

# Invest Now, Lead the World Tomorrow: The Transformation of the 'North Sea' into a 'Green Sea'

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## A Joint Strategy for Oil and Gas: The Transformation of the 'North Sea' into a 'Green Sea'

Over the next 30 years, the way we produce, process, distribute and consume energy will be transformed. New industries, based on renewable technologies that aren't in mass circulation today, such as carbon capture and hydrogen storage, will become mainstream, powering our economies whilst meeting our commitments to net zero emissions (in line with the Scottish 2045 agenda) and eventually replacing oil and gas activities. Scotland's track record puts it in a fantastic position to be able to lead the world in its green energy revolution. Already the nation has shown world leading progress in accelerating the use of renewables - with territorial emissions decreasing 45%<sup>1</sup> (1990-2018), higher than any other G20 nation as well as the UK average (-43%)<sup>2</sup> and a c.24%<sup>3</sup> renewable energy mix (vs 4% UK<sup>4</sup>).

The future transformation will present an exciting, but challenging opportunity for Scotland to keep advancing forward and building on its capabilities. The Oil and Gas industry has long been at the heart of the Scottish economy, both in terms of revenue, but also in world leading expertise and mass employment across the nation. As we look to reduce - but not stop - extraction activities in the North Sea, and diversify, it falls to the UK and Scottish government to work together in supporting this transition, and manage the impact on the Scottish economy. Scotland has the real potential to become the global leader in decommissioning, and create a renewable power hub across the North Sea. The question therefore is how to ensure that investment and support will be forthcoming to manage the transition and support new opportunities, for the North Sea to truly become a 'Green Sea'.

1 Note this figure is from source emissions; the reduction for Scotland based on emissions for reporting against targets as indicated by the Committee for Climate Change <https://www.gov.scot/publications/scottish-green-house-gas-emissions-2018/pages/3/>, accessed January 26th 2021

2 Include international aviation and shipping, figure excluding this is -47%. Comparative figures excluding international aviation and shipping include -43% for total UK, -20% France, -32% Germany, -32% Norway, -29% Denmark

3 <https://www.gov.scot/binaries/content/documents/govscot/publications/statistics/2018/10/quarterly-energy-statistics-bulletins/documents/energy-statistics-summary---december/energy-statistics-summary---december/gov-scot%3Adocument/Scotland%2BEnergy%2BStats%2BQ3%2B2020-1.pdf>, accessed February 15th 2021

4 [https://oilandgasuk.co.uk/wp-content/uploads/2020/10/Exploration-in-a-low-carbon-future\\_17\\_FCB.pdf](https://oilandgasuk.co.uk/wp-content/uploads/2020/10/Exploration-in-a-low-carbon-future_17_FCB.pdf), accessed 10 February 2021

## The Legacy of the Oil and Gas Industry in Scotland

The Oil and Gas industry has long been crucial to the Scottish, and indeed the UK economy, ever since extraction began in the North Sea in 1975. In total, over 44 billion barrels of oil have been extracted to date - totalling c.£330 billion in taxation revenues to the UK from production activities alone.<sup>5</sup> At the height of extraction in the mid 2000's, this represented c.£8-10 billion revenue annually, with an indicative geographic share of c.£6-8 billion for Scotland.<sup>6</sup> Even today, in a climate where we are seeing a maturing basin and renewed impetus for energy diversification, tax revenues still represent c.£724 million to the Scottish economy.<sup>7</sup> Perhaps most striking is the overall gross value add to the Scottish economy that all activities across the Oil and Gas supply chain provide - c.£8.8 billion GVA, representing c.5% of total Scottish GDP in 2019.<sup>8</sup>

This intrinsic value of the the Oil and Gas industry to Scotland extends beyond the North Sea's direct revenue generation. The sector supports the livelihoods of over 100,000 people, employed in related professions such as geoscience, subsea engineering and maintenance technicians.<sup>9</sup> In particular, its value to the North East region, encompassing broader Aberdeenshire, should not be understated - Aberdeen's industry has driven Scotland's recognition as a 'centre of global excellence' in offshore engineering, subsea technology and offshore goods and services. Subsequently, Scotland is able to successfully export

5 <https://www.gov.scot/policies/oil-and-gas/>, accessed 8 February 2021

6 Note - this is based on a geographic based share of the North Sea basin, to calculate income specifically for Scotland. Vast majority of this is from corporation tax, with c.10% from license fees. See <https://www.gov.scot/publications/government-expenditure-revenue-scotland-gers-2019-20/pages/4/>, accessed 8 February 2021

7 Note - this is based on a geographic based share of the North Sea basin, to calculate income specifically for Scotland. Vast majority of this is from corporation tax, with c.10% from license fees. See <https://www.gov.scot/publications/government-expenditure-revenue-scotland-gers-2019-20/pages/4/>, accessed 8 February 2021

8 <https://www.gov.scot/policies/oil-and-gas/>, accessed 8 February 2021

9 <https://www.gov.scot/policies/oil-and-gas/>, accessed 8 February 2021

its expertise and goods globally, worth a further c.£4 billion annually (and increasing rapidly - +31% over the last 2 years)<sup>10</sup> - albeit this may be curtailed by the new Scottish Trade Vision that places net zero as one of its major trade principles.

