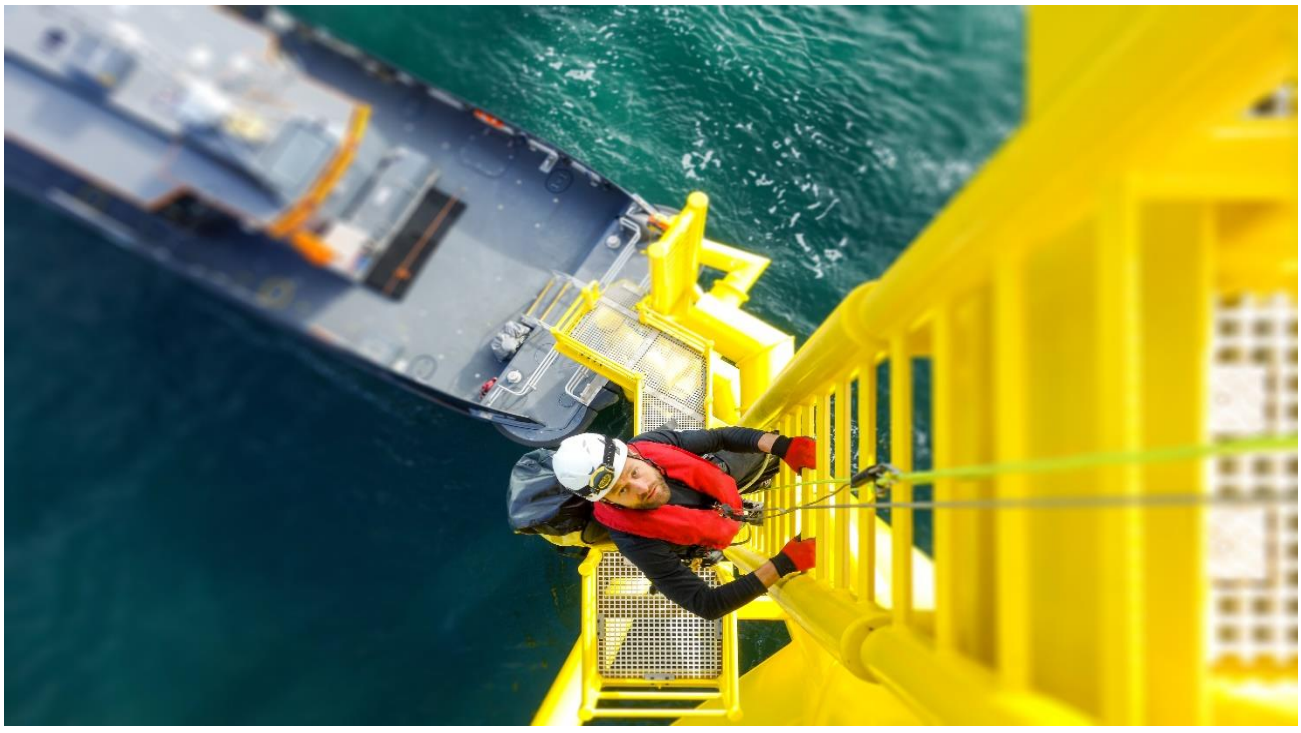
Department for Business, Energy & Industrial Strategy

OGUK

North Sea Transition Deal



March 2021

TOGETHER FOR OUR PLANET

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Foreword

The offshore oil and gas sector is a major UK industrial success story. Since production started in 1967, the sector has produced around 45 billion barrels of oil equivalent from the UK's Continental Shelf (UKCS)[1], generating more than £350 billion in production tax revenue alone[2]. This has maintained the country's energy security, while keeping our homes warm, our country moving and creating hundreds of thousands of high-quality jobs across the UK.

However, climate change represents an existential threat to the planet. So, building back better means building back greener. The UK has set a world-leading net zero target, the first major economy to do so by statute. Last year, the Prime Minister announced a new ambitious emissions target which aims for at least 68% reduction in greenhouse gas emissions by the end of the decade, compared to 1990 levels. But simply setting the target is not enough and, as the government's Energy White Paper[3] makes clear, we need to focus all our efforts on decarbonising our economy which still relies heavily on hydrocarbons for our energy demand.

This decade will be the decade of delivery and change. Tackling climate change will require decisive global action and significant investment and innovation, creating new industries, technologies, and professions. This offers a huge opportunity for both growth and job creation.

The UK's offshore oil and gas sector recognises this fact and was amongst the first major industries to publicly back the government's net zero objectives through its Roadmap 2035[4]. The UK's demand for oil and gas, though much reduced in the future, is expected by the Climate Change Committee to continue for decades to come[5].

This is why the government committed, in the 2019 election Manifesto[6], to deliver a transformational Sector Deal for the offshore oil and gas sector in recognition of the key role that it can play in helping the UK meet its net zero commitments.

The UKCS is a mature hydrocarbon basin with production having peaked around the turn of the century. The sector has also, in recent years, faced significant challenges with sustained low prices and the current COVID-19 pandemic. The tripartite partnership between the government, the Oil and Gas Authority and the offshore oil and gas sector has enabled the sector to remain an important part of the economy. It supports around 147,000 jobs directly

[1] OGA (2020). UK Oil and Gas Reserves and Resources as at end 2019, September 2020, OGA publication. https://www.ogauthority.co.uk/news-publications/publications/2020/uk-oil-and-gas-reserves-and-resources-as-at-end-2019/
[2] HMRC (2020). Statistics of Government revenues from UK oil and gas production, July 2020. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/902798/Statistics_of_government_revenues_from_UK_oil_and_gas_production__July_2020_for_publication.pdf
[3] HM Government (2020). Energy White Paper – Powering our net zero future, December 2020. https://www.gov.uk/government/publications/energy-white-paper-powering-our-net-zero-future
[4] OGUK (2019). Roadmap 2035, A blueprint for Net Zero, September 2019, OGUK.
[5] CCC (2020). The Sixth Carbon Budget, The UK's path to Net zero, Climate Change Committee, December 2020. https://www.theccc.org.uk/publication/sixth-carbon-budget/
[6] The Conservative Party Manifesto, Get Brexit Done, Unleash Britain's Potential, 2019 https://www.conservatives.com/our-plan

and in their supply chains,[7] employing people in locations right across the country and supporting many more local jobs in sectors that rely on a vibrant oil and gas industry.

The North Sea and indigenous oil and gas supply have been at the heart of the UK's energy and industrial strategy for over fifty years. The sector has developed an international reputation for leading the world in offshore exploration and production capabilities, and the UK has developed capabilities through its supply chain services which are exported around the world.

As output from the UKCS declines, domestic demand is also projected to decline, and there is a clear need for determined action to be taken to build on the proven capabilities within the sector to support the transition to net zero. The UK already has the capability and skills within the existing sector to lead in new and emerging energy technologies such as Carbon Capture, Usage and Storage (CCUS) and the hydrogen economy as well as to support the growth of new sectors such as offshore wind.

This Deal is about harnessing the power of the oil and gas sector and anchoring it to the UK for the energy transition. It aims to reset the relationship between the government and the sector and represents a quid pro quo partnership for taking long-term action which transforms the sector and delivers the energy transition. This will reinforce the aims of the government's strategy to build back better and is closely aligned to the government's Energy White Paper and key elements of the Prime Minister's Ten Point Plan[8].

Through the Deal, the UK's oil and gas sector and the government will work together to deliver the skills, innovation and new infrastructure required to decarbonise North Sea oil and gas production as well as other carbon intensive industries. Not only will it transform the sector in preparation for a net zero future, but it will also catalyse growth throughout the UK economy. Delivering large-scale decarbonisation solutions will strengthen the position of the existing UK energy sector supply chain in a net zero world, securing new high-value jobs in the UK, supporting the development of regional economies and competing in clean energy export markets.

By creating the North Sea Transition Deal, the government and the UK's oil and gas sector are ambitiously seeking to tackle the challenges of reaching net zero, while repositioning the UK's capabilities to serve the global energy industry. The Deal will take the UKCS through to maturity and help the sector pivot towards new opportunities to keep the UK at the forefront of the changing 21st century energy landscape.

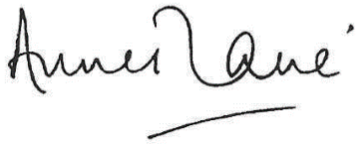
This is a Deal for the whole of the UK and, where appropriate, government will work with the governments of Scotland, Wales and Northern Ireland to take forward the aims of this Deal.

[7] OGUK (2019). Workforce Report, 2019. (Figure from 2018). https://oilandgasuk.co.uk/wp-content/uploads/2019/08/Workforce-Report-2019.pdf
[8] HM Government (2020). The Ten Point Plan for a Green Industrial Revolution, November 2020. https://www.gov.uk/government/publications/the-ten-point-plan-for-a-green-industrial-revolution.

The Rt Hon Kwasi Kwarteng MP

Secretary of State for Business, Energy and Industrial Strategy

Deirdre Michie OBE
Chief Executive, OGUK



The Rt Hon Anne-Marie Trevelyan MP

Minister of State for Business, Energy and Clean Growth, and UK International Champion on Adaptation and Resilience for the COP26 Presidency

Executive Summary

The North Sea Transition Deal builds on the UK's global strength in offshore oil and gas production and seeks to maximise the advantages for the UK's oil and gas sector from the global shift to clean growth. It is aimed at delivering on the commitments set out in the oil and gas chapter of the government's Energy White Paper and is closely aligned to the Prime Minister's Ten Point Plan.

