Response to Department of Energy Security and Net Zero's consultation on building the North Sea's energy future

Institute of Materials, Minerals and Mining

The Institute of Materials, Minerals & Mining (IOM3) is a professional engineering, environmental and scientific institution, a registered charity and governed by a Royal Charter. IOM3 supports professionals in materials, minerals, mining and associated technical disciplines to be champions of the transition to a low-carbon, resilient and resource efficient society. With around 13,000 members, IOM3 brings together expertise across the full materials cycle. This submission is informed by consultations with our members across various energy industries, who provided practical insights on the action needed to ensure the effective delivery of the government's ambitions.

To achieve a thriving and resilient clean energy hub in North Sea, it is essential to consider the full breadth of the materials supply chain on which the transition depends. Wind, CCUS, hydrogen and a range of other clean energy projects rely heavily on the sourcing, processing and recycling of materials and minerals. As such, proactive support to grow the UK's capacity in these areas is key to minimise import dependence and building longstanding energy sovereignty. Moreover, materials, minerals and mining industries have the potential to contribute significantly to economic growth and high-quality employment in the North Sea region.

Harnessing the full potential of the clean energy transition in the UK Continental Shelf (UKCS) will require a clear and consistent policy framework, as well as rapid investment to ensure necessary infrastructure and skills pipelines are in place across the supply chains.

Question 1a: What role can government play to ensure that local workers can benefit from the growth of these new energy sectors?

The offshore energy sector has been a source of employment for communities in the North Sea for decades. As this sector undergoes major shifts, the local workforce must be prioritised both to support a just transition and to help ensure an adequate supply of skilled labour to meet clean energy goals. In planning the future of the North Sea, it is imperative that the government understands and invests in the existing labour pool in the area.

Working offshore is a particularly demanding environment that requires huge lifestyle changes for workers, their families and their communities. It is uniquely challenging to attract and integrate new recruits into these working patterns, meaning that existing offshore energy workforces will have a vital role to play. Throughout the east coast of Scotland from Aberdeen to Dundee workers and communities are adapted to the demands of the offshore energy sector and the lifestyles associated with living offshore for extended periods.

The government can support local workers by promoting awareness of these strengths, investing in the development of clean energy supply chains regionally and supporting targeted programmes, such as the skills passport, to streamline the transition between sectors. Where skills are not directly transferable between oil and gas and clean energy, investment in standardised training programmes to fill these gaps will be essential. In addition, the government can support the smooth transfer of jobs indirectly associated with oil and gas industries, such as transportation, to supporting roles in the clean energy sector. These measures can all play a role in minimising the level of social and economic upheaval experienced by North Sea communities.

More generally, supporting UKCS workers means the development of diverse, resilient and secure clean energy supply chains in the region. To achieve this, the government must broaden its priorities to include not only the delivery of new energy projects, but also the material flows that underpin them. For instance, offshore wind farms require hundreds of kilometres of copper cables, yet there is limited cable manufacturing in the North Sea region and no copper refining capacity in the UK. At the same time, there are significant copper supplies in existing offshore energy assets, which after end of life could provide feedstock for new cable manufacturing activities, strengthening the material sovereignty of the offshore energy sector and providing additional regional employment opportunities.

This is just one example of how broadening the government's vision of the North Sea to include the full materials cycle could bolster the transition and contribute to the development of a thriving and sustainable economic cluster. Industries associated with the sourcing, processing and recycling of transition materials, including decommissioning, should be recognised as a key strategic priority and vital to promoting the interests of local workers.

Question 1b: In addition to the investments in clean energy industries outlined in this section, are there any other areas you think should be targeted for investment?

While the decommissioning and repurposing of oil and gas assets will be vital to an orderly transition in the basin, the opportunities associated with decommissioning wind turbines should not be overlooked.

There is over 1GW of UK offshore wind now over 15 years old and 0.6GW of this is located in the North Sea. These projects are already engaging with UK supply chains about decommissioning, though planning will take from 5-7 years. Offshore wind decommissioning will need significant quayside space, heavy lift capability, and appropriately permitted facilities to handle metals and composites. Targeted investment to deliver the skills and infrastructure needed for decommissioning will be vital.

Retention of materials in the UK is a key opportunity associated with offshore wind decommissioning. High-grade structural steel from wind turbine towers and foundations could be crucial to supplying UK electric arc furnaces. However, these strategic materials could easily be lost to export without sufficient investment in decommissioning and processing facilities locally. Moreover, offshore wind turbines contain significant quantities of permanent rare earth (iron-neodymium-boron, FeNdB) magnets.

