July 2024

Boosting low-carbon investment in the UK

A Policy Roadmap: Executive Summary

Lead Author: **Nick Molho**

Contributing Author: **Sophie English**

It takes Aviva Investors

AVIVA INVESTORS

Nick Molho

Head of Climate Policy, Aviva Investors

Main responsibilities

Nick is responsible for developing Aviva Investors' public policy positions across key sectors of the economy to accelerate the transition to net-zero emissions. He aims to drive public policy change that will unlock low-carbon investment across all sectors of the economy, thereby facilitating Aviva Investors' gathering of green assets as well as supporting the UK's and other countries' transitions to net-zero emissions. Nick also regularly provides climate and net-zero policy insights to investment and ESG colleagues across Aviva Investors.

Sophie English

Macro Stewardship Analyst, Aviva Investors

Main responsibilities

Sophie English is a Macro Stewardship Analyst within the Aviva Investors Sustainable Finance Centre for Excellence. She supports Nick Molho, Head of Climate Policy, to develop Aviva Investors' public policy positions to accelerate low-carbon investment across key sectors of the economy and support the economy-wide transition to net-zero emissions. She is also responsible for enabling effective communication of macro stewardship activity, through consistent reporting and case study development.

Contents

Acknowledgments and thanks: In addition to the research involved in producing this work, a wide range of businesses, trade associations, academic institutions and public bodies were consulted during the development of this *Roadmap*. We would like to thank the following individuals in particular for their feedback on previous iterations:

Professor Jim Watson (University College London), **Professor Robert Gross** (UK Energy Research Centre), **Chris Stark** (Climate Change Committee), **Matthew Bell** (Frontier Economics), **Sam Peacock** and **Alistair McGirr** (SSE), **Michelle Hubert** (National Grid), **Ana Musat** (Renewable UK), **Adam Berman** and **Dhara Vyas** (Energy UK), **Martin Casey** (Cemex), **Matthew Knight** (Siemens Energy), **Andy Walker** and **Sam French** (Johnson Matthey), **Daphne Vlastari** (BASF), **David Johnson** (Michelin UK), **Arjan Geveke** (Energy Intensive Users Group), **Benjamin Richards** and **Nick Lakin** (Kingfisher), **Julia Barrett** (Willmott Dixon), **David Symons** (WSP), **Steven Fitzgerald** (Ryanair), **Adam Read** and **Stuart Hayward-Higham** (Suez Recycling and Recovery UK), **Signe Norberg** and **Rachel Solomon Williams** (Aldersgate Group), **James Alexander** and **Oscar Warwick Thompson** (UK Sustainable Investment and Finance Association).

This acknowledgement does not constitute an endorsement of the report's recommendations from any of these individuals or organisations.

Foreword

The transition to net zero presents one of the greatest investment opportunities of our lifetime for the private sector. The change required is equivalent to that of the industrial revolution, but in a timeframe equivalent to the more recent digital revolution! It is big business, with huge implications for existing industries and with huge financing requirements.

This sense of opportunity was evident during my time at the COP28 Climate Summit in Dubai last year, where I was struck by the growing focus on mobilising not just public, but also private, finance to put the world economy on track for net zero. Putting in place the low-carbon infrastructure and solutions to achieve net zero is a major investment opportunity which, with the right policy framework, can deliver significant returns in terms of economic growth, job creation, levelling up and exports.

The final text agreed at COP28 called on countries to strengthen the regulatory, policy and incentive environments to mobilise private finance towards clean technologies and nature restoration and to work together to reform the international financial architecture to achieve these goals.

This *Roadmap* aims to help policymakers identify some of the key policy priorities for investors over the next five years, which could help unlock private investment in low-carbon infrastructure, solutions and businesses at the affordable cost, pace and scale needed to maintain progress towards the UK's 2050 net-zero target. It puts forward both cross-economy and sector specific policy priorities, with recommendations covering sectors such as power, heavy industry, surface transport, buildings, aviation, shipping, nature restoration and engineered carbon removals.

The *Roadmap* reflects our clients' growing desire to increase investment in sustainable businesses and projects which are able to deliver an appropriate level of risk-adjusted returns. Clarity on the forward-looking policy environment will be critical to determining the viability of investments today. The *Roadmap* also reflects how we see our duty in delivering long-term return to our clients, which involves engaging with policymakers to tackle and avoid key systemic risks, such as those relating to climate change, and to enable key investment opportunities, such as those presented by the net-zero transition.

Mark Versey
CEO
Aviva Investors

> *"This Roadmap aims to help policymakers identify some of the key policy priorities for investors over the next five years to help unlock the private investment needed to maintain progress towards the UK's 2050 net-zero target"*

Executive summary

The Climate Change Act requires the UK economy to achieve net-zero emissions by 2050, with successive governments and official oppositions sharing the ambition to make the UK one of the most competitive low-carbon economies in the world. As part of its support for the UK's successful transition to net zero, Aviva was the first major global insurer – and one of the first major financial institutions – to set itself a 2040 net-zero emissions ambition, covering emissions from its operations, supply chains and investment portfolios.[1, 2] This ambition was validated by the Science-based Targets initiative (SBTi) in 2022 and includes interim milestones on the pathway to 2040.[3]

Net zero: A significant economic growth opportunity

The **UK has had a strong start in transitioning to a low-carbon economy:** it reduced its emissions by 48 per cent between 1990 and 2021, while growing its economy by 65 per cent over that same period.[4] Significant investment has been committed in areas such as offshore wind – where the UK will soon be host to the five largest offshore wind farms in the world – electric-vehicle manufacturing and charging infrastructure. Low-carbon innovation projects are taking place across a wide range of sectors including aerospace, green hydrogen production and heavy industry.

48%

Reduction in UK emissions between 1990 and 2021

The *Mission Zero Review*, commissioned by HM Government, concluded that with 90 per cent of world GDP covered by some form of net-zero target, the net-zero transition was ***"the growth opportunity of the 21st century"***.[5] Analysis commissioned by the Climate Change Committee as part of Carbon Budget Six estimated that the annualised resource cost of putting the UK economy on track for net zero would amount to just under one per cent of GDP and that this investment could, with the right policy support in place, result in the level of UK GDP being two per cent higher by 2035 than it would otherwise be, as resources are redirected from fossil-fuel imports to UK investment.[6, 7] Recent research from the Grantham Research Institute at the London School of Economics and the Confederation of British Industry (CBI) supports these findings, with the CBI's 2023 *Green Growth Report* highlighting the potential to increase the size of UK GDP by £37 billion to £57 billion annually by 2030 (a 1.6 per cent to 2.4 per cent increase) through further investment in 27 low-carbon growth areas.[8, 9]

The UK Government's *Green Finance Strategy* estimated that the goods and services necessary to reach global net-zero ambitions would be worth up to £1 trillion to UK businesses between 2023 and 2030. UK exports from low-carbon and renewable energy sectors already grew by 67 per cent between 2020 and 2021, compared to a six per cent increase for total exports.[10]

67%

Growth in UK exports from low carbon and renewable energy sectors between 2020 and 2021

The rationale behind this *Roadmap*: The critical role of private investment to reach net zero

To keep the UK on track for net-zero emissions, the Government's *Green Finance Strategy* estimates that ***"through the late 2020s and 2030s, an additional £50-60 billion capital investment will be required each year".***[11] In addition, the delivery of the UK's nature restoration goals could require between £44 billion and £97 billion of investment over the next ten years.[12] While targeted public funding will have an important role to play in the transition to net zero, **a significant share of this investment will need to come from the private sector**. Private investors will therefore have a critical role to play in delivering a timely, affordable and economically successful transition to net-zero emissions for the UK economy and society.

Clear, ambitious and long-term public policy measures will be essential to Aviva Investors' ability – and that of our financial sector peers – to commit further investment into the decarbonisation of our portfolios and satisfy growing client demand for opportunities to invest in sustainable businesses and projects which are able to deliver an appropriate level of risk-adjusted returns. Based on the UK's welcome progress to date, this *Roadmap* therefore aims to help policymakers identify some of the key policy priorities for investors over the next five years, to unlock the private investment needed to achieve the UK's 2050 target and deliver an economically successful and socially equitable transition to net-zero emissions.

Public policy measures will be essential to unlock private investment in the transition to net zero

These recommendations build on the increased flexibility and encouragement to grow investment in low-carbon infrastructure and businesses provided by the Solvency II reforms and the Mansion House Compact.[13] A particular focus of this *Roadmap* is to put forward measures to make low-carbon products and services affordable, easily accessible and desirable for households, thereby **supporting a fair transition to net zero** and growing long-term market demand for low-carbon solutions such as insulation, heat pumps and electric vehicles (EVs).

Aviva Investors has had exposure to businesses and infrastructure across a wide range of low-carbon sectors, from renewable electricity, offshore power networks and electric-vehicle charging infrastructure, through to energy efficient buildings and nature restoration projects (see Figure 1). While important levels of investment have been committed in low-carbon power and the electric-vehicle supply chain over the last ten years, it is clear from our experience that **there is an insufficient pipeline of commercially viable low-carbon projects across most sectors of the economy to meet investor demand for investments in low-carbon infrastructure and businesses that can deliver an appropriate level of risk-adjusted returns**.

In the power sector, this has been partly due to a mix of planning delays for grid infrastructure and a mismatch between rising project costs and limited revenues provided by market mechanisms such as Contracts for Differences (CfD), as was seen in the AR5 auction round for new offshore wind projects in September 2023. In other areas, the policy framework is either yet to be fully finalised (energy efficiency in existing buildings; Carbon Capture, Usage and Storage [CCUS]) or at a relatively early stage of development (low-carbon hydrogen, low-carbon shipping and aviation), thereby creating uncertainty around the specific investment and infrastructure needs for each sector, and limiting the pipeline of commercially viable projects that developers – and subsequently investors – can support and scale up.

This *Roadmap* puts forward a range of public policy solutions to improve market conditions for low-carbon investment

Based on our experience to date, and given our clients' growing interest in low-carbon investment opportunities, **this *Roadmap* puts forward a range of public policy solutions for the next five years to address some of these issues and further improve market conditions to unlock low-carbon investment at greater pace and scale**. The focus of these recommendations is to **unlock private investment** in low-carbon infrastructure, goods, services, supply chains and businesses across the UK economy, **in a way that delivers both an appropriate level of risk-adjusted returns for investors and an affordable cost of finance for developers, businesses and society**. The *Roadmap* offers **cross-economy recommendations** and **recommendations that are specific to eight key sectors of the economy**. This work builds on recommendations put forward by a range of businesses, trade associations, public bodies and academic institutions, to which we have applied our investment expertise and sectoral insights.

Figure 1. **A snapshot of our exposure to the net-zero transition**

Aviva Investors and Aviva have made a wide range of investments across the UK's low-carbon economy. Examples include:

Renewable energy

Aviva Investors has invested around £3 billon to date in renewable energy and associated infrastructure in the UK and Europe. Highlights from Aviva's investments in the sector include a £400 million investment in one of the world's **largest offshore wind farms at Hornsea One** that can power over one million homes (2018), and providing financing towards the acquisition of **offshore transmission assets at the Hornsea Two Offshore Wind Farm** (2023).[14]

Real estate

As of May 2022, we had originated **over £1.04 billon in climate-transition focused real estate loans**, surpassing our 2025 target of £1 billion of loans three years early.[15]

EV-charging infrastructure

Aviva Investors is investing up to **£150 million in the UK and Ireland's EV-charging infrastructure**, including through a commitment to invest up to £110 million in Connected Kerb to support the company's plans to install up to **190,000 on-street EV chargers by 2030** and €30 million in Erapid to develop further sites across its growing EV-charger network.[16, 17]

Buses

Aviva Capital Partners has partnered with Rock Road and the UK Infrastructure Bank to provide a new funding platform for zero-emission buses. The partnership, alongside a debt facility from the UK Infrastructure Bank and HSBC UK, is committing an initial **£100m to fund up to 250 zero-emission buses and associated infrastructure**.[18]

Rail and ports

Aviva plc had invested over **£3 billion in the UK's rail sector** as at the end of 2022, including £150 million in finance towards rail initiatives in the Midlands and West Country.[19] Aviva plc provided **innovative financing to Associated British Ports (ABP)** with a sustainability-linked interest rate swap repack, which offers a discount to ABP on its hedging rate if it meets certain performance indicators, including a significant reduction in its combined Scope 1 and Scope 2 emissions by 2030, and which we believe to be the first of its kind.[20]

Nature restoration

In partnership with Par Equity, **Aviva Investors acquired 6,300 hectares of moorland in the Glen Dye area of West Aberdeenshire, to carry out a major nature restoration project** to restore 1,800 hectares of peatland and deliver native tree planting on over 3,000 hectares, as part of the Climate Transition Real Assets Fund. Around 1.4 million tonnes of carbon emissions should be sequestered during the project's lifetime, with local jobs created in the process.[21]

Innovation

In 2021, Aviva committed to invest **£50 million into venture capital funds focused on emerging technologies to support the transition to net zero**. This has supported investments in three sustainability focused funds including the EIP Frontier Deep Decarbonisation Fund (energy storage, carbon capture, direct air capture and industrial decarbonisation), the Clean Growth Fund (technology platforms offering zero-carbon services), and the Environmental Technologies Fund (future mobility and energy transition).[22]

Source: Aviva Investors, Aviva, 2024.