It will do this by:

1. The sector committing to early targets for the reduction of greenhouse gas emissions from production against a 2018 baseline and the government identifying potential funding opportunities for early offshore electrification.
2. The Deal will commit to deliver investment of up to £14-16 billion by 2030 in new energy technologies, with the government delivering a business model to enable CCUS and hydrogen at scale.
3. The sector voluntarily committing to achieve 50% local UK content across the lifecycle for all related new energy transition projects by 2030, as well as in oil and gas decommissioning. This will be supported by the appointment of an industry supply chain champion who will support the coordination of opportunities with other sectors.
4. Achieving a 60Mt reduction in greenhouse gas emissions, including 15Mt through the progressive decarbonisation of UKCS production over the period to 2030.[9]
5. Supporting up to 40,000 direct and indirect supply chain jobs in decarbonising UKCS production and the CCUS and hydrogen sectors.[10]
6. Government investment of £6.3 million in the Global Underwater Hub, and a further £2 million to develop the Deal, helping to support the sector to play a leading role in meeting the UK's net zero ambitions.[11]
7. Supporting the government's prompt payment initiative by championing the Prompt Payment Code.

Moving away from unabated greenhouse gas emissions resulting from combustion of fossil fuels will be achieved through a combination of energy efficiency, electrification, alternative

[9] The 60Mt also includes emissions savings from CCUS and hydrogen already set out in the PM's 10 Point Plan.
[10] The CCUS and hydrogen jobs will include some of the jobs already set out in the PM's 10 Point Plan.
[11] HM Government (2021) https://www.gov.uk/government/publications/budget-2021-documents.

decarbonised energy and the use of carbon capture technologies. The pace of this transition must be managed to balance the need to decarbonise with the need to maintain energy security and affordability. The oil and gas sector is committed to net-zero but it is a sector that is hard to abate, in view of the location and nature of the assets involved and it is exposed to international competition. It is therefore necessary to ensure that the costs of abatement are manageable and mitigate the risk of a relocation of production (and therefore carbon leakage) abroad and reduced investment in a strategic UK industry.

Oil and gas production will still be needed during the transition, but at lower levels than today. The delivery of this transformative plan, which is supported by elements of the North Sea Transition Deal, will enable the oil and gas sector to drive the energy transition by developing and deploying a range of technologies, transforming the UK supply chain, securing jobs, and protecting and building successful local communities.

It will unlock the UK's net zero ambition, delivering part of a fair and equitable energy transition by allowing the UK Continental Shelf (UKCS) to transition to a net zero basin as well as supporting decarbonisation of industries across the UK. The Deal will grow the economy, attract new investment, sustain jobs, and create new energy businesses benefiting local regions across the UK.

This Deal is built on five outcomes. Each of these is closely interlinked, meaning that the deal must be delivered as an integrated whole to achieve its full potential.

Key Outcomes

Supply decarbonisation

In 2018, upstream oil and gas activities in the UK accounted for four per cent of UK greenhouse gas emissions. The Deal will cut UK upstream oil and gas industry greenhouse gas emissions through an ambitious production emissions reduction programme. The sector has already responded to the UK's 2050 net zero targets by committing to becoming a net zero basin by 2050 and setting ambitious greenhouse gas emission reduction targets. Set against a 2018 baseline, subject to joint government and industry actions, the Deal's new early targets correspond to an absolute reduction in production emissions of 10% in 2025, 25% in 2027, and 50% in 2030 on the pathway to net-zero by 2050. This commitment focuses on actions the government and industry can take to reduce emissions from the UKCS oil and gas production, for example, electrification of offshore production installations and adherence to new standards on flaring and venting.

Carbon Capture, Usage & Storage

The Prime Minister's Ten Point Plan announced a commitment to deploy two carbon capture clusters by the mid-2020s and a further two clusters by 2030. The development of this technology will enable large parts of the UK industry and society to eliminate emissions. This commitment aims to unlock investment of £2-3 billion in CCUS Transport & Storage infrastructure from the sector, to underpin widespread capture rollout. The sector's extensive experience in implementing and operating large offshore infrastructure projects and investing in shared offshore infrastructure solutions, coupled with a deep knowledge of subsurface technologies, geoscience and reservoir management, means it is particularly suited to development of transport and storage facilities. These capabilities will enable efficiencies and cost reductions to be achieved as new CCUS projects are executed.

Hydrogen

Hydrogen is essential to meeting our net zero commitment in the UK. It could provide a clean source of energy across the economy, from industrial and domestic heat, to heavy transport, and flexible power and energy storage. The UK already has world-leading offshore wind potential and electrolyser capability, alongside unparalleled carbon capture and storage sites that the UK can maximise to scale up low carbon hydrogen production.

The hydrogen commitment in the North Sea Transition Deal focuses on creating the economic environment in which low carbon hydrogen production can flourish. This will help unlock billions of pounds of investment from the sector. The oil and gas sector is positioned to enable

the production of low-carbon hydrogen at scale as part of a long-term competitive market, supporting the UK's ambition to deliver 5GW of low carbon hydrogen production capacity by 2030.

Supply chain transformation

The Deal will help develop expertise to underpin growth in the domestic energy sector and subsequently in export growth markets, creating a globally competitive energy supply chain of international repute. The supply chain commitment focuses on supporting the transformation of the oil and gas supply chain to service low-carbon energy sectors at home and abroad. The sector has built a significant supply chain across the UK to support UKCS operations with an aggregate revenue of £26.5 billion in 2018[12]. The UK's energy supply chain should be competitively positioned to seize such opportunities presented by offshore electrification, CCUS, and hydrogen both in the domestic market and internationally. As production from the UKCS declines, demand for the conventional services it provides will also fall, threatening the high-value jobs the industry creates. The sector will set its own voluntary target of 50% UK content, including capital investment, over the lifecycle of all low-carbon projects, and offshore decommissioning, as well as 30% for locally sourced technology. This will be underpinned by the appointment of a supply chain champion for the sector. The government will invest £6.3 million in the Global Underwater Hub, and a further £2 million to develop the Deal, helping to support the sector to play a leading role in meeting the UK's net zero ambitions.

People & Skills

The Deal will support up to 40,000 high-quality direct and indirect supply chain jobs in our industrial heartlands. The People & Skills commitment contains actions that will both facilitate the reskilling of existing parts of the oil and gas workforce and will ensure that everyone employed in the sector – whatever their background - can fulfil their potential.

Many of the skills present in the sector are also transferrable across the wider energy sector. Offshore renewables, as well as the future CCUS and hydrogen industries will rely heavily on

[12] EY (2020). Review of the UK oilfield services industry, January 2020. https://assets.ey.com/content/dam/ey-sites/ey-com/en_uk/topics/oil-and-gas/oilfield-jan-2019/review_of_the_uk_oilfield_services_industry_january_2020.pdf (in https://www.ey.com/en_uk/oil-gas/ninth-annual-review-of-the-uk-oilfield-services-industry)

many of the current skillsets in the oil and gas industry such as geologists, project managers, a wide variety of engineers, and fabricators. A carefully managed transition will help to ensure a prosperous future for the communities affected and that the UK economy retains people with these key skillsets, as demand for their current roles in the oil and gas sector wanes with production decline, so that they can help unlock these vital emerging low carbon sectors. The sector will seek to link up with initiatives on workforce transition, skills and diversity & inclusion, being undertaken through other Sector Deals (such as the Offshore Wind Sector Deal), where this will add value.

Every effort will be made by both the government and the sector to meet the commitments as set out in this document. However, whilst the commitments in this Deal are undertaken in good faith, we recognise the wide range of uncertainties that may impact on delivery.

Commitments

1. Supply Decarbonisation

Sector action to support the energy transition

Establish overarching industry targets

The sector is committed to decarbonising and, subject to making progress on the shared actions, it will take action to reduce emissions from oil and gas production by 10% by 2025, by 25% by 2027 and by 50% by 2030 (all relative to 2018 baseline), as measurable steps to a net zero basin by 2050.

Improved emissions stewardship

The sector will support the development of, and rapidly implement and follow, the OGA's Net-Zero Asset Stewardship Expectation, to encourage emissions reductions from both existing and new developments.

Streamlined emissions monitoring and reporting

The sector will work with the government, OPRED, and the OGA on consistent reporting structures and frameworks to minimise the reporting burden and enable clearer monitoring of progress.

Methane Action Plan to reduce emissions and flaring

The sector will develop and commit to a Methane Action Plan. The plan will detail commitments to improve the monitoring and reporting of emissions, whilst separately stating a separate methane target. The sector will:

- Through individual assets, seek to accelerate compliance with the World Bank 'Zero Routine Flaring' Initiative ahead of 2030.
- Commit to the OGCI 2025 methane intensity commitment – currently 0.25% (ambition 0.20%)

Collaborative investment in electrification of assets

The sector will invest £2-3 billion, subject to making progress on the shared actions, to allow oil and gas production to be operated using electricity supplied from the main electricity networks and/or renewable resources meet the earlier emissions targets.

Government action to support the energy transition

Streamline emissions monitoring and reporting

The OGA and OPRED will provide continued regulatory cooperation on the monitoring, reporting and management of emissions.

