

Business Briefing

UK business and policy leadership for net zero:

analysis of progress to reduce emissions

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The University of Cambridge Institute for Sustainability Leadership

The University of Cambridge Institute for Sustainability Leadership (CISL) partners with business and governments to develop leadership and solutions for a sustainable economy. We aim to achieve Net Zero, protect and restore nature, and build inclusive and resilient societies. For over three decades we have built the leadership capacity and capabilities of individuals and organisations, and created industry-leading collaborations, to catalyse change and accelerate the path to a sustainable economy. Our interdisciplinary research engagement builds the evidence base for practical action.

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Introduction

The UK has an impressive track record on climate action. Over the past three decades, UK greenhouse gas (GHG) emissions have been falling steadily while the country has successfully decoupled emissions from economic growth.¹ In 2019, total UK GHG emissions were 45 per cent lower than in 1990.² However, this decoupling must accelerate for the UK to meet its 2030 and 2050 emissions reduction targets, with all sectors of the economy achieving their short and medium-term emissions reduction targets.

So far, the reduction in emissions has taken place at different paces in different sectors of the economy. The power sector has more than halved its emissions over the past 30 years and is now responsible for a smaller share of the UK's total emissions than surface transport, industry and buildings. While industrial emissions have also declined substantially from 1990s levels, largely as a result of the changing structure of the UK's manufacturing sector and greater use of lower carbon fuels,³ sectors such as surface transport and buildings have decarbonised at a much slower pace and now account for over half of the UK's total CO₂ emissions.² The rate of progress seen in the power sector will need to be replicated across all other sectors in the next three decades for the UK to achieve its carbon budgets and its 2030 and 2050 targets.



BEIS. (2020). 2019 UK Greenhouse Gas Emissions, Provisi BEIS. (2020). 2018 UK Greenhouse Gas Emissions, Final Figures.

Figure 1: History of emissions reductions in the UK by sector

This briefing examines how much progress has been made towards reducing emissions in four key sectors – **power and energy, built environment, road transport, and agriculture and land use**. It examines why some of these sectors continue to lag behind and how they need to evolve, drawing insights from business leadership in those sectors – looking at the different experiences and challenges in each sector. The insights from this briefing will be used by CISL's UK Corporate Leaders Group (CLG UK) to provide recommendations in a forthcoming report for how to bridge this gap.

Industrial sectors, which are also a key part of the transition, are not analysed in this report but will be examined separately in future work as these sectors require a more granular focus than was possible here.

For each sector, this briefing looks at the role that policy and clear, sector-specific ambitions have played in supporting the transition. The analysis in this briefing identifies barriers to progress, including the absence of sufficiently ambitious sector-specific targets and strategies, lack of policy initiatives, regulatory constraints, failure to instigate change effectively through policy interventions, and where lessons may be applied from the faster transition that has been achieved in the energy sector. It examines the action undertaken by business and where further action is required, using business case studies (see Annex B: Case studies) to illustrate what businesses have been doing to facilitate progress, where business action has made a substantial difference, and where the barriers to business action continue to limit their ability to drive positive change.

The dual challenge of transitioning to a climate neutral economy while also supporting economic recovery from the Covid-19 pandemic will require substantial investment in the UK's workforce, promotion of lower carbon behaviours, and innovation. In addressing climate change and supporting economic growth, it is important to note that all actions take place against a context of broader sustainability challenges that also need to be addressed. These challenges include levelling up the UK's regions, reversing the decline in nature and improving UK climate resilience. However, the ability to deliver on climate targets will not only result in substantial emissions reductions, but also in considerable employment gains and improved quality of life.³

This economic transition will also affect and be driven by business. During the 2020s, UK companies will need to establish new supply chains, develop new low carbon products and scale up low carbon operations to prepare for the mass roll-out of low carbon technologies, goods and services during the 2030s. Although the precise technological and policy challenges differ for each sector, the overall policy focus during the 2020s will need to be on supporting business models that will work in the growing markets for low carbon solutions, and on lowering the cost of finance. From 2030 onwards, policy will need to focus on further accelerating the rates of roll-out, tackling emerging barriers and systems challenges, and ensuring fairness across society during the transition to net zero.

Driving action across the UK economy

UK climate action has been supported by strong policy frameworks and ambitious targets. In 2008, the UK was the first country globally to set a legally binding climate change mitigation target through the introduction of the Climate Change Act.⁴ In 2019, this initial target of 80 per cent GHG emissions reduction by 2050 was revised upwards, making the UK the first major economy to set a legally binding net zero emissions target.⁵ As the designated host of the COP26 climate summit in 2021, the UK has assumed a strong climate leadership position at the global level, including through committing to a substantial proportion of Covid-19 recovery funds to finance a greener and more resilient future both at home and abroad.⁶

In 2020, the commitment to ambitious emissions reductions and to 'building back greener' in the aftermath of Covid-19 made frequent appearances in government policy documents. Among other things, the UK Prime Minister announced a new Ten Point Plan for a "green industrial revolution",⁷ and committed to raising the UK's Nationally Determined Contribution (NDC) to "a cut of at least 68% compared to 1990 levels by 2030".⁸ In April 2021, the UK government went further and within the sixth Carbon Budget committed to put in law a second interim target of reducing emissions by 78 per cent by 2035, incorporating in this target the UK's share of international aviation and shipping emissions for the first time.⁹ The new interim emissions reduction targets for 2030 and 2035, if delivered, should put the UK on track to achieve its target of net zero emissions by 2050. However, the current policies and recent progress do not set the UK on the pathway to achieving these targets.^{3,10,11}

Getting on track to achieve the 2030, 2035 and 2050 targets requires considerably more action to drive change across the economy, including effective business action in partnership with government, financial institutions and civil society.¹² The government is developing several key plans and strategies, to be united in a new, long-term 'Net Zero Strategy' that will show how its increased ambitions can be delivered.

