

Written evidence submitted by Energy UK (PEG0073)

Introduction

Energy UK is the trade association for the energy industry with over 100 members spanning every aspect of the energy sector – from established FTSE 100 companies right through to new, growing suppliers and generators, which now make up over half of our membership. We represent the diverse nature of the UK's energy industry with our members delivering over 80% of both the UK's power generation and energy supply for the 28 million UK homes as well as businesses. The energy industry invests over £13bn annually, delivers £31bn in gross value added on top of the £95bn in economic activity through its supply chain and interaction with other sectors, and supports 911,000 jobs in every corner of the country.

Energy UK welcomes the opportunity to respond to the BEIS Select Committee's Super Inquiry and this first call for evidence on the Post-pandemic economic growth. The Energy sector can play a key role in ensuring that the post-pandemic recovery delivers both in terms of economic growth and decarbonisation in line with the UK's net-zero target by 2050. We would be happy to also provide oral evidence in the near future.

Executive summary

Government's guiding principles should support economic growth, including jobs, climate targets and long term opportunities in line with the UK's net zero commitment by 2050. The energy sector will continue to play a key role in our decarbonisation journey and can support the economy and other sectors by developing new low carbon industries.

With investment of £50 billion per annum required to cover not just power generation and housing but all sectors of the economy in order to reach net zero by 2050, it is essential that Government maintain the policy frameworks that have been successful in bringing forward investment in low carbon technologies, and develop new ones to tackle other areas of the economy such as heat, where we recommend that Government and Industry work together to develop a Heat Sector Deal. Energy UK welcomes Government's recent announcement for a £2bn Green Homes Grant, which we see as a first step to relaunch the market for buildings retrofit. The longer term plan should be a government-backed, national energy efficiency programme to deliver on the £6bn committed by this Government in their Manifesto. Investing now in the electric vehicle (EV) supply chain offers a great opportunity to support and enhance the automotive industry and to really launch the switch to EVs.

The best way to deliver cost-effective decarbonisation of the UK economy is to ensure markets are competitive and open to any eligible technology that can contribute to net zero targets, so as to stimulate competition and innovation at lowest cost. Competitive auctioning under the CfD scheme must be available to all relevant low-carbon technologies to support economic growth and the transition to net zero at lowest cost. Cost effective financial products and services, regulations and standards are also needed to driver change in markets and demand.

Government needs to set clear policy initiatives that give direction to both markets and customers.

- Establish a Heat Sector Deal in partnership with industry, including a target of installing one million low carbon heat pumps by 2025 to stimulate an early market response.
- Deliver the Future Homes Standard by 2024 and create incentives to maximise the local content of materials used in retrofit.
- Build on the Green Homes Grant and develop a government-backed, national energy efficiency programme to deliver on the £6bn committed by this Government to retrofit buildings.
- Development of a smart flexible energy system is vital, smart meters should become the default option with customers having to opt-out.

- Link post-COVID support packages to businesses' willingness to deploy energy efficiency measures identified under the Energy Savings Opportunity Scheme (ESOS).
- Bring forward the phase-out date for petrol and diesel vehicles to 2030 as a clear indication to consumers that the market is moving to electric vehicles.
- Develop a local and national plan and mechanisms to coordinate efficient investment in public EV charge point infrastructure across the UK, where the market will not deliver.
- Build on the success of the CfD scheme by taking forward an ambitious programme and publishing an overall procurement strategy, at least out to 2030.
- Develop appropriate frameworks and business models for efficient investment in flexibility systems and strategic large-scale projects, such as CCUS, low carbon hydrogen and new nuclear where they deliver lowest system costs for customers.
- Commit to publish a UK low carbon hydrogen strategy by end 2020 that delivers an established low carbon hydrogen industry in the UK by 2030.
- Accelerate the creation of commercial and regulatory frameworks for CCUS to provide confidence for investors to support projects in the UK's five leading industrial clusters.
- Develop market mechanisms that value flexibility and support the energy transition in areas such as EVs, low carbon heating and low carbon generation.
- Provide early clarity on a chosen mechanism to deliver a strong carbon price from 1st January 2021 in line with the UK's climate ambition to promote low carbon development.
- Government needs to lead by example by decarbonising public sectors buildings and transport fleets.

By focussing our recovery on delivering net zero, Government can create a vision and pathway for job creation needed for the economic recovery and the transition to 2050. Hundreds of thousands of jobs can be created directly in low carbon industries and indirectly in their associated supply chains by developing them domestically. The energy industry needs to continue its efforts in recruiting a diverse workforce from all backgrounds to get the wide range of skills required to support a green recovery. Government needs to put training programmes in place geared towards supporting the expansion of the green economy and review the Apprenticeship levy for employers to make better use of it and work with Industry to develop green apprenticeship standards.

Government and businesses will also need to incorporate key learnings from COVID-19:

- Bring in learnings from COVID-19 on system balancing and the role of flexibility into the Energy White Paper.
- Create mechanisms that support a level playing field and sufficient incentives for investment in flexible power solutions to minimise whole system costs for consumers.
- Develop new low carbon industries and expertise and increase the multiplier effect by creating the associated supply chain domestically.

The UK has an unprecedented opportunity to develop existing and new low carbon industries to support the economic growth and decarbonise domestically but also to develop and export their expertise worldwide:

- Identify where it is possible and valuable for the UK to have some of the supply chain in the UK and make the UK an attractive place for international businesses to invest.
- Support the development of large energy infrastructure projects across the country to create new low carbon industries, jobs and help level up the economy.

- Develop or extend funding mechanisms to incentivise energy infrastructure, technology development and innovation now that the UK has left the EU and no longer has access to EU funding structures.

Where Government can be most effective is in setting out ambition and frameworks, and then allowing private markets and local actors to deliver solutions that best fit customers' needs.

- Develop a mechanism to make it easier for local authorities to benefit from funding of decentralised energy projects.
- Provide funding for a trial of Local Area Energy Planning (LAEP) to improve access to funding for feasibility and development work for local authority led low carbon projects.
- Provide incentives to onshore production through active assistance and by supporting the development of the skills base for production through Local Industrial Strategies.
- Local authorities should develop Clean Air Zones and smart city strategies to encourage in decarbonising road transport and in cycling and walking infrastructure.

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What core/guiding principles should the Government adopt/prioritise in its recovery package, and why?

- Government's guiding principles must support economic growth, including jobs, climate targets and long term opportunities in line with the UK's net zero commitment by 2050.
- The energy sector will continue to play a key role in our decarbonisation journey and can support other sectors by developing new low carbon industries.

