Department for Business & Trade

# Invest 2035: The UK's Modern Industrial Strategy

We thank you for your time spent taking this survey.
Your response has been recorded.

To complete the survey please make sure you have first downloaded and reviewed the PDF, ‘Invest 2035: the UK’s modern industrial strategy’ from this website, or read through the web-accessible document here.

We are grateful for all views. Please answer as many questions as you can but if certain sections are irrelevant, or you feel unable to give an opinion, feel free to leave the answer box blank.

We estimate it will take approximately 30 minutes to complete the full survey (depending on how many sections you complete or are relevant to you). You can save your answers and come back to them at any time.

This is a public consultation that will inform the development of the new Industrial Strategy, the Government's proposed plan to boost investment, growth, and stability. The final Industrial Strategy will be published in Spring 2025, alongside the multi-year Spending Review.

We are asking for your views on our approach, including evidence, analysis, and policy ideas. We welcome input from a range of partners, including businesses, experts, trade unions, local and regional actors, and other interested parties.

**The consultation closes at 11:59pm on 24 November 2024.**

**Download full list of questions**

You can download the full list of the questions here: Consultation questions

**Print or save a copy of your responses:**

At the end of this questionnaire, you have the chance to either print or save a copy of your response for your records. This option appears after you press 'Submit your response'.

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email to allow you to continue your response where you left off.

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## Personal Details

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## In what capacity are you replying to this call for evidence?

- ○ Business
- ◉ **Business association**
- ○ Charity
- ○ Member of the public
- ○ Researcher, academic
- ○ Think Tank
- ○ Trade Union
- ○ Other

## What is the name of your business/organisation?

Marine Energy Council

## Which sector do you work in?

Renewable energy

## Are you happy to be contacted directly about your response?

- ◉ **Yes**
- ○ No

## Sector Methodology

The Government has undertaken initial analysis to help determine eight growth driving sectors. Future work will build on this analysis to determine the key subsectors within these broad sectors, using evidence collected from this Green Paper as well as further evidence-gathering and use of wider methodologies.

Please read p.16-20 of the PDF (or here online) before completing these questions.

## Q1. How should the UK government identify the most important subsectors for delivering our objectives?

The Marine Energy Council (MEC) welcomes the inclusion of clean energy as one of the eight identified growth-driving sectors. The wave and tidal stream industries support the criteria set out in the consultation for subsectors being reviewed in terms of their contribution to Net Zero, regional growth, and economic security and resilience. In addition, the Government should consider the UK's relative strength in each subsector and make strategic decisions about where it can lead the world. The UK currently leads the world in marine energy with more installed capacity, generated power and knowledge capacity than any other developed market. This is critical if market share and growth is to be achieved. This sector has the potential to deliver over £40bn Gross Value Added to the UK economy, with the majority of this economic benefit felt in coastal communities. The Government should include export potential as a key criteria, and the ability of a subsector to support its ambition to be a Clean Energy Superpower. It is also important to define the existing criteria that the industrial strategy sets out. For example, contribution to Net Zero needs to include consideration of the UK's future energy system and generation mix. We know that the most cost-effective net zero energy system of the future will not be achieved by solely deploying the cheapest renewables available today. A strategic view about the importance of a diverse generation mix, which will need to include reliable and predictable generation and how different technologies will interact in the future is fundamental to achieving net zero in a secure and cost-effective manner. Research by the University of Edinburgh shows that deployment of 12GW of marine energy will lead to an energy system saving of £1bn per annum (https://supergen-ore.net/uploads/resources/Supergen-ORE-Power-System-Benefits-Study-2023_2023-01-30-110556_ygbg.pdf). The UK can deliver a cost-effective, well balanced and predictable energy system, whilst supporting technologies in which it has significant growth potential.

## Q2. How should the UK government account for emerging sectors and technologies for which conventional data sources are less appropriate?

There is a rich and growing evidence base for the value of marine energy to the UK and its economy. The Offshore Renewable Energy Catapult's world-leading research programmes has clearly set out the economic potential of marine energy, and the Government should ensure it utilises this expertise. Sites like the European Marine Energy Centre (EMEC) have already delivered £370m GVA to the UK economy, and research from the University of Edinburgh has set out the £40bn+ GVA potential of marine energy (https://www.supergen-ore.net/uploads/What-is-the-value-of-innovative-ORE-deployment-to-UK-economy.pdf). As the UK develops its 30GW of marine energy potential that benefit will be experienced in coastal communities. Research shows that a single 10MW wave array in Orkney will generate £14.5m in GVA to the local economy whilst supporting over 180 jobs (https://www.sciencedirect.com/science/article/pii/S1364032122002234?via%3Dihub#sec4). Realising this benefit can be a challenge, particularly given the primary mechanism for renewable deployment in the UK, the Contracts for Difference mechanism, focuses on delivering projects with the lowest Levelised Cost of Energy. Invest 2035 provides an opportunity to re-evaluate the outcomes of Government mechanisms and whether this is aligned with its broader ambitions. For example, technologies like tidal stream have been shown to reduce reliance on fossil fuel imports, boosting UK energy security and reducing household exposure to significant price fluctuations. The Government should engage with industry on where data indicates the UK has a global advantage and where benefit can be secured across the UK. It should for example utilise research that identifies where public investment can secure high returns. Average returns (on public investments in innovation) in marine energy projects and TSE is comparatively higher than investment in other renewable technologies and strongly supports balanced economic growth (https://economy2030.resolutionfoundation.org/wp-content/uploads/2022/05/Growing_clean_report.pdf). Establishing marine energy as a subsector will support identifying investment opportunities that lower the cost of realising the UK's potential. Marine energy received £74m in technology funding between 2017-22. Research demonstrates that innovation funding will rapidly increase learning rates and reduce the cost of technology in the future. An increase in the technology learning rate from 10% to 15% has the potential to reduce the total investment required for tidal stream from £18.6bn to £3.3bn and reduce the total investment required for wave from £20.5bn to £3.0bn when delivering 6GW of each technology by 2050. ORE Catapult forecast at 1GW of deployment both wave energy and TSE will be cheaper than new nuclear and TSE could fall to below £50/MWh by 2050. Despite this lack of investment, the UK still has world-leading marine energy sites, like Morlais in Anglesey and EMEC in Orkney. These sites enable standardisation, build industry and investor confidence, and accelerate the transition from pilot stages to commercial-scale deployment. The UK has a strong track record of market pull mechanisms within the renewable space. However, a lack of technology push mechanisms has led to other countries being more attractive for investors. This may be due to a focus on conventional data sources which fail to capture the broad benefits and future opportunities of developing emerging renewable technologies.

