydrogen-powered train trials on the UK's mainline rail network undertaken recently, must also be progressed.

Addressing the carbon in our heating is arguably the largest challenge for reaching net zero. With 24 million domestic boilers burning methane, we need new solutions for heating our homes. The joint CBI and University of Birmingham Heat Policy Commission, which I chair, has made a number of recommendations this year about how the UK can start to make some long overdue progress.

These include a target date to start installing hydrogen-ready boilers in peoples' homes, providing long-term financial incentives to help people pay for energy efficiency measures and heat pumps, and create a National Delivery Body to help plan and deliver this major infrastructure challenge.

The employment opportunities here are huge. An energy efficiency programme alone could support over 150,000 jobs by 2030, and the Green Homes Grant introduced this summer, will play an important role in delivering this.

We have welcomed the prime minister's "10 Point Plan" to deliver a green industrial revolution. While more action is undoubtedly needed to get us to net zero, this is an important step for the delivery of green jobs in the wake of the pandemic, giving business clear targets to work towards, and delivering on many of the priorities the CBI and its members called for earlier this year.

The plan also demonstrates the UK's continuing international leadership on climate change. The UK's hosting of the G7 and COP26 next year is a unique opportunity for the country to shape the international response to the climate crisis. Recent net zero commitments from China, Japan and South Korea, and the election of Joe Biden, who has committed to bringing the US back into the Paris Agreement, show that we are at a crucial for moment coordinating global action. The UK can help shape this next year through our diplomatic leadership at these events, as well as through the new trading arrangements around the world.

As we continue to battle against the coronavirus pandemic, and make breakthroughs in areas such as mass testing and vaccine development, we must not lose sight of the opportunity to deliver an economic recovery that creates green jobs, moves us closer to our net zero target, and establishes the UK as a global leader in climate diplomacy as we open a new and exciting chapter for our country.

The home heat decarbonisation challenge

Britain's two million rural homes will be the first to transition to low-carbon heating, but some are asking if the change will be fair, says Calor's head of strategy and corporate affairs, **Andy Parker**

With the possibility of a vaccine on the horizon, there is cause for some optimism in 2021 after a very difficult and challenging year for many. But while we have focused on Covid-19, one of the few things that has not changed is the vital need to tackle climate change and reduce national greenhouse gas emissions to net zero by 2050. Our recovery from Covid-19 must be a green recovery, and there is an opportunity to make urgent progress on reducing carbon emissions from home heating, which contributes a significant 14 per cent to the UK total. This must be a just transition, with everyone playing their part, and making sure the effort is shared fairly.

The government aims to tackle rural off-gas grid homes first, where many homeowners, landlords and social housing managers will be both asked and required to make changes to the heating and energy efficiency of their properties this decade. This is necessary to meet net zero, but it is easy for policymakers to underestimate the rural heat decarbonisation challenge. While rural homes situated off the gas grid represent just 8 per cent of all homes in Britain, we question the notion they are "low-hanging fruit," or easier to decarbonise than urban homes.

The nature of Britain's rural building stock means the transition to low-carbon heating will be more disruptive and expensive than in urban areas. Due to low building density, heat networks are unlikely to play a major role and hydrogen cannot be stored easily or transported off-grid. Good levels of energy efficiency – a prerequisite for some low-carbon heating solutions such as electric heat pumps – are absent in many rural homes, overlooked by successive government energy efficiency schemes. Lots have solid walls; 78 per cent are detached; 47 per cent built before 1949; and the prevalence of fuel poverty is greater. Only 3 per cent of off-grid homes in England have an Energy Performance Certificate (EPC) — a rough measure of building energy efficiency – rating of C or higher.

Such homes are loosely referred to as "hard to treat", as they are expensive and disruptive to upgrade their energy efficiency to the level required for heat pumps to work effectively and keep occupants warm; we estimate typical costs for such homes could reach over £30,000. This compares to a national average upgrade figure of £9,000, according to the Committee on Climate Change (CCC). These upgrades are also disruptive for householders, some taking several weeks for the hardest to

CALOR

treat. The Climate Assembly UK – made up of people from all walks of life to discuss how the UK can achieve net zero by 2050 – emphasised the need to minimise disruption in the home from upgrades and offer flexibility and choice to householders. Our recent YouGov survey of rural off-grid householders found 77 per cent already thought government prioritises urban concerns over rural in energy and climate policy. We must fully take account of these sentiments for policy to succeed.