Today there still remains hydrocarbon resource and 'associated' economic potential left in the basin. The shelf has, according to Oil and Gas UK, c.10-20 million barrels (c. 1/3 of the total basin), still yet to be extracted, or even discovered in some cases.<sup>11</sup> Yet despite the resources available and reliance of large proportions of the Scottish population on the industry, the future is not a case of 'business as usual' for North Sea extraction.

## The Sustainability of the North Sea as an Energy Field

The Basin faces two major challenges - diminishing returns due to maturing fields, and the drive towards energy diversification to aid the climate emergency we all face.

The North Sea is no longer a 'gold mine' - the cost of extraction is increasing due to maturing fields driving up production costs. As a result, investors are preferring to rely on new, larger, more efficient fields, of which few in the UK make the cut. Domestic production has already halved in the last 20 years.<sup>12</sup> This is being compounded by today's unstable economic environment - post 2010 there have been several price shocks, compounded by COVID's decimation of Brent crude's price to \$42 a barrel in 2020.<sup>13</sup> Many businesses are therefore curtailing future investment - for instance Enquest and Ithaca Energy, two of the major producers in the North Sea recently announced cutbacks, and a pause on future investment.<sup>14</sup> Estimates indicate with prices as they are, 1/3 of all available hydrocarbons in the North Sea may remain undeveloped between now and 2050.<sup>15</sup> Activity will rebound eventually - the global drive for energy will require it - but likely in a different form - - large cap conglomerate activity is reducing here, albeit with large scale investment potential still available West of Shetland.<sup>16</sup>

In meeting Scotland's commitments to carbon neutrality by 2045, the North Sea Oil and Gas Industry will have a vital role to play. Whilst extraction emissions only account for 4% of the UK's total greenhouse emissions, to meet carbon neutrality by 2045, and indeed industry set reduction milestones in 2030 (50%) and 2040 (90%), the 19 MtCO<sub>2</sub>e of

<sup>10</sup> <https://investaberdeen.co.uk/key-sectors/oil-and-gas>, accessed 8 February 2021

<sup>11</sup> <https://www.ogauthority.co.uk/data-centre/data-downloads-and-publications/reserves-and-resources/>, accessed 9 February 2021

<sup>12</sup> <https://www.gov.uk/government/publications/energy-white-paper-powering-our-net-zero-future/energy-white-paper-powering-our-net-zero-future-accessible-html-version#fn:193>, accessed 9 February 2021

<sup>13</sup> <https://www.statista.com/statistics/262860/uk-brent-crude-oil-price-changes-since-1976/#:~:text=The%20average%20annual%20price%20of,for%20Atlantic%20basin%20crude%20oils,> accessed 18 February 2021

<sup>14</sup> <https://www.bbc.co.uk/news/uk-scotland-north-east-orkney-shetland-52469529>, accessed 18 February 2021

<sup>15</sup> <https://www.ft.com/content/759c7bf3-9115-4e20-9a05-2110032d7344>, accessed 10 February 2021

<sup>16</sup> See page on 'changing face of ownership' - <https://www.ogauthority.co.uk/media/5407/oga-overview-2019-low-res.pdf> accessed 10 February 2021



emissions today needing to be reduced to 0.5 MtCO<sub>2</sub>e by 2050.<sup>17</sup> Yet the issue is far bigger than extraction - associated emissions with Oil and Gas usage remain far higher, given Oil and Gas made up 76% of UK energy usage in 2019.<sup>18</sup> To address this, we must reduce our reliance on Oil and Gas, and invest in renewable resources.

Inevitably, as a result, there is a clear dilemma here for Scotland, and the UK more broadly: **how to balance commitments to carbon neutrality and reduce reliance on the very resources that have strengthened our economy and form considerable employment across the nation?** This has been subsequently compounded with difficult market conditions for the basin, directly impacting Scottish jobs.