## Q3. How should the UK government incorporate foundational sectors and value chains into this analysis?

The development of domestic supply chain capabilities fit to support the ongoing Net Zero transition is a vital step in maintaining the socio-economic benefits associated with a successful marine energy sector within the UK. Without adequate financial support and policy oversight into supply chain capabilities, there is a very real danger that the marine energy sector, and the GVA and jobs benefits that are associated with it, could be led by other competing nations. Furthermore, a robust supply UK supply chain with the capability to underpin the marine energy sector has the added bonus of increasing overall energy security and providing a meaningful contribution to a fair transition to net zero by providing jobs in coastal communities. The Invest 2035 strategy should build up the supply chain for domestic projects, with the aim of gaining core skills and a competitive advantage for mass manufacturing and exports. This is the strategy Denmark adopted a generation ago in wind and it is one of the reasons why that country is one of the world's leading wind manufacturers today, with over 30,000 people employed in the sector and multi-billion export sales. By contrast, the UK has one of the largest offshore wind capacities in the world, but the core wind turbine generation technology is all imported. With marine energy we have an opportunity to manufacture technology and export it overseas. With regards to the manufacture of key underpinning subsystems, common across different marine energy devices, it is essential that if the UK wishes to maintain its world-leading position within the sector, then comprehensive policy support and financial investment is both provided and incentivised across the supply chain. Primarily this support should be utilised to provide a fully modernised supply chain, capable of competing with other established nations in the manufacture of key subsystems. This may include the uptake of advanced manufacturing techniques; automation of welding and other fabrication processes; digitisation and data analytics; and the use of robotics. Furthermore, policy support programmes to enable the competitive manufacture of these subsystems at volume, should be guided by a comprehensive framework that considers additional underlying drivers with the potential to influence the UK's competitive position, which may include drivers such as market opportunity; workforce capability and research & innovation support. In doing so policy programmes that can potentially enact sector-wide improvements could be implemented. With other competing nations waking up to the economic opportunities presented by a successful marine energy sector, the UK has to act quickly to ensure that domestic manufacturing capability is competitive enough to ensure that underpinning foundational sectors and supply chains remain within the UK. The Marine Energy Council believes that a range of underpinning subsystems manufacturing sectors such as tidal turbine blades; fabrication of device substructures, certain power take-off components; system integration; and device operation and maintenance should all be supported if the UK wishes to enforce its position as the leading nation in the development of the marine energy sector.

## Sectors

For each of the growth-driving sectors, we set out below how they link to the Industrial Strategy objectives, their strengths, and outline where Government can – in partnership with business and others – go further to support growth.

Please read p.21-26 of the PDF (or here online) before completing these questions.

## Q4. What are the most important subsectors and technologies that the UK government should focus on and why?

The MEC strongly believes that marine energy, both tidal stream and wave, should be established as a subsector under clean energy technologies. The UK has an existing leadership position within tidal stream and can benefit from a large export market for wave energy. To date an overarching strategy for delivery of tidal stream and wave between government and industry has been absent. The industrial strategy is an opportunity to rectify that and develop a Marine Energy Sector Plan, to align industry and government efforts behind a common goal. The International Energy Agency has forecast that 120GW of tidal stream capacity could be deployed by 2050. Developing this initial capacity could see tidal stream provide 30% of New Zealand's, 11% of the UK's and 10% of Indonesia's current electricity demand. There are significant opportunities for tidal stream to play a key role in local electricity systems. For example, Alaska's tidal stream capacity represents 5x its annual electricity demand, for China's Zhoushan province 150% and the Bay of Fundy in Nova Scotia, 50% of their demand (https://engrxiv.org/preprint/view/4078). The London School of Economics' Grantham Institute has identified tidal stream as an area where the UK is a specialised innovator, and could lead in developing, deploying and exporting tidal stream turbines around the world. The Intergovernmental Panel on Climate Change (IPCC) identified wave energy as the world's largest untapped renewable energy resource with over 29,500TWh potential, ten times more than Europe's annual electricity consumption. Wave energy could provide electricity for 500m homes whilst supporting 400k jobs globally. Its abundance means the economic opportunity for the UK is tremendous. The UK has over 30GW of tidal stream and wave energy potential, enough to meet over 30% of its electricity demand. When developing the next stage of the Industrial Strategy, and considering the subsectors under Clean Energy industries, tidal stream and wave energy, or marine energy, should be established as a subsector, with a clear plan to realise the UK's significant potential. Research by the University of Edinburgh has found that by achieving a leading position with regards to the development and deployment of marine energy technologies, the UK add £41bn GVA to its economy. This means high value jobs, supporting the renewables sector, in coastal communities and opportunities to contribute to global efforts to achieve net zero which provide growth and economic benefit to the UK economy.

## Q5. What are the UK's strengths and capabilities in these sub sectors?

The UK has the offshore engineering expertise, supply chain and natural resources to lead the world in tidal stream and wave energy. Marine energy projects are currently being developed, deployed and exported with over 80% UK supply chain content spend. This is significantly higher than other renewable technologies. The industrial strategy should seek embed UK content in projects deployed here and around the world. The National Energy System Operator's recent report into achieving clean power for Great Britain by 2030 noted that tidal stream is predictable and will feasibly play a role in delivering that target if costs continue to fall. The UK has demonstrated a long history of enabling cost reduction in renewable generation as it scales, this similar approach can be applied to wave and tidal stream, with strategic oversight and planning for the sector. The Offshore Renewable Energy Catapult has identified ten areas where it expects the cost of tidal stream to fall significantly, in its tidal stream technology roadmap (https://cms.ore.catapult.org.uk/wp-content/uploads/2024/03/ORE-Catapult-Tidal-stream-roadmap-report-2024.pdf). The UK can lead in developing engineering and expertise, to position itself to export around the world. This includes anchoring, hydraulics, tidal stream rotors and optimising wet mate connectors. The Invest 2035 consultation rightly notes that over 90% of the global GDP is now covered by Net Zero targets. For countries to achieve this ambition in a secure manner they will be required to deploy a range of different renewable technologies. The UK's future energy mix will be dominated by wind and solar, but that these technologies will not be sufficient to deliver net zero or provide the same levels of economic growth potential for the UK given competing countries having established leadership positions. Tidal stream's predictability can reduce the 'firm power' role that fossil fuels currently play in the energy system, reducing costs associated with curtailment, and the need for reserve gas capacity caused by supply/demand mismatch. Modelling carried out by Imperial College London demonstrated that tidal stream alone reduces the UK's required CCGT capacity by over 40%, from 8.1GW to 4.9GW. The UK can also lead the way in terms of innovative approaches to renewable deployment. The distance between offshore wind turbines can be as much as 1km, providing ample opportunity and space for wave energy converter deployment. 'Co-locating' wave and wind energy will deliver a saving of up to 12% in the Levelised Cost of Energy (LCOE) for both projects. As well as optimising offshore assets and reducing LCOE, wind and wave energy farms can significantly reduce storage capacity requirements (with power capacity up to 20% and energy capacity up to 35%) UK-based companies like Nova Innovation, Inyanga Marine, Orbital Marine Power and Mocean Energy are exporting technologies to the USA, Canada, Japan and Indonesia. With a strong supportive Marine Energy Sector Plan the UK can continue to lead in tidal stream and expand its capabilities to reap the benefits of a growing wave energy market.

## Q6. What are the key enablers and barriers to growth in these sub sectors and how could the UK government address them?

