

# The Future of the North Sea

## Maximising the contribution of the North Sea to Net Zero and Levelling Up

William Nicolle, Benedict McAleenan and Ed Birkett

Foreword by Ben Houchen, Mayor of Tees Valley





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# Foreword

By Ben Houchen  
Mayor of Tees Valley

The North Sea is integral to the way of life of many on the UK's east coast, supporting good jobs in shipping, fishing, and oil and gas. As the UK heads for Net Zero, the North Sea is starting to offer new opportunities in emerging industries like offshore wind, low-carbon hydrogen and carbon capture and storage. Coastal regions such as those on the east coasts of England and Scotland are ideally placed to benefit from the coming renewable energy boom. This important new paper sets out the concept of a 'Net Zero Triangle' between Humberside, Leeds and North East England which, together with key industrial hubs in Scotland, could lead the way to a prosperous clean economy.

Over the last few centuries, the North Sea economy has constantly reinvented itself. The fishing industry is not as big as it used to be, but it still plays a key role in local communities up and down the North Sea coast, something that can be strengthened as the UK takes back control of its waters at the end of this year. Since the 1960s, the North Sea's oil and gas industry has provided good jobs across the UK and has helped to ensure our energy security.

In the North East, we've seen the economic benefits of oil and gas, through our chemicals and refining industries. We know that, as we approach Net Zero, these industries will need to adapt. In my own area of the Tees Valley, hydrogen and carbon capture and storage both offer new opportunities for residents and businesses, and we've welcomed initiatives such as a new world-leading centre of excellence for developing hydrogen-powered transport. Advances like this are putting the North East of England back at the heart of global innovation, just as it was at the start of the industrial revolution.

You don't need to spend much time here to know that we have access to incredible offshore wind resources in the North Sea. These giant offshore turbines offer the prospect of new clean energy jobs along the North Sea coastline. We're already starting to see this and the UK is well on its way to becoming what the Prime Minister calls 'the Saudi Arabia of wind power'.

To make the most of this surge in investment, we must make sure that local people benefit from these new energy projects. Importantly, if we do not set in place the right policies and public investments then the North East of England and the east coast of Scotland will suffer economically as oil and gas declines, while the UK will miss its Net Zero target.

This report sets out some of the challenges and opportunities for the

North Sea and coastal communities like mine in the Tees Valley. We know that development in the North Sea needs to be properly planned so that we can maximise the opportunities and jobs that come from Net Zero. It is also crucial that local people benefit from the transition to Net Zero, so I'm pleased to see that Policy Exchange has recommended Community Benefits Funds for new offshore wind farms, among other investments that would help us to make the most of this economic boost.

If we get this right, there's a huge opportunity for the North Sea to contribute to cleaning up our energy system whilst levelling up the UK.

**Ben Houchen, Mayor of Tees Valley**

# Glossary of Terms

| Term   | Definition  |
|--|---|
| Bioenergy with Carbon Capture and Storage (BECCS)            | BECCS plants burn biomass to produce electricity. The resulting carbon emissions are captured and stored underground. If sustainable biomass is used, then BECCS can have negative greenhouse gas emissions.        |
| Blue hydrogen  | Hydrogen produced from fossil fuels, with the resulting CO <sub>2</sub> emissions captured and stored. Blue hydrogen is considered 'low-carbon hydrogen'.   |
| Committee on Climate Change (CCC)                            | Independent statutory body advising the UK Government and Devolved Administrations on emissions targets and preparing progress reports to Parliament.   |
| Carbon capture, utilisation and storage (CCUS)               | CCUS is an emissions reduction process that involves capturing CO <sub>2</sub> produced by industry. This CO <sub>2</sub> is then either used or stored securely underground.                                       |
| Contracts for Difference scheme (CfD)                        | A subsidy scheme for renewable energy generators in Great Britain. A CfD provides generators with a guaranteed fixed price for electricity generated. CfDs are awarded through competitive auctions.                |
| Carbon dioxide (CO <sub>2</sub> )                            | CO <sub>2</sub> is the main greenhouse gas. The vast majority of CO <sub>2</sub> emissions come from the burning of greenhouse gases.   |
| Carbon dioxide equivalent (CO <sub>2</sub> e)                | CO <sub>2</sub> e is a term used to account for the basket of greenhouse gases and their relative impact on climate change compared to CO <sub>2</sub> . Other greenhouse gases include methane (CH <sub>4</sub> ). |
| Department for Business, Energy & Industrial Strategy (BEIS) | UK Government department responsible for business, energy and industrial strategy.  |
| Department for Environment, Food & Rural Affairs (DEFRA)     | UK Government department responsible for environment, food and rural affairs. DEFRA is responsible for environmental regulation.  |

|                             |  |
|-----------------------------|--|
| Free Port                   | An area that is inside the geographic boundary of a country but legally considered outside the country for customs purposes. Goods brought into the free port don't face import tariffs (though if they are then sent into the rest of the country for sale, they are then taxed accordingly). |
| GB electricity market       | Electricity market of Great Britain, comprising England, Wales and Scotland. Northern Ireland is part of a single electricity market covering Ireland and Northern Ireland.  |
| Green hydrogen              | The production of hydrogen using renewable electricity sources. In the UK, the term 'green hydrogen' is typically used to describe all hydrogen produced with electricity. Green hydrogen is considered 'low-carbon hydrogen'.   |
| Grey hydrogen               | The production of hydrogen from fossil fuels, typically natural gas. Grey hydrogen is a high-carbon production method, relative to green and blue hydrogen.  |
| Gross Value Added (GVA)     | GVA is an economic measure of the goods and services produced in a region or a sector of the economy.  |
| Gigawatt (GW)               | Unit of power. 1 GW = 1,000 MW.  |
| Hydrogen                    | A clear, odourless gas which is highly flammable, the most common element in the universe which can be used as a low emission alternative fuel source.   |
| Industrial Cluster          | A hub of industrial activity. In the UK, the Government has identified industrial clusters that have high concentrations of greenhouse gas emissions.  |
| Interconnector              | Electricity interconnectors are electricity cables that connect neighbouring electricity markets, for example Great Britain and France.  |
| Levelling Up                | Levelling Up is a term used by the current Government to describes economic development in poorer areas of the UK.   |
| Low-carbon hydrogen         | Hydrogen produced with very low CO <sub>2</sub> emissions. Low-carbon hydrogen includes both 'blue hydrogen' and 'green hydrogen'.   |
| Marine Protected Area (MPA) | MPAs are protected areas of the sea, where certain activities are not permitted due to their environmental impact.   |

|   |   |
|---|---|
| Marine Spatial Planning                 | Marine Spatial Planning designates areas of the sea for certain activities. MSP is the rough equivalent of the land-based planning system for the sea.  |
| Megawatt (MW)                           | Unit of power. 1 MW = 1 million Watts.  |
| Million tonnes of oil equivalent (mtoe) | A measure of energy, that is typically used to measure quantities of oil and natural gas. Quantities of natural gas can be converted to a 'tonnes of oil equivalent'.   |
| Multi-purpose interconnector (MPI)      | A multi-purpose interconnector could link two neighbouring electricity markets, via a wind farm. An MPI has two purposes: to link two electricity markets, and to connect offshore wind farms to land.  |
| Natural Capital                         | Natural Capital is a term that describes elements of the natural environment that provide benefits to humans, such as soils, water and air. It seeks to make environmental risks easier to manage by valuing environmental 'assets' and 'services'. |
| Net Zero                                | 'Net Zero' emissions describe a balance between greenhouse gas emissions produced and removed from the atmosphere, therefore creating no net impact on climate change. The UK Government has a target for Net Zero by 2050.                         |
| Offshore wind                           | Wind turbines installed in the sea. Currently, the vast majority of offshore wind turbines are 'fixed' to the seabed. In future, 'floating' offshore wind farms may become more common.   |
| Ofgem                                   | The Office for Gas and Electricity Markets (Ofgem) is the gas and electricity regulator in Great Britain.   |
| Oil & Gas Authority (OGA)               | The OGA is an executive agency of BEIS, and its role is to regulate, influence and promote the UK oil and gas industry to achieve its statutory aim of maximising the economic recovery of the UK's hydrocarbon resources.                          |
| UK Continental Shelf (UKCS)             | The UKCS is the region of seabed surrounding the UK, where the UK has mineral rights, including the rights to extract oil and gas. The term 'UKCS' is often used to refer to the UK's domestic oil and gas resources.                               |

## Executive Summary

The North Sea is strategically central to meeting the UK's target of Net Zero emissions by 2050. By fully developing offshore wind, the North Sea could provide one-third of the UK's energy needs, and this proportion will grow if low-carbon hydrogen and carbon capture, utilisation and storage (CCUS) are also fully developed. This transition could generate £20bn per year of investment in coastal regions and could lead to a net increase of 40,000 direct jobs connected to the North Sea energy industry. This would help to 'Level Up' regions along the East coast of Britain but only if the Government overcomes a number of barriers, including resolving spatial conflicts in the UK's increasingly congested seas. To address these barriers, the UK Government should bring forward a new Strategy for the North Sea.

### **The North Sea is a huge opportunity, but uncoordinated development poses a risk.**

Offshore wind is driving a low-carbon energy revolution in the North Sea. To meet Net Zero, offshore wind will need to grow alongside investment in low-carbon hydrogen and CCUS, which the North Sea is also central to developing.

However, the UK's seas are increasingly crowded and there is a risk that uncoordinated development of offshore wind farms could prevent areas of the seabed being used for hydrogen and CCUS in future. Economic development in the North Sea also poses environmental risks, for example through negative impacts on the seabed and on birds. Net Zero requires investing in new technologies and in the low-carbon networks of the future, whilst collaborating across borders to optimise the development of the North Sea. Finally, there is a huge opportunity to use the North Sea to 'Level Up' communities along the UK's coastline. However, the sheer range of technologies and the pace of development means that the Government needs a coordinated plan.

### **The Government should deliver coordinated growth through a 'Strategy for the North Sea'.**

Developing the North Sea requires a holistic approach to the full range of economic activities and necessary environmental protections. Once the Government has a coordinated vision for the North Sea, they should use markets and competitive procurement (where possible) to reduce the costs of hydrogen and CCUS, building on approaches used for offshore wind. They must also engage with international partners in the European

Union, Norway and Iceland, particularly for cross-border energy projects. In this report we have made detailed recommendations for the Government, including:

- Creating a new ‘Net Zero Triangle’ integrating Humberside, Teesside and Leeds.
- Establishing a ‘UK Seas Authority’ to coordinate offshore development and environmental protection.
- Introducing an offshore wind community benefits scheme.
- Creating a new ‘Minister for North Sea Development’.

To fully exploit the potential of the North Sea, the Government must act within this Parliament. This will accelerate the North Sea’s low-carbon energy boom, protect the marine environment, and create tens of thousands of new jobs and billions of pounds of investment in communities along the North Sea coastline.

### **The North Sea today**

The North Sea is a hub of economic activity, including oil and gas, offshore wind, shipping, fishing, electricity interconnectors, telecoms and extraction of aggregates. The North Sea was Europe’s first offshore oil and gas basin, but it is now on the decline. Production peaked around 2000 and is now half of that level. Offshore wind has the potential to compensate for the North Sea’s falling oil and gas production, and the sector has grown rapidly in the last decade. Offshore wind now provides 10% of the UK’s electricity, a figure that is expected to double by 2025 and quadruple by 2030. The North Sea is crucial for offshore wind because it hosts two-thirds of UK offshore wind farms.

The basin is also criss-crossed with oil and gas pipelines that connect the UK to offshore oil and gas production wells, as well as to Norway and continental Europe. The North Sea is now increasingly home to electricity interconnectors, which allow the UK to trade electricity with its neighbours. New electricity interconnectors to Norway and Denmark will make the North Sea an increasingly important transit corridor for low-carbon electricity.

The North Sea’s fishing industry has declined over the last 50 years, and today is a marginal economic activity. The sector is important to the economies of some coastal communities though, and could have a bright future if technological developments in aquaculture take off.

North Sea ports handle over half of all goods traded through UK ports every year, and shipping lanes in the Southern North Sea are the second busiest in the world. More trade will shift to the North Sea as Arctic sea-routes become increasingly viable due to climate change, and North Sea ports tend to have the capacity to grow more than other major UK ports like Dover.

The impacts of these activities on the marine environment is currently siloed between multiple regulatory agencies, potentially limiting the future economic potential of the basin. Individual activities or projects in the UK's seas are assessed against environmental regulations, such as the Habitats and Birds Directives, through the marine licensing system. However, these regulations are not applied consistently to all activities in the North Sea, which risks undermining protection of the marine environment. In addition, certain areas of the North Sea are protected as 'Marine Protected Areas' (MPA), which do not permit certain activities within their boundaries. However, as the basin develops, a more extensive network of well-managed MPAs would create more space for the marine environment.

To manage growing competition for space in the North Sea, more prescriptive marine spatial planning (MSP) will be needed. Our research has found that MSP is currently not prescriptive enough over what activities should be prioritised, increasing the risks of spatial conflicts in the future. Moreover, the legal language that sits behind MSP could be strengthened to ensure that it is adhered to by the relevant regulators. This would keep uses of the seabed strategically open by ensuring that in certain areas current users of the seabed do not preclude future ones, such as by installing offshore wind farms on promising CCUS sites.

### **Drivers of change**

The UK Government's commitment to Net Zero emissions by 2050 is a driving force behind the transformation the North Sea, which is currently a hub for high-carbon oil and gas but will increasingly become the engine of the UK's low-carbon economy.

The current Government has spoken extensively about its desire to 'Level Up' areas of the country that have been left behind economically. This includes many of the regions along the North Sea's coastline, presenting an opportunity to achieve the Levelling Up agenda through Net Zero.

### **The North Sea energy sector in 2050**

The North Sea in 2050 will look very different to how it does today, especially in terms of energy (Figure 1). There will be significant growth in offshore wind, carbon capture, utilisation and storage (CCUS), electricity interconnectors, and hydrogen production. Despite the continued decline of the North Sea's oil and gas industry, growth in the other areas has the potential to offset job losses in oil and gas. Our analysis finds that exploiting the full potential of the North Sea generate economic benefits of £20bn per year and could support a net increase of 40,000 direct jobs.<sup>1</sup>

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1. The job creation estimate includes potential job losses in oil and gas.



Figure 1: Vision for the North Sea in 2050

### The full potential of the North Sea

- The North Sea is strategically central to achieving Net Zero greenhouse gas emissions by 2050.
- By 2050, North Sea offshore wind could produce nearly half of UK electricity supply, and a third of UK energy supply. The North Sea will also be critical to the development of low-carbon hydrogen and CCUS.
- The North Sea has the potential to support a net gain of 40,000 direct jobs by 2050 across offshore wind, hydrogen and CCUS.
- With the right policies, these jobs and investments will accrue in priority areas for the Government's 'levelling up' agenda.

### 2050 Vision

|               |  |
|---------------|--|
| Offshore Wind | The North Sea could host up to 100 GW of offshore wind, generating nearly half of the UK's electricity needs.                              |
| CCUS          | The North Sea could sequester 100 million tonnes per year of carbon dioxide (20% of current UK emissions).                                 |
| Hydrogen      | UK hydrogen consumption could grow up to 20 times, with the North Sea providing the majority of hydrogen production (both blue and green). |
| Networks      | 5-fold increase in UK interconnector capacity. Interconnectors able to meet 25% of UK peak electricity demand.                             |
| Oil & Gas     | Remaining platforms electrified, some infrastructure reused for CCUS. Skills applied to CCUS, hydrogen and floating wind.                  |

### Policy barriers

This report identifies six potential barriers to achieving this 2050 vision for the North Sea:

1. **Spatial Planning:** The UK's seas are increasingly congested, a problem that is not helped by the UK's often 'first come, first served' approach to planning marine space. Without greater coordination, the UK will not achieve the full potential of the North Sea to deliver sustainable economic

growth and Net Zero.

- 2. Environmental regulation:** Development in the North Sea will put pressure on the marine environment. Current regulations apply more stringently to some sectors than others, which risks environmental damage and gives an unfair advantage to some sectors.
- 3. Business models for new low-carbon technologies:** The Committee on Climate Change expects new technologies, including hydrogen and CCUS, to play an instrumental role in achieving Net Zero. Without Government support or clear routes to market, these technologies may not emerge in the UK, especially in 'harder to decarbonise' use cases such as industry.
- 4. Investment in low-carbon networks:** Current approaches to energy networks have delivered new capacity to connect the first tranche of offshore wind farms. However, the scale of future offshore development now means that a more strategic approach is required to support investments in new networks and where possible rationalise infrastructure to reduce the pressure on local communities and on the environment.
- 5. Cross-border collaboration:** To fully develop the North Sea, Governments must cooperate to allocate space, to coordinate the development of cross-border energy infrastructure, and also to protect the marine environment.
- 6. Capturing economic benefits:** The North Sea's low-carbon economy is intrinsically linked to some of the UK's least well-off areas, as well as to areas vulnerable to losing out from the transition to Net Zero. As these low-carbon industries grow, the Government must ensure that the economic benefits are captured locally as far as possible.

### A 'Strategy for the North Sea'

These barriers should be tackled in a new 'Strategy for the North Sea', which will accelerate investment and jobs in North Sea regions, as well as make progress towards Net Zero.