Investment is needed now to take advantage of forthcoming opportunities associated with the decommissioning of offshore wind, alongside oil and gas. This industry has the potential to form a significant part of the North Sea's clean energy economy in the coming years and decades. As there is a high level of skills crossover between oil and gas decommissioning and floating offshore wind decommissioning, investment in this area can contribute relevant employment opportunities for UKCS workers over the long term.

Question 1c: What opportunities do you foresee for the oil and gas industry to invest into clean energy?

The North Sea's longstanding oil and gas sector has facilitated the development of significant expertise and infrastructure in offshore energy. This background represents a significant competitive advantage and positions the region to become a world-leading clean energy hub. If the UK can effectively build on and

adapt its existing industrial resources, there is significant potential to attract investment from both domestic and international oil and gas companies into clean energy in and around the North Sea.

Oil and gas industries have both resources and expertise to contribute to the development of a clean energy hub in the North Sea and effectively mobilising this capital will be crucial to the successful delivery of the government's ambitions. One of the most obvious areas for oil and gas investment is carbon capture, utilisation and storage (CCUS). These projects are very much aligned with the network of technical expertise already possessed by oil and gas companies, making it possible to transfer existing employees to projects in this field. CCUS also presents an opportunity for companies to repurpose depleted oil and gas wells that are at or close to end of life, thus extending the commercial value of existing activities. For these reasons, there is already a willingness on the part of the industry to consider investments in this area, which should be actively encouraged by government.

Additionally, geothermal energy presents highly relevant investment opportunities for the oil and gas sector. The pioneering location for geothermal in the UK has generally been the South West, however the North Sea also has a part to play, particularly in deep geothermal. As geothermal energy is an emerging technology and very new in the UK, there will be a need for significant government intervention to support its growth. To incentivise and facilitate investment a clear regulatory landscape will need to be developed around geothermal, including in relation to insurance and upfront costs. In addition to creating a predictable and enabling policy landscape, the government can support universities and research institutions working on the advancement of geothermal energy, including those located in the North Sea such as the University of Aberdeen.

The substantial overlap of oil and gas with hydrogen energy, both in terms of skills and infrastructure, presents a significant investment opportunity. The North Sea infrastructure system, encompassing everything from pipelines and processing plants to shipping networks, can be adapted for the delivery of hydrogen energy. Moreover, while there are additional risks associated with hydrogen production compared to natural gas for instance, safety and risk assessment skills are transferrable between these industries. North Sea oil and gas producers have a highly experienced workforce equipped to manage gas volatility, material corrosion and safe structural design, all of which are readily

applicable to hydrogen. There is thus a clear path for domestic oil and gas producers to invest in hydrogen energy, as well as the potential to attract investment from overseas on account of the UK's existing human capital and infrastructure.

Finally, oil and gas companies operating in the North Sea are well positioned to invest in offshore renewable energies such as wind farms and tidal energy. The overlap between the oil and gas and these industries is significant, including skills in metallurgy, engineering, risk assessment, diving and welding, as well as infrastructure such as offshore stations and services such as marine transportation and personnel tracking. It is therefore possible to streamline the transition by repurposing existing industry assets towards wind and tidal projects. Such investments are strategically beneficial for oil and gas companies as they diversify their investment pool and offer longer term certainty in the context of a naturally maturing basin and evolving policies and regulations associated with the shift to net zero.

Question 1d: Which locations offer the best opportunities for investment in clean energy industries?

The opportunities associated with the clean energy transition are spread across the UK, with clusters forming in line with existing industrial and geographic advantages. This includes geothermal, nuclear and offshore wind in the South West, CCUS and hydrogen in North East England and offshore wind in various clusters along the coast. An important role for government in this context is coordinating the strategies and activities between all parts of the UK to maximise the efficiency of the transition. These coordination efforts need to include the North Sea as a focal point, building on the business expertise and workforce already present.

For the UKCS to reach its potential as a clean energy hub, significant government action is needed. The government must build on existing strengths in the regions and ensure effective harmonisation with other significant clusters throughout the UK. This includes sending clear and consistent market signals on the future of energy production in the UK and supporting oil and gas companies to diversify their energy investments in the North Sea accordingly. Moreover, investment in training and education will be vital to the development of a clean energy cluster and to ensure that the skills are in place to deliver the transition. Universities in Aberdeen and Dundee are already working on clean energy solutions and will have a significant role to play in this regard. Proactive government engagement

with education providers to identify challenges and streamline the delivery of both training and research can support necessary progress. Finally, as noted under Question 1a, additional focus is needed on the material cycles underpinning the delivery of clean energy projects and the potential for the North Sea and other clean energy clusters across the UK to capture the value associated with these supply chains.