Early-stage funding for Offshore Electrification

The government will identify potential funding opportunities for early-stage offshore electrification studies that businesses could bid into, on a match-funded basis by the end of 2021.

Delivering support for offshore electrification

The government recognises that the sector needs to unlock investment in capital intensive offshore electrification projects and will work with the sector to identify potential decarbonisation funding solutions by late 2022.

Cost-effective offshore electricity

The government will commit to working with the sector to explore the economics of electrification and work to identify the most cost effective options to unlock investment for the electrification of its assets, addressing both the upfront capital costs and the affordability of power from electricity transmission and network charges, and exposure to other levies. The OGA will promote the adoption of cost-effective electrification opportunities via the provisions in its new Strategy.

Whole system/ offshore cooperation

The government will create and lead a senior Offshore Implementation Group addressing the regulatory and legislative barriers to electrification and other offshore energy integration matters. This will be a task and finish group, chaired by BEIS and including senior representatives from the key regulators. The first meeting will be within one month of publication of this Deal and a time-table for addressing the barriers will be established as an early action.

2. Carbon Capture Usage & Storage (CCUS)

Sector action to support the energy transition

The sector will provide long-term investment to support CCUS

To support the UK becoming a world leader in technology to capture and store harmful emissions away from the atmosphere, the sector will invest £2-3bn to build the Transport & Storage infrastructure for at least 10MT/y of carbon capture by 2030.

Develop industry standards for CCUS

The sector will develop robust industry standards to address barriers to CCUS deployment in the UK.

Coordinate approach to CCUS cost reduction

The sector will transfer learnings from international CCUS projects and previous basin cost reduction initiatives such as decommissioning practice into CCUS deployment in the UK.

Government action to support the energy transition

Deliver a business model to enable Transport and Storage at scale

In 2021, the government will bring forward details of a revenue mechanism to bring through private sector investment in industrial carbon capture and hydrogen projects, to provide the certainty investors require to deliver CCUS at pace and scale.

Develop initial Transport and Storage infrastructure in support of CCUS

The government will establish a process to sequence the deployment of CCUS clusters, with the potential for CCUS in two industrial clusters by the mid-2020s subject to value for money and affordability considerations, and aim for four clusters by 2030, capturing up to 10 million tonnes of carbon dioxide per year. The government will deliver a £1bn CCUS Infrastructure Fund to enable the deployment of transport and storage and industrial carbon capture projects.

Create a CCUS Transport & Storage asset regulatory capability

The government will establish an independent economic regulator to regulate the Transport & Storage sector, and its duties and objectives will be prescribed in legislation. The government will work with the OGA in its role as the licensing and permitting authority to steward and implement CCUS policy.

Deliver a CCUS Transport & Storage infrastructure reuse policy

The government will work with OPRED and the OGA to develop policy and regulation to support deployment of CCUS Transport & Storage in the UK seeking to optimise oil and gas asset reuse.

Coordinate offshore strategic deployment

The government will coordinate strategic deployment issues relating to carbon dioxide transport and storage, including leasing and licencing considerations and necessary liaison with relevant offshore regulatory bodies such as the Crown Estate and the OGA.

3. Hydrogen

Sector action to support the energy transition

Create low carbon hydrogen production capacity

The sector will work with the government to deliver the ambition for 5GW of low carbon hydrogen production capacity by 2030.

Support Hydrogen RD&D

The sector will invest in RD&D for hydrogen technologies that support the production, transportation, storage and consumption of hydrogen at lower cost. The sector will work with the government to align innovation objectives and maximise investments.

Support offshore green hydrogen production

The sector will support the development and deployment of offshore green hydrogen production using offshore wind to enable the technology to reach maturity.

Continue the hydrogen safety programme

The sector will support measures related to safety working with the Health and Safety Executive (HSE) and others such as the Institution of Gas Engineers and Managers (IGEM) to facilitate the effective dissemination of evolving hydrogen equipment and gas handling safety standards through the workforce.

Understand hydrogen and public opinion

The sector will measure and track public opinion on the use of hydrogen across a variety of applications, focusing on heating, to better understand the public's appetite for hydrogen. This will inform communication campaigns.

Government action to support the energy transition

Support Hydrogen RD&D

The Government will deploy funding from the £1bn Net Zero Innovation Programme for hydrogen technologies supporting the production, transportation, storage and consumption of hydrogen at lower cost. The government will work with industry to align innovation objectives and maximise investments.

Establish a revenue mechanism

In 2021, the government will bring forward detail on preferred hydrogen business models and the revenue mechanism to stimulate private investment in new low carbon hydrogen production facilities. The government will finalise business models in 2022.

Structure the market to allow hydrogen demand

The government will review the overarching market framework set out in the Gas Act 1995 to ensure the appropriate powers and responsibilities are in place to facilitate a decarbonised gas future. This will include a review of gas quality standards to enable the widest range of gasses to be used to decarbonise energy.

Accelerate the hydrogen project planning process

The government will explore ways to simplify and accelerate the planning process for hydrogen production plants.

Continue the iron mains replacement

The government will monitor the delivery of the iron mains replacement programme and support network businesses investment in net zero technology through RIIO2 price control period.

4. Supply Chain Transformation

Sector action to support the energy transition

Develop a UK low carbon supply chain of international repute

The supply chain will seek to form UK-based consortia providing targeted, innovative and broad solutions in support of the industry and the UK government's net-zero agenda. They will leverage the UK's capability and support existing delivery bodies to deliver net zero projects and secure supply chain diversification and export opportunities.

Anchor UK content in the supply chain

The sector will set a target of 50% UK content, including capital investment, over the lifecycle of all related new energy projects, as well as oil and gas decommissioning, and 30% for locally provided technology. The sector will conduct strategic mapping of energy transition requirements and revise these UK content targets as our understanding of capability and gaps develops.

Developing industrial scale capability in UK for low carbon industry

The sector will appoint an industry supply chain champion to co-ordinate business opportunities with other energy sectors. This champion will also help the supply chain to access government schemes providing funding support for low carbon energy projects, CCUS and decommissioning.

Promoting energy supply chain's net-zero capability and services to the world

The sector will develop market intelligence capability for global energy transition projects where there could be export opportunities for UK businesses. This should integrate information from other energy sectors such as renewables, focusing on alignment, collaboration, and integration opportunities. The supply chain champion will work with other sectors to raise the profile of the energy supply chain capability at home and abroad.

Attract further inward investment for net-zero

The sector will work with the government to attract and secure investment supporting individual companies and consortia to pursue opportunities to enable low carbon opportunities

Incubate new technology development

The sector will leverage incubator funding to secure the development of new technologies, kickstarting pilot projects.

Develop the Global Underwater Hub

The sector will develop and fund the Global Underwater Hub through a subscription model, starting with the £6.3m support announced from the government. The Hub will develop and promote opportunities for our world-leading subsea engineering sector in the UK and across the world.

Prompt Payment

The sector will commit to support the government's prompt payment initiatives by championing the government's Prompt Payment Code.

Government action to support the energy transition

Develop a UK low carbon supply chain of international repute

The government will work with the sector to identify potential funding opportunities for supply chain led consortia by the end of 2021 supporting broad low carbon propositions across the UK, for the benefit of multiple users.

Anchoring UK content in the net-zero supply chain delivering first mover technology advantage

The government will support the sector's supply chain review to identify the UK's capability to deliver technology and services across both energy transition and decommissioning projects. The government will align existing mapping work in this area and support work to address gaps. The government will look to increase the visibility of the pipeline of clean growth projects to support the supply chain to assess forthcoming opportunities.

Developing industrial scale capability in UK for low carbon industry

The government will collaborate with the sector's supply chain champion in coordinating activities across sectors and between DIT, SDI, UK Export Finance and other exporting bodies to support the UK supply chain and maximise the benefit of emerging inward investment agreements.

Promoting and exporting the supply chain's net-zero services to the world

The government will use its resources and networks to promote the capabilities of the UK's energy supply chain in international markets, coupled with support for energy transition projects from UK Export Finance. This will include consideration within future trade deals.

Developing policy to attract further inward investment for net-zero

The government will develop policies to enable the net-zero supply chain to flourish, particularly in reference to the emerging CCUS and Hydrogen industrial hubs.

Simplifying funding access for new technology development

The government will simplify the various channels to access research and development and innovation funding and streamline application processes for incubator projects to bolster the UK supply chain's competitive advantage.

Support development of Global Underwater Hub

The government will support the development of the Global Underwater Hub with £5 million, subject to business case, on top of the £1.3 million committed last year. The Global Underwater Hub will work to broaden the focus of subsea engineering in the UK and will target global growth opportunities.

5. People & Skills

Sector action to support the energy transition

Energy Skills Alliance

The sector will support the work of the Energy Skills Alliance and work programme to ensure industry is prepared to meet the future demand for skills in oil and gas, and other related energy industries. This work will address:

i) Mapping of future energy skills demand

ii) Development of all-energy training & standards

iii) Implementation of all-energy apprenticeships

iv) Development of the “My Energy Future” programme

Integrated People and Skills Plan

The sector will create an integrated people and skills plan, with measurable objectives, to support its transition and diversification. Aligned with other established energy sector deals and the Energy Skills Alliance, as detailed above, and with strong commitment and support from the government, academia, trade unions and other relevant stakeholders, the plan will assess the industry’s future skills, training and standards requirements, and how industry will support and enable the transition of the workforce. This action will be led by OPITO, in collaboration with other skills providers, and in a way that supports commitments to skills diversification made in other sector deals. The plan will be presented to the Government by March 2022.