The solution is complex. We cannot simply halt all basin exploration and ongoing activities immediately - due to both energy security, economic dependence, and paradoxically, the environmental impact. The North Sea Basin provides c.45% of our energy needs,<sup>19</sup> and, with the 76%

of energy usage from Oil and Gas currently,<sup>20</sup> any immediate switch will see us having to import energy, or rely on renewables forms. Many renewables are not yet fully scaled or cost efficient across the UK - only 3.7% of the UK's total energy supply in 2019 was from renewables - albeit 37% of UK electricity demand.<sup>21</sup> This figure is slightly higher in Scotland - c.24% of total Scottish energy consumption came from renewables in 2019, and 61% of electricity, however renewable electricity capacity has not grown since June 2019.<sup>22</sup> Significant progress is required to reach 50% renewable energy by 2030.

Given the short term capacity challenges of renewables, meeting domestic demand without domestic oil and gas supply would see us completely reliant on imports, with supply likely coming from a less carbon efficient basin. Reliance on imports would mean Scotland, and the UK, would lose the ability to monitor and manage the decarbonisation process of this industry, let alone the loss of vital source of domestic engineering expertise transferable to other sectors. Therefore,

17 <https://roadmap2035.co.uk>, accessed 10 February 2021

18 [https://oilandgasuk.co.uk/wp-content/uploads/2020/10/Exploration-in-a-low-carbon-future\\_17\\_FCB.pdf](https://oilandgasuk.co.uk/wp-content/uploads/2020/10/Exploration-in-a-low-carbon-future_17_FCB.pdf), accessed 10 February 2021

19 <https://eandt.theiet.org/content/articles/2021/01/decarbonising-hydrocarbons-emission-impossible/>, accessed 10 February 2021

20 [https://oilandgasuk.co.uk/wp-content/uploads/2020/10/Exploration-in-a-low-carbon-future\\_17\\_FCB.pdf](https://oilandgasuk.co.uk/wp-content/uploads/2020/10/Exploration-in-a-low-carbon-future_17_FCB.pdf), accessed 10 February 2021

21 [https://oilandgasuk.co.uk/wp-content/uploads/2020/10/Exploration-in-a-low-carbon-future\\_17\\_FCB.pdf](https://oilandgasuk.co.uk/wp-content/uploads/2020/10/Exploration-in-a-low-carbon-future_17_FCB.pdf), accessed 10 February 2021

22 <https://www.gov.scot/binaries/content/documents/govscot/publications/statistics/2018/10/quarterly-energy-statistics-bulletins/documents/energy-statistics-summary---december/energy-statistics-summary---december/govscot%3Adocument/Scotland%2BEnergy%2BStats%2BQ3%2B2020-1.pdf>, accessed 15 February 2021



domestic supply must still remain an intrinsic part of any transition - albeit with managed 'draw down' as we invest in renewable technologies for the future - it is not about extracting every last drop. Commitment must be made to the Oil and Gas domestic industry to ensure this, and manage the draw down effectively, to ensure ongoing investment, fiscal predictability and incentives for the switch to cleaner energy within the sector.<sup>23</sup>

What we really require is a fully managed transition, to turn the North Sea into a 'Green Sea' - meeting climate targets, fulfilling our energy requirements whilst supporting the local economy.

Given the UK government is set to publish its North Sea Transition Deal in 2021 to support the local economy, we see that any successful deal for Scotland should be contingent on cooperation between Scottish and UK governments and stakeholders across the Oil, Gas and Renewable Technologies on the following:

- 1. Managed Draw Down of Hydrocarbons and Support for Low Carbon Domestic Activity**
- 2. Investment and Support for Renewable Energy Technology, including both existing Scalable Assets (Offshore Wind Farms) and Nascent Solutions (Carbon Capture, Hydrogen), and subsequent integration for a 'North Sea Power Hub'**
- 3. Investment and advocacy into 'Circular Economy' Decommissioning and Related Technologies**

<sup>23</sup> <https://www.gov.uk/government/publications/energy-white-paper-powering-our-net-zero-future/energy-white-paper-powering-our-net-zero-future-accessible-html-version#chapter-6-oil-and-gas>, accessed 10 February 2021



## 1. The Managed Drawdown of Hydrocarbons and Support for Low Carbon Domestic Activity

The continued extraction of North Sea Oil resources for domestic supply can only be successful if we create a fiscally secure investment climate, work with the stakeholders to develop comprehensive drawdown plans for the future, and support the transition to low carbon activity.

Fiscal security and predictability is vital in any industry requiring outside investment, and the Scottish and UK governments should signal their support for the role the Oil and Gas industry will play in energy supply now, and in the future. Similarly, they must collaborate heavily with industry stakeholders for long term planning including the sustainable draw down of oil and gas activities and portfolio diversification into renewables, as renewable activity takes off across Scotland. A live consultation on the review of available extraction licenses in the UK Continental Shelf is already underway, but will have to be reviewed periodically.

