28-29 Threadneedle Street, London EC2R 8AY
Telephone: + 44 (0) 20 7628 2555
Email: info@maritimeindustries.org
Website: maritimeindustries.org

SMI Response to Net Zero Ports Call for Evidence

June 2025

Overview

SMI welcomes the Government's recognition of ports as essential enablers of decarbonisation. We urge policy interventions that treat this as a systems-level challenge – with ports acting not only as infrastructure providers but as convenors of the wider maritime decarbonisation value chain.

Three key strategic enablers underpin our response:

1. The Maritime Decarbonisation Value Chain

UK ports sit at the intersection of clean energy, logistics, and maritime transport. Decarbonisation solutions—whether in shore power, fuels, or vessels—are interconnected. Fragmented, point-based interventions risk suboptimal outcomes. We recommend:

- Understanding the systems of the various decarbonisations value chains e.g. shipping, offshore wind, etc
- Understanding the useful intervention points to deliver a commercially sustainable approach that favours UK businesses and UK IP for future growth
- Understanding of how infrastructure can help UK businesses to grow (maritime businesses intersects with many support businesses that work in allied sectors e.g. energy, rail etc.)
- Understanding that different ports can have different focuses
- Delivery of a systems-led approach whereby the UK port habitat can be competitive not just for UK and overseas work, as part of a wider decarbonisation strategy
- Delivery an integrated decarbonisation approach.
- Cross-sectoral alignment with energy network upgrades, vessel retrofits, and supply chain investment.
- Inclusion of ports in industrial strategy planning alongside hydrogen, offshore wind, and battery innovation.

2. The 'Batting Order' of Finance

Public-private investment must be sequenced to unlock viable projects. The effective order is:

- Grid reinforcement and clean energy infrastructure, supported by strategic co-investment from Great British Energy and the National Wealth Fund.
- Shore power deployment, targeted first at high-frequency routes and vessels with predictable port dwell times.
- Alternative fuel readiness (hydrogen, ammonia, methanol) and associated bunkering capacity.

Front-loading funding and regulatory clarity for grid and shore power will de-risk private capital in vessel and fuel investments.

3. Commercialisation Pathways for Innovation

There is a widening gap between maritime innovation at demonstration stage and commercial deployment. The UK must close this gap through:

- Demand aggregation across port clusters.
- Technology-inclusive procurement mechanisms that support emissions reduction at berth.
- Clarity on at-berth requirements and emissions standards to stimulate long-term investment.

Port innovation / development for decarbonisation needs to be undertaken with an understanding of how an intervention can help leave a commercially sustainable approach, as well as supporting UK companies and IP that can also grow into a real commercial opportunity.

Policy Recommendations

- **Mandate Decarbonisation Plans:** Require ports above a defined size threshold to publish rolling decarbonisation roadmaps, aligned with master planning cycles.
- **Targeted Incentives:** Focus Government support on first-mover port projects integrating clean power access, bunkering, and logistics electrification.
- **Flexibility with Direction:** Ensure emissions-at-berth requirements are technology neutral but clearly signal that electrification and green fuels will be foundational.
- **Enable Demand Visibility:** Use industry-wide tools and digital platforms to share port energy demand forecasts and innovation opportunities.
- **Incentivise Aggregation:** Support consortia that pool demand and risk—especially in shore power and hydrogen bunkering—across multiple operators and regions.

Response

Q1: At an individual port level, please provide us with: (a) the number of connections that your port has to the electricity grid; (b) the total capacity of the connections you have to the electricity grid; (c) whether these connections are operating at or near their maximum capacity; and (d) the total electricity capacity that you have from the electricity grid and onsite energy generation such as wind or solar, for example.

N/A – As a trade association, SMI does not hold port-specific grid connection or capacity data. However, we note industry-wide issues regarding the availability, sequencing and cost of grid upgrades and recommend Government prioritise funding and policy certainty for strategic grid reinforcement.

Q2: At a port level, and on a monthly basis, please provide us with how much you pay in availability charges for your grid connection(s)? Has this changed over the last 12 months? If so, please provide details.

N/A – As a trade association, SMI does not hold port-specific grid connection or capacity data. However, we note industry-wide issues regarding the availability, sequencing and cost of grid

upgrades and recommend Government prioritise funding and policy certainty for strategic grid reinforcement.

Q3: If you have recently upgraded your grid connection(s), please provide a breakdown of the cost of the upgrades and what was your previous grid capacity, compared to your current grid capacity?

N/A – As a trade association, SMI does not hold port-specific grid connection or capacity data. However, we note industry-wide issues regarding the availability, sequencing and cost of grid upgrades and recommend Government prioritise funding and policy certainty for strategic grid reinforcement.

Q4: Please set out whether you have a renewable energy tariff for your electricity needs and the cost difference compared to a non-renewable electricity tariff?

N/A – As a trade association, SMI does not hold port-specific grid connection or capacity data. However, we note industry-wide issues regarding the availability, sequencing and cost of grid upgrades and recommend Government prioritise funding and policy certainty for strategic grid reinforcement.

Q5: Please set out if you are planning your future electrical grid capacity and whether your current capacity at an individual port level is sufficient to meet this? Please set out your reasons why.

SMI highlights the critical role ports can play as convenors in the maritime decarbonisation value chain. Decarbonisation is a systems challenge requiring coordinated investment across grid infrastructure, onshore power delivery, and bunkering solutions. We recommend targeted support for scalable, investable projects aligned with the UK's Clean Energy Superpower mission.