The UK has significant strategic advantages within marine energy. Firstly, it has a rich resource due to its geography. Harnessing tidal stream and wave energy could provide over 30% of the UK's current electricity demand. Secondly, it has world leading marine energy expertise and facilities in its universities like the University of Edinburgh's FastBlade, the world's first test facility that uses regenerative hydraulic technology to offer high-quality, low-cost fatigue testing of blades. Thirdly, the UK has a strong and growing supply chain that has enabled projects to be deployed with over 80% UK supply chain content spend. The UK has sites that have been developed and we know where the marine energy resource exists. Establishing marine energy as a subsector will support building on these strong foundations and getting technology in the water. A key aim of the subsector should be to deliver an overarching strategy through a Marine Energy Sector Plan. As part of this plan, industry requires a clear and consistent route to market and a long-term strategy for growth which is well articulated and shared with the industry. The strategy should include a clear target for deployment and capacity, to which Government and industry can work collectively to achieve. The UK Government should set a 1GW tidal stream and 300MW wave energy deployment target for 2035. This will boost investor confidence, supporting investment in coastal communities and beyond, creating green sustainable jobs in key areas for the UK Government. The Offshore Wind Industry Council (OWIC) has demonstrated the ability for the renewable sector and government to work effectively together to deliver practical change. The MEC envisions that as part of marine energy being established as subsector a similar initiative, that brings together the leading figures in the industry with government, will create the right environment for a targeted and focused plan. The Marine Energy Sector Plan should explore issues around consenting and other regulatory barriers to development. UK consenting processes are holding back delivery of marine energy projects. For example, in Scotland the consenting process can take, at a minimum, 4 years, and often longer. Consent is a required for a project to be eligible to bid into the CfD process and access revenue support. We know that projects can be built and deployed quickly, and under two years as demonstrated by Nova Innovation in Shetland. Government and industry can work together to improve deployment timescales, secure first mover advantage, and ensure the policy environment works for emerging as well as more-established technologies. Relatively small-scale marine energy projects are required to go through the same consenting process as multi-GW offshore wind farms and face greater hurdles than onshore projects where a Section 36 consent is required for projects over 50MW (offshore requires a Section 36 consent for projects over 1MW). These issues are exacerbated by regulatory agencies limited capacity, lack of remit to consent projects with low levels of associated risk and a need for a shared understanding of risk retirement. These barriers are surmountable, and with industry and government working together, supported by the establishing of marine energy as a subsector, can be speedily addressed. The UK has already made exciting positive steps forward, and established a world-leading deployment pipeline for tidal stream by setting a ringfence within its CfD mechanism. This should be increased to £30m for Allocation Round 7, and a £5m ringfence for wave energy needs to be introduced to ensure the UK keeps pace with countries like the US and China that have recently introduced supportive measures. All offshore renewable energy projects (including fixed and floating wind, Offshore Transmission Owners etc.) face significant challenges in the procurement of suitably capable vessels and crews for Operation & Maintenance, particularly when unscheduled. Vessel owners frequently prioritise long-standing oil and gas clients and their ad hoc

engagement in renewables projects is regularly subject to significant delays (with resulting downtime) and considerable upwards volatility in vessel day rates. The support of procurement of suitable vessels and trained crews to prioritise offshore renewables projects would have the combined “de-risking” effect of both reducing investors’ Internal Rate of Return (IRR) requirements and of enhancing the IRR levels actually achieved. By virtue of the huge level of demand, a strong investment case should be able to be made for such procurement support in its own right, for example through a “club” concept ensuring offshore renewables projects are treated as priorities. Finally, emerging technologies face significant challenges in terms of the perception of risk and the cost of capital. For tidal stream this increases its LCOE by upwards of 30%. Tidal stream energy projects are required to provide security for decommissioning costs of up to £1m/MW. The legal structure makes it difficult for developers to obtain bonds and are not permitted to build up the security during the lifetime of the project. This is an exorbitant cost for projects deploying emerging technologies to provide security in the form of cash deposits. This problem is exacerbated a single line in the Decommissioning Act (Section 105), which allows the Secretary of State to call in the bond at any time. There is a gap between what commercial insurers can provide and what financiers expect to see. The increasing cost of capital for the TSE sector is a significant barrier to its ability to raise project finance. Until data is available to enable competitive commercial insurance and finance options, this gap will remain a drag to growth. As part of developing the marine energy sector plan the Government should endorse the Ocean Energy Accelerator and act as a public sector guarantor to directly reduce the costs of deployment, and ‘crowd in’ commercial insurers. A Marine Energy Sector Plan will support removing these barriers and establish an enabling policy environment that supports realising the UK’s significant potential.

## Business Environment

The government will work in partnership with businesses, trade unions, mayors, devolved governments, experts, and other stakeholders to help address the biggest challenges to unlocking business investment, focusing on the 8 growth-driving sectors and clusters across the country.

Please read p.27-29 of the PDF (or here online) before completing this question.

## Q7. What are the most significant barriers to investment? Do they vary across the growth-driving sectors? What evidence can you share to illustrate this?

Our response focuses on the barriers to investment faced by marine energy rather than across other growth-driving sectors. - A lack of a clear and consistent route to market The UK demonstrated international leadership in establishing a ringfence for tidal stream in its renewable auctions. This has led to over 120MW of tidal stream being contracted. To put this in context globally there is around 20MW of tidal stream capacity currently deployed, half of which is in UK waters. The UK therefore can lead and grow the global installed capacity significantly. One of the challenges that the industry faces is that the ringfence is announced on an annual basis, and therefore there is a lack of sight for the sector in terms of the ringfence continuing and the amount that will be made available for the technology. This is a negative factor when encouraging long-term investor engagement. Prior to any project being able to bid into the CfD mechanism it requires a lease agreement, environmental licence and grid offer. This can take over 8 years. Going through this process is expensive and time-consuming, and companies are not incentivised to make capacity ‘eligible’ for the CfD mechanism due to the lack of clarity on there being a route to market at the end of this process. As noted above the tidal stream ringfence has each round secured 10s of MWs. Industry and Government should work together, as part of the marine energy subsector being established, to ramp this up to 100MWs, and unlock economies of scale and volume that will be key in reducing LCOE. For wave energy, which has not benefitted from a ringfence to date, this lack of a route to market is also stifling investment in the technology. This is despite its enormous potential to make the UK a clean energy superpower, creating green jobs in coastal communities, reducing energy system cost by over £1bn p/a, whilst meeting 20% of the UK’s electricity demand. - A lack of an agreed marine energy target The introduction of the tidal stream ringfence was an important step forward in realising the UK’s marine energy potential. The UK currently has a range of very ambitious targets across different renewables, which includes deploying 55GW of offshore wind, 50GW of solar, 35GW of onshore wind and 5GW of floating wind all by 2030. The reason for setting targets in these renewables is that it provides a clear direction of travel to industry and investors. Marine energy would benefit from the Government setting clear and ambitious deployment targets, whilst committing to work with the sector to deliver these. We believe these should be set at 1GW for tidal stream and 300MW of wave energy to be deployed by 2035. Reaching the 1GW tidal stream deployment target will create nearly 4000 jobs and deliver £1.4bn GVA to the UK economy (OREC (2024) Tidal Stream Response). - High cost of capital As noted in response to the previous question the high cost of capital and public funding bodies mandate is stifling the development of marine energy. Public financing should directly be aligned with delivery of the sector plan, focussing on lowering barriers to capital both for equity and debt facilities through a shared and transparent approach to risk. This could in part be addressed through modernisation of National Wealth Funds permitted ability to invest and a clear statement by GB Energy to support the sector. This can unlock private capital quickly, which is keen to engage in the sector. The MEC has proposed the introduction of Great British Energy: Sea Power (GBESP). Through committing £250m (3%) of GB Energy’s budget, the new publicly owned energy company can accelerate deployment of, and embed UK content in, tidal stream projects deployed here and around the world. It is envisioned that GBESP will take equity stakes under commercial terms in projects that have secured a CfD, bringing them to FID and into construction, helping to create essential momentum in the progress of the