Many of the government targets, progress indicators and plans rely heavily on contribution from the private sector. For example, substantial amounts of private sector investment will need to be unlocked to support the transition to the net zero carbon economy.¹³ At the same time, although a large number of UK businesses are already taking action on climate and driving change,¹² more ambitious policies and regulatory frameworks business will be needed to deliver the scope and scale of action required in the coming decades.

UK business climate leadership

Meeting the UK's 2050 net zero target will require action by all parts of the economy, with businesses playing a key role. In 2019, the business sector was directly responsible for nearly 20 per cent of the UK's annual CO_2 emissions and was a major contributor to the 34 per cent of all UK emissions from the transport sector, which includes business-related transport emissions.¹⁴

Business behaviour will need to change, both to reduce its contribution to the problem but also to seize the opportunities that come with new investment and innovation in support of a zero carbon economy. UK businesses can, and already are, taking leadership through setting ambitious targets

and driving significant change. CISL's Corporate Leaders Groups have been demonstrating this leadership since 2005, providing a strong leadership voice from business and helping to drive consensus among the UK, European and global business community in support of climate action.

UK businesses are taking a more proactive role in calling for more decisive action and greater commitment to climate from the government. In December 2020, a letter asking the UK Prime Minister to set out an ambitious emissions reduction target for 2030 was signed by 81 businesses and investors including Tesco, Anglian Water, BT plc, Scottish Power, Sky, National Grid, Nestlé UK & Ireland, EDF Energy, Heathrow Airport Ltd, JLL, SSE plc and Coca-Cola European Partners, as well as a number of progressive small and medium enterprises (SMEs).¹⁵ Prior to this, in May 2019, over 100 businesses, investors and business networks called for the 2050 net zero greenhouse gas emissions target and in June 2020, over 200 called for the government to deliver a clean, green recovery.¹⁶

An increasing number of UK businesses are showing leadership through developing comprehensive and ambitious decarbonisation plans. Many have done this by participating in the <u>Science Based</u> <u>Targets initiative</u> (SBTi). In March 2021, of the 1,346 companies globally that had so far signed up to setting emissions reduction targets through the SBTi, 187 are headquartered in the UK – nearly 14 per cent. These companies represent a cross-section of industries from services to food and drink, manufacturing, construction and energy.¹⁷ When looking at the UK's largest businesses, 40 of the FTSE 100 companies had committed to the SBTi; fifteen of these companies have so far had their plans that are aligned with the 1.5-degree target approved by the initiative. A further eight of the FTSE 100 companies have approved plans that are aligned with the 2-degree target. In total, 31 of the current FTSE 100 and FTSE 250 companies have verified 1.5 degree-aligned SBTs or net zero by 2050 goals.¹⁷

While a small number of businesses have initially led the way – for example, CLG members Tesco and Unilever first committed to the SBTi in May 2017 and both now have 1.5-aligned targets – there has been a four-fold increase in the number of UK businesses committing to the SBTi since the start of 2020. The UK government is hoping for this trend to continue in the lead-up to COP26, and is supporting it through the appointment of one of its MPs as the UK's Net Zero Business Champion,¹⁸ whose primary role is to drive sign-on by UK businesses to Race to Zero.

<u>Race to Zero</u> is the largest ever alliance of non-state actors committed to achieving net zero carbon emissions by 2050 at the latest. The UK COP26 President, Alok Sharma, has called on all businesses globally¹⁹ to set net zero targets that have a robust short-term decarbonisation plan, and cover both direct and indirect emissions, through signing the <u>Business Ambition for 1.5°C</u> commitment, one of the routes into Race to Zero that requires a business to set a science-based target (SBT). As of March 2021, 686 UK businesses were part of Race to Zero²⁰, of which 100 were signed up to <u>Business Ambition for 1.5°C</u> (making the UK the first country to reach this milestone – by 30 April 2021 this had risen to 106 – see Annex A) and 471 were signed up via the <u>SME Climate</u> <u>Commitment</u>. Most of the others were certified <u>B Corporations</u>, while the rest have joined via initiatives such as the Fashion Industry Charter for Climate Action,²¹ the <u>B Team</u> and the <u>Climate</u> <u>Pledge</u>.

The sign-up by SMEs to the SME Climate Commitment is significant for the UK - 99.9 per cent²² of all British businesses are classed as SMEs covering all sectors of the economy. SMEs employ 16.6

million people, meaning they provide work to 25 per cent of the UK population – a significant proportion. Their contribution to emissions is also significant, if broadly spread. SMEs are responsible for just under half of all UK territorial emissions from the business sector.

Putting sustainability at the heart of business

There is a wide and growing range of advice and resources for companies looking to engage on climate change. Alongside CISL,²³ the Climate Change Committee (CCC),¹² and the We Mean Business coalition (WMB)²⁴ all provide good general recommendations to support greater climate ambition among businesses.

These approaches all include recommendations to:

- Account for, and take action on, all emissions for which your company is responsible. Be consistent in your commitment to ambitious action on climate.
- Be transparent about your company's emissions reduction objectives and how you plan to achieve these. Measure, disclose, target, act and adjust.
- Adopt the highest possible ambition for your type and size of company, and aim to exceed the government targets where possible.
- Seek to address all direct and indirect emissions, including emissions that may occur in your company's supply chains (so-called Scope 3 emissions).
- Integrate positions on climate into corporate and brand communications to create the conditions for other businesses to step forward and lead. Collaborate with other businesses to deliver climate action at scale.