### Key principles

We recommend four key principles to underpin a Strategy for the North Sea:

- 1. Take a holistic approach to the diverse activities in the North Sea, including regulation and use of space.** Policy should consider all uses of the North Sea holistically, rather than focusing on individual sectors and activities.
- 2. Harness the low-carbon development of the North Sea to 'Level Up' coastal communities.** The Levelling Up agenda should use the growth of the North Sea's low-carbon economy to benefit local areas. This will create jobs and

unlock investment, as well as ensuring that areas dependent on oil and gas are resilient to the transition to Net Zero. It should do this by harnessing multiple levers for growth concurrently, such as transport, skills and culture.

3. **Use markets and competitive procurement where possible to support private enterprise in delivering Net Zero.** This will lower the cost of delivering Net Zero and allow more people to participate in the low-carbon economy. The Contracts for Difference (CfD) scheme for renewables has shown that the public and private sector can work together to lower costs and to deliver at scale.
4. **Engage with international partners to take a whole-basin approach to the development of the North Sea.** This is particularly important for cross-border projects such as interconnectors and wind farm, as well as to protect the marine environment.

## Policy recommendations

We have grouped our policy recommendations under six themes. These recommendations should form the basis of a Strategy for the North Sea:

### Recommendation #1: Create a new 'UK Seas Authority' (UKSA)

- 1.1. The Government should create a new UK Seas Authority (UKSA) to coordinate development across the UK's seas. This Authority should be responsible for producing Marine Plans.
- 1.2. The UKSA should be responsible for planning uses of the UK's seas for all industries but should not regulate any of those industries.
- 1.3. The Government should bring forward a new Marine Policy Statement, to direct the new UK Seas Authority to produce more spatially prescriptive Marine Plans.
- 1.4. The Government should introduce new legislation requiring all Departments to act "in accordance with" new Marine Plans, ensuring that all industries use the UK's seas in a consistent and low-conflict manner.
- 1.5. Marine plans should be authorised by the Secretary of State for Business, Energy and Industrial Strategy.

### Recommendation #2: Apply environmental regulation consistently across all economic activities and incentivise net improvements in the marine environment.

- 2.1. The Government should adopt a Natural Capital approach towards regulating activities that impact the marine environment.
- 2.2. The Government should create a new research fund jointly backed by the Government and industry to fund a strategically co-ordinated research programme into the impacts of economic activities on the marine environment, including the application of

natural capital. This should be led by a DEFRA agency, such as the Centre for Environment, Fisheries and Aquaculture (CEFAS).

- 2.3. Government should increase the consistency with which environmental regulation is applied to activities in the North Sea, and in the wider marine environment more generally.
- 2.4. Management plans and monitoring regimes should be implemented as soon as possible for all existing MPAs, and any future MPAs should have these plans in place promptly after they are proposed.
- 2.5. Over the medium to long term, the principle of environmental net gain should be introduced for the marine environment.
- 2.6. To promote a consistent environmental approach across the North Sea basin, the UK should work with the EU and Norway towards an international Natural Capital framework for the marine environment.

### **Recommendation #3: Introduce tailored support for new low-carbon technologies such as hydrogen and CCUS.**

- 3.1. The Government should make a final decision on the business models for hydrogen and CCUS by mid-2021, to enable the early deployment of these new low-carbon technologies.
- 3.2. Government should concentrate the development of low-carbon hydrogen production in North Sea industrial clusters. Initially this should be focused on replacing high-carbon hydrogen consumption in existing refineries and chemical plants.
- 3.3. Government should deploy low-carbon hydrogen in non-industry uses through increasingly ambitious pilots in the areas surrounding North Sea industrial clusters, such as in heavy duty transport.

### **Recommendation #4: Use new 'Future Marine Scenarios' to help to identify the investments in North Sea networks that are needed to unlock Net Zero.**

- 4.1. The new UKSA should produce "Future Sea Scenarios" to test the impact of different economic uses and environmental protections of the UK's seas. This will help to identify the major spatial and environmental conflicts resulting from Net Zero, as well as build the evidence base to support investment in new networks.

### **Recommendation #5: The UK Seas Authority should have a specific remit to work with international partners on the development of the North Sea.**

- 5.1. The UKSA should have a specific remit to work with international partners on the development of the North Sea, either through the EU's North Sea Energy Cooperation or through establishing a new multilateral cooperation forum.

- 5.2. The UK should seek a long-term ‘Energy Partnership’ with the EU, focusing on electricity trading and the development of low-carbon energy resources in the North Sea. The agreement should be signed by the end of this Parliament (by 2024).

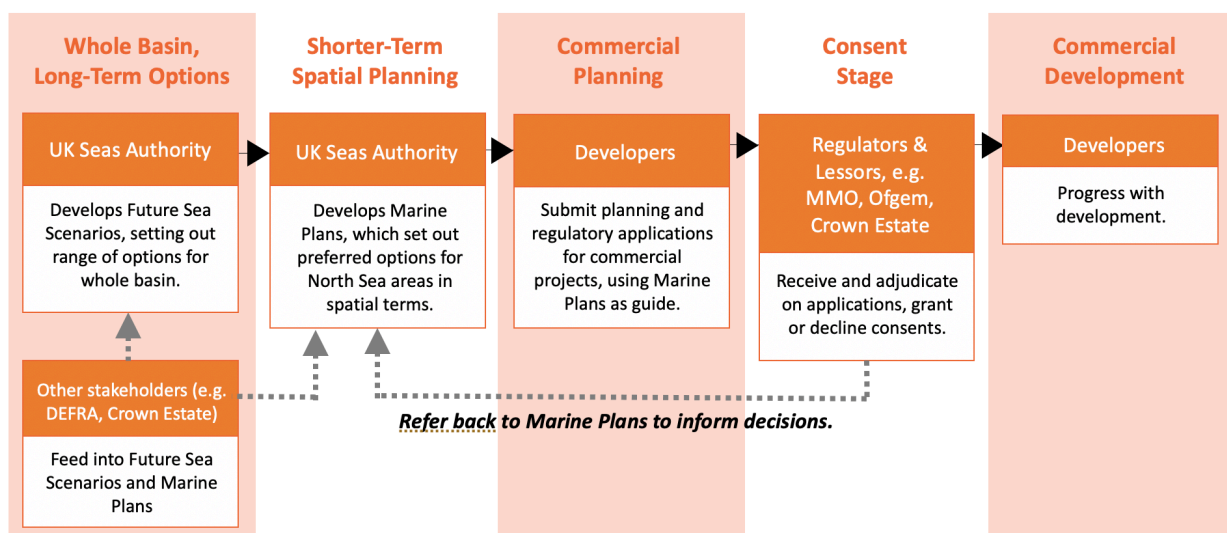
**Recommendation #6: Develop policies to unlock public and private investment in economically less-developed areas of the North Sea coastline.**

- 6.1. Ministers should promote a Net Zero Triangle which connects Humberside, Teesside and Leeds. This should be delivered through a package of measures focused on improving transport links and knowledge sharing within the Net Zero Triangle.
- 6.2. Government should introduce an ‘opportunity grant’ of at least £3,000 for every individual over the age of 21, with a Net Zero premium added within the Net Zero Triangle. The money should be drawn down by providers of approved job-relevant courses.
- 6.3. Government should suspend the current apprenticeship levy and replace it with a simplified model focused on school leavers, with Government and employers splitting the cost 50:50, as discussed in Policy Exchange’s recent report, *The Training We Need Now*.
- 6.4. The Government should support cultural development along the East coast of Britain, including creating and benefitting local institutions similar to the Welsh National Opera and Opera North.
- 6.5. Part of the future ‘UK Shared Prosperity Fund’ should be put under the control of Metro Mayors for cultural and social development.
- 6.6. The Government should support and strengthen Metro Mayors in the North Sea regions. For example, this could be done by providing them with more powers, revised voting requirements and greater tax raising remits.
- 6.7. Parliamentarians should apply coordinated scrutiny towards the development of the North Sea, for instance through the BEIS Select Committee or by creating a dedicated All-Party Parliamentary Group (APPG) for the North Sea.
- 6.8. Government should create a Minister of State for North Sea Development in the Department for Business, Energy and Industrial Strategy.
- 6.9. The UK Government should require operators of new offshore wind farms to establish a ‘Community Benefit Fund’ to ensure that coastal communities benefit from hosting offshore wind farms and supporting infrastructure. This should be funded through a charge of 50p/MWh on all new offshore wind farms for the duration of their 15-year Contract for Difference (CfD). The funds should be administered through local and regional organisations.

### How would a new UK Seas Authority work?

The new UKSA and our proposed changes to marine spatial planning would change the development process for new infrastructure by giving Marine Plans a more important role on determining the use of the UK’s sea. The proposed process is reflected in Figure 2.

Figure 2: Proposed development process



### Policy timeline for this Parliament

Low-carbon energy projects in the North Sea take many years to develop and build, so the Government needs to take early action to improve the process for future projects. The Government should pursue these priorities during this Parliament to ensure that the North Sea can be fully developed to meet the Net Zero and Levelling Up agendas, following the recommended timeline in Figure 3.

Figure 3: Proposed timeline for this parliament

| Theme                                       | 2020   | 2021   | 2022  | 2023  | 2024 |
|---|--|--|---|---|------|
| Spatial planning                            |  | Create new 'UK Seas Authority'. Amend Marine and Coastal Act 2009 to give Marine Plans more authority. |   | New North Sea Marine Plans used by all departments.                 |      |
| Consistent environmental regulation         |  | Publish management plans and monitoring regimes for all MPAs   | Develop a standard Natural Capital approach to the marine environment   |   |      |
| Low carbon business models                  |  | Decision on business models for CCUS and early-uses of Hydrogen.                                       | Final Investment Decision on first CCUS hub.  |   |      |
| Investments in networks                     |  |  | Implement changes to offshore regime for projects connecting 2025-2030.   | Implement changes to offshore regime for projects connecting 2030+. |      |
| Securing political support and Levelling Up | Appoint a Minister for North Sea Development                             | Introduce 'opportunity grant' with Net Zero premium + community benefits for offshore wind             | Support Metro Mayors in North Sea regions   |   |      |
| International cooperation                   | Negotiate UK-EU future energy relationship, focus on electricity trading |  | Develop and implement new approaches to electricity trading to enable wind-interconnector hybrid projects in the North Sea. |   |      |

# 1. Introduction

The North Sea's recent industrial history has been one of maturation and managed decline. The basin was one of the earliest to exploit offshore oil and gas reserves, benefitting from industrial expertise in the UK and the shallowness of the waters, which make seabed resources easier to access. This early development has also meant that the basin reached earlier maturity, reaching peak production around 2000-2001. This shifted political and economic emphasis away from oil and gas towards other uses of the North Sea.

The largest beneficiary of this shift has been offshore wind, which has grown substantially in the last decade in UK waters. The basin is particularly fruitful for wind: it has shallow banks to the South (such as around Dogger Bank), which makes it feasible to install fixed turbine wind structures. There are also generally long distances to coastlines, which generates high average wind speeds. In 2018, 99% of offshore wind turbine installations in the Europe occurred in the North Sea. In the UK section of the North Sea this growth has been particularly driven by the Contracts for Difference (CfD) scheme, owing to the UK government throwing its support behind offshore wind to help meet climate targets.

This rapid development of offshore wind, together with several undersea cables for international electricity and data transmission, is creating congestion, as reflected in Figure 5, *The Economic Map of the North Sea*.<sup>2</sup> The Southern North Sea is particularly affected, with offshore wind farms, electricity interconnectors and shipping lanes competing for space. There is also a political challenge among coastal communities who have to host new electricity infrastructure to connect offshore wind in multiple places.<sup>3</sup> But the modern competition for space in the North Sea is more intense than just this. It happens in ways that cannot be captured on a map, such as the growth in offshore wind disrupting the UK's air defence radar system.<sup>4</sup>

Deeper waters in the Northern North Sea are one solution, expanding development further offshore with floating wind turbines, a more recent innovation. In depths beyond 60 metres, offshore wind developments that use turbines that are fixed to the seabed are uneconomic.

Beyond wind, the North Sea also offers development opportunities in various forms of hydrogen production, further interconnection with neighbouring power grids and the potential to lock away a significant portion of the UK's carbon emissions through carbon capture, utilisation and storage (CCUS). This is on top of emerging opportunities in fisheries, shipping and seabed aggregates.

2. A digital version of this map can be found on this report's page on the Policy Exchange website.
3. The Southern North Sea is labelled 'IVc' on the *Economic Map of the North Sea*, page 22. 'IVb' and 'IVa' are the Central North Sea and Northern North Sea respectively.
4. HM Gov (2020), "Competition document: wind farm mitigation for air defence" ([link](#)).

This report explores these issues, aiming to provide a high-level strategy for the North Sea to maximise growth in these sectors. The end goal is for the North Sea – and particularly those parts under UK jurisdiction – to play its fullest possible role in delivering a high-growth, net zero economy.

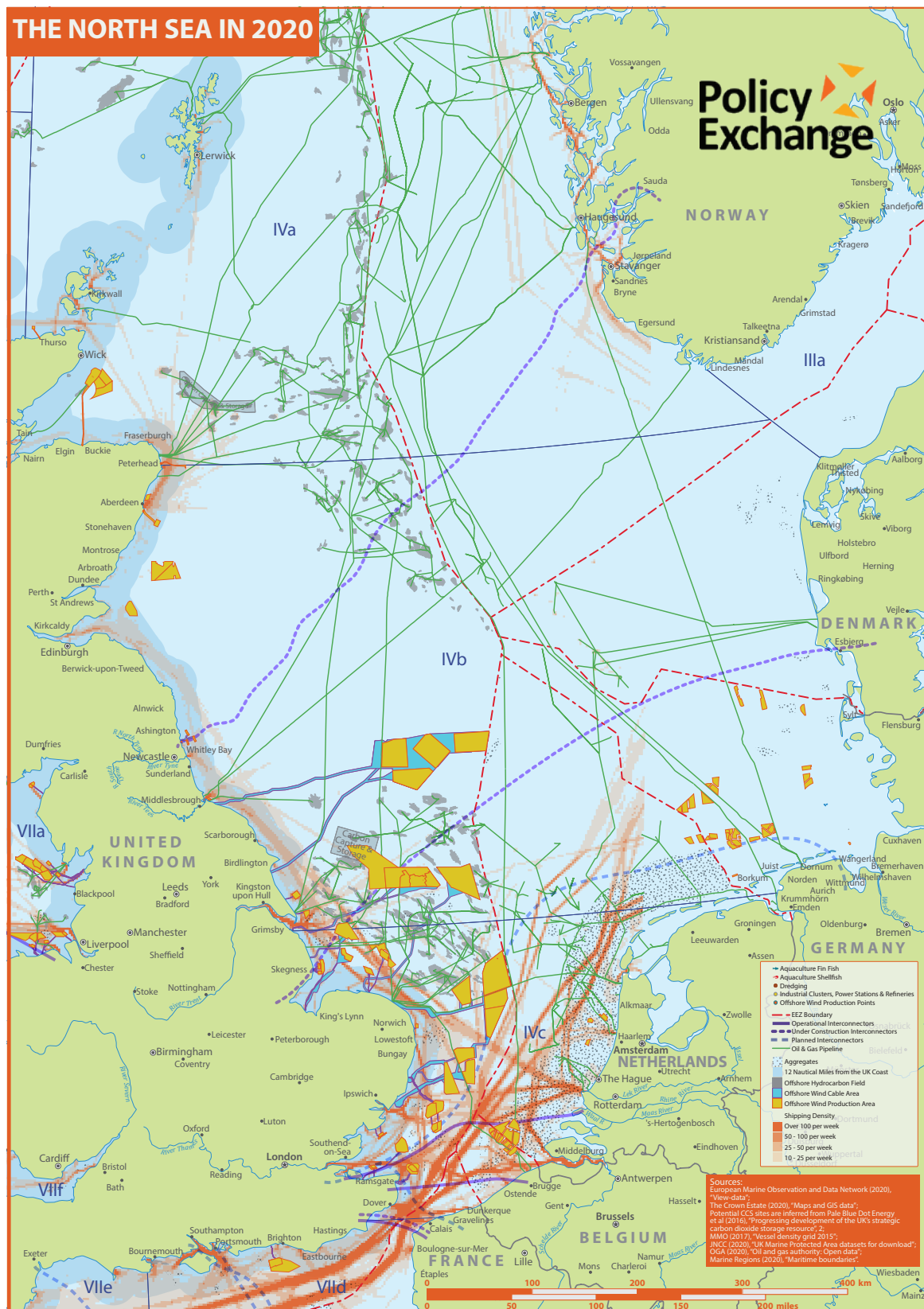
| Table 4: Stylised history of the North Sea.         |   |
|---|---|
| 12,000 BCE  | The ‘North Sea’ was formed by the melting of glaciers as the last ice age flooded land bridges between the European landmass and the areas that formed the British Isles. Some areas of the Sea are shallow, making it easier for later generations to access seabed resources.   |
| 8 <sup>th</sup> Century to 16 <sup>th</sup> Century | The North Sea was a major trading hub used by Romans, Vikings, Normans and the Hanseatic League of trading states. This trade created significant cultural and economic wealth around its littoral states, from Northern Scotland to key fishing towns such as Grimsby and Hull.  |
| Late 19 <sup>th</sup> Century                       | The 1881 North Sea Fisheries Convention, between littoral states of the North Sea, established common fishing rights beyond three miles of a country’s shores.  |
| 20 <sup>th</sup> Century                            | <p>In 1958, the Convention on the Continental Shelf established ‘Exclusive Economic Zones’ (EEZs), dividing up the North Sea between its coastal nations. The UK Continental Shelf Act 1964 allowed private companies to explore for hydrocarbons beyond 12 nautical miles from shore, with several restrictions on the use and sale of UKCS-derived gas, including a ban on their export and a monopsony for British Gas.</p> <p>In 1965, British Petroleum successfully drilled for gas off East Anglia, and an American company achieved the same for oil in 1975.</p> <p>Oil production grew rapidly throughout the 1970s, spurred on by the 1973 and 1979 oil crises. Britain became a net exporter of oil in the early 1980s and of gas in the early 1990s. The boom benefitted key industrial centres, such as Great Yarmouth, Lowestoft, Aberdeen, Orkney and Shetland.</p> <p>For fishing, the 1970s formed a turning point with the UK’s joining of the European Community (later the EU) in 1973 and the creation of the Common Fisheries Policy in the 1980s, allowing all member states equal access to fishing grounds. This severely depleted fish stocks in the North Sea, although they have more recently begun to recover, albeit from a low base.</p> |



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|  |  |
|--|--|
| Late 20 <sup>th</sup><br>Century / Early<br>21 <sup>st</sup> Century | <p>Oil and gas production peaked around 2001, shifting the narrative towards managing its decline. The Petroleum Act 1998 and the Energy Act 2016 set out terms for 'Maximising Economic Recovery' in the basin, i.e. minimising the decommissioning liabilities and maximising returns.</p> <p>Post 2000, the UK and other North Sea states invested heavily in offshore wind subsidies and created regulatory regimes to enable the development of 'electricity interconnectors', beginning a new phase in North Sea economic development.</p> |
|--|--|

Figure 5: Economic map of the North Sea.