Q6: If you require extra electrical grid capacity, please provide at an individual port level: (a) the extra number of connections you will need to the electricity grid; (b) the total size of the future connections to the electricity grid and whether that is 100% of the future electricity requirement at your port(s); (c) a breakdown of the cost or quotes that you have received for the increased electrical capacity; (d) whether the quotes you received were before, on or after 1 April 2023; (e) the proportion of those costs in comparison to yearly revenues; (f) the year of your connection window to the electricity grid and how that compares to what you were initially seeking; (g) when it comes to onsite generation of renewable energy at ports, what is the current and future capacity of the energy that will be produced?

N/A – As a trade association, SMI does not hold port-specific grid connection or capacity data. However, we note industry-wide issues regarding the availability, sequencing and cost of grid upgrades and recommend Government prioritise funding and policy certainty for strategic grid reinforcement.

Q7: What are the implications for port growth of any capacity constraints or long connection timeframes to secure additional electricity grid capacity?

Electricity grid capacity constraints and long connection timeframes are among the most critical bottlenecks affecting the growth potential of UK ports. The implications are severe and multifaceted:

- **Investment deferral or cancellation**: Without assured grid upgrades, capital-intensive decarbonisation projects (e.g. shore power, hydrogen electrolysers, cold ironing) are often deemed commercially unviable or are postponed indefinitely.
- **Blocked innovation**: Emerging technologies reliant on electrification—such as battery-electric workboats, autonomous yard equipment, and vessel charging infrastructure—cannot scale without secure, timely access to power.
- **Disruption to the decarbonisation value chain**: Grid delays at ports hinder progress across the wider maritime ecosystem, including ship operators, terminal tenants, and clean fuel suppliers. This risks undermining the UK's ability to deliver on its Clean Energy Superpower ambitions.
- **Loss of competitiveness**: UK ports without modern energy infrastructure risk falling behind European counterparts who benefit from earlier public intervention, especially around TEN-T corridors and green shipping corridors.
- **Stalled job creation**: Industrial development tied to offshore wind, green fuels, and freight electrification often hinges on enhanced energy availability. Grid delays postpone associated green jobs and economic multipliers.

SMI Recommendation: Prioritise strategic port grid connections within national infrastructure planning. Government must integrate maritime growth scenarios into electricity system planning (e.g.

via the Future System Operator) and accelerate funding from instruments like the National Wealth Fund and Great British Energy to unlock first-mover projects.

Q8: Have ports, or their customers lost out on any opportunities due to insufficient grid capacity? If so, please provide details.

Yes – Several UK ports and their customers have already lost out on significant commercial and decarbonisation opportunities due to insufficient or delayed grid capacity. While SMI does not collect site-specific operational data, feedback from members and stakeholders across the maritime engineering and infrastructure sector highlights the following examples and impacts:

- **Shore power deployments delayed or cancelled**: At least three major ports have reported being unable to progress shore power installations due to insufficient grid headroom or prohibitively long connection timelines from Distribution Network Operators (DNOs). As a result, shipping lines interested in decarbonising at berth have deferred investment or sought overseas alternatives.
- **Missed opportunities to host clean energy clusters**: Ports that had the potential to act as hubs for green hydrogen production, offshore wind logistics, or battery charging facilities have reported being sidelined in favour of sites with faster grid access. This not only undermines individual port competitiveness but weakens the UK's broader industrial strategy.
- **Impact on vessel electrification**: In ports with no grid surplus, operators of battery-electric or hybrid vessels (e.g. tugs, CTVs) are unable to charge reliably at berth. This limits fleet decarbonisation and deters vessel operators from basing low-emission operations in those locations.
- **Tenant investment deterred**: Manufacturers and logistics tenants seeking to electrify operations or co-locate with clean fuel production have been discouraged from siting at certain ports due to energy constraints, resulting in either relocation to non-port sites or overseas investment.

Conclusion: Grid constraints are already having a chilling effect on the very growth and transition opportunities that the Government seeks to unlock. Urgent and strategic intervention is required to convert high potential port projects into investable, shovel-ready infrastructure.

Q9: What are the advantages and disadvantages of increasing electricity capacity at ports incrementally versus installing 100% of your future electricity requirements, ahead of need?

Option A: Incremental Increases in Grid Capacity

Advantages:

- **Lower upfront capital requirement**, which is often more manageable for ports with limited or phased development budgets.
- **Reduced financial risk** if future energy demand projections (e.g. from tenants or vessels) do not fully materialise.
- **Regulatory flexibility**, allowing adjustments in response to evolving technologies, policy mandates, or commercial partnerships.

Disadvantages:

- **Delays and rework** due to repeated planning, permitting, and connection negotiations with Distribution Network Operators (DNOs).
- **Higher cumulative costs** over time, as repeated grid upgrades often incur higher unit costs (particularly if future reinforcement thresholds are triggered multiple times).
- **Market signal fragmentation**, undermining confidence from energy users (e.g. clean fuel producers, electrified shipping operators) who require clarity and certainty to invest.

Option B: Installing 100% of Future Electricity Requirements Upfront

Advantages:

- **Futureproofing** the port estate for known and projected energy needs from vessels, tenants, and decarbonisation infrastructure.
- **Economies of scale**, especially where transmission upgrades or on-site substations can be designed in a single package.
- **Stronger investment signal**, improving the business case for co-located industry, offshore energy hubs, and clean fuel developers.

Disadvantages:

- **High upfront capital costs**, with uncertain short-term revenue to justify investment—especially challenging for smaller or trust ports.
- **Stranded asset risk** if future demand assumptions prove overly optimistic or if policy shifts reduce the anticipated electrification load.

Q10: Have you estimated the potential cost difference of installing future electricity grid capacity incrementally versus investing 100% of your future electricity requirements, ahead of need? If so, please provide details of any estimates.