There are also other sources of insight and vision for businesses. Most notably, the UK benefits from one of the world's foremost champions of business sustainability and deploying business innovation to address environmental challenges. HRH The Prince of Wales, CISL's Royal Founding Patron, has been at the forefront of business action on climate change and related issues for decades. He has recently further raised the ambition of his efforts to address environmental issues and set out the clear economic and business case by founding the <u>Sustainable Markets Initiative</u> (SMI).

The SMI is a new global 'coalition of the willing' working to accelerate progress towards a sustainable future. Through the SMI, HRH The Prince of Wales has published *Terra Carta*,²⁵ a new charter putting sustainability and nature at the heart of the private sector that businesses can support by signing up. UK-based businesses that already support it include Anglian Water, AstraZeneca, Coutts, EY, Heathrow Airport, Thames Water and Unilever.

For more information, please see:

- <u>CISL's Net Zero Framework</u>
- <u>CCC's work on business actions to deliver net zero</u>
- WMB Climate Leadership Now approach

Transforming the power and energy sector

The power and energy sector has made the most significant progress of the four sectors covered in this report, cutting emissions faster than the wider economy, having more than halved its emissions over the past 30 years. Emissions in the power sector declined by 62 per cent over the period 2008–18, while the carbon intensity of the grid halved, and the amount of electricity generated from renewables grew fourfold to 100 TWh in 2018 (34 per cent of the mix).³ In 2019, CO₂ emissions from power stations accounted for 16 per cent of the UK's emissions² and the power sector was the only sector of the UK economy to outperform against the sector-specific progress indicators set by the Climate Change Committee (CCC).³

The rapid progress in the power sector has been driven primarily by changes in the mix of fuels being used for electricity generation, most notably the substantial decline in the use of coal, combined with greater efficiency resulting from improvements in technology and a decline in the relative importance of energy-intensive industries.²

The success in decarbonising the power sector is due to a set of policies that instigated progress and de-risked investment. The EU Emissions Trading System (ETS), supported by the UK carbon price floor, effectively priced coal out of the UK market, while the 2012 Electricity Market Reform introduced Contracts for Difference, a capacity market, an emissions performance standard, and a carbon price floor. Building on the success of the Renewables Obligation (2005–17) and supported by the UK Green Investment Bank (2012–17), the Electricity Market Reform reduced the risk of unexpected decline in future returns for low carbon investors.³ Policy measures such as Feed-in Tariffs, also known as FiTs (2009–17), also played an important role in supporting small-scale renewable electricity generation, especially solar photovoltaic (PV). However, the success of FiTs led to a rising cost of electricity, eventually resulting in the closure of the scheme and a subsequent hiatus in investment in small-scale renewables until the introduction of the Smart Export Guarantee in 2020.²⁶

The cost of renewables has now declined to a level where there is no additional cost for consumers associated with subsidies, and annual roll-out rates of new renewables are close to what will be needed through to 2050. However, policies to support large-scale roll-out of renewables in the future need to continue, including continuing regular auctions of long-term revenue stabilisation contracts to mitigate investment risks and the cost of finance. It is also critical that support for additional generation capacity will not make existing renewable electricity plants uneconomical, as the overall capacity will need to increase substantially to meet the growing demand for electricity from the buildings and transport sectors.

Additional policy measures are needed to unblock barriers (for example, by better co-ordinating the onshoring of transmission lines to offshore wind farms) and to deal with the system challenges (for example, through strengthening flexibility markets to accommodate intermittency and ensure adequate resilience of energy supplies as heat and transport become more electrified).¹³ Investment in upgrading electricity networks and the provision of ancillary services and medium to long-term storage to support the greater penetration of intermittent renewables is a pressing

challenge that needs to be resolved before the risk of blackouts caused by grid failures becomes imminent. New forms of remuneration mechanisms are likely to be needed to incentivise investment in non-fossil-based technologies that can deliver storage and ancillary services, such as pumped storage hydropower (PSH).²⁷

During the 2020s, the power sector must also develop the infrastructure that will be needed to enable the scaling up of low carbon electricity and hydrogen production, GHG removals and carbon capture and storage (CCS).¹³

The CCC's¹³ recommendations for the power sector for the 2020s are extensive, and include:

- phasing out coal for electricity generation by 2024 and unabated natural gas by 2035
- developing capacity to produce 1 GW of low carbon hydrogen by 2025, increasing to 25 TWh annually by 2030
- increasing offshore wind generation capacity to 40 GW by 2030 and adding 8 GW of new nuclear generation capacity by 2035
- cutting emissions from electricity generation to less than 50 gCO₂/kWh by 2030.

Many of these recommendations were responded to in 2020, when a number of new policies and funding for the power sector were announced as part of the Prime Minister's Ten Point Plan for a "green industrial revolution"⁷, the Energy White Paper²⁸ and the planned Covid-19 economic recovery spending.²⁹ These include the commitments to:

- bring forward the coal phase-out date from 2025 to 2024
- double the capacity of renewable energy to be contracted in the 2021 Contract for Difference (CfD) auction¹³ and bring onshore wind and solar into future auctions
- meet the CCC's target for 40 GW of offshore wind capacity, including 1 GW of innovative floating offshore wind, by 2030
- bring at least one large-scale nuclear power plant to the point of final investment decision by the end of this parliament, drawing on £500 million of new funding and support for nuclear power, including for innovation in small modular reactors, and an additional £100 million for nuclear fusion with the intention to build a 'commercially viable' fusion power plant by 2040
- drive the growth of low carbon hydrogen, with more detailed plans to be published in the upcoming Hydrogen Strategy
- a promise to design and implement the UK's own emissions trading scheme (UK ETS) from 1 January 2021 to replace the current EU ETS, which is to deliver greater emissions reductions than its EU counterpart
- scale up electrification in transport and heating, which is expected to double the demand for electricity by 2050 in spite of efficiency improvements

- a plan to introduce new business models based on the CfD framework to incentivise the use of CCS in power generation.

