

Supporting the Transition across the Economy

Chapter

4



4i. Innovation for net zero

Harnessing UK strengths in R&D to reach net zero

Our Key Commitments

- Increase government **investment in R&D to £22 billion**; increase total R&D investment to 2.4% of GDP by 2027.
- Publish the **UK's first Net Zero Research & Innovation Framework** to set out the key research and innovation challenges for the next 5-10 years; and a future update to demonstrate how the government is delivering against these.
- **Deliver a Government programme of innovation to enable decarbonisation** – funding of at least £1.5bn during next spending review period expanding a portfolio of cross government net zero innovation to fund BEIS-led programmes on power, buildings and industry; DfT-led programmes across transport; and DEFRA led programmes on natural resources, waste and F-gases, to target priorities aligned with the Net Zero Research & Innovation Framework. This spending includes new programmes set out in this Strategy such as £60m Heat Pump Ready programme.
- Take a **leadership role in Mission Innovation 2.0**, a global initiative working to accelerate clean energy innovation.¹

The challenge

1. Innovation is central to our approach to delivering net zero. It will require a step change in the rate of new technologies and processes being developed and deployed into the market and being adopted by businesses and consumers. Continued investment in cutting-edge research, development, and demonstration, will be integral to achieving this transformation and to the UK leading the world in areas of existing and potential competitive advantage. This investment

will also support businesses to grow and solutions to be delivered at scale. Research, development, and innovation are needed to allow government, industry and business to make decisions about what new technologies and systems are promising. To respond, government must enable the efficient scaling of technologies, systems, and business models to pull them through to commercialisation for 2050 - and beyond.

Our goal

2. Our goal is for the UK to be a global leader in the technologies, processes, services, and business models needed to decarbonise our economies, protect our environment, and adapt to a changing climate. We will support our world class innovators, entrepreneurs, and financial institutions to develop and deploy the key technologies of the future. This will need to take place alongside other cross-cutting policies, regulatory changes, and commitments.

3. By supporting innovation, we could unlock the potential for 300,000 jobs in exports and domestic industry through new commercial opportunities across low carbon sectors.

4. In the Prime Minister's *Ten Point Plan for a Green Industrial Revolution*,² we restated our commitment to raise total private and public R&D investment to 2.4% of GDP by 2027 – enabling the next phase of green innovation to help bring down the cost of the net zero transition, nurture the development of better products and business models, and understand consumer choices. We have started delivering on this with funding announced for programmes across the portfolio including renewables, energy storage and flexibility, and hydrogen.³ This is contributing to levelling up across all regions of the UK whilst helping us to achieve our net zero target.

The role of innovation

5. Innovation can significantly reduce costs of the technologies, processes, and systems needed to reach net zero. This goes beyond just developing technologies. It also means exploring new business models, approaches to financing, the regulatory environment and how consumers respond. Taking a whole systems approach to innovation will be integral to maintaining and developing the UK's global leadership in areas where we have, or can develop, an international comparative advantage or unique capability. We must harness the UK's international reputation to attract inward investment and anchor existing and emerging supply chains in the UK. International collaboration will also be critical to ensure that clean technologies become cheaper and more readily available.

6. Innovation is a process which occurs within an ecosystem of interacting actors, technologies, and institutions. This requires technologies, systems or processes to progress through multiple phases of development – from basic research, through to commercialisation and diffusion. However, innovation does not flow neatly in one direction from one phase to the next; it is unpredictable and serendipitous, involving constant cycles of learning, testing, refining, and discovery. At each phase of the innovation process there are different market failures and barriers, requiring distinct interventions. In the early stages, there are often minimal incentives for private actors to invest in innovation and direct funding policies can help 'push' technologies towards demonstration and early commercialisation. In the later stages, the importance of attracting private finance grows. Market incentive policies support the development of markets and leverage private finance to 'pull' technologies towards deployment and diffusion.

7. The Prime Minister's *Ten Point Plan for a Green Industrial Revolution*, our *Plan for Growth* and our new *Innovation Strategy* bring together ambitious policies and significant public investment to achieve net zero, whilst seeking to mobilise substantial private investment. These commitments will position the UK to take advantage of export opportunities in global markets presented by these low carbon technologies and services.

Case study: Glass Futures with Encirc pilot project

Through government's 2016-21 Energy Innovation Programme, BEIS funded Encirc (a glass container manufacturer) and Glass Futures (an industry research and technology organisation) to lead a trial project based in Derrylin, Northern Ireland to help determine the most effective approach to using low carbon fuels in manufacturing in the glass sector.

This revolutionary project has proven that new bottles can be made from 100% recycled glass by using energy only from burning low carbon biofuels. It is thought that this world-first initiative will set a global standard and make way for an industry-wide reduction in carbon emissions in the glass sector.

When made from waste organic materials, biofuels are a renewable and much more sustainable fuel source than those traditionally used by the glass sector and can reduce the carbon footprint of each bottle by up to 90%. By using up to 100% recycled glass to create new bottles, the trial has further minimised the lifetime impact of these new products.

Supporting innovation for net zero

8. Achieving net zero will require profound changes to the UK economy. It will mean increasing our low carbon electricity supply, making the transition to low carbon buildings, decarbonising transport, building a hydrogen economy, decarbonising industry, rolling-out carbon capture and storage, transforming the way land and marine spaces are used, improving agricultural management, adopting better waste management, and deploying technologies to remove greenhouse gases from the atmosphere. This should include innovation to mitigate any environmental impacts from new technologies on our pathway to net zero.

9. In each of these sectors, known technologies, business models, services and approaches will need to be demonstrated and then deployed at scale, while novel technologies need R&D support now to determine whether they can be affordable and viable options in the longer-term. Underpinning

this will be research to understand consumer acceptability and behaviour, and to create economic incentives will also be required for lasting change.

10. We're publishing the *Net Zero Research & Innovation Framework* which sets out the critical net zero research and innovation challenges across the UK that require development over the next 5-10 years, and presents timelines of short, medium, and longer-term priorities. The framework will help to align current and future government funding around agreed priorities and to crowd-in effort and investment from the private sector and research communities by providing a clear signal on our areas of focus.

Government R&D Support

11. Government investment in research drives progress on our goals, from the physics underpinning battery technology to the mathematics underlying climate modelling. In November 2020, we committed to increasing investment in core UK Research and Innovation (UKRI) and National Academy funded research by more than £1 billion by the April 2024 (the 2023/24 Financial Year). UKRI investment in research, innovation, and skills creates the conditions for the UK to address the complex and interrelated challenges of achieving net zero by 2050.

12. Beyond early-stage research, investment in new technologies is essential for bringing them closer to commercialisation. We will expand our cross government portfolio of net zero innovation support, delivering at least £1.5 billion during the next spending review period. This will accelerate the commercialisation of low carbon technologies, systems, and business models across the economy.

13. The Transport Decarbonisation Plan committed to implementing a range of innovation programmes to support the decarbonisation of transport, with successful projects for zero emission road freight trials and hydrogen transport pilots recently announced. Building on the success of our £20 million zero emission road freight trials, we will expand these to trial three zero emission HGVs technologies at scale on UK roads to determine their operational benefits, as well as their infrastructure needs. The accompanying *Jet Zero: our strategy for net zero aviation* proposes a suite of policies to reduce aviation emissions, including accelerating the development of sustainable aviation fuels and supporting the development of zero emission flight. The *Agricultural Transition Plan* set out the commitment to boost innovation and help farmers and growers increase productivity, sustainability, and resilience to a changing climate. Given the importance of R&D to

deliver emissions savings across the natural resources, waste and F-gases sectors, we are also committing to spend £75 million on net zero related R&D in these sectors over the next three years.

14. We will prioritise innovations where there is a strong case for UK Government investment, while leveraging additional funding from industry. It will also support the UK in maintaining its leadership in the development of technologies such as nuclear reactors and fusion energy,⁴ which are expected to complement renewable sources in the future. With high levels of innovation alongside ambitious policy support in technologies, the UK's low carbon sectors with the largest potential could unlock £60 billion of GVA in the UK.⁵

15. The Industrial Strategy Challenge Fund (ISCF),⁶ delivered by UKRI and its partners, drives UK growth and productivity by directing innovation across sectors and disciplines behind government's strategic priorities. ISCF has to date allocated £824 million to eight challenges aligned to the 2017 Industrial Strategy Clean Growth Grand Challenge. Examples include the Transforming Food Production Challenge; the Faraday Battery Challenge; the Driving the Electric Revolution Challenge.

16. The government's *Innovation Strategy* sets out our plans for a refreshed Innovation Missions programme to build on UK leadership in mission-driven innovation and bring government together with industry, civil society, and academia to respond directly to major challenges confronting the UK. As referenced in the *International* chapter, Missions can play an important role in stimulating and leveraging innovation for tackling complex problems while simultaneously promoting growth and improved business outcomes and restoring the UK's place as a science superpower.

17. It is a strategic focus of our *National Space Strategy* to utilise space technology in the fight against climate change. Satellites provide an extraordinary insight into our climate and environment and enable us to understand and monitor how climate change is impacting the Earth. We will strive to remain at the forefront of Earth Observation (EO) technology and know-how. This supports our ambition to be a global science and technology superpower and to lead the world in tackling climate change and biodiversity loss.

18. It is essential that we track cross-government activity and ensure that innovation funding is strategically aligned to deliver the government's net zero ambition. This will be supported by the Net Zero Innovation Board (NZIB), chaired by the UK Government's Chief Scientific Advisor.

19. Alongside our policies that specifically support our net zero objectives, there will be continued significant public investment in R&D to support all sectors. This includes the creation of a new institution – the Advanced Research and Invention Agency (ARIA) – to fund high-risk, high-reward research. ARIA's leadership will have full scope to determine the areas in which it will invest.

Case study: Hy4Heat Programme and Hydrogen Fuelled Appliances

The Hy4Heat programme was launched by BEIS in 2017 to explore the use of hydrogen gas for heating by seeking to demonstrate technical feasibility and safety. It aims to define quality and technical standards, and to develop domestic and commercial hydrogen appliances. The programme, with up to £25 million funded by BEIS, is supporting the innovation journey of a range of domestic hydrogen appliances and meters including world-first hydrogen-ready boilers, cookers, and fires.

These hydrogen appliances and meters are being installed at a hydrogen home facility, developed in partnership with Northern Gas Networks (NGN) and Cadent. This will enable industry and members of the public to see how these appliances work in a home setting. These properties will be the first UK houses to demonstrate the use of hydrogen appliances in a real-world setting.

Policy and regulatory frameworks

20. As set out in the *Ten Point Plan* and *Energy White Paper*, we will continue to develop a policy environment and regulatory framework which incentivises further deployment of new technologies, services, and business models. The UK's Electricity Market Reform is an example of how government can drive significant cost reductions in low carbon technology. Furthermore, while supporting the deployment of offshore wind through the Contracts for Difference scheme, costs have reduced by >50% in the last decade. This provides a clear example of policy 'pull' whereby open competition worked to drive cost reductions through deployment and innovation. As noted throughout the strategy, government will work with industry, businesses and consumers to consider the removal of regulatory barriers which may be hindering our transition to net zero.

Encouraging private sector investment

21. To deliver net zero, it is essential that public investment catalyses significant flows of private investment into innovative companies and activities. This means creating the right conditions for all businesses to innovate and giving them the confidence to do so. The right conditions will often involve de-risking capital in the forms of grants (allowing freedom to innovate) and concessionary capital (allowing businesses to commercialise and scale their operations). Providing the private sector with clarity on government R&D priorities can also help to build the confidence to invest in innovative companies and activities. As outlined, our *Net Zero Research & Innovation Framework* sets out a structure for this and a future update will demonstrate how the government is delivering against this Framework.

22. In *Build Back Better: our plan for growth*, and the *Innovation Strategy*, we set out our aim to unlock the potential of the £2.2 trillion held in UK pension schemes by addressing barriers to long-term investment. The government has established the Productive Finance Working Group, which published its roadmap for increasing productive finance investment in September 2021,⁷ and is progressing policy development through several Department for Work and Pensions consultations. These workstreams explore ways to make it easier for schemes to invest in alternative assets, including equity investment in innovative firms; creating the conditions for capital to flow into the UK's most promising firms will help ensure that finance is available for the innovation required to meet our net zero goals and improve outcomes for UK savers. Government will continue to engage closely with pension funds and the investment industry to understand the scope for industry-led initiatives that take advantage of innovation investment opportunities.

23. We will also provide the right conditions to attract private investment in R&D and innovation, including through tax and regulatory frameworks as well as policy signals from government. At Spring Budget 2021, the Government announced a review of R&D tax reliefs with the publication of a wide-ranging consultation. The review will ensure that the reliefs are up-to-date, competitive and well-targeted.

Case study: Energy Entrepreneur's Fund (EEF)

Since 2012, the UK government's Energy Entrepreneurs Fund (EEF) has awarded £72 million worth of grants, supported 156 projects, and leveraged more than £500 million in private investment – a figure that is still growing. The EEF supplies innovation grants for SMEs and start-up companies to back the development and demonstration of disruptive technologies whilst also supporting our decarbonisation targets.

Axis Energy Projects (AEP) was funded with over £200,000 with £40,000 of match-funding from the private sector. AEP tested floating offshore wind (FOW) technology in Edinburgh, Scotland simulating how FOW can be resistant to 100-year storm events in water depths of 65 – 100 metres. The project has increased technology readiness levels from 3 (research) to 6/7 (deployment). The programme has had

several achievements including supporting the displacement of over 21 million kilograms of CO₂ per year and it will also help to lower the Levelised Cost of Energy (LCOE) with a 30% reduction in comparison to other FOW designs and comparable offshore fixed installations. AEP's research and testing has also reduced the operating costs including low-cost deployment and reduced dependency on specialist vessels. A new company has been formed – Axis Energy TLB Ltd. – which will enable the commercialisation of the technology, having secured trademarks and patents around the world. A recent report from the Offshore Renewable Energy Catapult (OREC) predicts that the UK FOW industry could support up to 17,000 jobs by 2050 and generate a gross value added (GVA) of £33.6 billion.



Wider support

24. Non-financial support in the form of engagement with businesses is also key to the development and deployment of new technologies, systems, policies and business models to achieve net zero. This includes, for example, support provided through UKRI, its Knowledge Transfer Network, and other bodies like the Catapult network and Intellectual Property Office. It also includes UKRI's digital platform pilot programme, which will be used to bring net zero businesses together with investors for deal flow and to make information on companies more accessible to investors. The *Innovation Strategy* set out how we will build on this important support and provide advice, networking opportunities, skills development, and testing facilities. This includes a new online Innovation hub from Innovate UK, which will make it easier for businesses to navigate the government's funding offer, and expansion of the Innovate EDGE service which helps firms to enhance their investment readiness. More detail on our approach to green jobs and skills is set out in the *Green jobs, skills, and industries* chapter.

25. The *Innovation Strategy* also set out our ambition for government departments to procure more innovative solutions. Departments will produce clear policy problem statements that describe the priority outcomes that they want to solve or achieve. Alongside this, every major project⁸ should publish an outcome statement. Both measures will improve demand-signalling from departments, allowing them to procure innovation to accelerate the UK's transition to net zero. This will help us to leverage public procurement as a tool that drives greener and more resilient outcomes across public services.

International collaboration and leadership

26. Building on our approach domestically, we are committed to continued active membership of Mission Innovation as the primary forum to strengthen international cooperation on clean energy innovation which is essential for our long-term climate and energy goals. An ambitious second phase of Mission Innovation is a priority for government. We will provide global leadership and commit to co-leading missions to build a renewable-powered future and deliver low cost, low carbon hydrogen.

27. Elsewhere, UK participation in Horizon Europe, the world's largest collaborative research programme worth around €95 billion over the next decade, will help us reach our net zero goals. With a minimum of 35% of funding earmarked for climate change projects, this collaboration with other world leaders in net zero research will drive further progress.

28. Further detail on government's plans for international collaboration and leadership, including Mission Innovation, can be found in the *International leadership and collaboration* chapter of the strategy.

Case study: Horizon 2020

- **Secure, Clean and Efficient Societal Challenge** - Between 2014 and 2020, around €5.9 billion was allocated through Horizon 2020, to support non-nuclear research through the Secure, Clean and Efficient Energy Societal Challenge. This aimed to support transition to a sustainable and competitive system focused on efficiency, low carbon technologies and smart cities.
- **Nova Innovation** - Nova is an Edinburgh-based tidal energy device and project developer based in Edinburgh and Shetland. Nova was awarded a total of €32.9 million in funding from Horizon 2020, including €20 million funding from Societal Challenge for Secure, Clean and Efficient Energy for their projects investigating tidal energy. The project allowed Nova to access infrastructure that is not available in the UK, for example testing facilities in the Netherlands, and provided networking opportunities that led to Nova working with major multinational companies to create bespoke components.



4ii. Green Investment

Leading the world in green finance

Our Key Commitments

- Use the UK Infrastructure Bank (UKIB) to crowd in private finance, support more than £40 billion of investment, and pull through low carbon technologies and sectors to maturity and scale.
- Continue to issue green gilts following the success of the UK's debut sovereign green bond in September 2021, which aims to raise a minimum of £15 billion this financial year. Issue a National Savings & Investment Green Retail Savings Product.
- Support the British Business Bank's new objective to incorporate net zero and wider environmental, social and governance strategy across all activity, as well as the updated FCA and Bank of England's remit reflecting the importance of environmental sustainability and the transition towards net zero.
- Introducing new Sustainability Disclosures Requirements through *Greening Finance: A Roadmap to Sustainable Investing*, including through:
 - Becoming the first G20 country to make disclosures aligned to the Taskforce for Climate-Related Financial Disclosures (TCFD) mandatory across the UK economy.
 - Developing a UK Green Taxonomy and creating the Green Technical Advisory Group to advise on greenwashing and how to implement the taxonomy in a UK context.
- We published our roadmap setting out our approach to sustainability disclosures ahead of COP26. This includes a commitment to publish a second iteration of the *Green Finance Strategy* for the UK which will outline the pathway to net zero for finance in the UK.
- We will work with external partners and data providers to better track private investment into the net zero economy going forward.

The challenge

1. Both public and private investment will be crucial for any path to net zero. While we expect most investment to come from the private sector, market failures mean the private sector alone will not deliver emissions reductions and innovation at the pace required.

2. Our 2019 *Green Finance Strategy* demonstrated how the strategic use of public funds, long-term policy frameworks, and signalling can leverage private investment into the technologies and infrastructure that will be needed to deliver net zero. Each technology and sector will present its own challenges, and long-term government support for a large pipeline of projects will be needed.

Our goal

3. We will work with the private sector to deliver a world-leading net zero financial system, ready to seize the opportunities of net zero. Climate-related financial risk will be embedded into our regulatory frameworks to help guide capital flows to green investments.

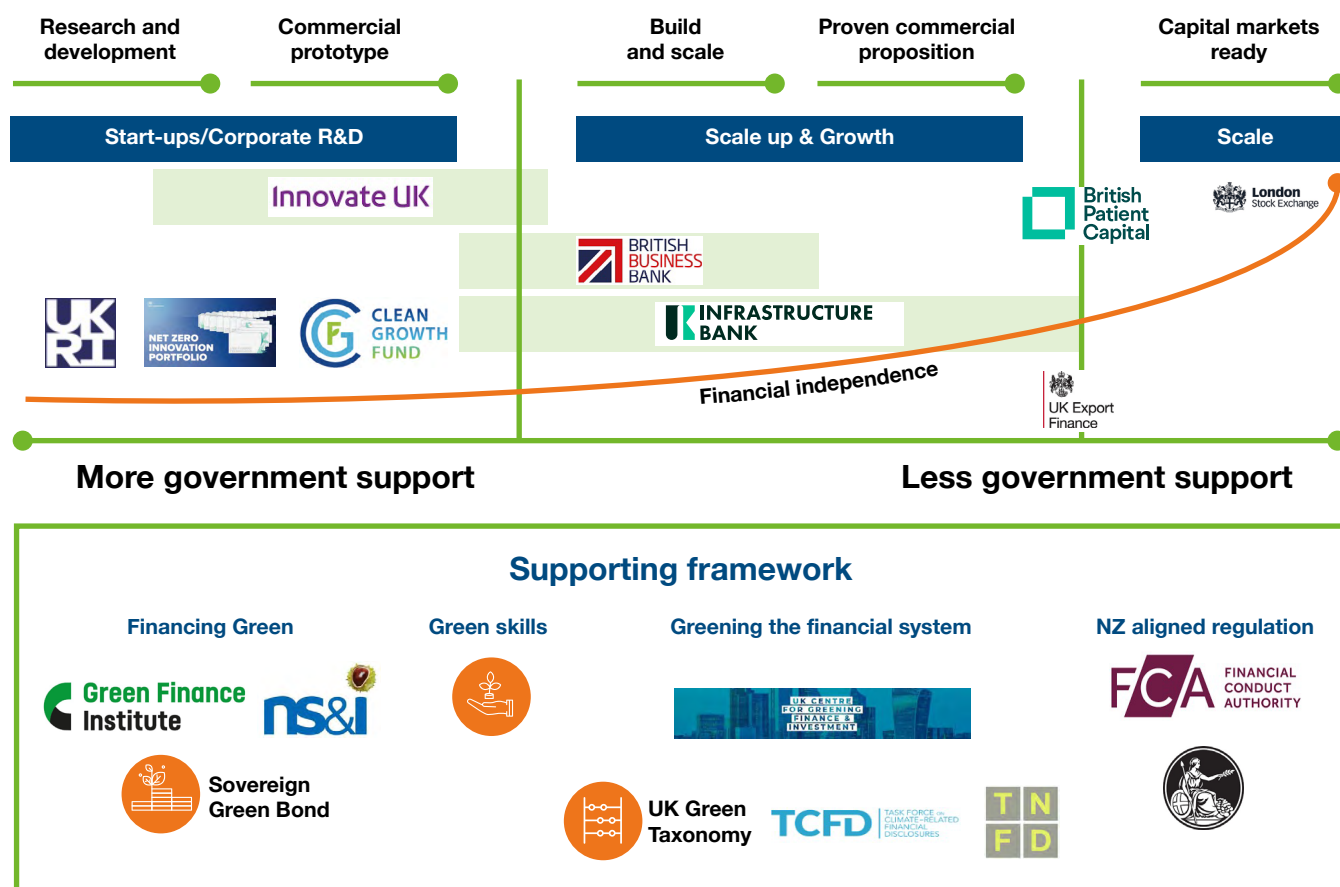
4. We estimate that additional capital investment must grow from present levels to an average of £50-60bn per year through the late 2020s and 2030s. Most of this investment will come from the private sector, providing new opportunities for businesses and investors.

5. This will mean supporting the full funding cycle, from emerging technologies through to infrastructure and project finance, to deliver the economic transition. Each green technology and infrastructure will require different types of financial support depending on its maturity, as shown in figure 28. We must engage all types of capital, from early-stage grant and angel investment through to institutional finance like pension fund investors.

6. The UK is a world leading financial hub, with access to global capital pools, outstanding professional services, and a robust legal and regulatory framework. As such, the UK financial services industry is poised to enable private capital to flow into our net zero investment needs.



Figure 27 - Public Finance Interventions across the different stages of commercialisation⁹



7. Public funds will be used strategically to support new technologies, as well as emerging sectors, as they move from the innovation stage through to commercialisation and deployment. Early-stage R&D is supported by various government grants. Later-stage organisations can reach commercialisation and benefit from investment through the Clean Growth Venture Capital (VC) Fund or support from the British Business Bank (BBB). These stages of support are essential for scaling the necessary technologies and supporting the growth of businesses aligned to meeting our net zero ambitions.

8. Providing the suitable conditions for regulatory and early-stage innovation is a significant part of our Net Zero Strategy, but we must also mobilise the wider financial sector to meet the upfront investment challenge. This means stimulating new ways of providing information to markets on green investment and exposure to climate related financial risk, and providing the investment conditions to mobilise private capital into a portfolio of net zero financing.

9. We are driving more disclosure and transparency in the markets on climate risks and opportunities through the introduction of Sustainability Disclosure Requirements, as outlined in *Greening Finance: A Roadmap to Sustainable Investing*. These bring together and streamline UK sustainability reporting requirements, including reporting aligned with the Taskforce for Climate-Related Financial Disclosures (TCFD) recommendations and UK Green Taxonomy disclosures.