emerging tidal project pipeline. These projects will deploy during this Parliament, ensuring GB Energy has a visible and tangible impact for constituencies across the UK. In addition to supporting projects with a CfD, emerging technologies often require grant funding and support for early-stage innovation. As we explore further in response to questions 10 and 11 this has been lacking from at a UK-level since the post-Brexit settlement. By failing to address this the UK is at risk of missing out on the marine energy potential, and what it can deliver to the UK energy system and economy. - These challenges should be addressed through a Marine Energy Sector Plan The marine energy industry wants to work with government to ensure that there is a clear and defined sector plan, that sets out the links between market mechanisms, technology deployment at scale and the role of public finance to ensure the growth and delivery of the industry over a defined timescale. This will avoid a staggered approach to the introduction of support for the sector and rapidly unlock investment from the private sector. In terms of next steps, the MEC would support the Department for Business and Trade identifying marine energy as a subsector with significant growth potential, and then a joint DBT, DESNZ initiative, replicating the OWIC's model to be established. This group should be tasked with developing an ambitious and deliverable plan to realise the UK's marine energy potential.

## Business Environment - People and Skills

The people that create and work in businesses will be central to the success of the growth-driving sectors and clusters, supporting the Government's Growth, Opportunity, and Clean Energy Missions in particular.

Please read p.29-31 of the PDF (or here online) before completing these questions.

Q8. Where you identified barriers in response to Question 7 which relate to people and skills (including issues such as delivery of employment support, careers, and skills provision), what UK government policy solutions could best address these?

The continued progression of the marine energy sector is highly contingent on investment into the future domestic workforce, ensuring that a pipeline of skilled workers, with backgrounds in essential underpinning skillsets such as electrical engineering; mechanical engineering; naval architecture; and project management, is nurtured and developed. Given the long lead times associated with training workers, efforts should be focussed now to ensure that the development of a future workforce happens at a similar rate to that of predicted sector growth. These efforts should not solely target higher education graduates from a STEM background, who are an important consideration of any future skilled workforce, but also consider apprenticeships and existing workers transitioning from the oil & gas and other relevant sectors, who often have transferable skillsets and exposure to the challenges of working in a marine environment. Additionally, future workers with the ability to work in highly digitized and automated workplaces will become increasingly important as these new ways of working are integrated into a modernised domestic supply chain. Working closely and engaging in an ongoing dialogue with marine energy technology developers will be essential to accurately gauge their needs and that of their sector. It should also be noted that the marine energy sector will be in direct competition with the skillset requirements of other established offshore renewable energy sectors, which do not offer the same domestic GVA, jobs and energy system benefits as the marine energy sector. This should underline the additional benefit of staffing this homegrown energy sector with a strong domestic workforce.

Q9. What more could be done to achieve a step change in employer investment in training in the growth-driving sectors?

A Marine Energy Sector Plan for tidal and wave energy will help give employers the confidence to put people through training that will benefit the sector. By being able to see the market, industry will be able to gear up to deliver its needs. At present those needs are not visible to those we need to attract into the space. Sustainable funding for technical and vocational training programs is essential, as many current initiatives rely on short-term, project-specific funding. Establishing centralised, continuous funding streams would help maintain a steady pipeline of skilled workers prepared for roles in project development, construction, and operations. Strengthening industry-academia partnerships is also critical. Government support for apprenticeship and trainee programs, particularly in technical and operations roles, would help bridge current skill gaps and prepare the workforce for emerging technologies like wave energy. The means to fund and support training must be in place and this will range from the re-skilling of members of the existing workforce through to developing the uptake of STEM subjects in junior schools and maintaining that interest throughout school careers. As part of the establishing marine energy as a subsector the MEC believes this will support employers taking a long-term view about opportunities, its requirements and support investment in training.

## Business Environment - Innovation

Accelerating the rate of innovation and increasing the adoption and diffusion of those ideas, technologies, and processes is an essential step for growing the productivity of our growth-driving sectors.

Please read p.31-33 of the PDF (or here online) before completing these questions.

## Q10. Where you identified barriers in response to Question 7 which relate to RDI and technology adoption and diffusion, what UK government policy solutions could best address these?

The UK Government has introduced a tidal stream ringfence with the understanding that the technology can be proven to come down the cost-reduction curve. However, due to a lack of accessible and sector specific RDI support, the projected reduction on LCOE arising from RDI investment and support has not been fully realised to date. This is expanded upon in our response to Question 11. Targeted innovation funding has also been proven to greatly reduce the overall cost associated with setting the market mechanism and quantum required to support emerging renewable energy technologies. For example, an increase in the cost reduction rate, an indicator of innovation, from 10% to 15% has the potential to reduce the overall market pull investment required for tidal stream from £18.6bn to £3.3bn, and wave from £20bn to £3bn when delivering 6GW of each technology by 2050 (https://supergen-ore.net/uploads/FINAL-double-page-Ocean-Energy-and-Net-Zero-Policy-Support-for-the-Cost-Effective-Delivery-of-12GW-Wave-and-Tidal-Stream-by-2050-03.07.23.pdf). The previous Government introduced the Net Zero Innovation Programme. Unfortunately, this did not include calls for marine energy. As part of a broader marine energy plan there should be consideration for targeted innovation support. The UK is already a world-leader in testing and demonstrating marine energy. To date, more ocean energy converters have tested at the European Marine Energy Centre (EMEC) than at any other site in the world. Independent economic report into the economic impact of EMEC found that it has delivered £370 million gross value add (GVA) to the UK economy. £263 million of that was accrued in Scotland; and half of that, £130 million, in the Orkney Islands where EMEC is head quartered, demonstrating a significant return on investment. It is critical that the UK builds on the strong foundations it has and provides a route for research and development and technology development. The innovation from components, operations and maintenance, efficiency and other areas will not only decrease the overall cost of marine energy but provide a route to commercialisation and additional GVA benefits to an existing and mature marine supply chain.