It is vital that Scottish and UK government work together to support low carbon domestic offshore extraction activity. This consists of several parts - the monitoring of existing emissions and benchmarking, as well as measures to improve carbon efficiency. Collecting data, monitoring and benchmarking carbon efficiency of offshore

infrastructure is a core component to assess progress and devise targets. Any Green North Sea requires a clear reduction in carbon intensity of all activities - the requirement for the Oil and Gas sector is crucial for an industry whereby 40% of its facilities and 25% of its pipelines were installed more than 30 years ago.<sup>24</sup> Historically, emissions intensity increases as assets age and productions decline - a real issue for this mature basin.<sup>25</sup> Approximately 79% of emissions from the industry in 2018 were emitted at offshore installations - mainly from running gas turbines to power platforms and flaring venting and leaks.<sup>26</sup>

Investment and support should be given to help support the oil and gas industry as it improves its efficiency - via operational improvement, reduced flaring and venting and step change action. Step change action will likely require significant investment that Scottish and UK government should support - both via electrification of assets, carbon capture and storage, the creation of offshore integrated energy hubs and electric power at onshore terminals.<sup>27</sup> Electrification alone is not cheap - c.£1.1 billion would be required to electrify a cluster of fields with a 200Mw power demand, and the further offshore a platform, the higher the cost.<sup>28</sup> There is real potential to link these platforms with renewable sources in the North Sea - i.e. by powering platforms by wind power.

<sup>24</sup> <https://eandt.theiet.org/content/articles/2021/01/decarbonising-hydrocarbons-emission-impossible/>, accessed 10 February 2021

<sup>25</sup> <https://oilandgasuk.cld.bz/OGUK-Pathway-to-a-Net-Zero-Basin-Production-Emissions-Targets-Report-2020/10/>, accessed 10 February 2021

<sup>26</sup> <https://eandt.theiet.org/content/articles/2021/01/decarbonising-hydrocarbons-emission-impossible/>, accessed 10 February 2021

<sup>27</sup> <https://oilandgasuk.cld.bz/OGUK-Pathway-to-a-Net-Zero-Basin-Production-Emissions-Targets-Report-2020/24/>, accessed 10 February 2021

<sup>28</sup> <https://eandt.theiet.org/content/articles/2021/01/decarbonising-hydrocarbons-emission-impossible/>, accessed 10 February 2021

## 2. Investment and Roll Out of Renewable Energy - including both scalable assets (Wind) and nascent solutions (Carbon Capture and Hydrogen), with subsequent integration into a 'North Sea Power Hub'

The future for Scottish, and indeed UK wide energy provision is in renewables, and the North Sea offers significant potential to become an integrated power hub for this, whilst becoming a leading provider of the technology and manufacturing capabilities. Getting there however is going to require heavy long term governmental investment to scale and expand existing technology (offshore wind farms) and develop nascent technology (carbon capture and utilisation, and hydrogen). Scotland cannot work in isolation on this, there needs to be a fully fledged plan across the UK, with delineated responsibilities and the establishment of public private partnerships to invest, scope the potential, and scale up these technologies.

Scotland already has vast offshore wind farm resources, and the Scottish government has set further ambition to increase capacity. By 2030, targets have been set to increase capacity to 11 GW of energy installed by 2030 - enough to power 8 million households,<sup>29</sup> far more than Scottish domestic supply. Such expansion plans are at the heart of the government's green agenda. Such a national commitment is vital, but there needs to be a coordinated effort to ensure that we are not only

investing in roll out nationally, but, given our expertise in production, can securing contracts for global wind farm exports, to support the full economy as we look to reduce our reliance on Oil and Gas.<sup>30</sup>

Separately, carbon capture and hydrogen technologies, although early in inception, are already attracting notable investment and government commitment as 'the next generation' of renewables. Hydrogen is produced either via natural gas using carbon capture and storage, captured from existing Oil and Gas depositaries ('blue hydrogen') or via electrolysis ('green hydrogen'), and is then used as an alternative to natural gas - c. 95% cleaner. The uses of carbon capture extend beyond hydrogen production, given 90% of CO<sub>2</sub> is captured, in processes such as cement production.<sup>31</sup> Clearly the benefit of transforming this greenhouse gas rather than emitting it into the atmosphere is crucial for net zero targets - but also for its ability to generate energy we can use to power national grids. The technology here is already proven and available, but its roll out is nascent due to the extra cost - to be competitive this will have to be reduced heavily. Projects such as the Acorn project in Scotland, supported by industry, the UK and EU government, seek to commercialise, and bring down the associated costs - a further 3 similar cluster hubs exist across the UK, and, if successful, the government's should prioritise further investment for this, as complementary technology to utilise emissions from mature assets in the North Sea.