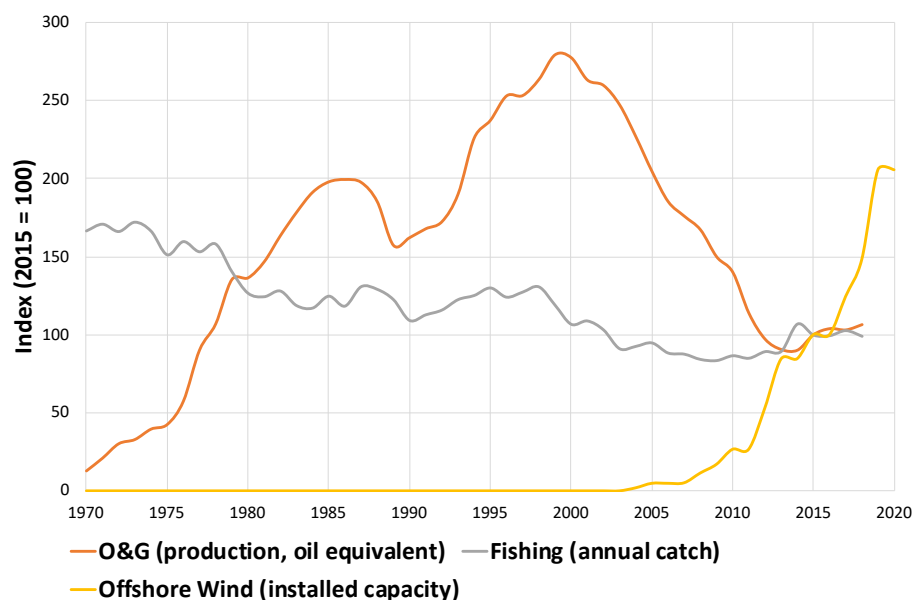


An interactive version of this map is available on this report's page on the Policy Exchange website, which includes additional information such as the North Sea's most promising CCUS aquifers and individual oil and gas installations. Shipping data is for UK flagged vessels only.

## 2. How is the North Sea used today?

Historically the North Sea economy was dominated by the fishing industry, and from the 1970s the oil and gas sector. However, current growth in the North Sea economy is focussed on offshore wind, which is experiencing a boom period having roughly doubled between 2015 and 2020.

**Figure 6: Index of UK North Sea offshore economic activities, 1970 - 2020 (2015 = 100).**



### Oil and gas

The North Sea oil and gas industry is likely to be around a third the size it is today in a net zero economy.<sup>5</sup> To offset the losses associated with this shrinkage, it must redeploy its specialist skills to accelerate the transition to the new low-carbon economy, in industries including Carbon Capture Utilisation and Storage (CCUS), hydrogen and offshore wind.

The UK's offshore oil and gas industry started in the 1960s, when the first commercial oil and gas wells were drilled on the UK Continental Shelf (UKCS). The North Sea is central to the UK's oil and gas industry, producing over 80% of UK oil and gas production.<sup>6</sup> Production from the UKCS peaked in 2000 at nearly 250 million tonnes of oil equivalent (mtoe) per year,<sup>7</sup> making the UK a net energy exporter at the time. Since the peak, UK oil and gas production has declined by over half and the UK

5. OGA (2019), "Projections of UK Oil and Gas Production and Expenditure".

6. Policy Exchange analysis using DUKES (2019)

7. OIES (2019), "Gas production from the UK Continental shelf" (Link).

is now a net energy importer.<sup>8</sup>

The UKCS was developed relatively early by international standards, in part due to the shallow waters and therefore relatively accessible offshore oil and gas reserves. This is one reason why UKCS is declining before many international oil and gas basins, combined with lower cost production from foreign producers including US shale. The decline in UKCS oil and gas production has also had an impact on employment in the sector, although it still supports around 300,000 UK jobs.<sup>9</sup> Since 2010, UKCS oil and gas production has stabilised around 85 mtoe per year, although this is expected to decline by a further two-thirds by 2050.<sup>10</sup>

The UK oil and gas regulator, the Oil and Gas Authority (OGA), currently regulates the sector under the Maximising Economic Recovery (MER) UK Strategy.<sup>11</sup> This strategy aims to maximise production from the UKCS to generate as much revenue as possible for the industry and the UK Government. The OGA is currently reviewing this strategy in light of the UK Government's commitment to Net Zero greenhouse gas emissions by 2050. The revised "OGA strategy" is likely to put additional focus on decarbonising oil and gas production, and contributing to the development of new low-carbon industries on the UKCS.<sup>12</sup> In practice, these changes would require oil and gas operators to reduce emissions from flaring, venting, and offshore electricity generation, as well as supporting carbon capture and storage projects, for example through reuse of existing infrastructure.<sup>13</sup>

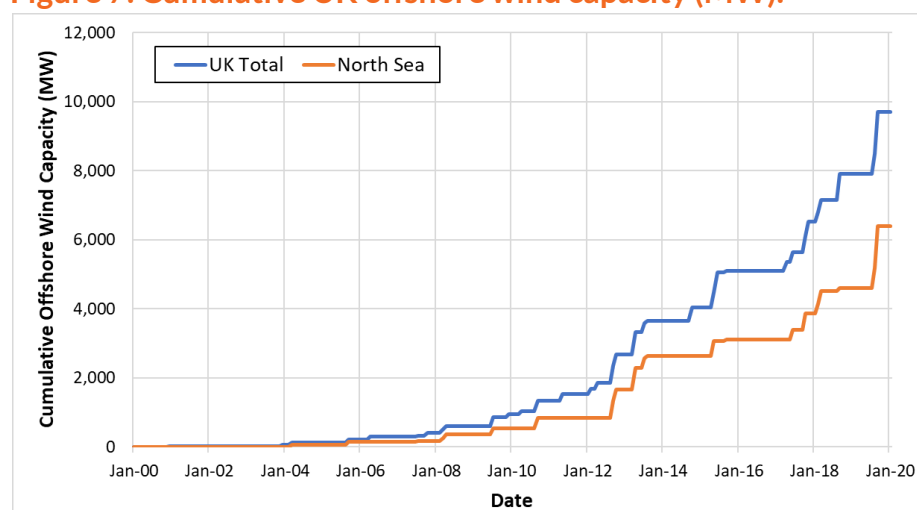
Job losses in the UK oil and gas sector will have a negative impact on the local economies of North Sea oil and gas hubs, especially Aberdeen, which is home to over 80% of direct oil and gas jobs in Great Britain.<sup>14</sup> The decommissioning of existing oil and gas assets is also an ongoing challenge for industry, but will also create jobs and potentially allow the UK to build up supply chains that will benefit from increased international decommissioning in future. Decommissioning is also a challenge HM Treasury, which has received tax revenue for oil and gas production but must now contribute towards decommissioning costs through tax reliefs.<sup>15</sup>

The specialist technical expertise of the UK oil and gas industry can be applied to new low-carbon technologies operating in the North Sea, as well as to international oil and gas basins that are less mature than the UKCS. This expertise will be particularly useful for the CCUS, low-carbon hydrogen and offshore wind industries, due to demands for similar skills sets from these activities. Depleted oil and gas wells have the potential to store carbon dioxide captured by CCUS projects. Some existing infrastructure could be reused for CCUS, particularly offshore pipelines.<sup>16</sup>

### Offshore wind

The UK's offshore wind sector has grown rapidly in the last decade, with nearly two-thirds of the UK's installed capacity in the North Sea (Figure 7). 10 GW of this installed offshore wind capacity already provides around 10% of the UK's electricity, a figure that is expected to rise rapidly as more offshore wind farms are completed.

8. DUKES (2019), "Table F.2 Gas Production".
9. OGUK (2019), "Economic report 2019", 14 ([Link](#)).
10. OGA (2019), "Projections of UK oil and gas production and expenditure" ([Link](#)).
11. OGA (website), "Regulatory Framework" ([Link](#)).
12. OGA (2020), "Consultation on proposals to revise the MER UK Strategy" ([Link](#)).
13. OGA (2020), "UKCS Energy Integration: Final report" ([Link](#)).
14. Invest Aberdeen (2020), "Oil and Gas" ([Link](#)).
15. NAO (2019), "Oil and gas in the UK – offshore decommissioning" ([Link](#)).
16. BEIS (2019), "Carbon capture, usage and storage (CCUS) projects: re-use of oil and gas assets" ([Link](#)).

Figure 7: Cumulative UK offshore wind capacity (MW).<sup>17</sup>

In March 2019, the UK Government and the offshore wind industry committed to building 30 GW of offshore wind capacity by 2030, subject to costs continuing to fall.<sup>18</sup> In September 2020, the Government reiterated its manifesto ambition to increase this target to 40 GW of offshore wind capacity by 2030.<sup>19</sup> Meeting the 40 GW target for 2030 will require projects to be developed beyond the current pipeline, and be deployed at a much faster rate than at present.

Almost all of the UK's offshore wind farms use fixed foundations, which are driven into the seabed. Fixed foundations typically only operate in relatively shallow waters, less than 60 metres, due to the commercial and technical challenges of operating in deeper water.<sup>20</sup> To date, developers have focussed on the areas of the North Sea with relatively shallow waters, most notably Dogger Bank. As UK offshore wind developers explore new sites, they are starting to assess locations in deeper waters, creating opportunities for floating offshore wind farms.<sup>21</sup> In October 2020, the Government set a target for 1 GW of floating offshore wind by 2030.<sup>22</sup>

Net Zero provides a huge opportunity for the North Sea offshore wind industry over the coming decades. Offshore wind capacity will double by 2025 and to quadruple by 2030, with most of the new capacity located in the North Sea. This will inevitably lead to increasing spatial conflicts, such as between offshore wind and fishing or shipping.<sup>23</sup> There will also be challenges with connecting these offshore wind farms to the onshore grid, particularly if these connections are uncoordinated.

## Offshore infrastructure

Offshore energy infrastructure plays a key role in connecting the UK with low-carbon energy sources across Europe.

The North Sea is criss-crossed with oil and gas pipelines that connect the UK to offshore oil and gas production wells, as well as to countries in Scandinavia and continental Europe. In addition to oil and gas pipelines, the North Sea hosts an increasing number of 'electricity interconnectors', which connect the electricity market of Great Britain to

17. Source: Renewable Energy Planning Database (March 2020), Crown Estate (2020) [Offshore Wind Operational Report 2019], and Policy Exchange analysis.

18. BEIS (March 2019), "Offshore wind Sector Deal: Key Commitments" (Link).

19. UK Government (2019), "The Queen's Speech 2019 (Background Briefing Notes)", 116 (Link); HM Gov (2020), "New plans to make UK world leader in green energy" (Link).

20. NREL (April 2020), "Floating Wind Turbines on the Rise" (Link).

21. Principle Power (2019), "Principle power strengthens its presence and capabilities in the UK" (Link).

22. ReNews (2020), "UK energy minister hails floating wind" (Link); HM Gov (2020), "The Government response to the Committee on Climate Change's 2020 progress report to Parliament", 15 (Link).

23. Wind Europe (2017), "Offshore wind energy in the North Sea", 8 (Link).

neighbouring markets (Table 1). Since 2010, interconnectors have been constructed between the UK and the Netherlands, Ireland and Belgium. These interconnectors allow the sharing of resources across European electricity markets, which is increasingly important as the market share of intermittent wind and solar grows.

Two new electricity interconnectors are currently under construction across the North Sea, which will connect Great Britain to Norway and Denmark. These connections will increase the diversity of the UK's electricity supply, enhancing security of supply and increasing access to overseas renewable energy resources such as hydropower in Norway.

As the number of interconnectors increases, there is the potential to combine interconnector and offshore wind projects to create 'multi-purpose interconnectors' (MPIs).<sup>24</sup> MPIs have the potential to reduce the costs of offshore wind and interconnector projects as well as reducing the amount of new electricity infrastructure required onshore, which can be controversial in some local areas.

In addition to electricity interconnectors and connections for offshore wind farms, there are likely to be opportunities for new or repurposed pipelines to carry carbon dioxide (for CCUS) or low-carbon hydrogen.<sup>25</sup> One vision for European hydrogen infrastructure includes hydrogen pipelines in the North Sea.<sup>26</sup>

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24. European Commission (May 2019), "Hybrid projects: How to reduce costs and space of offshore development", ([Link](#)).

25. E.g. Marko Maver (2020), "The case for re-using infrastructure for CO2 transport and storage" ([Link](#)).

26. Gas for Climate: A path to 2050 (2020), "European Hydrogen Backbone" ([Link](#)).

Table 1: GB electricity interconnectors (operating & under construction) to neighbouring markets. Source: Ofgem.<sup>27</sup>

| Project Name         | Country          | Capacity (MW) | Status             | Commissioning Date           | Sea             |
|----------------------|------------------|---------------|--------------------|------------------------------|-----------------|
| IFA                  | France           | 2,000         | Operating          | 1986                         | English Channel |
| Moyle                | Northern Ireland | 500           | Operating          | 2002                         | Irish Sea       |
| BritNed              | Netherlands      | 1,000         | Operating          | 2011                         | North Sea       |
| EWIC                 | Ireland          | 500           | Operating          | 2012                         | Irish Sea       |
| Nemo Link            | Belgium          | 1,000         | Operating          | 2019                         | North Sea       |
| Viking Link          | Denmark          | 1,400         | Under Construction | 2023                         | North Sea       |
| ElecLink             | France           | 1,000         | Under Construction | 2022                         | English Channel |
| IFA2                 | France           | 1,000         | Under Construction | 2020 (construction complete) | English Channel |
| North Sea Link (NSL) | Norway           | 1,400         | Under Construction | 2021                         | North Sea       |

Developing offshore infrastructure requires coordination between both the onshore and offshore regulators in order to rationalise the amount of infrastructure created, according to considerations such as how much future capacity is expected to be needed. Our research highlighted that there is currently a disconnect between the onshore and offshore regulatory systems. As the North Sea is increasingly developed and more offshore infrastructure is built, there is a risk that interconnectors, pipelines and cables will not be strategically coordinated, duplicating infrastructure and investment.

## Fisheries

The North Sea fishing industry has declined for the last 50 years, and today is a marginal economic activity. However, the sector is important to the economies of some coastal communities, and could have a bright future if technological developments in aquaculture take off.

Since the 1990s, the EU's Common Fisheries Policy (CFP) has focused on reducing pressures on fish stocks, which has contributed to further falls in catch. From 2007, catch levels have generally stabilised at more sustainable levels. Employment levels fell substantially over the 20<sup>th</sup> Century before plateauing in the mid-1990s.<sup>28</sup> This has led to negative outcomes for historically major fishing ports along the North Sea coastline, such as Grimsby.