No – As a trade association, SMI does not hold port-specific grid connection or capacity data. However, we note industry-wide issues regarding the availability, sequencing and cost of grid upgrades and recommend Government prioritise funding and policy certainty for strategic grid reinforcement.

Q11: When seeking new grid connections, have ports collaborated with any other energy users in their region to spread the cost? If so, how?

N/A – As a trade association, SMI does not hold port-specific grid connection or capacity data. However, we note industry-wide issues regarding the availability, sequencing and cost of grid upgrades and recommend Government prioritise funding and policy certainty for strategic grid reinforcement.

Q12: Are there any other barriers that ports face when upgrading their electricity connection?

N/A – As a trade association, SMI does not hold port-specific grid connection or capacity data. However, we note industry-wide issues regarding the availability, sequencing and cost of grid upgrades and recommend Government prioritise funding and policy certainty for strategic grid reinforcement.

Q13: What economic and environmental benefits would ports receiving their grid connection have on your business and customers?

While SMI is not a port operator, our members span the maritime engineering, clean energy, technology, and logistics sectors that depend on ports being fully integrated into the decarbonised energy system. The economic and environmental benefits of ports receiving timely and adequate grid connections are substantial for the sector and UK Plc.

Economic Benefits

- **Increased private investment**: Adequate grid capacity is a precondition for unlocking hundreds of millions of pounds in private capital across shore power, hydrogen, ammonia, and electrification projects. Without it, investment either stalls or relocates.
- **Supply chain activation**: Maritime suppliers—including SMI members involved in energy systems, vessel charging, substation construction, and control technologies—stand to benefit directly from expanded infrastructure delivery and long-term maintenance contracts.
- **Job creation and retention**: Ports with modern grid infrastructure are magnets for high-value job creation. This includes engineering roles, electrical installation and maintenance, clean tech manufacturing, and vessel retrofitting. These are often defined as “green jobs” per the ONS and align with the Government’s mission to Kickstart Economic Growth.
- **Improved port competitiveness**: Grid-enabled ports are more attractive to shipping lines seeking emissions compliance, as well as to freight operators and energy developers looking for clean energy logistics hubs.

Environmental Benefits

- **Reduced GHG emissions**: With sufficient grid access, ports can deploy shore power and electric handling equipment, dramatically cutting Scope 1 and 2 emissions and reducing reliance on diesel and other fossil fuels.
- **Improved air quality**: Electrification of vessels at berth and cargo handling machinery significantly reduces NOx, SOx, and particulate emissions, improving local air quality—especially important for port-adjacent communities.
- **Support for modal shift**: Clean energy infrastructure also enables low-emission logistics and intermodal freight transfer, encouraging a shift from road to rail and sea.

Q14: If you have installed or are exploring the installation of onshore wind turbines, solar panels, and other sources of renewable energy generation within the boundaries of a port, please provide us with the cost and details of these (e.g. installed capacity).

N/A – As a trade association, SMI does not hold port-specific grid connection or capacity data.

Q15: Please provide us with the use cases, the costs and the advantages and disadvantages of installing battery storage at ports.

N/A – As a trade association, SMI does not hold port-specific grid connection or capacity data.

Q16: What other options have you considered when it comes to onsite energy generation?

N/A – As a trade association, SMI does not hold port-specific grid connection or capacity data.

Q17: What do you expect the energy generated onsite from wind and solar to be used for?

SMI highlights the critical role ports can play as convenors in the maritime decarbonisation value chain. Decarbonisation is a systems challenge requiring coordinated investment across grid infrastructure, onshore power delivery, and bunkering solutions. We recommend targeted support for scalable, investable projects aligned with the UK's Clean Energy Superpower mission.

SMI also notes that ports need to have space allocated to be flexible, and UK ports are already massively constrained by historical size.

Q18: Do you agree or disagree that ports will play an increased role in directly providing or enabling third parties to provide the infrastructure that helps shipping to decarbonise? Please state your reasons why.

SMI agrees that ports will play an increasingly central role in directly providing—or enabling third parties to provide—the infrastructure needed for shipping to decarbonise.

1. Ports as Energy and Logistics Hubs

Ports are natural convenors in the maritime decarbonisation value chain. They host the interface between vessels, land-based energy infrastructure, and intermodal transport. This unique position gives them both the opportunity and the responsibility to enable decarbonisation across:

- Vessel emissions at berth (e.g. via shore power)
- Clean fuel bunkering (e.g. hydrogen, ammonia, methanol)
- Charging infrastructure for electric vessels
- Integrated clean energy supply chains (e.g. wind farm logistics, hydrogen production and export)

2. Addressing the 'Chicken and Egg' Problem

There is a well-documented market failure whereby vessel operators are hesitant to invest in zero-emission ships without certainty of fuel and charging infrastructure, while infrastructure investors need predictable demand. Ports can break this deadlock by:

- Aggregating demand across multiple users
- Acting as early infrastructure providers or co-investors
- Hosting demonstration and commercial deployment zones

3. Policy Alignment

Ports are explicitly recognised in the Government's *Maritime Decarbonisation Strategy*, *National Wealth Fund*, and *Great British Energy* priorities. This underlines their strategic role in achieving the missions to Kickstart Economic Growth and make the UK a Clean Energy Superpower.

4. Industry Readiness

SMI members—including technology providers, shipyards, and systems integrators—are already working with ports to deliver scalable decarbonisation infrastructure. Many UK ports have already published net zero strategies and are actively investing in clean energy capacity.

Conclusion: To maximise their enabling role, ports need supportive regulatory frameworks, access to co-investment capital, and clear market signals (e.g. emissions at berth requirements). SMI advocates for policy tools that empower ports to lead this transition collaboratively and at pace.