29 <https://www.gov.scot/news/increased-offshore-wind-ambition-by-2030/#:~:text=Supporting%20Scotland's%20green%20recovery,.more%20than%20eight%20million%20homes.>, accessed February 10 2021

30 <https://www.heraldsotland.com/news/18173934.scotland-loses-2bn-wind-farm-boom-ministers-pledge-action/>, accessed February 10 2021

31 <https://www.lse.ac.uk/granthaminstitute/explainers/what-is-carbon-capture-and-storage-and-what-role-can-it-play-in-tackling-climate-change/>, accessed February 10 2021



### 3. Investment and Advocation into the ‘Circular Economy’ Decommissioning and Related Technologies

Investment into the ‘circular economy’ within Oil and Gas is crucial for any basin - safe, effective and efficient late life management and decommissioning of assets remains a societal, and economic necessity. Operators in the North Sea are currently under a legal obligation to remove all platforms and associated structures. Yet decommissioning does not just involve the removal of the topsides - it involves everything from well decommissioning, to ecosystem management and onshore recycling and disposal.

Whilst we can see considerable investment is already being channeled by the government into supporting research projects developing decommissioning technologies, further support is required to build Scotland’s export potential. Currently, Scotland has followed the UK in indicating that decommissioning will form an ‘exemption’ to its policy of ending all overseas trade backing and promoting activities solely focused on fossil fuel goods by COP26, yet this is hardly full support and promotion of Scotland’s decommissioning expertise. With nations such as Norway, Denmark, the Netherlands and the US already having established decommissioning activities, the UK and Scottish government should be working together to establish and promote Scotland’s reputation as a centre of decommissioning excellence globally - the long term benefit to the economy is crucial.<sup>32</sup>

The benefit to Scotland in creating a successful decommissioning strategy exists via three opportunities:

1. There is **considerable economic value** (c.£17.6 billion between 2016-2025 alone)<sup>33</sup> in decommissioning activity within the North Sea, and, whilst activities have slowed under COVID, they are forecast to accelerate in the future.
2. Scotland already has **a clear ‘right to win’** in this sector, with decommissioning activities already well supported by the Oil and Gas Sector. Notable projects include the Decommissioning Facility in Fife and Forth Ports Dundee, Rosyth and Leith, the establishment of a National Decommissioning Centre in Aberdeen to build innovation and research expertise, and the Decommissioning Challenge Fund that has offered £10.3m for 28 projects and partnerships.<sup>34</sup>
3. Activity in other basins is nascent, particularly in deep water (only the shallow Gulf of Mexico has seen comparable activity)<sup>35</sup> - this represents a huge opportunity for Scotland to **export its capabilities** - cost effective decommissioning solutions have an estimated value at £80 billion in the next decade, and over £250 billion from 2022. Capturing even a small share of this will provide huge revenue to Scotland - given the expertise is there, Scotland must go after the business.<sup>36</sup>

<sup>32</sup> Scotland’s Vision for Trade - gov.scot ([www.gov.scot](http://www.gov.scot)), accessed 10 February 2021

<sup>33</sup> <https://oilandgasuk.co.uk/north-sea-decommissioning-to-grow-steadily-in-uk-and-norway-over-next-ten-years/>, accessed February 26 2021

<sup>34</sup> <https://www.gov.scot/publications/oil-and-gas-decommissioning-action-plan/> accessed 10 February 2021

<sup>35</sup> From interview with OGUK

<sup>36</sup> [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/943765/strengthening-uk-decommissioning-cfe-govt-response-pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/943765/strengthening-uk-decommissioning-cfe-govt-response-pdf), accessed 10 February 2021



## The Opportunities We Should Exploit for a Sustainable and Self Sufficient Scotland

Clearly, the Scottish and UK government areas must work together, alongside public private partnerships, commercial sponsors and research partners to provide adequate upfront investment and research support into its North Sea strategic priorities. Significant planning needs to occur to ensure that the most favourable solutions are prioritised. Getting the 'right' solutions for Scotland's long term strategy will be vital - these projects are hugely expensive with long lead times for research, development and implementation. We have to effectively utilise existing assets, knowledge and capabilities within these developments.