10. Targeted public intervention via the British Business Bank (BBB), UK Export Finance and the UK Infrastructure Bank (UKIB) will pull through investment from the private sector. For instance, British Patient Capital, a commercial subsidiary of the BBB, is contributing to the transition to net zero through its existing investment strategy: 9% of its underlying investment portfolio is in clean growth, sustainability, and mobility companies.

11. This builds on the growing voluntary commitments from financial institutions to a net zero transition that are already pivoting financial flows towards net zero in the run-up to COP26.¹⁰ For example, the Glasgow Financial Alliance for Net Zero (GFANZ), which was launched as part of the COP26 Presidency, brings together many of the world's biggest banks, asset owners, asset managers, insurers and service providers that are credibly committed to achieving net zero emissions. Using the UN's Race to Zero as the entry criteria, the gold standard for net zero commitments, GFANZ has raised, deepened, and broadened the global financial sector's net zero ambitions. GFANZ has launched an ambitious body of technical work to support net zero aligned investment and accelerate the transition to a net zero financial system and global economy.

12. We will publish an update to the *Green Finance Strategy* in 2022 which will include a net zero transition pathway for the UK financial sector. This will set out how this crucial sector will transition to net zero as a whole.

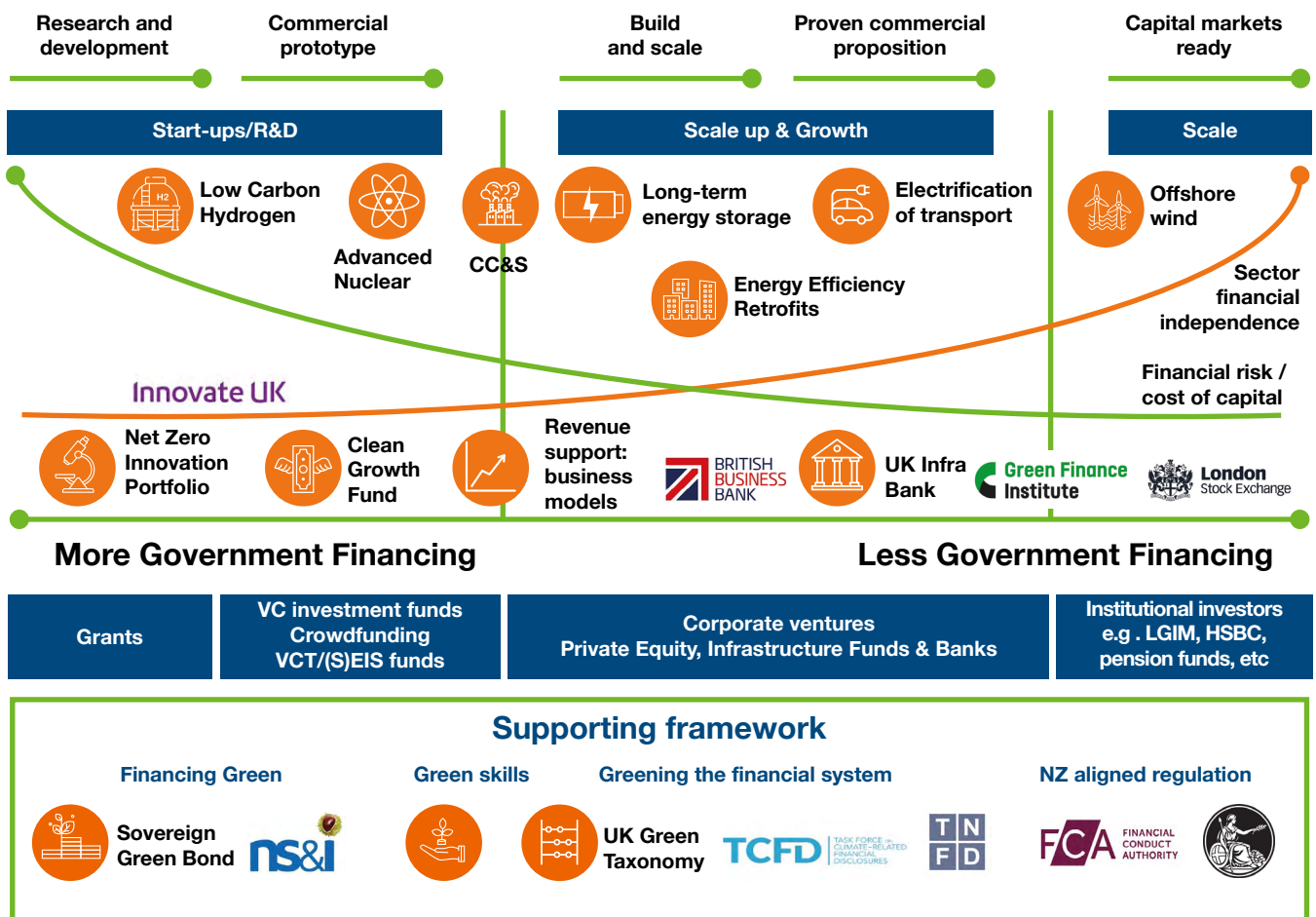


Financing green

13. The scale of the net zero challenge and persistent market failures mean that public sector intervention is needed to shape and accelerate the flow of private capital. The right policy signals can act as a catalyst for private sector investment, as shown by by £90 billion of new investment in renewable energy since 2012, in part facilitated by the Electricity Market Reforms (EMR).¹¹ By bringing down the cost of capital through strong policy frameworks, we will reduce the financing costs of reaching net zero, delivering a better deal for the taxpayer.

14. The pathways set out in this strategy demonstrate that, whilst each sector requires its own policy framework, there are cross-cutting interventions required to support the transition to net zero. We will replicate the success of offshore wind and take actions to secure access to finance across the economy, ensuring that all sectors are able to access private investment going forward. For example, the Industrial Decarbonisation and Hydrogen Revenue Support (IDHRS) scheme (see paragraph 19), will unlock private sector capital for industrial carbon capture and hydrogen production projects by providing long-term certainty to investors, de-risking revenue streams in these sectors.

Figure 28 - Low carbon sectors commercial maturity and associated capital requirements¹²



15. Through the net zero innovation portfolio, funding is provided for low carbon technology innovation. As these technologies, and sectors, commercialise, they can benefit from further investment readiness support to help them access repayable private finance. For example, the Natural Environment Investment Readiness Fund (NEIRF),¹³ launched by Defra and the Environment Agency in 2021, will build the portfolio of potential investments for net zero investors in nature.

16. Some of these technologies may also avail of venture capital to allow them to scale rapidly. Government has shown its support for this necessary innovation underpinning its clean growth objectives with a £20 million cornerstone investment in the venture capital Clean Growth Fund¹⁴. This Fund aims to accelerate the deployment of innovative clean technologies that reduce greenhouse gas emissions, alongside catalysing the UK clean growth venture capital market and leveraging private sector funding into early-stage clean tech start-ups. For example, the fund led a £4.7 million investment round into Piclo (the independent energy trading marketplace) with co-investment from Mott MacDonald Ventures.

17. The BBB is a government-owned economic development bank with a mission to drive sustainable growth and prosperity across the UK, and to enable the transition to a net zero economy, by improving access to finance for smaller businesses. UK Government has worked with the BBB on their new mission and objective to support the UK's transition to a net zero economy and incorporate environmental, social and governance issues across of its activities. The new net zero objective will support firms looking to move towards net zero, helping the UK reduce its energy consumption and mitigate the impacts of climate change.

18. Going beyond SME finance to larger scale infrastructure finance, there are significant pools of private finance ready to deploy into UK projects but there can be a mismatch between market appetite and the risk profile of projects. Infrastructure investment is vulnerable to market failure, as it is often complex, large, novel and long-term. Launched in June 2021, the new UK Infrastructure Bank can play a pivotal role in this space, crowding in private sector investment in important areas and helping to kick start new sectors. Across the Bank's full mandate (also covering regional growth), it has £12 billion of equity and debt capital and will be able to deploy £10 billion of government guarantees. We expect the Bank to use this to crowd in private investment as a cornerstone investor or guarantor to enable more than £40 billion of investment in the areas most prone to market failure, and to help deliver its dual policy focus of tackling climate change and supporting regional and local economic growth. Furthermore, the Bank will play a pivotal role in catalysing the role of local government in the transition, by financing strategic infrastructure projects led by local authorities, and providing advice and expertise in order to strengthen the pipeline of investable projects.

19. Industries will need to be supported in their transition away from high carbon emitting operations. For example, the IDHRS scheme will provide a revenue mechanism to enable deployment of industrial carbon capture and hydrogen production. UK Export Finance (UKEF)'s Transition Export Development Guarantees (TEDG), launched in 2020, will ensure that businesses, including those in the supply chain, are supported at all stages of their transition journey. This product can be used by a company for working capital, capital expenditure or R&D needs, provided they have a credible transition plan. The first TEDG was announced in August with UKEF providing an 80% guarantee on the £430 million commercial loan to Wood Plc. This support from UKEF will help Wood to continue to capitalise on opportunities linked to clean

energy, hydrogen and decarbonisation. Furthermore, this instrument will support the export of low carbon technology from the UK as evidenced by this guarantee which will support Wood to take advantage of green trade opportunities.

20. The UK financial system is also taking a global leadership role transition financing and sustainable finance more widely. An example of transition finance leadership is the London Stock Exchange Group (LSEG) which was the first exchange globally to launch a dedicated Transition Bond Segment. This distinct transition label is the application of globally recognised standards, enhancing visibility and providing assurance to issuers and investors. We have seen the financial sector in the UK take the lead in net zero transition (for example, through the Glasgow Financial Alliance for Net Zero¹⁵) as well as leading financial innovation (such as Green Home Finance Innovation fund).

21. The Chancellor, in his Mansion House speech¹⁶ in July 2021, set out how the government will ensure that the financial system in the UK plays a major role in the delivery of the UK's net zero target and ambition for a 'nature positive' future. This will build on the investment principles outlined in the 25 Year Environment Plan including 'do no significant harm' to the environment with investment, and implement a series of programmes aimed at building the portfolio of investable assets across the UK. This will involve providing grant programmes like the Natural Environment Investment Readiness Fund (NEIRF) to help nature-based projects become investment ready, but also providing capital through public-private impact funds such as the Big Nature Impact Fund to leverage in private finance. In addition to investing in climate and environmental solutions, government is also committed to ensuring sufficient private capital is available for investment into adaptation and resilience measures.

22. Furthermore, the government is supporting the development of a Taskforce on Nature-Related Financial Disclosures (TNFD). This will provide a framework for corporate and financial institutions to report and act on evolving nature-related risks to support a shift in global financial flows away from nature-negative outcomes and toward nature-positive outcomes. This market-led, global initiative will build, consult on, and test, its framework over the next 2 years and will be designed to complement the TCFD by building on its 4-pillar approach and drawing on its lessons learnt.

23. These interventions are important to driving the desired 'nature-positive' future. As set out in the Prime Minister's *Ten Point Plan*, we hope that the UK will also become a leader in high-quality voluntary carbon markets (VCMs). For these private markets to scale successfully in support of net zero, their integrity and use as an addition (rather than alternative) to rapid decarbonisation will be critical. The government is closely following the important work of various sector-led initiatives including: the Taskforce for Scaling Voluntary Carbon Markets (TSVCM); the Voluntary Carbon Markets Integrity Initiative UK VCM Forum; and, the Financing UK Nature Recovery coalition.

24. The UK Government issued its inaugural green gilt on 21 September 2021. This was a landmark transaction for sterling markets and the UK. At £10 billion, it was the largest sovereign green bond issuance to date and attracted the largest ever order book for a sovereign green bond. The inaugural green gilt also achieved the largest "greenium" for any debut sovereign green bond to date, demonstrating good value for money for the taxpayer (a "greenium" refers to more favourable pricing achieved by the issuer of a green bond compared to that for a hypothetical, equivalent conventional bond). The UK will then be following up with a second issuance in mid-to-late October, as the UK looks to build out a green yield curve. This

followed the successful publication of the UK Government Green Financing Framework on 30 June 2021, which outlines how proceeds raised from the green gilts will help tackle climate change, biodiversity loss and other environmental challenges.

25. NS&I will issue its retail Green Savings Bonds later in 2021. These bonds will be the first standalone retail product to be tied to a sovereign's green bond framework and will allow all UK savers to contribute to the fight against climate change and the government's other environmental objectives. It gives UK savers the opportunity to take part in this collective effort to tackle climate change by contributing to public spending on green, whilst increasing awareness in the government's green initiatives. This series of wholesale and retail green financing issuances demonstrate the UK's commitment to sustainable finance ahead of COP 26 in November.

26. We are also committed to tracking finance flows, to complement how we measure carbon. Hence, we will be working with external partners and data providers to better track private investment into the net zero economy going forward. This will enable the UK to robustly, and regularly, assess the alignment of the UK's financial flows with net zero.

27. The UK launched the Green Finance Education Charter in our 2019 *Green Finance Strategy*,¹⁷ reflecting the need for UK and global financial services industries to develop the capabilities of their workforce in green finance principles and practice. Since then, twelve leading professional bodies representing over 1 million finance professionals have signed up to the Charter, hosted by the Green Finance Institute. To further build UK capacity, capability and climate leadership, we will look to expand Charter membership to universities and others, and work with the Institute for Apprenticeships and Technical Education (IfATE). We will also seek to internationalise the Charter by encouraging similar development overseas.

Case study: The Green Finance Institute model

The Green Finance Institute (GFI) was established in 2019 with funding from HMG and the City of London Corporation, though it operates independently of government and is commercially focused.

Sitting at the nexus between the public and private sectors, the GFI provides critical guidance to government and the financial sector and delivers programmes which mobilise investment and lending towards real economy outcomes. Through the application of the GFI's rigorously designed financing solutions, they have already identified and co-designed effective interventions that have deployed capital towards a net zero, carbon resilient economy.

The GFI primarily operates by convening and leading coalitions of global experts that focus on different sectors and seek to identify scalable financial solutions that accelerate sector-specific transitions to a low carbon future.

There are several coalitions and initiatives that the GFI now operate:

- The Coalition for the Energy Efficiency of Buildings (CEEB) is the GFI's flagship programme, set up in 2019 to develop the market for financing a net-zero climate-resilient built environment. Today, the CEEB has over 300 members and accounts for 70% of the UK mortgage market. This work is now expanding into Europe.
- In September 2020, the CEEB launched the Green Home Finance Principles, in collaboration with the Loan Markets Association, to embed transparency and consistency into the green home finance market. Today, the Principles have supported 11 financial institutions with combined mortgage balances of +£480 billion to launch, or commit to launch, green lending products that minimise the risk of greenwashing.
- The Coalition for the Decarbonisation of Road Transport (CRDT) was established in May 2021 to unlock financial barriers to the decarbonisation of road transport and enabling infrastructure.
- The GFI played a key role in the Dasgupta Review and is also working on a series of potentially transformative funding mechanisms to support the UK's 25-year Environment Plan alongside Defra and the Environment Agency.
- The GFI was appointed Chair and convener of the Green Technical Advisory Group (GTAG), tasked with providing independent expert advice to government on how to implement a taxonomy in the UK.
- The GFI is also hosting the Executive Secretariat for the Taskforce on Nature-related Disclosures and launching an initiative this November to unlock the barriers to channel private finance towards nature in the UK.
- In partnership with the City of London Corporation, the GFI will host a Green Horizon Summit at COP26, which will focus on mobilising capital in the transition to net zero.

Greening finance

28. Financing the technologies required for our transition to net zero is only part of the solution. The transition represents both a risk and an opportunity for the real economy and the financial system that supports it. It is therefore vital that climate-related financial risks and impacts are factored into investment decisions and reflected in the cost of finance for different technologies and companies. To achieve this, we will harness the international reputation of the UK's leading financial sector to encourage private investment to support low carbon innovation and manage climate-related financial risk.

29. As the Chancellor outlined in his Mansion House speech,¹⁸ the government intends to introduce economy-wide Sustainability Disclosure Requirements covering the whole economy. This will include requirements to report on businesses and investment products impact on the climate and environment, as well as the risks and opportunities these impacts pose to business. Our approach is detailed in *Greening Finance: A Roadmap to Sustainable Investing*.

30. The UK has already established itself as a world leader on green finance regulation, becoming the first G20 country to make disclosures aligned with the Task Force on Climate-related Financial Disclosures (TCFD) recommendations fully mandatory across the economy by 2025. As part of the roadmap to delivery, BEIS consulted earlier in the year on mandatory climate-related financial disclosures by publicly quoted companies, large private companies and the largest Limited Liability Partnerships (LLPs) from the 6th April 2022. Following widespread support for the proposals, we will shortly be setting out regulations to bring this into force, including a requirement for scenario analysis - a powerful tool to support companies in their assessment of climate-related risks and opportunities.

31. Alongside measures to implement mandatory disclosures aligned with the TCFD recommendations for companies and LLPs:

- The Financial Conduct Authority has already introduced a listing rule for premium listed companies which commenced on 1 January 2021. This requires companies to include a statement in their annual financial report which sets out whether their disclosures are consistent with the recommendations of the TCFD, and to explain why if they have not done so.
- Government introduced regulations, in force from 1 October 2021, to require pension schemes with £5 billion or more in assets to report in line with the TCFD's recommendations. By October 2022, over 80% of members of occupational pension schemes – and more than 70% of assets under management – will be in schemes reporting in line with the TCFD recommendations.

32. Our stated objective is to increase the quantity and quality of climate-related financial disclosures in a proportionate manner. This is to ensure market participants have better information to adequately understand climate-related financial risks and opportunities to support the transition to net zero.

33. In November 2020, the Chancellor announced that the government is implementing a UK Green Taxonomy. This will clearly set out the criteria which specific economic activities must meet to be considered environmentally sustainable. The first two Technical Screening Criteria (TSC) on climate change mitigation and adaptation will be made by the end of 2022. To support the development of the TSCs, we have since announced the appointment of a Green Technical Advisory Group (GTAG) in June 2021. Made up of a range of financial

and business stakeholders, taxonomy and data experts, and subject matter experts, and chaired by the Green Finance Institute, this will provide independent, non-binding advice to the government on developing and implementing a Green Taxonomy in the UK context. For example, we have established an Energy Working Group as part of the GTAG to provide advice on key technologies such as hydrogen and carbon capture and storage. Taken together, these enhanced Sustainability Disclosure Requirements will support companies to communicate clear and credible low carbon transition plans needed by investors.

34. Key to delivering enhanced disclosure on climate change is the availability of data financial institutions can use. The UK Centre for Greening Finance and Investment (CGFI) is a national centre established to accelerate the adoption and use of climate and environmental data and analytics by financial institutions internationally. CGFI will equip financial institutions with the tools and capacity required to effectively allocate capital to meet net zero ambitions and ensure global UK leadership in green finance and green finance data and analytics.



Case study: Providing a net zero-aligned regulatory environment

In March 2021, the Chancellor outlined his recommendation to regulators that they should “have regard to the government’s commitment to achieve a net zero economy by 2050”. There has already been significant work by the Bank of England and the Financial Conduct Authority.

The Bank of England

The Bank’s approach to climate change is to play a leading role, through its policies and operations, in ensuring the financial system, the macroeconomy, and the Bank of England itself, are resilient to the risks from climate change and supportive of the transition to a net zero emissions economy.

Recent actions to deliver this include:

- In April 2019, the Bank published a comprehensive set of supervisory expectations for how banks and insurers should enhance their approaches to managing the financial risks from climate change. This was followed up in July 2020 with a Dear CEO letter, which included additional guidance and set a deadline for firms to embed fully these expectations by the end of 2021.
- In June 2021 the Bank launched its Climate Biennial Exploratory Scenario (CBES) exercise to assess the resilience of individual banks, insurers, and the wider UK financial system to three different climate scenarios. These scenarios are based on those published by the international central banks and supervisors Network for Greening the Financial System (NGFS), of which the Bank is a founding member and where it chairs the workstream developing the NGFS climate scenarios.
- In November 2020, the UK joint regulator and government TCFD Taskforce, of which the Bank is a member, published an interim report and roadmap for mandatory TCFD-aligned disclosure requirements across the economy by 2025.
- The Bank has also sought to lead by example and in 2021 became the first central bank to publish a climate-related financial disclosure which included analysis of financial asset portfolios held for monetary policy purposes. The Bank also committed to reduce the emissions from its physical operations to net-zero by 2050 at the latest.

The Financial Conduct Authority (FCA)

The FCA’s work on climate change and sustainable finance aims to make sure market participants can manage the risks, impacts and opportunities from moving to a more sustainable economy and can capture opportunities from the net zero transition. Key developments in 2021 include:

- Introducing a TCFD-aligned Listing Rule for premium-listed commercial companies, and consulting on new proposals to extend the application of the rule to issuers of standard listed equity shares, and to implement new disclosure rules for asset managers, life insurers, and FCA-regulated pension providers with a focus on the information needs of clients and customers;
- Co-chairing work on climate-related and sustainability disclosures at the International Organisation of Securities Commissions and the Financial Stability Board;

Net Zero Strategy: Build Back Greener

- Issuing a supervisory letter to the chairs of Authorised Fund Managers, including a set of guiding principles to help clarify the FCA's expectations for the design, delivery and disclosure of retail responsible and sustainable funds – both as applications are submitted for authorisation and on an ongoing basis;
- Launching a comprehensive innovation work programme on sustainability, including the announcement that the next cohort of the Digital Sandbox Pilot will focus on sustainability and climate change; the FCA has begun work with the City of London Corporation and industry to support the development of solutions to ESG data and disclosures issues via a digital testing environment, and is aiming for this environment to go live in Q1 2022; and,
- Alongside the other financial regulators, publishing an inaugural Climate Adaptation Report (CAR) setting out the actions the FCA and financial services industry are taking to adapt to the challenges of climate change; the CAR will include a chapter on net zero which will explore net zero commitments, targets, tools and challenges.



4iii. Green Jobs, Skills, and Industries

Creating the skilled workforce to deliver net zero and putting UK supply chains at the forefront of global markets

Our Key Commitments

- Publish sector and supply chain development plans for key low carbon sectors and work with business to encourage investment in green skills and industries in the UK.
- Publish a UK Critical Minerals strategy, setting out our approach to securing technology-critical minerals and metals.
- Support the development of a skilled, competitive supply chain for key green industries in the UK.
- Reform the skills system so that training providers, employers and learners are incentivised and equipped to play their part in delivering the transition to net zero – including by legislating for skills required for jobs that support action on climate change and other environmental goals to be considered in the development of new local skills improvement plans.
- Deliver a Lifetime Skills Guarantee and grow key post-16 training programmes (such as apprenticeships, Skills Bootcamps and T levels) in line with the needs of employers in the green economy, helping individuals get the training they need for a job in the green economy, either at the start of their careers or when retraining or upskilling once already in the workforce.
- Introduce a sustainability and climate change strategy for education and children's services which will include a focus on equipping children and young people with the knowledge and skills they need to contribute to the green economy.

The Challenge

1. The national and global shift towards net zero provides a once in a generation opportunity to level up the country, create new green jobs, and put the UK at the forefront of growing global markets in green technologies. Delivering on this promise, whilst meeting our ambitious climate and environmental targets, will be in a large part dependent on having a sufficiently skilled workforce and robust, competitive supply chains in the UK.

2. Recent developments have thrown into sharp relief the inherent vulnerabilities associated with complex global supply chains and shocks to the global economic system. The transition to net zero will change the nature of the UK's critical supply chains. Our aim is to help ensure that supply chains critical for the transition to net zero are secure, ensuring that we have access to the materials, minerals, and chemicals that our growing green economy will need. Our approach is that there is no "one size fits all" model for building resilience in individual supply chains: often a combination of levers may be the best solution to address a vulnerability.

3. We will need tens of thousands of engineers to build and maintain new offshore wind farms off the coasts of northern England and Scotland, construct nuclear power stations in the South of England, and manufacture electric vehicles in the Midlands; skilled builders and trades people to retrofit homes and buildings across the country; and conservation and biodiversity professionals to deliver nature-based solutions to climate change.