Question 2: What, if any, additional measures could help the oil and gas workforce to transition into a) clean energy and b) other industrial strategy sectors?

The UK's economic and environmental ambitions for the North Sea rely on a wide array of industries and skills, encompassing the production, instalment and management of offshore green energy infrastructure, as well as the sourcing, processing and recycling of minerals and materials used in these projects. As noted above, there is significant overlap between fossil fuel and clean energy skills, including offshore and marine skills, safety and risk assessment, metallurgy, construction and decommissioning. In this regard, there is a high potential for workers in these fields to transfer to new opportunities associated with green energy as oil and gas employment declines. However, it cannot be assumed this will happen through market mechanisms alone and there is a need for government planning to ensure a smooth workforce transition.

Both from a worker and an employer perspective, certainty around the future of energy industries in the North Sea is crucial to decision-making. The government has already taken strong steps to communicate its intentions for the North Sea's energy future, however ensuring concrete and effective follow through will be key to building confidence in clean energy opportunities. A level of central coordination and planning will be needed to provide clarity to workers considering transferring their skills and to employers determining the scale of their investment in human capital. This includes in areas such as the demand for raw and processed minerals, the timelines of new infrastructure projects, investment in green innovation and the decommissioning of assets. The consistent and predictable delivery of any of these areas will not be possible without sufficient access to skilled labour.

Another key element of workforce transition is training and education. Despite significant overlap, the skills developed in the oil and gas sector will need to be

adapted and, in some cases, retraining will be needed upon entry into the clean energy sector. There are several steps the government can take to enable the timely transfer of workers in these cases. First and foremost, facilitating standardisation of training and education wherever possible will enhance efficiency and minimise the burden of duplicate training for both workers and employers. The skills passport, discussed below, is useful in this regard. Moreover, the government can facilitate access to retraining by working with education providers to support and fund the development of relevant programmes at all levels. Local universities such as Richard Gordon will be key here, as will technical colleges and other institutions providing upskilling and retraining opportunities. In addition, there is a role for government to facilitate coordination between educational institutes and companies to ensure adequate provision of apprenticeships and graduate positions.

Finally, salaries in clean energy sectors such as offshore wind may not be competitive with oil and gas in the medium term. It is vital for the long-term success of government plans that the clean energy industry is able to attract both transfers from oil and gas and new recruits and invest time and resources into their (re)training. For existing oil and gas workers, the challenge will be offering a similar package to incentivise an industry switch, while for new entrants into the energy sector remuneration must be sufficient to make training and potential relocation worthwhile. The government can help deliver a smoother workforce transition by incentivising employers through measures such as tax breaks for new recruits.

Question 3a: What support is required for oil and gas workers to transition into low carbon sectors that align with the UK's longer-term environmental and economic ambitions, as proposed within this consultation? In your response, please consider the transition through different lenses – for example, by location (domestically and internationally) or by demographic.

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with green energy as oil and gas employment declines. However, it cannot be assumed this will happen through market mechanisms alone and there is a need for government planning to ensure a smooth workforce transition.

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entrants into the energy sector remuneration must be sufficient to make training and potential relocation worthwhile. The government can help deliver a smoother workforce transition by incentivising employers through measures such as tax breaks for new recruits.

Question 3b: How do you think we should approach measuring the transition of workers from the oil and gas sector to low-carbon industries? Do you have a view on what metrics we could be using to measure the transition of workers from the oil and gas sector to low carbon sectors?

Question 3c: How would you define a good work opportunity within the low-carbon economy? In your response, please consider fair remuneration, the role of trade unions and creating jobs that are inclusive and contracted with financial security.

As noted above, the conditions of offshore work, regardless of sector, can be extremely taxing. The mental and social strains of living at sea for weeks at a time, health and safety risks associated with the work and logistical challenges and uncertainties surrounding the movement on and offshore all play a role in this. Historically, the oil and gas sectors have attracted recruits through high wages, with a premium associated with work taking place offshore. There are concerns that the offshore wind sector is not matching this level of compensation[1], and may not be in a position to do so as profit margins currently lag behind that of oil and gas[2].