## Q11. What are the barriers to R&D commercialisation that the UK government should be considering?

To date there has been intermittent and insufficient technology innovation funding for marine energy in the UK. Between 2017 and 2022 total funding to support ‘technology push’ policies specific to the wave and tidal stream sectors in the UK amounted to £315 million. However, approximately only 23% (£74 million) of this came from domestic sources of funding, with £44 million coming directly from the Scottish Government initiatives (Wave Energy Scotland, EuropeWave and the Saltire Prize), concentrating predominantly on medium TRL status projects. The remaining £28 million of domestic funding is provided by the UK government, with the bulk of this coming in the form of EPSRC funding to the SuperGen programme. There is a clear opportunity for the UK government to invest more heavily in technology push funding that focusses on early-stage innovation (low to mid TRL status) to drive sustained technology innovation, ultimately helping marine energy technologies to access ongoing market pull mechanisms, such as the CfD, and accelerating the cost reduction of marine energy technologies. The UK has benefitted through continued participation in Horizon Europe, with two UK projects successful in the recent tidal stream call. SEASTAR and EURO-TIDES bring two of the most innovative tidal stream projects ever deployed to the UK, accelerating the commercialisation of this entirely predictable and renewable energy resource. However, due to not participating in the EU Emissions Trading Scheme, the marine energy sector does not benefit from its associated EU Innovation Fund programme. This is yet to be sufficiently replaced and risks harming the UK’s R&D competitiveness within marine energy against its EU neighbours. Innovate UK should be directed to provide support to marine energy to replace the EU Innovation Fund Programme. The experience of our members to date is that despite achieving strong scores through the Innovate UK Smart Grant process, funding has not been forthcoming. The primary barrier therefore to commercialising R&D in the UK is the lack of targeted support programmes at a Westminster level. For tidal stream this should be introduced and aligned with the OREC tidal stream roadmap and should be included in a Marine Energy Sector Plan, to target innovation in areas where the UK can lead and deliver good value for money , which will also support the commercial deployment of wave and tidal stream technologies.(https://cms.ore.catapult.org.uk/wp-content/uploads/2024/03/ORE-Catapult-Tidal-stream-roadmap-report-2024.pdf). The UK has a strong track record for invention and creative solutions. Sadly however, many of our innovations are often commercialised in other countries. While this is due to a wide range of reasons, the cost of capital is a primary factor. For example, the cost of capital for a company developing a new technology in the UK is often higher because of the perceived risk, whereas other countries in Europe with strong industrial strategies can access funding with a low cost of capital. This puts companies in the UK at a competitive disadvantage to their peers in other countries. Technology Readiness Levels (TRLs) are widely established in the UK, but there is limited awareness of Commercial Readiness Levels (CRLs) or Commercial Readiness Index (CRI). With them being well established and successful in other countries, we would strongly encourage the UK government to consider embedding them in the new industrial strategy. Not only will they help commercial technologies, but they will help emerging industries and companies to grow and scale-up. This

document published by the Australian Government more information about CRLs and how they work alongside TRLs: https://arena.gov.au/assets/2014/02/Commercial-Readiness-Index.pdf.

## Business Environment - Data

Data fuels modern business, both as users and producers. There is a huge opportunity for the UK to use its data more strategically, driving innovation and economic growth, including in the growth-driving sectors.

Please read p.33-34 of the PDF (or here online) before completing these questions.

Q12. How can the UK government best use data to support the delivery of the Industrial Strategy?

The MEC believes that in establishing marine energy as a subsector, and working with industry to deliver a plan, that this could provide an opportunity to consider how we better use and share data within the industry itself. That could include performance monitoring, environmental monitoring and understanding economic return. This would avoid the unnecessary replication of efforts driven by a competitive market mechanism, or support being provided by the Government and its agencies with the understanding that data and learnings will be shared openly as projects are deployed. For the UK to lead the world in marine energy as a sector will require new entrants into the supply chain. In establishing an open data approach as part of the marine energy subsector this could assist companies interested in providing services or goods to the marine energy sector identify opportunities.

Q13. What challenges or barriers to sharing or accessing data could the UK government remove to help improve business operations and decision making?

As part of the Marine Energy Sector Plan, the Government should consider how lessons from environmental monitoring could be applied elsewhere to expediate the process for creating marine energy capacity that is eligible to bid into future CfD rounds. Currently sites are required to undertake 2 years of environmental monitoring prior to deploying a project. As a sector we have a strong understanding of where the UK's tidal stream and wave energy resource is located and there should be focus on understanding and reducing impact risk at key project sites, as was undertaken for early wind developments in Round 1. Transmission and distribution network companies should be supported to ensure that there is sufficient and timely network capacity to these sites to avoid future bottlenecks in marine energy deployment.

## Business Environment - Infrastructure

An effective planning system is a fundamental enabler for business investment in our growth-driving sectors. Growth-driving sectors also require high quality infrastructure and transport connectivity.

Please read p.34-36 of the PDF (or here online) before completing these questions.

## Q14. Where you identified barriers in response to Question 7 which relate to planning, infrastructure, and transport, what UK government policy solutions could best address these in addition to existing reforms? How can this best support regional growth?

The MEC welcomes the Government's recognising that the planning consent process is too lengthy. Marine energy projects, like Nova Innovation's Shetland tidal array, have demonstrated that construction and deployment can be undertaken within 2 years of securing a route to market. However, the leasing, consenting, and securing a grid offer can take over 7 years. The issue around a lack of a plan or a route to market disincentivises market actors undertaking that process. By developing a marine energy sectoral plan with the industry that significant barrier can be addressed. In addition, the Government should consider the following three solutions to expediating project delivery: Firstly, it is critical that regulatory, consenting and leasing bodies have the capacity required to respond to marine licensing applications in line with a delivery plan that aligns with forecasted sector deployments and to align with the market mechanisms in place. A regulative and regulatory framework should help, not hinder, the marine energy sector. Secondly, the Government could consider a more proportionate approach to the consenting process for offshore marine energy sites. Relatively small-scale marine energy projects are required to go through the same consenting process as multi-GW offshore wind farms and face greater hurdles than onshore projects where a Section 36 consent is required for projects over 50MW (offshore requires a Section 36 consent for projects over 1MW). As part of the Marine Energy Sector Plan, we envision industry, government and non-governmental bodies working together to identify potential solutions to support proportionality. Canada for example, supports post-deployment monitoring. Deployment of a single unit for testing could be used as the evidential basis for environmental impact assessments, supporting technology development and reducing the journey to commercialisation by years. Finally, the Government could consider where there are opportunities to address the current project-based approach to environmental monitoring. Offshore environments are still poorly understood, with high cost associated with data collection in early site development. Industry could work with Government to monitor a broader area where we know there is strong marine energy potential, that allows multiple projects to deploy quicker in the future. Projects deploying offshore could be incentivised to also undertake monitoring with consideration for other offshore uses. For example, if an offshore wind company is supported to monitor with consideration of deploying wave energy converters in the future (at sites with good wave energy resource), this will help remove barriers and reduce timelines to realising the UK's wave energy potential.

## Q15. How can investment into infrastructure support the Industrial Strategy? What can the UK government do to better support this and facilitate co-investment? How does this differ across infrastructure classes?

Delivery of the Government's ambitious renewable energy targets and 2030 clean energy system plan will require significant electricity network and port infrastructure upgrades. This should be undertaken in consideration of marine energy to ensure that infrastructure upgrades are mutually beneficial for all offshore renewable energy sectors. Ensuring that there is a representative voice on the Industry Strategy Council can support marine energy being included in discussions and decisions as the Government moves forward with its 2035 industrial plan. Marine energy is often not included in government initiatives, including the recent announcement of the Clean Industries Bonus. We believe this is a missed opportunity, with compelling evidence to underline the many benefits of marine energy, such as domestic jobs and GVA and energy system dispatch cost reductions. Whilst the infrastructure requirements for marine energy are minimal in comparison to offshore wind, approaching investment and capacity building without marine energy could damage the future growth of the sector and could lead to the duplication of efforts, reducing overall cost-effectiveness. There is also an opportunity to share costs and optimise existing infrastructure. As noted in response to question 5, co-locating wave and wind energy will deliver a saving of up to 12% in the Levelised Cost of Energy for both projects. Better utilising offshore electricity network through co-location should be incentivised through mechanisms like the CfD scheme. Tidal stream energy companies are already making use of existing and under-utilised infrastructure. Orbital Marine Power's O2 device was the first vessel to launch from Dundee in over 40 years. In developing a Marine Energy Sector Plan government and industry can work together to identify where there are specific and immediate project opportunities to optimise existing infrastructure, whilst ensuring that future investment to support renewable growth accommodates wave and tidal stream energy. While in the very short-term, existing infrastructure is well-positioned to handle the requirements of the sector, the rapid expected sector growth will require large-scale infrastructure development projects to begin immediately. Therefore, opportunities to share space, resources and skills with the offshore wind sector should be actively investigated, given the significant overlap in technology.