4. Alongside a broader shift to digitisation and automation, we can expect the transition to net zero to be one of the dominant labour market trends in the next 30 years: approximately 6.3 million jobs in the UK, about one in five, are likely to be affected by the transition to a green economy, with workers experiencing either an increase or decrease in the demand for their skills.¹⁹

Our Goals

5. The government's ambition is to:
- Support up to 440,000 jobs across net zero industries in 2030, contributing towards a broader pivot to a greener economy which could support 2 million jobs in green sectors or by greening existing sectors by:
 - Working with business to grow green industries, supply chains and skills in the UK, and ensure our resilience to international changes in supply chains; and,
 - Using our net zero policy and funding to promote the growth of green skills and the green economy.
 - Enable workers, industries, and places to transition to a net zero economy by 2050, and support industry to develop the skilled workforce to deliver a green industrial revolution by:
 - **Reforming the skills system** to make it more responsive to the needs of employers, so that training providers, employers, and workers are incentivised and equipped to support the transition to net zero;
 - **Ramping up support for workers in the high carbon economy to transition to green jobs;**
 - **Working with business to ensure people from all backgrounds can access the opportunities in the green economy**, including through career advice; and,
 - **Providing children and young people with the high-quality education and training they need to work in a future green career**, through improving teacher training and development in STEM and other key subjects, and expanding post-16 training programmes in line with the needs of the green economy.

The Green Jobs Taskforce

To better understand how the UK could grasp opportunities of the Green Industrial Revolution, the Department of Business, Energy and Industrial Strategy and the Department of Education launched the Green Jobs Taskforce in November 2020. The Taskforce provided an independent assessment of the potential skills and labour market impacts of the net zero transition, including how we can ensure green jobs are open to all and support workers to transition to the green economy.

The independent Taskforce, which included representatives from industry, trade unions, the skills sector and community organisations, took a broad view of green jobs, as “employment in an activity that directly contributes to, or indirectly supports, the achievement of the UK’s net zero emissions target and other environmental goals, such as nature restoration and mitigation against climate risks.” Its report, published in July 2021, included 15 recommendations for government, industry and the skills sector, which focused on three themes across the “life cycle” of green jobs: driving investment in net zero to support good quality green jobs in the UK; building pathways into good green careers; and supporting workers in the high carbon economy to transition.

The ideas generated through the Taskforce and its engagement with industry have informed the development of this Strategy.

Working with business to grow green UK industries and resilient supply chains

6. The investment needed for the transition to net zero will primarily be delivered by the private sector. As such, our first priority is to provide businesses, investors, workers, and skills providers with policy certainty to unlock investment, ensuring we support green industries to develop in the UK.

7. In line with *Build Back Better: Our Plan for Growth*, we are taking action across a range of low carbon industries with the greatest economic potential and competitive strength. In doing so, we will support the growth of UK supply chains and create new opportunities for UK businesses and level up the country. We are acting to build green industries such as offshore wind in North East England and in Scotland, carbon capture and hydrogen production in our industrial heartlands, electric vehicles manufacture in the midlands and Northeast of England, and the restoration and protection of nature in rural areas.

8. We also recognise that the starting position when building resilience in critical supply chains should be to take a market-first approach. The UK prospers under an open economy and openness itself confers resilience. We will leverage the UK's competitive strengths across the supply chain, while deploying those levers available to the Government – including UK Export Finance and the new Office for Investment – to ensure that we exploit our strengths, while supporting those areas that could be vulnerable to global shocks.



Case studies: Driving investment into green supply chains in the UK

The Prime Minister's *Ten Point Plan*, and our subsequent sectoral strategies, put in place a range of funding and policy initiatives to enable green industries and supply chains to develop in the UK, supporting our ambition to deliver on green jobs:

Building the Offshore Wind Supply Chain

Announced as part of the *Ten Point Plan*, the UK's offshore wind manufacturing industry has already seen almost £1.5 billion of investment unlocked by the £160 million Offshore Wind Manufacturing Investment Support scheme, which aims to further develop the UK's offshore wind capabilities. The investments have seen a significant boost over the summer with up to 3,600 jobs supported across the Humber region. This continues to lay the groundwork to deliver 40 GW of energy from offshore wind by 2030 and for UK businesses and workers to take full advantage of the booming offshore market in the UK and internationally, support up to 60,000 jobs in the industry and its supply chain, and help eliminate the UK's contribution to carbon emissions by 2050.²⁰

We are preparing for the next wave of deployment around the UK, with world leading 1 GW deployment targets for innovative floating offshore wind turbines. The government has set up a floating offshore wind demonstration programme to support development of state-of-the-art technologies and products in the floating offshore wind industry.

Net Zero Hydrogen Fund

Government has set an ambition to deploy 5 GWs of low carbon hydrogen production capacity in the UK by 2030, supported by

a package of measures including the Net Zero Hydrogen Fund (NZHF). The NZHF will kickstart the hydrogen economy in the early 2020s by supporting projects with upfront costs, stimulating private sector investment, and developing the pipeline of projects needed to deliver hydrogen production at scale by 2030.

Transforming automotive manufacturing

The UK is already capitalising on opportunities from the global shift to electric vehicles, as demonstrated by recent investments made by Stellantis in Ellesmere Port, and Nissan and Envision AESC in Sunderland. Allocating a further £350 million of our up to £1 billion Automotive Transformation Fund (ATF) to support the electrification of UK vehicles and their supply chains. This will help ensure the UK maximises the benefits from the transition to a zero emission vehicle future and support tens of thousands of high-quality green jobs across the UK. Government and industry have also jointly committed around £1 billion through the Advanced Propulsion Centre for collaborative research and development in the next generation of low carbon vehicle technologies. A further £318 million of government funding has been provided to put the UK at the forefront of the design, development, and manufacturing of electric batteries through the Faraday Battery Challenge and nearly £80 million to Driving the Electric Revolution to accelerate growth in the supply chain for power electronics, machines and drives.

Driving investment and jobs in the natural environment

Government's Green Recovery Challenge Fund is supporting over 150 projects across England that are tackling climate change, restoring nature, and supporting 2,500 green jobs. The Nature for Climate Fund is also contributing to net zero and creating and supporting green jobs by funding new woodland creation and peatland restoration. In addition, the £9 million Natural Environment Investment Readiness Fund is stimulating a pipeline of nature projects that can attract private sector investment.

9. We are working in partnership with our world-class sectors to enable them to take part in the transition, for example through the *North Sea Transition Deal*, which committed to focusing on supporting the transformation of the oil and gas supply chain to service the low carbon energy sector. Building on this, we have established the Energy Supply Chain Taskforce (UKESC) as a joint enterprise between industry and government to guide policy making and maximise the jobs and business opportunities from the transition in the UK. The UKESC cover all energy sectors and regions of the UK and, building on work already underway, it will map the energy project pipeline and identify higher value segments of the supply chain to prioritise in the UK.

10. The *Integrated Review Security, Defence, Development and Foreign Policy* committed to ‘a resilient UK able to withstand and proactively tackle the challenges of today and the future’, including a specific focus on supply chain resilience, committing to ‘using all our economic tools and our independent trade policy to create economic growth that is distributed more equitably across the UK and to diversify our supply chains in critical goods’. Similarly, the *Plan for Growth* outlines the importance of international markets to ensuring diverse supply sources for the goods and services we need, improving the resilience of our supply chains and benefitting prosperity.

11. The development of resilient, efficient, and competitive supply chains will be a collaborative strategic endeavour. To support this, in May 2021 we published the *CCUS Supply Chain Roadmap*, which sets out how government and industry can work together to harness a strong UK supply chain, and we have committed to publish a hydrogen sector development action plan in 2022, which will outline how the government will support companies to secure supply chain opportunities, skills and jobs in the sector. We will build on this by working with industry to publish further sector and supply chain development plans for those low carbon sectors where the UK has the potential to capture an economic advantage. This will include ensuring we are resilient to international changes in supply caused by external shocks, including climate-related disruption, spikes in global demand, rising commodity costs, or artificial constraints on supply. For example, we will need to ensure we have access to a diverse range of sources of chemicals, given they feed into 95% of our manufacturing base. As we move forward, where possible, government will provide more visibility around planned deployment cycles to increase the opportunity for suppliers to invest in long-term production, infrastructure, and training.

Deep Dive - Critical Minerals, Supply Chains and Net Zero

The transition to Net Zero means new supply chains are becoming critical to the UK's energy production. Critical minerals are metals and non-metals that are vital for a defined economic activity and for the well-being of the country, yet whose supply may be at risk owing to geological distribution, lack of substitutes and/or other factors. Such minerals provide materials essential for components in many of today's rapidly growing clean energy technologies – from off-shore wind turbines to electric vehicles. The World Bank suggests that the production of minerals such as graphite, lithium and cobalt, could increase by nearly 500% by 2050 to meet the growing demand.²¹

The government is committed to working with industry and with international partners to safeguard these supply chains and our future economic resilience. We are actively supporting the adoption of transparent, ethical and responsible mining practices, reflecting environmental, social and governance (ESG) considerations, and are participating in the development of global standards through the British Standards Institution.

We will establish an Expert Committee on Critical Minerals to provide independent advice to government on the scope and content of a critical minerals strategy and will publish an updated list of these minerals to guide investment decisions. We will establish a Critical Minerals Intelligence Centre to provide robust, dynamic analysis on stocks and flows to guide our decision-making.

Going forward, the government will publish a UK Critical Minerals strategy in 2022, setting out our approach to securing the technology-critical minerals and metals aimed at:

- Ensuring the UK has a reliable supply of critical minerals and metals;
- Establishing an enabling environment for growing the sector in the UK;
- Showing leadership through working bilaterally and multilaterally to support work on international standards to extend and strengthen the circular economy in technology-critical minerals;
- Ensuring our work to build critical mineral supply chain resilience supports our international development priorities;
- Using our R&D resource to build a better understanding of markets and prices to help mitigate the impact of supply shocks and demand spikes, and to enable better foresight and early intervention; and,
- Work with UK industry (including SMEs) to consider how private and public sectors can better share risks to promote investment and drive innovation at all levels.

We will support the engagement of the UK's mining sector in new and existing markets, facilitating investment and collaboration in extraction and processing opportunities. We will also champion free and open global trade including through Free Trade Agreements to support this ambition and will explore use of Freeports to support opportunities for the UK to develop as a critical minerals processing hub supplying Europe and beyond.

Supporting workers, industries, and places to transition and develop the skills needed to deliver net zero

12. There are urgent and emerging skills challenges across the green economy which we will need to address over the short and long term if we are to meet our ambitions for a Green Industrial Revolution. We aim to quadruple our offshore wind capacity to 40 GW, with the growth in this sector supporting up to 60,000 jobs in 2030.²² In the construction and heating sectors, up to 230,000 skilled trades people could be required in 2030 to deliver the retrofitting of houses²³ and to meet our ambition of installing 600,000 heat pumps a year by 2028, we will need to rapidly increase the number of qualified installers from around 3,000 to 35,000 within the next 7 years.²⁴ As the automotive manufacturing sector transforms to producing electric vehicles, as many as 50,000 workers in the UK's automotive manufacturing sector could need reskilling by 2025.²⁵ In forestry and its supporting sectors, industry estimates point to projected labour demand of approximately 2,000 jobs over the next five years.²⁶

13. As well as specialists in these sectors, employers will also need workers with wider cross-cutting skills to deliver net zero, including digital and data skills, project management, communications and change management.²⁷ There will also be increased need to work in a multidisciplinary way due to the way work will change in some sectors such as whole house retrofitting will need knowledge of multiple technologies.²⁸

14. The impact of the transition on the labour market will not be evenly spread across the UK, reflecting the geographical distribution of where existing industries will need to adapt and others new ones will flourish.²⁹ However, there are opportunities for workers in transitioning sectors, such as oil and gas, to utilise their specialist skills in key important green sectors, sectors such as hydrogen and CCUS with these two sectors expected to grow from the middle part of this decade.

Working with industry and key partners to support good green jobs and skills

15. Industry and government will need to take action to ensure the UK has the skilled workforce to deliver net zero and that workers, industries and places are supported on the transition. This will be particularly important given the pace and scale of the change, and the specific challenges faced by smaller companies in some sectors and supply chains. To drive this forward we have announced a cross-cutting delivery group to include representatives from industry, the skills sector and other key stakeholders to support the development and delivery of the Government's plans for green jobs and skills. We will set out further details of the membership and mandate of the cross-cutting delivery group later this year.

16. To support this work, and monitor our progress, it is vital that we continue to develop the evidence on how net zero will impact jobs and skills. The Office for National Statistics will seek to refine our understanding and measurement of the green economy as the UK transitions to net zero, including looking at such issues as quality of work and diversity within the green economy.

17. Join up between local bodies, employers and local communities will be key to ensuring an effective transition. Building on the measures set out in the *Local Climate Action* chapter, and our skills system reforms, we will assess how local areas are working to support workers and communities with the net zero transition across England.

18. We want to see continuous improvement in the quality of jobs in the UK, both in the creation of new high-quality jobs which support Government priorities such as net zero, and through in-work progression. We will continue to drive this agenda forward through the Employment Bill, which will support our ambition to make the UK the best place in the world to work and grow a business, and the cross-cutting delivery group will consider how government and industry can work together to ensure green jobs are good jobs.

19. While skills policy is a devolved matter, the Government also welcomes close engagement with the devolved administrations, Mayoral Combined Authorities and the Greater London Authority, on this agenda, to ensure everyone across the UK has access to green skills and jobs.

Working together across the UK

Examples of policy action by the Scottish Government, Welsh Government and Northern Ireland Executive

Northern Ireland Executive

The forthcoming *Green Growth Strategy*, will be a multi-decade strategy to balance climate, environment and the economy. It means a move from a high to a low greenhouse gas emissions economy to improve people's quality of life through green jobs and a clean environment.

Innovation is key to the disruptive transition required. '10X Economy' sets out the vision for the 2020s as a decade of innovation bringing opportunity and growth. The focus on innovation is reinforced in the Energy Policy Options paper also strongly advocating innovation. New skills will be critical to allow innovation to flourish into delivery. The Skills Strategy consultation recognises that a transformational change in skills is required to take advantage of Northern Ireland's scale, yet addressing the challenges in the skills sector.

To take one example, the decarbonisation of gas infrastructure will involve the development of new supply chains for production of biomethane from anaerobic digestion plants and development of hydrogen production technologies, which will support green jobs and new skills in these sectors.

Scotland

The Scottish Government has set out a package of measures to create good, green jobs, reskill those that need it and provide a career platform for the next generation. It includes:

- a £100 million Green Jobs Fund to help businesses create new, green jobs. Related funding will make focused investments in machinery and equipment and research and development in five priority sectors: energy transition; transport; manufacturing; construction; agriculture and land use;
- a £25 million National Transition Training Fund with a focus on:
 - The provision of green skills;
 - A Young Person's Guarantee for 16-24 year olds;
 - The use of public procurement to build low carbon supply chains.

The Climate Emergency Skills Action Plan (CESAP) sets out a clear direction for the change of Scotland's skills system, and signals the role that businesses, communities and individuals across Scotland will play in achieving this.

The CESAP focuses on immediate action as well as the longer-term systemic change that needs to take place by 2045. It is being driven by senior representatives of central and local government and its agencies, skills providers, industry and independent experts, and is chaired by Professor Dave Reay of Edinburgh University.

The Scottish Government's Green Jobs Workforce Academy was launched in August 2021. The Academy will make it easier for people from a wide range of backgrounds to launch a green career, and to access

appropriate training. The Academy will support delivery of a skills guarantee for workers in carbon-intensive sectors.

Wales

Since its launch in 2010 the £30+ million BEACON, a collaboration led by Aberystwyth University, working with Bangor and Swansea Universities and the University of South Wales, has built up a strong skill base in the bio business sector by providing collaborative R&D support for Welsh businesses³⁰. BEACON has worked successfully with hundreds of companies, enabling them to develop and trial ideas on an industrial scale, and to get their products and services closer to market. Products include bio plastics, food additives, building materials and fuel.

Reforming the skills system

20. We are driving forward reforms to put employers at the heart of the skills system and ensure colleges are responsive to the needs of local economies. As demand for green skills continue to grow across the UK, employers in the green economy must prioritise investment in the retraining and upskilling of their workforce, and actively take the opportunity to engage with education providers to shape local provision.

21. Central to our strategic reforms are the plans set out in the Skills for Jobs White Paper, which will enable local employers to set out their green skills needs to drive provision in local colleges. The programme is made up of two parts: local skills improvement plans and the Development Fund.

22. First, the Trailblazers for local skills improvement plans, led by employer representative bodies will identify and articulate unmet and future local skills needs and work with further education providers to adapt their technical training offer so that it becomes more responsive to employers' needs. Through the Skills and Post-16 Education Bill, we are legislating to put the employer leadership of these plans on a statutory footing and ensure they have regard to skills needed to help deliver on our net zero target, adaptation to climate change, and other environmental goals.

23. Second, our £65 million Development Fund pilots in 2021-2022 will support work to identify employers' skills needs, design provision to respond, and build the capacity of local further education providers to deliver. Where local areas identify a skills need, for example increasing the number of trained retrofitters, providers could use this funding to purchase equipment, train their staff, bring in industry expertise to provide training, or deliver new provision. The majority of the 18 pilots announced in July 2021 include a project focused on green skills, covering areas including decarbonisation, renewable energy, and electric vehicles.

24. Alongside this, we want people to get the advanced technical and higher technical skills they need to get good jobs. Colleges' place at the centre of their local communities and economies means that they are key to unlocking opportunities across the country and to building back better. We are, therefore, reforming the adult skills funding and accountability system for further education colleges and other training providers in a way that will help improve our skills provision. We are consulting on a range of proposals to make sure colleges are better supported to focus on helping their students into good jobs; reduce the complexity of funding so that colleges can focus on their core role of education and training; and define clearer roles and responsibilities for the key players in the system. This means that, for the first time, we will be able to reflect the value that relevant courses deliver to the taxpayer in the funding rate colleges receive for putting on courses. This will encourage providers to put on courses in subjects where there is strong demand from employers. We will hold colleges to account for delivering good outcomes, and are consulting on proposals to introduce new Accountability Agreements setting out national priorities against which we expect colleges to deliver, for example enabling students to access opportunities in the green economy.

25. Supporting the transition through the skills system will require teachers in the further education sector to have a strong understanding of sustainability. To deliver this, we have worked with employers to develop a refreshed apprenticeship standard for further education teaching (Level 5 Learning and Skills Teacher), which came into effect in September 2021. For the first time, all further education teachers training via an apprenticeship will be required to integrate sustainability into their teaching, including through modelling sustainable practices and promoting sustainable development principles in relation to their subject specialism. Early estimates from the Trailblazer Group suggest around 1,500 teachers each year could train using this apprenticeship standard. This standard will soon be incorporated into all future further education teaching qualifications, so that all teachers across all subject areas will be able to embed and promote sustainability in their teaching.

Ramping up support for workers in high carbon sectors to transition to green jobs

26. Over 80% of the workforce of 2030 is already in work today³¹, as such meeting our ambitious targets for climate action in the next decade, and reaching net zero by 2050, will require government and industry to work together to ensure workers in high-carbon sectors can retrain and upskill as they move into jobs in the green economy. Much of this will take place in industry (see the case study below) and we will support this through our targeted programmes for industries and workers.

Case study: Industry action on reskilling for the transition

Centrica

Centrica have announced plans to hire 3,500 Smart Energy Apprentices by 2030, with the first 1,000 apprentices recruited by the end of 2022. Apprentices joining Centrica receive technical skills training and knowledge for the job at the company's academies in Dartford, Hamilton, Leicester, and Thatcham. Many have taken up the opportunity to upskill at Centrica to become domestic electrical installers, with skills in Electric Vehicle charging point installation, or to achieve gas boiler service and repair capability.

Upskilling training for domestic electrical installers lasts 20 weeks and is offered after Smart Energy Engineers have finished their apprenticeship. The gas boiler service and repair programme also takes place after completing the Smart Energy Apprenticeships, and is split over two years. Every year, Centrica's academies train and assess 5,000 engineers to keep all British Gas engineers compliant with their specific roles' regulatory and industry requirements.

27. In key sectors, we will ramp up our support to develop UK supply chains and enable workers to access green jobs. This will include working with industry on a Heat Network Skills Programme to increase the capacity and capability of the UK supply chain to support the sector to reach its growth potential. Our Public Sector Low Carbon Skills Fund will enable public sector organisations to acquire expert skills in order to unlock decarbonisation projects. Alongside this, we will work with industry to support training and new routes of entry to help boost heat pump installer numbers and other areas of skills shortage to support the decarbonisation of buildings. We will also support the development of new green skills for hydrogen, CCUS and industrial decarbonisation to ensure the UK workforce is ready to deploy low carbon technologies. Our funding for the Aberdeen Energy Transition Zone will position the region as an exemplar for low carbon development, supporting the transition of existing oil and gas skills to renewable energy sectors. We also will continue to support the forestry sector to improve its training and career services.

28. Through the Lifetime Skills Guarantee, we are supporting workers to gain the skills they need to transition to the green economy, including through targeted support for retraining. As part of this, through the National Skills Fund (NSF) investment we are delivering Skills Bootcamps, which are short, flexible courses covering digital, technical and green skills. Green Skills Bootcamps are available in areas such as housing retrofit, solar, nuclear energy and vehicle electrification. Overall, we expect there will be approximately 16,000 Skills Bootcamp places available across the country in financial year 2021-22. We will undertake robust evaluation of this exciting training model to explore potential future plans. In addition, our Free Courses for Jobs offer has, since April 2021, been supporting adults that do not have a qualification at Level 3³² or higher to access over 400 Level 3 courses for free. The offer currently includes

qualifications linked to green sectors such as Agriculture, Building and Construction, Engineering, Environmental Conservation, Horticulture and Forestry and Science. An estimated 11 million adults over the age of 24 in England are eligible for the Free Courses for Jobs offer. We will continue working closely with employers to understand where the offer could be extended further to enable more adults to access qualifications to give them skills needed for the net zero transition.

29. This will be underpinned by the Lifelong Loan Entitlement (LLE) from 2025, which will provide individuals with a loan entitlement equivalent to up to four years of post-18 education to use over their lifetime. As part of the pathway towards the LLE, we will trial short course provision at Levels 4-6 to support in-work adults to upskill and retrain, enabling learners to flexibly build towards a full qualification in subjects crucial for net zero including STEM and digital innovation.

30. Through the NSF we are also delivering an Emerging Skills Project in electrification and battery technology, which commenced in June 2021. Alongside this, our NSF funded In-Work Skills Pilot, launched in September 2021, will seek to respond to immediate skills shortages required for net zero, stimulate demand for short course provision at levels 4-5 across STEM sectors, and boost worker's career and progression opportunities in key green sectors, such as electrification in the auto industry and low carbon engineering.

31. Given the pace and the scale of the transformation, we are considering how government can work more closely with sectors in the future to support them in the green transition, and identifying where we can adapt and enhance our support for people at risk of redundancy to support a transition to green jobs. This builds upon our existing work coach interventions and targeted provision including Sector-based Work Academy Programmes (SWAPs), traineeships, apprenticeships and other skills provision which are ensuring jobseekers can develop the right skills to move into green jobs.

Working with business to support people from all backgrounds to have a green career

32. We support the Green Jobs Taskforce's recommendation that industry should prioritise ensuring that people from all backgrounds can work in green jobs, building on existing good practice and capitalising on the unique opportunity of young people's interest in climate change and the environment. A more diverse workforce will aid the transition by expanding the talent pool, encouraging new ways of thinking, enhancing innovation, and boosting profitability and productivity across the economy.³³

33. To drive this important work forward we will continue to encourage industry to ensure there is equal opportunity for all to work in the green economy, building on our support for industry initiatives such as the POWERful Women campaign and commitment under the 'Equal by 30 Campaign' to close the pay gap, improve female representation in senior roles and opportunity for women in the global clean energy sector by 2030. Through the cross-cutting delivery group we will explore what actions can be taken across industry to improve diversity in the green economy, including improving data collection and transparency.

34. Alongside this, we will continue to work with green employers to raise awareness of the opportunities in the green economy through an integrated careers information, advice and guidance offer through schools, colleges, universities, and employers to raise awareness of different career pathways in low carbon sectors.