### So what are the 'big' opportunities Scotland should invest and exploit to achieve these strategic aims?

#### Opportunity 1 - De-Carbonising Oil and Gas Activity via Electrification, and/or Offshore Power Generation Integration

Scotland will continue to use domestic oil and gas resources well into the 2050s, but with a managed draw down. Despite total emissions only forming c.4% of UK overall,<sup>37</sup> the business case for continued exploration and drilling activity is contingent in part on ensuring carbon efficiency within process. A significant proportion of the c.79% of offshore activity emissions could be minimised<sup>38</sup> - particularly those

produced by gas turbines for platform power and heat. UK wide targets pledge to halve such emissions by 2030 and reach net zero by 2050 - with Scotland 5 years ahead (net zero by 2045).

The two biggest opportunities to decarbonise oil and gas activity lie in platform electrification, and integration with offshore renewable power generation. Electrification involves the installation of an underwater electricity cable from mainland UK or Norway out to the platforms, tapping into an inter-connector. Separately these platforms could be linked up with nearby wind farms for power. The Oil and Gas Authority predicts that electrification could abate UK Continental Shelf operational emissions by 2-3 MtCO<sub>2</sub>e per annum by 2030 - the equivalent of reducing 20% of today's production emissions, and 40% by 2030.<sup>39</sup> To achieve this, at least two electrification projects in the North Sea need to be delivered - i.e. wind power supply to new projects West of Shetland.<sup>40</sup>

The technology is already tried and tested both by Scotland and Norway - the Beatrice Field in the Moray Firth is connected to the grid by subsea cable to Dunbeath and two offshore wind turbines. What is prohibiting mass roll out in the UK is the cost - c.£1.1bn to electrify a cluster of fields with a 200 MW power demand, rising for further offshore fields. Subsea power cables alone cost £1-2 million per km.<sup>41</sup> Yet if Scotland is to continue with oil and gas activity, investing in this electrification is vital to its long term

<sup>37</sup> <https://roadmap2035.co.uk>, accessed 10 February 2021

<sup>38</sup> <https://eandt.theiet.org/content/articles/2021/01/decarbonising-hydrocarbons-emission-impossible/>, accessed 10 February 2021

<sup>39</sup> <https://www.ogauthority.co.uk/news-publications/news/2020/oga-hosts-central-north-sea-platform-electrification-talks/>, accessed 15 February 2021

<sup>40</sup> <https://www.ogauthority.co.uk/news-publications/news/2020/oga-hosts-central-north-sea-platform-electrification-talks/>, accessed 15 February 2021

<sup>41</sup> <https://eandt.theiet.org/content/articles/2021/01/decarbonising-hydrocarbons-emission-impossible/>, accessed 15 February 2021



strategy - and indeed may prove cost effective if the price of carbon emissions rises under an ETS system.

#### **Scottish and UK Government must therefore cooperate to ensure:**

- Adequate investment to support the O&G industry's efforts to electrify their platforms, including lower electricity wholesale prices for offshore use
- At least two platform electrification projects materialise by the mid 2020s
- Regulatory restraints and burdens prohibiting cooperation and integration between offshore energy types are removed
- Future wind farm planning considers proximity to oil and gas platforms when location scouting

#### **Opportunity 2 - Sustainable Management of Life Cycle of O&G Assets via Decommissioning**

Decommissioning is now recognised as a crucial part of the oil and gas industry, in managing the legacy issues associated with fifty years of oil and gas development. Safe, effective and efficient late life management and decommissioning is a societal and economic necessity. Decommissioning processes itself extend beyond the removal of topsides, with c.50% of the costs in well plugging.<sup>42</sup>

We are entering an era of 'steady decommissioning' within the North Sea basin, with significant spend - Rystad predict an average of 23 assets per year are likely to be decommissioned over the next 5 years, 80% in the UK sector,<sup>43</sup> with annual spend at over £1.5bn annually.<sup>44</sup> Scottish firms are well placed to capture this financial reward, due to significant capabilities and expertise in project management and well decommissioning, as well as considerable technical innovation. Several tech projects have been supported by the Decommissioning Challenge Fund<sup>45</sup> and Aberdeen's National Decommissioning Centre.

<sup>42</sup> Interview with OGUK

<sup>43</sup> [https://www.rystadenergy.com/newsevents/news/press-releases/global-oil-gas-decommissioning-costs-to-total-\\$42-billion-through-2024-dominated-by-uk-north-sea/](https://www.rystadenergy.com/newsevents/news/press-releases/global-oil-gas-decommissioning-costs-to-total-$42-billion-through-2024-dominated-by-uk-north-sea/), accessed 16 February 2021

<sup>44</sup> Scottish Government Decommissioning Action Plan 2016

<sup>45</sup> See <https://www.gov.scot/publications/oil-and-gas-decommissioning-action-plan/>, accessed 15 February 2021

The continuance of a successful decommissioning strategy, placed at the heart of the North Sea transition alongside Scottish economic planning is vital. The North Sea alone presents a substantial economic opportunity - let alone the export potential of Scottish capabilities and expertise (the offshore market is predicted to be worth c.£80 billion in the next decade alone).<sup>46</sup> Scotland is already established as a key global player - 63% of oil and gas supply chain had worked on a decommissioning project overseas<sup>47</sup> - and must make the most of the opportunity to export.