## Business Environment - Energy

Access to cheap and reliable energy is an influential determinant of business competitiveness and an important consideration for internationally mobile investment.

Please read p.36-38 of the PDF (or here online) before completing these questions.

## Q16. What are the barriers to competitive industrial activity and increased electrification, beyond those set out in response to the UK government's recent Call for Evidence on industrial electrification?

As noted in response to the first question, delivering a cost-effective net zero energy system will not be achieved through simply deploying the cheapest renewables today. A diverse energy mix with complimentary technologies, is critical to delivering lower bills. Deployment of 12GW of marine energy will lead to an energy system cost saving of £1bn per annum. A higher penetration of marine energy results in lower dispatch costs, higher renewable dispatch, lower peaking generation and flexibility requirements. However, the current CfD mechanism, which is based on securing projects based on LCOE, is not an effective tool for supporting the delivery of a diverse energy mix. Through the Clean Industry Bonus and setting UK content targets for the renewable sector the Government is seeking to make tweak the CfD mechanism. In considering the criteria for supporting high-growth renewable sectors, the Government needs to also review the mechanisms that it is using within these sectors and if they are aligned with its key ambitions, to make the UK a Clean Energy Superpower, and rapidly decarbonise. For industrial activity, tidal stream could have an important role in supporting hydrogen production, offshore storage of energy and development of offshore data centres. With its power output being highly predictable, with up to 100-year projections based on modelling and harmonics setting out a generating profile. It is energetically very dense, with large regions of tidal resource situated across NW Europe, particularly in France and the UK (and Channel Islands), but also off the coasts of the Netherlands, Norway and the Faroes. It is typically situated within 10 km of the shoreline, has a low visual impact and high societal acceptance. The sector is making good progress in cost reduction and towards reaching commercial maturity and scale-out. Green hydrogen production is similarly at an emerging stage, with a range of demonstrator projects underway to scale the size of plant and reduce costs and also understand its application in areas such as commercial heating processes, transport and gas networks, as well as supplying existing users currently supplied from grey/black hydrogen, e.g. fossil fuels, which are large CO2 emitters and shouldn't be overlooked in the development of new market opportunities. A recent Interreg report has identified opportunities for tidal generated hydrogen to supply national and local gas networks. The relationship between marine energy and hydrogen should be explored further as part of the marine energy plan. (https://vb.nweurope.eu/media/21397/20231117_lt12_omp_business_case.pdf)

Q17. What examples of international best practice to support businesses on energy, for example Purchase Power Agreements, would you recommend to increase investment and growth?

The MEC would support the Government expanding dedicated marine energy zones, such as Morlais, with streamlined regulatory support and fast-tracked approvals. This will enhance competitiveness by creating additional eligible capacity to bid into the CfD mechanism, and could support accelerating deployments. Public-Private Partnerships (PPPs), as utilised in France and Japan, could co-fund necessary infrastructure like ports and grid connections, de-risking projects and drawing significant private investment.

## Business Environment - Competition

Competition and consumer policy, including subsidy control, is an important lever across and beyond the growth-driving sectors.

Please read p.38-40 of the PDF (or here online) before completing these questions.

Q18. Where you identified barriers in response to Question 7 which relate to competition, what evidence can you share to illustrate their impact and what solutions could best address them?

Q19. How can regulatory and competition institutions best drive market dynamism to boost economic activity and growth?

The UK has a strong regulatory and competitive framework that supports market dynamism, with a focus on short term reduction of energy costs. It is imperative that competition is seen as a means of securing desired outcomes, rather than an outcome in itself. The CfD mechanism is the UK's primary mechanism for renewable deployment. It is an effective means of price discovery in mature technologies and has been instrumental in rapidly scaling up renewable deployment. However, as it is focussed on securing projects at lowest LCOE this may not lead to the development of green supply chains and the creation of jobs within the UK. This is what has happened with wind, with the UK reliant on importing wind technology. Marine energy projects are currently deployed with upwards of 80% UK supply chain content spend. There is an opportunity to embed that in projects deployed here and around the world. The Marine Energy Sector Plan should strike the right balance between securing projects at the lowest possible LCOE in a manner that still supports the growth of green jobs and industries within the UK. Establishing marine energy as a subsector will support looking at this issue to position the UK to compete internationally, rather than stifling growth at a key time for the marine energy sector.

## Business Environment - Regulation

Regulation can address market failures, create economic certainty, and drive innovation to stimulate growth while protecting consumers and businesses.

Please read p.40-41 of the PDF (or here online) before completing these questions.

## Q20. Do you have suggestions on where regulation can be reformed or introduced to encourage growth and innovation, including addressing any barriers you identified in Question 7?

The MEC strongly agrees with the consultation, that a clear direction of travel provides businesses with the stable conditions and clear incentives to invest in technology and adopt products which move away from higher emission activities, towards Net Zero. Currently there is a lack of clarity within the marine energy sector, that could be addressed through establishing it as a subsector and committing to delivering a marine energy plan. As a sector we are ready to work with the Regulatory Innovation Office to support the UK being the best place in the world to innovate and speed up regulatory decisions for new technologies. Consenting agencies need to be empowered to support project deployment and learning by doing. For example, in Canada the Department for Fisheries and Oceans allows for post-deployment recognising the limitations of monitoring prior to deployment. The Government should also consider where there might be opportunities to allow for increased flexibility and demonstration projects in sites that have already been developed. Supporting ‘sandbox’ projects not only helps move the marine energy sector forward, but it will make the UK competitive with other international initiatives. The US Government recently announced over $112m of funding to advance the commercial readiness of wave energy technologies through open water testing and system validation. This is in addition to creating PacWave in Oregan that will be able to host 20 wave energy converters. The UK, through EMEC, has a leadership position, but that is under threat with international developments. The MEC is engaging with NESO and Ofgem on the connection reform process. We are concerned that the present system favours the incumbents and has led to an almost complete absence of anticipatory investment. In Orkney’s case the 200 MW connection presently being constructed was driven by concerted and dogged determination by local advocates rather than as a strategic investment. The scheme has taken 25-years to progress, its capacity is insufficient for Orkney’s potential and lacks the sense of urgency required. In the specific case of tidal energy; the locations of the resource are known and the technology is being developed to harness it, however there has been no hypothecation of space on the grid for this strategically important energy source. Small developers are being asked to fight for space with the incumbent wind interests and provide securities for connections that are unaffordable. Government needs to take a position on how to enable such strategic developments to take place. Consenting agencies need to be empowered to support project deployment and learning by doing. For example, in Canada the Department for Fisheries and Oceans allows for post-deployment recognising the limitations of monitoring prior to deployment. In the case of marine energy there are tensions over the potential risks of injury to seal and cetacean populations from turbines. Although not a proven risk, the regulators are taking a particularly cautious approach to permitting of scheme. This is driven by fear of legal challenge to any decision and is not informed by rigorous modelling due a paucity of data. A higher degree of political determination to see such technologies deployed would help give the regulators the confidence to permit the schemes.