Q19: Do you agree or disagree that there's sufficient collaboration between ports, shipping operators and infrastructure providers to decarbonise shipping? Please state your reasons why.

There needs to be a systemic approach to the above and a clear grid connection programme to allow infrastructure and asset management to be undertaken effectively. Ports do not work in isolation from other ports, neither in terms of local asset nor national logistics. It therefore needs to be taken into a UK context.

SMI disagrees that there is currently sufficient collaboration between ports, shipping operators, and infrastructure providers to fully decarbonise shipping. While isolated examples of successful cooperation exist, they are the exception rather than the norm. Systemic gaps persist that hinder the pace and scale of decarbonisation. Reasons include:

1. Fragmented Incentives and Timelines

- Ports, vessel operators, and energy providers often operate on different investment cycles and regulatory frameworks.
- Shipping lines are hesitant to commit to zero-emission vessels without firm infrastructure guarantees, while ports need demand certainty to justify capital spend—creating a coordination gap.

2. Lack of Structured Demand Aggregation

- Without formal mechanisms to aggregate vessel demand (e.g. for shore power or hydrogen bunkering), infrastructure projects often appear commercially unviable.

- High-frequency users (e.g. ferry or Ro-Ro operators) are natural candidates for early deployment, but lack structured industry-wide platforms to coordinate investment with ports and suppliers.

3. Data and Visibility Gaps

- There is insufficient real-time visibility of vessel movements, dwell times, and energy needs to inform robust infrastructure planning.
- Port masterplans and decarbonisation strategies are not routinely shared with energy system operators or vessel operators, weakening alignment.

4. Absence of Enabling Frameworks

- Government-led forums (such as the Freight Energy Forum) are still in early stages of development.
- No clear regulatory requirement or incentive exists for ports and shipping lines to coordinate on emissions-at-berth or fuel-readiness strategies.

Q20: Do you agree or disagree that ports have the existing powers to directly provide energy to vessels that leave the port? Please state your reasons why.

SMI agrees in principle that most ports have the legal and operational powers to directly provide energy to vessels, including those that will leave the port.

Most UK ports—whether trust, private, or municipal—have broad statutory authority or leasehold control that permits them to provide services including electricity or fuel to vessels, especially when these are used at berth. Some ports already supply fuel, water, and ancillary services under berthage or quay agreements, and the provision of electrical or alternative fuel energy can be incorporated similarly.

However, in practice, the exercise of these powers is constrained by regulatory, commercial, and technical barriers that limit their widespread deployment.

1. Licensing and regulatory uncertainty

- Ports are not currently classified as licensed electricity suppliers under Ofgem rules, which creates ambiguity around the resale of electricity, particularly for vessel use after departure.
- This uncertainty discourages investment in energy resale infrastructure and may require legal clarification or exemption pathways.

2. Grid connection and metering complexity

- Ports face challenges in installing sub-metering systems and allocating usage to individual vessels, especially those that operate infrequently or do not pre-register.
- For vessels departing the port, distinguishing between energy used at berth versus en route may raise accounting and liability questions.

3. Liability and safety considerations

- Providing fuels such as hydrogen or ammonia introduces new regulatory burdens under Control of Major Accident Hazards (COMAH) and marine safety legislation, which many port authorities are not currently resourced to manage without third-party involvement.

4. Competition law and commercial neutrality

- Some port landlords may be reluctant to directly compete with private energy suppliers or bunkering firms, particularly if this could be perceived as distorting the market.

Q21: What measures could government take to increase certainty in terms of ensuring adequate supply of infrastructure at ports and the subsequent demand for use of that infrastructure?

SMI highlights the critical role ports can play as convenors in the maritime decarbonisation value chain. Decarbonisation is a systems challenge requiring coordinated investment across grid infrastructure, onshore power delivery, and bunkering solutions. We recommend targeted support for scalable, investable projects aligned with the UK's Clean Energy Superpower mission. The UK needs:

- A systemic view of which ports need to be prioritised for which sector and then offered better connections.
- A supply chain plan to grow into the space to develop the companies to help decarbonisation, which will in turn offer growth, employment and ability to export.

Not planning, not prioritising and waiting for market failure before intervening at a systems level will prevent the UK from being able to optimise its decarbonisation routes.

Q22: Do you agree or disagree that introducing an emissions at berth requirement will be effective at reducing at berth GHG emissions and air pollutants surrounding ports?

SMI agrees that introducing an emissions-at-berth requirement would be effective at reducing greenhouse gas (GHG) emissions and air pollutants surrounding ports—provided that it is accompanied by enabling infrastructure, financial support, and flexible implementation mechanisms.

Q23: What are the technological solutions that will most likely prevail if a requirement for zero or near zero emissions at berth is implemented? Please state your reasons why and any evidence that supports it.

The technological solutions most likely to prevail under a zero or near-zero emissions at berth requirement are:

1. Shore Power (Cold Ironing) – High Likelihood of Adoption

Rationale:

- **Mature technology**: Widely deployed in ports globally (e.g. Rotterdam, Long Beach, Gothenburg), with proven emissions reduction impact.

- **Compatible with large vessels**: Especially container ships, cruise liners, and Ro-Ro ferries with long dwell times and regular port calls.
- **Supports public health goals**: Offers the most immediate air quality improvements by eliminating auxiliary engine emissions while berthed.
- **Standardisation under development**: IEC/ISO standards (e.g. IEC/ISO/IEEE 80005) are supporting global uptake and reducing commercial risk.

Limitations:

- High capital cost and long lead time for infrastructure and grid reinforcement.
- Vessels must be shore power capable—retrofit costs can be high for older fleets.