Transferability of Skills

The sector will work to ensure that the workforce’s skills and competencies are mutually recognised across energy sectors enabling easier job transferability. The sector will promote the uptake of relevant existing initiatives and expand these as appropriate. The sector will complete an assessment of where this is needed which will be presented as part of the People & Skills Plan. The sector will seek to link up with initiatives on workforce transition and skills being undertaken through other Sector Deals (such as the Offshore Wind Sector Deal), where this will add value.

Industry support for The Centre for Doctoral Training (CDT) in Geoscience and its role in the low carbon energy transition and challenge to meet net-zero emissions targets (GeoNetZero; GNZ)

The sector will provide continued support and previously committed matched funding for the UK Centre for Doctoral Training (CDT) in GeoNetZero (GNZ), helping create the next generation of academic expertise in the energy transition.

High employment standards

The sector will promote the UK's high employment standards to ensure the workforce is engaged in quality work.

Equality of opportunity

The sector will work to ensure that everyone employed in the sector – whatever their background - can fulfil their potential.

Government action to support the energy transition

Government support for Energy Skills Alliance

The government will continue to support the work of the Energy Skills Alliance's four workstreams

Potential government funding and support for Centre for Doctoral Training in geoscience and its role in the low carbon energy transition and challenge to meet net-zero emissions targets (GeoNetZero; GNZ)

The government will explore potential opportunities for the UK Centre for Doctoral Training (CDT) in GeoNetZero (GNZ) to ensure more students can benefit from this programme to create the next generation of academic expertise in the energy transition.

Support for the sector and workforce

The government will continue to champion the role of the sector and its workforce in the energy transition, supporting work on its People and Skills Plan. The government will continue to prioritise support for people in high carbon sectors of the economy, which need to transition, via the Green Jobs Taskforce.

Implementation Plan

Every effort will be made by both the government and sector to meet the commitments as set out in this document. However, whilst the commitments in this Deal are undertaken in good faith, we recognise the wide range of uncertainties that may impact on delivery.

North Sea Transition Forum – April 2021

The government to establish senior offshore implementation group to coordinate strategic development of integrated energy projects such as CCUS, hydrogen, wind and electrification of oil and gas assets – April 2021.

Deliver a business model to enable transport and storage of Carbon at scale (including legislative proposals where necessary) - in accordance with commitments in the 10 Point Plan. Strategic mapping of energy transition capabilities for domestic and external markets – start Summer 2021

Appointment of a Supply Chain Champion – Summer 2021

The sector to develop Business Cases for offshore electrification FEED studies and supply chain consortia funding for comprehensive spending review – Summer 2021

North Sea Transition Forum – October 2021

Further progress business models for carbon capture for industrial and power generation and low carbon hydrogen including legislative proposals where necessary in in accordance with commitments in the 10 Point Plan.

Produce an integrated people and skills plan – March 2022

One year on – Report on implementation – March 2022

The Offshore Oil and Gas Sector in Context

The UK's domestic oil and gas sector has had a critical role in maintaining the country's energy security for over five decades, and remains a major contributor to our economy.

The offshore oil and gas sector contributed about 0.9% to the UK's GVA in 2019[13] and has paid around £350 billion in production taxes to date[14]. The sector is a source of high-quality jobs, supporting directly or indirectly around 147,000 jobs in total across the UK in 2018. Many jobs supported by the sector are located in Scotland, particularly in Aberdeen, a global hub for the oil and gas industry. Critical supply chain clusters have grown in the North, East and South East of England. These jobs, and the estimated additional 113,000 jobs[15] induced by the sector, help support the wider UK economy.

While the Oil & Gas Authority (OGA) estimates that there are still around 10 to 20 billion barrels of oil equivalent remaining in the UKCS[16], domestic production has more than halved since 2000[17]. The Climate Change Committee (CCC) estimates that production of natural gas could drop by up to 80%[18] by 2050, compared to levels in 2017. However, the projections for demand for oil and gas, though much reduced, are forecast to continue for decades to come.

Much of the crude oil from the North Sea basin is exported, with the UK making extensive use of strong trading links to meet domestic refinery demand. Domestic production of natural gas

[13] GVA: ONS (2020). 'GDP output approach – low-level aggregates', tab CVM £million, https://www.ons.gov.uk/economy/grossdomesticproductgdp/datasets/ukgdpolowlevelaggregatesTaxes
[14] OGA (2020). Government revenues from UK oil and gas production in 2019-2020 prices https://www.ogauthority.co.uk/exploration-production/taxation/government-revenues-from-uk-oil-and-gas-production/
[15] OGUK (2019). Workforce Report, 2019. (Figure from 2018). https://oilandgasuk.co.uk/wp-content/uploads/2019/08/Workforce-Report-2019.pdf
[16] OGA (2020). UK Oil and Gas Reserves and Resources 2018, https://www.ogauthority.co.uk/data-centre/data-downloads-and-publications/reserves-and-resources/
[17] OGA (2020). OGA oil and gas production projections, table 4, https://www.ogauthority.co.uk/media/6407/oga-production-and-beis-demand-projections-february-2020.xlsx
[18] CCC (2019). Net Zero – The UK's contribution to stopping global warming, https://www.theccc.org.uk/publication/net-zero-the-uks-contribution-to-stopping-global-warming/

still met 46%[19] of the country's supply of gas in 2019, with the vast majority of this supplied from North Sea offshore production.

The UK's offshore oil and gas sector has been severely affected by COVID-19. The pandemic led directly to the global collapse in demand for oil and resulted in a roughly 65% drop[20] in the price of Brent Crude between January and April 2020. OGUK has estimated that the UK sector responded by cutting expected capital expenditure by around 30 to 40% and operating expenditure by around 10 to 20% compared with anticipated expenditure at the start of the year, while maintaining production levels[21].

There is widespread recognition across the sector that it is imperative for the upstream oil and gas industry to transform itself and that 'business as usual' is no longer an option. Government support must now be within the context of delivering our net-zero target. The concerns about climate change are mirrored by the market with investors and the public more widely placing pressure on the sector to respond to the challenge. Shareholders, for example, are increasingly requiring listed companies to price carbon into their business models and demonstrate how they can reduce emissions from their operations or support the wider decarbonisation of the economy.

Many oil and gas companies are now responding to the challenge. Their investment decisions are beginning to anticipate a world without fossil fuels beyond 2050. There is great potential for the sector to play an important part in the energy transition and retain vital skills across key regional hubs around the country, supporting the CCUS and hydrogen "Super Places" clusters announced in the Prime Minister's Ten Point Plan, and helping accelerate the deployment of renewable energy generation in the North Sea.

A 2019 survey by OGUK revealed that more than half of its members had already diversified into other energy sectors, even as oil and gas remained their primary source of income. This includes many supply chain companies that are already diversifying into other energy and non-energy sectors.

Supply decarbonisation

Around 75% of the UK's primary energy needs are currently supplied by oil and gas, and production from the UKCS will continue to be a central element of the nation's energy supply as the UK transitions to net zero. The sector currently supplies over 40% of total UK primary energy demand from its operations in the UKCS. The independent Climate Change Committee's analysis underlines the ongoing need for oil and gas during the transition to net zero, albeit at significantly declining rates.

[19] BEIS (2019). Energy Trends Table 4.1, https://www.gov.uk/government/statistics/gas-section-4-energy-trends
[20] Bloomberg tracker for Brent Crude.
[21] OGUK (2020). Business Outlook 2020: Market and Investment. https://oilandgasuk.cld.bz/OGUK-Business-Outlook-2020-Markets-Investments/2

Although the UK will continue to import part of its energy needs going forward, there is no reason why the UK's indigenous industry cannot cover a sizeable part of this demand, while significantly reducing emissions associated with production.

Emissions Reductions

In 2018, upstream oil and gas activities in the UK accounted for four per cent of total UK greenhouse gas emissions. The sector has already responded to the 2050 net zero targets by committing to becoming a net zero basin by 2050 and setting ambitious greenhouse gas emission reduction targets with respect to production. Set against a 2018 baseline, the Deal's ambitious new targets correspond to an absolute reduction of 10% in 2025, 25% in 2027, and 50% in 2030 on the pathway to net-zero by 2050. This includes industry's direct greenhouse gas emissions arising from upstream exploration and production activities on the UKCS and onshore processing, including CO_2, methane and other greenhouse gas emissions.

The Deal sets out how industry, working with government, will look to achieve these targets in practice and in particular, highlights the pathway to deep decarbonisation of production activities, through the connection of oil and gas assets to low-carbon electricity production. The projects needed to achieve these targets have been identified and will need measures undertaken by both industry and government to be implemented in a timely manner if they are to proceed at the required pace.

The Deal is designed to change the nature of oil and gas production in the UK by 2030. This will be achieved through a combination of industry efforts with respect to operational practices and investment, appropriate changes to the regulatory regime, and the development of offshore infrastructure, in parallel with the major changes already needed to significantly expand offshore wind production. The outcomes expected through the Deal regarding supply decarbonisation are as follows:

1) Significant emission reduction from UKCS oil and gas production, delivered via regulatory co-operation that facilitates decarbonisation of exploration and production operations.