## Business Environment - Crowding in Investment

UK firms have access to one of the world's leading financial services sectors. Despite this, as outlined above, the UK has consistently invested less than its international peers, with levels varying depending on firm size, sector, and region.

Please read p.41 of the PDF (or here online) before completing this question.

Q21. What are the main factors that influence businesses' investment decisions? Do these differ for the growth-driving sectors and based on the nature of the investment (e.g. buildings, machinery & equipment, vehicles, software, RDI, workforce skills) and types of firms (large, small, domestic, international, across different regions)?

Establishing an enabling policy environment with a strong and clear pathway to scale and commercialisation is critical to crowding in investment in growth-driving sectors. A clear example of that is that the establishment of a tidal stream ringfence led to a tenfold increase in the UK's tidal stream deployment pipeline. The market signal, giving an opportunity for growth has been pivotal to date. This has already had a tangible impact in terms of companies moving and opening offices to support project delivery, including HydroWing in Anglesey and inward investment from the US and Spain in tidal energy projects based in the UK. This route to market is critical for supporting businesses invest in emerging renewable technologies. Within wave energy we can see the deleterious effect of not having a route to market. There is no deployment pipeline for wave energy in the UK, and in the absence of a ringfence in future CfD auctions this will not be addressed. Wave energy companies can relocate where support is provided and the UK at risk of being left behind. The United Sates is investing $152m over the next five years to advance the commercial readiness of the sector, and China has enshrined the 'large-scale deployment of ocean energy' in its five-year plan and in 2023 deployed its first full scale wave energy converter. As part of an enabling policy environment it is critical that advanced sight of opportunities and a clear plan for deliver is provided, where possible. The CfD budget and ringfences are currently announced on an annual basis. This means that there is no clarity on whether the ringfence for tidal stream will continue, and what this will be set at, and for wave energy whether a ringfence will be established. This is hampering investment confidence and could quickly and easily be addressed by the Government setting longer-term budgets or establishing clear technology deployment targets. These challenges, and solutions to these, should be addressed by a Marine Energy Sector Plan. These issues could be proactively identified and acted upon if the right forum existed. The MEC believes having marine energy as a subsector could create that forum.

## Business Environment - Mobilising Capital

The UK has a complex landscape of public and private business finance providers and institutions. However, the Government knows from businesses that there is still much to do to improve ease of access to growth capital and scale-up finance in the UK.

Please read p.41-43 of the PDF (or here online) before completing these questions.

Q22. What are the main barriers faced by companies who are seeking finance to scale up in the UK or by investors who are seeking to deploy capital, and do those barriers vary for the growth-driving sectors? How can addressing these barriers enable more global players in the UK?

The MEC welcomes the introduction of the National Wealth Fund and GB Energy as two enabling actors that could support the mobilisation of private capital in the UK. It is important that these institutions are supported to invest in emerging technologies with significant potential and can accommodate a different risk profile to the private sector. The MEC has proposed that GB Energy commits 3% of its budget to taking equity stakes in marine energy projects that have a CfD, bringing them to FID and into construction, helping to create essential momentum in the progress of the emerging tidal project pipeline. These projects will deploy during this Parliament, ensuring GB Energy has a visible and tangible impact for constituencies across the UK. By taking an equity stake in projects committed to maintaining high levels of UK supply chain content, GB Energy will support the UK lead the world in marine energy and becoming a Clean Energy Superpower. By investing alongside private debt and equity investors to derisk initial projects, GBESP will stimulate multiples of its own investments into the supply chain across the UK, ensure the benefits of tidal stream are secured and shared, whilst positioning the UK to benefit from a global export market that is forecasted to deliver over £17bn Gross Value Added to the UK economy. GBESP will require due diligence processes to ensure that investment is directed alongside private finance into projects that deliver value for UK taxpayers, billpayers and communities. The commitment to UK content will position communities across the UK to benefit from the tidal stream opportunity. As noted in a recent study from the LSE, “with a sizeable domestic renewable resource with high predictability, tidal stream energy has the potential to contribute to sustainable economic growth in the UK, enhancing net zero efforts, improving energy security and generating jobs across the country.” Setting the target investment budget at £250m provide sufficient capital for GBESP to invest in multiple marine energy projects to support the development of the UK’s marine energy sector, including wave energy. After a project is deployed it is envisaged that GB Energy will divest its project stake, profiting on its investment and recycle this into new marine energy projects and opportunities. In addition to GB Energy, the Government should consider the introduction of a debt credit facility to unlock early projects.

Q23. The UK government currently seeks to support growth through a range of financial instruments including grants, loans, guarantees and equity. Are there additional instruments of which you have experience in other jurisdictions, which could encourage strategic investment?

The Government could explore establishing an equity investment mechanism where companies have the right to buy-back shares at a fixed strike price. This could be set an acceptable return for the taxpayer, giving enhanced upside for founders, private investors and creating a supportive environment for companies working in emerging technologies. Wave Energy Scotland's (WES) Pre-Commercial Procurement (PCP) model has been a tremendous success, and should be adopted at a Westminster-level to support emerging technology development across the UK. WES was established in 2014 to drive forward the development of wave energy technology. It is funded by the Scottish Government with additional funding from the EU Horizon Europe Programme. The PCP model challenges industry to develop innovative technical solutions to public sector needs. This PCP model is delivered through: open public procurement rounds – procurement rounds set out clear challenges for suppliers to pitch their R&D services to addressing these. Bids are then judged in a competitive environment, delivering cost-effective solutions; Competitive development in phases – WES works with industry to understand the critical next steps in technology development and organises and manages procurement rounds to align with these needs. Breaking each step into competitive phases allows SMEs working in the supply chain to participate and benefit from the growth of the renewable sector; and risk/benefit sharing under market conditions – public procurers share the benefits and risks related to Intellectual Property Rights (IPR) resulting from the R&D with suppliers. Suppliers retain IPR ownership rights, while procurers keep usage and licensing rights. WES has delivered 131 projects on time and within budget, providing over 132 R&D contracts worth £50m to 300 organisation from industry and academia. Since its launch in 2014 there has only been one project that did not complete. It is internationally recognised for excellence –the EU Commission has adopted the WES model in the latest Horizon Europe and via the EuropeWave programme. The benefit of this model is that it is applicable across a range of emerging technologies – WES is comprised of 12 engineers and project managers with extensive experience of running successful technology and innovation programmes. This expertise and model can be applied to any emerging renewable technology.

## Business Environment - Trade and International Partnerships

The UK is a proud trading country and among the most open economies in the world. The UK holds strong and constructive partnerships all over the world, built on principles of openness and shared prosperity and a commitment to upholding the international rules-based system.

Please read p.44-47 of the PDF (or here online) before completing these questions.

Q24. How can international partnerships (government-to-government or government-to-business) support the Industrial Strategy?

As previously noted, the marine energy sector has greatly benefited from the UK's continued participation in Horizon Europe. The MEC strongly advocates that the UK and EU work as closely together as possible on energy issues, including linking emissions trading schemes. This will give UK companies access to the EU Innovation Fund, and bolster innovation investment in the UK. There are currently high levels of UK supply chain content in projects being deployed here. However, it is not likely, nor is it desirable for the entirety of the marine energy supply chain to be in the UK. Maintaining positive trading relationships with countries like Germany and the US will be key to supporting the UK's marine energy growth. Whilst the MEC is focused on realising the UK's marine energy potential our membership is global. We hope that in establishing marine energy as a subsector we will be able to utilise the views of our members to understand barriers to investing in the UK marine energy sector. This will bring international experience and an understanding of what has worked well in other countries.