The Energy White Paper has been commended for acknowledging the need for fundamental changes in the power system as it takes on an increasing share of intermittent renewables; the potential benefits of smart technology in providing more flexibility to the power system; the need to keep household electricity and gas bills low; the need to address the existing skills gap that currently hinders the uptake of energy efficiency improvements and shift to low carbon heating; and the potential limitations to using hydrogen in home heating.^{30,31}

However, the Energy White Paper and Ten Point Plan have been criticised for not yet delivering the emissions cuts that will be required to achieve the UK's climate targets, and for making unrealistic promises on certain matters, such as the speed at which the UK ETS can be delivered, and the emissions reduction potential of such a system.³⁰ Another area that has prompted discussion is the acknowledged challenge in sourcing funds for the planned expansion of nuclear capacity, and the credibility of plans on nuclear fusion.³⁰

The government has committed to provide further detail over the next two years, as part of its plans for the Sixth Carbon Budget, its Net Zero Strategy and through various sector-specific strategies.

What is business doing?

The UK power sector has become significantly less concentrated in recent years. Although a few large businesses dominate transmission-connected generation, smaller organisations have grown recently to around 20 per cent of total capacity.³²

Many businesses in this sector have already made climate commitments. National Grid, which runs the transmission system, has pledged to reduce direct greenhouse gas emissions to net zero by 2050. Scottish Power generates 100 per cent renewable electricity and has a target to be carbon neutral by 2050. EDF's mission is to build a net zero energy future and it has committed to achieving carbon neutrality by 2050. In the UK, its purpose is helping Britain achieve net zero. Each of these business examples is covered in more detail in Annex B: Case studies.

Several large and small generation businesses already provide 100 per cent renewable power, and nearly all wholesalers and retailers offer renewable or zero carbon tariffs.³³

More widely, numerous UK businesses are committed to 100 per cent renewables either through on-site generation or procurement through green tariffs or Power Purchase Agreements. The UK business signatories of the RE100 group procure 4 per cent of the UK's electricity in this manner.³ A total of 43 UK businesses are now part of RE100, with an average target date of 2024 to procure 100 per cent renewable energy.³⁴

Rethinking road transport

Transport accounts for around a third (34 per cent in 2019)² of all UK carbon dioxide emissions. Most of these emissions come from road transport, which has been the single highest emitting sector in the UK since 2015. The current trend in emissions reductions shows this sector is off track to achieve existing emissions reduction targets.^{2,3}

Between 2008 and 2018, emissions from road transport fell by a mere 3 per cent.³ This slow progress is largely due to ineffective efforts to incentivise behaviour change. Despite recent calls by the general public and local authorities to reduce private car use,^{35,36,37,38} car and van journeys still account for 83 per cent of the average person's trips that involve a vehicle.³ While efficiency standards have driven improvements in car performance for each class, the impact of these improvements on emissions has been largely offset by growth in higher emission sport utility vehicles (SUVs), the increased distance driven and low rates of EV sales.³

The low take-up rate of EVs in the first half of the 2010s has been attributed largely to their comparatively high upfront cost¹³ and lack of charging infrastructure (causing 'range anxiety'), a factor that continues to hinder efforts to decarbonise private vehicle use.³⁹ Supported by a combination of upfront purchase subsidies, preferential tax treatment and support for the charging network, the take-up of EVs accelerated during the second half of the 2010s. However, the share of EVs (including plug-in hybrids) currently accounts for only around 1 per cent of the total number of cars on the UK's roads.³

In 2019, 3.15 per cent of all new car registrations were EVs (excluding plug-in hybrids), substantially below the 5.3 per cent market share estimated as necessary to be on track to meet the UK's Fourth and Fifth Carbon Budgets.³

The CCC^{3,13} sets out medium and long-term targets for the transport sector. Recommended actions for the 2020s include:

- ramping up the EV market and focusing on developing associated infrastructure in the first half of the 2020s
- phasing out sales of petrol and diesel cars, vans and motorbikes in the early 2030s and rapid turning over of fleets to zero emission vehicles from 2030 onwards
- large-scale implementation of 'enabling' policies (such as measures to address the higher cost of EVs and electric vans, and investment in charging infrastructure and power network upgrades) to scale up EV sales,¹³ in addition to a total ban on all petrol and diesel cars by 2050¹³
- design and implementation of new policies to **reduce road travel** and to **incentivise shifts to public transport and active modes of travel**.¹³

In 2020, the government committed substantial funds to support the decarbonisation of road transport as part of the Prime Minister's Ten Point Plan for a "green industrial revolution"⁷ and to boost recovery from Covid-19.²⁹ Both of these plans focus primarily on accelerating the delivery of

EV charging infrastructure and supporting demand-side measures, alongside investments in connected and autonomous technologies. The headline announcements include:

- £1.3 billion to accelerate the roll-out of EV charging infrastructure, targeting support on rapid charge points on motorways
- £1 billion to support the electrification of UK vehicles and their supply chains
- £582 million to extend the plug-in car, van, taxi and motorcycle grants to 2022–23 to reduce their sticker price for the consumer
- £20 million during 2021 to pioneer hydrogen and other zero emission lorries to support industry to develop cost-effective, zero emission heavy goods vehicles (HGVs) in the UK.⁷

The government also announced its intention to end the sale of new petrol and diesel cars and vans by 2030, and the sale of hybrid cars and vans by 2035.²⁸ This move is expected to generate multiple economic and employment benefits, including creating 32,000 new jobs by 2030 and boosting gross domestic product (GDP) by 0.2 per cent – or £4.2 billion – in 2030.⁴⁰ The early phase-out of polluting vehicles could also lead to substantial additional economic benefits if it enabled the UK to capture a larger share of both the domestic and European markets for electric cars and vans.⁴⁰