The clean energy sector must learn from the oil and gas industry's history on the unique challenges of recruiting offshore workers. The current situation wherein offshore clean energy workers are offered similar packages to onshore employees[3] risks exacerbating skills gaps in the North Sea. This is especially true given that the number of roles expected to be lost in oil and gas in the coming five years (30,000- 60,000)[4] may not be sufficient to meet the forecast demand for new workers in clean energy (up to 104,000)[5], as discussed in Question 3e. It cannot be assumed that transfers from the existing oil and gas workforce will

[1] https://www.agcc.co.uk/news-article/inquiry-warns-oil-and-gas-workers-to-be-paid-significantly-less-working-in-renewables
[2] https://energyfocus.the-eic.com/renewables/profits-prove-elusive-clean-energy-transition#:~:text=Straddling%20O%26G%20and%20renewables,O%26G%20and%2038%25%20to%20renewables.
[3] https://www.agcc.co.uk/news-article/inquiry-warns-oil-and-gas-workers-to-be-paid-significantly-less-working-in-renewables
[4] https://www.rgueti.com/wp-content/uploads/2024/05/63968-Delivering-Our-Energy-Future.pdf
[5] https://www.rgueti.com/wp-content/uploads/2023/09/powering-up-the-workforce.pdf

provide a sufficient labour pool to deliver the transition and talent will likely need to be recruited from outside the energy sector and the North Sea region. If providing the kinds of financial remuneration seen in oil and gas is not possible at present, the clean energy sector must be able to compensate with other benefits and conditions.

In particular, taking steps to ensure a reasonable work-life balance, more flexible working conditions, an inclusive and supportive working culture and strong employment security could all be crucial in attracting new talent. Despite the significant challenges inherent to offshore work, the clean energy industry can strive to build a reputation for positive working environments by setting itself high standards for employment conditions. Ultimately, the attractiveness of these sectors to workers will be key to the successful delivery of the government's ambitions for the North Sea.

Question 3d: What, if any, other key occupations not already listed could oil and gas workers transition into that you think are important to supporting the transition to a low carbon economy?

The government has outlined key industries associated with the low carbon transition that can offer a source of employment for existing oil and gas workers. However, a greater emphasis is needed on the material supply chains underpinning these industries and their economic value to the basin. When envisioning the new configuration of high-quality employment in the North Sea, the government must widen its scope. Materials sciences such as composites engineering for the production of wind turbine blades, surface technology needed to develop corrosion resistant material coatings for CCUS technology, elastomers used in sealing systems for hydrogen storage and the mining and processing of critical minerals used in wind turbines can all have the potential to contribute to job creation the UK. Many of these areas overlap with existing oil and gas skills, particularly those relating to material properties and performance which are vital to safety and risk management in fossil fuel production. Offshore oil and gas workers also possess skills that are also transferable to deep sea mining for critical minerals. However, even where the direct transfer from oil and gas workforces is not feasible, building the UK's capacity in specialised materials industries can nonetheless contribute to high-quality employment opportunities in the North Sea, while also reducing import dependency.

In addition, there needs to be a greater focus on circularity and the role this can play in regional job creation. Energy assets in the North Sea that are at or approaching end of life must be understood as a strategic priority both for the purposes of material security and economic growth. While the government outlines opportunities for the decommissioning of oil and gas rigs, increased attention on the development of decommissioning and recycling infrastructure across all offshore energy sectors is needed. The first generation of offshore wind turbines in the North Sea are approaching end of life and there is the potential for the UK to repurpose high volumes of steel, as well as other strategic materials, from these turbines. With the right investment and planning, the circular economy surrounding green energy has the potential to form a cornerstone of employment generation and economic growth in the UKCS. On the contrary, if the UK fails to build the necessary infrastructure, supply chains and skills pipelines, the material security, value and employment associated with decommissioning industries may be captured by overseas competitors such as the Netherlands or Norway.

Question 3e: Do you think the UK has a sufficient skills base to underpin the transition? What role will the oil and gas sector play in the availability of critical skills?

The UK does not currently have a sufficient skills base to support the transition to clean energy in the North Sea basin. As noted above, offshore energy is a skilled and demanding sector and meeting clean energy goals will require the attraction and retention of talent at an accelerated rate. According to the Offshore Wind Industry Council[6], the industry will require over 100,000 roles by 2030, with significant labour shortfalls predicted in high level electrical skills, digital skills, consenting skills and marine and port skills in particular. The offshore renewables workforce as a whole is expected to increase from 34,000 in 2023 to up to 138,000 in 2030[7].