Unlocking private investment to deliver net zero

Our recommendations can be grouped under **five core areas of action**:

1. Overcoming systemic hurdles to investment.

2. Using limited public funding in a targeted way to de-risk private low-carbon investment.

3. Accelerating the deployment of clean electricity and low-carbon fuels.

4. Creating enduring markets for low-carbon supply chains.

5. Delivering a fair transition and growing market demand for low-carbon goods and services.

1 Overcoming systemic hurdles to investment

The *Roadmap* identifies a range of key actions to overcome systemic issues that are currently slowing or preventing private investment, including:

a. Delivering a net-zero-aligned planning system to cut planning delays and accelerate investment in low-carbon infrastructure projects

As called for by the National Infrastructure Commission, and energy companies and trade groups such as Renewable UK and Energy UK, this should include:

(i) Embedding the net-zero target in the ***National Planning Policy Framework***;

(ii) Providing **local authorities, planning bodies and regulators with additional resourcing** to efficiently process applications, building on the five-year industry programme to increase skills and capacity in Local Planning Authorities recently launched by the British Chamber of Commerce and supported by Aviva;

(iii) Implementing at pace the positive reforms set out in the Government's ***Transmission Acceleration Action Plan and Connections Action Plan*** to speed up the construction of – and connections to – new power transmission and distribution lines. A more efficient planning system is essential to deliver Aviva's sustainable infrastructure investment ambitions. We estimate reforms to Solvency II will allow Aviva to invest at least £25 billion over the next ten years across the UK, including in critical areas such as green energy projects.[23, 24, 25, 26, 27, 28, 29]

> A more efficient planning system is essential to deliver sustainable infrastructure ambitions

b. Tackling existing skills gap through implementing a detailed Green Skills Action Plan

As recognised by the Government's Green Jobs Taskforce, a cross-economy and sector specific plan is required to overcome the significant skills gaps which are slowing down low-carbon investment in sectors such as power grids, renewable power, heating, construction, heavy industry and nature restoration.[30] Such a plan should put forward measures to increase the accessibility of STEM skills and broader low-carbon skills in schools and further/higher education. It should also be focused on delivering a "Just Transition", by introducing measures to deliver skills provision and corresponding financial support to workers in high-carbon sectors who are adjusting to changes in their sector or looking for employment opportunities in low-carbon sectors.

c. Deliver a stronger, gradually increasing and more predictable UK carbon price

This could be done through either further reforms to the UK Emissions Trading Scheme (UK ETS) or a linkage agreement with the EU Emissions Trading Scheme (EU ETS) as already contemplated in the UK – EU Trade and Cooperation Agreement.[31]

As highlighted by trade group Energy UK, the UK's low carbon price – which fell to around £35 per tonne of CO_2 in December 2023, compared to a price of just over €70 under the EU ETS at that time – undermines the investment signal in low-carbon infrastructure and could result in UK businesses facing high carbon costs when exporting to the EU under the EU's newly set up Carbon Border Adjustment Mechanism.[32, 33] A linkage between the UK and EU Emissions Trading Schemes is supported by many business groups such as the CBI, Energy UK, the British Chambers of Commerce, the UK Emissions Trading Group, the Energy Intensive Users Group and the Carbon Capture and Storage Association.[34, 35, 36, 37] A linkage between these schemes would improve liquidity, price discovery and predictability of the future carbon-price trajectory and would deliver greater alignment between the EU and UK Carbon Border Adjustment Mechanisms. It could follow the precedent set by the Swiss – EU Emission Trading Schemes Linkage Agreement, in a way which does not undermine the sovereignty of either party.

Carbon price reforms are a key part of supporting low-carbon investment

d. Implementing at pace the 2018 Resources and Waste Strategy to improve access to high-quality secondary materials and commodities across supply chains

Strategies to decarbonise business operations in sectors such as heavy industries, construction, automotive, energy, electronics and retail often require access to high volumes of affordable and high-quality secondary materials. These include recycled materials such as steel, glass, aluminium, rare earth materials and wastes suitable for sustainable fuel production. To deliver these materials at scale, a comprehensive policy framework including product standards, green public procurement, fiscal incentives and consumer engagement is required to drive resource-efficient product design across sectors, retain secondary materials in the economy and unlock investment in material recovery, sorting, recycling and remanufacturing facilities.[38, 39]

2 Using limited public funding to de-risk low-carbon investment

Public funding has a targeted, but important, role to play in stimulating low-carbon investment across the economy. Recognising the Government's limited ability to deploy new public funding in the current economic context, public investment needs to be carefully focused on accelerating low-carbon innovation and on crowding in private investment in areas where market barriers subsist, and where private investment is not yet flowing at the necessary pace and scale. Public funding – which could be delivered through bodies such as the UK Infrastructure Bank and other similar institutions – could be most effective if targeted towards:

Public investment has a targeted but important role to play in stimulating private low-carbon investment across the economy

a. Areas involving emerging technology risk

This could include first-of-a-kind projects involving the electrification of heavy industrial plants (building on the Government's proposed support for the development of new electric arc furnaces in the steel sector), low-carbon hydrogen production and CCUS technology.[40, 41] As highlighted by the impact on the workforce from the closure of coal blast furnaces at the Port Talbot steelworks, this direct investment should form part of a coherent industrial strategy, with a particular focus on delivering positive outcomes for the workforce.

Direct public investment should form part of a coherent industrial strategy

b. Areas where projects are logistically very complex for private investors

This could include targeted public intervention to attract private investment to support the mass energy-efficiency and low-carbon-heat retrofit of the UK's housing and building stock, with all 28 million homes and two million commercial buildings needing to be low carbon by the mid-2030s.

c. Critical infrastructure that is strategic to economy-wide decarbonisation and the growth of essential supply chains

This could include investment in port infrastructure and battery factories to support the growth of the floating offshore wind and EV supply chains.

3 Accelerating the deployment of clean electricity and low-carbon fuels

In several sectors of the economy – such as surface transport, heating, heavy industry, aviation and shipping – investment in low-carbon solutions and infrastructure will only be possible if plentiful supplies of affordable zero-emission electricity and other low-carbon fuels are available in the near to medium term. Key recommendations for the next five years include:

Economy-wide, low-carbon investment relies on plentiful supplies of affordable zero-emission electricity and low-carbon fuels

a. Strengthening policies to ensure that the power sector is fully decarbonised by 2035

As recommended by bodies such as Renewable UK and Energy UK, this includes:

(i) a full implementation of the **power-grid planning reforms highlighted above;**

(ii) **a regular review of the maximum CfD strike prices** and size of the annual auction funding pot **for offshore wind and other renewables** to ensure annual auctions deliver a high volume of commercially viable projects each year;

(iii) the **completion of the Review of Electricity Market Arrangements** and other related policy reforms to further increase investment in low-carbon generation, grid, storage and flexibility infrastructure, and reduce the price of electricity.[42, 43]

b. Accelerating the delivery of low-carbon hydrogen production and the first storage and transport projects

Eleven green hydrogen projects (renewable-energy based) were given the go ahead, backed by £2 billion of Government funding, under Hydrogen Allocation Round 1.[44] The Government has produced a *Hydrogen Production Delivery Roadmap*, setting out how green, blue (gas+ carbon capture) and other types of hydrogen-production projects meeting the UK's Low Carbon Hydrogen Standard will receive funding support through the newly developed Hydrogen Production Business Model and the Net Zero Hydrogen Fund.[45] A Hydrogen Transport and Storage Networks Pathway has also been developed, setting out next steps for the deployment of hydrogen transport and storage infrastructure. Priorities going forward should be to:

11

Green hydrogen projects were given the go ahead under Hydrogen Allocation Round 1

(i) **rapidly grow the pipeline of green hydrogen production projects** through annual allocation rounds through to 2030;

(ii) **grow the pipeline of blue hydrogen projects (gas + carbon capture)** by moving ahead with contract allocations under the CCUS Cluster Sequencing Programme;

(iii) **complete by 2025 the business models and contract allocation for the first hydrogen transport and storage infrastructure projects**.[46]

c. Delivering market deployment policies to accelerate the roll out of low-carbon aviation and shipping fuels

On aviation, this should include delivering an effective implementation of the **Sustainable Aviation Fuel (SAF) Mandate set to come into force in January 2025**, which will require a two per cent share of SAF in the UK aviation fuel mix by 2025, increasing to ten per cent in 2030 and eventually 22 per cent in 2040, to grow the supply of SAFs.[47] This should be underpinned by a revenue certainty mechanism and focused guarantees to support the construction of the first SAF plants as recommended by expert advice commissioned by Government and in line with the Government's ambition for five plants to be under construction by 2025.[48, 49]

Deliver an effective implementation of the SAF Mandate, set to come into force in January 2025

On shipping, this should include introducing **a mandate and revenue-guarantee mechanisms to grow the supply of low-carbon fuels** such as hydrogen, ammonia and methanol as envisaged in the Government's 2022 Course to Zero consultation.[50]

4 Creating enduring markets for low-carbon supply chains

There are a range of sectors where low-carbon technologies and business models are either well established or rapidly progressing through the innovation cycle, but where private investment is not yet being deployed at the necessary pace and scale due to a lack of regulatory measures, fiscal incentives and/or market mechanisms. To address this, this *Roadmap* highlights a range of sector-specific recommendations to plug outstanding policy gaps and deliver enduring market frameworks for low-carbon supply chains.

Recommendations include:

a. Buildings

Introduce minimum regulatory standards and corresponding fiscal incentives to drive investment in energy efficiency in the housing stock and deliver an effective implementation of the Clean Heat Market Mechanism scheduled to start in April 2025, to gradually grow the supply – and cut the cost of – low-carbon heating systems and drive job creation across these supply chains.[51]

b. Surface transport

Deliver a robust implementation – and, subject to market trends, a potential tightening – of the Zero Emission Vehicle (ZEV) mandate for cars and vans to grow the supply of zero-emissions vehicles. Consider their use in other parts of the transport sector such as heavy goods vehicles (HGVs) and buses.

> Deliver a robust implementation and potential tightening of the ZEV mandate

c. Heavy industry

Complete all business models for CCUS projects, allocate part of the £20 billion of Government funding announced in the 2023 Budget to allow the first four shortlisted CCUS cluster projects to go ahead, finalise a strategy to facilitate industrial electrification (including through more competitive power prices), and develop a plan for dispersed industrial sites (i.e., sites not located in industrial clusters) in sectors such as glass and cement to help them connect to carbon capture, hydrogen and grid infrastructure.

d. Nature restoration

Introduce a land-use framework overseen by a coordinating body setting out England's strategy to restore nature through more sustainable land use across different economic activities (e.g., food production, biomass production, afforestation etc), with tangible nature restoration commitments set for – and tailored to – different economic sectors; complete the policy detail, option design and payment rates for agri-environment schemes in England, Wales and Scotland; and complete the different guidelines and investment standards required to create a framework for world-leading nature markets in the UK.

> Introduce a land-use framework to coordinate England's strategy to restore nature through more sustainable land use

5 Delivering a fair transition and growing the market demand for low-carbon solutions

Unlocking private investment at scale in low-carbon infrastructure and businesses is only possible if investors can identify long-term market demand for a range of low-carbon goods and services. This in turn can only be delivered if policies are in place across the economy to make low-carbon products and services affordable, practical and easily accessible for households, citizens and businesses around the country.