35. To further break down perceived barriers to working in the energy sector, boost diversity and increase STEM skills, our Build Back Better campaigns will seek to inspire people from all walks of life to work in the green economy, and raise awareness of green education, training, and careers.

36. The UK's joint presidency of COP26 brings a unique opportunity to showcase green careers to a new generation of children and young people. We are capitalising on this by working with industry to launch the Faces of The Energy Transition campaign to showcase the inspiring people, projects and organisations working to achieve the clean energy transition, and supporting green careers events at COP26 in Glasgow.

Building a foundation for future green careers

37. Schools and colleges will play a vital role delivering high-quality education and training to equip young people with the knowledge and skills required for the green economy. This will help to grow the pipeline of skilled workers needed to help deliver the net zero transition.

38. The science, geography and citizenship programmes in the National Curriculum at both primary (KS1-2) and secondary (KS3-4) cover key content which supports knowledge and understanding of sustainability and climate change. An environmental science A Level was introduced in 2017. Equipping students with secure knowledge and skills in STEM and other key subjects will be critical in supporting them to progress to skilled jobs in the green economy. We are, therefore, supporting teachers to deliver high-quality

teaching in these subjects by creating a world-class teacher development system that builds from initial teacher training through to early career support, specialisation and onto school leadership. Our vision is that a golden thread of training, support and professional development - informed by high-quality evidence - will run through each phase of a teacher's career. We are also funding several initiatives to support subject-specific professional development in STEM subjects across all key stages. We are working with Oak National Academy to give teachers access to high-quality curriculum resources to support their teaching, including in subjects that cover sustainability and climate change. We are also working with industry, through programmes such as Tomorrow's Engineers Code, to showcase the diversity of roles and people that make up the STEM sector, encouraging more young people from different backgrounds to choose a career in the sector.

39. We will build on this by bringing forward a strategy which will set out how our children's services, education and skills systems will support the UK to meet its net zero target, become more resilient to climate change and improve biodiversity. This will include a focus on ensuring excellence in education for a changing world, which will prepare children and young people with the knowledge and skills they need to contribute to the green economy.

40. At post-16 level, we will continue to build on our apprenticeship reforms, set out in the *Skills for Jobs White Paper*, to align the majority of post-16 technical education and training with employer-led standards by 2030. A strengthened system of employer-led standards, underpinning apprenticeships, T-levels and new higher technical qualifications will ensure employers, including in low carbon sectors, have a central role in designing and developing qualifications and training.

41. To ensure this system reflects the needs of the green economy, the Institute for Apprenticeships and Technical Education (IfATE) has convened a Green Apprenticeships Advisory Panel (GAAP) to work with employers to align apprenticeships to net zero objectives. Work is underway to map existing apprenticeship standards against green occupations and identify opportunities to create new standards in areas including retrofit, agri-tech and renewable energy and the GAAP has endorsed existing apprenticeships which support green career pathways. We have already seen positive engagement in the energy sector with over 1,000 apprenticeship starts in Wind Turbine Maintenance and Operations Engineering Technician standards in 2019/20. The GAAP will build on this list into 2022, in line with the *Ten Point Plan* and the findings of the Green Jobs Taskforce. The work of the GAAP will also support other key post-16 programmes that are underpinned by the same standards as apprenticeships (such as T levels and higher technical qualifications) to align with the needs of the green economy.

42. In 2021, we introduced the first occupational traineeships, in collaboration with sector bodies, to provide a clear, planned transition to an apprenticeship at Level 2-3 for young people aged 16-24. Going forward, we will consider the potential to develop and introduce other occupational traineeships, including in priority and green sectors to ensure that young people secure the jobs of the future.

43. We are continuing to roll out T Levels that support green careers, providing high quality technical qualifications as an alternative to A Levels which are underpinned by the same employer-led approach as apprenticeships. The building services engineering for construction T Level, launched in September 2021, will cover housing retrofit and heat pump installation. From September 2022, new T Levels will be available in Engineering, Manufacturing, Processing and Control, with

Agriculture, Land Management and Production available by September 2023. IfATE is exploring the suitability of potential future T Levels and occupational specialisms, focusing on areas to support green skills.

44. IfATE has introduced an approval process for Higher Technical Qualifications (HTQs) at Levels 4 and 5. HTQs will be rolled out for teaching from September 2022, covering eleven occupational routes - including qualifications in digital, construction and engineering – coming on stream up to 2025. Future roll-out will continue supporting the development of skills for the transition to net zero as a key government priority. The goal is to grow the number of learners undertaking high-quality level 4 and 5 qualifications to meet skills needs at this level. Earlier this year, we launched an £18 million higher technical education provider growth fund to allow investment in new equipment that will support providers to expand technical studies, and boost local employer links. Our growth fund is supporting 15 universities and 87 FE colleges to teach HTQs from next year.

45. Finally, our network of Institutes of Technology (IoTs) across England are utilising their state-of-the-art facilities to offer training in green skills. This includes the East London IoT which offers training in green and zero carbon energy production, and the Greater Birmingham and Solihull IoT which focuses on sustainable engineering. The network is supporting increased participation from under-represented groups, including women, helping to grow the pipeline of individuals with STEM skills needed for green jobs. We are investing £120 million in the second wave of IoTs, to be up and running by 2022.

Next steps

46. The policies set out in this chapter represent a first step in addressing the challenges identified by the Green Jobs Taskforce. We will progress further work through the cross-cutting delivery group, maintaining the momentum generated by the Taskforce to drive action across the green skills agenda. Working alongside industry, we will continue to build the evidence on the skills gaps which could hamper the net zero transition if left unaddressed, assess how far existing interventions are on course to address those skills gaps, and where appropriate identify further opportunities to flex key skills programmes to support green sectors and occupations.

4iv. Embedding Net Zero in Government

Climate considerations underpinning policy across Government

Our Key Commitments

- Require the government to reflect environmental issues in national policy making through consideration of five environmental principles.
- Ensure that decisions taken on government spending are informed by their impact on meeting net zero.
- New measures to reduce emissions from Government's £292 billion procurement spending – and ensure suppliers have plans for achieving net zero on major qualifying public contracts.
- Continue to fund the Public Sector Decarbonisation Scheme at £475 million per year to drive ambitious emissions reductions in schools, hospitals, and other public buildings, whilst taking further action on skills, reporting, and targets.
- Publish an annual progress update against a set of key indicators for achieving our climate goals.
- Expand climate change training to ensure the Civil Service has the skills and people it needs to deliver net zero.

The challenge

1. Net zero is a complex and transformative undertaking for the UK. The way the government operates must rise to meet this challenge. This means reducing the public sector's own carbon footprint – but also changing how we are organised and how we take decisions. Building on our recent historic progress, we are now going further to ensure the whole government meets the challenge of net zero.

Our goal

2. Since setting the net zero target, a huge effort has taken place across government to ensure we are set up in the right way to deliver on our climate ambitions. We have gone further than ever before to put the climate at the heart of our decision-making. This includes:

- Establishing two Cabinet Committees dedicated to climate change;
- Announcing as part of the Integrated Review of Security, Defence, Development and Foreign Policy that tackling climate change and biodiversity loss will be the Government’s number one international priority;
- Using the Environment Bill to require the government to reflect environmental considerations in national policy making through consideration of five environmental principles;
- Taking new approaches to embed net zero in spending decisions;
- Establishing the No.10 Delivery Unit to ensure the government maintains a sharp focus on delivering the country’s key priorities. One of the four priorities for this Unit is the delivery of net zero; and,
- Setting out in collaboration with key net zero delivery departments, a high level strategy for delivering on the UK’s net zero commitments through the BEIS Outcome Delivery Plan 2021-2022. This plan identified key programmes critical to delivery and set out an evaluation plan to monitor and assess progress.

3. These efforts put climate change at the heart of our decision-making and have led to the ambitious announcements set out in recent years: the Prime Minister’s *Ten Point Plan for a Green Industrial Revolution*, dedicated strategies for key sectors of the economy, and this Net Zero Strategy; and set us up to deliver on those commitments.

4. Our goal is to go even further to embed net zero across government activity. This will mean that government takes net zero into account when taking decisions, public sector buildings will emit less carbon, our procurement decisions will lead to greener supply chains, and civil servants across government will have the skills they need to deliver this mission.

5. To do this we must understand the interactions between climate change and other UK priorities. The measures set out in this chapter are crucial for ensuring that the UK takes a whole system approach to tackling climate change:

- Multiple forums – including Cabinet Committees – that bring together different perspectives on net zero and its interaction with other priorities;
- Delivering climate skills and training across the Civil Service – not just to civil servants working directly on climate issues;
- Close working relationships with local government and the Devolved Administrations; and,
- Embedding net zero in a wider range of decision-making levers.

Net zero in government decision-making

6. In the last two years the Government has made commitments to strengthen governance around net zero. Two Cabinet committees were established in 2020 to rationalise climate governance and put net zero at the heart of government decision-making. This is driven by the Prime Minister, who chairs the Climate Action Strategy Committee (CAS). This Committee considers matters relating to the delivery of the UK's domestic and international climate strategy. In addition, the Climate Action Implementation Committee (CAI) which is chaired by the COP President Designate. It considers the delivery of COP 26, net zero and building the UK's resilience to climate impacts. These committees' ability to scrutinise progress and take whole system decisions will be strengthened by the new measures described in this chapter.

7. These committees are supported by well-established and robust governance at official level. This includes a cross-government Director General group that was established in 2019 to ensure a whole-of-government approach to climate policy, with oversight at the most senior levels. Chaired by the BEIS Director General for Net Zero and International, this group brings together officials from across government, creating a whole system perspective, to support the delivery of significant climate announcements, including those contained in this Strategy.

Consistency of approach across the UK

8. To reach net zero we must take a UK-wide approach. The UK Government and the Devolved Administrations are committed to working together to deliver coordinated policy action to meet respective emissions reduction targets across the UK. Combined, Scotland, Wales and Northern Ireland produced 22% of UK emissions in 2019,³⁴ and accounted for 16% of the UK's population, 13% of economic activity³⁵ and nearly half of the UK's land area (46%).³⁶ Powers and policies to deliver ambitious emissions reductions in the Devolved Administrations Scotland, Wales and Northern Ireland are partly reserved to the UK Government and partly devolved.

9. The UK Government and the Devolved Administrations have established governance arrangements to ensure a joined-up and collaborative approach to climate change. At the bimonthly Net Zero, Energy and Climate Change Inter-Ministerial Group, UK Government ministers meet with Devolved Administration counterparts to discuss emerging policies that will contribute to delivery of net zero targets across the UK, such as delivering a UK-wide Emissions Trading Scheme, and the level of the sixth carbon budget which was set in law in June 2021. The Group is supported by the official-level Net Zero Nations Board on alternate months.

Embedding net zero in government decisions

10. Climate change is a major issue for all governments in the 21st century. Our mission to reduce emissions, seize economic opportunities, and adapt to extreme weather events will affect many more of the decisions that the Government takes than it would have done in previous decades. To that end, it is essential that we put in place new levers to ensure that all the Government's decisions adequately take climate change into account. This Strategy sets out key measures we will take to ensure a climate-focus on key future decisions made by the government.

11. We are using the Environment Bill to require the government to reflect environmental issues such as climate change in national policy-making through consideration of five environmental principles:

- The integration principle is the principle which states that policy-makers should look for opportunities to embed environmental protection in other fields of policy that have impacts on the environment.
- The prevention principle means that government policy should aim to prevent, reduce or mitigate harm.
- The rectification at source principle means that if damage to the environment cannot be prevented it should be tackled at its origin.
- The polluter pays principle is the principle that those who cause pollution or damage to the environment should be responsible for mitigation or compensation.
- The precautionary principle states that where there are threats of serious or irreversible environmental damage, a lack of scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation.

12. The duty to consider these principles should be applied in the early stages of policy development and considered throughout. In doing so, the extent to which a policy will contribute to climate change should be considered alongside other impacts of the policy on the environment. Net zero will therefore be facilitated by the principles where they are applied to relevant decisions.

13. The integration principle will create a prompt for policy makers to embed environmental protection in policy making, triggering consideration of the government's priorities for environmental protection (such as net zero) and whether these priorities can be supported through the new policy. The polluter pays and prevention principles could also help to contribute to net zero targets, through encouraging policies that reduce carbon emissions and prevent adverse impacts on climate where possible. These principles will ensure the environment is at the heart of policymaking across government.

14. Ensuring spending decisions contribute to net zero is a major priority for HM Treasury. The Green Book already mandates the consideration of climate and environmental impacts in spending. It has been updated so that policies must be developed and assessed against how well they deliver on the Government's long-term policy aims such as net zero.

15. Spending reviews are critical moments for the Government to look strategically at the country's priorities and make spending decisions based on these. At Spending Review 2020 (SR20), guidance required departments to state the greenhouse gas emissions of bids, and their impact on meeting Carbon Budgets and net zero. Allocations to departments were informed by this information, and £12 billion was committed to green measures. We have reviewed the learning from this exercise to further embed climate change in spending decisions in the next spending review and in the long term.

16. In September 2021, the Government published updated guidance on how impacts on greenhouse gas emissions should be measured in policy decisions. As a result, departments must place a significantly higher value on emissions in determining policy, as the values now fully reflect the UK's increased ambitions on climate. This complements wider considerations on natural capital impacts in policy decisions – and represents a significant step forward in incorporating environmental impacts into policy development.

17. As set out in the *Green Investment* chapter, we have also taken steps to ensure net zero is embedded in government funding and regulation of the financial system. Arm's-length bodies, such as the British Business Bank, have adopted net zero as a core objective. This will expand the flow of finance to those innovative firms that will help us reduce our energy consumption and mitigate the impacts of climate change.

18. This builds on important announcements in the 2021 Budget, particularly the new UK Infrastructure Bank that will use its £22 billion of financial capacity to crowd-in private investment to support economic growth, accelerate our progress to net zero, and help level up the UK. One of the Bank's objectives is to help the UK transition to net zero emissions by 2050.

19. We will make sure that the reformed planning system supports our efforts to combat climate change and help bring greenhouse gas emissions to net zero by 2050. For example, as part of our programme of planning reform we intend to review the National Planning Policy Framework to make sure it contributes to climate change mitigation and adaptation as fully as possible.

Supporting UK businesses

20. We are considering net zero through our support to business too across government activity. Innovate UK is the UK's Innovation Agency, it drives productivity and economic growth by supporting UK businesses to commercialise new ideas and address the big societal challenges facing the UK today.

21. As the UK moves to a net zero economy, Innovate UK is supporting businesses to exploit new ideas, develop supply chains, and thrive in growing global markets. Last year Innovate UK committed to spend £276 million with UK businesses to tackle net zero.

Net zero in the work of regulators

22. Many of the UK's regulators will play a role in facilitating delivery of the infrastructure, technologies and activities that will deliver the net zero transition. Several examples are set out in the sector focused chapters in this strategy. The government is also considering whether and how the functions of those regulators most important to the transition can be strengthened.

23. For example, to provide strategic guidance to Ofgem on the government's energy policy, the *Energy White Paper* committed the government to consulting on an energy sector strategy and policy statement (SPS) for Ofgem during 2021. The SPS will set out the strategic priorities and policy outcomes of the government's energy policy, with net zero as the driving theme. This will impose a legal obligation on Ofgem to have regard to the strategic priorities and policy outcomes when exercising its regulatory functions. To provide clear legal accountability, Ofgem will be required to report on how it intends to implement the SPS at the outset, and then report annually on its performance and its plans for the coming year.

24. The Competition and Markets Authority (CMA) is reviewing how the UK can better use the tools available under competition and consumer law to achieve net zero and our sustainability goals. The CMA will provide this advice in early 2022. This follows recent CMA work on misleading environmental claims, its market study into electric vehicles and its publication of information to businesses on sustainability agreements.

25. The National Infrastructure Strategy committed to taking a long-term approach to investment for the benefit of both investors and consumers, responding to the findings of the National Infrastructure Commission's report on the future of economic regulation in key infrastructure. The government also committed to publishing an overarching policy paper in 2021. The policy paper will set out next steps on key issues including: the consideration of duties in the round to ensure they reflect new challenges such as

achieving net zero, promoting coherence, and supporting a transparent strategic framework; and the exploring of the merits of a cross-sector-strategic Policy Statement to provide clarity on government's overarching strategic vision for the regulated sectors.

26. In addition, the Government has recently consulted on proposals for reforming the UK's regulatory framework. When the consultation response is published, it will include the Government's decisions on how regulators can be encouraged to consider themes such as competition, innovation and net zero in their regulatory activities. For example, the consultation sought views on whether regulators might be granted more flexibility by government to choose how they intervene in their sectors, to allow more agile, smarter regulation. The Government would like to see a consistent approach taken across the various regulated sectors and will set out more thinking on this in due course.

Demonstrating progress towards net zero

Increasing transparency of progress

27. Every year the government comprehensively reports the UK's historic emissions since 1990 and publishes projections of future emissions.³⁷ The UK's 'Energy and Emissions Projections' is a world-leading approach to projecting the UK's annual emissions, by sector, according to United Nations Framework Convention on Climate Change guidelines.

28. We are now going further to clearly demonstrate the tangible milestones that the UK will have to reach to achieve net zero, and to communicate and invite scrutiny on this progress to the public.

29. It is critical for public and industry confidence that the UK has a clear plan for achieving net zero – and that we are transparent about how this plan progresses and changes over time. The *Journey to Net Zero* chapter of this Strategy report set out a delivery pathway: an indicative trajectory of emissions reductions based on potential in each sector of the economy, which keeps us on track to meet the sixth carbon budget ending in 2037. Sector chapters set out policies and proposals in line with this indicative pathway to ensure we are on track for net zero. While it is impossible to predict every path to net zero, this pathway sets out the decisive action we know is needed and acts as the best plan we have to measure progress against.

30. We are therefore committing to provide a public update every year on progress in the previous year against the delivery pathway to net zero set out in this Strategy. This will include:

- An update on progress against the targets and ambitions set out in this Strategy (see Table A), building on this list over time to incorporate additional Government targets and wider non-Government indicators of progress;

- Commentary on contextual changes that might affect the exact pathway to meeting decarbonisation commitments; and,
- A summary of key areas of progress made against this pathway the policies and proposals in this strategy.

The following targets and ambitions will form part of the Government’s annual update on progress towards net zero:

Power	<p>By 2035 all our electricity will come from low carbon sources subject to security of supply.</p> <p>40GW of offshore wind by 2030, including 1GW floating wind.</p>
Industry	<p>Ambition to deliver 6 MtCO₂ per year of industrial CCUS by 2030, and 9 MtCO₂ by 2035.</p>
Fuel supply and hydrogen	<p>5GW of low carbon hydrogen production capacity by 2030.</p> <p>Achieve a final decision on whether to enable blending up to 20% hydrogen by volume into the Great Britain gas network by 2023, subject to successful completion of safety trials.</p> <p>The offshore oil and gas sector to have an absolute reduction in production emissions of 10% by 2025, 25% by 2027, and 50% by 2030 on the pathway to net zero by 2050.³⁸</p>
Heat and buildings	<p>Aim to reduce direct emissions from public sector buildings by 75% by 2037 compared to 2017.</p> <p>Achieve a minimum market capacity of 600,000 heat pumps per year by 2028.</p> <p>As many homes to reach EPC Band C as possible by 2035, where practical, cost effective, and affordable.</p> <p>As many fuel poor homes as reasonably practicable to Band C by 2030.</p>

<p>Transport</p>	<p>Double cycling from 2013 to 2025.³⁹</p> <p>Increase walking activity by 2025.⁴⁰</p> <p>Deliver 4,000 new zero emission buses and the infrastructure needed to support them.</p> <p>25% of the government car fleet ultra low emission by December 2022 and 100% of the government car and van fleet zero emission by 2027.</p> <p>100% of new cars and vans sold are zero emission by 2035.</p> <p>100% of new HGV sold are zero emission.</p> <p>100% of new buses/coaches sold are zero emission.</p> <p>Maximise GHG savings from low carbon fuel use in transport by increasing the Renewable Transport Fuel Obligation main obligation from 9.6% in 2021 to 14.6% in 2032.</p>
<p>Natural resources, waste, and F-gases</p>	<p>Restore at least 35,000 ha of peatlands in England by 2025 and approximately 280,000 hectares of peat in England by 2050.</p> <p>Increase tree planting rates from 13,660 hectares across the UK in 2020 to 30,000 hectares each year by the end of this Parliament.</p> <p>Deliver the UN Sustainable Development Goal 12.3 to halve food waste by 2030.</p> <p>Explore policies to work towards the near elimination of biodegradable municipal waste to landfill by 2028.</p> <p>Meet the Kigali Amendment target of reducing HFC consumption by 85% by 2036, as well as the F-gas Regulation’s target of a 79% reduction by 2030.</p>
<p>Greenhouse gas removals</p>	<p>At least 5 MtCO₂/yr of engineered removals by 2030.</p>

31. We will publish an updated Net Zero Strategy when we set the next Carbon Budget.

Strengthening delivery oversight of net zero projects and programmes

32. Significant recent steps have been taken to oversee the delivery of key projects and programmes that will contribute to net zero. This year, the Prime Minister established the No. 10 Delivery Unit to ensure the government maintains a sharp focus on delivering the country’s key priorities. One of the four priorities for this Unit is the delivery of net zero. BEIS in parallel has developed a new model for monitoring net zero delivery and reporting on programme and project-level risks – ensuring decision makers get early visibility

of common issues and inter-dependencies across all programmes delivering net zero. This will enable them to make informed, timely decisions to enable us to stay on track to meeting net zero.

33. This complements work led by the Infrastructure and Projects Authority (IPA). The IPA is the government’s centre of expertise for infrastructure and major projects, supporting the successful delivery of all types of major projects. The IPA sits at the heart of government, reporting to the Cabinet Office and HM Treasury. The Project Outcome Profile Tool launched in July 2021, ensures that projects and programmes are clearly linked to government priorities (such as net zero) from the outset and support their delivery. Its assurance toolkit has recently been updated

to include key tests and key questions on the environment, climate adaptation, and net zero, in the Government's gateway process. Through the IPA's *Transforming*

Infrastructure Performance: Roadmap to 2030, it is driving the use of whole life carbon reporting to reduce embodied carbon in the built environment.

Government leading by example

Decarbonising the public sector

34. Government and the wider public sector will lead by example during the transition to net zero. As well as ensuring that net zero is reflected in our structures and practices, we will continue to take ambitious action to reduce public sector emissions, showing leadership to the wider economy, and making a direct contribution to reaching net zero.

35. Direct emissions from public sector buildings account for around 2% of total UK emissions, and the public sector has reduced its emissions by around 40% since 1990.⁴¹

36. We intend to act in three areas to ensure we are on track to achieve net zero: investment, transparency, and capacity and capability, and in doing so will aim to reduce direct emissions from public sector buildings by 75% against a 2017 baseline, by the end of Carbon Budget 6.

Investment

37. Reducing direct emissions from public sector buildings requires investment in measures to reduce fossil fuel use, including the installation of low carbon heating and complementary energy efficiency improvements, and the installation of low carbon electricity systems such as rooftop solar PV. The Public Sector Decarbonisation Scheme is providing over £1 billion in grants over 2020/21 and 2021/22 for public sector bodies to fund heat decarbonisation and energy efficiency measures.

38. Building on the success of the Public Sector Decarbonisation Scheme, we will continue and extend the scheme to ensure that public sector bodies have access to finance to continue decarbonising their estates, investing a further £1425 million over 2022/23 to 2024/25.

High standards with transparency

39. Public sector organisations should be taking steps to achieve net zero now should report their progress so they can be held accountable and as publicly funded organisations. Government departments and their arm's length bodies already set and report against targets to reduce their greenhouse gas emissions in Greening Government Commitments. The updated Greening Government Commitments framework for 2021-25 will ensure the public estate continues to reduce its environmental footprint, align with commitments in our 25 Year Environment Plan and be consistent with a trajectory to achieving net zero greenhouse gas emissions by 2050.

40. All public sector bodies should now be monitoring their energy use and have targets to reduce emissions, particularly, to reduce the direct emissions for which they are responsible. To ensure we are on track to reach net zero, emissions from the public sector should be reported and monitored on a consistent and coherent basis. We will provide guidance to make clear the government's expectations in this regard.