As noted above, many skills associated with the delivery of offshore wind can be drawn from the current oil and gas workforce provided there is an enabling policy environment. This transition is essential both in terms of easing skills gap and ensuring socio-economic stability in communities in the North Sea. Nonetheless,

[6] https://www.owic.org.uk/media/gf5ddwxt/offshore-wind-skills-intelligence-report-2023.pdf
[7] https://www.rgueti.com/wp-content/uploads/2023/09/powering-up-the-workforce.pdf

UK oil and gas is experiencing an ageing workforce and a significant portion of workers in this sector will remain working on existing fields. According to Richard Gordon University Energy Transition Institute, the UK oil and gas workforce is expected to lose between 30,000 and 60,000 roles, depending on the pace of transition[8]. However, these figures do not include those who will remain in oil and gas through decommissioning work and it cannot be expected that every worker who leaves the industry will make the transition to clean energy. As such, transfers from this labour pool alone will likely be insufficient to overcome the shortages facing the offshore clean energy sector over the coming years.

Proactive action from government in collaboration with educational institutes will be needed to attract and retain sufficient new entrants to the energy workforce at pace. This must include the promotion of STEM subjects from a young age, including at GSCE and A levels and incentives and funding to support a sufficient pipeline of students entering applied natural science, materials and engineering degrees.

Moreover, it is vital for the government to recognise that the skills shortages associated with the clean energy transition in the North Sea span far beyond the assembly, installation and operation of infrastructure. For instance, while offshore wind relies on the availability of electrical, digital, consenting and marine skills at the delivery stage, these projects are equally dependent on skilled labour at earlier stages of wind turbine development. This includes the extraction and processing of critical materials for permanent magnets, the manufacturing of composites such as carbon fibre or glass fibre-reinforced plastics for wind turbine blades, the development of long-life surface coatings to minimise maintenance burdens, and so on. Similarly, in addition to the skills required at site, CCUS technology will not be possible without the development of advanced material coatings that can withstand corrosion.

Major skills shortages across energy materials supply chains present a significant challenge for government's plans in the North Sea and should be recognised as a key strategic concern. For instance, the composites industry, vital in the production of wind turbines, is facing a severe shortage of skilled workers at all levels. There is very limited workforce capacity in raw materials manufacturing due to an absence of domestic production in this sphere. In the UK there is just one small carbon fibre plant, located in northeast Scotland, which is in danger of closing. However, to ensure energy sovereignty over the long term, the UK

[8] https://www.rgueti.com/wp-content/uploads/2024/05/63968-Delivering-Our-Energy-Future.pdf

needs the ability to make the raw constituents for composites used in wind turbine blades. The 2016 UK Composites Strategy identified the role of composites in enabling the energy transition and highlighted the need for an additional 50,000 workers in the sector by 2030[9].

Similar skills challenges can be seen across other important industries for clean energy, including surface technologies, metallurgy and mining. Moreover, the decommissioning sector is facing severe shortages of practical skills such as burners and welders. The government must take a comprehensive approach to assessing the skills required to deliver the energy transition and ensure that the UK has sufficient workforce capacity across the full materials cycle. Industries further up the supply chain and after end of first life have the potential to form part of a world-leading and sovereign green energy hub in the North Sea basin. However, this can only be achieved in the context of targeted intervention to address growing skills gaps.

Question 4a: How can government and industry develop the skills passport into a meaningful and effective mechanism for workers to transition from oil and gas into other industries? What is the correct role for industry and government to make this happen?

Question 4b: What can we do to further support specific local communities that are heavily reliant on oil and gas through the transition?

As noted in Question 1a, the development of a diverse, resilient and secure clean energy cluster in the North Sea is vital to supporting local communities who have historically relied on oil and gas for employment. The economic benefits of the transition need not be limited to offshore employment or work directly associated with clean energy industries. Rather, the UK can take the energy transition in the UKCS as an opportunity to grow its industrial capacity across the full materials cycle, capturing economic value and generating employment at every stage of the clean energy supply chain, including after end of first life. Examples of this include initiatives such as new cable manufacturing facilities being proposed in the North Sea region, however far more can be done to onshore the varied opportunities associated with the green transition.

[9] 2016 UK Composites Strategy | Composites Leadership Forum

Developing a more multifaceted industrial hub can maximise the opportunities for local communities and contribute to more inclusive and resilient growth.