2. Battery Systems and Hybridisation – Moderate Likelihood

Rationale:

- **Feasible for short-sea and workboat operations** (e.g. crew transfer vessels, tugs, pilot boats) where onboard battery systems can power hotel and portside operations.
- Can provide at-berth zero emissions without reliance on grid infrastructure, particularly where vessels return to a home port regularly.

Limitations:

- Limited energy storage capacity—less suitable for large ocean-going vessels.
- Requires onboard investment and operational changes from vessel operators.

3. Mobile Power Units / Gensets Fuelled by Hydrogen or Ammonia – Emerging

Rationale:

- May offer flexible, low-emission alternatives to grid-tied shore power where infrastructure is not feasible in the short term.
- Aligns with Government ambitions to support hydrogen and ammonia as clean maritime fuels.

Limitations:

- Still in demonstration or pilot phase; fuel supply chains and safety regulations are not yet mature.
- Higher OPEX and potentially lower GHG savings than full electrification unless green hydrogen is guaranteed.

Q24: In your opinion, does the government need to direct ports towards a certain default technological solution (e.g. electrification) to achieve zero or near zero emissions at berth, whilst enabling other technologies where appropriate through exemptions?

SMI supports a directed-flexibility approach. The Government should strongly signal electrification (shore power) as the default technological pathway to achieve zero or near-zero emissions at berth, while enabling the use of alternative compliant technologies through a clear exemptions and equivalency framework.

Q25: When developing the requirement, what can the government do to ensure it improves/protects air quality at ports?

To ensure that a zero or near-zero emissions-at-berth requirement effectively improves and protects air quality at ports, the Government could design the policy with explicit air pollution reduction goals, supported by technical standards, compliance mechanisms, and integrated health impact considerations.

Additionally, the system needs greater grid capacity to allow decarbonisation. This will help UK supply chain companies provide equipment for connection to grow into that space and be an export capability in the future.

Q26: What features of a regulatory regime would support the decarbonisation of at berth emissions from shipping?

A regulatory regime designed to decarbonise at-berth emissions must balance clarity, flexibility, and enforceability while creating the right market conditions for investment and innovation.

Q27: How should government define high frequency services with short turnaround times at ports for the purpose of an at berth requirement? Please explain your rationale and any supporting evidence

A definition based on call frequency and turnaround time strikes a pragmatic balance between emissions impact, operational feasibility, and infrastructure investment. It supports early deployment in the most cost-effective and environmentally beneficial use cases.

Q28: Do you agree or disagree that high frequency services with short turnaround times at ports should be captured in any future emissions at berth requirement?

SMI agrees in principle that high-frequency services with short turnaround times should be included in future emissions-at-berth requirements, provided that the regulatory approach is practical, proportionate, and technologically feasible for the vessel class concerned.

Q29: Please provide us with a) any current examples of and b) any examples of future plans for zero and near-zero GHG emission refuelling production, storage, import and export terminals at ports for alternative fuels such as hydrogen and hydrogen derivatives (e.g. ammonia or methanol)?

N/A – As a trade association, SMI does not hold port-specific grid connection or capacity data. However, we note industry-wide issues regarding the availability, sequencing and cost of grid upgrades and recommend Government prioritise funding and policy certainty for strategic grid reinforcement.

Q30: What are the barriers that ports face in becoming near-zero or zero GHG emission refuelling hubs? Please state your reasons why, including any safety barriers.

Ports face a wide range of **technical, regulatory, financial, and safety-related barriers** in becoming near-zero or zero greenhouse gas (GHG) emission refuelling hubs. These obstacles limit their ability to support the scaling-up of alternative fuels such as hydrogen, ammonia, methanol, and electricity.

1. Infrastructure and Grid Constraints

Most UK ports lack the **electrical capacity, substation infrastructure, and space** to accommodate hydrogen electrolysers, ammonia storage, or large-scale bunkering systems.

Long grid connection lead times delay deployment of energy-intensive equipment, such as fuel synthesis plants or battery charging systems.

2. Unclear Regulatory Frameworks

There is **no comprehensive national permitting regime** for alternative fuel bunkering at ports (unlike for traditional fuels), creating delays and uncertainty.

Ports lack detailed, consistent guidance on compliance with **COMAH regulations**, **health and safety rules**, and **fire codes** for hazardous fuels like ammonia or liquid hydrogen.

3. Safety and Liability Risks

Hydrogen, ammonia, and methanol each come with **distinct flammability, toxicity, or corrosiveness profiles** that require new safety protocols, emergency planning, and specialist staff training.

The **lack of established safety case law** and port-specific experience in the UK increases perceived liability for port operators and insurers.

4. Financial Risk and Demand Uncertainty

High capital costs for zero-emission refuelling infrastructure—often tens or hundreds of millions—are **difficult to justify without long-term offtake agreements**.

Vessel operators are often unwilling to commit without assurance of multi-port fuel availability, reinforcing the **chicken-and-egg market failure**.

5. Land Use and Planning Complexity

Zero-emission fuel hubs require dedicated, often segregated, areas of port land. Many UK ports are **space-constrained** or lack planning approval for energy-intensive use classes.

6. Limited Public Funding Mechanisms

Although the **National Wealth Fund** and **Great British Energy** are welcome developments, **access routes for ports remain unclear**, particularly for risk-sharing on first-of-a-kind infrastructure.

Q31: What are the estimated costs and timeframes for building near-zero or zero GHG emission refuelling hubs? Please provide us with the evidence and assumptions that you have used in this response.

N/A – As a trade association, SMI does not hold port-specific grid connection or capacity data. However, we note industry-wide issues regarding the availability, sequencing and cost of grid upgrades and recommend Government prioritise funding and policy certainty for strategic grid reinforcement.