41. We will also legislate to enable us to require the reporting of public sector emissions on a consistent and coherent basis if this is not done on a voluntary basis, and, if insufficient progress is made on reducing emissions in the public sector, to require that all public sector organisations are working toward and reporting against a legally-binding target to reduce their greenhouse gas emissions.

Capacity and capability

42. Reducing emissions requires specialist skills and expertise, as well as funding. Action at an unprecedented scale is required to reduce emissions from public sector estates in line with net zero, and organisations need the right skills and structures to deliver on this. We will continue to work with partners across government and the wider public sector to understand these needs, and provide the support needed to address them.

Delivering net zero through public procurement

43. The Government is determined to leverage public procurement to help achieve net zero. We will use our buying power to drive decarbonisation and to create the policy tools and training to enable public procurers to grasp this opportunity.

44. Clearly establishing the strategic importance of net zero at project design stage, as described above, will mean that it is easier to draw through this ‘golden thread’ when reaching procurement stage. The government has recently announced three distinct new policies that can all help public procurers fully embed net zero into their work. These all kick in at different stages of the commercial cycle, complementing each other in terms of their scope and their reach.

45. *The National Procurement Policy Statement (NPPS)*, published in June 2021, sets out clear principles that contracting authorities should be following organisationally. Tackling climate change and achieving net zero is one of the key considerations established – this should then be woven through individual procurements (for qualifying procurements).

46. The Procurement Policy Note on *Taking account of carbon reduction plans in the procurement of major government contracts* comes into effect from Autumn 2021. This will impact over £50 billion of procurement spend. For qualifying contracts, it requires suppliers who are bidding on central government contracts (over £5 million p/a in value) to commit to achieving net zero by 2050 and to detail their organisation’s UK greenhouse gas emissions via the publication of a Carbon Reduction Plan. Failure to do so may mean exclusion at supplier selection stage. Government will continue to take action to reduce emissions, and this policy is an important step in ensuring our supply chain is sharing this ambition and taking similar steps to reduce their emissions.

47. The Social Value Model requires government to expressly evaluate environmental, social and economic benefits, with these factors comprising a minimum of 10% of the evaluation score for qualifying procurements.⁴²

48. Throughout the development of these policy measures, government has been working with departments, suppliers and industry bodies to raise awareness of how environmental considerations can be brought into the commercial process, and to build capability in understanding and assessing suppliers’ commitments. Several thousand buyers across government have completed Social Value training to develop the skills required to embed environmental policy outcomes and improve the sustainability of government contracts. We will continue to

support the adoption and implementation of environmental policy measures to deliver the best commercial and environmental impact for the UK.

49. These measures provide a platform for even stronger action. We have embarked upon a programme of major domestic procurement reform. This will enable us to use flexibilities provided by our departure from the EU to give even greater consideration to environmental factors in our decision making. One specific example is the proposal to break the subject matter of contract link so that a company's wider environmental proposals for the project can be factored into procurement decisions.

50. Domestically we also want to make it easier for procurers to balance carbon against cost. We want to underpin our net zero target and COP26 ambitions by developing tools to help us decarbonise the government's supply chains and stimulate innovation and growth in the UK's green economy. This work also takes into account the Climate Change Committee's (CCC) call for credible, quantifiable pathways for sectoral decarbonisation. We will also explore the possibility of establishing a new single unit for all sustainable procurement policy within government to strengthen performance, coordination, and oversight.

51. Our ambition is necessarily high – we are changing the expectations on ourselves when it comes to utilising £292 billion of annual procurement spend. In doing so we are also sending a clear signal to the market: data on carbon impact, and immediate ambition to reduce it, will be increasingly important in how we choose to do business with you.

Showing leadership on domestic and international standards

52. The BSI, in its role as the UK's national standards body, works across the sectors and topics that will be critical in achieving net zero, including greenhouse gas management, energy transition, biodiversity and sustainable finance. This work is helping the UK to take a global leadership role in net zero and influence change on a global scale. To this effect BSI and the International Organization Standardization have developed the London Declaration – a commitment to actively consider climate change in the development and revision of all international standards and to facilitate the involvement of civil society and those most vulnerable to climate change.

53. Through BSI's international reach, the UK will be able to help stakeholders reach consensus in international climate change standards and lead change globally in support of net zero.

Ensuring the right skills and talent in government

54. The government has established the Government Skills and Curriculum Unit (GSCU) to oversee the delivery of better training, knowledge and networks that the over 440,000 people working in the Civil Service will need today and in the future.

55. Net zero will continue to be a priority for the government until 2050 and beyond. To that end, BEIS and GCSU are reviewing the skills, training and networks that civil

servants need to lead the UK's future efforts to decarbonise (see infographic below).

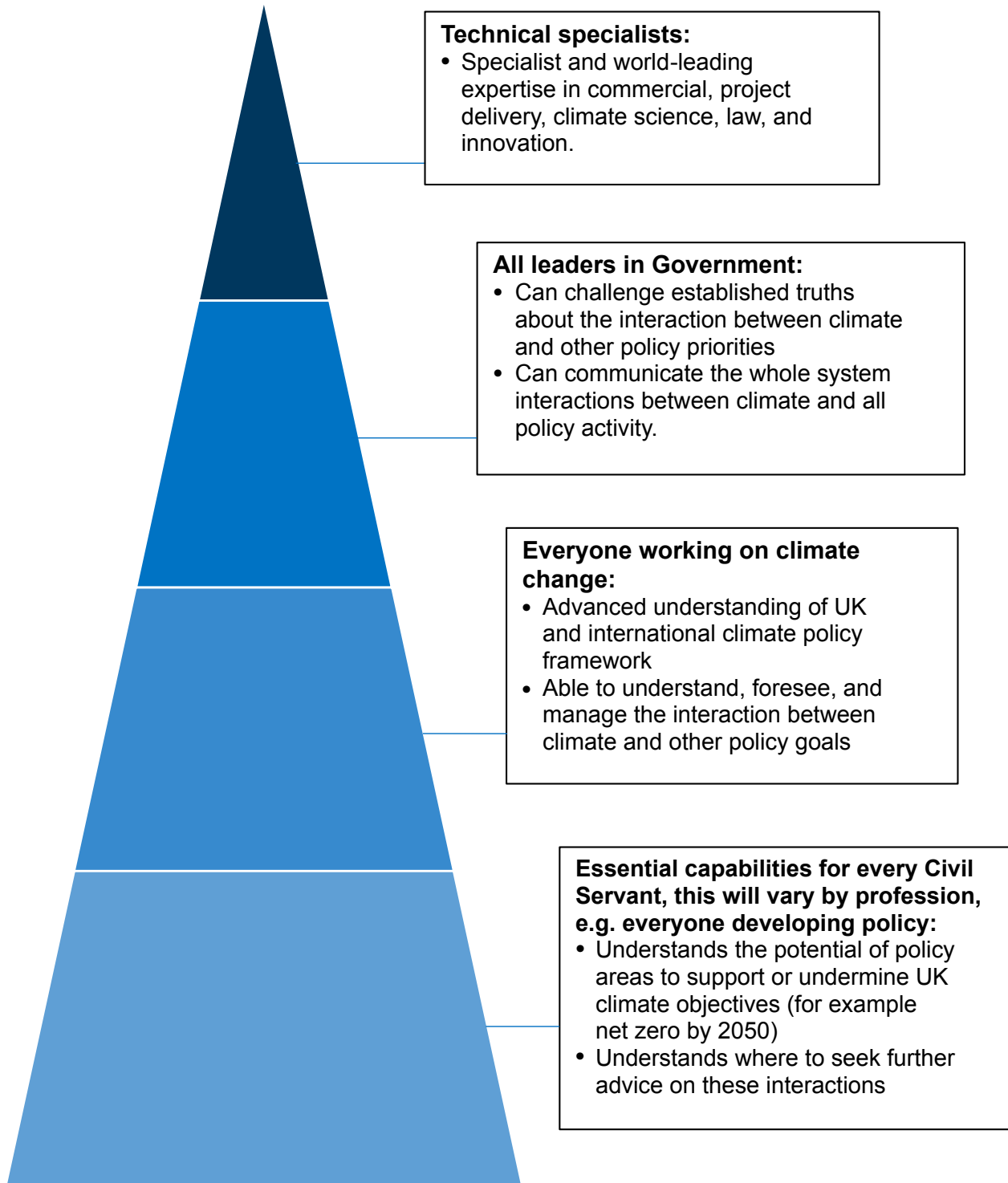
56. We are expanding the curriculum for civil servants to include specific training on climate change. We are also establishing climate specific training within the Civil Service Fast Stream curriculum.

57. We have also embedded climate considerations in the Policy Profession Standards, the competency framework that supports professional development for all civil

servants developing policy. For the first time, this makes explicit that good policymaking requires an awareness of the potential for all policy areas to contribute or undermine our climate goals.

58. We are establishing a new climate focus within the Civil Service Fast Stream Generalist Scheme, which will focus on providing relevant skills and opportunities to some of the future leaders of the Civil Service.

Ambition for climate capabilities across Government



4v. Local Climate Action

Supporting decarbonisation and regeneration in our local areas and communities

Key Commitments

- Set clearer expectations on how central and local government interact in the delivery of net zero.
- Build on existing engagement with local actors by establishing a Local Net Zero Forum to bring together national and local government senior officials on a regular basis to discuss policy and delivery options on net zero.
- Continue the Local Net Zero Programme to support all local areas with their capability and capacity to meet net zero. This includes provisions to:
 - Continue the Local Net Zero Hubs (previously known as the local energy hubs) to support all areas of England to reach net zero, including those lacking capacity and capability, or those facing unique challenges.
 - Promote best practice and support local authorities to develop net zero projects that can attract commercial investment.
 - Increase knowledge sharing to demonstrate and share successful net zero system solutions.

The challenge

1. Devolved and local government play an essential role in meeting national net zero ambitions. Across the UK many places have already made great strides towards our net zero future, having set their own targets and strategies for meeting local net zero goals. Taking a place-based approach to net zero is also vital to ensuring that the opportunities from the transition support the government's levelling up agenda.

2. The combination of devolved, local, and regional authorities' legal powers, assets, access to targeted funding, local knowledge, and relationships with stakeholders enables them to drive local progress towards net zero. Not only does local government drive action directly, but it also plays a key role in communicating with, and inspiring action by, local businesses, communities, and civil society. Of all UK emissions, 82% are within the scope of influence of local authorities.⁴³

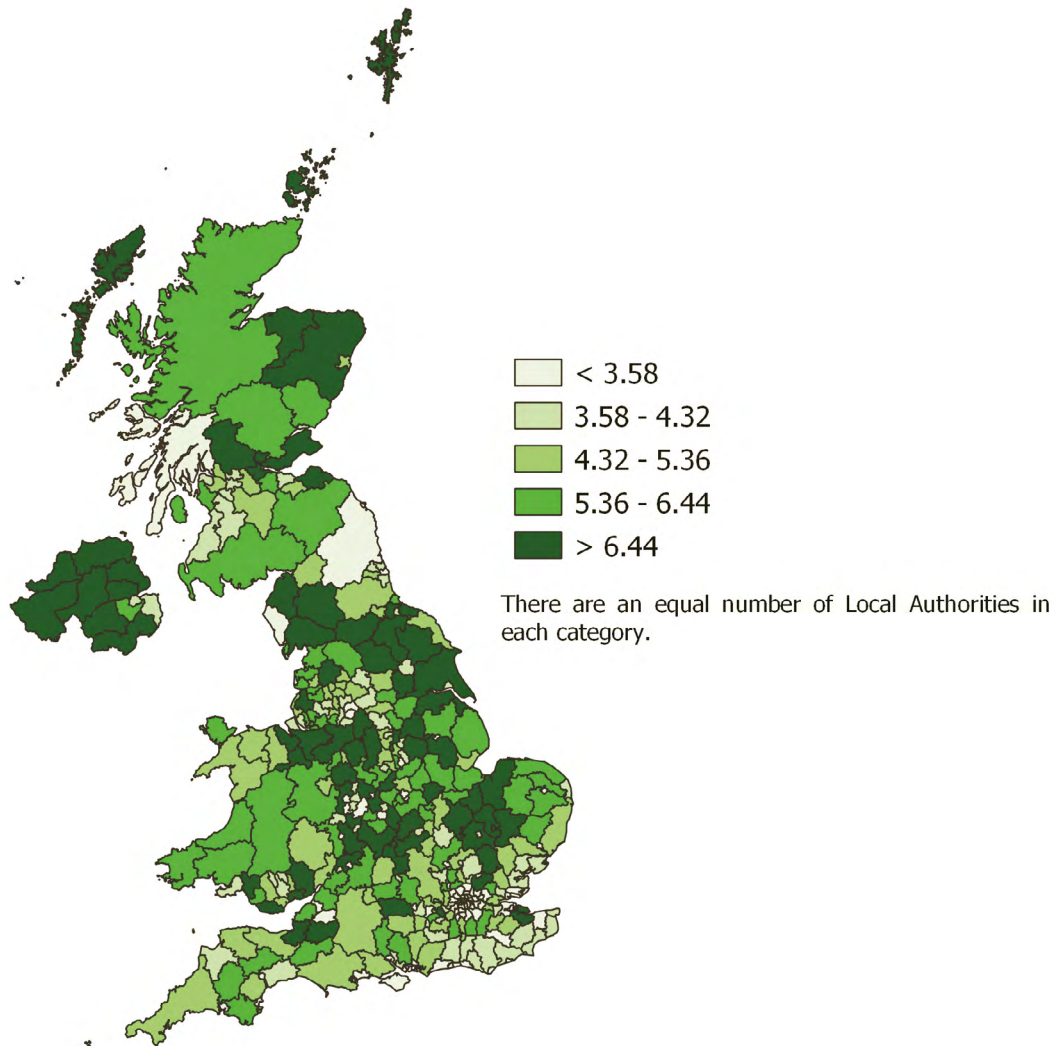
3. Local leaders are well placed to engage with all parts of their communities and to understand local policy, political, social, and economic nuances relevant to climate action. The government currently works with the Core Cities Group, for instance, which undertakes a range of activities to promote climate change adaptation, raise awareness and foster leadership in cities. Local government decides how best to serve communities and is best placed to integrate activity on the ground so that action on climate change also delivers wider benefits – for fuel poor households, for the local economy, for the environment and biodiversity, as well as the provision of green jobs and skills.



4. Despite the excellent work already underway, we understand that there remain significant barriers to maximising place-based delivery on net zero. We know that some places are moving faster than others and that places and communities will face different challenges when meeting net zero commitments and adapting to climate change.

5. There are significant regional variations in the level of emissions (see Figure 29 below) and some of the hardest hit local economies that face multiple development and growth challenges are proportionally home to a greater number of lower skilled workers. Many of these areas are also where high-carbon industries are located.

Figure 29: Net emissions of carbon dioxide per capita by Local Authority (tonnes CO₂e per capita) in 2019



Source: ONS

6. We also recognise that certain types of communities, such as rural and coastal communities, face significant and unique challenges. For example, the increased age of rural housing makes it both more difficult and expensive to introduce energy efficiency measures and rural communities also have greater reliance on cars. Similarly coastal communities face significant challenges as they may be vulnerable to more frequent

flooding, rises in sea level, and accelerated coastal erosion which will have the potential to affect public services and infrastructure. However different types of localities may also have opportunities available to them that do not exist everywhere. For instance, coastal communities may be able to utilise tidal energy or industrial scale water source heat pumps, and rural areas may have access to sustainable biomass.

7. There are currently no net zero statutory targets on local authorities or communities in the UK, and we do not believe that a new general statutory requirement is needed. This is because of the existing level of local commitment with the sector, and because it is difficult to create a uniform requirement that reflects the diversity of barriers and opportunities local places experience. However, we do understand that there is a real need to ensure local leaders across the board are supported by enhancing the capacity and capability of local areas to deliver net zero, coordinating engagement with local authorities, and clarifying expectations at a national level to accelerate local progress towards net zero.

Our goal

9. The government will continue to set UK-wide priorities for meeting carbon budgets and for assessing how each sector will help meet those budgets. Local government has a key role in integrating delivery at a local and regional level to deliver more cost-effective routes to net zero and derive local co-benefits that embed climate action in the heart of local places and services. By taking this approach, we can achieve even more for net zero and for the economy locally and nationally; we recognise that a one-size-fits-all approach will not work. We want to build strong partnership working between central, devolved, and local government, increase the co-ordination and better support all levels of government to utilise the influences available to them.

10. We want to continue to empower our local leaders to take the actions which will lead to the biggest gains in emissions reduction, including the potential opportunities in building back greener and meeting our ambitions to level up the country. While the COVID-19 pandemic has severely impacted our communities, it has also reshaped how we think about place, community, and our natural and built environment.

8. Central and local government will need to work closely together to deliver net zero and our interim carbon budgets. Government analysis suggests that over 30% of the emissions reductions needed across all sectors to deliver on our Carbon Budget 6 target, as set out in this strategy, rely on local authority involvement to some degree.⁴⁴

11. Community empowerment, engagement, and action can play a role in supporting the UK's transition to net zero and enable communities to access the benefits that it brings, from greener jobs to improved health. Communities are especially well placed to help raise awareness and engage people in adopting net zero behaviours. For example, community ownership of renewables and other assets, often in partnership with other organisations, can be an important driver of reducing local emissions. It can also enable people to learn more about climate change and build sustainable behaviours.

12. We will continue to provide support for public and private investment opportunities in local places that will enable the local delivery of emissions savings across the sectors. In the sector chapters we have shown the range of programmes from building retrofit, heating, electric vehicle charging and many others where funding will go to local government to deliver action in their communities.

Enabling local areas to deliver net zero

13. To support all local government in developing and delivering their net zero delivery plans, we need to act in three key areas:

- a. Setting clearer expectations** for local places, clarifying how the partnership with local government should work, and considering how action at national, regional, local, and community levels fits together to tackle the emission and climate risk challenges we face, and the wider benefits the transition brings.
- b. Providing resources** for local places to deliver stronger contributions to national net zero targets, across dedicated funding streams for net zero and non-ringfenced funding, noting the number of broader priorities on which local government needs to deliver.
- c. Building capacity and capability** at the local level to support ambition and share best practice, while also providing support in areas that may not have made as much progress to date.

14. To act effectively across these areas, and for local government to translate national goals into local action, we will build on our existing engagement to improve the way local and national government collaborate on net zero. The Department for Business, Energy and Industrial Strategy (BEIS) will take overall responsibility for improving coordination with local government and other local actors on the effective design and delivery of local net zero policies, as part of the Department's overall responsibility and wider leadership on delivering net zero. Other departments will continue to lead on their specific policy areas such as Department for Transport on the decarbonisation of transport. We intend to

build on many of the existing ways of working together to provide more consistency and clarity over roles and responsibilities between national and local government.

15. We will do this by establishing a Local Net Zero Forum to ensure that there is direct input from local leaders. Chaired by BEIS, the Forum will be cross departmental and bring together national and local government senior officials on a regular basis to discuss policy and delivery options on net zero. The forum will build on our current engagement mechanisms through the representative bodies such as the Local Government Association (LGA), Association for Public Service Excellence (APSE), Core Cities and the Association of Directors of Environment, Economy, Planning & Transport (ADEPT). The creation of the Forum also draws on the recommendations for a policy framework put forward by member network UK100. The Forum will support the establishment of clearer delivery roles for local government and provide a single engagement route into HM Government in a coordinated and coherent way.

16. On adaptation, local actors will be supported through increased Environment Bill powers to take effective action, reduced financial burdens from waste management and stronger abilities to improve health and social outcomes for local citizens.

17. Achieving our aims requires national decision makers to have the right knowledge and awareness to understand the local impacts of decisions. BEIS will work with other departments and stakeholders to demonstrate successful net zero system solutions by creating a network of experience that amalgamates learning through case studies and non-spatial planning tools.

18. We have already developed a Carbon Literacy toolkit for the delivery of Carbon Literacy training for local authorities. This training has been made available to all local authority staff and aims to increase awareness and ability to reduce emissions across all the policies and programmes local government work on. BEIS has created a sector course and places like Manchester and Sheffield are among the early adopters who have trained staff and councillors.

Funding

19. Funding for local climate action comes from a combination of the Local Government Finance Settlement, other government grants and support schemes, borrowing, and private finance. Collectively, this means there is a range of funding available for local authorities to act on climate change. Some have chosen to explore community bonds and crowdfunding. A third of local authorities say their climate change plans will be cost-neutral by incorporating goals into existing service area strategies, drawing on the funding available for those services.

20. An important part of the funding landscape is the diverse range of grant funding schemes provided by HM Government to support local delivery. The recent National Audit Office (NAO) review into local government and net zero identified 22 dedicated grant schemes for net zero work from central to local government. We recognise that longer term and more co-ordinated funding streams can enhance innovation and investment, reduce bureaucracy, and encourage more efficient and integrated decision making. We will explore how we could simplify and consolidate funds which target net zero initiatives at the local level where this provides the best approach to tackling climate change. Building on the vision in the Prime Minister's *Ten Point Plan*, we also will work across departments to explore how we can give certainty to investment in longer-term programmes supported by regeneration initiatives.

21. In addition to the above, the UK Infrastructure Bank (UKIB) will lend to local authorities for strategic and high value projects and invest in projects alongside the private sector, crowding in private sector capital. It has twin objectives of helping to tackle climate change, particularly meeting the UK's net zero emissions targets and helping to support regional and local economic growth across the UK. The UKIB will offer loans to local authorities for high value and strategic projects of at least £5 million. To complement this investment activity, over time, the UKIB will develop an expert advisory service to help local authorities develop and finance projects. The UKIB will build partnerships across the UK including with government departments, government sponsored bodies, local authorities and relevant representative organisations to foster collaboration and drive value for money. As it engages with the market, the UKIB will continue to learn and adapt, which will ensure that its loans to local authorities are as effective as possible.

22. The UKIB is currently operating in an interim form, as it expands its capability and capacity. It will continue to refine the Local Authority Lending Function over the coming months.

23. The Department for Business, Energy and Industrial Strategy will continue to work with partners and the finance sector to develop new finance and business models to support local delivery. These business models will look to develop aggregated projects and portfolios of projects building up scale and spreading delivery risk more effectively for investors.

Sectoral priorities at a local level

24. We understand that for local areas to deliver net zero they will need specific support to plan and identify priorities across different sectors of the economy.

Local energy

25. Decarbonisation of our buildings, transport systems and energy system will require significant action at a regional and local level. Generation and storage are becoming increasingly decentralised, with solar and batteries being deployed in buildings, vehicles, and local communities. Heat and transport decarbonisation in particular needs to be delivered in a way that meets local needs and with the involvement of local decision makers. Decarbonisation will require strong co-ordination across electricity, heat, hydrogen, transport, and buildings. That means local actors can be strong drivers of change, enabling coordinated non-spatial planning and engagement with markets, and supporting cleaner, cheaper and more efficient energy whilst providing a significant contribution towards local economic strategy.

26. Better engagement and information sharing across organisations can enable better forward-planning and a more coordinated approach. BEIS has work underway with Ofgem to develop a better understanding of the opportunities and challenges presented by local area energy mapping and planning (LAEMP) and are considering the most appropriate policy options to take forward. This work could help to bring together key local stakeholders to explore the impact of decarbonisation choices across sectors and how different technology options may impact on local energy networks.

27. The Government has committed up to £102.5 million of funding through the Industrial Strategy Challenge Fund to Prospering from the Energy Revolution. This is an innovation programme which develops smart local energy systems to provide investable, scalable local business models and finance mechanisms using integrated approaches to deliver cleaner, cheaper energy services. The programme is supporting three places to demonstrate the use of this framework today and a further ten places to develop detailed plans and business cases to deliver whole place decarbonisation.

28. The programme is designed to work across a range of different areas including, big urban conglomerations, cities, towns, industrial regions, regeneration projects and rural communities. Each of these face different challenges and opportunities in reaching net zero and the programme seeks to identify the economic as well as the social and environmental benefits of delivering integrated Smart Local Energy Systems, not just for the place but also nationally.