As outlined under Question 3, targeted government intervention is also needed to ensure that oil and gas workers can reap the benefits associated with the transition. This includes fostering a clear and predictable regulatory and policy landscape, investment in training and education, coordination of apprenticeships and graduate positions and tax incentives for hiring new entrants. Direct engagement with local communities, businesses and workforces can help identify additional challenges associated with the transition for these actors and find effective solutions.

Question 4c: Are you aware of any examples of successful collaborations between regions or sectors that could serve as a model for facilitating worker transitions?

Question 5a: We would welcome any evidence you can share on any of the barriers mentioned in this section (pay, geography, policy uncertainty, employer incentive to support retraining, aging workforce).

Question 5b: What, if any, additional barriers not already mentioned in this section are you aware of?

Question 5c: What do you think could be done to improve the pay and standards of the clean energy sector and help ensure a proper role for trade unions?

Question 6: How can we enhance diversity within the sector? In your response, please consider the role of external organisations (such as employers and trade unions), and detail which group or persons this intervention would benefit.

Promoting equity, diversity and inclusion (EDI) is an important step to addressing skills shortages in the delivery of clean energy and ensuring ongoing high-quality employment opportunities for communities with a reliance on oil and gas sectors. The energy sector generally does not have a strong track record in terms of diversity. Available statistics suggest that only 5% of the UK energy workforce

comes from Black, Asian, and Minority Ethnic (BAME) backgrounds[10]. Moreover, in 2024, women made up just 29% of board members in UK energy companies, 34% of leadership roles and 32% of middle management roles[11]. Poor diversity and inclusion pose a barrier to attracting new entrants from marginalised backgrounds and to the advancement of talent within the industry. Offshore work in particular has historically been male-dominated and relied on familial and community networks onshore to support workers staying at sea for significant stretches. As the offshore clean energy sector seeks to overcome significant skills gaps, it is vital that the evolving expectations around work and home life are considered and that working conditions are attractive and inclusive for employees of all backgrounds.

Fostering EDI is not a goal that government can achieve in isolation. Changing longstanding norms, practices and perceptions will require a coalition of actors including government, industry, trade unions, learned institutions and academia. These actors can play a role by raising the voices of underrepresented groups who have already found success in the clean energy industry, including women and people of colour. Promoting these stories and positive experiences, particularly in relation to recruitment and career progression, can help to shift narratives around the industry and attract a more diverse range of talent to the North Sea. External organisations can also engage in outreach with marginalised groups prior to their entry into the workforce, including through encouraging the pursuit of STEM subjects and apprenticeships in the energy industry among girls and schoolchildren of ethnic minority backgrounds. As well as engagement with primary and secondary education, social media can prove a valuable asset in reaching younger audiences and ensuring a more inclusive perception of the energy industry among future workforces. Finally, both employers and trade unions can play a role in promoting policies and practices that foster meaningful inclusion for workers of all backgrounds, ensuring that positive narratives are reflected on the ground. The government should strive to actively support these efforts, including through funding and resources for relevant EDI projects.

[10] https://www.euskills.co.uk/download/workforce-renewal-skills-strategy-2020-2025/
[11] https://internationalwim.org/wp-content/uploads/2024/10/PfW-annual-state-of-the-nation-summary-May2024-FINAL-WEB-PAGES.pdf

Question 7a: Which parts of the oil and gas industry supply chain do you think will be most affected by the transition, and what impacts will it have on the workers within those businesses?

Insofar as oil and gas industries embrace the transition to similar areas such as CCUS, hydrogen and geothermal, it is likely that much of the supply chain will be able to successfully adapt. The delivery of infrastructure such as piping and offshore structures, the demand for construction materials such as steel, and the marine services currently associated with oil and gas should all be readily adaptable to emerging clean energy industries. Depending on the product or service in question, these changes will require significant investment, and smaller companies may not be in the position to upfront these costs. There will likely be a role for government funding to support those industries that are logistically capable of adapting but lack the capital to do so. There will also be additional opportunities for supply chain expansion, including in shallow geotechnical work for wind farm foundations and so on.

However, the aspects of the supply chain that will face most significant challenges will be those delivering highly specialised services that are specific to oil and gas. With the decline of the basin over the coming years and decades, these providers may need to shrink their operations, with potential knock-on impacts on employment. In these cases, it is possible that alternative markets can be found in clean energy that are compatible with existing skills, systems and infrastructure, though the level of investment required and the need for government support will likely be greater. Moreover, existing oil and gas fields will continue production for years to come, meaning that at least a portion of these supply chains can and will remain in their current form.