## Q25. Which international markets do you see as the greatest opportunity for the growth-driving sectors and how does it differ by sector?

As previously noted, net zero targets now cover over 90% of the world's economies. The Government is right therefore to prioritise clean energy as a sector. Making marine energy a subsector will support the UK establishing and maintaining an international leadership position. Tidal stream is an entirely predictable renewable resource. Its predictability means tidal stream will provide a key service to the world's future net zero energy systems, replacing the role that fossil fuels previously played in the energy system. The International Energy Agency has forecast that 120GW of tidal stream capacity could be deployed by 2050. Tidal stream has the potential to provide 30% of New Zealand's, 11% of the UK's and 10% of Indonesia's current electricity demand. There are significant opportunities for tidal stream to play a key role in local electricity systems. For example, Alaska's tidal stream capacity represents 5x its annual electricity demand, for China's Zhoushan province 150% and the Bay of Fundy in Nova Scotia, 50% of their demand. The UK can play a leading role in exporting tidal stream turbines, technology, and expertise to these countries, supporting the Government's ambition to make the UK a Clean Energy Superpower. The LSE's Grantham Institute has undertaken research into the technologies that the UK has the potential to lead the world in developing, deploying and exporting. Its report has singled tidal stream out as a technology where the UK could capture export opportunities from high-value products relevant for tidal stream energy such as turbines, in which it is already specialised (https://www.lse.ac.uk/granthaminstitute/publication/seizing-sustainable-growth-opportunities-from-tidal-stream-energy-in-the-uk/). Wave energy is the world's largest untapped renewable energy resource with over 29,500TWh, ten times more than Europe's annual electricity consumption. It has significant potential to deliver the world's net zero targets and create significant economic opportunities for first movers. The USA is investing $152m over the next five years to move wave energy to commercial readiness. China has enshrined the 'large-scale deployment of ocean energy' in its 2023 five-year plan and deployed its first full scale wave energy converter. In Europe Portugal has a 70MW deployment target for utility scale wave energy by 2030, Spain is targeting 60MW deployment by 2030 and ESB has partnered with CorPower to deploy a 5MW wave energy array in Ireland. Marine energy is abundant, and we are seeing progress towards harnessing its potential. The UK can still lead this global marine energy market and add over £40bn GVA to its economy, exporting turbines and wave energy converters to China, the US, Canada, Indonesia and around the globe.

## Place

A core objective of the industrial strategy is unleashing the full potential of our cities and regions by attracting investment and creating the best environment for businesses in them to thrive.

Please read p.48-50 of the PDF (or here online) before completing these questions.

Q26. Do you agree with this characterisation of clusters? Are there any additional characteristics of dimensions of cluster definition and strength we should consider, such as the difference between services clusters and manufacturing clusters?

The MEC welcomes the Government seeking to unleash 'the full potential of its cities and regions' as a core objective of the Industrial Strategy. Whilst it is expected that around 60% of the tidal stream and wave energy economic benefit will be experienced in coastal communities, the supply chain that services the sector stretches across the UK. Orbital Marine Power's O2 device was delivered with 80% UK supply chain spend. The O2 was conceived in Orkney, designed in Orkney and Edinburgh, built in Dundee with steel from Motherwell, blades from the Solent, anchors from Anglesey and hydraulics from the Midlands. In the first 18 months of operation of Nova Innovation's world-first offshore tidal array in Shetland, 98% of supply chain expenditure went to UK companies, with 60% going to companies in the Highlands and Islands region. The MEC supports clusters having a large geographical span to ensure the broader local opportunity for high-growth technologies can be identified. Key tidal stream sites including PTEC in south England could play a critical role in decarbonising the Isle of Wight's energy system, whilst creating exciting opportunities for green hydrogen in the Solent area. It is important that the focus on place does not put projects outside of the cities listed at a competitive disadvantage.

Q27. What public and private sector interventions are needed to make strategic industrial sites ‘investment-ready’? How should we determine which sites across the UK are most critical for unlocking this investment?

Q28. How should the Industrial Strategy accelerate growth in city regions and clusters of growth sectors across the UK through Local Growth Plans and other policy mechanisms?

Q29. How should the Industrial Strategy align with Devolved Government economic strategies and support the sectoral strengths of Scotland, Wales, and Northern Ireland?

The devolved administrations should be given a key role in shaping and supporting the implementation of the Industrial Strategy.

## Partnerships and Institutions

The ambition set out across this paper can only be realised in partnership. Only by working with the network of businesses, investors, civil society, international partners, local leaders and devolved governments who play a critical role in the UK economy, can we shape and deliver an industrial strategy that can truly drive growth.

Please read p.51-53 of the PDF (or here online) before completing these questions.

Q30. How can the Industrial Strategy Council best support the UK government to deliver and monitor the Industrial Strategy?

It is critical that the marine energy sector is represented on the Industrial Strategy Council. This will help decisions being made that support the UK's rapid growth in tidal stream and wave energy and securing the economic potential that entails. As reflected in the questions in this consultation, one of the challenges the Government has is in identifying areas where there is significant growth potential in sectors that may not yet have traditional data sets. Representation therefore at a council level will be fundamental to ensure that the marine energy sector is not overlooked. There are significant synergy opportunities between marine energy and other renewable technologies. For example, investment in port infrastructure that supports offshore wind should be futureproofed to for future marine energy deployment. This can also be applied to environmental monitoring, grid investment and expansion, and in training and retraining the UK's workforce. However, if there isn't marine energy representation these opportunities may be missed.

## Q31. How should the Industrial Strategy Council interact with key non-government institutions and organisations?

The Industrial Strategy Council should have broad representation including non-government institutions and organisations. The MEC would support representatives from the Industrial Strategy Council to come from the subsectors that are established. There could then be specific task and finish groups when barriers are identified. This could be led at a subsector, and between government and industry, or at the Industrial Strategy Council level.

## Q32. How can the UK government improve the interface between the Industrial Strategy Council and government, business, local leaders and trade unions?

As noted above the Industrial Strategy Council could have a key overarching role and support high-growth sectors working together. However, subsectors should be supported to move forward to address subsector-specific challenges.

## Theory of Change

Economic growth is a complex issue with interrelated short-term and long-term drivers, many of which are structural in nature.

To effectively prioritise policies within the industrial strategy, targeted at the right sectors and types of economic activity, the government needs to rationalise this complexity into a series of potential causal pathways. This will also help to identify where to further develop the evidence and analysis.

Please read p.55-57 of the PDF (or here online) before completing these questions.

Q33. How could the analytical framework (e.g. identifying intermediate outcomes) for the Industrial Strategy be strengthened?

Q34. What are the key risks and assumptions we should embed in the logical model underpinning the Theory of Change?

Q35. How would you monitor and evaluate the Industrial Strategy, including metrics?

## Additional Information

Q36. Is there any additional information you would like to provide?

The key messages from the Marine Energy Council's response are: * the UK has significant marine energy resource and the potential to lead the world in tidal stream and wave energy technology. * Marine energy should be established as a subsector. *As part of this an OWIC-style initiative should be tasked with delivering a Marine Energy Sector Plan. *This should seek to deliver key deployment targets, and embed UK content in projects deployed here and around the world.