This *Roadmap* puts forward a range of "demand side" measures to this effect, including:

a. Buildings

Ensure that effective financial support is in place to support the take-up of insulation and low-carbon heat systems for low-income households and social housing, through improvements to schemes such as ECO4. Provide tailored support for other households through fiscal incentives such as VAT and Stamp Duty rebates and by keeping the overall size of the Boiler Upgrade Scheme under review to support a growing uptake of affordable heat pumps, building on the recent £1.5 billion funding increase.[52]

> Provide effective financial incentives to support installation of insulation and low-carbon heat systems

b. Transport

Introduce targeted grants to support consumers with the purchase of affordable EV models until they reach upfront cost parity with petrol and diesel vehicles, explore the possibility of applying the same rate of VAT to public and private EV charging to provide affordable EV charging for all groups of consumers,[53] run an awareness-raising campaign to address concerns around range anxiety, and increase the affordability and accessibility of low-carbon transport alternatives such as rail by undertaking a coordinated review of fare pricing and taxation across all transport modes.

c. Heavy industry

Introduce green public-procurement criteria and mandatory low-carbon product standards on intermediate goods (steel, cement) and finished goods (vehicles) to grow the market demand for and cut the cost of low-carbon industrial goods for businesses and retail consumers. Complementing these tools by implementing Government plans for a UK Carbon Border Adjustment Mechanism by 2027 will also help provide a level playing field for UK heavy industries investing in decarbonising their assets and operations (see points on carbon pricing above).

> Introduce green public-procurement criteria and mandatory low-carbon product standards to grow demand for low-carbon industrial goods

A more detailed overview of the most important policy recommendations made in this *Roadmap* is set out at the end of this executive summary, with more in-depth recommendations set out in the following sections. A timeline of the key policy recommendations and targets is also set out in Figures 2 and 3.

Navigating the *Roadmap*

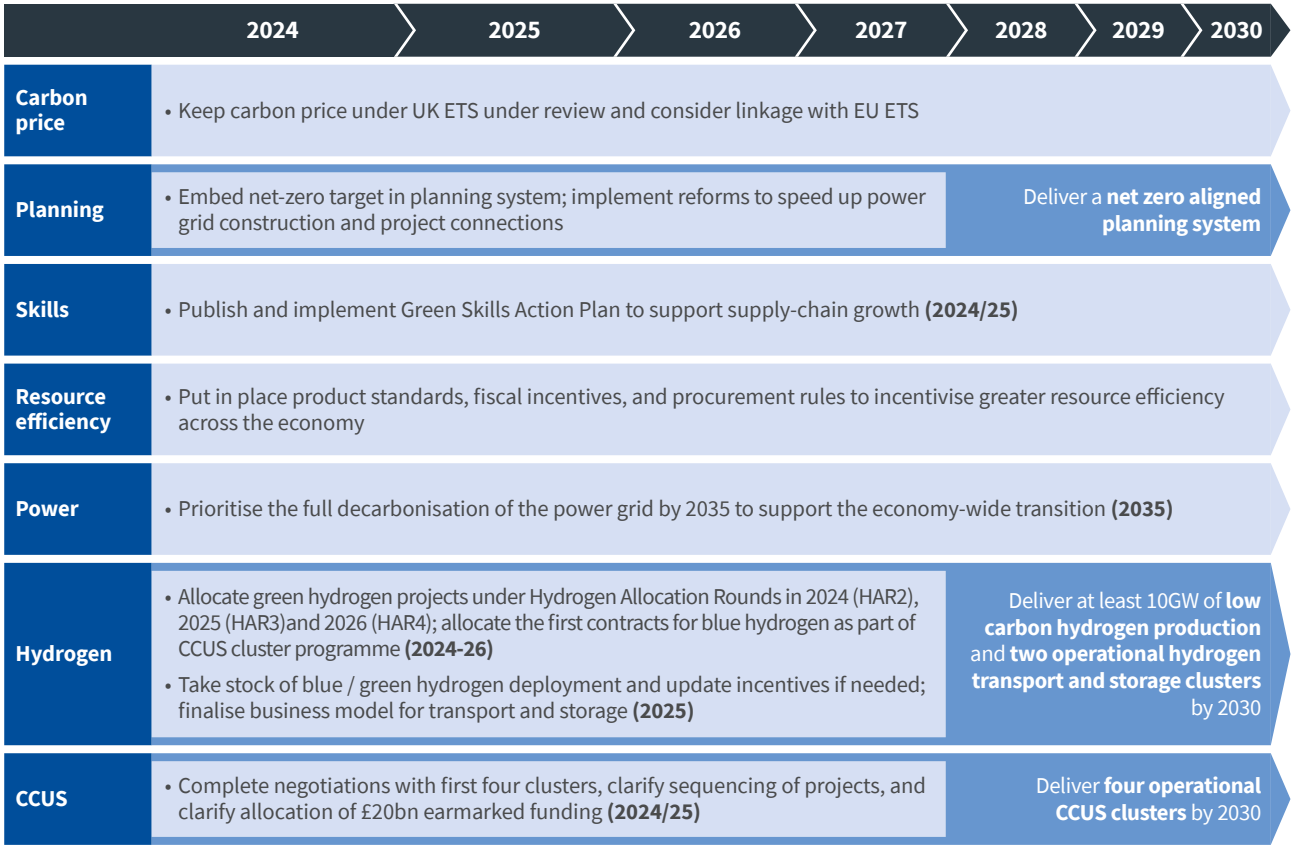
Following the executive summary, this *Roadmap* first puts forward **a range of cross-economy policy levers** to stimulate low-carbon investment across multiple sectors of the UK economy. It then provides **a range of sector specific solutions** to plug existing policy gaps that are currently slowing private investment flows, with a focus on the following sectors and activities: **power, heavy industry** (foundation and energy intensive industries such as steel, cement, chemicals, glass, ceramics), **surface transport** (cars, vans, HGVs, buses and rail), **buildings** (energy efficiency and heat), **aviation, shipping, nature restoration** (through sustainable agricultural and land use practices) and **engineered carbon removals**. Each section of the *Roadmap* contains a table summarising the key public policy solutions to overcome existing challenges and the benefits these solutions can bring in terms of unlocking investment.

This *Roadmap* **does not seek to express technological preferences in the transition to net zero**. It highlights what is required to improve the investment context for the different low-carbon technologies and solutions that currently feature in the scenarios and pathways put forward by the Government and key public bodies such as the Climate Change Committee (CCC). These scenarios contain a wide range of technologies which are at different stages of technical and commercial maturity. We note that the deployment potential for technologies that are not yet widely commercially available – such as low-carbon hydrogen, carbon capture and engineered carbon removals – is subject to a higher degree of uncertainty than for more established technologies such as offshore wind and electric vehicles.

> This *Roadmap* highlights what is required to improve the investment context for low-carbon technologies and solutions across the economy

References to new public funding commitments in this *Roadmap* are made on the understanding that UK public finances face important constraints and that the potential to deploy additional public investment in the near-term is therefore limited and needs to be targeted towards the most material market barriers. Other references to public funding in this *Roadmap* refer to existing public funding pots which have either not yet been fully deployed or where there is an investment case to extend these further into the future.

Figure 2. **The *Roadmap's* recommendations in a timeline: Cross economy**



Source: Aviva Investors, April 2024.

Figure 3. **The Roadmap's recommendations in a timeline: Sector-specific**

	2024	2025	2026	2027	2028	2029	2030
Power	• Complete the Review of Electricity Market Arrangements and gradually implement reforms to accelerate investment in renewables, grid, energy storage and flexibility technologies, and cut the cost of electricity **(from 2025)** • Keep CfD strike prices and auction pot sizes under review to maximise volume of commercially viable offshore wind projects				Unlock investment towards a **decarbonised power grid** by 2035 or sooner		
Heavy industry	• Implement British Industry Supercharger package and consider further reforms to cut industrial electricity costs **(2024/25)** • Develop product standards and green public procurement rules to grow the demand for low carbon industrial products **(from 2024)** • Complete design of UK carbon price levy **(2027)**				Decarbonise **heavy industry** and grow low carbon industrial supply chains		
Surface transport	• Implement the ZEV mandate (2024) so that zero-emission vehicles achieve at least 80% of new car sales and 70% of van sales by 2030; double annual installation of charging points; provide targeted grants to support consumers with upfront EV costs **(2024-30)** • Put in place enablers to achieve 75% rail freight growth target; review fare and taxation framework across all transport modes to improve the affordability and grow market demand for low carbon travel options, such as rail				Decarbonise **road transport** and grow zero emission vehicle supply chains		
Buildings	• Implement the Future Homes + Buildings Standard (2025), introduce minimum regulatory energy efficiency standards and fiscal incentives to drive energy efficiency investment in existing homes (2025/26) and review social housing schemes such as ECO4 to support the installation of efficiency and low carbon heat measures **(2025/26)** • Implement a Clean Heat Market Mechanism to grow the supply of low carbon heat solutions and heat pumps, and keep the overall funding pot size in the Boiler Upgrade Scheme under review **(from 2024)**				Drive significant take-up of **energy efficiency** and **low-carbon heat** by 2035		
Aviation	• Accelerate deployment of innovation funding under the Aerospace Technology Institute Programme to support hybrid, hydrogen and electric aircraft **(from 2025)** • Introduce a Sustainable Aviation Fuel (SAF) mandate with strong environmental criteria and a revenue certainty mechanism for SAF production by 2025. Support construction of five SAF plants by 2030 **(2025-30)**				Deliver 10% SAFs in the **aviation** fuel mix by 2030		
Shipping	• Publish a Clean Maritime Plan for the UK shipping sector, with a focus on investment in innovation, a low-carbon fuel mandate, revenue-certainty mechanisms, and investment in shore power infrastructure **(2024/25)** • Implement the new Clean Maritime Plan				Work towards net zero **shipping** by 2050		
Nature restoration	• Implement a co-ordinated Land Use Framework; progress agri-environment schemes in England and devolved nations **(2024/25)** • Develop rules and investment standards under the Nature Markets Framework **(2024-26)** • Implement the Environmental Improvement Plan (EIP) and broaden Environment Act targets **(until 2030)**				Deliver a pipeline of **nature restoration projects** through land use and agriculture		
Engineered removals	• Complete the business models for Greenhouse Gas Removals (GGRs), and clarify the integration with the CCUS Cluster Sequencing Programme and with CCS transport and storage infrastructure **(2024/25)** • Put in place robust sustainability criteria on MRV for negative emissions and on the prioritisation, production, and use of biomass as well as enhanced compliance criteria **(2024-30)**				Capture **5m tonnes** of CO_2 annually from 2030 through engineered removals		

Source: Aviva Investors, April 2024.