2) Immediate reductions in production related emissions from improved production efficiency, energy efficiency, operational processes change, consideration of fuel use and equipment upgrades.

3) Investment and deployment of new technologies that allow for a step-change in emissions reductions, in particular platform electrification or other localised solutions.

4) Phasing out of high-emission assets that are unable to economically or technically reduce emissions at prevailing carbon and commodity prices.

5) Phasing out of routine flaring and venting with a reduction of 30%, over and above natural decline, improving gas recovery and implementing new flare management plans. Individual asset owners will work to accelerate the commitment to support the World Bank Zero Routine Flaring by 2030 initiative.

6) Earlier alignment of UKCS with global methane standards through the implementation of a Methane Action Plan, incorporating enhancement quantification and measurement, followed by systematic programme of reduction of platform and fugitive emissions.

Flaring and Venting

Gas is flared at both onshore and offshore assets as part of the production process, both as routine flaring for disposal of waste gas and sometimes for safety reasons. Flaring and venting are recognised to be major sources of methane emissions which the industry has committed to reduce in line with the World Bank 'Zero Routine Flaring by 2030'.[22] A significant reduction is required to meet these 2030 targets and to achieve net zero emissions by 2050.

The sector is developing an action plan on methane which aims to promote the continuous reduction in methane emissions, establish a UKCS baseline and related methane specific emissions reduction target. The Methane Action Plan supports the World Bank Initiative and seeks to share best practice across the industry, for example: zero routine flaring in the design of newbuilds; improved gas recovery in field development plans; the development and implementation of flare management plans.

Electrification of Offshore Assets

Achieving ambitious emissions reduction targets will ultimately require a step change in emissions performance by focusing on reducing or removing the largest sources of upstream emissions. These arise from hydrocarbon fuelled electricity generation, process heat generation and direct powering of gas compression and pump systems.

Step-change abatement options under consideration include the full or partial electrification of offshore assets by connection to onshore power networks in the UK or Norway, potentially also including linking to offshore renewables and the creation of integrated energy hubs.

The electrification of offshore assets could unlock energy integration on the UKCS supporting not only oil and gas decarbonisation but also benefiting and supporting growth in other offshore sectors such as offshore wind development and green hydrogen through the energy hubs they create and the infrastructure they provide.

Significant investment will be required in technology, offshore renewable resources and infrastructure to facilitate offshore electrification of either existing or new assets. This is a major undertaking and is likely to take a decade to deploy at scale. It may be the case that some

[22] https://www.worldbank.org/en/programs/zero-routine-flaring-by-2030

existing assets can be fully decarbonised whereas it may ultimately only be feasible to partially decarbonise others.

Unlike the other routes to emission reduction, which will be largely incentivised through higher carbon prices, electrification of existing offshore assets remains commercially challenging.

An estimated £15 billion investment is required in offshore transmission infrastructure to connect an additional 30GW of offshore wind between now and 2030. There is a high degree of alignment between future offshore wind zones and existing oil and gas infrastructure. There is an opportunity for coordination between different types of infrastructure to improve the commercial case for electrification as well as reducing the burden of any offshore transmission infrastructure on the environment and coastal communities.

The range of projects includes full or partial electrification of brownfield assets, development of fully electrified greenfield projects and integrated energy projects, with cost estimates per project ranging from £0.2 billion to £2 billion or higher for the largest projects. The expected emission reduction opportunities from these projects vary from 40,000 to 2 million tonnes of CO_2 per annum per project.

To deliver the 50% emission reduction target by 2030, it is estimated that between £2-3 billion of investment will be required to allow the completion of at least one or two of the currently identified electrification projects. Pace will be needed to deliver these projects by the required deadlines to meet the timetable of emissions reduction commitments. This will need an alignment of interests and incentives between industry and government and with other energy users of the North Sea.

The Government will work with the sector to identify potential funding sources and opportunities for early-stage offshore electrification studies (at concept and FEED stages) that businesses could bid into, on a match-funded basis. The government will commit to working with the sector to explore the economics of electrification and work to identify the most cost-efficient options for the electrification of its assets, considering the upfront capital costs and the cost of power from electricity transmission and network charges and exposure to other levies. The OGA will promote the adoption of cost-effective electrification opportunities via the provisions in its new Strategy.

The government will lead further work to explore how regulatory or legislative barriers to electrification and large-scale offshore energy integration projects can be reduced. Government will establish an Offshore Implementation Group for the energy transition, led by BEIS and including senior representation from Ofgem, the Crown Estate, OGA, OPRED, HSE, Marine Scotland and the Crown Estate Scotland. This will be a time-bound task-and-finish group which will commit to meet within the first month of publication of the Deal. The government will seek alignment of policy between the regulators in support of offshore electrification, so that barriers to platform electrification development and offshore electricity networks are identified and dealt with quickly and effectively across all regulators and policy makers.

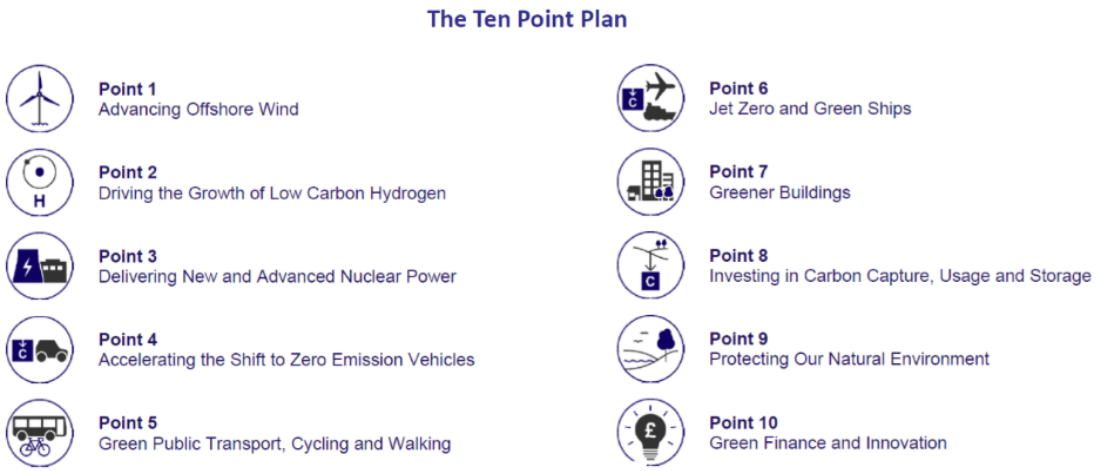
There are increasing demands on the marine area including ambitions around climate, food security and transportation/communication. Carbon capture and storage is one of the many government ambitions for the UK's area. These ambitions include those set out in the Ten Point Plan (see Figure 1) which highlights the need to 'Advance Offshore Wind' and to protect our natural environment. Regulators will, when making decisions in the marine environment, take into consideration these ambitions as well as having regard to other directions like the Marine Policy Statement and subsequent Plans, the UK Marine Strategy (and good environmental status) and Fisheries Act.

Carbon Capture Utilisation & Storage (CCUS)

Investments in key technologies like hydrogen and CCUS, together with broader interventions, such as through helping people to retrain, will be crucial to enhancing local economic growth and creating jobs. The government has committed to working with local government and businesses to consider how an integrated strategic approach can most effectively be developed to enable local places to capitalise on this opportunity to build back greener. Supporting the delivery of four low-carbon clusters will enable greater decarbonisation, leading the way for a more sustainable industry.

The government has created the Carbon Capture and Storage Infrastructure Fund (CIF) to commit the investment needed to realise this opportunity. In his Budget of March 2020, the Chancellor committed at least £800 million through the Fund to support CCUS deployment. As announced in the Prime Minister's Ten Point Plan, government is now raising our commitment to £1 billion up to 2025 to facilitate the UK's deployment of operational CCUS in four industrial clusters by the end of the decade. This new carbon capture industry could support up to 50,000 jobs in the UK by 2030.[23] Developing carbon transport and storage infrastructure will require large upfront capital expenditure, to construct offshore and onshore pipelines and develop storage sites and wells. The government will help to put in place this critical network, as the foundation for the scaling up of CCUS across the UK.

[23] The estimate for CCUS jobs set out in the Ten Point Plan publication includes all parts of the CCUS sector including export opportunities and is not directly comparable with other jobs estimates in this document.



The government will use the CCS Infrastructure Fund to facilitate the deployment of CCS in two industrial clusters by the mid-2020s, subject to value for money and affordability constraints, and a further two clusters by 2030, supporting our ambition to capture 10MtCO_2 per year by the end of the decade.

For the majority of industrial sectors, CCUS is not yet a viable investment. The market currently does not provide a sufficiently robust price signal to make industrial carbon capture viable. In addition, low-carbon products do not attract a price premium, making investment harder to justify without a support mechanism. It can be hard for early investors to fully reap the benefits of learning and innovation which is generated from backing this first-of-a-kind technology. The government will therefore design and implement a business model to provide revenue support and improve companies' confidence for investing in carbon capture solutions. The government will also aim to finalise a new commercial framework by 2022.

As part of the Deal, the oil and gas sector will help lead the development of CCUS technology by leveraging existing oil and gas infrastructure to provide transport and storage (T&S) facilities. These T&S hubs will enable CO_2 to be captured at various locations, including the industrial clusters undergoing decarbonisation throughout the UK. In addition to those hubs already under development, there is significant potential for the initial locations to be expanded and other sites to be considered for development, particularly where there is the potential to build out CCUS infrastructure in line with hydrogen projects.