Government policies and actions should support economic growth, including jobs, climate targets and long term opportunities. It should seek to do so using technology neutral market based mechanisms where ever possible. The UK is a perfect example of how compatible economic growth and decarbonisation are. According to the Committee on Climate Change (CCC), the UK territorial emissions fell by 28% between 2008 and 2018, while the economy grew by 14%¹. The net-zero by 2050 commitment passed into law in June 2019 provides the direction of travel and this economic recovery provides an opportunity to accelerate the pace by aligning today's recovery and job creation plans with tomorrow's vision.

Energy UK's report, in collaboration with PwC, "[Rebuilding the economy: fairer, cleaner, more resilient](#)", also integrates the objective of fairness alongside economic growth and decarbonisation. There is a need to support those most affected by the COVID-19 crisis by providing avenues for job upskilling but also by supporting the most vulnerable in making their homes more energy efficient and therefore

¹ Reducing UK emissions: 2020 progress report to Parliament

cheaper to run. Businesses that want to decarbonise to make themselves more resilient should also be supported. Government's ambition to level up the economy aligns well with this objective of fairness.

Finally, as we know from history, recessions can be a time of reconstruction and reinvention. We see long term opportunities in building new low carbon industries, service companies and supply chains. The UK is already a leader in offshore wind, but more will be needed to support the recovery, so why not bring the supply chain and jobs to these communities. Switching to electric vehicles (EVs) and low carbon heat also requires investment in infrastructure, training and creation of new jobs. Low carbon hydrogen and carbon, capture, use and storage (CCUS) have both been identified as crucial to the transition to net zero; the UK needs to turn these opportunities into reality by supporting initial projects through development funding to grow the industry and put in place investable business models.

Done the right way, the economic recovery and the energy transition will support each other and avoid a duplication of costs and retrofiting later.

How can the Government borrow and/or invest to help the UK deliver on these principles?

- Investment of £50 billion per annum² is required to cover not just power generation and housing but all sectors of the economy in order to reach net zero by 2050.
- The CfD framework has been a successful tool for delivering investment and bringing forward low cost, low-carbon generation.
- A Heat Sector deal, as a public-private partnership, which among other things would allow one million heat pumps to be installed by 2025.
- A government-backed, national energy efficiency programme needs to be developed now to deliver on the £6bn committed by this Government to retrofit buildings.
- Investing now in the EV supply chain offers a great opportunity to support and enhance the automotive industry.
- Provide appropriate frameworks to support CCUS, low carbon hydrogen production and new nuclear development where they deliver lowest system costs for customers.
- Government needs to put training programmes in place geared towards supporting the expansion of the green economy.
- Government needs to borrow now at the lowest available cost to secure funding and by extension make borrowing accessible and affordable to customers and businesses.

In line with the principles outlined previously, Government will want to focus its financial support where it can deliver jobs, deep decarbonisation and long lasting economic opportunities across the country.

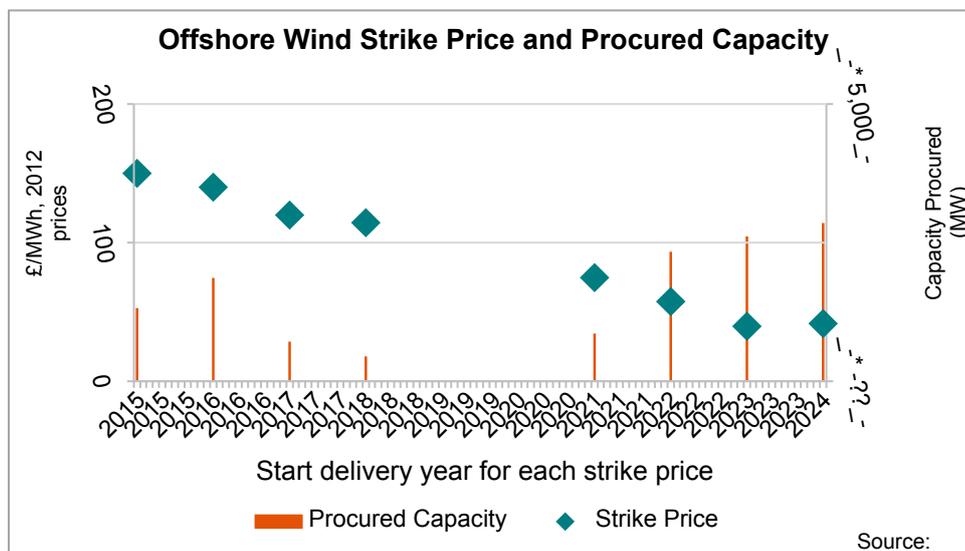
The Committee on Climate Change estimates that investment of £50 billion per annum is required to cover not just power generation and housing but all sectors of the economy in order to reach net zero by 2050. Investment on this scale could be transformational in creating a truly low carbon economy based on sustainable economic and job growth, helping build a fairer, more resilient economy. The energy sector already invests £13bn per annum³ towards creating a smarter, more flexible energy system that supports our transition to net zero. Securing investment in the capacity needed to continue to decarbonise the power sector while maintaining the UK's security of supply remains a priority.

The Electricity Market Reform (EMR) has supported the transition to date, with promising results highlighted by impressive cost reductions in recent Contracts for Difference (CfD) and Capacity Market (CM) auctions. However, we must continue to ensure that the regulatory and market frameworks harness the opportunities offered by a range of low carbon and flexible technologies to ensure that decarbonisation is delivered at least cost.

² Energy in the UK and PwC report: Rebuilding the economy: fairer, cleaner, more resilient

³ BEIS - UK energy in brief 2019

The CfD framework has been a successful tool for delivering investment and bringing forward low cost, low-carbon generation. This joint Industry and Government effort has helped to deliver the cost reduction targets set for offshore wind (£100/MWh) four years ahead of target and the last auction saw clearing prices well below expectations at £39.65/MWh (2012 prices).