Summary of key policy recommendations

Sector and areas of action	Recommendation	Expected benefit and context
Cross-economy		
Tackling **planning delays** (Section 1)	• Embed the **net-zero target across the planning system**, through: (i) regular updates to the **National Planning Policy Framework** and associated **National Policy Statements**; (ii) using the recently created **ministerial planning forum to regularly identify and address planning barriers** to major low-carbon projects; (iii) providing greater resourcing to local and other planning authorities and regulators to support efficient decision-making, building on the industry programme recently launched by the British Chamber of Commerce to increase skills and capacity in Local Planning Authorities.[54, 55]	• Incorporating the net-zero target as a key delivery objective for the planning system – backed by adequate resourcing for planning bodies and regulators – will help accelerate planning consents and unlock investment in critical low-carbon infrastructure projects. • This should happen hand in hand with implementing: (i) the *Transmission Acceleration Action Plan* and *Connections Action Plan* to cut planning and connection delays for power-grid and clean-power infrastructure (see below); (ii) implementing the operational reforms announced in March 2024 to reduce timelines and improve the flexibility of the planning consenting process for nationally significant infrastructure projects.[56]
Directing **public funding** towards market barriers (Section 1)	• **Within the constraints facing UK public finances, deploy targeted public funding to accelerate low-carbon innovation and crowd in private investment in areas where market barriers subsist** and private investment is not yet flowing at the necessary pace and scale. This could include directing a degree of public funding towards three **key pillars**: (i) **areas involving emerging technology risk** (such as first-of-a-kind low carbon industrial plant, CCUS, low-carbon hydrogen); (ii) **projects that are logistically complex for private investors** (such as the mass installation of energy-efficiency measures and low-carbon heat in homes); (iii) **infrastructure that is critical for economy-wide decarbonisation and supply-chain growth** (such as investment in ports and gigafactories to support offshore wind and EV supply-chain growth).	• In light of the constraints facing UK public finances, the potential to deploy new public funding is limited and therefore needs to be targeted at areas where it can have the most material impact in terms of unlocking private low-carbon investment. • Building on welcome commitments in the *2023 Autumn Statement* and *2024 Spring Budget* to invest around £5 billion of public funding into advanced low-carbon manufacturing sectors, including through the £1.1 billion Green Industries Growth Accelerator, **a strategic approach to the deployment of public funding should have the objective of de-risking and crowding in private investment in areas where market barriers are the greatest**. This could include areas involving emerging technologies and business models, highly complex projects, and strategic infrastructure that is essential to support economy-wide decarbonisation and supply chain growth. • This funding could be distributed in a range of ways, including through new or established institutions (such as the UK Infrastructure Bank) and sector-specific investment vehicles.
Strengthening the **UK carbon price** (Section 1)	• Consider **further reforms to the UK ETS to strengthen the carbon price and deliver a more predictable future trajectory**. • As already contemplated in the UK-EU Trade and Co-operation Agreement, options to consider should include **a linkage with the EU ETS**, building on the precedent set by the EU-Swiss Emissions Trading Schemes Linkage Agreement.[57,58] • A linkage between the UK and EU Emissions Trading Schemes has been called for by a number of business groups including the CBI, Energy UK, the British Chambers of Commerce, the UK Emissions Trading Group, the Energy Intensive Users Group and the Carbon Capture and Storage Association.[59,60,61,62]	• Despite the July 2023 amendments to the UK ETS, **the UK carbon price fell significantly in summer and autumn 2023, down to around £35/t in December 2023**, equivalent to approximately half the value of carbon under the EU ETS at that time.[63] This undermines the low-carbon investment signal for investors and could result in UK exporters to the EU facing high carbon costs under the EU's Carbon Border Adjustment Mechanism. • **Further reforms** to tighten the emissions reduction pathway under the UK ETS – **including by means of a linkage** and price convergence with the EU ETS – **could strengthen the carbon price, improve market liquidity and carbon price discovery, provide a predictable pricing trajectory for investors** and help align the UK's and the EU's Carbon Border Adjustment Mechanisms.

Summary of key policy recommendations *(continued)*

Sector and areas of action	Recommendation	Expected benefit and context
Cross-economy		
Increasing the **availability of affordable clean electricity and low-carbon fuels** to support economy-wide decarbonisation (Sections 1, 2, 3, 6 and 7)	• **Electrification: Complete market deployment policies and planning reforms to ensure the power sector is affordably and fully decarbonised by 2035**, with sufficient added capacity to support the electrification of several parts of the economy such as surface transport, heating and heavy industry. *See specific power sector recommendations below.* • **Hydrogen:** (i) **grow the pipeline of green-hydrogen production projects** (based on renewable energy) over the next three years through Hydrogen Allocation Rounds 2 to 4 and through further annual allocation rounds out to 2030; (ii) grow the pipeline of **blue-hydrogen production projects (gas + carbon capture)** through contract allocation under the CCUS cluster sequencing programme; (iii) **carry out an assessment of early progress in 2025** to update the deployment projections and supportive policies for all types of hydrogen production; and (iv) **complete the business models and first projects allocation for hydrogen transport and storage infrastructure by 2025.** *See specific recommendations on heavy industry below.* • **Low-carbon fuels for shipping and aviation:** Complete market deployment policies to **grow the availability of sustainable aviation fuels and low-carbon fuels for shipping** (hydrogen, ammonia, methanol). *See specific recommendations on aviation and shipping below.*	• **Overview:** In sectors such as surface transport, heating, heavy industry, shipping and aviation, **investment in low-carbon solutions will only be possible if plentiful supplies of affordable zero-emissions electricity and other low-carbon fuels are available in the near to medium term**. Policies to accelerate their market deployment and affordability must be prioritised to unlock private investment. • **Hydrogen production:** The Government has **a target of 10GW of low-carbon hydrogen production capacity by 2030**, with 6GW coming from renewable-energy-based "green hydrogen", and 4GW from "blue hydrogen" (produced using natural gas; the carbon generated is captured). The *Hydrogen Production Delivery Roadmap* sets out how green, blue and other types of hydrogen-production projects meeting the UK's Low Carbon Hydrogen Standard will receive funding support through the Hydrogen Production Business Model and the £240 million Net Zero Hydrogen Fund.[64,65,66,67] • **Green-hydrogen production:** Eleven green hydrogen projects (125MW capacity), which were backed by £2 billion of Government funding over 15 years and are expected to unlock £400 million of private investment in the next three years, were given the go-ahead in December 2023 under Hydrogen Allocation Round 1 (HAR1).[68] In February 2024, an extra £21 million of government support for seven new green hydrogen projects was announced.[69] **Under the *Hydrogen Production Delivery Roadmap,* HAR2 (875MW capacity – 2024), and HAR3 and 4 (combined capacity of 1.5GW – 2025 and 2026) are expected to give the go-ahead to a growing pipeline of green-hydrogen production projects**, with the Strategy contemplating potential further annual auctions out to 2030.[70] • **Blue-hydrogen production:** While supported by the same Hydrogen Production Business Model as green-hydrogen projects, blue-hydrogen projects are to be awarded contracts under the CCUS Cluster Sequencing Programme. However, negotiations for the first CCUS cluster projects are still ongoing and **contractual arrangements for the first blue-hydrogen projects have therefore not yet been finalised**. • **Hydrogen transport and storage:** The *Hydrogen Transport and Storage Networks Pathway* aims to develop the first business models for hydrogen storage facilities and associated pipeline infrastructure by 2025, with **two storage sites and pipelines in operation or construction by 2030**.[71] • **Aviation and shipping fuels:** The Government is developing a mandate to set **a ten per cent share of sustainable aviation fuel in the UK aviation fuel mix by 2030**, but market penetration is currently small. The market penetration for sustainable shipping fuels is near zero.

Summary of key policy recommendations *(continued)*

Sector and areas of action	Recommendation	Expected benefit and context
Cross-economy		
Developing strong sustainability criteria for sustainable fuels and biomass (Sections 1, 4, 6, 7 and 9)	• Ensure that policies promoting new sustainable fuels in sectors such as aviation and shipping are subject to **sufficiently stringent emissions reduction requirements** compared to conventional fuels to meet the UK's emissions reduction targets. • Build on the *2023 Biomass Strategy* by: (i) continuing to **refine the UK's strategy on the priority uses of biomass** with a focus on hard-to-abate sectors where alternatives are currently limited; (ii) publishing **a common sustainability framework for the use of biomass** across different economic sectors; (iii) publishing a Low Carbon Fuels Strategy.[72] *See more detail on biomass sustainability considerations in GGR section below*.	• Developing stringent and transparent emissions reduction criteria for sustainable fuels – such as those set to be introduced under the UK SAF Mandate in the aviation sector from January 2025 – is essential to achieve emissions reduction targets and avoid the risk of greenwashing which could tarnish public perceptions of sustainable fuels. • **A coordinated approach to** the **sustainability criteria**, development and use of biomass energy and waste-based fuels **is essential to ensure that investment in these scarce resources is directed towards those industry sectors that need them the most** and where low-carbon alternatives are currently limited.
Strengthening **cross-departmental coordination on net zero policy** making (Section 1)	• Put in place a **Net Zero Delivery Unit** jointly run by Cabinet Office, Department for Energy Security and Net Zero (DESNZ) and HM Treasury to streamline net-zero policymaking across Whitehall. • Include the delivery of **the net-zero target as a core objective in HM Treasury's organisational delivery plan**, with annual updates on progress independently reviewed by the Office for Budget Responsibility (OBR) and the CCC.[73]	• The transition to net-zero emissions will affect all sectors of the economy. **Decisions in one sector (such as power) will have knock-on impacts on others (such as transport, heating and heavy industry)**. Putting in place enduring structures across Whitehall to increase consistency and cross-departmental coordination will deliver a joined up and predictable policy framework for investors.
Addressing low-carbon **skills gaps** (Section 1)	• Put in place and implement **a detailed Green Skills Action Plan** to urgently tackle skills gaps across key economic sectors such as power grids, renewables, construction, heating, heavy industry and nature restoration. • As recommended by the *Green Jobs Taskforce,* the implementation of this plan should include **skilling-up schemes and support measures directed at both**: (i) **the future workforce** with a particular focus on embedding STEM skills and other low-carbon skills across the education system; (ii) **those already in the workforce**, with a focus on providing the necessary financial support and training to workers adjusting to changes in their sectors or transitioning from high-carbon to low-carbon activities.[74]	• The development and implementation of a detailed action plan will help tackle major low-carbon skills gaps (such as on STEM skills), observed in multiple sectors of the economy. This will help unlock investment to grow low-carbon supply chains across the economy, in areas such as power grids, heat pumps, construction and nature restoration. • Directing skills provision measures at both the current and future workforce will help deliver a Just Transition and ensure that a wide cross-section of the workforce is well equipped to benefit from the employment opportunities created by the net-zero transition.

Summary of key policy recommendations *(continued)*

Sector and areas of action	Recommendation	Expected benefit and context
Power – supply side		
Tackling **grid construction and connection** delays (Section 2)	• **Implement at pace the welcome commitments set out in the Government's *Transmission Acceleration Action Plan* to cut construction time for new transmission infrastructure.**[75] Important commitments include implementing a Strategic Spatial Energy Plan, modernising the regulatory and planning approval processes and increasing public engagement to grow support for grid infrastructure. • **In parallel, implement at pace the six key actions outlined in the Government/Office of Gas and Electricity Markets (Ofgem) *Connections Action Plan* to cut grid-connection queue delays for new clean-power projects.**[76] A particular focus should be on prioritising awarding connection dates to those projects that are most strategic and likely to progress quickest.	• Following the *Nick Winser Review,* implementing the regulatory and administrative reforms set out in the *Transmission Acceleration Action Plan* could **halve the construction time for new power-grid infrastructure in the UK from 14 years to seven years**, thereby improving the business case and accelerating investment in grid extensions and reinforcements.[77] • Implementing the grid-connection queue reforms set out in the *Connections Action Plan* could significantly cut the deployment time for large projects such as offshore wind, which in some cases have had connection dates to the grid set ten years out into the future.
Improving the **commercial viability of offshore wind** (Section 2)	• Build on the £1 billion funding pot announced for the AR6 renewables auction round in September 2024 and the recent increase to maximum CfD strike prices for offshore wind and floating offshore wind by **regularly reviewing the overall funding pot and level of strike prices for offshore wind, floating offshore wind and other renewables** to ensure eligible revenues for new projects sufficiently reflect the evolution of the underlying supply chain and finance costs for these projects.[78]	• Regularly reviewing the maximum CfD strike prices and overall auction funding pot is essential to: (i) improve the long-term commercial viability of – and investment case for – new offshore wind projects and other renewables; (ii) to ensure that a growing volume of projects come through annual auctions from 2025 onwards. This will help **plug the capacity gap created by the lack of offshore wind projects supported at the September 2023 AR5 allocation round**.
Power – supply and demand side		
Review of Electricity Market Arrangements (REMA) and additional reforms to deliver more competitive electricity prices (Section 2)	• Build on the March 2024 consultation to complete the **REMA** reforms. Key objectives should be to: (i) accelerate further investment in renewables, flexibility tools, short-duration storage and long-duration storage (such as long-duration electricity storage [LDES] and Hydrogen to Power plants); (ii) reduce system constraint costs; (iii) better reflect the falling cost of renewables in the overall price of electricity.[79,80] • To support investment confidence and as called for by the energy sector, **reforms should be implemented in a way which minimises disruption to low-carbon investment in the near-term** and increases long-term investment certainty.[81] • In parallel with the completion of REMA and as called for by industry groups such as UK Steel, Make UK and the Energy Intensive Users Group, **facilitate the development of additional solutions to provide energy-intensive industrial sectors such as steel, cement and chemicals with greater access to low-cost renewable electricity.**[82] • In addition to implementing the cost reduction measures set out in the *British Industry Supercharger Package,* additional support to heavy industries could include options such as facilitating a growing use of zero-carbon Power Purchase Agreements.[83,84,85]	• Completing the REMA reforms and implementing them in a gradual way will provide greater clarity to investors on the future market conditions for investment in renewables, grid, short- and long-term storage and demand-side response infrastructure. By unlocking this investment at scale, these reforms could further reduce power-sector emissions, improve energy security and have a downward impact on electricity prices, thereby incentivising the broader electrification of the economy. • Broader reforms to deliver a more effective passing through of reduced renewable-energy project costs onto electricity prices will improve the business case for – and accelerate investment in – the affordable electrification of key sectors of the economy, such as steel and cement, and the growing use of heat pumps in homes and buildings. • UK heavy industrial electricity prices were between 25 per cent and 44 per cent higher than the European average in 2019.[86,87] A UK Steel report suggests that in the 2023/2024 fiscal year, UK steel manufacturers paid electricity prices that were 86 per cent higher than their competitors in France and Germany.[88] • The Government introduced a *British Industry Supercharger Package* in April 2024 to provide energy-intensive sectors like steel, paper and chemicals with a degree of compensation for electricity networks, renewable-energy policies and capacity market costs. However, some industry groups believe that the measures will still leave an electricity price competitiveness gap with their European competitors.[89]