27. Ofgem (2020), "Electricity interconnectors" ([Link](#)).

28. MMO (2017), "Statistics about fishing in the UK and beyond" ([Link](#)).



Over half of fish caught by UK fishing vessels are caught in the North Sea. The sustainability of fishing in the North Sea has improved in recent years, with around two thirds of North Sea fish stocks now at healthy population levels.<sup>29</sup> However, there are still major issues facing the UK's North Sea fishing industry. The vast majority of fish in the UK's share of the North Sea are caught by foreign vessels; this is why fishing has a central place in the negotiations between the UK and EU over the future relationship.<sup>30</sup> Despite the political salience of fishing, it remains a marginal part of the UK economy, contributing just 0.1% of UK GDP.<sup>31</sup>

Future growth in the UK fishing industry could come from oceanic aquaculture (fish farming). UK aquaculture is currently concentrated around the Scottish coastline, which benefits from the sheltered coastlines that are suited to current aquaculture techniques. However, new aquaculture technologies are under development that could unlock much of the North Sea to aquaculture, particularly off the East coast of England and further offshore. This would allow the UK fishing industry to farm rather than fish some of the species that are currently threatened in the wild.<sup>32</sup>

The UK fishing sector could significantly gain from Brexit by receiving larger fishing quotas. However, this will depend on the outcome of the ongoing negotiations between the UK and the EU. If there is no deal, tariffs will apply on UK fish exports to the EU and vice versa, which would reduce the market access for UK-caught fish. In addition, around a third of North Sea fish stocks are still overfished, raising questions about whether increasing UK catches is compatible with sustainability.<sup>33</sup>

### Maritime trade

North Sea ports have handled a large proportion of UK trade over the 20<sup>th</sup> Century, particularly with continental Europe and Scandinavia. However, as the nature of global trade has changed, more trade began to move away from them. For instance, as lorry-based 'roll on, roll off' trade became increasingly economical, more trade has shifted to ports like Dover, which has specialised infrastructure for lorry-based trade. Despite this shift, North Sea ports remain integral to UK trade, handling 54% of all goods handled by UK ports in 2018.<sup>34</sup>

The North Sea's maritime sector is one of the busiest in the world. For instance, the Southern North Sea is the second busiest sea globally, with 7,600 ships passing through monitored 'hotspots' every day, second only to the South China Sea.<sup>35</sup>

Most sea-borne trade between Europe and East Asia currently travels through southerly routes, such as the Suez canal. However, Northerly trade routes that pass through the Arctic circle are becoming increasingly feasible as Arctic sea ice melts due to climate change. This will increase North Sea trade volumes over the next few decades.

By mid-Century, Arctic sea routes are expected to save 10 – 12 days on a commercial voyage from East Asia compared to using the Suez canal.<sup>36</sup> The consequence of this is that more sea-borne trade travelling to markets

29. European Environment Agency (2019), "Status of the assessed European commercial fish and shellfish stocks in relation to Good Environmental Status (GES) per EU marine region in 2015-2017".

30. Michael Hearth and Robin Cook (2020), "Risks to North Sea fish stocks and wildlife if post-Brexit fishery negotiations fail to reach agreement on quotas and access to UK waters", 8 ([Link](#)).

31. ONS (2019), "Regional GVA (balanced) by industry: all NUTS regions" ([Link](#)).

32. Government Office for Science (2017), "Future of the Sea: Trends in aquaculture", 15 ([Link](#)).

33. European Environment Agency (2020), "Status of marine stock" ([Link](#)).

34. Department for Transport (2019), "UK major port freight traffic maps" ([Link](#)).

35. NorthSEE project (2017), "Transnational maritime spatial planning in the North Sea: The Shipping Context", 5 ([Link](#)).

36. Government Office for Science (2018), "Foresight Future of the Sea: A report from the Government Chief Scientific Adviser", 46 ([Link](#)).



in Europe will pass through the Northern North Sea. North Sea ports are geographically located to handle such trade, and roundtables hosted as part of this research highlighted that North Sea ports generally have a greater capacity to handle this future growth in trade than busy ports like Dover, as they have more land to expand into.

### Environmental regulation

Regulation of activities in the North Sea is currently siloed between multiple regulatory agencies, which could limit the future economic potential of the North Sea.

Individual activities or projects in the UK's seas are assessed against environmental regulations, such as the Habitats and Birds Directives, through the marine licensing system.<sup>37</sup> In addition, certain areas of the UK's seas are protected as 'Marine Protected Areas' (MPA). In these areas, certain activities are not permitted.

There are six different types of MPA in the UK. Through the OSPAR Convention, the UK committed to create a series of MPAs covering 10% of the North Sea. The UK has surpassed its target, with 18% of the North Sea now covered by an MPA.<sup>38</sup> However, our research has found that the North Sea's MPAs are largely a tick-box exercise to meet international targets. Few of the UK's MPAs have management plans in place, and monitoring generally occurs once every five to fifteen years.<sup>39</sup> In addition, MPAs are not protected from many destructive activities, particularly fishing by 'super trawlers', which arguably defeats the point of establishing them.<sup>40</sup>

Marine licensing implements environmental regulations by only allowing activities that minimise their impact on the environment. For instance, a licence to develop a wind farm might only be granted if measures are taken to minimise impacts on migratory bird populations. Increasing development in the North Sea will put greater pressure on the marine environment, but current regulatory approaches do not assess environmental impacts on a basin level. This is important, as the marine environment is highly interconnected and regulation should be applied as holistically as possible.

A complementary approach to environmental regulation is that of Natural Capital, which considers the environment as a collection of assets, goods and services. Whilst technically difficult, there are ways to develop standard and reliable methods of valuing Natural Capital. Moreover, Natural Capital approaches open the door to not only limiting damage to the environment but improving outcomes for nature, for example through environmental offsetting.

### Marine planning

As the North Sea is further developed, Marine Spatial Planning (MSP) will be increasingly important to manage spatial conflicts. In addition, MSP will be essential to keeping different options open for development, such as through limiting development on the most promising sites for CCUS.

The UK introduced MSP through the Marine and Coastal Access Act

37. Environmental regulations that target land-based activities are relevant here as these activities can negatively impact the marine environment through chemicals or waste reaching the sea, but we focus on MPAs and marine licensing given the diffuse nature of the former.

38. OSPAR Commission (2019), "2018 status report on the OSPAR network of Marine Protected Areas", 1 (Link); JNCC (2020), "UK MPA network statistics" (Link).

39. Natural Capital Committee, "Marine and the 25 year plan", 17 (Link); Environmental Audit Committee, "Sustainable Seas", 5: *Marine Conservation* (Link).

40. Greenpeace (2020), "Super trawlers spend 2963 hours fishing in UK marine protected areas in 2019", (Link).

2009, which requires the production of a Marine Policy Statement and Marine Plans. Marine Plans are the equivalent of Local Plans in the land-based planning system. They contain specific information that regulators should take into account when deciding whether or not to permit an activity. Marine Plans are produced for different regions of the North Sea, and all are due to be published by 2021.<sup>41</sup>

However, there are several issues with the current Marine Plans. Our research has found that they are not prescriptive enough over what activities should be prioritised when deciding which should be allowed to go forward. Moreover, regulators only have to have “regard to” the Marine Plans when sanctioning activities. This weak legal language means that regulators can deviate from the Marine Plans. Our research further highlighted that there is no authority coordinating uses of the seabed.

The Crown Estate de facto performs this role as the owner of the seabed and its interaction with many different users of the North Sea. In general, stakeholders are very positive about the current performance of the Crown Estate, including its desire to coordinate developments strategically. However, the Crown Estate’s remit does not encompass all marine activities, for example fishing and shipping. Arguably, there is a need for a single body to coordinate all uses of the UK’s seas.

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41. HM Gov (2011), “UK Marine Policy Statement” ([Link](#)).

## 3. Drivers of change in the North Sea

When considering the North Sea, the challenge and opportunity for policymakers is to marry the Net Zero and Levelling Up agendas. This will allow them to deliver steep reductions in emissions whilst capturing the benefits of this low-carbon economic activity to reduce the UK's regional inequalities. This section explores the Net Zero and Levelling Up agendas.

### Net Zero

All sectors of the UK economy will be affected by the UK's 2050 Net Zero target.<sup>42</sup> North Sea industries have traditionally emitted high amounts of greenhouse gases, including from oil and gas production and from the industrial clusters along the North Sea coastline. As UK carbon emissions continue to fall, these industries must also decarbonise. New North Sea industries are expected to flourish under Net Zero, including offshore wind, CCUS, hydrogen, electricity interconnectors and low-carbon manufacturing.

Since 1990, UK greenhouse gas emissions have fallen by 40%, whilst GDP has risen by 75% (Figure 8). In recent years, carbon reductions in the electricity sector have dominated the UK's emissions reductions (Figure 9). This has provided a boost to the North Sea economy through an expansion of offshore wind farms and electricity interconnectors. In the coming decades other sectors of the economy will need to bear a higher burden of emissions reductions, particularly heavy industry, transport and buildings. This poses particular challenges for the North Sea oil and gas industry, as fossil fuel usage will need to fall and remaining fossil fuel installations will need to be fitted with technologies for CCUS.

As the North Sea oil and gas industry is put under increasing pressure, local economies that rely on North Sea hydrocarbons will suffer negative economic impacts. In 2015, North Sea oil and gas extraction employed 10,000 people in areas along the coastline, with 5,500 of these in Aberdeen alone.<sup>43</sup> The actual number of jobs that depend on North Sea oil and gas is likely to be much higher, as this is only for the direct extraction of oil and natural gas. For instance, Oil and Gas UK (OGUK) estimates that, in 2018, the offshore oil and gas workforce in the North Sea was over 33,000.<sup>44</sup>

However, other areas along the North Sea coastline are benefitting from the growth in low-carbon industries, particularly offshore wind. Direct employment in the offshore wind industry is expected to triple by 2030, up from around 10,000 today. Over 85% of these jobs are expected to

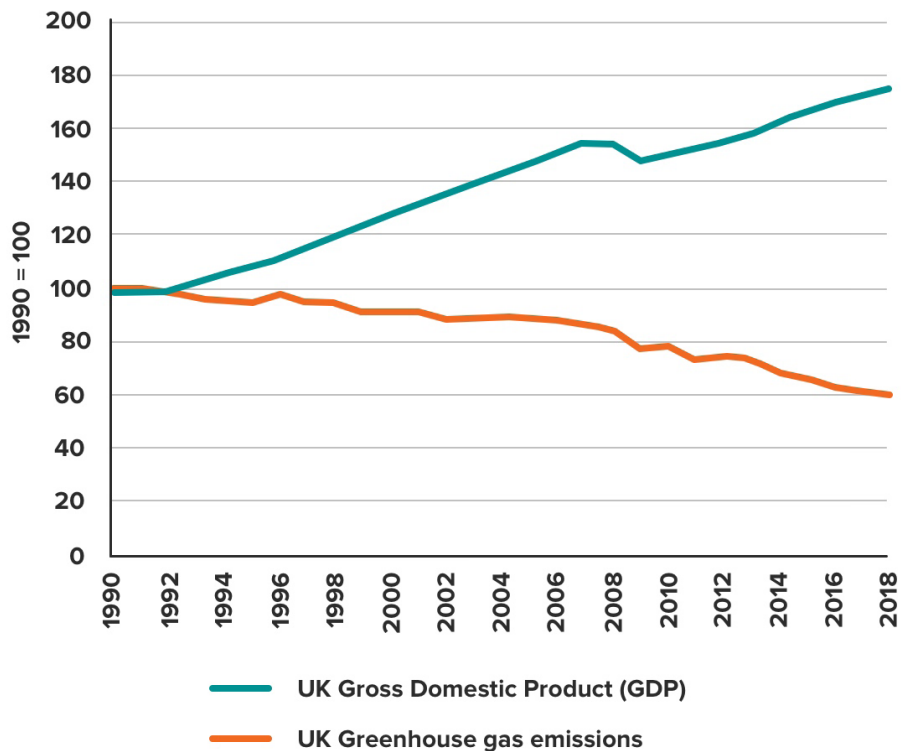
42. BEIS (June 2019), "UK becomes first major economy to pass net zero emissions law" ([Link](#)).

43. Policy Exchange analysis of ONS (2020), "Business Register and Employment Survey 2015", accessed via the Nomis database; data is only for the category 'Extraction of crude petroleum and natural gas'.

44. OGUK (2019), "Workforce report 2019", 19 ([Link](#)).

be in areas along the North Sea.<sup>45</sup> The Prime Minister recently announced plans to invest £160 million in the offshore wind industry, supporting around 60,000 jobs by 2030.<sup>46</sup> The number of direct jobs this will create is unclear though.

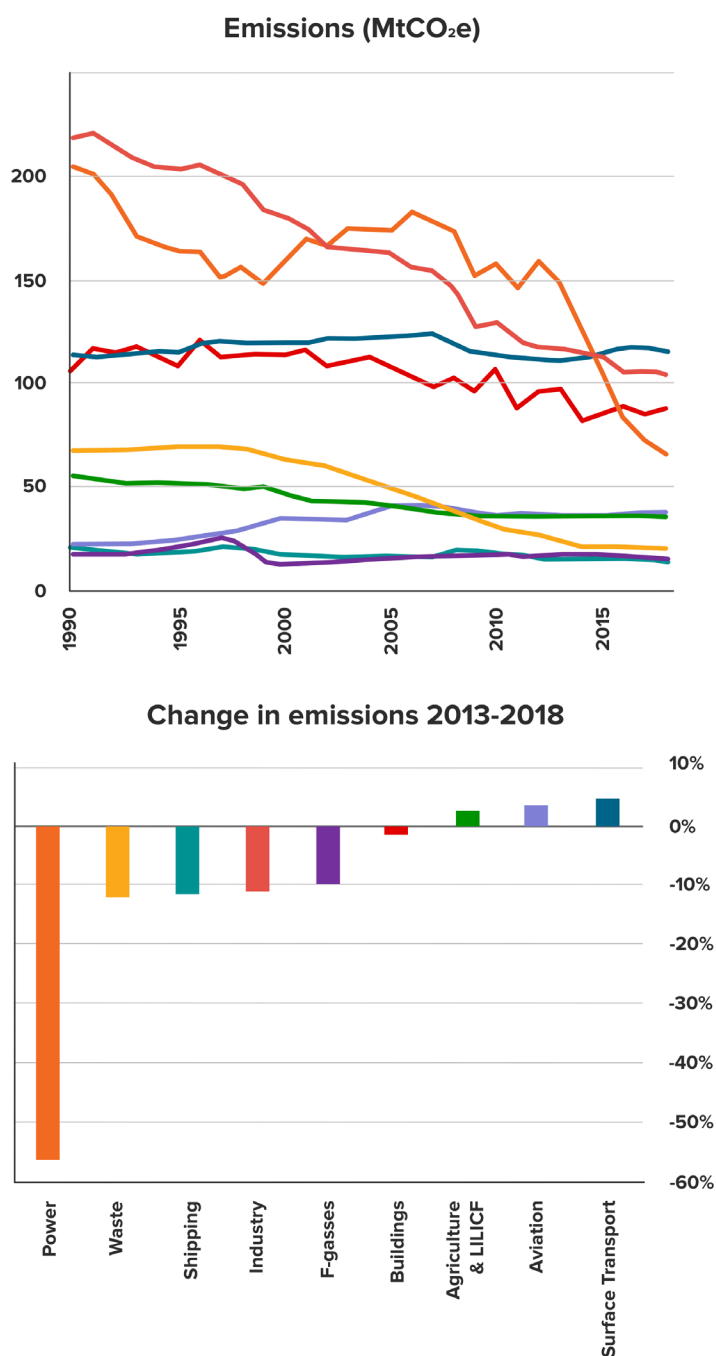
Figure 8: UK greenhouse gas emissions compared to GDP (1990-2018).<sup>47</sup>



45. Policy Exchange analysis of Energy and Utility Skills (2018), "Skills and labour requirements of the offshore wind industry", 36 ([Link](#)).

46. Nicholas Withers (2020), "UK's wind farm announcement will support 60,000 jobs and power every home by 2030" ([Link](#)).

47. CCC (2019), "2019 Progress Report to Parliament".

Figure 9: UK greenhouse gas emission by sector, 1990-2018.<sup>48</sup>

## Levelling Up

‘Levelling Up’ refers to the current Government’s stated aim of reducing regional inequalities and to ensure everyone in the UK can “get a fair share of future prosperity”.<sup>49</sup> As an aim of a UK Government, this is not new: the Blair Government’s ‘New Deal for Communities’ and the Coalition Government’s aim to create a ‘Northern Powerhouse’ were both driven by the desire to increase prosperity outside the South of England. Arguably, these repeated attempts to reduce regional inequality have actually deepened political and socio-economic disparities.<sup>50</sup>

48. Ibid.

49. The Conservative Party (2019), “Get Brexit Done: Unleash Britain’s Potential”, 26 ([Link](#)).

50. Philip McCann (2019), “UK has higher level of regional inequality than any other large wealthy country” ([Link](#)). See also David Goodhart’s *The Road to Somewhere* (Penguin, 2017) on the connection between regional disparities and social and political trends.

Regional industrial centres along the East Coast of the UK have seen relative economic declines for a number of reasons. These include a long-term failure to invest in heavy industries, relative to similar economies such as Germany and the USA, and a failure to replace their original sources of wealth, such as the coal mining industry. Globalised economic competition has added to this decline. However, the Net Zero agenda now presents an opportunity to make up for some of this underinvestment.

North Sea-related industrial communities are at risk of further economic decline. For example, the oil and gas industry is widely expected to reduce in size as it faces competition from more cost-competitive basins abroad and as North Sea oil and gas production continues to fall. The Oil and Gas industry must also respond to the challenge of decarbonisation, which is a particular challenge for cities like Aberdeen.<sup>51</sup> The North Sea fishing industry is also at risk, due to historical levels of overfishing that threatens the future sustainability of the North Sea's fish stocks. This could lead to a future reductions in catch rates. For manufacturing, the offshoring of the UK's heavy industries is changing the makeup of the North Sea's industrial clusters, putting jobs at risk in sectors such refineries and chemical plants.