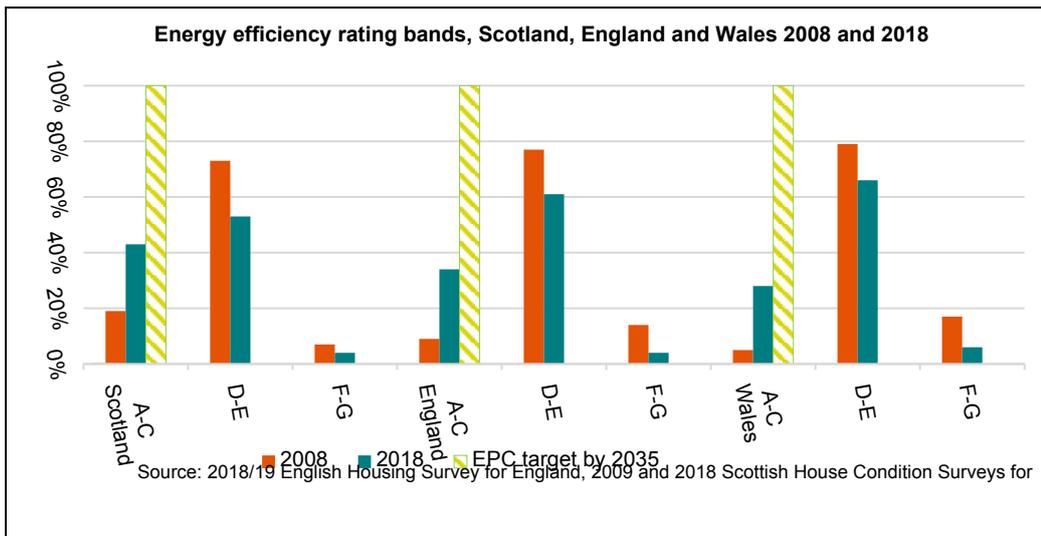
All this work will need to continue to be supported by a robust carbon pricing framework. The uncertainty created by the UK leaving the EU means that there is limited visibility of the carbon price after 2020. Government needs to provide urgent clarity on its chosen mechanism to deliver a strong carbon price from 1 January 2021 in line with the UK's climate ambition and to promote low carbon development. While all sectors do not pay a carbon price, the level of that price helps to understand the cost of carbon to the economy and we believe that other sectors, such as greenhouse gas removal, heat and transport will also need to integrate a carbon price in the near future.

The decarbonisation of heat remains one of the main challenges of our journey to net-zero. Energy UK has developed a proposal for a Heat Sector deal, as a public-private partnership, which would provide visibility for private investors and supply chain, while delivering on jobs and net-zero. Within that we note the need for ambition on targets including aiming to see one million heat pumps installed by 2025. Government should also provide local authorities with funding to develop regional plans for decarbonising heat, either through Local Energy Planning (LAEP) or through large scale trials.

Government recently announced a £2bn Green Homes Grant providing at least £2 for every £1 towards energy efficiency for homeowners and landlords, with half of the funds going to the most vulnerable [up to £5,000 per household / up to £10,000 for lowest income households]. While this is welcome as a first step to relaunch the market and provide jobs in the short term, we will still need a longer term plan. The Government has already committed over £6bn towards the retrofitting of buildings to improve their energy efficiency. This needs to be actioned this year in order to deliver within this Parliamentary term. This would be the start of what Energy UK calls for, a government-backed, national energy efficiency programme. Every £1 spent on energy efficiency could increase GDP by £3.20⁴.

The graph below shows the challenge ahead of us, and the need for funding and further action. To stimulate greater demand, government needs to implement progressive tightening of regulatory minimum standards. For example, restricting the sale or rental of properties below an Energy Performance Certificate (EPC) C standard from 2030 (or no later than 2035) would provide a long-term credible signal for homeowners and landlords to take action and catalyse a market response.

⁴ Parliamentary Briefing "Future Energy Efficiency Policy" (2017)



There is also a need for government to work with industry to develop funding models for large scale low carbon infrastructure projects at lowest cost to customers. Decarbonisation of the power sector requires a balanced generation mix including firm low carbon power from sources such as new nuclear and biomass – alongside a high level of renewables, increased system flexibility, storage, and new technology solutions, such as low carbon hydrogen and CCUS. In the case of low carbon hydrogen, as has been seen in other countries, the UK needs a hydrogen strategy to deliver a hydrogen market framework, alongside incentives that stimulate demand for and reward production of hydrogen, to enable investment and deliver a low carbon hydrogen industry by 2030.

Government also needs to assess how best to support sectors, such as the automotive industry, which have been struggling during the crisis and also need to redefine their business models in order to make the transition to net-zero. Investing now in the EV supply chain offers a great opportunity to support and enhance the automotive industry, a sector that already has the expertise in exporting worldwide.

One crucial aspect of the recovery is to get people back into work. Where it is not possible for workers to go back to their previous job, solutions to move to other types of jobs and other sectors will be needed. Government will need to invest in training and skilling the labour force through training programmes designed in collaboration with businesses and geared towards supporting the expansion of the green economy.

The UK is currently experiencing very low interest rates so Government should seek to secure some funding now to borrow at the lowest available cost and by extension make borrowing accessible and affordable to those able to pay. Government will also need to consider reviving the concept of a green investment bank, alongside developing green financial and fiscal products such as green mortgages and loans.

What measures and support will businesses need to rebuild consumer confidence and stimulate growth that is sustainable, both economically and environmentally?

- Government needs to set clear policy initiatives that give direction to both markets and customers.
- Bring forward the phase-out date for ICE vehicles to 2030 as a clear indication to consumers that the market is moving to electric vehicles.
- Deliver the Future Homes Standard by 2024 and create incentives to maximise the local content of materials used in retrofit.

- Make smart meters the default option in non-domestic premises and new build homes. Government must also give stronger signals to domestic customers on the importance of accepting a smart meter.
- Link post-COVID support packages to businesses' willingness to deploy energy efficiency measures identified under the Energy Savings Opportunity Scheme (ESOS).
- Government needs to lead by example by decarbonising public sectors buildings and transport fleets.

Providing a clear vision for the future will be key to supporting businesses and rebuilding consumer confidence.

Government needs to set clear policy initiatives that give direction to both markets and customers. The transformation of the white goods market is a good example of how policies and industry standards inform the supply side of the market which automatically influences the demand side. Looking at the electrification of light transport, drivers should choose to invest in an EV because this is the most appealing product on the market in the knowledge that Government's policy is to move the market away from internal combustion engine (ICE) vehicles. Government provides clear guidance, the market adapts and consumers follow the trend. We would therefore encourage Government to bring forward the phase-out date for ICE vehicles to 2030. This is the clearest possible indication a market can get.

Industries taking their own initiatives and driving their own transformation through developing standards also gives confidence to consumers that they are buying a product they will not need to replace a few years down the line. Strong commitments from Government and the building industry towards low carbon homes would make all new builds fit for the future, avoiding having to retrofit homes at a later date. We recommend Government deliver the Future Homes Standard by 2024 and create incentives to maximise the local content of materials used in retrofit.

Government should work with industry and consumers so that a smart meter is the default option, and introduce regulatory levers which signal customers' duty to accept a smart meter. Non-domestic premises and new build homes are two obvious areas where strengthening regulation should be considered. Reviewing time-of-use signals to make them more dynamic and attractive will also help consumers see the benefits of having a smart meter.

Where Government sees it necessary to financially support businesses, it should link post-COVID support packages to their willingness to deploy energy efficiency measures identified under the Energy Savings Opportunity Scheme (ESOS).