29. The government also provides funding to deliver programmes that support decarbonisation through the Local Net Zero Programme (previously known as the Local Energy Programme), which is supporting Local Enterprise Partnerships (LEPs), local authorities, and communities in England to play a leading role in decarbonisation and clean growth. Almost £22 million has been invested in the Local Energy programme to date, including funding for the creation and continuing support of 5 Local Net Zero Hubs. The Hubs promote best practice and support local authorities to develop net zero projects that can attract commercial investment. The Hubs are currently supporting local authorities to develop projects with a potential capital value of over £2 billion and have identified further possible projects that take the potential capital value of the pipeline to over £3 billion.

Heat and buildings

30. Local Authorities have been, and will continue to be, key delivery partners when it comes to improving the housing and building stock across the country, especially through integrating activity on energy efficiency, heating and retrofit. This has been recognised in recent years through their delivery of Green Home Grants, Home Upgrade Grant, and heat networks. As demonstrated in previous chapters (*Heat and Buildings*), local delivery of these schemes has been integral in reducing carbon emissions and supporting local economies. For example, over 200 local authorities have taken part in phase 1 of the Green Home Grants Local Authority Delivery Scheme (LAD) which is focussed on low-income households in homes that most need energy efficiency upgrades. Phases 1 and 2 of the Local Authority Delivery schemes aim to support around 50,000 households who will benefit from energy efficiency upgrades, making it easier and cheaper to heat their homes. Government has also delivered the Public Sector Decarbonisation scheme which provides grants for public sector bodies to fund heat decarbonisation and energy

efficiency measures. Under Phase 1 of the scheme, over £500 million was awarded to local authorities.

31. National planning policies already recognise the importance of sustainable development and make clear that reducing carbon emissions should be considered in planning and decision making. The National Model Design Code provides tools and guidance for local planning authorities to help ensure developments respond to the impacts of climate change, are energy efficient, embed circular economy principles, and reduce carbon emissions. The government is considering how the planning system can further support our commitment to reaching net zero. We will make sure that the reformed planning system supports our efforts to combat climate change and help bring greenhouse gas emissions to net zero by 2050. For example, as part of our programme of planning reform we intend to review the National Planning Policy Framework to make sure it contributes to climate change mitigation and adaptation as fully as possible.

Local transport

32. To decarbonise the transport sector, in July, the government published its *Transport Decarbonisation Plan*, which sets out the commitments and the actions needed to decarbonise the entire UK transport system. One of the six strategic priorities of the plan is developing solutions that consider the needs of different locations, highlighting the importance of tackling emissions at a local level to ensure that every place in the UK has its own net zero transport network by 2050, serving the unique needs of its communities.

33. To support this, we will reform the way local transport infrastructure is funded to drive decarbonisation at a local level, engaging local areas about their investment priorities in the round, and making quantifiable carbon reductions a fundamental part of local transport planning. Later this year we will also publish a Local Authority Toolkit to help local authorities reduce emissions from transport. It will provide local authorities with guidance and information to help them build business cases, develop innovative policies, secure funding, and deliver measures on the ground.

Local green infrastructure and the environment

34. Government will launch a new National Framework of Green Infrastructure Standards in 2022. This will support local areas and regions to deliver well-designed green infrastructure where it is most needed to deliver multiple benefits. These networks of green and blue spaces and other natural features, including trees, provide an opportunity to benefit local economies and bring about long-term improvements in people's health and wellbeing. At the same time, it can help us to mitigate and adapt to climate change, through capturing and storing carbon, shading and cooling, and reducing flooding.

35. The Environment Bill is also creating a new system of spatial strategies called Local Nature Recovery Strategies to target action for nature and to drive the use of nature-based solutions to tackle environmental challenges like climate change. It is expected that there will be approximately 50 Local Nature Recovery Strategies covering the whole of England with no gaps and no overlaps. Preparation of each Strategy will be locally led and collaborative, with local government taking a critical role. This will provide local government with a new tool through which they can work with local partners to identify where effort to create or restore habitat would have greatest benefit for climate mitigation, whilst also having positive benefits for nature and the wider environment. Between 2021 and 2027, we will be doubling our overall investment in flooding and coastal erosion to £5.2 billion.

36. In addition, £200 million will be invested in the Innovative Flood and Coastal Resilience Innovation Programme. This will help over 25 local areas over six years to take forward wider innovative actions that improve their resilience to flooding and coastal erosion. The Environment Agency is also working with coastal authorities on a £1 million refresh of Shoreline Management Plans.

A universal offer to harness opportunities across the UK

37. We are committed to supporting all local areas and communities, ensuring that none are left behind and creating net zero solutions which work for all of them. As we are reducing emissions across the economy, we must also ensure that the transition to net zero is a fair one.

38. As outlined above, BEIS has been successfully running the Local Programme (previously known as the Local Energy Programme) to support all local areas capability and capacity to meet net zero and government has committed to continuing the Programme. The programme has developed over time and now takes a place-based

approach to tackling net zero in the round, covering all net zero issues. The programme will continue to help places make faster progress towards net zero, improve cost-effectiveness, and significantly increase the economic benefits of the green industrial revolution by attracting commercial investment and supporting green jobs.

39. The programme will focus on all areas of England, including those lacking capacity and capability, or those facing unique challenges, such as rural and coastal communities. The programme will ensure that all local areas can engage on issues relating to net zero.

Case study: Investing in industrial heartlands

The government has invested £95 million for two new offshore wind ports to be constructed in the Humber region and Teesside, boosting the UK's world-leading industry, and creating thousands of new jobs in the North.

Able Marine Energy Park, on the South Bank of the River Humber, will receive up to £75 million government investment, and Teesworks Offshore Manufacturing Centre, on the River Tees, will benefit from up to £20 million. Construction will begin later this year to upgrade the two ports with new infrastructure - helping to revitalise these historic industrial heartlands. Together these new ports will have the capacity to house up to 7 manufacturers to support the development of the next-generation offshore wind projects, boosting the UK's offshore wind manufacturing base while directly creating up to 3,600 new green jobs.

40. The Government has embedded a net zero principle in initiatives which target different types of places, such as the Levelling Up Fund, the Towns Fund, and the Community Renewal Fund. This is to ensure that all funded schemes have considered how to align with our net zero ambitions. We will continue to monitor the impacts of these schemes

and strengthen these criteria if necessary. We will take the same approach with other new schemes and priority places such as Freeports. Investment into places through the UK Shared Prosperity Fund should also align with the government's net zero objectives.

41. This year we are working with local businesses on the future role of Local Enterprise Partnerships (LEPs), ensuring local businesses continue to have clear representation and support in their area to drive the green recovery from the COVID-19 pandemic. LEPs have played a significant role in providing advice and incentives for businesses to reach net zero. As part of the LEP review, we are committed to ensuring a strong local business voice is retained, particularly to support businesses to transition to net zero.

42. In England, the government works closely with local government, and Defra hosts the Local Adaptation Advisory Panel (LAAP), a forum for dialogue on climate change adaptation between local authorities, central government, and delivery bodies. This supported the production of a guide on adaptation for local government, published in 2019 by the Association of Directors of Environment, Economy, Planning and Transport (ADEPT).

Case study: the Green Recovery Challenge Fund

The government's £80 million Green Recovery Challenge Fund is kickstarting over 150 nature projects across England. For example, the Wildfowl and Wetlands Trust was awarded £1.58 million to create and restore 130 hectares of nature-rich wetland habitat along the Somerset coast. This habitat will help increase flood resilience, improve soil, water quality, and help absorb carbon, increasing the robustness of the county's coastline overall. The GRCF is also support green jobs and is currently on track to support up to 2,000 jobs by the end of 2021, rising to up to 2,500 by the time all projects are completed in March 2023.

Working with local communities

43. To ensure that all parts of the UK benefit from the transition to net zero we also want local communities to take bold action that supports the transition. Local communities benefit from strong relationships and ties to their areas and their local authorities; these can be key to reducing emissions across the economy and making sure people stay engaged in the process. Where local authorities and communities work together effectively, we have already seen significant improvements in both delivery and in wider public engagement.

44. Some very ambitious campaigns on food, recycling, water, and other areas critical to climate action, have been launched and run by pioneering local communities and activists. Community projects can also act as a catalyst for raising public awareness and promoting green choices.

45. Community groups can bring together people, finance, and ideas to have a real impact on the behaviours, infrastructure, and attitudes locally. Community cohesion and grassroots initiatives are also central to locally based resilience to climate change risks, such as flooding and heatwaves.

46. Government understands the important role that communities have in the transition to net zero. Through the introduction of UK-wide growth funding schemes, such as the Community Renewal Fund, the Levelling Up Fund, and the Towns Fund, Government is enabling local areas to tackle net zero goals in ways that best suit their needs. For example, under the Towns Fund, Clay Cross

in Northeast Derbyshire developed a Town Investment Plan setting out their low carbon energy ambitions. Government also works with community groups, both geographic and communities of interest, such as sports clubs, faith groups, and youth groups, on key behaviour change strategies and communications.

Case study: Clay Cross

Clay Cross, in Northeast Derbyshire, was one of the 101 Towns invited to develop a Town Investment Plan. The plan, submitted to Government in October 2020, set out their ambition to establish the town as an exemplar at the forefront of the low carbon revolution. This involved working with established local businesses, including the key local employer Worcester Bosch, to deliver innovation in clean energy and showing the potential to deliver a net zero economy. By 2030 they hope to be able to show significant reductions in the overall levels of emissions by ensuring clean growth principles underpin investment. These ambitions will be realised through a cohort of projects which include the development of a low carbon energy strategy for the town, a low carbon energy demonstrator project linked to the rebuilding of the local leisure centre, low carbon workspace and housing proposals, and a skills and enterprise training centre, which will have an emphasis on providing energy industry related skills.

Community Energy

47. Community Energy is an example of how communities can come together to reach local and national net zero targets. Community Energy England's 2021 *State of the Sector Report* outlined that there are 424 community energy organisations working across the UK to deliver a net zero future and with the appropriate support, they estimate that the community energy sector could contribute up to 5,270 MW, power 2.2 million homes, support 8,700 jobs and add £1.8 billion to the economy each year.⁴⁵

48. Government has provided support to community energy projects through the Rural Community Energy Fund (RCEF), a £10 million fund to supporting community-run projects in England that benefit the energy transition to net zero. The fund has provided development stage grants to projects focusing on a variety of technologies including solar, wind, low carbon heating and electric vehicle charging. Communities have predominantly financed their schemes commercially through share offers and borrowing.

49. The Government has also supported Community Energy England to develop and maintain their knowledge sharing role which includes peer mentoring. This resource can help communities develop their own schemes across heat and power generation, transport, energy efficiency, and also wider approaches to net zero.

Case Study: Cuckmere Community Solar – a world first

Cuckmere Community Solar has an ambition to power the rail network in East Sussex with solar energy – a world first. Working in collaboration with Riding Sunbeams, an innovator focused on decarbonising rail networks, the organisation aims to establish a template for similar projects.

Cuckmere Community Solar plans to build a new 4 MW solar farm at Berwick, East Sussex. This will enable the local community to benefit from a higher income from renewable energy generation, and for the rail network to benefit from cheaper, low carbon power. The Rural Community Energy Fund has provided grant funding for the development stage of the project which includes the cost of studies, land agreements, investigation of the connection point, and legal work.

The project has also recently received capital funding support from the South East Local Enterprise Partnership's £85 million share of the government's Getting Building Fund, which aims to help economic recovery.

50. Ofgem also supports community energy projects and following a consultation process has announced that from February 2022 it plans to welcome applications from community interest groups, co-operative societies, and community benefit societies to the Industry Voluntary Redress Scheme. This will allow groups to apply for funds to deliver energy related projects that support energy consumers in vulnerable situations, support decarbonisation, and will benefit people in England, Scotland, and Wales.

51. To build on our existing actions, we intend to continue to work closely with Community Energy England and will reintroduce the Community Energy Contact Group. Since 2017, this group has been merged in a wider Local Energy Contact Group, but given the scale and pace of work being taken forward, and with the development of the Local Net Zero Forum, we believe that it makes sense to strengthen our engagement with the community sector further by reintroducing a dedicated forum for community groups to engage across Government.

4vi. Empowering the Public and Business to Make Green Choices

Moving towards a net zero society together

Our Key Commitments

- Explore how to improve and enhance public facing climate content and advice on gov.uk. We will also enhance our digitally-led Simple Energy Advice (SEA) service to provide homeowners with personal, tailored advice on improving and decarbonising their homes, including tailored retrofit advice in local areas, and links to local, accredited, trusted installers.
- Continue supporting UK businesses to meet their net zero commitments, including exploring a government-led advice service that consolidates and simplifies advice and other support on net zero.
- Increase awareness of net zero and empower businesses and the public to make green choices, by building on government communications and engagement, and exploring providing environmental impact labelling of products, goods, and services.
- Make green choices affordable and easy by working with businesses and industry to set strong regulatory signals and collaborating to reduce costs and provide better quality, longer lasting and lower environmental impact products, and services.

The challenge

1. Together we are moving towards a net zero society, led by technological innovation. We will see transformations to our economy, society, and the way we live and work: new low carbon technologies, infrastructure and job opportunities; cleaner air, greener spaces and reduced flooding; and changes to everyday life such as in the way we travel, heat our homes and save our money. To reach net zero, everyone will need to play their part. We know that public concern about climate change is high – with 80% in the UK either concerned or very concerned.⁴⁶ We also know that people and businesses recognise that change must happen – 80% of respondents in a recent survey believe the way we live our lives will need to change to address climate change.⁴⁷ Equally, however we know that the public is unsure of what net zero will mean in practice, what steps they can take, or they face barriers that stop them from acting.⁴⁸ This chapter sets out how government will support individuals and businesses to make green choices – an act of choosing the more, or most, sustainable option from a range of possibilities, such as using an electric vehicle instead of a petrol or diesel vehicle when it is time to change your family car, replacing an old gas boiler with a heat pump, or switching to innovative green financial products.

Our Goal

2. Our goal is to make the act of choosing green significantly easier, clearer and cheaper. We recognise that the best way to do this is to go with the grain of existing behaviour and trends and by working closely with partners like Local Authorities, voluntary sector organisations, social enterprise regulators, and businesses, who all play an important role in how we use and choose different services.

The role of green choices in meeting net zero

3. There are numerous individual actions – some one-off and some we take regularly – that people can take to contribute to our pathway to net zero. These individual actions combine to create wider systemic change required to meet net zero. New analysis on green choices,⁴⁹ has helped us to identify choices and behaviours that impact on net zero, broadly falling into three categories:

- **Adopting new low carbon technologies**, such as switching to zero emission vehicles.
- **Using energy, technologies, or services more efficiently**, such as using smart meter-enabled ‘time of use’ tariffs which reward consumers financially for using energy at off-peak times, or when there is excess clean energy available.

- **Everyday business and consumer choices**, such as choosing green financial products like the recently launched NS&I Green Savings Bond, or seeking more responsibly invested pension schemes.
4. We want to better understand the behavioural factors that need to be considered in the policies required to meet net zero. The Government Chief Scientific Adviser and Government Office for Science will be producing a scenario-based foresight report to understand the system wide implications of these factors, to be published in 2022.



Our approach for supporting green choices

5. We know that people want to play their part in achieving net zero. Our approach for how government will empower everyone to make green choices is underpinned by six principles.⁵⁰ Although they were developed with the public in mind, many of them equally apply to green choices taken by businesses, particularly medium or small enterprises. The principles reflects wider public engagement from across the country and Parliament.

6. Public engagement, including through communications campaigns such as Together for Our Planet, plays a significant role in driving green choices. We will deliver public engagement on net zero to:

- a.** Communicate a vision of a net zero 2050, build a sense of collective action, improve understanding of the role different actors play in reaching net zero, and how and when choices can be made;
- b.** Ensure there is trusted advice and support for people and businesses to make green choices;
- c.** Mobilise a range of actors and stakeholders to increase and amplify their communication and action on net zero and green choices; and
- d.** Give people opportunities to participate in and shape our plans for reaching net zero, thereby improving policy design, buy-in and uptake of policies.



Principles underpinning green public and business choices

Principle 1: Minimise the ‘ask’ by sending clear regulatory signals

7. By targeting measures at an industry level, rather than at the individual consumer, we can make green choices much simpler for the consumer. This will also help grow a stronger market for low carbon goods and give businesses clear, early signals. For example, the 2030 phase out date for petrol and diesel cars and vans sends a signal to industry and will improve the availability and quality of zero emission vehicles on the market. Similarly, as set out in the *Heat and Buildings Strategy* there are a range of policies we will introduce that will bolster the low carbon heating market, creating new opportunities for business, and better choice for the consumer.

8. We are taking action to ensure that products are more sustainable, both in relation to their energy efficiency during use and use of materials over their lifetime (resource efficiency) through developing proposals for new regulatory product standards and better consumer information. We are exploring updating and expanding ‘Ecodesign’ product regulation which sets minimum requirements to phase out the least energy and resource efficient products from the market.

Principle 2: Make the green choice the easiest

9. By addressing all the major, practical barriers to individual behaviours we can make it easier for people to make green choices. We will ensure that we take a consumer-centred approach to net zero policy design, removing frictions and minimising disruptions to people’s lives.

10. In our *Transport Decarbonisation Plan*, we have committed to better integrating transport modes, with more bus routes serving railway stations and improved integration of cycling and walking networks, so that opting to make a green travel choice is easier. This is in addition to delivering interventions to enable more people to walk and cycle for short journeys such as a national e-cycle support programme. Our vision is that half of all journeys in towns and cities will be cycled or walked by 2030. We are also committed to increasing road vehicle occupancy. This will help decarbonise and decongest our roads. We will publish guidance for local authorities on support for shared car ownership and shared occupancy schemes and services and are continuing to build our evidence base to understand the barriers and potential policies to increase the uptake of shared mobility.

11. We are committed to removing inconvenience and increasing availability of green choices. Following the commitments made in our Resources and Waste Strategy, the Environment Bill will introduce powers that will allow us to require separate food waste collections in all local authorities in England, which will help people to reduce emissions from food waste with ease.

Principle 3: Make the green choice affordable

12. We are already seeing the upfront cost of green choices, such as electric vehicles, drop. We are looking across all sectors to see how we can continue this trend and make green choices more affordable.

13. Through the Smart Export Guarantee (SEG) energy suppliers are moving to increasingly innovative tariffs which support electric vehicle deployment while continuing to enable households to access a market-led route for exporting and receiving payment for their unused electricity. As committed to in our *Heat and Buildings Strategy*, the Boiler Upgrade Scheme will provide grants to help households transition to low carbon heating. We are also supporting motorists through plug-in vehicle grants, which provide support towards the upfront purchase of eligible cars, vans, motorcycles, and trucks.

14. We are supporting the public to both save and contribute towards public spending that helps the UK reduce its emissions through the NS&I Green Savings Bond. The Green Finance Institute and Abundance Investment, supported by UK100, Local Partnerships and Innovate UK, have also launched a national campaign to help local authorities issue a type of municipal finance investment – Local Climate Bonds. For citizens, the Local Climate Bond provides a low-risk and fixed return investment, and a way to mobilise their savings to help tackle the climate change in their area.

Principle 4: Empower people and businesses to make their own choice.

15. Consumer preference can shape producers' decisions, but sometimes consumers and businesses lack clear information to make informed choices. As announced by the chancellor in his Mansion House speech in July 2021, we will work with the Financial Conduct Authority to introduce a sustainable investment label - a quality stamp - so that consumers and retail investors can clearly compare the impacts and sustainability of their investments for the first time.

We plan to help empower people to make informed choices about the goods and products they buy and services they use by exploring how we better label these with their emission intensity and environmental impact. We are also exploring the use of product labelling to show the durability, repairability and recyclability of products, as well as their environmental footprint with a view to stimulating demand for better quality items. We continue to explore the evidence base for environmental labelling within food production and disposal, including the most accurate methodologies to monitor and verify the carbon emissions, and environmental impact, of food items.

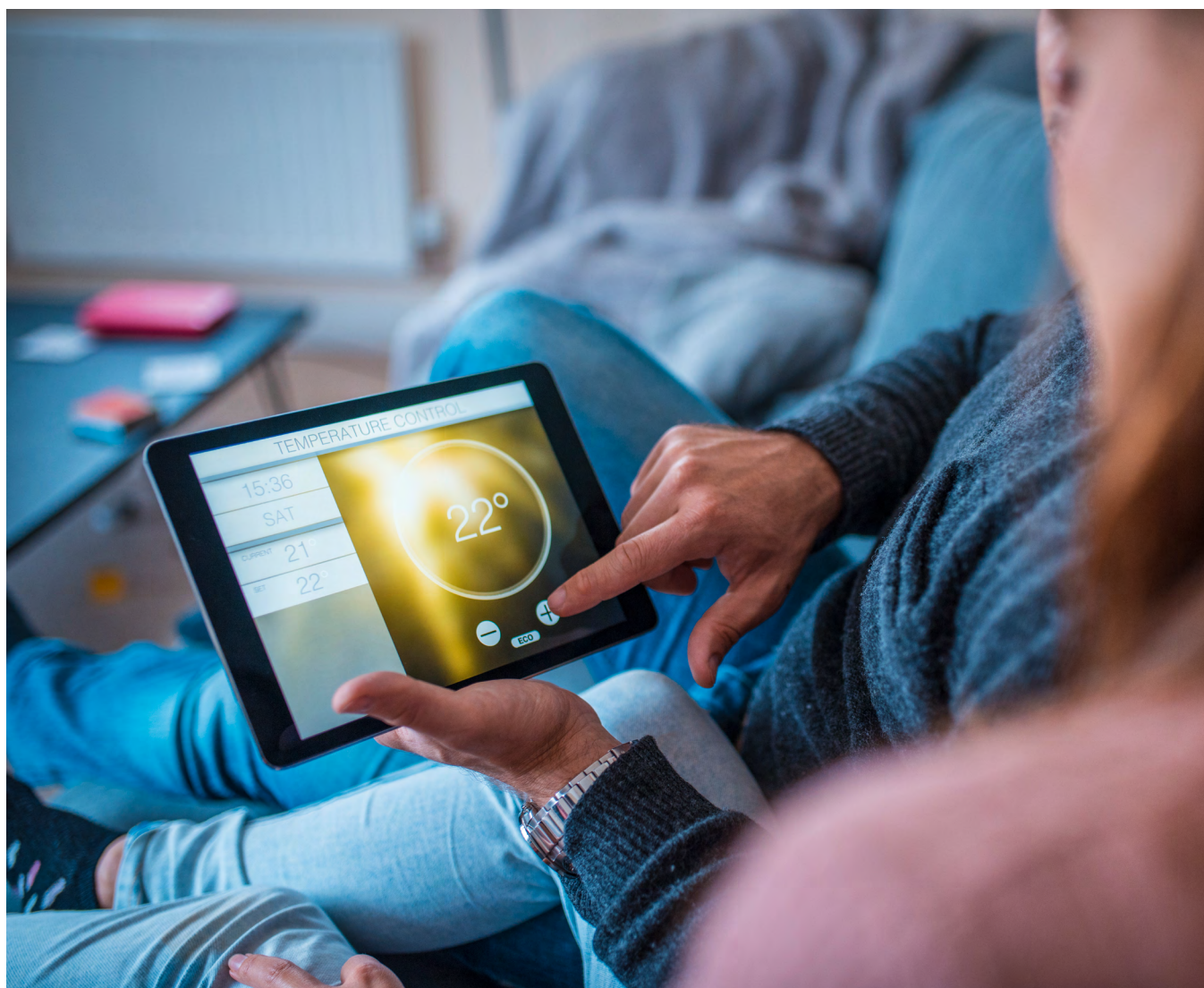
16. Our *Transport Decarbonisation Plan* outlines how we will explore the feasibility of a travel reward scheme that uses peer-driven motivation and encourages individuals to switch to, or continue to use, sustainable modes of travel.

17. We are providing tailored advice and support to homeowners on what they can do to improve their homes. Our Simple Energy Advice service has already had over 1.5 million users, providing homeowners with personal, tailored advice for improving and decarbonising their homes and links to local, accredited, trusted installers. Homeowners can also find out about government schemes

for which they may be eligible. We will enhance the digitally led service and are considering options to support tailored retrofit advice in local areas, supported by tailored local advice. This includes moving our Simple Energy Advice service to gov.uk, which will improve user experience, and supporting local advice provision.