**To make the most of the decommissioning opportunity, Scottish and UK Government should:**

- Continue to invest in decommissioning technology i.e. the National Decommissioning Centre
- Actively promote North Sea decommissioning activities, working with investor strategies
- Establish appropriate Scottish / UK wide decommissioning benchmarking to advertise what 'good' is globally
- Create a full plan and strategy for export of decommissioning technology and promote it

**Opportunity 3 - The Next Generation of Renewables - 'Hydrogen' and 'Carbon Capture'**

The future for Scottish energy provision is in integrating the 'next generation' of renewable technology - carbon capture and hydrogen - to the North Sea energy ecosystem.

Hydrogen represents the 'fuel of the future' - through either 'blue hydrogen' from natural gas carbon capture or renewable powered electrolysis - 'green hydrogen'. The hydrogen produced can then be used as an alternative to natural gas, or in fuel cells to transport power, with c.95% cleaner energy than natural gas without carbon capture. Renewable hydrogen is seen as crucial for nations to decarbonise the final 20% of energy consumption in the future.<sup>48</sup>

Widespread adoption of hydrogen technology is not predicted before the 2030s, however the market has to be developed today to bring down costs. Yet the industry is lacking the investment it requires with Scotland and the UK behind the curve. Projects do exist - the question is whether it is enough given the potential of hydrogen, and in comparison to investment by other nations? The recent UK Government White Paper indicated that the UK is aiming to invest c.£500 million in hydrogen, targeting 5GW of low carbon hydrogen production capacity by 2030, and hopes for £4 billion of private investment.<sup>49</sup> The European Commission in contrast is targeting 40GW of capacity by 2030.<sup>50</sup>

The Scottish and UK governments must work to provide substantial prolonged investment into hydrogen, as well as an attractive investor climate and policy frameworks, so the industry can scale. Support too can be given with the establishment of hydrogen hubs, deployment

46 [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/943765/strengthening-uk-decommissioning-cfe-govt-response-pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/943765/strengthening-uk-decommissioning-cfe-govt-response-pdf), accessed 10 February 2021

47 <https://oilandgasuk.co.uk/wp-content/uploads/2019/09/OGUK-Decommissioning-Call-for-Evidence-Response.pdf>, accessed 26 February 2021

48 <https://www.power-technology.com/features/report-uk-hydrogen-stocks-have-risen-but-the-sector-lacks-government-support/>, accessed 15 February 2021

49 <https://www.gov.uk/government/publications/energy-white-paper-powering-our-net-zero-future/energy-white-paper-powering-our-net-zero-future-accessible-html-version#chapter-3-energy-system>, accessed 15 February 2021. See also <https://www.bakermckenzie.com/en/insight/publications/2021/01/uk-government-commitment-to-clean-hydrogen>, accessed 15 February 2021

50 <https://www.investorchronicle.co.uk/news/2021/01/06/is-now-the-time-to-invest-in-hydrogen/>, accessed 15 February 2021

targets and tax relief.<sup>51</sup> Scotland's North Sea has the potential to become part of the next phase of hydrogen production, utilising surplus energy from offshore wind farms for green hydrogen, and carbon capture from oil and gas assets (whether new or matured) for blue hydrogen - but will require substantial investment. Separately, there needs to be long term thought into end user applications - i.e. Aberdeen transportation run on hydrogen - and the transportation of hydrogen.

The other half of the 'next generation' renewable solutions lies in carbon capture itself. Carbon capture and storage (CCS) naturally is important for the development of blue hydrogen, but its uses extend beyond this - for low carbon fossil fuel emissions and use in cement production.<sup>52</sup> Similarly it is important to supplement renewables for the power and industrial sectors, by capturing and storing their emissions.<sup>53</sup> Projects such as the Acorn project in Scotland, supported by industry, the UK and EU government seek to commercialise, and bring down the associated costs of carbon capture - this model has been applied across 3 other CCS Hubs, with the government investing £1billion to support their development.<sup>54</sup> Whilst this industry does have some level of environmental impact, it is still a more sustainable method of transforming fossil fuels. CCS will be crucial for Scotland going forward, particularly as North Sea activities draw down - there is huge potential to capture and effectively use the carbon coming from North Sea assets. Both governments must stick to their commitment - previous 'backsliding' on CCS development in 2015 curtailed the development of this technology - we cannot risk this at our current juncture.