Whether it is making our homes low carbon and smart or encouraging people to switch to EVs, strong communication campaigns will be needed to raise awareness among consumers that the market is changing and they need to follow the trend.

Finally, it will be important for Government to lead by example to show that the efforts demanded by the transition to net zero apply to all and leads to real benefits. Any new/refurbishment of public sector buildings should meet net zero aspirations as most will still be in use in 2050. Government should also commit to zero carbon transport of any new public sector vehicles purchases.

Whether the government should give a higher priority to environmental goals in future support?

- Preserve the improvement in air quality by incentivising the switch to EVs and low carbon heat, including a time-limited increase in the plug-in car grant to help bring forward EV purchases and setting targets for uptake of heat pumps.
- Establish a replacement UK process for BAT determination that can underpin the right environmental permitting regime to support a green recovery.
- UK Government and devolved administrations to work together to ensure a level of consistency on environmental policies.

One of the positives from the lockdown has undeniably be cleaner air and reduced noise pollution. We can preserve some of this by acting now to ensure that drivers switch from conventional petrol and diesel

vehicles to electric vehicles (EVs). To support the recovery, a time-limited increase in the plug-in car grant could help bring forward EV purchases. One way of doing this would be to increase the grant to £5,000, similar to what the French and German Governments have done, and then reduce it by £500 per quarter until it reaches its current level in a year's time. Government should also consider extending the current 0% benefit in kind rate for company car tax by an additional year. This tax is a very strong incentive covering a large section of the vehicle market however due to the COVID-19 pandemic will not have had the same impact this year as it would otherwise have had. The concept of a zero-emission scrappage scheme should also be explored to incentivise the switch. These measures would boost EV production, protect automotive jobs and provide an opportunity for UK businesses to become leaders in battery technology and EV infrastructure.

The ongoing transition to cleaner industries, transports and infrastructure encompasses more than just decarbonisation and the targets enshrined by the Climate Change Act 2008 to reduce greenhouse gas (GHG) emissions. It also has a strong positive effect on pollution and air quality. 32,000 deaths per year are caused by long-term exposure to man-made air pollution – which disproportionately impacts lower income communities⁵.

The energy sector has again made major strides in cutting its contribution of other emissions – such as sulphur dioxide (SO₂), nitrogen oxides (NO_x) and particulate matter (PM) which have very serious consequences for people's health as well as the environment. Between 2000 and 2018, we achieved a 97% drop in SO₂ emissions, alongside a 76% cut in NO_x emissions and reductions in PM ranging from 84-91%⁶. But we still have work to do as power generation remains the one of the biggest sources of SO₂, alongside domestic combustion and refineries.

For industrial installations, including power stations, the process of determining Best Available Techniques (BAT) is key to environmental permitting. Once the UK leaves the EU, access to the development of Best Available Techniques Reference Documents (BREFs - also known as the Seville Process) will be lost, so it is vital for future regulatory clarity that Defra establishes as a matter of urgency a replacement UK process for BAT determination that can underpin the right environmental permitting regime to support a green recovery. This will be particularly important for CCUS, which currently does not have well-developed BAT criteria. Energy UK would also welcome efforts from the UK Government and devolved administrations to work together to ensure a level of consistency on environmental policies and enforcement across the UK after the transition period ends.

Environmental goals play a crucial role in bringing our environment back to a healthier state and by extension society as a whole. They also falls under the net-zero objective principle. If we are to meet our net-zero target by 2050, there need to be a transformational approach to ways of life and the value that is put on the environment. Clean and healthy environment, air and water are common goods that need to be protected and enhanced.

Whether the Government should prioritise certain sectors within its recovery package, and if so, what criteria should it use when making such decisions? What conditions, if any, should it attach to future support?

- Government should prioritise sectors and industries that have their place in a low carbon economy and society.
- Build on the success of the CfD scheme by taking forward an ambitious programme and publishing an overall procurement strategy, at least out to 2030.
- Review carbon policies across all sectors to give a clear direction to markets and encourage low carbon products and services.

⁵ Faraday Institution

⁶ National Atmospheric Emissions Inventory

- Develop funding models for efficient investment in flexibility systems and strategic large-scale projects, such as CCUS, low carbon hydrogen and new nuclear where they deliver lowest system costs for customers.
- Prioritise digitalisation of energy network infrastructure to enable more accurate public data on the evolving needs of the system and examine where anticipatory investment in physical assets might be needed.
- Develop market mechanisms that value flexibility and support the energy transition in areas such as EVs, low carbon heating and low carbon generation.
- Develop a local and national plan and mechanisms to coordinate efficient investment in public charge point infrastructure across the UK, where the market will not deliver.
- Provide grants for large-scale low carbon heat pathfinder projects in homes and businesses across the UK, and in targeted regions to aid “levelling up”.
- Establish a Heat Sector Deal, including targets for installing over one million low carbon heating systems by 2025, to stimulate an early market response.
- Accelerate the creation of commercial and regulatory frameworks for CCUS to provide confidence for investors to support projects in the UK’s five leading industrial clusters.
- Commit to a UK low carbon hydrogen strategy to have established a low carbon hydrogen industry in the UK by 2030.

The energy sector is central to the functioning of the economy and society, and leads the way on decarbonisation. In line with the principles presented earlier in this document, Government should ensure that economic growth and deep decarbonisation are the pillars of the economic recovery and as such should ensure the energy sector is provided with all the support it needs to deliver on both.

To reach net-zero by 2050, power demand is expected to at least double from the current c. 300TWh of annual consumption⁷. The CCC estimated that power generation capacity build rates in the range of 9 and 12 GW per annum would be needed, depending on the final technology mix and the degree of electrification of transport and heat. In comparison, build rates over the past five years have been on average 4 GW⁸. To support the transition to net zero, we will need to maintain a mix of generation capacity, including gas power stations that will continue to play a key role in providing flexible generation, while we deploy new low carbon generation and upgrade our networks.