Q32: What are the potential markets and end use sectors that can be supplied when a port becomes a near-zero or zero GHG emission refuelling hub? Please set out whether these are domestic and/or for international export markets.

N/A – As a trade association, SMI does not hold port-specific grid connection or capacity data. However, we note industry-wide issues regarding the availability, sequencing and cost of grid upgrades and recommend Government prioritise funding and policy certainty for strategic grid reinforcement.

Q33: What are the potential growth opportunities of ports becoming near-zero or zero GHG emission refuelling hubs?

N/A – As a trade association, SMI does not hold port-specific grid connection or capacity data. However, we note industry-wide issues regarding the availability, sequencing and cost of grid upgrades and recommend Government prioritise funding and policy certainty for strategic grid reinforcement.

Q34: What bunkering facilities does your port currently offer and what types of services use these facilities? If not available, are the users aware of where bunkering takes place?

N/A – As a trade association, SMI does not hold port-specific grid connection or capacity data. However, we note industry-wide issues regarding the availability, sequencing and cost of grid upgrades and recommend Government prioritise funding and policy certainty for strategic grid reinforcement.

Q35: What is the estimated cost of installing electric charging infrastructure for vessels (boats or ships)?

N/A – As a trade association, SMI does not hold port-specific grid connection or capacity data. However, we note industry-wide issues regarding the availability, sequencing and cost of grid upgrades and recommend Government prioritise funding and policy certainty for strategic grid reinforcement.

Q36: What transport and storage infrastructure for fuels are available at ports and what do you see as the barriers to safely repurposing this infrastructure for alternative fuels such as hydrogen, methanol, and ammonia?

N/A – As a trade association, SMI does not hold port-specific grid connection or capacity data. However, we note industry-wide issues regarding the availability, sequencing and cost of grid upgrades and recommend Government prioritise funding and policy certainty for strategic grid reinforcement.

Q37: Please provide us with the number of tenants and entities that operate within the landward and seaward boundary of your port(s) and their economic activities.

N/A – As a trade association, SMI does not hold port-specific grid connection or capacity data. However, we note industry-wide issues regarding the availability, sequencing and cost of grid upgrades and recommend Government prioritise funding and policy certainty for strategic grid reinforcement.

Q38: What actions can ports take to help their tenants decarbonise and reduce wider environmental impacts?

N/A – As a trade association, SMI does not hold port-specific grid connection or capacity data. However, we note industry-wide issues regarding the availability, sequencing and cost of grid upgrades and recommend Government prioritise funding and policy certainty for strategic grid reinforcement.

Q39: What barriers do ports face in helping their tenants to decarbonise?

N/A – As a trade association, SMI does not hold port-specific grid connection or capacity data. However, we note industry-wide issues regarding the availability, sequencing and cost of grid upgrades and recommend Government prioritise funding and policy certainty for strategic grid reinforcement.

Q40: From the perspective of a tenant at a port, how can your landlord(s) help you to decarbonise?

N/A – As a trade association, SMI does not hold port-specific grid connection or capacity data. However, we note industry-wide issues regarding the availability, sequencing and cost of grid upgrades and recommend Government prioritise funding and policy certainty for strategic grid reinforcement.

Q41: Are there any sources of direct GHG emissions at ports that have not been mentioned in the examples above?

N/A – As a trade association, SMI does not hold port-specific grid connection or capacity data. However, we note industry-wide issues regarding the availability, sequencing and cost of grid upgrades and recommend Government prioritise funding and policy certainty for strategic grid reinforcement.

Q42: What sources of direct GHG emissions at ports (e.g. specific types of vehicles and equipment) are particularly challenging to decarbonise?

N/A – As a trade association, SMI does not hold port-specific grid connection or capacity data. However, we note industry-wide issues regarding the availability, sequencing and cost of grid upgrades and recommend Government prioritise funding and policy certainty for strategic grid reinforcement.

Q43: What are the main options for reducing direct GHG emissions at ports? Please provide evidence of technological readiness and financial costs and benefits of these options.

N/A – As a trade association, SMI does not hold port-specific grid connection or capacity data. However, we note industry-wide issues regarding the availability, sequencing and cost of grid upgrades and recommend Government prioritise funding and policy certainty for strategic grid reinforcement.

Q44: What are the current main barriers and incentives to reduce direct GHG emissions from port operations?

N/A – As a trade association, SMI does not hold port-specific grid connection or capacity data. However, we note industry-wide issues regarding the availability, sequencing and cost of grid upgrades and recommend Government prioritise funding and policy certainty for strategic grid reinforcement.

Q45: In addition to GHG emissions, there are likely to be additional environmental impacts at ports, such as air quality (for example from emissions of nitrogen oxides and particulates), noise and biodiversity impacts. What opportunities and challenges are there to reduce these impacts as ports decarbonise?

N/A – As a trade association, SMI does not hold port-specific grid connection or capacity data. However, we note industry-wide issues regarding the availability, sequencing and cost of grid upgrades and recommend Government prioritise funding and policy certainty for strategic grid reinforcement.

Q46: If you are, for example, a technology, equipment, services, fuel, or energy provider, what growth or other opportunities are presented by ports addressing their direct GHG emissions?

As the representative body for the UK's maritime engineering, science, and technology sectors, SMI can confirm that ports addressing their direct GHG emissions present substantial growth opportunities for technology, equipment, services, fuel, and energy providers. These opportunities span infrastructure delivery, systems integration, innovation deployment, and long-term maintenance.

Q47: What skills (both in terms of capacity and capability) does the maritime workforce need to develop in order to enable ports to decarbonise their operations? What new jobs will be created as maritime decarbonise?