Where technically and economically feasible, offshore asset operators will also identify specific assets for reuse to provide these facilities and reassess asset end of life planning to deliver support for CCUS deployment. The UK's ambitions to develop four initial CCUS industrial hubs across the UK can be enhanced by developing the right infrastructure based on the re-use of existing oil and gas pipelines, plants and assets.

The industry will also foster cross-sector cooperation to develop capture facilities for a variety of applications. These anchor projects will ensure that infrastructure is developed at an appropriate scale and improve understanding of the attainable CO_2 capture rates and possible mechanisms by which they can be improved. Collaborative efforts across industry will enable the UK to accelerate CCUS development and reduce deployment cost. This cost-saving will

ultimately benefit the consumers and end-users of various industries and help position the UK as a world leader in this space.

Developing suitable sites offering transportation and storage will be key to unlocking CCUS more widely across the UK including industrial capture projects. With an appropriate business model for both the capture and use as well as the transport and storage, each unit of T&S capacity delivered will help enable capture projects with a multiple of 3-4 times in terms of local economic impact. A reliable T&S network will also help the UK offer an internationally accessible carbon storage resource.

The oil and gas sector believes that a combination of the £1 billion funding and the development of the regulatory regime set out by BEIS will help address many of these challenges. If successful these actions will unlock £2 billion-£3 billion in investment that could deliver 6,600 direct and indirect jobs, across all of the clusters to be developed by 2030. The opportunity for the local supply chain is also significant given the capability overlap between the existing oil and gas industry and the future CCUS industry and could be underpinned by dynamic and voluntary industry commitments around local content as capability develops.

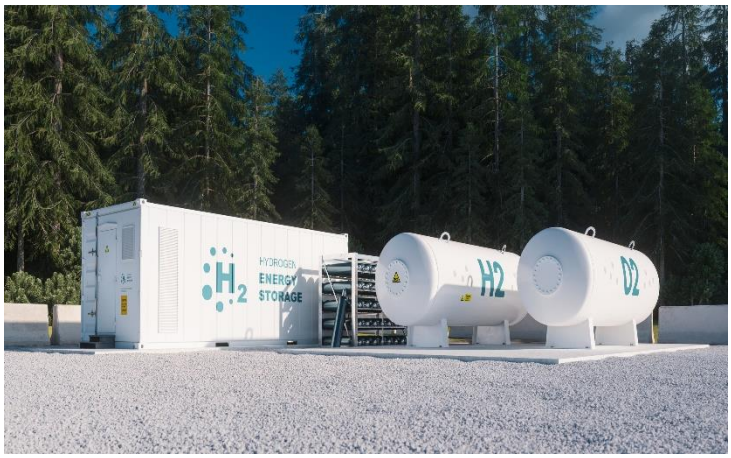
At least 10MtCO_2 per annum of transport and storage capacity will enable the abatement of a variety of difficult to decarbonise industrial sources such as natural gas combustion for high grade heat, process emissions (e.g. steel or cement), or emissions from reforming natural gas to produce hydrogen. As described above, the clusters where this infrastructure is targeted will have sufficient capacity to grow rapidly once the market is established, and in some cases will even be able to offer the facility to import carbon dioxide from overseas.

The UK is in a strong position to become a global technology leader in CCUS. The UK has the opportunity to develop a domestic supply chain by utilising the expertise of our existing oil and gas industry. Innovative start-up companies, spun out of the UK's world-class academic institutions, are focused on driving cost reductions and creating new UK-based innovative carbon capture technologies. With the potential to store more than 78 billion tonnes of carbon dioxide, the UK can be a global leader in carbon storage services.

Deployment of CCUS could create new markets for UK businesses, at home and abroad, as other countries look to meet their emissions reduction commitments. Action now can harness the UK's strengths in engineering, procurement, construction, and management services, with export opportunities from CCUS estimated at £3.6 billion by 2030.

Hydrogen

The Deal will position the oil and gas sector to develop and support the deployment of hydrogen production capacity in the UK. As a gas that can be used as a fuel without emitting harmful greenhouse gasses at the point of use, hydrogen will be critical in reducing emissions from heavy industry, as well as in power, heat and transport. When heavy goods transport or a process such as steel production relies on fuel for energy, hydrogen can provide a crucial, low-carbon alternative to fossil fuels.



The Prime Minister's Ten Point Plan and the Energy White Paper confirmed our commitment to publish the UK's first ever Hydrogen Strategy, which the government will bring forward in the first half of this year. The Strategy will detail the key steps needed in the 2020s to deliver our 5GW ambition and set the context for further scale up on the way to net zero in 2050. This will provide a clear long-term signal that government is committed to building a world leading UK hydrogen economy, and set out the detail of how the government will work with industry – including the oil and gas sector to achieve this.

To achieve this growth in hydrogen it is expected that up to £4 billion of capital investment will need to be unlocked to develop the hydrogen production projects to deliver 5GW of clean hydrogen production capacity in 2030, equating to 42TWh/y, and supporting up to 8,000 direct jobs by 2030[24] across our industrial heartlands and beyond.

Action now to deploy hydrogen during the 2020s will stimulate domestic supply chains, enabling UK businesses to capture increasing international demand for hydrogen goods and services. Ensuring this happens will be an important part of the UK's forthcoming Hydrogen Strategy.

The exact mix of different end uses for clean hydrogen in 2050 will depend on a variety of factors including cost, availability and technical application. Action is needed now to enable hydrogen to be deployed flexibly in the future. The UK will need production at scale by 2030 to provide assurance on safety, security cost and the potential for emissions reduction, before the UK can scale up even further during the 2030s. To put the UK on this pathway, the oil and gas industry is well positioned to enable the production of low-carbon hydrogen at scale as part of a long-term competitive market. There is a growing range of initiatives and a pipeline of

[24] These estimates set out in the Ten Point Plan publication are not directly comparable with other estimates in this document.

projects with respect to hydrogen development including those that are aligned to the main CCUS cluster locations.

The government will create a Net Zero Hydrogen Fund to support low-carbon hydrogen production, providing £240 million of co-investment out to 2024/25. The Net Zero Hydrogen Fund will deliver a major boost to production capacity, ensuring that clean hydrogen can be utilised for decarbonising industrial clusters, kick starting an expanded UK hydrogen economy that can play its role in delivering net zero. However, achieving our 2030 ambition for clean hydrogen will also require the right commercial frameworks which encourage sustained private sector investment. The government will put the necessary building blocks in place now to provide confidence that clean hydrogen can be produced reliably and cost-effective. The government will introduce a commercial framework by 2022, which enables project sponsors of all types of clean hydrogen to finance their projects. The government will consult on the preferred model in 2021.

The UK is already a world leader in investigating the use of hydrogen for heating, replacing fossil fuels like natural gas with hydrogen and hydrogen blends. The government are keen to accelerate this work by working with the oil and gas sector and others.

Both the government and the gas industry are currently running major studies and testing projects. The government will increase the funding available for testing and trialling projects, working with the industry to ensure that the overall programme of work is comprehensive and fully coordinated. A range of further research and development (R&D) and testing projects is required, including an assessment of the options for major new hydrogen infrastructure, such as gas transmission networks and inter-seasonal storage. Hydrogen will be one of the ten key priority areas in the £1billion Net Zero Innovation Portfolio.

Trials of hydrogen will also be key to evaluating the practicalities of converting existing boiler appliances and the way in which consumers experience hydrogen for heating in their own homes and workplaces. The government will support wider UK industry to begin a Hydrogen Neighbourhood trial by 2023, and a large Hydrogen Village trial by 2025. The knowledge and experience gained in delivering trials in communities, together with the results of our wider R&D and testing programme, will enable strategic decisions around the mid-2020s over the long-term role of hydrogen for heating and develop a plan for a potential Hydrogen Town before the end of the decade.

To facilitate the transition and development of the gas network, the government will continue to work with the HSE to enable up to 20% hydrogen blending on the network by 2023. This is subject to the success of testing and trials.

Supply Chain transformation

Over the last five decades as the UK has benefitted from its offshore oil and gas resources, a supply chain of world renown has developed, servicing the industry's needs both domestically and abroad. The supply chain has advanced in clusters around the main centres of offshore activity in North-East Scotland, the North of England and East Anglia, building on the UK's previous strengths in marine and maritime engineering and broader heavy industrial engineering capabilities.

The oil and gas supply chain has grown to be a valuable component of the UK economy which has gained the skills to be competitive on the world stage. It supports around 147,000 direct and indirect jobs in the UK and contributes c.£28 billion to the UK economy, including around £12.7. billion in exports 2019[25]. The oil and gas supply chain has historically been a powerhouse for innovation and employment in the UK economy. With targeted support it can pivot to bring that same innovation to meet the needs of the energy transition whilst building from its base capabilities developed by servicing the needs of the UK's domestic oil and gas sector.

Diversified Supply Chain

There are already signs of diversification with oilfield service companies generating around 27% of revenue[26] (in 2018) from non-exploration and production revenue streams. Recent OGUK member surveys indicate that as many as half of supply chain companies already provide goods and services to other sectors.

The UK oil and gas supply chain already has the necessary expertise and proven capabilities to service the needs of the energy transition both at home and abroad, putting the UK in a uniquely competitive position.