Summary of key policy recommendations *(continued)*

Sector and areas of action	Recommendation	Expected benefit and context
Heavy industry		
Finalising critical **funding arrangements and business models for electrification, CCUS and hydrogen** (Section 3)	• **Electrification:** Building on the electricity market and policy reforms above and the recent call for evidence, finalise a strategy to facilitate **industrial electrification,** including by means of lower industrial power prices.[90] • **CCUS:** Complete the **market framework for initial CCUS projects**, by clarifying the sequencing of the CCUS Cluster Programme, how and when the £20 billion earmarked for CCUS in the *2023 Spring Budget* will be allocated to specific projects and completing the business models for the transport of CO_2. • **Hydrogen:** Clarify the investment opportunity for low-carbon hydrogen production, by: (i) **growing a pipeline of green-hydrogen production projects** over the next three years through Hydrogen Allocation Rounds 2 to 4, and through further annual allocation rounds out to 2030; (ii) growing the pipeline of **blue-hydrogen production projects (gas + carbon capture)** through contract allocation under the CCUS Cluster Sequencing Programme; (iii) **completing the first business models for hydrogen transport and storage by 2025**; and (iv) giving the go-ahead to the first two hydrogen storage and transport projects in 2025 so that these can connect to industrial clusters by the early 2030s. *See detailed recommendations in cross-economy section above.* • As called for by many energy-intensive businesses, put in place **a plan for industrial dispersed sites** in sectors like cement and glass, so that these can ultimately have access to critical carbon capture and storage (CCS) and hydrogen infrastructure that will be primarily located in clusters.[91]	• **Electrification:** The availability of **plentiful volumes of low-carbon electricity will be essential to drive investment in** the full or partial **electrification of sectors such as steel, cement, chemicals, glass and ceramics**. • **CCUS:** £20 billion of funding over the next 20 years was allocated to support the first CCUS projects in the *2023 Spring Budget*.[92] Completing the business model framework, funding allocation timelines for different types of CCS, and negotiations for the first CCUS cluster projects will be essential to drive investment in early projects. • **Hydrogen production:** Growing the pipeline of low-carbon hydrogen production projects through forthcoming Hydrogen Allocation Rounds and the CCUS Cluster Sequencing Programme will help unlock private investment in these projects and meet the Government's target of 10GW of low-carbon hydrogen production capacity (green + blue) by 2030. • **Hydrogen transport and storage:** The *Hydrogen Transport and Storage Networks Pathway* identifies the major power and industrial clusters as likely to be priority sites for hydrogen transport and storage infrastructure to support the decarbonisation of those sites by the early 2030s.[93] To unlock investment at the necessary pace and scale in onshore hydrogen facilities and associated pipelines for those sites, **investors will require completed business models for transport and storage and clarification on chosen projects by around 2025**.
Introducing measures to **grow the demand for low-carbon industrial goods** (Section 3)	• Introduce **demand-side measures** such as **green public-procurement** reform, low-carbon **product standards** and a carefully designed **Carbon Border Adjustment Mechanism (CBAM)** to grow the demand for low-carbon industrial products and create a level playing field for UK businesses. *See also the recommendations on carbon-pricing reform above.*	• **Demand-side measures are essential to create long-term market demand and a level playing field for low-carbon industrial goods.** This will attract long-term private investment in low-carbon industrial supply chains, gradually reducing the need for public funding. The Government has committed to introducing **a UK CBAM by 2027**, with consultation on the scheme's details expected in 2024.[94]
Surface transport		
Providing **stable market signals to the zero-emission vehicles supply chain**: cars, vans, HGVs, buses (Section 4)	• Deliver an **effective implementation and ratcheting up of the ZEV mandate from 2024 onwards**, ensuring compatibility with the target of 100 per cent zero-emission cars and vans sales by 2035 or sooner. Consider implementing **similar schemes for buses and HGVs**. • Closely monitor the learnings from the £200 million zero-emission HGVs pilot projects funded by Government/Innovate UK and **make a rapid and evidence-based decision on the preferred decarbonisation route(s) for HGVs**.[95]	• An effective implementation of the ZEV mandate will **stimulate growing investment in zero-emission vehicles manufacturing, reduce the costs of these vehicles and help grow long-term market demand**. This will have positive knock-on impacts on investment in supply chains and charging infrastructure. • There are currently **three main routes being explored to decarbonise HGVs, each with significant underlying infrastructure requirements**. Accelerating the pace of pilot projects and making early, informed decisions on the preferred decarbonisation pathway(s) could stimulate early private investment in zero-emission HGV supply chains and put UK businesses at the forefront of the global zero-emission HGV market.

Summary of key policy recommendations *(continued)*

Sector and areas of action	Recommendation	Expected benefit and context
Surface transport		
Prioritising the roll-out of **charging infrastructure** (Section 4)	• Complete the **installation of rapid-charging infrastructure** (and supportive power infrastructure) across the **strategic road network**, building on – and increasing the effectiveness of – the existing **Rapid Charging Fund**. • Prioritise the **doubling of annually installed charge points** to support the growth of the EV market. As part of this, explore the possibility of **applying the same rate of VAT to public and private EV charging** to provide affordable EV charging for all groups of consumers, in line with the *Net Zero Review*, and as called for by a range of industry groups including the Society of Motor Manufacturers and Traders and the Fair Charge campaign and backed by industry names such as Jaguar Land Rover and E.ON.[96,97,98,99] • Direct investment to **tackle the lack of charging infrastructure in rural areas** and the **disparities in charging-points coverage between local authorities,** such as through a more rapid delivery of funding already allocated under the **Local Electric Vehicle Infrastructure scheme (LEVI)**, and through an extension of the funding beyond 2025.[100]	• The EV-charging infrastructure network **grew by one third in 2022**. However, an acceleration of the EV-charging infrastructure roll-out across nationally strategic and local roads is necessary to maintain EV-market growth. **The number of annually installed charge points needs to double to keep pace with the projected uptake of EVs.**[101] • Private EV charging is subject to a lower rate of VAT (five per cent) than VAT applicable for public charge points. Applying the same lower rate of VAT to both types of charging will improve the affordability of charging for all consumer groups. • The development at pace of charging infrastructure on both strategic national roads and local road networks is **key to strengthen consumer perception of the reliability of electric cars and vans**, thereby supporting long-term market demand.
Supporting consumer uptake of zero-emission vehicles (Section 4)	• As recently recommended by the House of Lords Environment Committee, introduce **targeted grants to support consumers with the purchase of new, affordable zero-emission vehicle models** until such time as the upfront cost of EVs reaches parity with that of petrol and diesel vehicles.[102] • Work closely with industry to: (i) **introduce additional quality assurance schemes for used EVs** – such as by introducing **a cross-industry battery health standard**; (ii) consider **introducing targeted grants for used EVs** as seen in other markets such as the Netherlands.[103] • **Address consumer concerns around range anxiety** by carrying out **an awareness-raising campaign** on the extent to which electric vehicles can already match consumer needs and current driving patterns.[104]	• Despite recent growth, **the market demand for EVs and investment in EV supply chains are still being held back** due to: (i) the difference between the upfront cost of EVs and that of petrol and diesel vehicles; (i) the limited size of the used EV market; (iii) consumer concerns around range anxiety. • In addition to the downward price pressure which should be achieved through the implementation of the ZEV mandate, **financial support with the purchase cost of new EVs will help maintain steady demand growth until such time as the upfront costs of EVs reach parity with petrol and diesel vehicles**, thereby supporting continued investment in the EV supply chain. • **EVs represented only one per cent of used car sales in 2022**, with concerns around battery lifespan and upfront cost listed as key concerns.[105] Introducing independent quality-assurance standards and targeted grants is key to improve consumer confidence in the used EV market and improve its affordability, thereby growing overall EV market penetration. • An evidence-based awareness raising campaign could go a long way to addressing consumer concerns on range anxiety and supporting growing market penetration for EVs.
Encouraging investment in low-carbon alternatives (Section 4)	• Building on the welcome 75 per cent **rail freight growth target for 2050, develop a long-term plan to enhance the capacity, reliability and affordability of the railway network** to support growth in rail freight and passenger traffic and a shift away from road transport.[106]	• Clear targets and supportive measures to drive a shift from road to rail for passengers and freight will **drive investment in the railway network**, thereby optimising its pivotal role in the transport sector's transition to net zero.

Summary of key policy recommendations *(continued)*

Sector and areas of action	Recommendation	Expected benefit and context
Buildings – energy efficiency and low-carbon heat		
A long-term **policy plan for the decarbonisation of homes and buildings** (Section 5)	• Put forward **a long-term policy plan for the decarbonisation of homes and commercial buildings**, combining: (i) minimum **regulatory energy-efficiency standards** with (ii) **fiscal incentives** to drive the take-up of energy-efficiency and low-carbon heat measures. *See more below on heat.* • Building on the *Future Homes and Buildings Standards Consultation,* complete the **technical details for the Future Home Standard and Future Buildings Standard**, ensuring that all new homes and commercial buildings built from 2025 meet high levels of energy efficiency, renewable electricity low-carbon heat provision and resilience to extreme weather events.[107]	• Around **28 million homes and two million commercial buildings need to be highly energy efficient and equipped with a low-carbon source of heat by the mid-2030s**. A predictable, long-term policy plan will be essential to attract investment at the necessary pace and scale and at a reasonable cost of finance. • A combination of long-term regulatory signals and fiscal incentives is essential to build a predictable market for the growing uptake of energy-efficiency and low-carbon heat measures, thereby driving supply-chain growth, investment in skills and cost reductions.
Decisive interventions to **improve investment clarity for low-carbon heating** (Section 5)	• **Strategic decisions on heat and the role of hydrogen:** Building on the steer provided in the Government's *Future Homes and Buildings Standards Consultation* and as called for by the National Infrastructure Commission, clarify that heat pumps – and in specific areas heat networks – are the default low-carbon heat options for new and existing buildings.[108, 109] Make **a final decision on the limited role of hydrogen in home heating as soon as possible** and well before the current 2026 deadline. • **Heat pumps:** Deliver **an effective implementation of the Clean Heat Market Mechanism from its scheduled start date in 2025 onwards, and gradually increase the minimum targets for the share of heat pumps** in overall boiler sales to grow the availability of heat pumps for households, cut their costs and send a clear supply-chain growth signal.[110] • **Heat pumps and Boiler Upgrade Scheme (BUS):** Building on the recent increases to heat-pump grants and the overall size of the BUS scheme,[111] keep **the overall budget for the BUS scheme under regular review** and consider increasing it if necessary to drive higher heat-pump uptake. Introduce **equivalent schemes for large heat pumps** suitable for commercial buildings. • **Heat networks:** Following the enabling powers under the Energy Act 2023, work with Ofgem to **complete a regulatory framework for heat networks and heat-networks zoning by 2025**.[112] • **Heat networks: Deploy the funding already earmarked until 2028 under the Green Heat Network Fund and Heat Network Efficiency Scheme to accelerate the roll-out of heat networks** and consider a potential extension of that funding beyond 2028 if required. Ensure that policy support for heat pumps does not undermine the commercial case for heat networks where they are the best option.	• **Strategic decisions on heat and the role of hydrogen:** As made clear by the National Infrastructure Commission, the Climate Change Committee and a range of other bodies, there is **ample evidence that electric heat pumps – and in specific areas, heat networks – are the most suitable form of low-carbon heating for the majority of properties, with only a limited role for hydrogen boilers**.[113] The Government's *Future Homes and Buildings Standards Consultation* identifies heat pumps, electrification and low-carbon heat networks as a default option for new homes and buildings. • Bringing forward the decision on the role of hydrogen in heating will clarify the future heating technology mix for investors and accelerate much needed investment in heat-pump and heat-networks supply chains. • **Heat pumps:** The Clean Heat Market Mechanism is due to start in April 2025, mandating large manufacturers meet a growing minimum percentage of heat-pump sales as part of overall boiler sales, starting at six per cent in 2025/2026, and increasing further after that.[114] **An effective implementation and tightening of the Mechanism over time will help investors forecast the growth of the heat-pump manufacturing market in the 2020s**, encourage investment in the supply chain and support job creation. • **Heat pumps and Boiler Upgrade Scheme (BUS):** Regularly reviewing the adequacy of the overall budget for funding schemes such as BUS will improve the affordability of low-emissions heating systems in the near to medium term for households and businesses, support market growth and accelerate cost reductions in the manufacturing of these systems through economies of scale. • **Heat networks:** Finalising a regulatory framework for heat networks and zoning will be essential to drive investment in these networks at the necessary pace and scale. A coordinated approach to low-carbon heat policy is important to support the commercial viability of new heat networks.