Recent developments in England include the setting up of a new body, Active Travel England, and the first-ever National Bus Strategy. These pledge support for substantial improvements to public transport infrastructure, including trains, buses, and active transport such as walking and cycling.^{7,29,41} £120 million of new funding was committed to begin the introduction of at least 4,000 additional British-built zero emission buses in 2021, and £2 billion over this Parliament to build over 1,000 miles of segregated cycle lanes and to create more low-traffic neighbourhoods that better support active transport modes.^{7,41}

However, not all of the government's plans have been so clearly aligned with its climate goals. £14 billion was committed for building new roads, which is expected to increase demand for car travel and has been criticised as being incompatible with the UK's net zero targets.¹¹

More detailed plans for the transport sector will be set out in the Transport Decarbonisation Plan, which is due to be published in 2021 and should set out actions across government to further increase active travel, public transport, and accelerate the roll-out of EVs, including HGVs.

What is business doing?

Businesses are already showing leadership in moving fleet vehicles to electric and committing to increasing private sales of EVs ahead of the UK's 2030 target. Corporate fleets are a valuable first step for EVs as their high mileage and regular routes will help the economics of EVs and roll-out of charging infrastructure alongside reducing emissions. They also have a high turnover rate, which will be critical in stimulating the second-hand EV market.

In the UK, there are around one million company cars. Alternatively fuelled vehicles (AFVs) make up 9 per cent of the market in the fleet sector (although the majority of those are hybrids), compared to around 3 per cent (including hybrids) for privately owned cars.⁴² The UK Electric Fleets Coalition⁴³ is advocating for accelerating the transition to EVs in the run-up to COP26. To date, 29 companies

with headquarters in the UK have committed to fully electric fleets by 2030 through the Climate Group's EV100 initiative;⁴⁴ an additional 15 with operations in the UK have also committed to the same goal. These organisations, including BT, Unilever and SSE, have jointly committed to delivering over 79,000 EVs within their UK fleets by 2030, and to make charging available at nearly 1,200 locations for customers and staff.⁴⁵

According to a 2019 survey,⁴⁶ 65 per cent of fleet managers said their fleets currently included both pure EVs and plug-in hybrids (PHEVs), and 89 per cent⁴⁷ of UK fleet managers expect EVs and PHEVs to play a "dominant" role in their fleets by 2028. Commitments to transition fleets of EVs are also appearing in sector-level net zero roadmaps. For example, through the Water UK 2030 net zero commitment,⁴⁸ English water companies have committed to ensuring that 100 per cent of fleet passenger vehicles are electrified and 80 per cent of commercial vehicles (large goods vehicles (LGVs) and HGVs) converted to alternative fuels by 2030 at the latest.

All the top five UK car manufacturers have ambitious commitments to reduce carbon emissions and transition sales to EVs. These include the following:

- Jaguar Land Rover⁴⁹ is already certified as carbon neutral in its manufacturing, and is aiming to become a net zero carbon business by 2039. Jaguar will become an all-electric luxury car brand by 2025 and will produce six all-electric variants in the next five years.⁵⁰
- Nissan (see Annex B: Case studies) is the world's largest EV manufacturer, with global sales of more than 320,000 all-electric vehicles (2018), including the top-selling Nissan LEAF. The company is aiming to sell one million electrified vehicles by 2022, 40 per cent of the company's sales in Europe by 2022, reaching 50 per cent by 2025.
- Mini,⁵¹ through its parent company BMW, has committed to cutting emissions in line with the goals of the Paris Agreement through a science-based target.
- Toyota⁵² intends to reduce the CO_2 emissions from its vehicles by 90 per cent by 2050.
- Honda⁵³ has a goal for its cars to emit 80–90 per cent less CO₂ than 2001 models by 2050 and has pledged to stop selling cars in Europe that rely only on the internal combustion engine by 2022.⁵⁴

The route to decarbonising heavier vehicles is less well established. HGVs and vans currently each account for around 15 per cent of road transport emissions, while buses and rail emit less than 5 per cent each.⁴² The Society of Motor Manufacturers and Traders estimates that, to meet its contribution to the CCC's Balanced Pathway approach, zero emission vehicles would need to make up 96 per cent of new sales of HGVs, buses and coaches by 2035, and there would need to be around 170,000 zero emission HGVs and coaches (approximately 33 per cent of the fleet) in operation by 2035.⁵⁵

Modernising the UK's buildings

Progress in reducing emissions from the UK buildings sector has been limited – UK homes in particular are deeply energy inefficient, with 70 per cent having an energy performance certificate (EPC) rating of D or below.¹¹ In 2019, buildings accounted for 19 per cent of the UK's CO₂ emissions,² of which more than three-quarters came from residential buildings.⁵⁶ Prior to this, emissions fell by only 14 per cent in the period 2008 to 2018.

Most of this decline in emissions occurred between 2008 and 2015 and was driven by policies to support the phasing out of non-condensing boilers, along with the supplier obligations targeting home energy efficiency (from 2008) and appliance efficiency standards. Since 2015, advances have been negligible:³ while new-build properties are more energy efficient than the older buildings stock, direct emissions from fuel use in existing buildings rose for the second year running in 2016.⁵⁷

Slow progress in improving building energy efficiency is contributing substantially to the UK's projected failure to meet its Fourth and Fifth Carbon Budgets.⁵⁶ The key areas where urgent action is needed include decarbonisation of heating and hot water supply, and energy efficiency improvements through renovation and retrofitting of existing properties.⁵⁶ Installations of insulation fall far below the annual targets (see Table 1), with more than 20 times as many loft insulations – and five times as many cavity wall installations – needed every year than are currently carried out.³