18. We are also reviewing other existing digital information and advice services related to net zero and exploring how to improve wider existing public-facing net zero content and advice on gov.uk

19. We know that technologies can also improve public understanding of energy use and energy efficiency. In-Home Displays for smart meters give accurate information about energy consumption to help households easily understand how to use less energy and save money on their bills. Building on this, the Smart Energy Savings initiative is trialling how innovative products and services can use smart meter data to provide consumers with advice on how to manage their energy use. At the end of June 2021, there were 25.2 million smart and advanced meters in homes and small businesses across Great Britain.⁵¹



Principle 5: Motivate & build public acceptability for major changes

20. Achieving our net zero target must be a shared endeavour. It is therefore vital that we listen to the public's views on how to reach net zero. We already regularly invite the public to shape policies on net zero through consultations and deliberative dialogues. Since 2019, we have run, funded, or are still running deliberative dialogues on a range of net zero issues, such as green choices, homes, heating, transport decarbonisation, green savings, hydrogen, food, Carbon Capture Use and Storage (CCUS) and Advanced Nuclear Technologies (ANT).

21. To ensure that the transition to net zero is fair and affordable, and does not negatively impact disadvantaged groups, we are committed to assessing the impact of our net zero policies. We consult on policy changes and we will continue to make it easier for people and businesses, including those who are most marginalised, to feed into key policy decisions on net zero.

22. The Devolved Administrations have a range of initiatives aimed at engaging and motivating the public around net zero and climate action:

- a.** The Scottish Government launched a draft *Public Engagement Strategy for Climate Change* in December 2020, and the final report of Scotland's Climate Assembly was laid in Scottish Parliament in June 2021.
- b.** The *Welsh Government Engagement Approach for Low Carbon Delivery Plan 2* was published in June 2021, encouraging collective action on climate change through four Calls to Action.
- c.** In March 2021, the Northern Ireland Executive unveiled a new digital climate action campaign, delivered by MyNI in the run up to the COP26 conference. It aims to raise climate awareness, encourage change, enable action, and exemplify climate leadership.

Principle 6: Present a clear vision of how we will get to net zero and what the role of people and business will be

The role of business in delivering net zero

Businesses have significant power to drive change towards achieving our domestic net zero goal. Our approach to supporting businesses to deliver this change will need to be differentiated by business size and sector, as these factors will influence the ease with which a net zero target and other relevant actions can be adopted. We have seen significant numbers of companies signing up to science based targets alongside sector-specific ambition being put forward already. For example, Water UK has launched the world's first sector-wide plan to deliver net zero carbon emissions by 2030.

We know that businesses account for 18% of UK territorial emissions and so encouraging them to take action to reduce their emissions is important.⁵² But just as vital is the role businesses are playing in designing the ground-breaking new technologies, world leading products and innovative approaches that we need to develop the low carbon economy and enable others to reach net zero. Collaboration across sectors and value chains will enable us to innovate faster, create stronger incentives for investment and drive down costs for low carbon alternatives through the global mechanisms laid out in the Paris Agreement.

To underline the importance of this area, the Prime Minister appointed a net zero Business Champion, Andrew Griffith MP, to spearhead business engagement nationwide in the year to COP26. Already over half of the FTSE100 companies have committed to Science-Based Targets by joining the global Race to Zero campaign. Alongside engaging large corporates, the Net Zero Business Champion has led a campaign targeting small and micro businesses across the UK. Over 1,900 have joined the Race to Zero to date by visiting the Business Climate Hub, developed in partnership with a global business coalition led by the International Chambers of commerce. Companies, particularly large businesses, once they have joined the Race to Zero, should work with others to drive breakthroughs in their sectors, regions, and support SMEs in their value chains to take action. We're encouraging Business Representative Organisations (BROs) to become Race to Zero Accelerators by recruiting members into the Race to Zero. To be recognised officially as an Accelerator, businesses must recruit at least 20% of members not already in Race to Zero by COP26.

Many businesses across the UK have said they want to tackle climate change, but that they don't know where to start⁵³. Through the small business campaign, government has taken an important step towards making net zero relevant to SMEs by helping them access the support they need. Beyond COP26 we will continue to support UK businesses to meet their net zero commitments, including exploring a government-led digital advice service that consolidates and simplifies advice, funding, and other support on net zero.

Net Zero Strategy: Build Back Greener

For larger businesses, we want to ensure businesses are aware of their energy and carbon use so they can take action towards reaching net zero. Climate risks must be assessed and disclosed through the Task Force on Climate-related Finance Disclosures (TCFD). This is complemented by Streamlined Energy and Carbon Reporting, which requires energy and emissions reporting in all UK large businesses to improve awareness of energy costs. We also require large businesses and their corporate groups to carry out a broader assessment of their energy use from buildings, transport and industrial processes every 4 years under the Energy Savings Opportunity Scheme (ESOS), which is designed to identify practicable and cost-effective energy saving opportunities. In the future building users and decision makers will be able to compare the performance of their buildings to other similar buildings using a performance-based energy rating to support targeted investments.

Government will work in partnership not just with businesses themselves, BROs, sector-based trade associations, business groups in the Devolved Administrations and local and regional organisations to translate the pathways within this strategy into business specific plans to reach net zero.



23. Supporting people to make green choices will be a collective effort between government, businesses, voluntary sector, social enterprise and community groups, local authorities, media organisations and others. However, we know that others look to Government to set the narrative on how we should get to net zero and what people’s role will be.

24. We will build on government communications and engagement on net zero to increase awareness of how we plan to deliver the net zero target in the UK. Building on the momentum of COP26, the Together for our Planet campaign is showcasing how people across the UK are going “One Step Greener” to tackle climate change - from the engineers working on the offshore wind farms now powering our homes and businesses, to local initiatives encouraging children and parents to walk to school. The campaign demonstrates that taking a single step can have a positive impact on the environment, using the inspiring stories of 26 One Step Greener Ambassadors who are playing their part for the planet - be it by walking to work, repairing their clothes, or reducing their food waste - to encourage others to join them. The

‘One Step Greener’ Ambassadors come from all walks of life in their pursuit of a greener future and demonstrate how going one green step can culminate in a large collective impact in helping to make the UK a more sustainable place.

25. We will build on the success of Together for Our Planet, through which the UK business community is demonstrating global leadership in efforts to combat climate change, with over 1,900 SMEs signed up to reach net zero by 2050. Up and down the country, local high street shops are proudly displaying their climate leadership by sharing their net zero journey on social media. Examples include Caribe Coffee, a family run coffee business in Northumbria, John Sankey, a sustainable furniture maker in Derbyshire, and SilverHare, a jewellery maker in West Cornwall. In doing so, they are acting as changemakers in their local communities. The focus of the campaign in the run-up to COP26 has been on encouraging business to make net zero pledges. After COP26, we commit to continuing to support businesses to meet their commitments whilst developing their climate resilience.

4vii. International Leadership and Collaboration

Accelerating the global transition to a resilient net zero future

Our Key Commitments

- Increase global climate action through our push for global net zero, including our COP26 Presidency objective to keep 1.5°C within reach. As part of this, strengthen international collaboration in key sectors including by working with others to accelerate the innovation and deployment of clean technology and continue to convene the Zero Emission Vehicle Transition Council, the Energy Transition Council, the FACT dialogue, and other flagship initiatives that will be announced at COP26.
- Deliver against net zero on a trajectory in line with the Paris Agreement, decreasing UK emissions by at least 68% by 2030 as set out in our Nationally Determined Contribution,⁵⁴ 78% by 2035 compared to 1990 levels in line with our Sixth Carbon Budget.
- Double our International Climate Finance to at least £11.6 billion between 2021 and 2025 to support net zero support adaptation and build resilience internationally. Within this, invest at least £3 billion in solutions that protect and restore nature, and £200 million at a minimum to help countries access technical expertise to limit emissions and build back greener.
- Drive international innovation in key low carbon technologies through Mission Innovation, including co-leading the Green Powered Future and Clean Hydrogen Missions.
- Lead by example internationally on inclusive climate policies, Action for Climate Empowerment and support for the UNFCCC Gender Action Plan.
- Set out a clear vision and priorities to guide UK international climate and nature action in the coming decade through a 2030 Strategic Framework, and publish a refreshed Export Strategy outlining HMG support for exporters in the low carbon economy.

The challenge

1. Meeting our shared objective of avoiding dangerous climate change requires a dramatic, global acceleration of progress towards net zero CO₂ emissions by mid-century and net zero greenhouse gas emissions (GHG) by around 2070.⁵⁵ Over 2020-21 there has been considerable progress, with all G7 countries, over half of the G20, and around 75% of global emissions now covered by net zero targets. However, the world is still not on track to reach the Paris Agreement temperature goal, which aims to limit global warming to well below 2°C and pursue efforts to limit warming to 1.5°C, compared to pre-industrial levels. More must be done to turn these targets into immediate action.

2. UK emissions account for about 1% of the global total.⁵⁶ To accelerate progress towards a resilient net zero future, we need to play a prominent role in promoting collective global action, working together to ensure the transition is quicker, cheaper, and easier for all building on a strong foundation of domestic action.

3. The transition to net zero must be supported by a joined-up approach to halting biodiversity loss. The two are inextricably linked: the greatest drivers of biodiversity loss, land use change and agriculture are also responsible for approximately one fifth of global GHG emissions. Simultaneously, climate change itself is a direct driver of biodiversity loss, and terrestrial and marine ecosystems act as carbon sinks for human-driven CO₂ emissions.⁵⁷

Our goal

4. As set out in the *Integrated Review of Security, Defence, Development and Foreign Policy* (the Integrated Review), tackling climate change and biodiversity loss is the number one international priority for the UK for the coming decade.⁵⁸

5. As the world recovers from the COVID-19 pandemic our actions must be aligned with the Paris Agreement to ensure a fair and inclusive transition to net zero. This includes enhancing adaptive capacity, strengthening resilience, and reducing vulnerability to climate change.

6. The international emissions reductions required to keep 1.5 degrees warming within reach are only achievable if the international community works together. And by working together, we can create stronger incentives for investment, we can innovate faster, we can achieve economies of scale more quickly

and we can create level playing fields. This international collaboration will make the transition to net zero cheaper, faster, and more accessible for all countries. This is not a matter of shouldering a burden between us, but of sharing an opportunity. It will support the UK's own transition and stimulate UK jobs and prosperity.⁵⁹ Over the past decade alone, we have seen over an 80% drop in the costs of clean energy technologies thanks to technology innovation, learning-by-doing, and greater deployment at scale domestically and globally.⁶⁰

7. Collaboration across borders and society is a key aim for our COP26 and G7 Presidencies. Beyond these, we will continue to advocate for enhanced international collaboration, and coordinate action across science, innovation, finance, and trade.

Delivering our Paris Agreement commitments

Mitigation

8. Parties to the Paris Agreement shall communicate ambitious short-term targets to reduce greenhouse gas (GHG) emissions through Nationally Determined Contributions (NDCs) and should strive to underpin these targets with credible pathways set out in Long Term Strategies (LTSs).

9. The UK's NDC commits us to reducing our economy-wide GHG emissions by at least 68% by 2030, compared to 1990 levels.⁶¹ This strategy sets out the UK's plans to deliver on the NDC and reach net zero by 2050 and will be submitted to the UNFCCC as our revised LTS under the Paris Agreement.

International Climate Finance (ICF)

10. The UK's ICF helps over 100 developing countries mitigate and adapt to the impacts of climate change. This includes supporting countries' resilience to the damaging effects of climate change, accelerating the clean energy transition, supporting low carbon infrastructure, and investing in climate change solutions that protect and restore nature and biodiversity.

11. The UK has committed to doubling our ICF to at least £11.6 billion between 2021-2025, including at least £3 billion for nature and biodiversity.⁶² This forms part of an ambition by developed countries to mobilise \$100 billion in climate finance annually. We have also committed to aligning all UK Official Development Assistance (ODA) with the Paris Agreement and ensuring that all new UK bilateral aid spending does no harm to nature. This delivers on our Integrated Review objective of investing in a nature-positive economy.

2021 cumulative UK ICF Achieved results (2011-2021, last year's in brackets)



88 million
people supported to cope with
the effects of climate change
(66 million)



41 million
people improved access
to clean energy
(33 million)



180 million
people avoided or reduced tonnes
of greenhouse gas emissions
(31 million)



2,400 MW
capacity of clean
energy installed
(2,000 MW)



£5.2 billion
public finance mobilised
for climate change
(£4.1 billion)



£3.3 billion
private finance mobilised
for climate change
(£2.2 billion)

Source: BEIS analysis (2021)

12. UK ICF is stimulating a shift in private finance mobilisation for climate action from the billions to the trillions. Between 2011 and 2021, UK ICF mobilised £3.3 billion of private finance for climate change purposes in developing countries.⁶³ We target investment in developing economies with the highest potential to accelerate the global transition to net zero, ensuring that everyone can share the opportunities of clean growth sooner.

13. We support the work of key multilateral funds and have significant bilateral programming drawing on UK experience and expertise, enabled by the diplomatic work of our climate, energy and environment

attaché network embedded in UK Embassies and High Commissions. UK Partnering for Accelerated Climate Transitions (UK PACT) is supporting developing countries with potential for high emissions reductions to build the knowledge and expertise required to both develop and implement the ambitious plans needed to limit emissions and realise the opportunities of clean growth.

14. For all new and existing International Climate Finance programmes, we will ask delivery and monitoring partners to include analysis of the impacts of programmes on certain groups of people to manage any negative impacts.⁶⁴

Case study: UK-Colombia Partnership for Sustainable Growth

Through our Partnership for Sustainable Growth, the UK is working with Colombia to help drive real world emissions reductions and global climate ambition. The partnership and UK programmes are supporting Colombia to reduce deforestation, accelerate the energy transition, and conserve biodiversity. For example, UK technical assistance helped deliver Colombia's first renewable energy auction in 2020 – which will increase solar and wind capacity in the country from 50 MW to nearly 2,500 MW – as well as the development of the country's strategic planning for a low carbon energy sector through skill-shares with UK experts. Our strong climate partnership has also supported increased ambition in line with the goals of the Paris Agreement and a net-zero future, with Colombia committing in 2020 to cut 51% of greenhouse gas emissions by 2030, compared to a projected scenario.

15. Climate change disproportionately affects the world's poorest and can exacerbate economic and social disparities. However, local communities and indigenous knowledge systems can also play a key role in solutions.

16. As part of our incoming COP26 Presidency, the UK has developed a framework that aims to guide investment towards a global net zero transition that also supports the UN's Sustainable Development Goals. The framework will indicate how support for developing countries and emerging economies can accelerate climate ambition and enable a global green recovery

in an inclusive way. This is the first time donor countries will have set out how they will support this transition, including through financial flows for quality local jobs in the most vulnerable communities.

17. Low carbon transitions should be fair and affordable and not negatively impact disadvantaged groups.⁶⁵ We are committed to monitoring the impacts of our climate and clean energy policies, and any disparities which arise, to assess the need for targeted support for disproportionately impacted groups, in line with the UNFCCC Gender Action Plan and domestic law.

Influencing global action

COP26 Presidency

18. The four goals of our COP26 Presidency are: (1) mitigation to secure global net zero by mid-century to keep 1.5°C within reach; (2) adapting to protect communities and natural habitats; (3) mobilising finance and (4) collaboration: working together to deliver, finalising the Paris Rulebook and accelerate action to tackle the climate crisis through collaboration between governments, businesses, and civil society.

19. There will also be a renewed focus on accelerating near-term action in the top priority areas of coal phase out, zero-emission vehicles, climate finance and halting deforestation. We will ask countries to sign up to initiatives under each goal:

- **Coal:** to push for an immediate end to new unabated coal power and international coal financing, and the scaling up of low carbon power to rapidly move away from existing coal.
- **Trees:** to halt natural forest loss by 2030 and restoring millions of hectares of degraded landscapes and forestlands. This is alongside improving governance and increasing forest finance.

- **Cash:** developed countries to make good on their promise to mobilise at least \$100 billion in climate finance per year through to 2025.
- **Cars:** to accelerate the shift to zero emission vehicles (ZEVs), pushing for all new car sales in leading markets to be ZEV by 2035.

20. Our COP26 Presidency has defined five areas vital to a zero-carbon future: energy transitions, clean transport, nature-based solutions, adaptation and resilience, and, tying it all together, finance. We are working with those affected by climate change and with wider civil society to harness innovation and commitment in these areas and will continue this work throughout our COP26 Presidency year up to November 2022.

Case study: 2020 Climate Ambition Summit

A major milestone ahead of COP26 was the 2020 Climate Ambition Summit, co-convened by the UK, UN, and France, in partnership with Chile and Italy. This landmark event demonstrated how we can help drive collective ambition by combining major domestic commitments with diplomatic engagement, working closely with multilateral organisations and international partners.

Achievements included more ambitious Nationally Determined Contributions (NDCs) from 45 leaders. We also saw 24 countries announce new commitments, plans or strategies to reach net zero, and a UK announcement on ending direct government support for fossil fuel energy sector overseas. When the UK was confirmed as host of COP26, less than 30% of global GDP was signed up to net zero or carbon neutrality commitments. Again, thanks in part to UK leadership, that figure is now over 80% - and rising.

We will continue to encourage all countries to set targets to get to net zero by 2050, and more ambitious 2030 emissions reduction targets to get us there. We are also encouraging countries to publish Adaptation Communications or National Adaptation Plans. We will use COP26 and our Presidency year to turn these commitments into action to make the next ten years the decade of delivery.

G7 Presidency and G20

21. Under our 2021 G7 Presidency, members committed to becoming ‘a net zero G7 by 2050 at the latest’; ensuring a green recovery from COVID-19 that is sustainable, resilient, and inclusive; phasing out new direct government support for international fossil fuel energy, and pursuing commitments to support those most vulnerable to the impacts of climate change and environmental degradation. These have helped to lay the foundation for COP26.

22. As inclusivity was at the heart of the UK’s G7 Presidency, these commitments are underpinned by pledges to support affected workers and sectors so that no person, group, or geographic region is left behind.

23. As part of our G7 Presidency, the UK hosted several follow-up workshops including on Net Zero Sectors and the Industrial Decarbonisation Agenda (IDA). G7 members supported the idea of using the IDA to unlock market potential through high-level G7 government coordination and collaboration on ambitious industrial decarbonisation initiatives. Driving international cooperation on decarbonisation will help to diffuse ‘first mover’ risks and address carbon leakage risks at the outset. The IDA is due to be integrated into the rotating G7 Presidency with Germany taking ownership in 2022. During the rest of our G7 Presidency, we will work with our partners to consider how best to coordinate efforts on the pricing of carbon to mitigate emissions, and to explore international solutions to prevent carbon leakage, helping us deliver the transformational change required by the Paris Agreement.



Key G7 climate commitments

- Submitting net zero-aligned NDCs to 2030 and LTSs to 2050 ahead of COP26;
- Reaffirming the collective developed country goal to jointly mobilise \$100 billion per year through to 2025;
- Increasing adaptation finance, including a commitment to submit adaptation communications ahead of COP26;
- Accelerating the transition away from unabated coal capacity and to an overwhelmingly decarbonised power system in the 2030s;
- Ending new direct government support for unabated international thermal coal power generation by the end of 2021, alongside phasing out new direct government support for international fossil fuel energy as soon as possible;
- Increasing the pace of the global decarbonisation of the road transport sector throughout the 2020s and beyond;
- Decarbonising hard-to-abate sectors, including through a new UK-US-led Industrial Decarbonisation Agenda;
- Launching a new partnership to modernise development finance tools to build back better for the world, including for resilient infrastructure and technologies to address the impacts of climate change;
- Pledging cooperation on the risk of carbon leakage and to aligning trading practices with the Paris Agreement; and
- Recognising the potential of carbon pricing to foster emission reductions, while ensuring environmental and social considerations are accounted for.



24. The G20 includes both developed and developing nations. Its members are jointly responsible for approximately 80% of global emissions⁶⁶ and more than 80% of global GDP⁶⁷: it must play a leading role in global efforts to tackle climate change. In July 2021, UK Climate and Energy Ministers met with their G20 counterparts in Naples to agree to accelerate action in the 2020s, to submit ambitious 2030 targets by COP26,

and to urge each other to develop long term strategies in line with keeping the 1.5°C temperature goal within reach. The UK will advocate for further action from the G20 to meet the commitments of the Paris Agreement. The Leaders' Summit in Rome in October, on the eve of COP26, will be a crucial moment to build consensus for urgent and ambitious action on climate change and the clean energy transition.

Facilitating a global transition

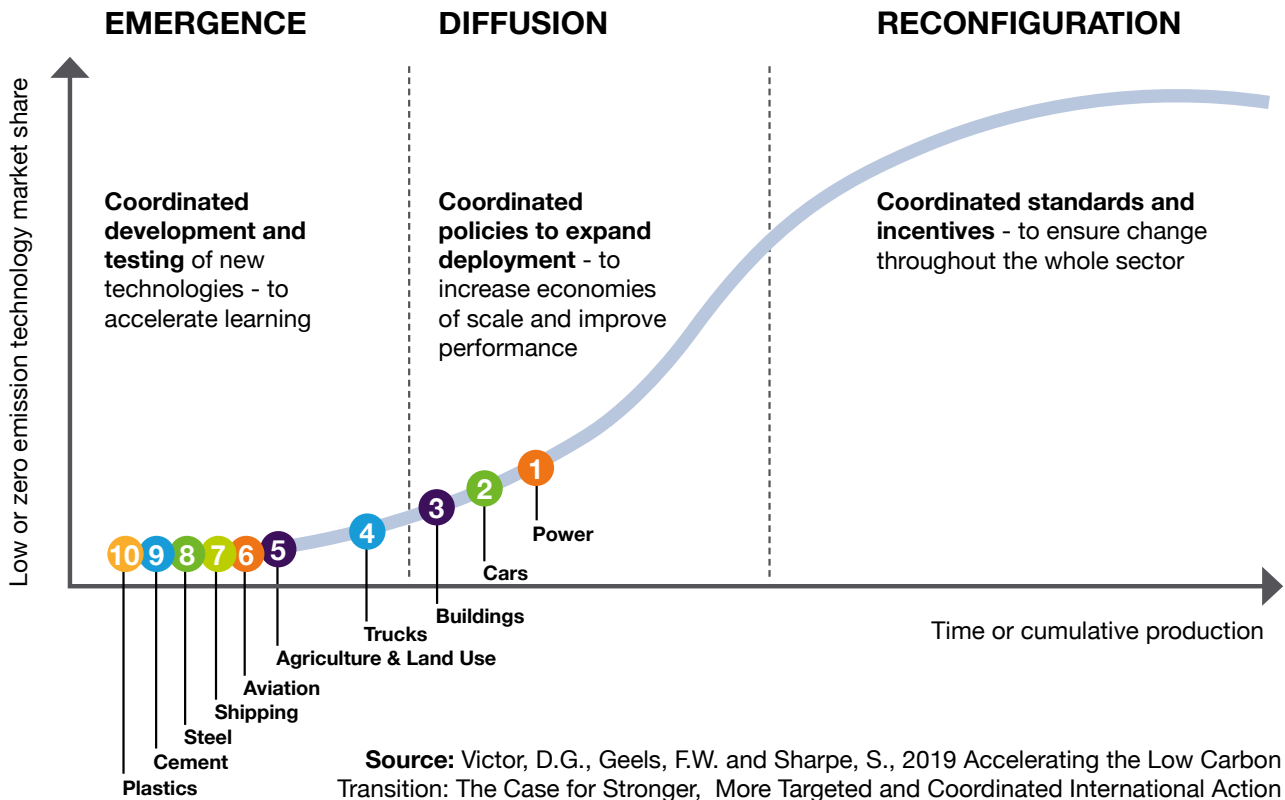
25. The global move to a green and net zero economy will require accelerated transitions across all major emitting sectors – including power, transport, buildings, industry and agriculture, forests and land-use. All countries, including the UK, can benefit from greater collaboration to help achieve their net zero targets more quickly and more cheaply.

26. Across the global economy, different sectors are experiencing the transition at different speeds (see infographic below for one interpretation of the progress by sector). International collaboration focused at the sector level can accelerate action towards our global goals, which is why it is a key focus for the UK. This includes delivering faster innovation through coordinating on research, development, and demonstration of clean technologies, as well as faster deployment of technologies, by coordinating on policy, finance, and trade measures to create new demand, economies of scale, and supply chains for clean technologies.