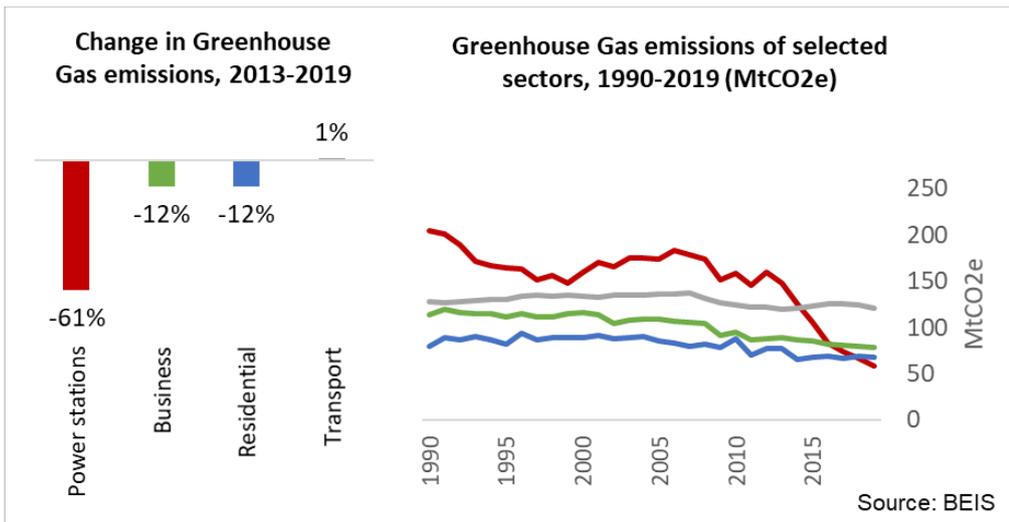
Government has already committed to 40GW of offshore wind by 2030, four times more than what we currently have, with estimates for 2050 being much higher. In our latest report, we advise Government to build on the success of the CfD scheme by taking forward an ambitious programme and publishing an overall procurement strategy, at least out to 2030. Government also needs to work with industry to agree consistent, sustainable funding models for efficient investment in strategic large-scale projects, such as low carbon hydrogen, CCUS and new nuclear which could benefit from cost savings through replication.

Alongside the efforts to deploy low carbon technologies, there is a need to ensure that electricity and gas networks are able to cope with the transformation the energy system is going through. This means that we need to prioritise digitalisation of energy network infrastructure to enable more accurate public data on the evolving needs of the system and examine where anticipatory investment in physical assets might be needed. Market mechanisms that value flexibility and support the energy transition in areas such as EVs, low carbon heating and low carbon generation also need to be developed.

Overall, Government should prioritise sectors and industries that have their place in a low carbon economy and society. Where these sectors are not yet fit for tomorrow’s world then support should be commensurate to their willingness to evolve their business models and to their efforts to make their operations net-zero compatible.

⁷ CCC - Net Zero – Technical Report

⁸ Energy UK analysis of LCP’s data



Transport and heat remain high emitters of greenhouse gases (GHG) and therefore should be strongly incentivised to decarbonise. Regarding light road transport, we recommend that any financial support must incentivise zero emission vehicle purchases (rather than ICE vehicles) e.g. through a time limited increase to the Plug-in Car Grant and/or a zero-emission scrappage scheme. Government should also implement the EV Energy Taskforce’s recommendation to develop a local and national plan and mechanisms to coordinate efficient investment in public charge point infrastructure across the UK, where the market will not deliver.

For the decarbonisation of heat, Government should provide grants for large-scale low carbon heat pathfinder projects in homes and businesses across the UK, and in targeted regions to aid “levelling up”, inclusive of heat pumps, hybrid heat systems, district heat networks, hydrogen boilers, solar thermal and waste water recovery. Government should also work with industry to establish a Heat Sector Deal, including a target of installing one million low carbon heating systems by 2025 to stimulate an early market response.

The UK is developing technologies and fuels that are net-zero compatible (renewable and low carbon energy, EVs, etc.) but also technologies that allow decarbonisation (greenhouse gas capture and removal). These removal technologies will allow some industries to continue to operate even though they emit GHGs, by preventing these emissions from entering the atmosphere. However, these industries should still play their role in reducing their carbon footprint by taking steps in other areas of their operation: energy efficiency, water efficiency.

Industrial clusters will need to decarbonise. That will require deploying CCUS and low carbon hydrogen production, alongside other technologies to allow them be carbon neutral. We need to accelerate the creation of commercial and regulatory frameworks for CCUS to provide sufficient visibility and confidence for investors to support projects in the UK’s five leading industrial clusters – creating a credible pathway to decarbonisation. Government also needs to commit to a UK low carbon hydrogen strategy. Pathfinder auctions should be held this year for both green and blue hydrogen production, growing year-on-year, in order to develop large-scale plants in the UK by the mid-2020s and have established a low carbon hydrogen industry in the UK by 2030.

All this work will need to be supported by robust carbon policies that are consistent with net zero, whether a carbon price, standards, fiscal signals and regulations to give a clear direction to markets and encourage low carbon products and services.

How can the Government best retain key skills and reskill and upskill the UK workforce to support the recovery and sustainable growth?

- By committing to net zero, Government creates a vision and pathway for job creation needed for the economic recovery and the transition to 2050.
- Hundreds of thousands of jobs can be created directly in low carbon industries and indirectly in their associated supply chains by developing them domestically.
- The energy industry needs to continue its efforts in recruiting a diverse workforce from all backgrounds to get the wide range of skills required to support a green recovery.

Government will need to work with industry to develop training and reskilling programmes across the country. This will require a mapping and matching exercise of current skills and jobs versus future skills and jobs in a low carbon world to identify gaps that need to be filled. This can be achieved through several channels:

- Increasing support of STEM activities in schools to encourage school leavers to enter into careers in the energy and energy management sectors.
- Government could extend the period of time employers have to use their Apprentice Levy, especially given that Covid-19 has impacted on Apprenticeship delivery and on the recruitment and selection of new apprentices. This could provide industry incentives to recruit apprentices and to increase recruitment numbers for subsequent years.
- Encourage, support and prioritise employer development groups who wish to develop new 'green' Apprenticeship standards and increase the levy funding for green Apprenticeships.

By committing to its ambition of reaching net zero by 2050, Government can create a vision and pathway for job creation to support the sectors and industries that are needed during the transition and the decarbonisation process.

- Energy efficiency at national scale over the current Parliament and beyond is a significant infrastructure project with the potential to create thousands of jobs to deploy energy efficiency measures while giving confidence to the supply chain to expand and therefore recruit. The EEIG estimates that investment in home renovation can help to 'level up' infrastructure and opportunity across the UK – supporting over 150,000 skilled and semi-skilled jobs to 2030⁹.
- National Grid recently identified that approximately 117,000 posts will need to be filled over the next ten years within the broader energy sector, with half of them being completely new posts e.g. building and operating new power generation plants, doing energy efficiency improvements and upgrading transport, power and gas network infrastructure (including the smart meter program, EV charging points, gas and electricity network reinforcements)¹⁰.
- There are around 125,000 registered gas engineers¹¹ in the UK. As increasing numbers of gas boilers are replaced by low carbon heating systems, the engineer workforce will need to retrain to adapt to the new range of products that need to be installed and maintained. There are 22 million households in the UK with gas central heating¹².
- In a similar manner, engineers and workers in the offshore oil and gas industry are a good match for the offshore wind grid that we need to build in the North Sea if we are to achieve our 40GW by 2030. Developing the supply chain in coastal regions where offshore wind farms are located can also boost job creation. The same goes for EVs: if Government commits to a 2030 phase out target for ICE vehicles, then industry will follow and so will the labour market and supply chain.
- The construction of Hinkley Point C nuclear power station is expected to have employed 25,000 people once the project is completed. Such large projects require a vast range of skills.