### **Declines in strategic industries exacerbates regional inequality.**

These issues can significantly limit local economic growth and are partly why the UK's regional inequality is so high relative to other countries.<sup>52</sup> The work of economists like Enrico Moretti emphasise the importance of 'tradable' sectors to local productivity. Tradable sectors produce a good or service that can be exported outside of the area, such as wind turbines, steel or certain professional services like finance.<sup>53</sup> Non-tradable sectors are those that produce things that can only be consumed in the local area where they are sold, such as a haircut or a cleaning service.

These 'tradable' sectors are strategic to local economies, because they tend to generate economic activity that supports local non-tradable businesses. For instance, manufacturing attracts people to work in an area, which supports local businesses like coffee shops. When these 'tradable' sectors face decline or collapse, local economies can become increasingly insular, which can cause four significant economic and social effects:

- **Economic Isolation:** Losing a significant component of a region's tradable value isolates it from other parts of the national and international economies. The flow of money, people and ideas between that region and the rest of the economy falls. It can be hard to rebuild these flows once they have been lost.
- **Brain Drain:** Strategic industries often act as a magnet for attracting to and retraining skilled workers in an area. Once a skilled workforce is lost, an area is less attractive to investment and to new businesses, making it harder to reverse the trend.
- **Social and Cultural Capital Decline:** Social and cultural capital makes it attractive to live and work in a place. It includes good restaurants, cinemas, theatres and sports clubs, schools, hospitals,

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51. Just Transition Commission (2020), "Interim report" ([Link](#)).

52. Philip McCann (2019)m "UK has higher level of regional inequality than any other large wealthy nation" ([Link](#)).

53. See Enrico Moretti (2010), "Local multipliers", *American Economic Review: Papers & Proceedings*, 100: 1-7; Anthony Venables (2020), "Why some places are left-behind: urban adjustment to trade and policy shocks", Department of Economics Discussion Paper Series No. 903, University of Oxford.

good quality parks, shops associated with leading brands and an attractive environment. A poor image can create a negative spiral, where people and investors avoid an area, keeping it poorer and worsening its image further. This can have long-lasting impacts on the aspirations of people that live and work in an area, often eroding community pride and sense of purpose.<sup>54</sup>

- **Loss of Political Influence:** The UK's political structure is unusually centralised. This creates the risk of London-centric politicians and civil servants making public investment decisions that neglect areas that have lower economic significance.<sup>55</sup> For example, a 2013 report by the Department for Transport noted that countries with a federal political system were able to appraise infrastructure need better than those with unitary systems.<sup>56</sup> Areas with declining economic importance, fewer jobs and paying less in tax are especially vulnerable to this effect. Without strong champions in the right political circles, communities can find themselves behind London and other powerhouses in Treasury spending rounds.

These four factors can reinforce each other. For example, brain drain makes it difficult to attract investment or business, which increases economic isolation. This is the opposite of 'agglomeration effects', which occur when an area's assets work together to increase economic activity.

#### **Areas connected to the North Sea have particularly insular economies.**

These negative effects have been noted in regions associated with the North Sea, which now generate much less GVA from tradable sectors than the UK average (Figure 10). Of the 39 regions linked to the North Sea, 31 generated levels of tradable GVA lower than the UK average in 2018, with 15 of these generating under half of the UK average. Without sustained government interventions, this lack of tradable industries will continue to hamper local economic growth.

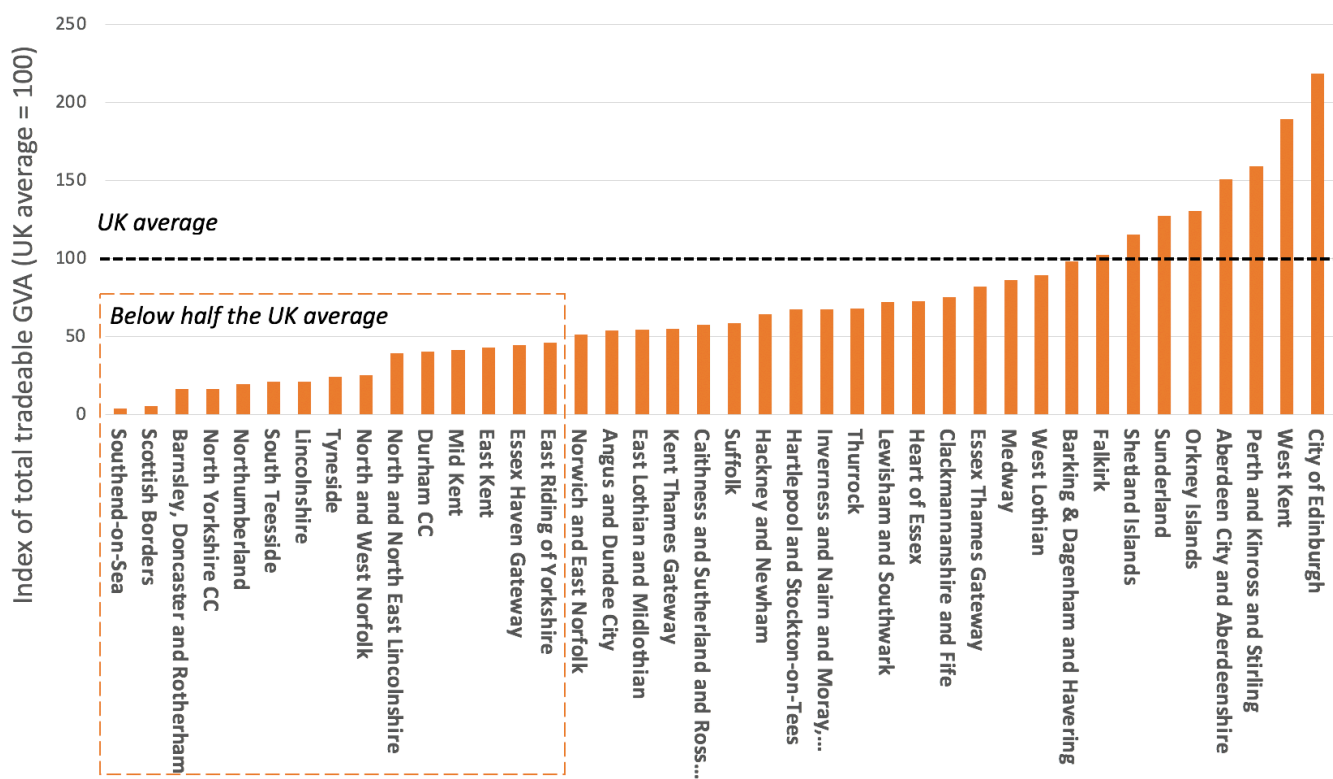
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54. Linda McDowell (2010), "Learning to Serve? Employment aspirations and attitudes of young working-class men in an era of labour market restructuring", *Gender, Place and Culture*, 389 – 416.

55. British Academy (2019), "Governing England: Devolution and funding".

56. University of Leeds / UK Department for Transport (2013), "International comparisons of transport appraisal practice" ([Link](#)).

Figure 10: Indexed estimate of total GVA from tradeable industries in North Sea regions, 2018 (UK tradeable GVA = 100).<sup>57</sup>



### Investment in low-carbon industries can reduce regional inequality and improve productivity

Many North Sea regions will economically benefit from the shift to a low-carbon economy, for example by becoming hubs for offshore wind manufacturing and associated professional services. Other areas may not benefit directly from investment to reach Net Zero but will still benefit indirectly. For instance, investment in areas like Humberside and Teesside will generate more tradable output, which in turn supports jobs in non-tradable sectors elsewhere.

Aberdeen and its surrounding areas are heavily dependent on oil and gas. The city will need to generate tradable value in new, low-carbon industries, as the returns from the hydrocarbon economy diminish. The opportunities for Aberdeen include oil and gas decommissioning services, offshore wind operations and maintenance expertise, hydrogen production and CCUS.

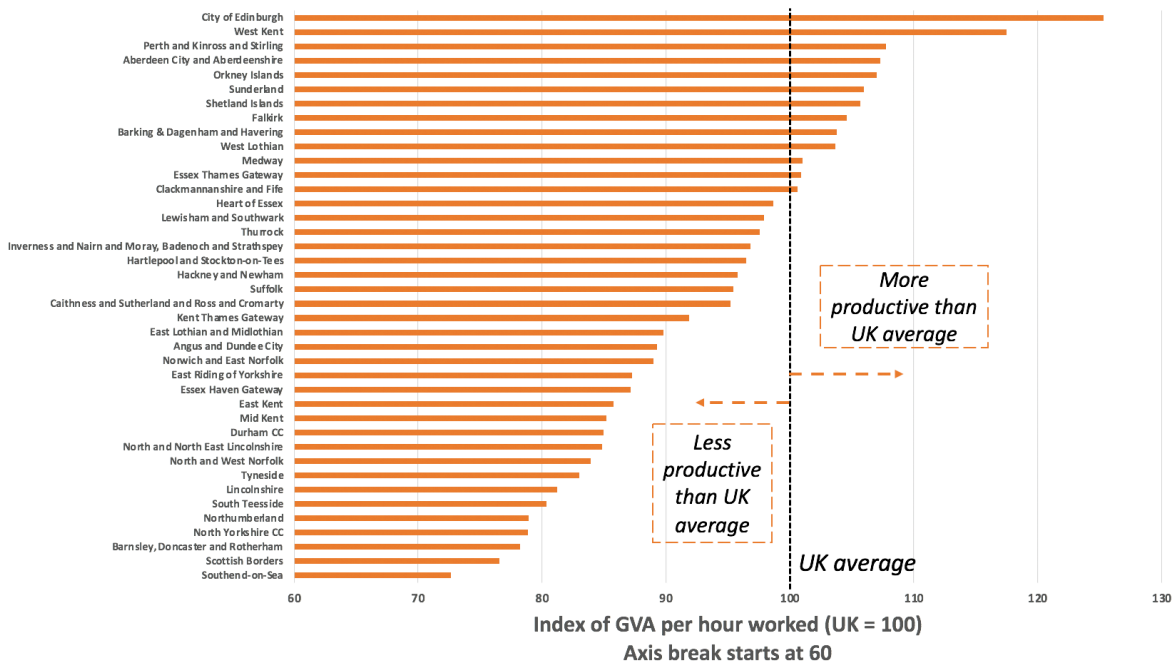
Growth in the North Sea’s low-carbon industries also offers an opportunity to improve the productivity of areas along the east coast of Britain. Lack of capital investment is blamed for up to half of the UK’s productivity stagnation since the financial crisis.<sup>58</sup> Areas linked to the North Sea are generally less productive than the UK average (Figure 11), but as the North Sea develops new, capital-intensive industries then these regions are likely to see growth in GVA per hour worked.

57. Policy Exchange Analysis of ONS (2019), *Regional gross value added (balanced) by industry: all NUTS level regions* (Link).

58. Sam Bowman and Stian Westlake (2020), "Reviving economic thinking on the right: A short plan for the UK" (Link).



Figure 11: Indexed GVA per hour worked, 2018 (UK = 100).



Net Zero is an opportunity to create tradable value through the development of industries linked to the North Sea, especially in the energy sector. These are determined by distinct geographic features, such as CCUS aquifers or high wind speeds, and therefore inherently non-replicable elsewhere. The strategic role they can play in the delivery of Net Zero makes them worthy of government investment.

## 4. The North Sea energy sector in 2050

Offshore wind power, CCUS and hydrogen all offer high-value industries for UK energy production, decarbonisation and export potential. The UK can therefore use the North Sea as a strategic asset in delivering Net Zero, whilst promoting positive economic outcomes for regions linked to its key industries.

This chapter presents a ‘high ambition’ scenario for the North Sea’s economic development in 2050, outlining what could be achieved if the UK realises the basin’s full potential.

### The North Sea energy industry

UK offshore wind is expected to double in capacity by 2025 and to quadruple by 2030, in line with the Conservative Party’s 2019 Manifesto commitment to 40 GW of offshore wind installed by 2030. The majority of this growth is expected to be in the North Sea. By 2050, the North Sea could be home to up to 100 GW of offshore wind, a fifteenfold increase compared to today’s capacity, and offshore wind could generate half of the UK’s electricity.<sup>59</sup> We estimate that, by 2050, the offshore wind industry could support 37,000 direct jobs.<sup>60</sup>

There are currently no large-scale carbon capture, utilisation and storage (CCUS) projects operating in the UK. Drax power station in North Yorkshire is conducting a pilot carbon capture project,<sup>61</sup> and the UK Government has recently announced £100m in funding for early-stage research and development on Direct Air Capture.<sup>62</sup> The CCC argues that the UK needs to develop at least two operational CCUS clusters in the 2020s.<sup>63</sup> The Government has committed to an operational CCUS hub by the mid-2020s, including a £800m funding commitment in the 2019 Manifesto and the 2020 Budget.

Bioenergy with Carbon Capture and Storage (BECCS) is expected to play a growing role in the UK’s Net Zero economy, providing ‘negative emissions’ to offset remaining greenhouse gas emissions in harder to decarbonise sectors such as aviation and industry.<sup>64</sup> By 2050, the UK CCUS industry could be sequestering over 100 million tonnes of CO<sub>2</sub> per year, equivalent around a fifth of the UK’s current greenhouse gas emissions.<sup>65</sup> We estimate that, by 2050, the CCUS industry could support a directly-employed workforce of 13,000.

Low-carbon hydrogen is currently a hot topic in the UK and across Europe. Policy Exchange’s 2018 report, *Fuelling the Future*, set out the many

59. National Grid ESO (2020), “Future Energy Scenarios 2020” ([Link](#)).

60. HM Gov (2019), “Industrial Strategy: Offshore wind sector deal”, 5 ([Link](#)); based on 27,000 jobs supported by 30 GW of offshore wind.

61. Drax (2019), “Carbon dioxide now being captured in first of its kind BECCS pilot”, ([Link](#)).

62. BEIS (2020), “Direct air capture and other greenhouse gas removal technologies competition” ([Link](#)).

63. CCC (2018), “Hydrogen in a low-carbon economy”, 15 ([Link](#)).

64. Ibid (NG ESO, FES 2020).

65. CCC (2019), “Net Zero – The UK’s contribution to stopping global warming”, ([Link](#)).

possible use cases for low-carbon hydrogen in a Net Zero economy.<sup>66</sup> Today, UK hydrogen demand is concentrated in refineries, where hydrogen is used in the refining of crude oil.<sup>67</sup> The 2020s is likely to be characterised by replacing existing hydrogen supply (mostly ‘grey’ hydrogen) with low-carbon hydrogen, which could be either ‘blue’ hydrogen or ‘green’ hydrogen.<sup>68</sup> The North Sea will be critical in the production of low-carbon hydrogen, due to the availability of low-carbon electricity to produce green hydrogen and the availability of natural gas and CCS aquifers to produce blue hydrogen. By 2050, UK hydrogen demand could be 20 times higher than today, with low-carbon hydrogen used by a combination of industry, heavy duty transport, and possibly for providing domestic heating.<sup>69</sup> The UK’s growing hydrogen industry will support the development of offshore wind and CCS industrial hubs, both key to the decarbonisation of the UK economy. We estimate that, by 2050, the UK hydrogen industry could support 15,000 direct jobs.

Network infrastructure is crucial to harnessing low-carbon energy production in the North Sea. Today, the North Sea is home to two electricity interconnectors that connect Great Britain’s electricity market to the Netherlands and Belgium. By 2030, new electricity interconnectors will create new connections to Norway, Denmark and possibly to Germany. Early demonstrations of multi-purpose interconnector (MPI) projects may be operational, although there are significant policy and regulatory barriers to overcome. By 2030, the UK will also have completed the first CO<sub>2</sub> transport and storage projects, which will be crucial to the development of CCUS and low-carbon hydrogen. By 2050, the North Sea could be home to a connected offshore energy grid, comprising offshore wind, electricity interconnectors, CCUS and low-carbon hydrogen production.<sup>70</sup>

The North Sea oil and gas industry will be smaller in 2050 than it is today, with production possibly only one-third of current levels.<sup>71</sup> However, the skills of the oil and gas industry will have a crucial role in delivering Net Zero. The CCUS industry will undoubtedly benefit from the North Sea oil and gas expertise in geology, drilling, monitoring, and in building and operating pipeline and platform infrastructure. Floating offshore wind will need the skills of the oil and gas industry in designing and operating floating platforms in offshore environments. The North Sea’s remaining oil and gas fields will need to transition to low-carbon electricity supply, as the industry currently consumes approximately 10% of the UK’s electricity but this is mostly generated by gas and diesel generators. This will involve linking some oil and gas platforms to the onshore electricity network, or potentially powering the platforms with dedicated floating offshore wind turbines.