The decarbonisation of ports will require both an expansion of workforce capacity and a transformation in capability across technical, operational, and managerial domains. As the sector transitions toward zero-emission operations, it will create new job roles, new skills demand, and opportunities for cross-sector reskilling. These could include:

- Shore power technicians and installers
- Alternative fuel bunkering operatives
- Battery systems engineers and storage specialists
- Emissions monitoring and compliance officers
- Digital infrastructure and data analysts
- Port sustainability coordinators and ESG leads
- Hydrogen/ammonia safety officers and risk assessors
- Training providers and assessors for green port operations

Q48: Do you monitor your direct emissions in your port?

N/A – As a trade association, SMI does not hold port-specific grid connection or capacity data. However, we note industry-wide issues regarding the availability, sequencing and cost of grid upgrades and recommend Government prioritise funding and policy certainty for strategic grid reinforcement.

Q49: In tonnes of CO2 equivalent (CO2e), please provide evidence to quantify any savings you have achieved in your annual direct GHG emissions.

N/A – As a trade association, SMI does not hold port-specific grid connection or capacity data. However, we note industry-wide issues regarding the availability, sequencing and cost of grid upgrades and recommend Government prioritise funding and policy certainty for strategic grid reinforcement.

Q50: Do you monitor the additional environmental impacts such as air quality, noise, and biodiversity from the sources of your direct emissions at your port?

N/A – As a trade association, SMI does not hold port-specific grid connection or capacity data. However, we note industry-wide issues regarding the availability, sequencing and cost of grid upgrades and recommend Government prioritise funding and policy certainty for strategic grid reinforcement.

Q51: If you have a decarbonisation goal, what goals have you set?

N/A – As a trade association, SMI does not hold port-specific grid connection or capacity data. However, we note industry-wide issues regarding the availability, sequencing and cost of grid upgrades and recommend Government prioritise funding and policy certainty for strategic grid reinforcement.

Q52: What considerations have you taken to set your decarbonisation goal(s)?

N/A – As a trade association, SMI does not hold port-specific grid connection or capacity data. However, we note industry-wide issues regarding the availability, sequencing and cost of grid upgrades and recommend Government prioritise funding and policy certainty for strategic grid reinforcement.

Q53: What are the costs or investment required to achieve your decarbonisation goals? Please provide any calculations used for your cost and/or investment estimates.

N/A – As a trade association, SMI does not hold port-specific grid connection or capacity data. However, we note industry-wide issues regarding the availability, sequencing and cost of grid upgrades and recommend Government prioritise funding and policy certainty for strategic grid reinforcement.

Q54: What are the economic and environmental benefits of achieving your decarbonisation goals, including co-benefits through the reduction of air quality, noise, biodiversity and adapting to climate change impacts?

N/A – As a trade association, SMI does not hold port-specific grid connection or capacity data. However, we note industry-wide issues regarding the availability, sequencing and cost of grid upgrades and recommend Government prioritise funding and policy certainty for strategic grid reinforcement.

Q55: If you are, for example, a technology, equipment, services, fuel, or energy provider are there any additional growth benefits of supplying ports with equipment or services that helps them meet their decarbonisation goals?

Yes, there are substantial **additional growth benefits** for technology, equipment, services, fuel, and energy providers who support ports in achieving their decarbonisation goals. These benefits go beyond immediate commercial returns and contribute to long-term strategic advantages for both the supplier base and the wider UK economy.

1. Expanded Domestic and Export Market Opportunities

- Ports investing in decarbonisation become **anchor clients** for UK suppliers, enabling firms to scale production and improve cost competitiveness.
- Proven domestic success cases strengthen suppliers' **credentials for export**, particularly as global ports pursue similar emissions and air quality mandates (e.g. EU FuelEU Maritime, California Air Resources Board).

2. Stimulus for Innovation and First-of-a-Kind Projects

- Port decarbonisation often involves **systems integration, innovation deployment, and novel applications**, which provide a platform for:
- Field-testing emerging technologies (e.g. rapid shore power connectors, ammonia bunkering systems)
- Developing IP and data-driven services for global application
- Participating in funded demonstrator programmes (e.g. Clean Maritime Demonstration Competition)

3. Long-Term Maintenance and Service Contracts

- Unlike traditional fuel infrastructure, many low-emission technologies (e.g. battery storage, hydrogen safety systems, digital energy platforms) require **recurring service, inspection, and compliance support**.
- This creates **stable, high-value service-based revenue streams** for equipment and systems providers.

4. Strengthened Regional and Supply Chain Clustering

- Supplying ports helps create local economic clusters involving:
    - Apprenticeship and training partnerships
    - Co-located manufacturers and service providers
    - Logistics synergies with offshore energy, rail freight, and industrial decarbonisation zones

5. Contribution to ESG and Corporate Objectives

- Many suppliers view port decarbonisation projects as aligned with their own **sustainability and net zero strategies**, strengthening their attractiveness to investors and customers.
- Participation in such initiatives enhances **brand positioning, innovation credentials, and regulatory alignment**.

Conclusion: Supplying ports with decarbonisation-enabling solutions is not just a commercial transaction – it is a **strategic growth multiplier** that unlocks innovation, skills, and export potential. Government support to accelerate port investment will have positive knock-on effects across the UK's maritime and clean technology sectors, including many SMI members.

Q56: In your opinion, are both large and small ports adequately planning their approach to reaching net zero?

N/A – As a trade association, SMI does not hold port-specific grid connection or capacity data. However, we note industry-wide issues regarding the availability, sequencing and cost of grid upgrades and recommend Government prioritise funding and policy certainty for strategic grid reinforcement.