Diversity of the workforce is also important both in terms of gender balance and encouraging more people from minority backgrounds to join the industry. Energy companies continue to work to encourage

⁹ EEIG – Rebuilding for resilience – June 2020

¹⁰ National Grid (2020) Building the Net Zero energy workforce

¹¹ EAU article on the progress of new mandatory legislation – Boiler Plus

¹² Installer online

more women to choose the field of engineering studies. Last year, women comprised only 22% of 37,000 A level physics students, 8% of all STEM apprentices and just over 15% of 42,000 engineering and technology undergraduates¹³.

Many of Energy UK members have developed internships, apprenticeship and training schemes for those wishing to learn their trade in the field, as well as industrial and graduate placements to young (and less young) graduates, in areas such as civil engineering, R&D, data and digitalisation, human resources or supply chain. Some work directly with universities and schools in their communities to attract local talents.

Forums such as Energy UK’s Young Energy Professionals (YEP) also help to showcase the industry and reach out to young people. The YEP Forum is a network of around 1,500 people, with representation spanning over 340 different companies. It brings together those considering a career in energy with those already working in industry, offering the opportunity to broaden their knowledge, share development successes and network with peers.

Some programmes are more specialised, aimed at employees with disabilities, encouraging social mobility and supporting good health and well-being for employees. Companies are actively doing more to attract but also retain the right people.

However, despite energy companies’ effort to attract the skills and labour workforce they need, the energy industry, like many others, suffers from labour and skill shortages and a retiring workforce. It is predicted that throughout the next decade, 27% of the Utility workforce will retire which combined with the requirement for new jobs will create 277,000 vacancies in the Utility sector in the next 10 years¹⁴. Restrictions to be imposed on the EU workforce’s ability to travel to work in the UK will likely make it more difficult to fulfil all vacancies. This situation makes it even more important to put in place programmes to develop the right skills and help people get back to work.

Is the Industrial Strategy still a relevant and appropriate vehicle through which to deliver post pandemic growth?

- Government needs to update the Industrial Strategy and publish its National Infrastructure Strategy, with both frameworks reflecting the need to support economic growth and to reach net zero by 2050.

The Industrial Strategy launched in 2018 provides a comprehensive approach to transform the economy and society and can be pertinent to deliver post-pandemic growth. Whilst the Industrial Strategy has been less evident in recent developments from the Government, the approach to build sector partnerships is still relevant, so too the focus on grand challenges and opportunities. A critical element will be to add Net Zero as one of the main foundations.

The Sector Deals approach allows the Industrial Strategy to be taken forward with key commitments from both Government and Industry under each of the current foundations. The Nuclear Sector Deal and the Offshore Wind Sector Deal will support the development of both industries to support energy security of supply and the decarbonisation of the power sector.

| Progress on the Nuclear Sector Deal | Progress on the Offshore Wind Sector Deal |
|---|--|
| <ul style="list-style-type: none"> - Publication of a National Decommissioning and Waste Management Pipeline in June 2019. - Up to £16 million in research and development grants for advanced manufacturing, awarded in November 2019. | <ul style="list-style-type: none"> - Development and establishment of the Offshore Wind Growth Partnership: a £100 million OWGP fund has been established by the sector to help raise productivity and improve supply chain competitiveness over the next 10 years. - Development of eight regional clusters (Deep Wind (North Scotland), Forth & Tay Offshore, North East England, Humber, East Anglia, |

¹³ National Grid (2020) Building the net zero energy taskforce

¹⁴ Workforce renewal and skills strategy – 2020-2025

| | |
|--|--|
| <ul style="list-style-type: none"> - Support from the Industrial Strategy Challenge Fund to a Rolls-Royce-led UK consortium to develop a Small Modular Reactor, announced in November 2019. - Publication of a Nuclear Sector Gender Roadmap and Gender Commitment in December 2019. | <p>Solent, Celtic Sea Cluster, North West & North Wales)</p> <ul style="list-style-type: none"> - An Investment in Talent Group has been established, comprised of senior representatives across the sector and has met twice. An HR Forum, and 3 subgroups focusing on gender balance, ethnicity and apprenticeships have been established and are meeting regularly. The sector has identified a target to increase the number of BAME workers from 5% today to 9% in 2030. |
|--|--|

The Grand Challenges would need to be reviewed and adapted to incorporate the new challenges brought by the pandemic, with the inclusion of supporting young people through training and jobs, widening the challenge on people, currently focused on an ageing society.

We would however need to understand whether the current government is still using this framework, and if so, when they are planning to update it to reflect the net zero target and the need to support an economic recovery.

Government should also consult with the National Infrastructure Commission to ensure that the upcoming National Infrastructure Strategy is aligned with net zero, as well as integrating any consideration of the role of national infrastructure in economic recovery.

How should regional and local government in England, (including the role of powerhouses, LEPs and growth hubs, mayoralities, and councils) be reformed and better equipped to deliver growth locally?

- Where Government can be most effective is in setting out ambition and frameworks, and then allowing private markets and local actors to deliver solutions that best fit customers’ needs.
- Develop a mechanism to make it easier for local authorities to benefit from funding of decentralised energy projects.
- Provide funding for a trial of LAEPs to improve access to funding for feasibility and development work for local authority led low carbon projects.
- Provide incentives to onshore production through active assistance and by supporting the development of the skills base for production through Local Industrial Strategies.
- Local authorities to develop Clean Air Zones and smart city strategies to encourage in decarbonising road transport and in cycling and walking infrastructure.

Our 2019 Future of Energy report explores how Central Government can work effectively with Local Governments in addressing issues such as the decarbonisation of heat. Where Government can be most effective is in setting out ambition and frameworks, and then allowing private markets and local actors to deliver solutions that best fit customers’ needs. Considering the scale of the transformation needed, it is clear that done the right way, this would boost growth and jobs locally.