66. Policy Exchange (2018), “Fuelling the Future” ([Link](#))

67. Marquez, M. and Tian, X. (2016), “The role of oxygen and hydrogen in refining” ([Link](#))

68. Please see glossary for explanations of these terms.

69. Aurora Energy Research (2020), “Hydrogen for a Net Zero GB” ([Link](#)).

70. North Sea Wind Power Hub programme (undated), “Vision” ([Link](#)).

71. OGA (2019), “Projections of UK Oil and Gas Production and Expenditure” ([Link](#)).

**Table 2: Summary of the 2050 vision for the North Sea energy industry.<sup>72</sup>**

| Technology    | Today (2020)  | By 2030  | By 2050   |
|---------------|---|--|---|
| Offshore Wind | 6 GW of offshore wind, two thirds of the UK total.  | c.30 GW of offshore wind in the North Sea.<br><br>(40 GW UK total).                  | Up to 100 GW in the North Sea.  |
| CCUS          | Trial CO <sub>2</sub> capture projects, including £100m for R&D into Direct Air Capture and £800m to support CCUS infrastructure deployment which includes BECCS.<br><br>CfDs proposed for power and industrial CCUS. | At least two operational UK CCUS clusters.<br><br>Up to 3.6 GW of BECCS.             | CCUS sequestering 75-175 MTPA of CO <sub>2</sub> . Up to 10 GW of BECCS.                        |
| Hydrogen      | UK consumption: 27 TWh per year, mainly in refineries.<br><br>£100m low-carbon hydrogen production fund. <sup>73</sup>  | Main focus on displacing existing grey hydrogen demand with blue and green hydrogen. | UK demand for hydrogen between 200 and 500 TWh per year (up to 20 times current demand).        |
| Networks      | 2 GW of interconnectors in the North Sea, out of 4.75 GW UK total.  | Around 20 GW of UK interconnectors, of which 10-15 GW in the North Sea.              | 15-20 GW of North Sea interconnectors. High potential for an offshore grid.                     |
| Oil and Gas   | O&G installations use 10% of UK electricity generation, almost all fossil fuel powered.   | Platform electrification well underway.  | Oil and gas production falls around two-thirds. Remaining platforms focus on CCUS and hydrogen. |

72. Sources: NG ESO (Future Energy Scenarios 2020); BEIS (Renewable Energy Planning Database); CCC (Net Zero [2019]); Aurora Energy Research (Hydrogen for a Net Zero GB); OGA (UKCS Energy Integration); OGA (Projections of UK Oil and Gas expenditure); and Policy Exchange analysis.

74. Policy Exchange analysis; BEIS (2020), "Energy flow chart 2019" ([Link](#)).

75. Policy Exchange analysis; National Grid ESO (July 2020), "Future Energy Scenarios 2020" ([Link](#)).

73. UK Parliament (2019), "Statement made by Andrew Leadsom, Secretary of State for Business, Energy and Industrial Strategy: Clean Steel Fund and Low Carp Hydrogen Production Fund", ([Link](#)).

### North Sea contribution to UK energy supply

Today, the North Sea oil and gas industry produces around 40% of the UK's primary energy supply.<sup>74</sup> The traditional narrative is that the North Sea's contribution to UK energy supply is in a terminal decline. However, by 2050, North Sea offshore wind could produce one-third of the UK's primary energy supply, in addition to any contribution from remaining North Sea oil and gas production.<sup>75</sup> The contribution of North Sea offshore

wind to UK electricity supply could rise from 7% today, to around 40% by 2050.

### Levelling Up North Sea regions through Net Zero

Maximising the potential of the North Sea to meet Net Zero will generate economic benefits and will create new jobs. Our analysis suggests these benefits could equate to £20bn per year in Gross Value Added (GVA) and a net gain of 40,000 direct jobs, mainly from the development of offshore wind, CCUS, and hydrogen (Box 1). These figures are likely to underestimate the economic benefits that are on offer, because they do not consider indirect jobs and economic multipliers.

#### Box 1: Estimating investment and direct jobs in the North Sea energy industry in 2050.

We have estimated the investment and employment potential of the North Sea energy industry in 2050. We found the following headline results:

- Investment in the North Sea energy industry could contribute £20bn per year in Gross Value Added (GVA).
- The North Sea energy industry could support a net increase of 40,000 direct jobs.

These job increases are mainly expected to be in the offshore wind industry, alongside increases in low-carbon hydrogen and CCUS.

#### Methodology

We used the following methodology to estimate potential investment and direct jobs in the North Sea energy industry:

- We estimate the potential for offshore wind, CCUS, oil and gas, and low-carbon hydrogen in the North Sea in 2050. These estimates are summarised in Table 2.
- We estimated the Levellised Cost Of Energy (LCOE) for each sector in 2050. We used this as a proxy for the total investment (or turnover) in the North Sea energy industry.
- We converted the estimates of total investment into total Gross Value Added (GVA) using ratios from the Office for National Statistics.<sup>76</sup> For CCUS and hydrogen we used appropriate existing sectors as proxies, based on similar costs of capital and asset lives.
- We used a similar approach to estimate direct jobs in each industry.

The Government's 'Levelling Up' approach should begin with support for Net Zero industries, whilst supporting the ability of North Sea-related communities to capture the economic benefits. This means reversing some of those factors that result from a lack of tradable industries. Table 3 sets out some principles in response to these challenges:

76. ONS (2020), "Annual business survey 2018: Revised results" ([Link](#)).

**Table 3: Principles for Levelling Up through the Net Zero agenda**

| Issues   | Possible remedies  |
|--|--|
| Lack of tradable industries in an area creates inability to self-sustain economic growth | Support creation of new industries under the ‘Net Zero’ agenda.  |
| <b>Economic isolation</b>  | <ul style="list-style-type: none"> <li>• Improve physical flows through better transport connections.</li> <li>• Support localised deregulation, such as free ports or planning zones, to attract capital investment.</li> <li>• Raise the profile of an area’s economic potential.</li> </ul> |
| <b>Brain drain</b>   | <ul style="list-style-type: none"> <li>• Invest in apprenticeships and retraining in skills linked to Net Zero industries.</li> <li>• Support affordable housing to retain skilled workers.</li> </ul>   |
| <b>Social and cultural capital decline</b>   | <ul style="list-style-type: none"> <li>• Invest in cultural attractiveness of key areas to attract workers.</li> <li>• Emphasise region’s nationally important role in addressing Net Zero.</li> </ul>   |
| <b>Loss of political influence</b>   | <ul style="list-style-type: none"> <li>• Localise decision-making and spending powers.</li> <li>• Rebalance Treasury investment rules.</li> <li>• Increase explicit Ministerial responsibilities for North Sea.</li> </ul>   |

The right set of policies are needed to ensure that the economic benefits of the North Sea’s low-carbon transition accrue in the regions that need them most. As set out in our ‘Drivers of Change’ chapter, long-term industrial decline has undermined their ability to do so in four key ways: economic isolation, loss of political influence, brain drain and social capital erosion. All of these four elements are important – it is not just industry that should benefit from investment in Net Zero technologies, but also their host communities.

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## 5. Policy themes

If the North Sea economy is to transition from today (Section 2) to the '2050 Vision' for the North Sea (Section 4), policymakers and industry will have to overcome significant policy barriers. During this project Policy Exchange has held discussions with over fifteen industry experts from all sectors of the North Sea economy. The process has highlighted six clear policy themes as the key barriers to achieving the full potential of the North Sea and Levelling Up regions associated with it over the next three decades.

### Spatial planning

Marine Spatial Planning (MSP) means organising the use of the sea by specifying how authorities should balance the demands for space from competing activities. The Marine Management Organisation (MMO) currently has responsibility for marine planning in the UK, but has limited scope and status and is too closely tied to the fishing sector.

Space constraints in the UK's seas are increasing, particularly due to the growth of offshore wind farms and other emerging energy infrastructure. These spatial conflicts are particularly pressing in the southern North Sea. The UK's MSP system is light touch, often leading to a 'first-come, first-served' approach to the allocation of seabed. Without a greater role for MSP, there is a risk that uncoordinated development could limit the potential of the North Sea to deliver sustainable economic growth and Net Zero.

If the Government reforms spatial planning, it will need to consider how prescriptive it wants Marine Plans to be: i.e. should a Marine Plan specify that a particular area is reserved indefinitely for one activity or should there be a hierarchy of permitted activities? The Government must ensure that all departments act in accordance with Marine Plans, which is currently not the case. As spatial constraints become more apparent, marine planning is likely to become more politically contentious. The Government and Devolved Administrations will therefore need to consider the role of democratic oversight governing the use of marine resources.

### Environmental regulation

The current environmental regulatory regime in the North Sea does not prevent environmental damage effectively because it does not apply evenly to all sectors, nor to the whole of the North Sea. Fishing generally impacts the marine environment more than other activities, such as through operating in some Marine Protected Areas (MPAs) unabated. Another way in which current environmental regulations fall short is limited ambition:

they only try to prevent that environmental damage from occurring. Conservation is undeniably important, but it does not incentivise active improvements in the environment, which are important in degraded habitats in which natural recovery may not be enough, or may be very slow.

The marine environment in the North Sea will experience increasing pressure as the basin is developed. Environmental regulations need to take stock of all these pressures and to be able to respond to them. Importantly, the application of regulations should be consistent across all activities in the North Sea, so that the ‘environmental budget’ of the basin is not taken up by any one sector.

### Business models for new low-carbon technologies

New energy projects will only be developed if investors assess that they can make a return on their investments. For established technologies, such as oil and gas, there are well-developed business models that give private investors the confidence to invest in the exploration, production, refining and distribution of North Sea hydrocarbons. For newer low-carbon technologies, a subsidy from the Government may be required, and the business model that the Government specifies will be key to rolling out these new technologies at the lowest cost. The Government is consulting on the appropriate business models for hydrogen, and recently completed one for CCUS.<sup>77</sup> The success of these consultations, and the design of subsequent support mechanisms, will be crucial to delivering Net Zero.

When developing business models for new technologies, the Government must consider the appropriate balance of risk sharing and financial returns for the private and public sectors. They must also consider the geographical differences between parts of the North Sea. This is evidenced in the Government ‘industrial clusters’ approach, which recognises the benefits of economies of scale, particularly for CO<sub>2</sub> transport and storage, as well as that different technologies may be appropriate in different clusters.

### Investment in low-carbon networks

Current approaches to network investment have delivered the new networks needed to connect low-carbon energy projects, such as offshore wind. However, the scale of development means that some communities are having to accept substantial new infrastructure. A more strategic approach could allow multiple offshore wind farms to share a single connection to the onshore grid. This would reduce the pressure on local communities and on the environment. The Government is already considering new approaches through the Offshore Transmission Review.<sup>78</sup>

The existing policy and regulatory frameworks are not set up to promote strategic or anticipatory investment to support the delivery of new coordinated offshore networks. This is partly due to uncertainty over the future allocation of space in the UK’s seas. Investment decisions in new networks are supported by the ‘Future Energy Scenarios’ (FES) and the Networks Options Assessment (NOA), both of which are produced

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77. BEIS (2020), “Future support for low-carbon heat” ([Link](#)); BEIS (2020), “Carbon capture, usage and storage: A government response on potential business models for Carbon Capture, usage and storage” ([Link](#)).

78. BEIS (2020), “Offshore transmission network review” ([Link](#)).



by the Electricity System Operator (ESO). The Future Energy Scenarios explore possible decarbonisation pathways out to 2050. The NOA is more granular, focusing on engineering options to upgrade the onshore electricity network, including options to connect offshore wind farms to the onshore grid. The FES and the NOA form part of the evidence base that the Government and Ofgem use to support the business case for investment in new networks.

The FES and the NOA do not focus on other spatial constraints that may require a particular network solution. This is especially true in the offshore environment, where spatial constraints are increasing, including shipping lanes, fishing grounds, and MPAs.

Any new strategic approach to connecting offshore wind farms should apply equally to hydrogen and CCUS infrastructure, electricity interconnectors, and the electrification of oil and gas platforms. It should support strategic investments in new networks, for example offshore electricity substations that can connect to multiple offshore wind farms.

A further constraint on new network infrastructure is political. As part of our research, several Members of Parliament reported discontent among their constituents at the arrival of infrastructure such as cables and substations. Often, the opposition was based on the likely impacts on visual amenity and on the local ecology, and the disruption of construction. If the Government were to implement a more strategic approach to planning this infrastructure, it would help local politicians and project developers to justify their proposals.

### Cross-border collaboration

To fully develop the North Sea fully, Governments will need to cooperate to allocate space, to coordinate the development of cross-border energy infrastructure and also to protect the marine environment.

Cross border collaboration is needed for electricity interconnector projects, which involve Governments, regulators and electricity network companies (TSOs) in the countries at each end of the interconnector. This collaboration will become much more complicated for multi-purpose interconnector projects, including a potential 'North Sea grid'. These projects will require new approaches, including for electricity bidding zones and cost-benefit analysis. The delivery of North Sea offshore wind will be substantially more costly without multi-purpose interconnectors.

Protecting the marine environment and maximising the returns from natural capital will be difficult in a highly connected marine environment if a similar approach is not adopted throughout the whole of the North Sea.

### Capturing economic benefits

The transition to Net Zero will generate significant economic activity in areas linked to the North Sea. If North Sea regions can capture the benefits of this economic activity, it will go some way towards 'Levelling Up' coastal communities.

As set out in our ‘Drivers of Change’ chapter, long-term industrial decline has undermined their ability to do so in four key ways: economic isolation, loss of political influence, brain drain and social capital erosion. Therefore, public policy will need to take a role in supporting the ability of such areas to capture economic benefits. All of these four elements are important – it is not just industry that should benefit from investment in Net Zero technologies, but also their host communities.

## 6. A strategy for the North Sea

The six policy themes identified in the previous chapter should form the basis of a new economic strategy for the North Sea. This would allow the UK to realise investment and job creation in North Sea regions, whilst making progress towards the UK's Net Zero obligations. This section outlines our recommended principles and policy recommendations.

### Recommended approach and principles

The Government should take a consistent approach to the North Sea to achieve the Net Zero and Levelling Up agendas. We recommend four principles to underpin a Strategy for the North Sea:

- 1. Take a holistic approach to the diverse activities in the North Sea, including regulation and use of space.** Policy should look at the North Sea as a whole, and not at sectors and activities within specific areas.
- 2. Harness the low-carbon development of the North Sea to 'level up' areas linked to its key industries.** The Levelling Up agenda should leverage growth in the low-carbon economy to the benefit of local areas along the North Sea coastline to create jobs and unlock investment. It also needs to ensure areas dependent on oil and gas are not made worse off by the transition to Net Zero.
- 3. Use markets and competitive procurement where possible to support private enterprise in delivering Net Zero.** This will lower the cost of delivering Net Zero and allow more people to participate in the low-carbon economy. The Contracts for Difference (CfD) scheme for renewables has shown that the public and private sector can work together to lower costs and to deliver at scale.
- 4. Engage with international partners to take a whole-basin approach to the development of the North Sea.** This is particularly important for cross-border projects, such as interconnectors and wind farm, as well as to protect the marine environment.

## Policy recommendations

We have grouped our recommendations into six themes, which respond to the six policy themes outlined in the previous section.

### Theme #1: Create a new 'UK Seas Authority' (UKSA)

**Recommendation 1.1:** The Government should create a new UK Seas Authority (UKSA) to coordinate development across the UK's seas. The Authority should be responsible for producing Marine Plans.

**Recommendation 1.2:** The UKSA should be responsible for planning uses of the UK's seas for all industries but should not regulate any of those industries.

This Authority should coordinate development across industries in the UK's seas, enabling a more strategic approach. Although the new body would be particularly focussed on the North Sea, given the latter's size and resource potential, it should cover all domestic UK waters. The new UKSA should be responsible for Marine Spatial Planning (MSP), an activity that currently sits with the Marine Management Organisation (MMO).

MSP is a devolved function for inshore waters (under twelve miles from the coast), with some limited devolution over planning for offshore areas of sea (over 12 miles from the coast). When writing Marine Plans, the UKSA will therefore need to coordinate with the Devolved Administrations over inshore aspects, but will have the remit to plan for most offshore activities.

Currently, the MMO prepares Marine Plans, which set out preferred uses of the North Sea. The MMO also has responsibility for regulating and licensing the fishing and marine aggregates industries. This dual role creates the potential for a conflict of interest, or at least the appearance of one, between the MMO's role in planning uses of the seas for all industries and regulating a subset of those industries. The MMO should therefore pass its Marine Planning duties to the UKSA, whilst remaining the regulator and licensor for fishing and aggregates industries.

Similarly, the Crown Estate plays a central role in the commercial development of North Sea resources, although this is mostly limited to leasing the seabed. The Crown Estate works on behalf of the taxpayer to ensure strong financial returns to the Treasury from its assets. Under a new marine planning regime, the Crown Estate should continue with its current role, albeit within a new framework led by the UKSA. The Crown Estate should feed in to the UKSA's marine planning process and should continue to lease the UK seabed.

The UKSA should also support and promote the development of the UK's marine environments. Its leadership team should see the UKSA's role as ensuring maximum economic activity within sustainable parameters. The Oil and Gas Authority (OGA) currently performs such a role for the oil and gas industry, combining it with regulatory duties. This 'promotional'

duty should be removed from the OGA and passed to the UKSA, leaving the OGA to act as a straightforward regulator for oil and gas. By doing so, the UKSA will be able to take a strategic, multi-sector approach to promoting economic activities in the basin.<sup>79</sup>

Marine planning is likely to become increasingly contentious, so the UKSA should not have any dual roles outside of planning and supporting the development of the basin to optimise its utility for all industries.

**Recommendation 1.3:** The Government should bring forward a new Marine Policy Statement, to direct the new UK Seas Authority to produce more spatially prescriptive Marine Plans.

**Recommendation 1.4:** The Government should introduce new legislation requiring all Departments to act “in accordance with” new Marine Plans, ensuring that all industries use the UK’s seas in a consistent and low-conflict manner.