Shifting buildings away from natural gas to low carbon heat solutions has likewise been slow, with fewer than 200,000 homes being heated with heat pumps in 2019.³ The annual number of heat pump installations (at 26,000 in 2018) lags behind the government's current target of 600,000 heat pumps installed annually by 2028⁵⁸ and does not put the UK on track to achieve the minimum of one million heat pump installations that will be required every year by 2030.⁵⁹

Measure	2019 indicator	Actual installations
Lofts insulated	545,000	27,000
Cavity walls insulated	200,000	41,000
Solid walls insulated	90,000	11,000
Heat pumps installed	>30,000	26,000 (2018)

Source: CCC³ (page 110)

The CCC recommends ending sales of oil boilers to all homes and businesses by 2028 and gas boilers by 2033, ahead of phasing out natural gas by 2035 and banning the use of oil and gas boilers altogether by 2050.¹³ However, the uptake of zero carbon or electric heating solutions has so far been hindered by limited awareness of the contribution of gas boilers to CO₂ emissions, and policy measures that have worsened rather than improved the situation. For example, the Renewable Heat Incentive and the Green Deal failed to deliver the necessary increase in installations of renewable heating solutions and energy-saving measures such as loft and wall insulation, while the scrapping of the 2016 Zero Carbon Homes standard means that there are now 1.8 million more homes that will require zero carbon retrofit than there were when the Climate Change Act was passed in 2008.³

On the other hand, the revised Energy Company Obligation (ECO3), which replaced previous schemes with the same name in 2018 and includes a requirement to target energy efficiency improvement measures specifically at low-income and vulnerable customers, should deliver both social benefits to households as well as emissions reductions.^{60,61}

Strong and decisive action is needed to facilitate progress towards the CCC's recommended 2030 target of all buildings (except owner-occupied non-fuel poor homes) achieving EPC rating C by 2030, and the 2050 target of the buildings stock being a carbon sink rather than a source of emissions.¹³ Additional measures are needed to address the challenges associated with improving energy efficiency in the so-called hard-to-treat properties, including listed properties and properties with solid walls.

The scale of the challenge requires better energy efficiency monitoring and reporting systems, more stringent standards and enforcement mechanisms, financial support for home retrofits, and upskilling of the existing workforce in the building, heat and ventilation supply trades. Regulations that require mortgage lenders to report annually on the EPC breakdown of their portfolios could potentially create lower-cost mortgage products to incentivise existing homeowners with a mortgage and new buyers to improve the energy efficiency of their properties.

A strong and coherent set of policy and regulatory measures is also needed to support the decarbonisation of heating, with a focus on technologies that can reduce primary energy demand as well as contribute to emissions reductions, such as heat pumps. While the scale of the task at hand is considerable, it is not impossible. In Finland, heat pumps were installed to around a third of all homes in the country between 2000 and 2018, enabled through a combination of expertise and policy co-ordination involving a carbon tax on heating fuels, stringent building codes, tax-deductible labour costs and capital subsidies.⁵⁸ A similar approach could achieve comparable outcomes in the UK, although the relative high cost of electricity, which is needed to operate heat pumps, may present a barrier to widespread adoption of this technology.⁶²

To ensure that new-build properties will not add to the already sizeable retrofit challenge, fast implementation and a robust definition is needed of the Future Homes Standard, supported by appropriate legislative measures in advance of its planned introduction in Scotland in 2024 and England and Wales in 2025. This Standard should incorporate a mandatory minimum whole-life carbon standard (including embedded emissions) for buildings as well as other infrastructure, with differentiated targets by function and use of the building.¹³ In a recent letter to the Ministry of Housing, Communities & Local Government (MHCLG), the CCC⁶³ also suggested that the MHCLG should consider bringing forward the date for introducing the Future Homes Standard to 2023.

In 2020, new policies and funding to support the decarbonisation of the buildings sector were announced as part of the Prime Minister's Ten Point Plan for a "green industrial revolution"⁷ and Covid-19 economic recovery spending,²⁹ with more detailed policy measures and funding to be set out in the Heat and Buildings Strategy due in 2021. So far, the government has pledged:

• to implement the Future Homes Standard "in the shortest possible timeline", although without committing to bringing this forward from the planned 2025

- to set up a consultation on introducing more stringent energy efficiency requirements for private sector landlords, requiring all private rented homes to achieve EPC band C by 2030 (although pending the results of an ongoing consultation,⁶⁴ this date may be brought forward to 2028)
- to aim for 600,000 heat pump installations per year by 2028
- £3 billion for the Green Homes Grant scheme and Public Sector Decarbonisation Scheme to improve energy efficiency and replace fossil fuel heating⁶⁵
- a £50 million Social Housing Decarbonisation Fund to pilot innovative energy efficiency retrofit in social housing
- to extend the Energy Company Obligation to 2026
- to explore the possibility of introducing mandatory disclosure requirements for mortgage lenders on the energy performance of homes on which they lend and setting voluntary improvement targets.

While these plans have been largely welcomed, they have also been criticised for being insufficient to address the scale of the decarbonisation challenge and for failing to provide the much-needed "long term, fully funded strategy that sets out comprehensive policies, regulation and incentives to reach a net zero aligned building stock in the UK".¹¹ Many of the fixed-term solutions and incentives aimed at the building sector have been largely unsuccessful. For example, the Green Homes Grant was closed at the end of March 2021, after only six months, despite most of the earmarked grant funding remaining unspent.^{66,67} It is also widely believed that upgrading existing buildings to EPC rating C is unlikely to be sufficient to decarbonise the buildings sector to a level that is compatible with the UK's net zero by 2050 target if natural gas continues to be used for heating. A recent high-profile report by the International Energy Agency argues that the sale of new gas boilers should be stopped in 2025, several years ahead of the current UK plans, for the world to achieve net-zero emissions by the middle of this century.^{68,69}

There is a clear need to accelerate alternative sources of heating, and the government has committed to expanding heat pumps but also is investigating the use of hydrogen, including plans to support a large village hydrogen heating trial by the mid-2020s and a possible pilot hydrogen town before the end of the decade. Both technologies require infrastructure investment and disruption of homes so will need support to be deployed. Hydrogen is also likely to be more expensive and less efficient, and has a lower technology readiness level than heat pumps,⁷⁰ so the CCC has suggested it may have a role but is unlikely to provide widespread low carbon heating.⁷¹

The forthcoming Heat and Buildings Strategy should provide additional clarity and guidance from government as to how to accelerate action in this sector.