Government needs to develop a mechanism to make it easier for local authorities to benefit from funding of decentralised energy projects. Local Area Energy Planning (LAEP) provides the opportunity to enable a collaborative dialogue amongst local government, network operators and other stakeholders to help plan for the delivery of the changes needed to energy networks, homes and other buildings to deliver a low carbon and clean energy future¹⁵. Energy UK believes that a whole system approach that involves all relevant actors can help local governments develop strong Local Industrial Strategies to deliver local

¹⁵ Energy System Catapult, Local Area Energy Planning: Guidance for local authorities and energy suppliers

growth and decarbonisation. As such, we recommend that Government provide funding for a trial of LAEPs to deliver rapid holistic decarbonisation of a local area and improve access to funding for feasibility and development work for local authority led low carbon projects, e.g. solar. Supporting local authority funding of distributed energy schemes can provide new sources of council income and create a greater sense of engagement of communities with the energy they use.

Government should also work with local authorities to provide incentives to onshore production through active assistance and by supporting the development of the skills base for production through Local Industrial Strategies.

Finally, with cleaner air and reduced noise pollution being two positive outcomes from the lockdown in the UK, local authorities should seek to build on this and develop Clean Air Zones (CAZ). Greater support for CAZs and smart city strategies would provide more clarity for the EV supply chain and encourage public-private investment in decarbonising bus, taxi and commercial fleets and for public investment in cycling and walking infrastructure.

What opportunities does this provide to reset the economy to drive forward progress on broader Government priorities, including (but not limited to) Net Zero, the UK outside of the EU and the 'levelling up' agenda? What should the Government do to ensure that delivering on these priorities does not exacerbate the vulnerability of businesses, consumers and communities/workers that have been impacted by COVID-19?

- Support the development of large energy infrastructure projects across the UK to create new low carbon industries, jobs and help level up the economy.
- Develop a government-backed national programme focused on vulnerable households that are not in a position to make decisions (tenants) or to pay themselves.
- Examine the question of how to fund the economic recovery and net zero in a fair way to address the issue of regressive cost recovery policies.

Providing the energy sector with the tools identified in this document will drive deep decarbonisation within the sector but also across the economy. We have identified several areas that we know need to materialise, such as energy efficiency, low carbon heat and EVs which provide high economic multipliers.

As previously mentioned, we need to decarbonise industrial clusters in the UK with most of them located in the Midlands, the West and North of England. Relatively high percentages of fuel poor households¹⁶ and low energy efficiency standards mean that trials in these regions could effect social change as well as enable decarbonisation. Research by IPPR has highlighted the high potential for trials in the North of England, with the range of existing assets including low carbon hydrogen production and CCUS, boosting the argument for large-scale deployment of solutions in the region¹⁷. Such large energy infrastructure projects have the potential to create new low carbon industries, jobs and help level up the economy across the country.

Our call for energy efficiency to be delivered through a government-backed national programme is for a programme that focusses on vulnerable households that are not in a position to make decisions (tenants) or to pay themselves. Poorer households spend a much greater proportion of their income on energy (10%) than the richest households (3%) with the proportion of poorer households' incomes to meet different energy policy funding being over eight times that of the richest households¹⁸.

The question of how to drive and fund the economic recovery and net zero and where costs fall needs to address this issue of regressive cost recovery and come up with a fair and progressive framework. For example, moving the funding of social policies, like the current energy efficiency scheme - ECO, to general taxation, would help reduce this burden on low income households. The government should

¹⁶ BEIS, Sub-regional Fuel Poverty 2016 data

¹⁷ IPPR, Net Zero North

¹⁸ UKERC - Funding a Low Carbon Energy System: a fairer approach?

review the Dieter Helm Cost of Energy Review, in particular the treatment of legacy costs to bring about reduction in energy bills.

Low carbon transformation, including decarbonisation and energy efficiency, will ultimately increase the resilience and competitiveness of the UK: our industries, our communities, and our homes.

What lessons should the Government learn from the pandemic about actions required to improve the UK's resilience to future external shocks (including – but not limited to – health, financial, domestic and global supply chains and climate crises)?

- Incorporate key learnings from COVID-19 on system balancing and the role of flexibility into the energy white paper.
- Create mechanisms that support a level playing field and sufficient incentives for investment in flexible power solutions to minimise whole system costs for consumers.
- Develop new low carbon industries and expertise and increase the multiplier effect by creating the associated supply chain domestically.
- Both Government and businesses need to review how they worked during the pandemic, especially around the amount of office space needed.
- Make NHS facilities more energy efficient would help reduce energy bills and increase the level of comfort inside.

The lockdown has helped shine some clarity and clearly show how our actions are the source of carbon emissions with drastic drops in emissions from industry, commercial buildings and transport, so we know where to act. We also saw during that time people buying more EVs, and overall people noticing better air quality with registrations increasing by 132% in the first five months of 2020 compared to the same period the year before¹⁹.

We have also come to realise that remote working works, and that while it has not happened for the right reasons, it provides some positives to people's lives with more flexibility and less time spent commuting. Both Government and businesses need to review how they worked during the pandemic and ask themselves if they really need employees and large numbers of civil servants commuting to large offices every day.

We have also seen how in order to manage periods of low demand, National Grid ESO were required to take action, in particular, downward management services used to turn down embedded generation (solar and wind) resulting in higher than normal system balancing costs. The ESO will need to learn from this to develop a better understanding of the need to have strong visibility and influence beyond transmission level assets, combined with transparent, cost effective market based procurement of system services, and the need to find new solutions to avoid wasting renewable power. Government will need to incorporate key learnings from COVID-19 on system balancing and the role of flexibility into the energy white paper.

BEIS, Ofgem and ESO need to create mechanisms that support a level playing field and sufficient incentives to speed up investment in a range of flexible power solutions in order to minimise whole system costs for consumers. This should be applied to both ESO markets and those more local markets currently being developed across distribution networks.

We have also realised how crucial it is that our hospitals and medical facilities can work efficiently. Making such facilities more energy efficient would help reduce energy bills and increase the level of comfort inside.