Current Marine Plans are not particularly prescriptive over which uses of the sea should be prioritised in which areas. There are some advantages to this approach, particularly around flexibility of the market to determine the most efficient uses of the North Sea. However, as competition for space in the North Sea increases, Marine Plans will need to become more prescriptive. The Government should therefore introduce a new Marine Policy Statement (MPS) to increase the prescriptiveness of Marine Plans.

New Marine Plans have the potential to significantly improve the allocation of space in the UK’s seas, particularly in the congested Southern North Sea. However, in practice Government Departments can deviate from Marine Plans in practice, undermining their usefulness. Departments have to act “in accordance with” the plans, but are allowed to “have regard to” them if “relevant considerations” are given.<sup>80</sup> Only requiring Departments to “have regard to” Marine Plans means the Plans can be deviated from, undermining their effectiveness as a tool to avoid spatial conflicts. As marine planning becomes more important, Marine Plans must carry more weight with all Government Departments and other relevant decision makers.

In particular, Marine Plans should consider:

- Identifying preferred corridors for infrastructure that could be shared by multiple projects. For example, the UKSA could identify sections of coastline that could serve as the landing point for multiple pipelines and subsea electricity cables;
- Reserving areas of the seabed above the most promising CCUS aquifers because it may not be possible to accommodate both carbon storage and wind farms or mining activity;
- Marine Protection Areas and their juxtaposition with more intensive activities;
- Key shipping routes, including likely greater use of the Northern

79. See the conclusion for the envisaged development process (Figure 13).

80. HM Gov et al (2011), “UK Marine Policy Statement”, 13 ([Link](#)).

North Sea as Arctic sea routes open up due to climate change.

**Recommendation 1.5:** Marine plans should be authorised by the Secretary of State for Business, Energy and Industrial Strategy.

As marine planning becomes more important and more prescriptive, there is a need for enhanced political legitimacy. This would enable marine planners to make contentious decisions over the allocation of space. In the UK Government, responsibility for marine activities is split across a number of departments, including BEIS and DEFRA. This should be remedied by placing development of the basin under the remit of BEIS alone. This would clarify the role of marine planning as an economic function. DEFRA would continue to have a role via its regulatory agencies. The UKSA should also refer to DEFRA in the development of Marine Plans, but BEIS should carry ministerial responsibility for the North Sea's development.

**Theme #2: Apply environmental regulation consistently across all economic activities and incentivise net improvements in the marine environment.**

**Recommendation 2.1:** The Government should adopt a Natural Capital approach towards regulating activities that impact the marine environment.

As discussed in Section 2, regulation of the marine environment needs to be able to 'take stock' of the health whole environment. This includes biotic and abiotic elements, like fish as well as the state of the seabed. Current environmental regulation does not evaluate the marine environment as a whole, and this means regulation can be siloed, with some activities having a greater impact on the marine environment than others.

Natural Capital approaches provide a better understanding of the 'health' of the marine environment, allowing policymakers to be more informed about the effectiveness of conservation policy. In particular, a Natural Capital approach considers economic activity and the environment as dependent on one another. Maximising the economic potential of the North Sea therefore also depends on a healthy marine environment.

In the land planning system, Natural Capital approaches are already beginning to be introduced, such as the Environment Bill's 'biodiversity net gain' provision. Land and sea environments are interconnected, and introducing Natural Capital approaches to conservation on both land and sea allows for policy to consider the environment as a whole, and therefore how it can holistically be improved.

The UK's exit from the EU provides the opportunity to adopt Natural Capital approaches in certain areas through, for example, allowing the UK to diverge from the EU's Common Fisheries Policy (CFP).

**Recommendation 2.2:** The Government should create a new research fund jointly backed by the Government and industry to fund a strategically co-ordinated research programme into the impacts of economic activities on the marine environment, including the application of natural capital. This should be led by a DEFRA agency, such as the Centre for Environment, Fisheries and Aquaculture Science (CEFAS).

Natural Capital approaches are still relatively new, and appropriate methods to value the marine environment are still being refined. However, Natural Capital approaches focused on valuing land environments are more established, and there is no reason the same cannot be done for the marine environment.

To advance our understanding of the marine environment as a system of natural capital ‘assets’ and ‘flows’, better data is required. Current ecosystem-based approaches also lack sufficient ecological data to understand some parts of the marine environment properly. For instance, little is known about the health of some North Sea fish stocks still, largely due to a lack of data on their population levels. ‘Natural Capital Accounts’, which are datasets of the UK’s natural capital, have been compiled for land and freshwater environments, and there is no reason the same should not also be done for the marine environment. Establishing timely accounts for the marine environment would open the door to mandating net improvements in the marine environment, through tools like ‘net gain’ and environmental offsetting.

There is a lack of strategic research in this space; the UK government could fund such research in partnership with offshore industries, such as wind farms and CCUS. Such a research programme would aim to understand the optimal balance between offshore industries and ecological restoration in marine environments. This means that as the North Sea is increasingly developed to meet Net Zero, any negative impacts on the marine environment can be increasingly understood, and therefore reduced.

**Recommendation 2.3:** Government should increase the consistency with which environmental regulation is applied to activities in the North Sea, and in the wider marine environment more generally.

Environmental regulation is not applied equally to all sectors, which provides some sectors with a greater licence to pollute than others. For instance, fisheries management provides concessions to the fishing industry to damage the marine environment over and above other activities through not being subject to the same scrutiny as, say, large infrastructure projects. The Environmental Impact Assessment process ensures that, where possible, major infrastructure projects where possible avoid, minimise, and compensate for their impacts on protected habitats and species under the Habitat and Birds Directives. However, fishing is not subject to the same scrutiny, with the most obvious example being that fishing can widely occur within MPAs, damaging the valuable habitats

within them.

A Natural Capital approach would help make the environmental impacts of different activities comparable, and therefore easier to apply regulation more equally to.

**Recommendation 2.4:** Management plans and monitoring regimes should be implemented as soon as possible for all existing MPAs, and any future MPAs should have these plans in place promptly after they are proposed.

The OSPAR Convention sets the target for an ‘ecologically coherent network of MPAs’ to be established in the North East Atlantic, which includes the North Sea. The UK has established enough MPAs, but they do not meet the criteria to form a ‘coherent’ network because many lack appropriate management and monitoring plans.<sup>81</sup>

**Recommendation 2.5:** Over the medium to long term, the principle of environmental net gain should be introduced for the marine environment.

Over the medium to long term, the principle of *environmental* net gain should be implemented for the marine environment. This is similar to *biodiversity* net gain, which is being implemented through the Environment Bill, but is more reflective of the marine ecosystem through being based on more than just a biodiversity metric. It aims to generate a net increase in ecosystem services that stem from the marine environment, rather than just increasing habitat or biodiversity. However, this will only be possible over the medium to long term once adequate data sets and dependable Natural Capital approaches are established.

**Recommendation 2.6:** To promote a consistent environmental approach across the North Sea basin, the UK should work with the EU and Norway towards an international Natural Capital framework for the marine environment.

Environmental regulation in the North Sea will need to be coordinated with other countries. The marine environment is more interconnected and dynamic than land-based ecosystems, increasing the importance of protecting the marine environment either side of a maritime border.

The UK is taking a stronger Natural Capital approach towards environmental regulation post-Brexit than it has done previously. Both the Environment and Fisheries Bills outline ambitions to be informed by Natural Capital approaches, replacing previously EU-derived environmental law. However, other North Sea countries will continue to regulate the environment using different approaches and metrics. The benefits of a Natural Capital approach are maximised when the whole

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81. Natural Capital Committee, “Marine and the 25 year plan”, 11 ([Link](#)); Environmental Audit Committee, “Sustainable Seas”, 5: Marine Conservation ([Link](#)).



system is accounted for. This requires all countries bordering the North Sea to regulate the impacts of activities from a common Natural Capital point of view, allowing for a unified regulatory approach to protect the marine environment.

**Theme #3: Introduce tailored support for new low-carbon technologies such as hydrogen and carbon capture, utilisation and storage (CCUS).**

**Recommendation 3.1:** The Government should make a final decision on the business models for hydrogen and CCUS by mid-2021, to enable the early deployment of these new low-carbon technologies.

Government support for new technologies should be specific to each use case. In some cases, it may be possible to take a technology-agnostic approach, whereas other use cases will require technology-specific support schemes. This has been the case for the UK's successful Contracts for Difference (CFD) scheme, which has 'pots' for more established and less established technologies. Competitive procurement through mechanisms such as CfDs has significantly lowered the cost of offshore wind.

The Government has already completed a lot of work on new business models for new low-carbon technologies such as hydrogen and CCUS. The challenge now is to make a final decision on those business models in good time, to enable the rollout of these new technologies.

**Recommendation 3.2:** Government should concentrate the development of low-carbon hydrogen production in North Sea industrial clusters. Initially this should be focused on replacing high-carbon hydrogen consumption in existing refineries and chemical plants.

**Recommendation 3.3:** Government should deploy low-carbon hydrogen in non-industry uses through increasingly ambitious pilots in the areas surrounding North Sea industrial clusters, such as in heavy duty transport.

Today, hydrogen use is concentrated in refineries and chemical plants, many of which are located in North Sea industrial clusters. The North Sea will be critical to the production of low-carbon hydrogen due to the availability of low-carbon electricity to produce green hydrogen and the availability of natural gas and CCS aquifers, which are necessary for the production of blue hydrogen. It therefore makes sense for the Government to concentrate low-carbon hydrogen production in existing industrial clusters along the North Sea coastline.

The Government has already started in this direction by creating the Hydrogen Transport Centre in Teesside, where currently around half

the UK's hydrogen is produced.<sup>82</sup> The Government should deploy low-carbon hydrogen in other sectors through increasingly ambitious pilots in the same industrial clusters, to take advantage of agglomeration effects. Almost all current hydrogen production has a high carbon-intensity.

**Theme #4: Use new 'Future Sea Scenarios' to help to identify the investments in the North Sea networks that are needed to unlock Net Zero.**

**Recommendation 4:** The new UKSA should produce "Future Sea Scenarios" to test the impact of different economic uses and environmental protections of the UK's seas. This will help to identify the major spatial and environmental conflicts resulting from Net Zero, as well as build the evidence base to support investment in new networks.

More spatially prescriptive Marine Plans will increase the certainty over which new networks are needed to deliver Net Zero. However, Marine Plans are likely to have a relatively short time horizon and will only provide a single vision for the future of the UK's seas. To explore future scenarios for the marine environment, the new UK Seas Authority should produce 'Future Sea Scenarios'. These scenarios should explore a wide range of possible economic uses and environmental protections of the UK's seas over the longer-term, for example to 2050 and beyond.

Future Sea Scenarios should supplement the evidence that the Government and Ofgem use to assess the relative economic merits of proposed investments in new networks such as a coordinated offshore grid in the North Sea. The Future Sea Scenarios would consider all uses of the North Sea (and other UK seas, basin by basin), including energy production and storage, shipping, fishing, marine aggregates, zones of environmental protection and more.

Both Marine Plans and Future Seas Scenarios should consider the potential for coordination between projects and the need for onshore infrastructure including electricity substations, power lines, pipelines and industrial facilities. They should also consider future demographic and industrial developments on land. Onshore infrastructure inevitably has higher impacts to communities in certain areas, which should also be considered.

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82. Tasmin Lockwood, "Teesside to be clean energy leader and home of the UK's first hydrogen transport centre", *The Northern Echo*.

**Theme #5: The UK Seas Authority should have a specific remit to work with international partners on the development of the North Sea.**

**Recommendation 5.1:** The UKSA should have a specific remit to work with international partners on the development of the North Sea, either through the EU's North Sea Energy Cooperation or through establishing a new multilateral cooperation forum.

International cooperation will be crucial to the full development of the North Sea as an economic resource whilst strengthening environmental protection. For energy projects, coordinated spatial planning will be required across borders, and new approaches will be needed for electricity trading, particularly for multi-purpose wind interconnector projects.

The European Union operates the 'North Seas Energy Cooperation' (NSEC), which aims to coordinate the development of cross-border energy projects, including offshore electricity grids and offshore wind projects. The UK left the NSEC in January 2020 as a result of Brexit but the EU reserves the right to invite the UK to participate "in exceptional circumstances... when it is necessary in the interest of the EU." The UK controls the largest portion of the North Sea. It is therefore in everyone's interests for the EU to invite the UK to rejoin the NSEC as a full member.

If the EU does not allow the UK to rejoin the NSEC with full membership, then the UK should establish its own multilateral cooperation forum. The UK should invite Norway and individual EU Member States to join. The UKSA should have a specific remit to lead the UK's engagement with its neighbours in the North Sea.

**Recommendation 5.2:** The UK should seek a long-term 'Energy Partnership' with the EU, focusing on electricity trading and the development of low-carbon energy resources in the North Sea. The agreement should be signed by the end of this Parliament (by 2024).

Electricity trading is a live issue in the UK-EU negotiations on the Future Relationship. New approaches will be needed to accommodate complex offshore electricity grids and offshore wind 'hubs', particularly as these projects are likely to cross international borders. A stable framework will be needed to ensure investor confidence and to drive down the cost of these novel offshore low-carbon energy projects.<sup>83</sup>

Policy Exchange's recent report, *The Future of UK-EU Energy Cooperation*, explored new models for energy cooperation between the UK and the EU after the end of the Transition Period. We recommend that, in the short term, the UK and the EU should seek an 'Energy Agreement', allowing the most crucial aspects of energy cooperation to continue. This agreement should focus on maintaining electricity market coupling as far as possible.

<sup>83</sup> Ed Birkett (2020), "The Future of UK-EU energy cooperation", *Policy Exchange*.

In the long-term, and by the end of this Parliament, the UK and the EU should seek a long-term ‘Energy Partnership’, based on shared interests in competitive energy markets, robust carbon pricing, and the sharing of renewable energy resources across borders.

**Theme #6: Develop policies to unlock public and private investment in economically less-developed areas of the North Sea coastline under the Levelling Up agenda.**

**Recommendation 6.1:** Ministers should promote a Net Zero Triangle which connects Humberside, Teesside and Leeds. This should be delivered through a package of measures focused on improving transport links and knowledge sharing within the Net Zero Triangle.

The Net Zero agenda creates significant opportunities for regional economic development. Policy Exchange analysis suggests that Net Zero could create £20bn in Gross Value Added (GVA) per annum and an additional 40,000 direct jobs by 2050 in North Sea regions.

As discussed in Chapter 3, we have identified four barriers to this Levelling Up agenda, which undermine the ability of North Sea regions to capture the economic benefits of Net Zero:

1. Economic isolation as a result of decline in tradable industries
2. ‘Brain drain’ or skills loss due to poor employment prospects
3. Loss of social and cultural capital, making areas less attractive to live or work in
4. Loss of political profile at a national level.

To reduce the economic isolation of North Sea regions, the Government should focus the development of low-carbon industries in these areas. Part of this process involves maximising agglomeration effects by connecting workforces, knowledge hubs, and industrial resources where possible.

The North East of England hosts two key industrial clusters, a number of engineering and scientific centres of excellence in leading university towns like Leeds, Durham and York, and population hubs such as the Leeds-Bradford conurbation. The Government should invest in connecting these strengths.

The Government should promote a ‘Net Zero Triangle’, linking the industrial clusters of Humberside and Teesside with Leeds-Bradford conurbation. Other North Sea industrial centres such as Grangemouth and Aberdeen should receive similar investment in connectivity, including airports, ports and other transport links.

**Recommendation 6.2:** The Government should introduce an ‘opportunity grant’ of at least £3,000 for every individual over the age of 21, with a Net Zero premium added within the Net Zero Triangle. The money should be drawn down by providers of approved job-relevant courses.

It should be possible for residents of North Sea regions to plan fulfilling careers within their areas as part of the low-carbon transition. Development of the North Sea will create these opportunities, but there is an important role for policy to fulfil demand. This involves closer links between businesses and education and training centres.

Policy Exchange has previously recommended that the Government should introduce an ‘opportunity grant’ for all individuals over the age of 21.<sup>84</sup> This grant should be introduced and extended within the Net Zero Triangle to supply the skilled workforce needed for locally important industries.

A ‘Net Zero premium’ should be drawn down by approved providers of job relevant courses, such as industry-specific training centres that the Government’s various ‘Sector Deals’ are promoting.

**Recommendation 6.3:** Government should suspend the current apprenticeship levy and replace it with a simplified model focused on school leavers, with Government and employers splitting the cost 50:50, as discussed in Policy Exchange’s recent report, *The Training We Need Now*.

Learning by doing is an often-overlooked source of innovation in industry, which can be supported through greater investment in in-work training. The Apprenticeship Levy is a charge on UK employers to fund apprenticeships. As Policy Exchange has argued, the current levy of £15,000 covers only a third of the costs of a conventional apprenticeship. Many employers have used it on discretionary training for older workers, whilst currently less than 10% of school leavers enter an apprenticeship.<sup>85</sup> A new model focused on school leavers would be more appropriate, especially to address skills shortages in strategic sectors that are needed to deliver the low-carbon transition. This would also alleviate the brain drain effect seen in many North Sea regions whereby young people leave their hometowns to pursue education and training in universities across the country.

**Recommendation 6.4:** The Government should support cultural development along the East coast of Britain, including creating and benefitting local institutions similar to the Welsh National Opera and Opera North.