What is business doing?

Many businesses with activities relating to a building's life cycle and value chain have made commitments. There are a number of sector-level initiatives in the UK, including the Royal Institute of British Architects (RIBA) 2030 Climate Challenge,⁷² which helps architects meet net zero (or

better) whole-life carbon for new and retrofitted buildings by 2030, the Institution of Civil Engineers Shaping Zero project,⁷³ the Construction Leadership Council's (incorporating the Green Construction Board) Net Zero Carbon Industry Initiative⁷⁴ and the UK Green Building Council's (UK GBC's) Advancing Net Zero campaign,⁷⁵ which includes the net zero carbon buildings framework.⁷⁵ Collectively, such initiatives will ensure the whole sector makes good progress towards net zero.

Businesses are also taking action to commit to occupy, as well as construct, buildings with high energy efficiency, low carbon heating and low embodied carbon. So far, 42 companies in the UK, including major developers, real estate or property managers and investors, have signed up to the World Green Building Council's Net Zero Carbon Buildings Commitment.⁷⁶ This commitment requires corporate buildings to have net zero operational emissions and ideally include embodied carbon disclosure. It also provides a pathway into the EP100 initiative,⁷⁷ which commits businesses to "doubling their energy productivity, rolling out energy management systems, or achieving net zero carbon buildings (all within set timeframes)." The number of UK companies included in these three commitments is six, four and 23 respectively.⁷⁸ There are clear financial, as well as reputational and other, opportunities from these businesses moving quickly to net zero. In a recent survey, 37 per cent of people said they would be willing to pay more for a 'zero carbon' new home.⁷⁹

Business is also involved in developing key new solutions that can enable a less carbon intensive built environment. From insulation products to smart energy management systems, there is ongoing innovation and new product development in this sector. One key example is LED lighting – converting home lighting to LED combined with smart controls can yield major savings in energy and carbon and ensure light is provided only where it is needed. However, lighting is not covered by current energy efficiency systems such as the Green Homes Grant Scheme, potentially missing an opportunity to further accelerate action.

The number of businesses within the sector setting climate targets is also increasing. A total of 20 built environment businesses have committed to set SBTs,¹⁷ including eight construction and engineering, one construction materials, three homebuilding and eight real estate businesses. Of these, eight have already set 1.5-aligned targets, including Barratt Developments (see Annex B: Case studies) and a further three have 2-degree-aligned targets. Some commercial property businesses are also setting their own net zero targets, which include emissions from use of buildings. For example, 63 businesses have committed to net zero by 2040, convened through the British Retail Consortium.⁸⁰ This includes decarbonising stores by 2030, deliveries by 2035 and products by 2040.

New approaches to agriculture and land use

The agriculture and land use sectors account for roughly 7 per cent of all UK emissions.¹¹ Unlike the other sectors covered in this report, agriculture and land use sectors already simultaneously contribute to greenhouse gas emissions and provide a major store of carbon dioxide emissions.

Our approach to land use has huge implications, not only for climate but also for broader challenges affecting nature, environment and biodiversity, as well as human wellbeing and adaptation to climate change. Addressing environmental degradation and biodiversity loss through changing land use practices and minimising the environmental impacts of agriculture are increasingly regarded as crucial to protecting the planet, not just from global warming as a result of climate change, but also other harmful effects of human activity on wildlife and water and air quality. Any practices in this sector must be viewed through that wider lens.

Emissions from the agriculture and land use sectors have proven to be particularly difficult to cut, partly due to the characteristics of the sector and the sources of the emissions, and partly as the result of limited policy interventions and financial support.³ So far, efforts to reduce emissions from agriculture and land use sectors have been dominated by a voluntary approach. This has centred on supplying advice and information, while afforestation has relied heavily on funding from agri-environmental schemes covered until recently under the EU's Common Agricultural Policy (CAP).³ Agriculture forestry and fisheries are a devolved policy area, so UK wide policies are supplemented by devolved action plans, targets and policies.

During the period of 2008 to 2018, GHG emissions from agriculture increased by 2 per cent, while the scale of carbon stored due to forestry and other land use practices increased by 15 per cent. The combined effect of these two trends is that the overall emissions from agriculture and land use have remained largely unchanged, decreasing by just 2 per cent.³

In its recommendations for the Sixth Carbon Budget, the CCC¹³ urges the UK government to:

- ensure that, following Brexit, the post-CAP framework promotes transformational land-use change and measures for deep emissions reductions
- end rotational burning of peat by the end of 2021
- set up and support Environmental Land Management pilots by 2021, to have an Environmental Land Management scheme up and running by 2024
- increase annual tree-planting rates to at least 30,000 hectares per year by the mid-2020s and 50,000 hectares per year by 2035
- implement a trading or auctioning system to deliver private sector investment in tree planting by 2024
- invest in innovation, research and development (R&D), and testing and piloting of options to deliver sustainable agricultural productivity improvements in crops and livestock,

including low carbon technologies and options for low carbon agricultural machinery, and to deliver productivity improvements in trees and energy crops

- develop and implement policies to encourage a shift to less carbon-intensive diets, starting with the public sector.