Summary of key policy recommendations *(continued)*

Sector and areas of action	Recommendation	Expected benefit and context
Buildings – energy efficiency and low-carbon heat		
A predictable framework for **social housing and public buildings** (Section 5)	• **Review the effectiveness of existing grant schemes for social housing and fuel-poor homes** – such as ECO4 – to increase the uptake of energy-efficiency and low-carbon heat measures. • **Deliver at pace the funding already earmarked under the Public Sector Decarbonisation Scheme** until 2028 to support investment in energy efficiency and low-carbon heating in public buildings, and clarify future funding and policy support beyond that date.[115]	• Schemes like ECO4 currently provide **little support for the installation of low-carbon heat measures relative to gas boilers**. Improving the effectiveness of the grants available for social housing and fuel-poor homes will drive investment in the installation of the best energy-efficiency and low-carbon heat measures in these properties. • Clarity on the funding and policy commitments for the installation of energy-efficiency and low-carbon heat measures in public buildings beyond 2028 will help maintain steady investment flows.
Aviation		
Global mechanisms and carbon pricing to achieve net-zero aviation emissions by 2050 (Section 6)	• Push for **credible global delivery mechanisms** within the International Civil Aviation Organisation (ICAO) to achieve the 2050 global net-zero aviation emissions target. This should include making the case for the global Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) to deliver a carbon price that predictably increases in value and covers a growing scope of global aviation emissions over time.	• **Globally agreed delivery policies, underpinned by a strong carbon price covering an increasing scope of emissions, will be essential to accelerate global innovation** and market deployment of low-emission aviation fuels and low-emission aircraft. • A stronger global carbon price with a broader application for aviation will also reduce the current disparity between the higher carbon price under the UK and EU ETS applicable to short-haul flights, and the lower carbon price applicable to long-haul flights under CORSIA.
Completing the **market framework** to create a UK **Sustainable Aviation Fuel (SAF)** supply chain (Section 6)	• Deliver an effective implementation of the **SAF Mandate** from its scheduled start in January 2025, requiring a **gradually increasing share of SAFs in the UK aviation fuel mix** to reach at least ten per cent in 2030, with continued growth out to 2040. • Conclude the consultation and make a decision on the design of a **revenue certainty mechanism** to de-risk investment in the UK's first SAF plants, such as through the preferred option of a CfD-style guaranteed strike price for the production of SAFs and focused guarantees for the first manufacturing projects. • Through the implementation of the SAF mandate and the development of a revenue certainty mechanism, **focus on incentivising a growing share of second-generation waste-based and advanced SAFs** which are less dependent on limited resources. • Look for **opportunities for policy collaboration and alignment** on growing SAF supply chains with international partners such as the US and the EU.	• The Government's proposal for a SAF Mandate – due to be approved by Parliament in summer 2024 – targets **a minimum share of SAF on a blended basis in the UK aviation fuel mix of at least two per cent in 2025, rising to ten per cent in 2030 and 22 per cent in 2040, with a sub-target for advanced Power to Liquids fuels (PtL)**. Implementing the SAF Mandate from early 2025, as planned, is essential to provide near-term clarity to the aviation industry, its supply chain and investors on the expected market growth for SAFs in the UK. This is particularly important for second-generation waste-based and more advanced SAFs where the UK currently has a competitive advantage.[116] • A final decision on the complementary policies to the SAF Mandate is needed to provide a degree of revenue predictability to investors in the first UK SAF plants and overcome challenges around the emerging nature of this industry. • **Using incentives to stimulate investment, growth, and cost reductions in second generation SAFs** (such as waste-based fuels and other advanced fuels such as PtL) **is essential as some of these fuels are less dependent on limited feedstocks** and may in some cases offer greater emissions reduction savings potential. • **The EU, US, UK and other international partners are currently developing different approaches to supporting the growth of the SAF sector**. Collaboration with key international partners will help accelerate the growth of SAF supply chains and help provide a more coherent policy framework for SAF manufacturers, airlines and investors.

Summary of key policy recommendations *(continued)*

Sector and areas of action	Recommendation	Expected benefit and context
Aviation		
Ramping up **innovation in other low-emission aircraft solutions beyond SAFs** (Section 6)	• Deploy at pace the £975 million of **innovation funding** awarded in the *2023 Autumn Statement* to the Aerospace Technology Institute Programme for 2025-2030 to support innovation in a range of hybrid and zero-emission aircraft solutions (fully electric and hydrogen), as well as to improve understanding of the non-CO_2 effects of aviation.[117] • Consider targeted additional funding over that period subject to the evolution of pilot projects.	• Continued research and innovation in other low-carbon aviation solutions beyond SAFs is essential given the early stage of development of the SAF industry, and to provide the sector and investors with a broader range of potential low-emissions investment opportunities.
Creating a market for **credible carbon offsets** Promoting investment in **low-carbon alternatives** to aviation (Section 6)	• Introduce **robust guidelines** to ensure residual emissions from the aviation sector are addressed through investment in **transparent, high-quality and near-permanent nature-based carbon offsets**. • Introduce measures to **encourage growing demand for and investment in low-carbon alternatives to aviation where appropriate.** This could include a coordinated review of pricing and taxation for all transport modes to **improve the affordability, reliability and accessibility of low-carbon alternatives.**	• Adopting clear guidelines for company and voluntary offsetting schemes is essential to **avoid greenwashing and provide market confidence** in the quality of carbon offsets. • Given the challenges facing the market deployment of SAFs and zero-emission aircraft in terms of volume and timescales, introducing a clear strategy to promote demand for – and investment in – viable low-carbon alternatives to aviation (such as rail and video-conferencing technologies) will help reduce the scale of the challenge and drive investment in other low-carbon solutions. • **The long-term price trend for rail travel shows a 32 per cent increase on 2009 levels compared to a ten per cent decrease in the cost of short-haul business flights** over the same period.[118]
Shipping		
Shaping **a coherent global framework for net-zero shipping** (Section 7)	• Play **a proactive role in ongoing consultations and discussions at the UN International Maritime Organisation** (IMO) to encourage achievement of the IMO's "stretch interim emission-reduction targets" for 2030 and 2040, and the **introduction of credible delivery mechanisms** to achieve these targets.	• Putting in place credible global mechanisms to achieve the IMO's stretched interim emissions-reduction targets will accelerate global investment in innovation and market deployment of zero-emission shipping fuels, zero-emission ships and supporting infrastructure. It will increase the credibility of the IMO's mid-century net-zero emissions goal for global shipping.
Publishing and implementing **a comprehensive Clean Maritime Plan for the UK** (Section 7)	• Introduce and implement a revised version of the **UK Clean Maritime Plan**, with policy priorities focused on **four key pillars**: (i) **investment in** "no regret" **shore power infrastructure** in ports; (ii) **innovation and research funding** into different low/zero-emission fuels and shipping technologies; (iii) **market mechanisms to grow the availability of low/zero-emission shipping fuels and technologies:** such as through a low-carbon shipping **fuel mandate**, a revenue-certainty mechanism such as **CfDs** for the manufacturing of these fuels and a potential **phase-out date** for the sale of non-zero-emission ships. (iv) **international collaboration to develop zero-emission shipping routes** with shared low-carbon shipping fuel infrastructure, building on the *COP26 Clydebank Declaration* for Green Shipping Corridors and the £1.5 million International Green Corridor Fund (agreed between the UK, Netherlands, Norway, Ireland and Denmark).[119,120]	• **Key solutions to decarbonise shipping include battery-electric ships, the use of low- or zero-emission fuels (ammonia, methanol, hydrogen, biofuels) and the use of shore power in ports**. The market penetration of low-emission shipping fuels and zero-emission ships is near zero. The UK and global policy framework for low-carbon shipping is also at an early stage of development. • A coordinated UK Clean Maritime Plan based on these four key pillars will provide the policy framework to attract investment in the innovation and commercialisation of low-emission ships and fuels, support supply-chain development and the development of supportive infrastructure in ports. • The development of international green shipping routes with close trading partners and shared low-carbon fuel infrastructure will be essential to deliver a viable transition to net zero for global shipping.

Summary of key policy recommendations *(continued)*

Sector and areas of action	Recommendation	Expected benefit and context
Nature restoration		
Publishing **a coordinated Land Use Framework** (Section 8)	• Publish **a coordinated Land Use Framework** overseen by a coordinating body setting out England's strategy to restore nature through more sustainable land use across different economic activities (e.g., food production, biomass production, afforestation etc), with tangible nature restoration commitments set for – and tailored to – different economic sectors.[121,122] • Maximise **coordination between UK nations** on nature restoration approaches in agriculture and other land use sectors.	• **England does not have an integrated land use strategy and policy frameworks often differ across devolved nations**. This results in an overall policy framework for nature restoration that is hard to navigate for investors. • An overarching Land Use Framework, backed by sector-specific commitments, will provide investors with clarity on the investment needs, categories of projects and available market mechanisms to **invest in nature restoration at scale**. A coordinated approach with devolved nations will help **create a coherent investment framework** for nature restoration across the UK.
Completing the design of **agri-environment schemes** (Section 8)	• Complete the **policy detail, option design and payment rates for agri-environment schemes** under the Environmental Land Management Schemes (England), Sustainable Farming Scheme (Wales) and Agriculture Bill (Scotland).	• Providing full clarity on the policy design and payment rates for agri-environment schemes across all UK nations is essential to attract investment at scale in nature restoration projects in the agricultural sector.
Implementing the **EIP** and **Environment Act**	• Implement at pace the **key commitments set out under the Environment Act targets and the EIP**, including measures relating to the development of the Nature Recovery Network, Local Nature Recovery Strategies and biodiversity net gain. • Consider **extending the scope of nature restoration targets under the Environment Act**, covering new areas such as soil and peatland restoration.[123] • Oversee the successful operation of the newly introduced, mandatory **biodiversity net gain** requirement for developers and learn lessons for the broader scaling up of nature restoration markets.[124]	• Implementing the policy commitments highlighted in the Environment Act Targets and EIP will help drive growing investment in nature restoration and **achieve the Government's ambition to mobilise at least £500 million of annual private capital by 2027 and over £1 billion by 2030**. • Broadening the scope of targets under the Environment Act can help attract private investment across a broader range of nature restoration projects and markets. • **The biodiversity net gain requirement** introduced in February 2024, pursuant to the Environment Act and EIP, **requires developers to deliver ten per cent improvements for nature on all new housing, commercial and industrial infrastructure projects in England**.
Tackling skills gaps in peatland and woodland restoration (Section 8)	• **Focus the incentives for peatland and woodland restoration on tackling the skills gaps** and lack of workforce availability that are currently slowing down project delivery.	• Tackling the ongoing skills and workforce availability gaps for peatland and woodland restoration is key to growing the project pipeline and unlocking investment at scale.
Develop the **groundwork for nature markets** (Section 8)	• Build on the Government's ***Nature Markets Framework*** and put in place the Framework's market guidelines, market access rules, BSI investment standards and regulatory arrangements to create and grow high-integrity nature markets in the UK.[125]	• Rapidly putting in place the necessary guidelines, rules, investment standards and governance arrangements highlighted in the UK Government's *Nature Markets Framework* will help the UK create world-leading nature markets and attract domestic and global private investment.