While it is possible for companies, and even whole sectors, to fare well through downsizing, transition or expansion into new areas, fallout associated with supply chain shifts will inevitably be felt by some sections of the workforce. This is particularly true for workers in specialised oil and gas industries with very particular technical skillsets, those for whom access to retraining or upskilling is limited and those in roles where remuneration and conditions in comparable clean energy sectors fails to match that provided by the oil and gas industry. Government intervention can address some of these challenges, including though funding for the pursuit of relevant training courses, as discussed in Question 3a.

Question 7b: What potential barriers exist for current oil and gas supply chains to transition to alternative sectors?

Question 7c: What additional measures can we take to support these supply chains during the transition?

It may be beneficial to create a tiered system wherein those industries and businesses that struggle most to translate their operations to new supply chains are prioritised for contracts with oil and gas, while those that are most readily adaptable to clean energy are supported to make the transition at an earlier stage. This kind of planned, phased supply chain transition could help minimise the number of UK companies and sectors that lose out as a result of the changing energy landscape.

Where market challenges prevent UK oil and gas supply chains from transferring to clean energy, there is a risk that overseas competitors will fill the gaps. This would create an increased reliance on imported infrastructure and critical services, compromising energy sovereignty and forgoing significant economic opportunity. As such, for those aspects of the supply chain that are willing and able to invest in making the transition in the short term, the government should take proactive steps to facilitate their success. This includes acting as an incubator for initial changes through funding and tax benefits for companies making the switch.

Question 7d: What are the current existing key strengths in the UK supply chains for these sectors?

Question 7e: Do you think that UK supply chain companies will be competitive in accessing growing clean energy sectors in the North Sea? What role can government play in supporting them?

Question 7f: What key export opportunities do you anticipate will be open to the UK supply chain, as a result of the development of clean energy sectors in the North Sea?

Question 7g: Where do you see the main opportunities in a) offshore wind b) floating offshore wind, c) CCUS (T&S) d) hydrogen e) decommissioning for the oil and gas supply chain?

Question 8: How can we improve our understanding of the interconnected basin, including its opportunities and risks? Do you have any evidence you can share about this?

The interdependency of energy production in the North Sea basin has created efficiencies and coordination between companies that can be of value in the green transition. Much of the shared infrastructure in the basin, including pipelines, processing plants and shipping lanes, can be adapted or repurposed to accommodate clean energy projects. As such, existing commercial partnerships can be continued in the delivery of offshore wind, hydrogen, CCUS and geothermal energy, especially where the government supports ongoing collaboration and sends clear market signals on the future of the North Sea's energy economy.

It is worth noting that interdependency in the basin extends beyond physical infrastructure and includes digital systems. For instance, the Vantage POB (Personnel On Board) system used to track the movement of workers offshore was first introduced in the early 2000s and has long been an industry standard in the basin. It is available to all organisations working offshore including wind and CCUS. This is an important example of a cross-industry system originally developed for oil and gas being effectively applied to the clean energy sector.

In some areas, a more proactive government approach may be needed to reap the benefits of coordination as the basin undergoes transition. The port system is an important example. Under the current system, ports are privately owned and highly competitive, with large companies generally obtaining and controlling the most lucrative port space. This model does not lend itself well to collaboration and has not always produced the most efficient outcome from the perspective of maximising the North Sea's energy potential. Indeed, there is currently insufficient port space to accommodate all activity coming from the UKCS and commercial opportunities are often relocated overseas as a result. Moreover, while there is potential for decommissioning and offshore wind to be accommodated on the same port infrastructure, this kind of coordination has not been invested in. In this instance, some level of government coordination or involvement could support the development of interdependent infrastructure and the most efficient use of assets for the growth of the clean energy sector.

While collaboration between companies and industries has efficiency benefits and can help overcome infrastructure shortages, this model also presents challenges. Where there is shared infrastructure and assets, legal complexities may arise with respect to the separation of liability. This is particularly true as new technologies and regulations are emerging associated with the transition to green energy. The government can help overcome these risks by offering

legislative clarity so that companies can move forward with new collaborations in confidence of their legal status.

Question 9: How can we manage future oil and gas production from existing fields, in a way that accounts for the interdependencies across existing assets and supports an orderly transition across the basin? We would welcome examples of technical or commercial dependencies including timing-related considerations if relevant.

Question 10: How can decarbonisation projects or asset repurposing support an orderly transition of the basin, or vice versa? Please share any evidence to support your suggestions.

Question 11a: To what extent do you agree or disagree that this position on new licenses will support the UK to set a globally leading example in tackling climate change?