Social and cultural capital is what makes a place attractive and enjoyable to live and work in. The importance of social and cultural capital is often overlooked and seen as a result of economic development. However,

84. David Goodhart (2020), “The Training We Need Now”, 5.

85. David Goodhart (2020), “The Training We Need Now”, 6.

evidence suggests that it plays a central role in supporting economic development by acting as a magnet to attract skilled workforces to an area.<sup>86</sup> The full potential of the North Sea industries will not be realised without persuading skilled workers to move to North Sea regions. Increasingly, research suggests that salary is only one element of what attract people to live and work in an area; quality of life is also key.<sup>87</sup>

Developing the North Sea will bring economic benefits to regions along its coastline, which our analysis suggests could be £20bn GVA a year, and around 40,000 extra direct jobs. These economic benefits should be used as an opportunity to make these areas nicer places in which live. Investing in the cultural development of North Sea regions will therefore support the delivery of Net Zero. Policy Exchange has previously argued for key national institutions to create branches throughout the UK.<sup>88</sup>

**Recommendation 6.5:** Part of the future 'UK Shared Prosperity Fund' should be put under the control of Metro Mayors for cultural and social development.

A consequence of the UK leaving the EU is that the EU's 'Structural Investment Fund' will no longer flow to UK regions. The fund is the EU's mechanism for funding economic development in less well-off regions, and the UK receives around €2.3 billion per year from it.<sup>89</sup> The Government has committed to set up the 'UK Shared Prosperity Fund' to replace it, although details on the design of the fund are yet to be consulted on.

Metro Mayors have so far been successful in championing areas through attracting investment and representing their regions in Westminster. Greater resources should be put under their control to develop the social and cultural capital of the areas they represent. This would allow invest in projects that support civic pride, which has often been undermined by industrial decline.

**Recommendation 6.6:** The Government should support and strengthen Metro Mayors in the North Sea regions. For example, this could be done by providing them with more powers, revised voting requirements and greater tax raising remits.

Treasury rules and centralisation create a public spending bias in favour of the South East and urban centres, which poses a threat to the capacity of North Sea regions to deliver Net Zero. Metro Mayors have proven a successful model for improving the prospects of areas outside the South of England. London's Mayorality has been replicated by other areas, such as Greater Manchester, Liverpool, and Teesside.

As Policy Exchange has previously recommended, greater autonomy should be provided to Metro Mayors through reviewing mayoral combined authority voting requirements. They often act as unhelpful restraints on Mayoral power and should be reconsidered. For example, the number

86. Richard Florida (2014), "The creative class and economic development", *Economic Development Quarterly*, 28(3): 196 – 205.

87. Daniel Finkelstein (2020), "Flaw at the heart of Boris Johnson's big idea: The government's ambition to 'level up' parts of Britain outside the big cities will only make them more socially liberal", *The Times*.

88. Jack Airey et al (2019), "Modernising the United Kingdom", *Policy Exchange*.

89. IFS (2020), "Sharing prosperity? Options and issues for the UK Shared Prosperity Fund" ([Link](#)).

of votes needed to overturn the municipal authority's proposed budget should be reviewed to strengthen a Mayor's hands. Greater autonomy to raise money would also provide Mayors with the ability to stimulate local growth independently of the Treasury.

**Recommendation 6.7:** Parliamentarians should apply coordinated scrutiny towards the development of the North Sea, for instance through the BEIS Select Committee or by creating a dedicated All-Party Parliamentary Group (APPG) for the North Sea.

Political momentum is necessary to maximise the development potential of the North Sea due to the lengthy timescales involved. Ministers should be held to account for this strategic delivery through a coordinated effort by Parliament.

**Recommendation 6.8:** Government should create a Minister of State for North Sea Development in the Department for Business, Energy and Industrial Strategy.

Maximising the potential of the North Sea requires political leadership. This effort could be led by a new Minister for North Sea Development, who would have a similar remit to the Minister for the Northern Powerhouse.

**Recommendation 6.9:** The UK Government should require operators of new offshore wind farms to establish a 'Community Benefit Fund' to ensure that coastal communities benefit from hosting offshore wind farms and supporting infrastructure. This should be funded through a charge of 50p/MWh on all new offshore wind farms for the duration of their 15-year Contract for Difference (CfD). The funds should be administered through local and regional organisations.

Offshore wind farms and transmission cables are necessary for Net Zero, but there are negative impacts on local communities. Policy Exchange has previously argued that owners of onshore wind farms should make community benefit payments to improve public acceptability.<sup>90</sup> The UK Government currently advises owners of onshore wind farms to pay at least £5,000 per MW per year in community benefits; however, this guidance is not mandatory. The Net Zero agenda risks losing political support if compensation is not offered to those who are negatively affected.<sup>91</sup>

The Government's Offshore Wind Sector Deal includes a commitment to "invest in projects that will benefit local communities in the regions in which they operate, for example through community benefit funds".<sup>92</sup> However, this is also not mandatory, there is no minimum level of support specified, and there is no mandatory framework for distributing funds. Some operators already make voluntary community benefit payments. For example, we calculate that the Burbo Bank Offshore Wind Farm already pays community benefits equivalent to

90. Ed Birkett (2020), "Onshore wind is ready to contribute to local communities and net zero", *Policy Exchange*.

91. *Policy Exchange*; BEIS (2020), "Offshore wind sector deal" ([Link](#)).

92. BEIS (2020), "Offshore wind sector deal" ([Link](#)).

around 20p/MWh.<sup>93</sup> By contrast, we calculate that the £5,000/MW per year paid by onshore wind farms is equivalent to £1.90/MWh.

To maintain local support for offshore wind, community benefit funds should be made mandatory. Operators of new offshore wind farms should be required to pay 50p/MWh to local communities. This 'Community Benefit' should apply to new offshore wind turbines for the 15 years of their Contract for Difference (CfD) from the Government. A 13 MW turbine running at 50% load factor would generate nearly £30,000 per year in community benefits, or £450,000 per turbine over the lifetime of the CfD. This money could be split between local and regional organisations, which would need to have appropriate governance regimes in place. At a local level, it could contribute to community sports facilities, cultural activities and/or public realm improvements. At a regional level, community benefit funds could support larger regional economic development, including training and public infrastructure.

This rate of payment is significantly less than what the Government recommends for onshore wind community benefit funds in its best practice guidance.<sup>94</sup> It is also just over 1% of the current CfD strike price (c. £45/MWh) and therefore will not undermine the business case for new offshore wind farms. We expect the 50p/MWh charge to be passed through to customers via higher strike prices in the CfD auctions. The Government should decide on the exact level of the community benefit charge in consultation with communities and industry.

Taken alongside other recommendations in this report, which seek to simplify the wind development process and thereby create cost savings, we expect a net reduction in the cost of offshore wind. The 50p/MWh community benefit payment is effectively a transfer from all consumers, who will benefit from low-cost offshore wind, to coastal communities, who are affected by its negative externalities.

### Policy timeline for this Parliament

Low-carbon energy projects in the North Sea take many years to develop and build, so early action from Government is needed to improve the process for the projects of the future. The Government should pursue these priorities during this Parliament to ensure that the North Sea can be fully harnessed to meet the Net Zero and Levelling Up agendas (Figure 12).

We recommend the following timeline:

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93. See appendix.

94. See Table 5 in the Appendix; DECC (2014), "Community benefits from onshore wind developments: Best practice guidance for England" (Link).

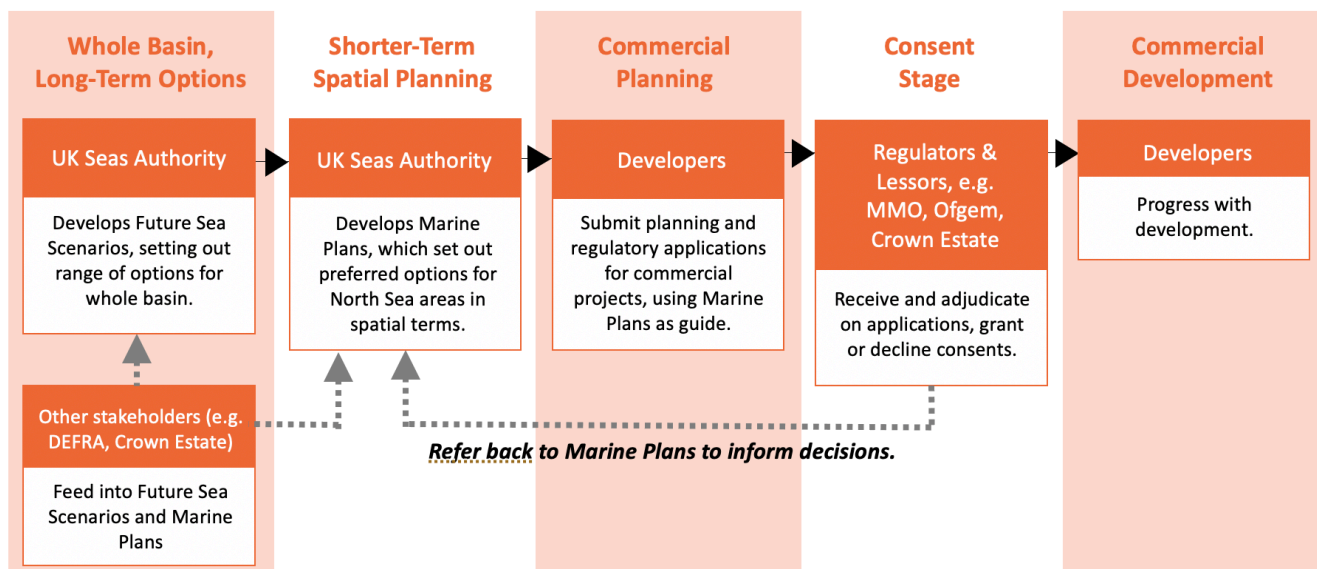


Figure 12: Recommended policy timeline for this Parliament

| Theme                                       | 2020   | 2021   | 2022  | 2023  | 2024 |
|---|--|--|---|---|------|
| Spatial planning                            |  | Create new 'UK Seas Authority'. Amend Marine and Coastal Act 2009 to give Marine Plans more authority. |   | New North Sea Marine Plans used by all departments.                 |      |
| Consistent environmental regulation         |  | Publish management plans and monitoring regimes for all MPAs   | Develop a standard Natural Capital approach to the marine environment   |   |      |
| Low carbon business models                  |  | Decision on business models for CCUS and early-uses of Hydrogen.                                       |   | Final Investment Decision on first CCUS hub.                        |      |
| Investments in networks                     |  |  | Implement changes to offshore regime for projects connecting 2025-2030.   | Implement changes to offshore regime for projects connecting 2030+. |      |
| Securing political support and Levelling Up | Appoint a Minister for North Sea Development                             | Introduce 'opportunity grant' with Net Zero premium + community benefits for offshore wind             |   | Support Metro Mayors in North Sea regions                           |      |
| International cooperation                   | Negotiate UK-EU future energy relationship, focus on electricity trading |  | Develop and implement new approaches to electricity trading to enable wind-interconnector hybrid projects in the North Sea. |   |      |

The creation of the UKSA and the implementation of our proposed changes to marine spatial planning would alter the development process in the UK's seas. This process is reflected in Figure 13 and should be implemented by the end of the current Parliament (by 2024).

Figure 13: Proposed development process



## 7. Conclusion

The North Sea is about to experience its next phase of development. Some activities will continue to decline, most notably oil and gas, whilst development of the low-carbon economy accelerates. There is a significant prize on offer, in terms of £20bn a year in Gross Value Added and up to 40,000 direct jobs, driven by the transition to a low-carbon economy and the Levelling Up agenda.

However, there are a number of barriers to realising the full potential of the basin that the UK Government should tackle through a Strategy for the North Sea. This strategy should include:

- Reforming spatial planning to better coordinate use of a finite seabed.
- New approaches to the environmental regulation of the seabed need to be considered to provide better sight of damages to the marine environment as more development takes place. Importantly, environmental regulation should apply to all sectors: the ‘environmental budget’ of each activity will decrease as development increases in the North Sea, leaving no room for privileged licences to damage the marine environment.
- Clarity on how Government will support new low-carbon technologies is necessary in the short term, to provide certainty on their development pathways over the medium to long term.
- A strategic approach to planning low-carbon networks. Some new networks, for example for CCUS, will not materialise without greater Government support.
- International cooperation across a number of areas is needed to get the most out of the North Sea through a whole-basin approach. This particularly applies to cross-border energy projects, as well as to environmental regulation.
- Finally, North Sea regions need to capture the economic benefits of developing the North Sea to meet Net Zero. This will enable these regions to contribute more to the low-carbon transition whilst also undoing the effects of decline in some of their strategic industries like oil and gas, fishing and heavy industry.

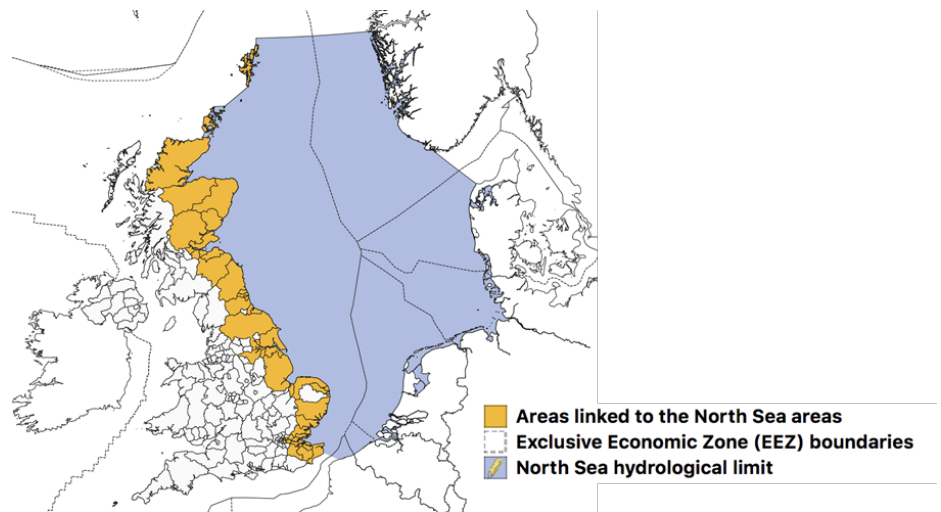
Maximising returns from the North Sea can be achieved through a new Strategy for the North Sea which tackles these barriers. Some of the barriers can start to be addressed within the next parliament, and Government adopt a strategic approach to the North Sea now to realise the long term economic and emissions reductions benefits it can generate.

## Appendix

The definition of the North Sea used in this report includes:

- **Areas of the North Sea that the UK has sovereignty over.** This includes the UK's EEZ, which extends up to 200 nautical miles from the baseline of a country's coast, which encompasses the UK's territorial sea and continental shelf.
- **The International Hydrographic Organisation's** definition of the North Sea area (the 'North Sea hydrological limit')
- **Areas linked to the North Sea on a NUTS3 scale.** These are in the South, East and North East of England and East of Scotland. A complete list of North Sea areas on a NUTS3 scale can be found below in Table 4.

This is shown graphically below:



**Table 4. List of NUTS 3 areas used to define 'North Sea areas'**

|  |  |
|--|--|
| Southend-on-Sea                                | Suffolk  |
| Scottish Borders                               | Hackney and Newham                                     |
| Barnsley, Doncaster and Rotherham              | Hartlepool and Stockton-on-Tees                        |
| North Yorkshire CC                             | Inverness and Nairn and Moray, Badenoch and Strathspey |
| Northumberland                                 | Thurrock   |
| South Teesside                                 | Lewisham and Southwark                                 |
| Lincolnshire                                   | Heart of Essex   |
| Tyneside                                       | Clackmannanshire and Fife                              |
| North and West Norfolk                         | Essex Thames Gateway                                   |
| North and North East Lincolnshire              | Medway   |
| Durham CC                                      | West Lothian   |
| Mid Kent                                       | Barking & Dagenham and Havering                        |
| East Kent                                      | Falkirk  |
| Essex Haven Gateway                            | Shetland Islands                                       |
| East Riding of Yorkshire                       | Sunderland   |
| Norwich and East Norfolk                       | Orkney Islands   |
| Angus and Dundee City                          | Aberdeen City and Aberdeenshire                        |
| East Lothian and Midlothian                    | Perth and Kinross and Stirling                         |
| Kent Thames Gateway                            | West Kent  |
| Caithness and Sutherland and Ross and Cromarty | City of Edinburgh                                      |

**Table 5: Comparison of the UK government recommendations for onshore wind community benefit funds, and Policy Exchange's proposal for offshore wind.<sup>95</sup>**

| Onshore Wind (UK Gov Best Practice) |      |             |
|-------------------------------------|------|-------------|
| Community Benefit                   | 5000 | £/MW/year   |
| Load Factor                         | 30%  | %           |
| Annual Generation                   | 2628 | MWh/MW/year |
| Per MWh Benefit                     | 1.90 | £/MWh       |
| Offshore Wind (Proposed)            |      |             |
| Community Benefit                   | 2190 | £/MW/year   |
| Load Factor                         | 50%  | %           |
| Annual Generation                   | 4380 | MWh/MW/year |
| Per MWh Benefit                     | 0.50 | £/MWh       |

95. DECC (2014), "Community benefits from onshore wind development: Best practice guidance for England" (Link).





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