Summary of key policy recommendations *(continued)*

Sector and areas of action	Recommendation	Expected benefit and context
Engineered Greenhouse Gas Removals (GGRs)		
Putting in place **a policy framework for GGRs** **Connecting GGRs to CCS infrastructure** and CCS market frameworks. (Section 9)	• **Accelerate the development of a policy framework for GGRs**, such as Direct Air Capture with Carbon Storage (DACCS) and Bioenergy and Carbon Capture and Storage (BECCS). This should include: (i) **completing a business model for GGRs** to provide greater clarity on revenue streams for negative emissions, building on the December 2023 *GGR Business Model Update;*[126] (ii) **clarifying the volume and timing of funding allocation** for early stage GGR projects; (iii) providing GGR projects with **access to the CCUS policy framework and CCS infrastructure**, such as by including GGRs in the early wave of projects to be progressed under the CCUS Cluster Sequencing Programme.	• Urgent development of the policy framework for GGRs will help the UK compete with jurisdictions like the US to attract capital. It is also key to meeting the **target of removing five million tonnes of carbon emissions per year by 2030, as set out in the UK's Nationally Determined Contribution** under the Paris Agreement. • Providing near-term clarity as to how engineered GGR projects are to connect to the CCS network and be included in the CCUS Sequencing Programme is essential to support the technical and commercial viability of early stage BECCS and DACCS plants, and for these projects to be considered by private investors.
Robust guidelines on emissions removals and biomass (Section 9)	• **Negative emissions:** Develop **robust guidelines** for the **monitoring, reporting and verification of emissions removals**, including an independent review of the lifecycle carbon footprint and biodiversity impacts of BECCS projects, going beyond the recent *BECCS Task and Finish Group Report*.[127] • **Biomass sustainability:** Build on the *Biomass Strategy* and recommendations from the National Audit Office (NAO) on biomass sustainability, by:[128,129] (i) further refining the UK's **strategy on the priority uses of biomass**; (ii) developing **a common sustainability framework for the use of biomass** across different economic sectors; (iii) **strengthening criteria on the sustainable sourcing of** domestically produced and imported **biomass**, and **strengthening the compliance process** with these criteria; (iv) developing plans for sustainable domestic biomass production.	• Robust guidelines on monitoring, reporting and verification (MRV) are essential to provide investors, business and the public with confidence regarding the permanent carbon-emissions removals being delivered by GGR projects and avoid risks of greenwashing. • Robust sustainability criteria on the use and sourcing of biomass is essential to prevent unintended negative environmental impacts from the use of biomass in engineered GGR technologies and other sectors.

References

1. "Transitioning to net zero: how Aviva is walking the walk", Aviva, September 15, 2022.
2. "Climate-related financial disclosure 2022", Aviva plc, 2022.
3. Find out more about Aviva's net zero ambition in: "Climate-related financial disclosure 2022", Aviva plc, 2022.
4. HM Government, "Powering up Britain", GOV.UK, March 30, 2023.
5. "Mission zero: Independent review of net zero", Rt Hon Chris Skidmore MP, January 13, 2023.
6. "The Sixth Carbon Budget: The UK's path to net zero", Climate Change Committee, December 2020.
7. Unnada Chewpreecha and Philip Summerton, "Economic impact of the sixth Carbon Budget", Cambridge Econometrics, December 2020.
8. James Rising, et al., "What will climate change cost the UK? Risks, impacts and mitigation for the net zero transition", The Grantham Research Institute on Climate Change and the Environment, School of Economics and Political Science, 2022.
9. "Going for green: The UK's net zero growth opportunity", CBI, 2023.
10. HM Government, "Mobilising green investment: 2023 Green Finance Strategy", GOV.UK, March 2023.
11. HM Government, "Mobilising green investment: 2023 Green Finance Strategy", GOV.UK, March 2023.
12. HM Government, "Mobilising green investment: 2023 Green Finance Strategy", GOV.UK, March 2023.
13. "Chancellor's Mansion House Reforms to boost typical pension by over £1,000 a year", GOV.UK, July 10, 2023.
14. "Aviva Investors provides financing for acquisition of Hornsea Two offshore transmission assets", Aviva Investors, August 3, 2023.
15. "Aviva Investors makes strong progress towards net zero targets for Real Assets business", Aviva Investors, May 30, 2022.
16. "Connected Kerb secures up to £110 million from Aviva Investors to deliver "game-changing" on-street EV charging revolution", Connected Kerb, September 26, 2022.
17. Ellen O'Regan, "EV charging company Erapid secures €30m investment from Aviva Investors", The Irish Times, October 20, 2023.
18. "UK Infrastructure Bank, Rock Rail and Aviva launch £100m funding platform to support 'Rock Road' in accelerating the UK's transition to a zero emission bus network", UK Infrastructure Bank, April 8, 2024.
19. "Sustainability report 2022", Aviva plc, 2022.
20. "Aviva Investors & BNP Paribas complete first ESG SONIA swap repack for Associated British Ports (ABP)", BNP Paribas, May 25, 2021.
21. "Major peatland restoration, carbon capture & woodland creation scheme announced following acquisition of Glen Dye Moor", Aviva Investors, December 20, 2021.
22. "Climate-related financial disclosure 2022", Aviva plc, 2022.
23. "Delivering net zero, climate resilience and growth: Improving nationally significant infrastructure planning", National Infrastructure Commission, April 2023.
24. Rob Norris, "Planning reforms outlined by Government are essential for Britain's energy security", RenewableUK, February 23, 2023.
25. "Accelerating planning to deliver a net zero energy system", Energy UK, June 2022.
26. Department for Energy Security & Net Zero, "Policy paper: Electricity networks: transmission acceleration action plan", GOV.UK, November 22, 2023.
27. Department for Energy Security and Net Zero and Ofgem, "Connections action plan: Speeding up connections to the electricity network across Great Britain", GOV.UK, November 2023.
28. "Support for Solvency 2 reforms", Aviva, November 17, 2022.
29. "BCC launch industry-led skills programme to unblock Britain's planning pressures", British Chambers of Commerce, February 18, 2024.
30. Department for Energy Security and Net Zero, Department for Business and Trade, and Department for Business, Energy & Industrial Strategy, "Green Jobs Taskforce: Report to Government, Industry and the Skills Sector", GOV.UK, July 14, 2021.
31. "The EU-UK Trade and Cooperation Agreement", European Commission, April 30, 2021.
32. "UK paying the price for carbon cost fall", Energy UK, October 30, 2023.
33. "Live carbon prices today", CarbonCredits.Com. Date accessed: February 2024.
34. "Next steps for UK-EU trade", CBI, 2022.
35. "UK paying the price for carbon cost fall", Energy UK, October 30, 2023.
36. "Green innovation: Building sustainable futures for UK business", British Chambers of Commerce, February 2024.
37. "CCSA response to the joint consultation on Developing the UK Emissions Trading Scheme (UK ETS)", The Carbon Capture & Storage Association, June 17, 2022.
38. "Keep Britain Tidy report released | Improving public understanding of waste prevention", Suez in the UK, March 8, 2024.
39. "Closing the loop: Time to crack on with resource efficiency", Aldersgate Group, July 14, 2021.
40. "UK agrees £500m deal to secure Port Talbot steelworks", Financial Times, September 15, 2023.
41. "British Steel closes in on £500mn support package", Financial Times, November 3, 2023.
42. Rob Norris, "Next clean power auction could attract record investment in offshore wind", RenewableUK, November 16, 2023.
43. "Energy UK responds to Government announcement for the next Contracts for Difference Round (CfD)", Energy UK, November 16, 2023.
44. Department for Energy Security and Net Zero and The Rt Hon Claire Coutinho MP, "Major boost for hydrogen as UK unlocks new investment and jobs", GOV.UK, December 14, 2023.
45. Department for Energy Security and Net Zero, "Hydrogen production delivery roadmap", GOV.UK, December 14, 2023.
46. Department for Energy Security and Net Zero, "Hydrogen transport and storage networks pathway", GOV.UK, December 14, 2023.
47. Department for Transport and The Rt Hon Mark Harper, "Aviation fuel plan", GOV.UK, April 25, 2024.
48. Philip New, "Developing a UK sustainable aviation fuel industry: Independent report", GOV.UK, April 17, 2023.
49. Department for Transport, "Sustainable aviation fuels revenue certainty mechanism : revenue certainty options", GOV.UK, April 25, 2024.
50. Department for Transport, "UK domestic maritime decarbonisation: Consultation: Plotting the course to zero", GOV.UK, July 2022.

51. Department for Energy Security & Net Zero, "Closed consultation: Clean heat market mechanism: proposal to change the scheme start date to 1 April 2025", GOV.UK, March 14, 2024.
52. Department for Energy Security and Net Zero, HM Treasury, The Rt Hon Claire Coutinho MP, and The Rt Hon Jeremy Hunt MP, "Families, business and industry to get energy efficiency support", GOV.UK, December 18, 2023.
53. Rt Hon Chris Skidmore MP, "Mission zero: Independent review of net zero", GOV.UK, January 13, 2023.
54. Department for Levelling Up, Housing & Communities and HM Treasury, "Policy paper: Government response to the National Infrastructure Commission's report on Delivering net zero, climate resilience and growth: improving nationally significant infrastructure planning", GOV.UK, November 22, 2023.
55. "BCC launch industry-led skills programme to unblock Britain's planning pressures", British Chambers of Commerce, February 18, 2024.
56. Department for Levelling Up, Housing & Communities, "Consultation outcome: Consultation on operational reforms to the Nationally Significant Infrastructure Project (NSIP) consenting process", GOV.UK, March 6, 2024.
57. "The EU-UK Trade and Cooperation Agreement", European Commission, April 30, 2021.
58. "Agreement on linking the emissions trading systems of the EU and Switzerland", European Commission, December 19, 2019.
59. "Next steps for UK-EU trade", CBI, 2022.
60. "UK paying the price for carbon cost fall", Energy UK, October 30, 2023.
61. "Green innovation: Building sustainable futures for UK business", British Chambers of Commerce, February 2024.
62. "CCSA response to the joint consultation on Developing the UK Emissions Trading Scheme (UK ETS)", The Carbon Capture & Storage Association, June 17, 2022.
63. "Live carbon prices today", CarbonCredits.Com. Date accessed: February 2024.
64. Department for Energy Security and Net Zero, "Hydrogen production delivery roadmap", GOV.UK, December 14, 2023.
65. Department for Energy Security & Net Zero, "UK Low Carbon Hydrogen Standard", GOV.UK, December 2023.
66. Department for Energy Security and Net Zero, "Research and analysis: Hydrogen production business model", GOV.UK, August 9, 2023.
67. Department for Energy Security and Net Zero, "Net Zero Hydrogen Fund strands 1 and 2: Round 2 (closed to applications)", GOV.UK, February 27, 2024.
68. Department for Energy Security and Net Zero and The Rt Hon Claire Coutinho MP, "Major boost for hydrogen as UK unlocks new investment and jobs", GOV.UK, December 14, 2023.
69. Department for Energy Security and Net Zero, The Rt Hon Claire Coutinho and Lord Callanan, "Press release: Boost for UK hydrogen as government backs world-leading industry", GOV.UK, February 27, 2024.
70. Department for Energy Security and Net Zero, "Hydrogen production delivery roadmap", GOV.UK, December 14, 2023.
71. Department for Energy Security and Net Zero, "Hydrogen transport and storage networks pathway", GOV.UK, December 14, 2023.
72. Department for Energy Security & Net Zero, "Biomass strategy", GOV.UK, 2023.
73. "Ambition, action, and accountability: Building on the UK's leadership on Transition Plans to shape a policy response to the US Inflation Reduction Act", Aviva, 2023.
74. Department for Energy Security and Net Zero, Department for Business and Trade, and Department for Business, Energy & Industrial Strategy, "Green Jobs Taskforce: Report to Government, Industry and the Skills Sector", GOV.UK, July 14, 2021.
75. Department for Energy Security and Net Zero, "Policy paper: Electricity networks: transmission acceleration action plan", GOV.UK, November 22, 2023.
76. Department for Energy Security and Net Zero and Ofgem, "Connections action plan: Speeding up connections to the electricity network across Great Britain", GOV.UK, November 2023.
77. Nick Winser CBE, "Electricity Networks Commissioner's letter to Secretary of State", GOV.UK, June 2023.
78. Department for Energy Security and Net Zero, et al., "Press release: Boost for offshore wind as government raises maximum prices in renewable energy auction", GOV.UK, November 16, 2023.
79. Department for Energy Security and Net Zero, "Closed consultation: Review of electricity market arrangements (REMA): second consultation", GOV.UK, March 12, 2024.
80. House of Lords, Science and Technology Committee, "Long-duration energy storage: get on with it", GOV.UK, March 13, 2024.
81. David Stewart, "Government's power market reform plan questioned by renewables industry", RenewableUK, March 12, 2024.
82. "New report shows Government should reduce electricity prices ahead of electric steel future", UK Steel, November 13, 2023.
83. Department for Business & Trade, "Consultation outcome: Government response: British Industry Supercharger Network Charging Compensation Scheme", GOV.UK, October 11, 2023.
84. Professor Michael Grubb and Paul Drummond, "UK industrial electricity prices: Competitiveness in a low carbon world", UCL and Aldersgate Group, February 2018.
85. Michael Grubb, et al., "A zero-carbon power grid and the electrification of heavy industry: how to deliver on a twin challenge", UCL and Aldersgate Group, April 2023.
86. Paul Drummond, Professor Michael Grubb and Elsa Barazza, "Policy briefing: Delivering competitive industrial electricity prices in an era of transition", UCL and Aldersgate Group, September 2021.
87. Michael Grubb, et al., "A zero-carbon power grid and the electrification of heavy industry: how to deliver on a twin challenge", UCL and Aldersgate Group, April 2023.
88. "New report shows Government should reduce electricity prices ahead of electric steel future", UK Steel, November 13, 2023.
89. "New report shows Government should reduce electricity prices ahead of electric steel future", UK Steel, November 13, 2023.
90. Department for Energy Security & Net Zero, "Enabling industrial electrification: A call for evidence on fuel-switching to electricity", July 2023.
91. "Accelerating the decarbonisation of industrial clusters and dispersed sites: A report on behalf of the Aldersgate Group", Frontier Economics, September 2021.
92. HM Treasury, "Policy paper: Spring Budget 2023", GOV.UK, March 21, 2023.
93. Department for Energy Security and Net Zero, "Hydrogen transport and storage networks pathway", GOV.UK, December 14, 2023.
94. HM Treasury and The Rt Hon Jeremy Hunt MP, "News story: New UK levy to level carbon pricing", GOV.UK, December 19, 2023.
95. Department for Transport, Richard Holden MP, and The Rt Hon Jesse Norman MP, "New story: Government invests £200 million to drive innovation and get more zero emission trucks on our roads", GOV.UK, October 19, 2023.