Question 11b: Is there anything else you think should be considered in the Government's definition of i) licensing and ii) new fields? What would be the case for doing so, including consideration of the commercial and environmental impacts?

Question 11c: Aside from oil and gas, are there any other sectors you think would be affected by these proposals? If yes, how would they be affected?

Question 11d: Do you anticipate any situations where additional targeted interventions might be needed or beneficial to support the government's climate and North Sea objectives? If so, what criteria or mechanism do you think should be used to determine whether such situations have arisen?

Question 12a: What, if any, impact do you think these policy considerations could have on businesses? Please consider if small and micro and/or medium-sized businesses would be disproportionately affected.

Question 12b: What, if any, impact do you think these policy considerations could have for individuals with protected characteristics? If there are negative impacts, what potential mitigations could be explored?

Question 13a: Which of the following options for revising the principal objectives, if any, do you prefer? Revised single principal objective Introduction of sub-objectives Multiple primary objectives Other: Please specify Don't know Prefer not to say

Question 13b: Please share your rationale for your answer to question 13a. If you prefer the introduction of a revised single principal objective, or the introduction of sub-objectives or multiple primary objectives, please outline what you think the objective(s) should cover.

Question 14a: What are your views on the ideas for reforms to the NSTA's powers considered above?

A revision and expansion of the NSTA's role around decommissioning activity is a necessity. This sector is not only vital to the protection of the marine environment but also has the potential to contribute massively to investment, growth and job creation in the North Sea. At the same time, as the government recognises, progress on decommissioning is often delayed and uneven. Deferrals and inefficiencies in decommissioning activity compromise the environmental and economic gains this industry can offer.

While the consultation already highlights some of the opportunities and challenges surrounding decommissioning, there are additional points that the government should consider when reviewing the NSTA's role. Firstly, decommissioning is not only important from an environmental and economic perspective but is also vital for material security. As noted in previous answers, the energy transition in the UKCS and beyond will rely heavily on materials, minerals and mining industries. Secure access to the raw and processed materials used in green infrastructure and technology will have major implications for the sovereignty of the UK's energy system. The assets in the North Sea contain high volumes of strategic materials and the recovery and reuse of these materials at their highest possible value should be considered a key priority. For instance, Zero Waste Scotland estimates that oil and gas substructures removed from the North Sea between 2022 and 2031 will amount to 1.4 million tonnes of steel[12]. The NSTA's stewardship role over the transition in the basin should include a mandate to seek the maximum recovery of strategic materials from end of life assets.

Another key point to note is that the decommissioning industry is by no means limited to oil and gas. As noted above, the first generation of offshore wind will be at end of life in the next decade and there will be major opportunities for material recovery and job creation. The skills and infrastructure required for the decommissioning of wind turbines overlap significantly with that for oil and gas

[12] mf-qwstm9se-1688475468d

assets, making it all the more advantageous as an avenue for growth and investment in years and decades to come. While focusing on oil and gas, hydrogen and CCUS, the NSTA may nonetheless have a role to play in supporting coordinated cross-industry decommissioning efforts with offshore wind, managing potential interdependencies and establishing best practice procedures in the sector.

Finally, for both oil and gas and clean energy assets, major proactive intervention is needed to ensure the UK is in a position to take advantage of forthcoming opportunities. The decommissioning industry requires significant investment in infrastructure, supply chains and human capital. If the UK does not build the capacity to deliver cost-competitive decommissioning services now, then these contracts will be lost to more well-established decommissioning industries overseas. Under the current system, the decommissioning of assets is at the discretion of private companies, meaning that projects are inconsistent, uncoordinated and often postponed. This creates a level of uncertainty that is incompatible with attracting the investment and talent needed for a thriving and competitive decommissioning industry in the UK.

The proposed amendments to the NSTA's powers would go some way to mend this by minimising postponements and creating greater predictability around future decommissioning opportunities. However, there is potentially scope for a greater level of coordination and oversight from the NSTA, in tandem with other relevant regulatory bodies, to maximise the efficiency of decommissioning activities. For instance, in the Netherlands, the National Platform for Reuse and Decommissioning is a joint initiative of the Dutch state and the Dutch oil and gas industry, focused on facilitating a structured, innovative and collaborative approach to oil and gas decommissioning. In reviewing the role of the NSTA in decommissioning, the government should also consider what role the body could play in a more systematic and managed approach to this industry, as has been seen elsewhere.

Question 14b: In addition to those explored above, are there any other areas of the NSTA's powers which could benefit from reforms