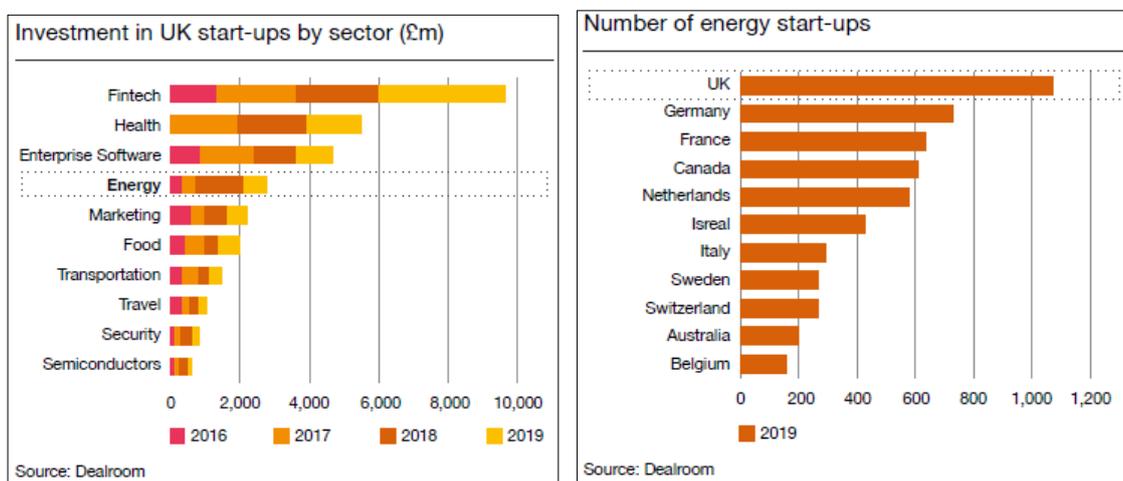
The pandemic has also shone some light on countries' dependency on the global supply chain. We have identified in this document opportunities to develop new low carbon industries and expertise, and the multiplier effect that creating the associated supply chain domestically could bring.

¹⁹ SSMT – EVs and AFVs registrations

What opportunities exist for the UK economy post Brexit and the pandemic for export growth?

- The UK has an unprecedented opportunity to develop existing and new low carbon industries to support the economic growth and decarbonise domestically but also to develop and export their expertise worldwide.
- Identify where it is possible and valuable for the UK to have some of the supply chain in the UK and make the UK an attractive place for international businesses to invest.
- A sub-optimal deal with the EU risks creating barriers to UK industries' ability to develop export markets.
- Government should seek to retain access to the EIB's funding mechanisms as well as programmes such as Horizon 2020.
- Government should develop mechanisms that delivers equivalent incentives for energy infrastructure, technology development and innovation.

The UK energy sector has one of the most advanced energy systems in the world. It is at the forefront of the transition to decarbonise power generation and it attracts significant private investment in innovative, start-up businesses, both relative to other sectors in the UK and internationally.



Energy UK believes that the UK has an unprecedented opportunity to develop existing and new low carbon industries to support the economic growth and decarbonise domestically but also to develop and export their expertise worldwide.

The UK is a global leader in the deployment of offshore wind technology and must capitalise on this knowledge and expertise to develop markets outside of the UK. We are also one of few countries having set a phase-out date for ICE vehicles meaning that we need to renew our fleet over the next ten-fifteen years. We should reap the rewards of being an early mover and identify opportunities abroad. Our ambition to install one million heat pumps by 2025 also creates opportunities for the supply chain and to move on one of the most difficult decarbonisation challenges. Demand side response and electricity storage are already part of our energy systems and will need to grow further over the next few years.

We also know that we need to deploy carbon removal and negative emissions technologies. Bio Energy Carbon Capture and Storage (BECCS) is already being trialled in the Humber region with a second planned for later this year²⁰. Low carbon hydrogen is also set to become a new growing industry, which the UK is well placed to capitalise on with its offshore geology for carbon storage and high proportion of low carbon power from renewables and nuclear sources.

²⁰ Drax

For all these technologies, we need to identify where it is possible and valuable for the UK to have some of the supply chain in the UK. We need to attract international businesses to the UK if they are not here already. This includes expanding upon the UK's valuable position in boiler manufacturing by developing manufacturing capability for other technologies across low carbon heat. We also see potential for the UK to develop our capability in the development and manufacture of smart technologies, including smart appliances and smart grid technologies.

The ability for the UK to attract businesses and investment is however likely to depend on whether the UK can strike a deal with the EU in the next few weeks and what this deal means for business. The risks of having tariffs and quotas with the EU, the issue around restricted labour mobility and access can undermine the UK's attractiveness as a place to set up a business and to trade with. The risk of divergence in standards and regulations between the UK and the EU means that businesses might see opportunities for a domestic supply chain but not an international one.

EU funding programmes, provided and supported by the European Investment Bank (EIB) group contribute financial support to infrastructure and development projects, including innovation and R&D, throughout Europe. The UK has been a prominent recipient for many years. Ensuring that new low carbon technologies, still at a relatively early stage of development and deployment, have access to innovation funding is crucial to ensure the UK does not fall behind in the race to enter these new markets.

Government should seek to retain access (potentially as an associate member) to the EIB's funding mechanisms as well as programmes such as Horizon 2020. If this is not possible, Government should explore the possibilities and the need for the replacement of these mechanisms in a way that delivers equivalent incentives for energy infrastructure, technology development and innovation. The UK should seek to enhance its international collaboration in R&D and funding programmes to ensure the widest access to financing.

What role might Government play as a shareholder or investor in businesses post-pandemic and how this should be governed, actioned and held to account?

- The best way to deliver cost-effective decarbonisation of the UK economy is to ensure markets are competitive and open to any eligible technology that can contribute to net zero targets, so as to stimulate competition and innovation at lowest cost.
- Competitive auctioning under the CfD scheme be available to all relevant low-carbon technologies, to support economic growth and the transition to net zero at lowest cost.
- Cost effective financial products and services, regulations and standards are also needed to driver change in markets and demand.

The power sector requires a balanced generation mix: a high level of renewables together with firm low carbon power such as nuclear, hydro, and low carbon thermal generation (low carbon gas and / or post combustion CCUS), complemented by increased system flexibility, storage, and new technology solutions, such as hydrogen and CCUS to maintain security of supply at all times.

The best way to deliver cost-effective decarbonisation of the UK economy is to ensure markets are competitive and open to any eligible technology that can contribute to net zero targets, so as to stimulate competition and innovation at lowest cost.

The scale of the investment challenge to get to net zero and to support economic growth post-pandemic is vast. In order to deliver, investors require a predictable policy landscape and investible mechanisms, backed by consistent legislation.

Since privatisation 30 years ago, the sector has invested over £200bn²¹ to radically transform itself and reduce the reliance on carbon-intensive fuels such as coal. The CCC, in its 2019 report on reaching net zero by 2050, estimates that £20bn per year²² would be needed to further decarbonise the power sector.

²¹ Energy UK's analysis of CAPEX investment made by energy industries (ONS), adjusted for inflation and extrapolated

Energy UK has welcomed the re-introduction of onshore wind and solar in the Contracts for Difference (CfD) scheme. Competitive auctioning under the CfD should continue and be available to all relevant low-carbon technologies, to support the transition to net zero at lowest cost and economic growth.

Cost effective financial products and services, regulations and standards are also needed to driver change in markets and demand.

Predictable policy frameworks and investment and financing tools are needed to enable the investment required to deliver at least 9 GW of generation per year until 2050 and for the energy sector to support other sectors on their decarbonisation journey.

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