96. Rt Hon Chris Skidmore MP, "Mission zero: Independent review of net zero", GOV.UK, January 13, 2023.
97. "Car industry urges 'fair tax for a fair transition' to put EVs back in the fast lane", Society for Motor Manufacturers and Traders, March 1, 2024.
98. "Our objectives", FairCharge. Date accessed: February 2024.
99. "Businesses call for lower VAT on EV charging", Fair Charge, March 25, 2024.
100. "The UK's electric vehicle strategy needs a rapid recharge says Lords Committee", UK Parliament, February 6, 2024.
101. "Progress in reducing emissions: 2023 Report to Parliament", Climate Change Committee, June 2023.
102. "The UK's electric vehicle strategy needs a rapid recharge says Lords Committee", UK Parliament, February 6, 2024.
103. "The UK's electric vehicle strategy needs a rapid recharge says Lords Committee", UK Parliament, February 6, 2024.
104. "The UK's electric vehicle strategy needs a rapid recharge says Lords Committee", UK Parliament, February 6, 2024.
105. "The UK's electric vehicle strategy needs a rapid recharge says Lords Committee", UK Parliament, February 6, 2024.
106. Department for Transport, "Policy paper: Rail freight growth target", GOV.UK, December 20, 2023.
107. Department for Levelling Up, Housing and Communities, "Closed consultation: The Future Homes and Buildings Standards: 2023 consultation", GOV.UK, February 22, 2024.
108. Department for Levelling Up, Housing and Communities, "Closed consultation: Future Homes and Buildings Standard: 2023 consultation", GOV.UK, December 13, 2023.
109. Rob Mallows, "Long term review sets out pressing need to modernise infrastructure to support economic growth and climate action", National Infrastructure Commission, October 18, 2023.
110. Department for Energy Security & Net Zero, "Clean heat market mechanism consultation: Summary of responses and government response," GOV.UK, November 2023.
111. Department for Energy Security and Net Zero, HM Treasury, The Rt Hon Claire Coutinho MP, and The Rt Hon Jeremy Hunt MP, "Families, business and industry to get energy efficiency support", GOV.UK, December 18, 2023.
112. "Energy Act 2023", legislation.gov.uk, October 26, 2023.
113. "Progress in reducing emissions: 2023 Report to Parliament", Climate Change Committee, June 2023.
114. Department for Energy Security & Net Zero, "Clean heat market mechanism consultation: Summary of responses and government response," GOV.UK, November 2023.
115. Department for Energy Security and Net Zero, HM Treasury, The Rt Hon Claire Coutinho MP, and The Rt Hon Jeremy Hunt MP, "Families, business and industry to get energy efficiency support", GOV.UK, December 18, 2023.
116. Philip New, "Developing a UK sustainable aviation fuel industry: Independent report", GOV.UK, April 17, 2023.
117. HM Treasury, et. al., "News story: £360 million to boost British manufacturing and R&D", GOV.UK, March 4, 2024.
118. "Progress in reducing emissions: 2023 Report to Parliament", Climate Change Committee, June 2023.
119. Department for Transport, The Rt Hon Mark Harper MP, and Baroness Vere of Norbiton, "New story: Clean Maritime Day package sets UK on course to make green shipping a reality and level up coastal communities", GOV.UK, September 14, 2023.
120. Department for Transport and Lord Davies of Gower, "New green international shipping routes backed by government funding", GOV.UK, April 5, 2024.
121. "Progress in reducing emissions: 2023 Report to Parliament", Climate Change Committee, June 2023.
122. "A land use framework for England", Wildlife and Countryside Link, November 1, 2023.
123. "Nature targets welcome but ambition will need to grow over time", Aldersgate Group, December 16, 2022.
124. Department for Environment, Food & Rural Affairs, "Guidance: Understanding biodiversity net gain", GOV.UK, February 22, 2024.
125. HM Government, "Nature markets: A framework for scaling up private investment in nature recovery and sustainable farming", GOV.UK, March 2023.
126. Department for Energy Security & Net Zero, "Greenhouse gas removals: Update on the design of the Greenhouse Gas Removals (GGR) business model and Power Bioenergy with Carbon Capture and Storage (Power BECCS) business model", GOV.UK, December 2023.
127. Department for Energy Security & Net Zero, "The ability of BECCS to generate negative emissions: Task and Finish Group report", GOV.UK, August 2023.
128. Department for Energy Security & Net Zero, "Biomass strategy", GOV.UK, 2023.
129. Department for Energy Security & Net Zero, "Report: The Government's support for biomass", National Audit Office, January 24, 2024.

Important Information

THIS IS A MARKETING COMMUNICATION

Except where stated as otherwise, the source of all information is Aviva Investors Global Services Limited (AIGSL). Unless stated otherwise any views and opinions are those of Aviva Investors. They should not be viewed as indicating any guarantee of return from an investment managed by Aviva Investors nor as advice of any nature. Information contained herein has been obtained from sources believed to be reliable, but has not been independently verified by Aviva Investors and is not guaranteed to be accurate. Past performance is not a guide to the future. The value of an investment and any income from it may go down as well as up and the investor may not get back the original amount invested. Nothing in this material, including any references to specific securities, assets classes and financial markets is intended to or should be construed as advice or recommendations of any nature. Some data shown are hypothetical or projected and may not come to pass as stated due to changes in market conditions and are not guarantees of future outcomes. This material is not a recommendation to sell or purchase any investment.

The information contained herein is for general guidance only. It is the responsibility of any person or persons in possession of this information to inform themselves of, and to observe, all applicable laws and regulations of any relevant jurisdiction. The information contained herein does not constitute an offer or solicitation to any person in any jurisdiction in which such offer or solicitation is not authorised or to any person to whom it would be unlawful to make such offer or solicitation.

In Europe this document is issued by Aviva Investors Luxembourg S.A. Registered Office: 2 rue du Fort Bourbon, 1st Floor, 1249 Luxembourg. Supervised by Commission de Surveillance du Secteur Financier. An Aviva company. In the UK this document is by Aviva Investors Global Services Limited. Registered in England No. 1151805. Registered Office: 80 Fenchurch Street, London EC3M 4AE. Authorised and regulated by the Financial Conduct Authority. Firm Reference No. 119178. In Switzerland, this document is issued by Aviva Investors Schweiz GmbH.

In Singapore, this material is being circulated by way of an arrangement with Aviva Investors Asia Pte. Limited (AIAPL) for distribution to institutional investors only. Please note that AIAPL does not provide any independent research or analysis in the substance or preparation of this material. Recipients of this material are to contact AIAPL in respect of any matters arising from, or in connection with, this material. AIAPL, a company incorporated under the laws of Singapore with registration number 200813519W, holds a valid Capital Markets Services Licence to carry out fund management activities issued under the Securities and Futures Act (Singapore Statute Cap. 289) and Asian Exempt Financial Adviser for the purposes of the Financial Advisers Act (Singapore Statute Cap.110). Registered Office: 138 Market Street, #05-01 CapitaGreen, Singapore 048946.

In Australia, this material is being circulated by way of an arrangement with Aviva Investors Pacific Pty Ltd (AIPPL) for distribution to wholesale investors only. Please note that AIPPL does not provide any independent research or analysis in the substance or preparation of this material. Recipients of this material are to contact AIPPL in respect of any matters arising from, or in connection with, this material. AIPPL, a company incorporated under the laws of Australia with Australian Business No. 87 153 200 278 and Australian Company No. 153 200 278, holds an Australian Financial Services License (AFSL 411458) issued by the Australian Securities and Investments Commission. Business Address: Level 27, 101 Collins Street, Melbourne, VIC 3000 Australia.

The name “Aviva Investors” as used in this material refers to the global organization of affiliated asset management businesses operating under the Aviva Investors name. Each Aviva investors’ affiliate is a subsidiary of Aviva plc, a publicly- traded multi-national financial services company headquartered in the United Kingdom.

Aviva Investors Canada, Inc. (“AIC”) is located in Toronto and is based within the North American region of the global organization of affiliated asset management businesses operating under the Aviva Investors name. AIC is registered with the Ontario Securities Commission as a commodity trading manager, exempt market dealer, portfolio manager and investment fund manager. AIC is also registered as an exempt market dealer and portfolio manager in each province of Canada and may also be registered as an investment fund manager in certain other applicable provinces.

Aviva Investors Americas LLC is a federally registered investment advisor with the U.S. Securities and Exchange Commission. Aviva Investors Americas is also a commodity trading advisor (“CTA”) registered with the Commodity Futures Trading Commission (“CFTC”) and is a member of the National Futures Association (“NFA”). AIA’s Form ADV Part 2A, which provides background information about the firm and its business practices, is available upon written request to: Compliance Department, 225 West Wacker Drive, Suite 2250, Chicago, IL 60606.

543682 – 31/05/2025Dealer, and a Commodity Trading Manager. Aviva Investors Americas LLC is a federally registered investment advisor with the U.S. Securities and Exchange Commission. Aviva Investors Americas is also a commodity trading advisor (“CTA”) registered with the Commodity Futures Trading Commission (“CFTC”) and is a member of the National Futures Association (“NFA”). AIA’s Form ADV Part 2A, which provides background information about the firm and its business practices, is available upon written request to: Compliance Department, 225 West Wacker Drive, Suite 2250, Chicago, IL 60606.

543682 – 31/05/2025

Contact us

Aviva Investors
80 Fenchurch Street
London EC3M 4AE
+44 (0)20 7809 6000

www.avivainvestors.com