Q57: Is there sufficient government or industry led guidance to help ports to decarbonise?

SMI believes there is currently insufficient government or industry-led guidance to fully support ports in planning and delivering effective decarbonisation strategies. While important steps have been taken, notably through the Maritime Decarbonisation Strategy and initiatives from Maritime UK, British Ports Association, and the UK Major Ports Group, key gaps remain that hinder delivery at scale and pace.

Q58: Of the measures listed in paragraphs 3.18 – 3.20, which measure(s) would enable ports to decarbonise most effectively?

Current Gaps in Government-Led Guidance

- **Lack of a dedicated regulatory roadmap** for port decarbonisation, particularly around emissions-at-berth requirements, alternative fuels infrastructure, and safety regulations (e.g. hydrogen and ammonia handling).
- **No centralised toolkit or planning framework** for ports to baseline emissions, develop net zero plans, or model future electricity and fuel demand.
- **Limited integration with national infrastructure planning**, particularly around coordination with Distribution Network Operators (DNOs), Great British Energy, and the National Wealth Fund.

Industry-Led Guidance – Progress, but Fragmented

- Tools like the **Net Zero Maturity Model** (led by the British Ports Association) are useful, but **voluntary and not universally adopted**.
- Port decarbonisation content in sector masterplans (e.g. Freeports, Local Industrial Strategies) is **inconsistent and lacks technical depth**.
- SMEs and regional ports in particular lack access to **affordable technical support, model procurement frameworks, or peer learning networks**.

Conclusion: Without enhanced and coordinated guidance, particularly for mid-sized and smaller ports, the UK's transition to net zero will be uneven and delayed. SMI calls for a clear, structured, and funded support framework to empower all ports to decarbonise effectively and confidently.

Q59. Of the measures listed in paragraphs 3.18 – 3.20, would any measure(s) adversely affect port's ability to effectively decarbonise?

Yes, **SMI believes that some of the measures listed in paragraphs 3.18 to 3.20 of the Call for Evidence could adversely affect ports' ability to decarbonise effectively**—*if implemented without proportionality, flexibility, and support mechanisms*.

Paragraph 3.18 – Introducing a Legal Requirement for Decarbonisation Plans

Potential Adverse Effect:

- A legal obligation to publish and periodically update decarbonisation plans could place a **disproportionate administrative and financial burden on smaller ports**, particularly those without in-house sustainability or strategy teams.
- There is a risk of **form over function**—where compliance becomes a paperwork exercise rather than a driver of practical change.

Paragraph 3.19 – Voluntary Commitments by Ports

Potential Adverse Effect:

- While well-intentioned, relying solely on voluntary action risks a **fragmented and inconsistent response** across the sector, with leaders advancing and laggards avoiding responsibility.
- This could distort market competition and reduce peer pressure to raise ambition.

Paragraph 3.20 – Encouraging Inclusion of Decarbonisation in Port Masterplans

Potential Adverse Effect:

- Without clearer statutory standing, simply "encouraging" ports to integrate decarbonisation into masterplans may lead to tokenistic or inconsistent treatment.
- Local planning authorities may also **lack capacity or expertise to assess decarbonisation content**, weakening enforcement.

Conclusion: None of these measures are inherently problematic—but **their effectiveness depends on proportionality, clarity, and alignment with funding and technical support**. SMI supports a regulatory approach that raises ambition while recognising the operational and financial diversity of UK ports.

Q60. In addition to the measures listed above, are there any government or industry led measures not mentioned here that would incentivise the sector to decarbonise?

Yes, in addition to the measures outlined in paragraphs 3.18–3.20, **SMI recommends several further government and industry-led interventions** that would provide stronger and more targeted incentives for the port sector to decarbonise.

Additional Measures to Incentivise Port Decarbonisation

1. Strategic Use of Public Finance to De-risk Investment

Provide **co-investment or matched funding** for grid upgrades, shore power deployment, and clean fuel infrastructure through:

- The **National Wealth Fund**
- **Great British Energy**
- The **UK Infrastructure Bank**

2. Reform of Port Dues and Taxation

- Allow port authorities to **offer discounts or rebates on port dues** for vessels that connect to shore power or operate with zero-emission propulsion at berth.
- Explore **accelerated capital allowances or tax reliefs** for port landlords and tenants investing in decarbonisation-related equipment (e.g. cranes, charging stations, hydrogen bunkering).

3. Integrated Planning and Regulatory Coordination

- Require local planning authorities and distribution network operators (DNOs) to **treat port decarbonisation infrastructure as critical infrastructure**, unlocking priority grid access and streamlined planning approval.
- Develop a **joint DfT–DESNZ–Ofgem roadmap** for port electrification and alternative fuels, aligned with Maritime 2050 and industrial decarbonisation clusters.

4. Port Cluster and Innovation Zones

- Designate select ports as **Green Maritime Clusters** or **Innovation Zones**, with regulatory sandboxes, access to demonstration funding, and support for R&D-led consortia.
- Encourage cluster-based decarbonisation planning among ports, tenants, and shipping operators to **aggregate demand and reduce unit costs**.

5. Digital Decarbonisation Tools

- Fund the development and rollout of **digital emissions calculators, MRV (Monitoring, Reporting & Verification) platforms**, and infrastructure planning tools for ports.
- Enable smaller ports to access **shared technical services** and online tools to baseline emissions, model infrastructure needs, and evaluate ROI on decarbonisation investments.

Conclusion: SMI believes that decarbonising ports is not only essential for meeting climate goals, but a **strategic economic opportunity**. A combination of clear regulation, financial support, and sector-wide coordination will provide the certainty and capability the sector needs to act decisively. We welcome continued collaboration with Government to design and deliver these measures.