Some positive policy developments took place in 2020. The UK Agriculture Act, which passed into law in November 2020, includes a new plan for sustainable farming and a new Environmental Land Management system, which will pay farmers to improve 'public goods' with better air and water quality, improved soil and thriving wildlife.⁸¹ Productivity grants will be made available for farmers to invest in modern technology to make their businesses more efficient and more profitable, while reducing their emissions.⁷

Some positive announcements were also made as part of the Prime Minister's Ten Point Plan for a "green industrial revolution"⁷ and Covid-19 economic recovery spending.²⁹ These include:

- a commitment to plant 75,000 acres (around 30,000 hectares) of trees every year by 2025, supported by a pledge of up to £80 million in funding for nature-based investments, which also include peatland restoration, via the Green Recovery Challenge Fund in 2020–21
- launch of the Green Jobs Challenge Fund of £80 million to help conservation organisations and their suppliers create and safeguard up to 5,000 jobs
- launch of the Green Jobs Taskforce, which is to work in partnership with business, skills providers and unions to develop plans for the future of green jobs in the UK
- an announcement to start the process for designating new National Parks and Areas of Outstanding Natural Beauty
- £5.2 billion for a six-year capital investment programme for flood and coastal defences
- an announcement to initiate ten long-term Landscape Recovery projects during 2022–24
- a commitment to launch Environmental Land Management pilots in 2021, as per the CCC's¹³ recommendation.

Achieving the required emissions reductions in the land use sector will require action across all segments of society. It will be necessary to accelerate afforestation and peatland restoration, shift to healthier diets, reduce food waste and transition to low carbon farming practice. However, it will be essential for large-scale initiatives such as tree planting to be delivered in a way that does not risk biodiversity loss, damage peatlands or imperil rare species and habitats.⁸²

The existing plans and recent announcements have been criticised for being inadequate to achieve the scale of change that is needed, largely due to lack of detailed strategy and insufficient funding.¹¹ Finance is likely to remain a challenge in the decarbonisation of agriculture and land use because nature-based solutions (measures to protect, restore and manage natural and semi-natural ecosystems to improve human wellbeing, to capture carbon emissions and to protect biodiversity) do not easily lend themselves to revenue-based business models, meaning that new pricing mechanisms and incentives are needed to achieve substantial progress.

More details on forthcoming policies and funding plans are expected to be announced in the England Tree Strategy (2021), the Peatland Strategy (2021), the National Food Strategy and White Paper (2021), and the Nature Strategy for England (2022). While ensuring these are all robust and the implementations interconnected, there is an opportunity for the government to build on the Agriculture Act and Environment Bill to provide a comprehensive decarbonisation strategy for the sector, backed with a thorough, funded action plan.

What is business doing?

Much of this sector is large and diverse, while farm businesses vary greatly in size. As a result, the actions of individual businesses will be relatively small compared to the total level of commitment and actions needed. For example, there are around 212,000 agricultural holdings in the UK, almost half of which are under 20 hectares in size.⁸³ However, even here notable progress is being made.

The National Farmers Union (NFU) has set an aspiration to achieve net zero by 2040,^{84,85} working with its 55,000 members in England and Wales to achieve this. Planned action will centre on improving farming's productive efficiency (for example, through increasing uptake of anaerobic digestion and using controlled release fertilisers and inhibitors to increase efficient use of nitrogen and thereby to reduce emissions), and storing and sequestering carbon (for example, through improved soil management and enlarged hedgerows).

Many food and drink producers, several of which have committed to set SBTs, are seeking to work with their supply chains to reduce emissions. For example, in identifying that 90 per cent of its emissions relate to its supply chain, Coca-Cola European Partners⁸⁶ has committed to support its supply chain to set their own SBTs by 2023, use 100 per cent renewable electricity across their operations by 2023 and share their carbon footprint data with them.

On a sectoral level, the Food and Drink Federation, which represents over 800 food and drink companies operating in the UK, is aiming to achieve net zero by 2050^{87} through collaboration (for example, by facilitating knowledge sharing on technology innovations and implementation), supporting policy development and ensuring appropriate financial support is in place. Meanwhile, English water companies, which are collectively responsible for around 1 per cent of total GHG emissions in the country,⁴⁸ have set a sector-wide target of net zero operational emissions by 2030. They have also committed to planting 11 million trees by 2030.⁸⁸

In summary

This briefing examined the progress that has been made towards reducing emissions in four key sectors: **power and energy, built environment, road transport, and agriculture and land use**. In each, this briefing examined the landscape of policy and business leadership.

The scale of **action by UK businesses is impressive**. Since the start of 2020, there has been a fourfold increase in the number of UK businesses committing to the Science Based Targets initiative, and there are numerous further examples of large, medium and small businesses committing to reduce emissions individually or as part of sector-led plans. However, this analysis shows that the current level of ambition and commitment from business is not yet enough to deliver a resilient, net zero future. The UK hosting COP26 provides an opportunity to drive further business commitments and action in the short term, and to accelerate the development of sector roadmaps to deliver significant emissions reduction over the long term.

With the notable exception of power, **climate action remains too slow**, with most sectors showing only small reductions and still contributing significant emissions. This briefing highlights that in some sectors like power, change is well underway, supported by effective business action, and the main need is to step up the pace and ambition of action. In transport, business and policy ambition are coming together to drive change but there is further to go on both fronts as progress to date has been slow. In the buildings sector, despite significant business action and a wide range of initiatives the overall pace of change is slow, with limited and unstable policy support. Finally, in agriculture there are strong examples of leadership, but business has not come together as a force for systemic change, and promising policy ambitions need to be urgently transformed into action.

Next steps

The insights from this briefing will be used by CISL's UK Corporate Leaders Group to provide recommendations for how to bridge the gap between where these sectors are now and where they need to get to.

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