27. Collaborative action also sends clearer market signals to businesses and consumers about the global direction of travel. This confidence in a credible global net zero pathway is especially important for the harder to abate sectors, such as heavy industry, where we know that the pace of emissions reduction will progress more slowly up to 2030. However, action is needed in these sectors now to lay the significant groundwork required to set the path for future emission reductions.

28. We will therefore continue to work with countries to accelerate sectoral technologies at COP26 and beyond – including continuing to convene the Zero Emission Vehicle Transition Council, the FACT Dialogue, and the Energy Transition Council – as well as working with partners to set a common vision for the next decade of clean technology innovation and deployment at COP26.

Figure 30: The sectoral S-curve



Case study: COP26 Energy Transition Campaign

Our COP26 Energy Transition Campaign will help accelerate the global transition from coal to renewables, enabling the energy sector to achieve net zero. The UK is working through the Powering Past Coal Alliance (PPCA) and the Energy Transition Council (ETC) up to, and beyond, COP26. This will strengthen the coalition of countries, sub-national governments, and businesses phasing out unabated coal power and reduce international coal finance.

Solar and wind power are now cheaper than new coal and gas power plants in two-thirds of the world.⁶⁸ The Energy Campaign will bring together countries, development banks, investors and civil society to strengthen low carbon power investment and assistance so that it is viable for every country.

The UK has also worked with the IEA to launch a COP26 Product Efficiency Call to Action, to double the efficiency of four key products (air conditioners, refrigerators, industrial motors, and lighting) by 2030. These four products combined currently account for more than a third of global electricity consumption. Global action to improve product efficiency will lead to a significant reduction in the energy sector's carbon emissions.

The UK driving inclusive climate action

29. We will drive forward our commitment under the 'Equal by 30 Campaign' to work towards equal pay, leadership, and opportunities for women in the global clean energy sector by 2030, and champion increased gender representation across the UK's international organisations.

30. The UK remains committed to strengthening the evidence base and understanding of differentiated impacts of climate change on men and women, the role of women as agents of change and on equal opportunities for women. We continue to support amongst other things, increasing the proportion of women and girls in decision-making and leadership positions, supporting their access to finance, education, building their resilience to climate change, and improving data on gender and inclusion.

Science and innovation

31. Science and innovation are essential to achieve global climate goals. The UK will continue to work closely with countries to drive innovation, research, and aligned policy to ensure that clean technologies become cheaper and more readily available. The UK will also continue to promote the vital role of the Intergovernmental Panel on Climate Change (IPCC) and other scientific research, ensuring the best available science is accessible and understood by all, enabling informed decision-making across the world.

32. The UK will continue to use its world-leading position in climate-related science and innovation to build global multidisciplinary networks and facilitate knowledge exchange to support effective global climate action through initiatives such as Mission Innovation, the Adaptation Research Alliance, and the Visions for a Net-Zero Future project.

Case study: Mission Innovation

The UK has played a leading role in Mission Innovation (MI) since it launched at COP21 as the primary intergovernmental forum focused on clean energy innovation essential to achieving net zero. We have more than doubled our MI baseline clean energy innovation spend over the past five years, exceeding our MI commitment.

The second phase of Mission Innovation (MI 2.0) was launched in June 2021, bringing together countries responsible for more than 90% of global R&D clean energy investment and committed to a decade of action and investment in innovation for clean energy solutions. Commitments included developing National Innovation Pathways describing enhanced ambition to pioneer clean energy technologies and sectors.

The UK is co-leading two of the three Missions. Launched as part of MI 2.0, The Green Powered Future Mission is bringing together governments and businesses to enable the transition to variable renewable power. The Clean Hydrogen Mission aims to make clean hydrogen cost competitive. The UK is also participating in the Zero-Emission Shipping Mission which aims for ships capable of running on zero-emission fuels to comprise at least 5% of the global deep sea fleet by 2030.

Trade

33. The whole system shift that will be required for the UK to reach net zero will also mean changes to how and what we trade. Taking a leading role in the global shift to net zero presents a significant economic opportunity for the UK. Estimates suggest the UK's low carbon economy could deliver up to £170 billion of export sales of goods and services by 2030.⁶⁹ The UK will seek to improve market access for green goods and services through our trade policy, our growing array of free trade agreements (FTAs) and our seat at the World Trade Organization (WTO). For example, when we exited the EU, we unilaterally removed tariffs on over 100 additional products used in renewable energy generation, energy efficiency, carbon capture, and the circular economy as part of the UK's Global Tariff.⁷⁰

34. We will seek to reaffirm our commitment to the Paris Agreement in all UK trade agreements and will ensure that they preserve our regulatory autonomy to pursue our climate targets including our Carbon Budgets, enhanced 2030 NDC and 2050 net zero commitment. We will use our multilateral fora to galvanise international partners to adopt climate-ambitious trade policy, and to promote global trade rules that are aligned to net zero and the Paris Agreement, for example through the WTO committees and the new Trade and Environmental Sustainability Structured Discussions.

35. While there are significant opportunities for UK trade to support our climate and nature ambitions as we transition to net zero, it is important we ensure that our policy interventions support global emissions reductions. The UK is at the forefront of measuring and publishing statistics of emissions generated overseas in the production of goods and services consumed by UK residents. We recognise there is much more to do on consumption emissions globally which is why we are urging and supporting other countries to raise ambition on climate change, including on effectively pricing carbon, as well as considering this issue as we negotiate new FTAs.

36. Decisions on the liberalisation of partners goods must account for their environmental and climate impact. Where there is evidence that liberalisation could lead to significant carbon leakage the case for maintaining tariffs or pursuing conditional market access, through clauses on standards or eco/carbon intensity, should be carefully considered.

37. We will publish a refreshed Export Strategy by the end of 2021. The Strategy will help deliver jobs and growth and maximise export opportunities for green UK technologies and innovation. It will also support our transition to net zero, enabling the UK to take advantage of the window to boost UK competitiveness in key low carbon technologies, services and systems. The Strategy will also help developing countries mitigate and adapt to climate change and nature loss by reducing trade barriers to help them benefit from the green transition.

38. UK Export Finance is also expanding its suite of green products and published the UK Export Finance Climate Change Strategy in September 2021. The UK is also one of the founding signatories of the Export Finance for Future initiative, a coalition of countries which endorsed a statement of principles to better integrate climate in export finance.

Finance

39. At COP26 the UK is working to achieve the finance goal, agreed in Article 2.1.c of the Paris Agreement, to make finance flows consistent with a pathway towards low greenhouse gas emissions and climate-resilient development. The UK Presidency published our Priorities for Public Finance earlier in 2021, and Priorities for Private Finance in 2020.⁷¹

40. Following COP26, the UK will continue to strive for greater ambition on finance. Achieving the global transition requires renewed action from all stakeholders to support the needs of developing countries. From the global to the local level, we need to

put in place the conditions for a sustainable recovery and climate action, creating the right investment environments and aligning national budgets and planning processes with the goals of the Paris Agreement and 2030 Sustainable Development Agenda.

41. However, international public finance alone will never be enough to achieve the trillions of investment needed and put the world on a sustainable footing; the private sector will be key. Achieving net zero and our finance goals requires changes from the whole economy – we need every company, bank, insurer, and investor to adjust their business models, develop credible plans for the transition and implement them.

UK global climate action beyond COP26

42. Beyond our COP26 and G7 Presidencies, and the commitments outlined in this chapter, the UK will continue championing the fight against climate change and biodiversity loss internationally and at home in the decade to come.

43. The UK COP26 Presidency will formally begin at the Summit in November 2021 and run until COP27 in November 2022. Throughout our Presidency year, we will build on the outcomes from COP26 and the COP26 campaigns, including further strengthening the architecture for collaboration in key sectors, and work with international partners to keep the 1.5°C temperature goal alive. This entails continuing to advocate for our four Presidency goals with a focus on progress against our agreed targets in critical sectors and building the conditions for further ambition and a successful Global Stocktake in 2023.

44. Building on our COP26 Presidency, we are developing a 2030 Strategic Framework due to be published in 2022. The Framework will provide a coordinated approach to deliver against the climate and biodiversity commitments set out in the Integrated Review.

It will also establish a common vision and clear priorities to guide UK international climate and nature action over the next decade. The UK will continue to play a leadership role in delivering the change needed by capitalising on our areas of strengths including diplomacy, finance, science, technology and innovation, trade, and domestic leadership.

45. On top of the 2030 Strategic Framework, we will aim to mobilise greater finance for nature, tackle the key drivers of biodiversity loss, and deliver against the targets contained in the post-2020 Global Biodiversity Framework.

46. The upcoming International Climate Finance Strategy will set out how we will use our £11.6 billion ICF to deliver transformational programmes in support of mitigation and adaptation action in developing countries across the four themes of clean energy, nature, resilience, and infrastructure.

Endnotes

- ¹ Mission Innovation is a global initiative of 24 countries, including the UK and the European Commission, working to accelerate clean energy innovation. It was established in 2015.
- ² BEIS (2020), 'The Ten Point Plan for a Green Industrial Revolution', <https://www.gov.uk/government/publications/the-ten-point-plan-for-a-green-industrial-revolution>
- ³ This includes legacy funding from government's previous £505 million Energy Innovation Programme.
- ⁴ We recently published a Fusion Strategy and a Fusion Regulation Green Paper, recognising that fusion could be the ultimate clean power solution, representing a low carbon, safe, continuous and effectively unlimited source of energy. BEIS (2021), 'Towards fusion energy: the UK government's fusion strategy', <https://www.gov.uk/government/consultations/towards-fusion-energy-proposals-for-a-regulatory-framework>; BEIS (2021), 'Towards fusion energy: proposals for a regulatory framework' <https://www.gov.uk/government/consultations/towards-fusion-energy-proposals-for-a-regulatory-framework>.
- ⁵ BEIS analysis based on the methodology used in the Energy Innovation Needs Assessments. BEIS (2019), 'Energy Innovation Needs Assessments'.
- ⁶ The Industrial Strategy Challenge Fund (ISCF) aims to bring together our world-leading research base with Britain's best businesses to address the biggest challenges society faces, including clean growth. The fund, which is part of government's £4.7 billion investment in R&D over 4 years is delivered by UK Research and Innovation (UKRI) and its partners.
- ⁷ Bank of England (2021), 'A roadmap for increasing productive finance investment', <https://www.bankofengland.co.uk/report/2021/a-roadmap-for-increasing-productive-finance-investment>
- ⁸ Major projects are defined as those which: require spending over and above departmental expenditure limits; require primary legislation; and are innovative or contentious. More information can be found at <https://www.gov.uk/government/groups/major-projects-authority>
- ⁹ This diagram is not an entirely accurate representation of the stages of development at which these institutions and funds intervene and it is simplification of the varied programmes and impacts they have on different sectors, businesses and technologies. However, it demonstrates roughly where these government interventions have greatest impact and have a key role to play in delivering economy-wide net zero solutions.
- ¹⁰ Mark Carney and the COP26 Private Finance Hub – in partnership with the UNFCCC Climate Actions Champions and the Race to Zero campaign and the COP26 Presidency- have launched a coalition that combines existing and new net zero finance initiatives into a wider strategic forum: The Glasgow Financial Alliance for Net Zero (GFANZ). GFANZ aims to raise ambition in the financial sector by allowing firms to demonstrate collective commitment to net zero.
- ¹¹ BloombergNEF (2021), Database accessed 12/10/2021

- ¹² This diagram is only an approximation of the maturity of different sectors to illustrate potential public sector interventions.
- ¹³ Defra, Environment Agency, Natural England (2021), 'Innovative nature projects awarded funding to drive private investment', <https://www.gov.uk/government/news/innovative-nature-projects-awarded-funding-to-drive-private-investment>
- ¹⁴ BEIS (2020), 'Government launches new £40m Clean Growth Fund to supercharge green start-ups', [Press release] <https://www.gov.uk/government/news/government-launches-new-40-million-clean-growth-fund-to-supercharge-green-start-ups>
- ¹⁵ Chaired by Mark Carney, is bringing together over 160 firms from the leading net zero initiatives across the financial system to accelerate the transition to net zero emissions by 2050 at the latest.
- ¹⁶ Chancellor sets out how UK financial services can create prosperity at home and project values abroad in first Mansion House speech: <https://www.gov.uk/government/news/chancellor-sets-out-how-uk-financial-services-can-create-prosperity-at-home-and-project-values-abroad-in-first-mansion-house-speech>
- ¹⁷ BEIS (2019), 'Green Finance Strategy', <https://www.gov.uk/government/publications/green-finance-strategy>
- ¹⁸ Chancellor sets out how UK financial services can create prosperity at home and project values abroad in first Mansion House speech: <https://www.gov.uk/government/news/chancellor-sets-out-how-uk-financial-services-can-create-prosperity-at-home-and-project-values-abroad-in-first-mansion-house-speech>
- ¹⁹ LSE Grantham Institute (2021), 'Green economy: how the transition to net-zero could affect UK jobs across the country', <https://www.lse.ac.uk/granthaminstitute/news/green-economy-how-the-transition-to-net-zero-could-affect-uk-jobs-across-the-country/>
- ²⁰ BEIS (2021), 'Wind of change for the Humber region', [Press release] <https://www.gov.uk/government/news/wind-of-change-for-the-humber-region>
- ²¹ The World Bank, Climate-Smart Mining: Minerals for Climate Action, <https://www.worldbank.org/en/topic/extractiveindustries/brief/climate-smart-mining-minerals-for-climate-action>
- ²² BEIS (2020), 'The Ten Point Plan for a Green Industrial Revolution', <https://www.gov.uk/government/publications/the-ten-point-plan-for-a-green-industrial-revolution>
- ²³ CITB (2021), 'Building Skills for Net Zero', <https://www.citb.co.uk/about-citb/construction-industry-research-reports/search-our-construction-industry-research-reports/building-skills-for-net-zero/>
- ²⁴ Heat Pump Association (2020), 'Building the Installer Base for Net Zero Heating', https://www.heatpumps.org.uk/wp-content/uploads/2020/06/Building-the-Installer-Base-for-Net-Zero-Heating_02.06.pdf
- ²⁵ BEIS (2021), 'Green Jobs Taskforce Report', <https://www.gov.uk/government/publications/green-jobs-taskforce-report>
- ²⁶ Forestry Skills Forum (2021) 'Forestry Workforce Research', <https://www.confor.org.uk/media/2678188/forestry-workforce-research-final-report-august-2021.pdf>

- ²⁷ BEIS (2021), 'Green Jobs Taskforce report', <https://www.gov.uk/government/publications/green-jobs-taskforce-report>
- ²⁸ BEIS (2021), 'Green Jobs Taskforce report', <https://www.gov.uk/government/publications/green-jobs-taskforce-report>
- ²⁹ BEIS (2021), 'Green Jobs Taskforce report', <https://www.gov.uk/government/publications/green-jobs-taskforce-report>
- ³⁰ *Building back better and greener*, BEACON, <https://beaconwales.org/>
- ³¹ Industrial Strategy Council (2019), 'UK Skills Mismatch 2030 – research paper', <https://industrialstrategycouncil.org/uk-skills-mismatch-2030-research-paper>
- ³² *What Qualification Levels Mean*, GOV.UK, <https://www.gov.uk/what-different-qualification-levels-mean/list-of-qualification-levels>
- ³³ BEIS (2021), 'Green Jobs Taskforce report', <https://www.gov.uk/government/publications/green-jobs-taskforce-report>
- ³⁴ *BEIS Analysis; NAEI (2021), 'Greenhouse Gas Inventories for England, Scotland, Wales & Northern Ireland: 1990-2019'*, "https://eur02.safelinks.protection.outlook.com/?url=https%3A%2F%2Fuk-air.defra.gov.uk%2Freports%2Fcat09%2F2106240841_DA_GHGI_1990-2019_Final_Issue1.2.xlsx&data=04%7C01%7CCarys.Parkinson%40beis.gov.uk%7C3fcede07e99f45792dde08d98d882921%7Ccbac700502c143ebb497e6492d1b2dd8%7C0%7C0%7C637696438200726854%7CUnknown%7CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzliLCJBTiI6IjEhaWwiLCJXVCi6Mn0%3D%7C1000&sdata=OjdCXyKW2%2FON40TzziyLmu6qxINXUeWV90NZOL60vyl%3D&reserved=0" https://uk-air.defra.gov.uk/reports/cat09/2106240841_DA_GHGI_1990-2019_Final_Issue1.2.xlsx
- ³⁵ ONS (2021), 'Regional gross domestic product: all ITL regions', 1998 - 2019, "<https://eur02.safelinks.protection.outlook.com/?url=https%3A%2F%2Fwww.ons.gov.uk%2Feconomy%2Fgrossdomesticproductgdp%2Fdatasets%2Fregionalgrossdomesticproductallnutslevelregions&data=04%7C01%7CCarys.Parkinson%40beis.gov.uk%7C3fcede07e99f-45792dde08d98d882921%7Ccbac700502c143ebb497e6492d1b2dd8%7C0%7C0%7C637696438200746767%7CUnknown%7CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzliLCJBTiI6IjEhaWwiLCJXVCi6Mn0%3D%7C1000&sdata=xonO3pzT%2FBi81uXG-8jQcG75pJSRS1Z5oSpyvzCLkDtE%3D&reserved=0>" <https://www.ons.gov.uk/economy/gross-domesticproductgdp/datasets/regionalgrossdomesticproductallnutslevelregions>
- ³⁶ CCC (2020), 'Sixth Carbon Budget', <https://www.theccc.org.uk/publication/sixth-carbon-budget/>
- ³⁷ BEIS (2021), *Final UK greenhouse gas emissions national statistics. BEIS (2020), Updated energy and emissions projections: 2019.*
- ³⁸ Compared to 2018 baseline.
- ³⁹ Where cycling activity is measured as the estimated total number of cycle stages made each year, from 0.8 billion stages in 2013 to 1.6 billion stages in 2025.
- ⁴⁰ Where walking activity is measured as the total number of walking stages per person per year, to 300 stages per person per year in 2025

- ⁴¹ *Collection Final UK Greenhouse gas emissions national statistics*, BEIS, <https://www.gov.uk/government/collections/final-uk-greenhouse-gas-emissions-national-statistics>
- ⁴² Government Commercial Function, 'Guide to using the Social Value Model'. 3 December 2020. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/940827/Guide-to-using-the-Social-Value-Model-Edn-1.1-3-Dec-20.pdf
- ⁴³ This analysis excludes the LULUCF sector, which is a net sink of emissions in most local authorities, however the proportion is not sensitive to this approach.
- ⁴⁴ Provisional assessment of policies and proposals. Savings cover only aspects of the policy package where it has been possible to determine the likely local authority role.
- ⁴⁵ Community Energy England (2021), 'Community Energy State of the Sector 2021', <https://communityenergyengland.org/pages/state-of-the-sector>
- ⁴⁶ BEIS Public Attitudes Tracker: Wave 37 – Key Findings', <https://www.gov.uk/government/statistics/beis-public-attitudes-tracker-wave-37>
- ⁴⁷ BEIS Research Report Number: 2021/034, 'Climate change and net zero: public awareness and perceptions', Annex 1: data tables, <https://www.gov.uk/government/publications/climate-change-and-net-zero-public-awareness-and-perceptions>
- ⁴⁸ BEIS (2021), 'Net zero public dialogue', <https://www.gov.uk/government/publications/net-zero-public-dialogue>
- ⁴⁹ [Net Zero Societal Change Analysis Project](#), Energy Systems Catapult Research, June 2021
- ⁵⁰ This draws on work commissioned by BEIS from the Behavioural Insights Team 'Net zero: principles for successful behaviour change initiatives', The Behavioural Insights Team. BIT conducted a rapid evidence review of relevant literature, compiled a total of 87 policy case studies from OECD countries and consulted with 10 experts from a range of behavioural and social sciences.
- ⁵¹ Smart metering statistics, Quarterly update June 2021, <https://www.gov.uk/government/collections/smart-meters-statistics>
- ⁵² ONS, Provisional UK greenhouse gas emissions national statistics 2020: <https://www.gov.uk/government/statistics/provisional-uk-greenhouse-gas-emissions-national-statistics-2020>
- ⁵³ BEIS W11 Kantar Attitudes Tracker, Jan 2021 (Question: % agree that as a business we have a responsibility to reduce our carbon emissions to tackle climate change)
- ⁵⁴ The 68% excludes International Aviation and Shipping
- ⁵⁵ IPCC (2018), 'Special Report on Global Warming of 1.5C', <https://www.ipcc.ch/sr15/>
- ⁵⁶ PBL Netherlands Environmental Assessment Agency (2020), 'Trends in global CO₂ and total greenhouse gas emissions', <https://www.pbl.nl/en/trends-in-global-co2-emissions>
- ⁵⁷ PBL Netherlands Environmental Assessment Agency (2020), 'Trends in global CO₂ and total greenhouse gas emissions', <https://www.pbl.nl/en/trends-in-global-co2-emissions>

- ⁵⁸ Cabinet Office (2021), 'Global Britain in a Competitive Age: the Integrated Review of Security, Defence, Development and Foreign Policy', <https://www.gov.uk/government/publications/global-britain-in-a-competitive-age-the-integrated-review-of-security-defence-development-and-foreign-policy>
- ⁵⁹ IEA (2021), 'Global Energy Related CO₂ emissions in the net zero pathway and Low International Cooperation Case, 2010-2090', <https://www.iea.org/data-and-statistics/charts/global-energy-related-co2-emissions-in-the-net-zero-pathway-and-low-international-cooperation-case-2010-2090>
- ⁶⁰ Rocky Mountain Institution (2019), 'Seven Challenges for Energy Transformation', <https://rmi.org/seven-challenges-report/>
- ⁶¹ BEIS (2020), 'The UK's Nationally Determined Contribution under the Paris Agreement', <https://www.gov.uk/government/publications/the-uks-nationally-determined-contribution-communication-to-the-unfccc>. The 68% excludes International Aviation and Shipping.
- ⁶² Prime Minister's Office, 10 Downing Street (2021), 'Prime Minister commits £3bn UK climate finance to supporting nature' [Press release], <https://www.gov.uk/government/news/prime-minister-commits-3bn-uk-climate-finance-to-supporting-nature>
- ⁶³ FCDO (2021), 'UK Climate Finance results 2021', [Corporate report] <https://www.gov.uk/government/publications/uk-climate-finance-results-2021>
- ⁶⁴ BEIS (2021), 'BEIS Equality Objectives', [Corporate report], <https://www.gov.uk/government/publications/beis-equality-objectives>
- ⁶⁵ BEIS (2021), 'BEIS Equality Objectives', [Corporate report], <https://www.gov.uk/government/publications/beis-equality-objectives>
- ⁶⁶ UN Environment Programme (2020), 'Emissions Gap Report 2020', <https://www.unep.org/interactive/emissions-gap-report/2020/>
- ⁶⁷ UN Environment Programme (2020), 'Emissions Gap Report 2020', <https://www.unep.org/interactive/emissions-gap-report/2020/>
- ⁶⁸ International Renewable Energy Agency (2021), 'Majority of New Renewables Undercut Cheapest Fossil Fuel on Cost', [Press release], <https://www.irena.org/newsroom/pressreleases/2021/Jun/Majority-of-New-Renewables-Undercut-Cheapest-Fossil-Fuel-on-Cost>
- ⁶⁹ CCC (2017), 'UK business opportunities of moving to a low-carbon economy', HYPERLINK "<http://www.theccc.org.uk/publication/uk-energy-prices-and-bills-2017-report-supporting-research/>" www.theccc.org.uk/publication/uk-energy-prices-and-bills-2017-report-supporting-research/
- ⁷⁰ DIT (2020), 'UK Global Tariff backs UK businesses and consumers', <https://www.gov.uk/government/news/uk-global-tariff-backs-uk-businesses-and-consumers>
- ⁷¹ Mark Carney, UN Special Envoy for Climate Action and Finance and the Prime Minister's Finance Adviser for COP26 (2021), 'Priorities for Private Finance for COP26', https://ukcop26.org/wp-content/uploads/2020/11/COP26-Private-Finance-Hub-Strategy_Nov-2020v4.1.pdf