However, a new approach to transformation and capability development will be required to develop an all-energy, UK-based supply chain that can deliver decarbonisation at scale to meet the net-zero target. Current assessments show that the UK supply chain can provide some of the skills, capabilities and expertise needed to deliver the outcomes identified in the Deal – decarbonising traditional oil and gas production by offshore electrification, providing low carbon hydrogen, and safely capturing, transporting and storing carbon. Given the different

[25] EY, (2021). The 10th EY annual review of the UK oilfield services industry, https://www.ey.com/en_uk/energy-resources/how-accelerating-energy-transition-will-shape-the-industry
[26] EY (2020). Oilfield Services Report https://www.ey.com/en_uk/oil-gas/ninth-annual-review-of-the-uk-oilfield-services-industry

nature of some of the investments required to support the Deal there is scope for contractor companies, alongside traditional investors and infrastructure businesses, taking a lead in drawing together the consortia and funding required. The sector will seek to link up with supply chain initiatives in other sectors (such as offshore wind), where this will add value.

Supply Chain Consortia

This step-change in the role of the supply chain to drive decarbonisation at scale will require support from both industry and government. Supporting UK supply chains at these early stages in the development of the energy markets and technologies of the future will be key to anchoring existing skills and high-quality jobs in the UK and will provide energy security and resilience in the face of global competition.

The supply chain will create the consortia that can lead the development of competitive low carbon solutions and deploy them at scale in the UK and internationally, making the most of the technology, innovation and expertise that has built the UK supply chain's international reputation within the oil and gas sector. These are the companies that will emerge as the low carbon supply chain of the future.

There are few energy supply chain giants in the UK and creating such supply chain led consortia with appropriate government support and funding will bring together the critical skills, technology, and capability to win business in the energy transition.

Access to government research, development and innovation funding that companies and consortia can bid into with matched funding will substantially grow the pipeline of projects reaching investment sanction both before 2030 and beyond, to the wider benefit of the UK economy. The consortia established by the oil and gas sector's supply chain should reflect the broader nature of the supply chain and provide opportunities for all sizes of businesses to work together on the emerging opportunities. These groupings will leverage the UK's capability to deliver net zero projects and secure supply chain diversification and export opportunities, and where necessary underpinned by government and industry funding to help manage investment risks.

The establishment of supply chain consortia enables balance sheets, skills, technologies, and capability to be pooled whilst business and technical risks are more effectively mitigated. Kickstarting such supply chain consortia will accelerate the movement into these new energy markets.

Net Zero Innovation Portfolio

The Prime Minister's Ten Point Plan announced a new £1 billion Net Zero Innovation Portfolio that will help bring down the cost of the net zero transition, nurture the development of better products and new business models, and influence consumer behaviour.

This fund aims to accelerate the commercialisation of innovative low-carbon technologies, systems and processes in power, buildings and industry to set the UK on the path to net zero and create world-leading industries and new jobs. The portfolio will focus on ten priority areas to decrease the costs of decarbonisation and underpin innovation across the whole energy system. Priority areas will include floating offshore wind, hydrogen and advanced CCUS.

As well as accelerating the commercialisation of novel clean energy technologies, innovation also plays an important role in driving economic growth, anchoring new technology to the UK, levelling-up opportunities across the country and reducing our significant exposure to the risks of climate change.

An ambitious and well-designed energy innovation strategy could, by 2050, annually generate £54 billion of business opportunities for the UK. The current BEIS £505 million Energy Innovation Programme is delivering some of the UK's most significant advances in low-carbon technologies, leveraging £200 million industry investment, including the UK's first CCUS plant at Tata Chemicals, Cheshire (£17 million total investment).

Prompt Payment Code

Late payment causes real hardship to smaller businesses, and the issue is more prevalent than ever due to the continued impact of the pandemic. It is important for businesses of all sizes but particularly larger businesses, to demonstrate their commitment to ending the culture of late payment and helping to increase business confidence.

In January, the government announced the reformed Prompt Payment Code. Under this Code, business signatories will, in addition to their current public commitment to pay 95% of all payments to their supply chain within 60 days, have committed to paying 95% of their small business suppliers within 30 days. The government commends all businesses to go further than this.

Under the industry's Supply Chain Principles, companies are encouraged to pay suppliers promptly for their services. These principles also recognise the flexibility that companies may choose to include in their payment terms for commercial reasons and respecting that

companies should follow the terms within which they contract services. Beyond these principles OGUK will champion the adoption of the government's Prompt Payment Code within its constituent companies.

Driving UK Industrialisation

The sector will leverage supply chain capability mapping to understand where the UK supply chain can realistically deliver energy transition and decommissioning projects, considering their competitive position both in relation to the domestic market and internationally. In parallel, the government will develop its understanding of the capability required to deliver the energy transition.

The government will deliver the energy transition, including work to assess the scale of the opportunity for companies in the emerging CCUS and hydrogen sectors. In addition, the government will look to increase the visibility of the pipeline of clean growth projects in order to support the supply chain to assess forthcoming opportunities.

Based on existing knowledge, the sector will commit to voluntary targets for the proportion of UK content within an overall lifecycle of at least 50%, playing on UK strengths in project design, installation, integration and lifecycle operations. It is also proposed that a voluntary target of a minimum of 30% locally provided technology content is incorporated in all low carbon projects to reinforce the growth of domestic capabilities and the development of low carbon solutions that industry-led consortia can help foster.

Supply Chain Representation

The role of the UK energy supply chain needs more profile. Strengthening UK capability to service domestic needs as well as being positioned to compete effectively in the global market will need to be included within the considerations of future trade deals. By appointing a supply chain champion who will represent the energy supply chain, there will be a welcome focal point, enabling the coordination of activities across government, and with export focused bodies to support the UK supply chain.

Department for International Trade (DIT) strategy for the energy transition

The shifting global landscape, the increasing complexity, the deepening interrelatedness of technologies and markets have together shaped a different environment, within which DIT must deliver the government's energy trade and investment ambitions. DIT has traditionally focussed strongly on direct trade and investment support – this will continue across the government's global network - but often the 'full and long-term economic value' of that approach is not captured within the transactional, short-term nature of this focus. When considering value to the UK in the round other factors also become important including:

- Sustaining and growing key skills and capacities for the long-term
- Enhancing UK's ability to compete internationally
- Building national resilience in the face of unforeseen events
- Maintaining the security, affordability, and sustainability of energy supply
- Creating new jobs and innovation opportunities.

The energy transition has created a once-in-a-generation opportunity and DIT is ideally placed to use its international networks, corporate relationships, and market knowledge to be a major contributor to the building of a lasting and sustainable energy sector in the UK.

DIT's vision is clear: maximise the investment, growth, and export potential of the energy transition.

Government's contribution to achieve this will be to:

- Support efforts to ensure Free Trade Agreements (FTA) and other trade policy mechanisms are as supportive as possible of clean energy, with a focus on creating an exemplar 'green' FTA.
- Work directly on ambition-critical and high-profile investment and export projects resulting from our work to 'make markets'.
- Develop government to government relationships with a small number of priority markets in an effort to drive market-making activity and create pull for UK solutions.
- Informed by transition mapping and Prosperity Fund pilot projects, proactively engage with the design and delivery of relevant technical assistance programmes, supported by non-ODA resource.
- Create high-quality marketing and promotional materials to support the DIT network in messaging to buyers and suppliers.
- Work with BEIS and industry to map current and future skills needs and develop a plan to protect and grow UK energy skills, linked to the timescales and ambition for low-carbon solution deployment.
- Work with BEIS to ensure UK supply chain development is central to domestic policies supporting the deployment of low-carbon energy technologies.
- Work with domestic policy makers on sector-specific issues that impact on current and future investment and export ambitions.
- Work with suppliers in neighbouring and traditional industries and support their access to domestic clean energy projects, helping them to build competitive cost and quality propositions.
- Implement a streamlined approach to account and stakeholder management, taking a pan-energy approach wherever possible.
- Support supply chain sustainability and resilience, including a focus on the carbon intensity of these supply chains.

- Develop a new approach to working with UK Export Finance, including joint account management of key companies, a shared pipeline and upskilling of DIT staff.

People & Skills

The people and skills commitments of the Deal outlines some of the crucial steps needed to ensure that industry can retain and attract talent within the hydrocarbon industry as well as the new low carbon sectors and how it will support the workforce to transition between these. It sets out clear actions for both industry and government to work collaboratively together to achieve the commitments.

Oil and gas and heavy industry are some of the sectors most exposed to the energy transition. These industries are distributed across the UK, concentrated in regions such as North East Scotland and Aberdeen, North of England and East Anglia, and could be vulnerable to a transition of this scale.

Scotland for example is still significantly dependent on the oil and gas industry, with over 10% of workers in Aberdeen directly employed by the sector. Poorly managed, the transition may have serious impacts on the broader local economy.[27] but workers in this sector have a crucial part to play in the transition, at least 68% of the UK's oil and gas workers have skills that could transition to the low carbon sector.

Green Jobs Taskforce

In 2019, the UK set a world leading target of reaching net zero emissions by 2050. This transition will transform our economy and require changes across our transport and energy systems, the way in which we construct and heat our buildings, industrial processes and our land, agriculture and food.