As these technologies develop, we must ensure that we support the localised manufacturing processes involved in their production and establishment. This will ensure jobs are created locally. We can

learn from the large scale outsourcing that has occurred within wind farm manufacturing - where fields were located off of Scotland, but manufactured work was imported from places such as Indonesia, China and the UAE.<sup>55</sup>

#### Scottish and UK government should therefore:

- Provide prolonged investment into hydrogen and carbon capture projects, particularly supporting cluster hub projects, and those that seek to integrate both technologies
- Actively work with industry to promote investment into and partnerships for these new renewables
- Consult and create policy frameworks for these new technologies
- Ensure the development of end use applications that can effectively use hydrogen - i.e. in transportation
- Support and promote local manufacturing processes for this technology

51 <https://www.power-technology.com/features/report-uk-hydrogen-stocks-have-risen-but-the-sector-lacks-government-support/>, accessed February 15 2021

52 <https://www.lse.ac.uk/granthaminstitute/explainers/what-is-carbon-capture-and-storage-and-what-role-can-it-play-in-tackling-climate-change/>, accessed February 10 2021

53 <https://www.equinor.com/en/what-we-do/northern-lights.html> accessed February 26 2021

54 <https://www.globalccsinstitute.com/news-media/press-room/media-releases/uk-government-set-to-fund-four-ccs-hubs-and-clusters/>, accessed February 15 2021

55 <https://www.theguardian.com/commentisfree/2020/oct/07/offshore-wind-jobs-windfarms-scotland>, accessed February 26 2021



## Conclusion: A Greener Sea...A Greener Future for Scotland and the World

A Green North Sea will bring exciting opportunities for Scotland, both in its ability to lead the way towards the renewable focused future and in transforming its economy at home. Already Scotland - both alone, and with the wider UK - has made great progress to establish itself as a centre of expertise for decommissioning, and in rolling out renewable technology for the North Sea. Investment further into improving the carbon efficiency of oil and gas activities, and new nascent renewables for use in the North Sea will further propel Scotland forward in meeting its 2045 net zero targets.

The time is now to signal our intent - both politically and fiscally - into the future of the North Sea Transition. We must continue to support projects that are driving carbon efficiency within oil and gas activities, and work with the oil and gas stakeholders as they proactively draw down activities, and seek diversification opportunities in the North Sea. Similarly, given the oil and gas industry's intrinsic ties to Scotland, we must further promote decommissioning as part of our industry wide expertise - and successfully implement this in the North Sea to capture spend, and signal our authority globally. Finally, we have the opportunity here to redesign the entire basin towards renewables - there should be active planning into what a new integrated power hub in the North Sea would look like - with no financial barriers. Investing now will allow future Scottish generations to reap the rewards - without minimising resources or the world's 'health' for the next. This inevitably involves seeking commercial partners and providing seed funding into nascent technologies - both hydrogen and carbon capture, and the unfound technologies of the future. Just looking at the development of the last 50 years shows what more can be advanced when we couple technological innovation with adequate financing.

Scotland must collaborate with the UK government to achieve these Green Sea objectives. A divided island will only act to curtail progress and potential - streamlining policy and fiscal funding, with support for Scotland's industries, will allow Scotland, and the wider UK to benefit.

**More directly, there are 5 direct areas where Scotland and the UK can collaborate now to support the Green agenda:**

1. Data collection, monitoring and benchmarking for carbon emissions from offshore oil and gas infrastructure
2. Significant investment into solutions for improving carbon efficiency (i.e. electrification) and in new renewables (hydrogen and carbon capture)
3. Creation of engagement and policy frameworks to support new and emerging renewable technology
4. Incentives to develop and roll out end use applications that can effectively use renewables - growing the domestic market in Scotland and the UK
5. The creation, financial support and active promotion of a Scottish led decommissioning export strategy

As COP26 comes to Glasgow in November 2021, we have an opportunity to show our true 'Green leadership'. There is no reason why Scotland cannot take the lead in exemplifying the potential for comparable resource basins in their green transformations. This will not only aid Scotland both in reputation and future financial reward as it exports its expertise and capabilities, but in reducing its full consumption emissions - given over 50% of emissions come from imports.<sup>56</sup> The world is watching, the opportunity is there, it is now up to our governments to act.

<sup>56</sup> <https://www.gov.scot/publications/scotlands-carbon-footprint-1998-2016/>, accessed 5 February 2021

ScotlandCan aims to set out fresh thinking and new ideas on how Scotland can become fairer, greener and deliver social justice to our most deprived communities, now.

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