A rural first approach will lead to a slower pace of decarbonisation than a national approach. There are "no regrets" homes both on and off grid which are ready right now for low carbon heating solutions, such as electric heat pumps and hybrid heat pumps, and available bioenergy solutions for homes where alternatives are needed. So why restrict activity to off-grid, which will slow and increase the cost of deployment? We should put the right technology in the right home, right now, regardless of where that home is.

For each home we need the right technology

At Calor we have been providing energy to rural homes and businesses off the gas grid for over 85 years and we supply many hard to treat rural homes. We do not see them as low-hanging fruit. To help these homes decarbonise, we have already started our transition to net zero, supplying renewable bioLPG (a direct, drop-in replacement for conventional LPG) since 2018. Our commitment is to supply 100 per cent renewable energy products by 2040. Independent analysis suggests bioLPG, either in standalone boilers or in combination with a heat pump in a hybrid system, will be the most affordable way to decarbonise around 44 per cent of rural homes currently heated by highly polluting heating oil.

BioLPG provides high temperature heating and effectively heats even poorly insulated homes, providing instant carbon savings, while their energy efficiency is improved to the extent it is economically and technically feasible.

Heat pumps generally require good levels of insulation to heat effectively. If heat pumps are installed in the wrong home, occupants may not be warm enough, and may have bigger energy bills than they were expecting. There are also space, planning and technical restrictions which will further limit heat pump installations. The reality is many off-grid homes will never be suitable for standalone electric heat pumps so alternative low-carbon heating options are vital to achieve net zero.

These points are not being fully debated among policymakers and government risks picking winners when it should focus on outcomes. The government thinks about 80 per cent of off-grid homes are suitable for heat pumps, and the CCC suggests around 50 per cent. Current policies favour biomass boilers burning imported wood pellets as filling much of this gap, although their negative impact on air quality means we should deploy these sparsely. The CCC see hybrid heat pumps, in combination with biofuels, as a key solution. The reality is we will need all these options, including bioLPG.

Rural homeowners and especially those on heating oil, will need significant financial and technical assistance to help them on this journey. The government needs to urgently bring rural energy efficiency levels up to scratch and expand the number of technologies it supports through Green and Clean Home Grants to include bioLPG. The government's forthcoming Heat and Buildings Strategy, which will set the policy direction to decarbonise our homes over the course of the next two decades, needs to treat rural off gas grid households fairly. If we want to get it right for the people living in Britain's two million rural homes off the gas grid, we need all options available for this diverse range of properties. For many, bioLPG is not only the best value, but also the fairest way to do it.

Building back better: a green recovery

Mitigating the climate crisis while stimulating jobs and economic growth

Crises are often the catalyst for real, lasting and positive change. During the coronavirus pandemic, experts and researchers at The University of Manchester have been helping prepare the world for a post-pandemic future. By considering local prosperity, jobs, resilience and equality, they are at the forefront of new thinking, helping drive the innovations that are needed to help build back better.

With a network of over 600 energy and climate change experts and researchers, the university is committed to working with government, institutions, and businesses to create a better, greener, fairer, and healthier future. Here are just a few examples of how The University of Manchester's research is addressing the climate emergency.

Low-carbon energy sources

Only by accomplishing a massive energy shift can we reduce the climate threat created by fossil fuels. Experts at the university in this area include Professors Mike Barnes, Tim Stallard and Francis Livens, who focus on generating power from offshore wind, tidal and nuclear respectively. Another focus is on mass deployment and fast-track decarbonisation by using low-carbon solutions already available in areas such as retrofitting in homes and public buildings (Professor Stefan Bouzarovski), aviation and shipping (Professor Alice Larkin), and food emissions (Professor Sarah Bridle).

Transformational technology

New technologies offer us the chance to transform our economy, generating jobs, reducing inequality between different parts of the UK, and promoting a healthier environment and society. Dr Clair Gough and Dr Sarah Mander are leading work on carbon capture and storage, hydrogen, and industrial decarbonisation, while Professor Frank Boons brings expertise on how to accelerate the circular economy.