The Prime Minister has set out the government's determination to build back better and greener from COVID-19 and announced our Ten Point Plan to tackle climate change and drive a green industrial revolution. It will mobilise £12 billion of government investment to support up to 250,000 highly skilled green jobs in the UK, and spur over three times as much private sector investment by 2030.

The Green Jobs Taskforce forms part of the Ten Point Plan and will set the direction for the jobs market as the UK transitions to a high skill, low carbon economy. The taskforce will focus on the immediate and longer term challenges of delivering skilled workers for the UK's transition to net zero.

[27] IPPR (2020). Net Zero North Sea: A managed transition for oil and gas in Scotland and the UK after Covid-19, December 2020. http://www.ippr.org/research/publications/net-zero-north-sea

The Taskforce is chaired by the Minister of State for Business, Energy and Clean Growth, Anne-Marie Trevelyan, and Parliamentary Under Secretary of State for Apprenticeships and Skills, Gillian Keegan.

The priority focus areas for the Taskforce are to:

1. Support a Green Recovery and ensure the UK has the immediate skills needed.
2. Develop a long-term plan that charts the skills needed to help deliver a net zero economy focusing on the next decade.
3. Ensure green jobs are goods jobs and open to all.
4. Support workers in high carbon sectors to transition and retrain.

Oil and Gas Sector Workforce

The UK's offshore oil and gas industry is a source of significant employment, with OGUK calculating that approximately 260,000 jobs were supported in 2018, of which around 147,000 were in direct and indirect employment in the oil and gas sector[28]. As a mature hydrocarbon basin, it is forecast that production from the UKCS and investments in new developments will gradually decline over the coming decades. This will have an impact on employment in the sector, likely resulting in a corresponding decline in workforce numbers.

Based on the Roadmap 2035 production profile forecasts, OGUK estimates that over 190,000 people may still be supported by the industry in 2030 (with around 105,000 of these in direct and indirect employment). Although this is still a significant workforce, it does represent a decline compared to today's figures.

Arguably, the rate of attrition accelerated in 2020 due to the difficult business environment as the sector tackled the combined issues of COVID-19, low gas prices and low and volatile oil prices. OGUK estimated that up to 30,000 jobs could be lost by the end of 2021[29].

Many of the skills present in industry today are transferrable across the wider energy spectrum. Offshore renewables, as well as the future CCUS and hydrogen industries, will rely heavily on many of the current skillsets in the oil and gas industry such as geologists, project managers, a wide variety of engineers and craftspeople. A carefully managed transition will help to ensure that the UK retains people with these key skillsets, so that they can help unlock these vital and emerging low carbon sectors.

[28] OGUK (2019)., Workforce Report, 2019. (Figure from 2018). https://oilandgasuk.co.uk/wp-content/uploads/2019/08/Workforce-Report-2019.pdf
[29] OGUK (2020). Workforce Insight 2020, https://oilandgasuk.cld.bz/Workforce-Insight-2020

The Energy Transition

It is estimated that up to 40,000 direct and indirect supply chain jobs could be supported as a result of the investment outlined in the Deal. These jobs represent opportunities for the current oil and gas workforce to transition into, as demand for their current roles in the oil and gas industry wanes with production decline. It also represents opportunities for new entrants into the energy sector.

Equality of Opportunity

To attract and retain diverse talent, the sector needs to ensure it is also an inclusive and appealing place to work and therefore a sustained focus on diversity and inclusion in the workplace will be vital.

As an industry, the oil and gas sector does have some way to go in terms of improving representation of underrepresented groups in its workforce and becoming more reflective of modern UK society.

To truly reap the benefits of a diverse workforce, it is critical to ensure that an inclusive working environment is created, enabling every individual in an organisation to participate, contribute and achieve their full potential. As well as benefitting individuals, good diversity and inclusion practice also has benefits for businesses; according to the CIPD, the three main benefits include talent retention and acquisition, market competitiveness and corporate reputation.

Recognising the need for improvements in this area, the following actions are taking place:

- Industry is currently conducting a survey to test and understand sentiment within the sector's workforce which will be used to create an Inclusion Index to identify areas for improvement.
- In 2021, industry will run an employer survey to understand the sector's current demographics and establish a baseline. The questions will seek to gain an understanding of the workforce's current makeup in terms of gender, ethnicity, age, disability, and sexuality. Key findings and a list of recommended actions to help improve diversity will be published with follow-up surveys to be run throughout the decade at agreed intervals to measure progress and change.

- The sector is committed to ensuring everyone working in the industry – whatever their background – has the opportunity to unleash their potential.
- The government will work with the oil and gas industry, alongside others, to ensure that equality of opportunity will be considered from the outset as the UK hydrogen and CCUS sectors are developed, starting with appropriate representation of groups at HMG/industry boards.

Post Graduate training

The Centre for Doctoral Training's (CDT) GeoNetZero (GNZ) programme, focuses on geoscience and its role in the low carbon energy transition and the challenge to meet net-zero emissions targets. The programme is a PhD course focused on progressing the transition to a low carbon energy economy through geology-focussed projects and theses.

Industry and academia have already pledged initial support to this newly formed scheme by contributing £7.5 million to set the programme up via £5 million towards PhD research scholarships and £2.5 million to underpin an accompanying bespoke 20-week training programme. The research funding will cover the costs for a total of 48 students who will participate and complete the programme in three annual cohorts starting in 2020-22. The first cohort, which had space for and successfully recruited 16 students, received over 260 high-quality applications; the second cohort received over 350 high-calibre applications and has led to a further 16 students being recruited in 2021. This demonstrates the huge appetite for this programme and underlines that it is at present significantly underfunded.

The government will work with the CDT to help ensure more students can benefit and, in turn, bring their expertise into the workforce to address the low carbon energy transition, extend the life of the North Sea by overseeing the re-purposing of existing infrastructure and ensure that the basin attains its net zero emission targets.

Cross Energy Skills

It is widely accepted that the oil and gas workforce possess many of the key skills and expertise that will be needed to support the CCUS and hydrogen sectors. However, a better understanding of the future skills profile is crucial to ensuring that the developing CCUS and hydrogen sectors both have access to a skilled workforce. Such profiling will increase the visibility of skills needed in all three sectors as well as highlighting potential shortages, surpluses, and opportunities for role transfer, thereby helping to ensure that demand can be met across the board.

The Energy Skills Alliance (ESA) is championing this work through its Future Energy Skills Demand workstream, which seeks to map the energy sectors' current capabilities and future requirements. This work is set to be completed in 2021, after which it will be critical for businesses, academia and governments to carefully consider how they can work collaboratively to ensure that this demand is met.

This work will be supported by a focused Integrated People & Skills Plan for the oil and gas sector. The findings of this detailed plan will be fed into the ESA's workstream.

The sector is committed to ensuring that roles within the sector, both existing and future, are of good quality and so OGUK is committed to working with its members and union representatives to ensure the UK's high employment standards are promoted across industry.

Governance of the Deal

Oversight of the implementation of the North Sea Transition Deal will be led by a delivery group, which will review progress against objectives at quarterly meetings. The delivery group will be chaired by an industry representative of the North Sea Transition Forum (NSTF) and BEIS and supported by a small Project Management Office hosted by OGUK.

The governance for the North Sea Transition Deal will build on the existing tripartite mechanism involving government, industry, OGA and the North Sea Transition Forum, which meets twice a year. The Forum, supported by its steering committee, will set the strategic direction for the sector and will also be accountable for the delivery of the Deal, including the review and approval of the work programme.

Once the Deal enters the implementation phase, representatives of the Delivery Group will report on progress bi-annually to BEIS Ministers responsible for the Deal. The Forum will be responsible for reporting to the government on delivery at regular intervals.

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Glossary

BEIS	Department for Business, Energy and Industrial Strategy
CCS	Carbon Capture and Storage
CCC	Climate Change Committee
CCUS	Carbon Capture Utilisation and Storage
CDT	Centre for Doctoral Training
CIF	Carbon Capture and Storage Infrastructure Fund
CIPD	Chartered Institute of Personnel and Development
COP26	Conference of the Parties to the Convention on Climate Change
DIT	Department for International Trade
D&I	Diversity and Inclusion
E&P	Exploration and Production
ESA	Energy Skills Alliance
FEED	Front End Engineering Design
FTA	Free Trade Agreement
GNZ	Geo Net Zero
GVA	Gross Value Added
GW	Gigawatt
HSE	Health and Safety Executive
IGEM	Institute of Gas Engineers and Managers
JVs	Joint Ventures
KPIs	Key Performance Indicators
Mt	Megatonne
NSTF	North Sea Transition Forum
ODA	Official Development Assistance

Ofgem	Office of Gas and Electricity Markets
OGA	Oil and Gas Authority
OGCI	Oil and Gas Climate Initiative
OGTC	Oil and Gas Technology Centre
OGUK	Oil and Gas UK
OPITO	Offshore Petroleum Industry Training Organisation
OPRED	The Offshore Petroleum Regulator for Environment and Decommissioning
RIIO 2	Revenue Incentives, Innovation and Outputs
R&D	Research and Development
RD&D	Research, Development and Deployment
ROV	Remote Operated Vehicles
SDI	Scottish Development International
SMEs	Small and Medium Enterprises
SNS	Southern North Sea
T&S	Transport and Storage
TWh/y	Terawatt-hours per year
UKCS	United Kingdom Continental Shelf
UKEF	United Kingdom Export Finance

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