The right insight

The key to preparing the world for the challenges of climate change is access to the right insight. Manchester's experts and researchers are currently working with policymakers on how to measure and account for carbon emissions (Dr Chris Jones); how to drive businesses to deliver on net zero (Professor Jonatan Pinkse); and how to build a resilient infrastructure where renewable energy, lifestyle changes, and new technology can be brought together to tackle climate change (Dr Ruth Wood).

Harness our expertise

Energy is one of the university's research beacons. It is an example of interdisciplinary collaboration and cross-sector partnerships, which lead to pioneering discoveries and solutions to global challenges.

If you would like to arrange a bespoke briefing, please email: policy@manchester.ac.uk to match your needs with the relevant expertise.
For more information, please visit: www.manchester.ac.uk/energy-beacon

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Why sustainability must be the guiding light for business

The UK Business Council for Sustainable Development (UKBCSD) is urging the British government to take two steps towards tackling the climate crisis. Firstly, to define the policy drivers that will enable change. Secondly, to bring the United Nations' 17 Sustainable Development Goals (SDGs) into the mainstream.

The SDGs carry social and economic value, beyond their obvious contributions to protecting the environment. They are key to sustaining society, as well as industry in the future; so think of all 17 SDG outcomes, including clean water, affordable energy, new technologies, health and wellbeing, and transport infrastructure, as inter-linked. Hence, we are calling for an SDG Act 2021 to replace the Social Value Act of 2012.

The private sector has been demanding such legislation for some time. There is currently no legal requirement to action net zero, no common metric, baseline or policy driver – but there is a lot of talk. The majority of local authorities in the UK have declared climate emergencies, yet it is unclear how this is being measured. Are they all responding to the same set of guidance? With some exceptions, the impression is generally of a box-ticking exercise than of tangible changes.

It is our view that public sector procurement must require active outcomes against net zero, greater weighting on sustainability equal to cost, hence rewarding those who are actively delivering net zero. If you don't abide by the legislation, you won't get the work. New legislation shaping procurement that rewards only those who follow SDGs will drive positive behaviours, resulting in desperately needed change. In order to convince those who doubt the cost-effectiveness of SDG adoption, we need to demonstrate that the cost of implementation is outweighed by the benefit of investment and new economies and opportunities.

The government must stand firm in embedding climate-consciousness into the private sector's psyche, says Jason Longhurst, chairman and chief executive at the UK Business Council for Sustainable Development

So alongside our parent organisation, the World Business Council for Sustainable Development, the UKBCSD is seeking to mainstream SDGs to drive a green recovery, which we believe should be integral to every business decision taken from here on in. We must define what a green economy means for business, ask what a green-collar job looks like, seek to identify the biggest influencers – positive and negative – and explore how implementing SDGs will reap dividends, both for biodiversity and the economy. None of us can afford to keep talking about this; now is the time for long-term solutions, which will define the path ahead.

The UKBCSD was a signatory of a recent letter from the Corporate Leaders Group, calling on the UK government to set out an ambitious nationally determined contribution (NDC) ahead of the UN climate change conference, COP26, next November. We see this as an opportunity to give clear direction to galvanise businesses across all sectors to transition to net zero. UKBCSD members are proof businesses can do so, and they will share their expertise with others. We ask the government to set the benchmark, ultimately using legislation that supports the NDC and fixes SDGs in the business psyche.


UNIVERSITY OF PORTSMOUTH
ARE YOU READY FOR
REVOLUTION
PLASTICS
If we don't take radical action, the consequences of plastic pollution on our health and the environment will be catastrophic. We've got to build a world that's more sustainable. A globe-spanning plastics economy based on circular principles. Before it's too late.
Right now, our researchers are making change happen. We're working to transform the potential of plastic recycling and reuse. Engineer enzymes to break down plastic faster. Reduce waste through packaging innovation. Develop new, sustainable materials. Further the world's understanding of how microplastics affect our seas, economy and the air we breathe.
A revolution has started in Portsmouth. We call it **Revolution Plastics**. It's going to take global partnerships to turn the world around. If you're with us, email **revolutionplastics@port.ac.uk**
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