Ports – Sustainable and Secure Energy Hubs in an Evolving Transport Landscape

Date: Monday, 28 April 2025

Theme: Shipping & Ports

The session discussed ports' evolving role in the context of sustainability, decarbonisation, and energy transition, focusing on the challenges and opportunities of integrating sustainable energy solutions. The following experts were invited:

Linda Styhre, Senior Researcher at IVL - Swedish Environmental Institute
Insights on: Alternative fuels for shipping, an exemplary road map on an energy transition plans for Umeå port region.

Manfred Lebmeier, Port Energy Solutions – Strategy at Hamburg Port Authority
Insights on: Port authorities' viewpoint on electrification of ports, onshore power and alternative fuel supply, and resilient transport systems.

Jan Jarmakowski, President of the Management Board, Managing Director at Gydina Container Terminal
Insights on: Terminal operators' viewpoints on electrification of terminal equipment, on-shore power and alternative fuel supply, and resilient transport systems.

Henning Dierks, Senior Business Developer - Sustainable Fuels at Mabanaft
Insights on: availability and demand of future fuels (H2, Ammonia, Methanol), regulatory red tape- and needs

Wojciech Muchlado, Director Freight Sales, Eastern Europe P&O Ferrymasters

Challenges and Opportunities for Ports

The session opened by acknowledging the challenging landscape faced by ports, driven by both business and geopolitical factors. Ports are at the centre of decarbonisation efforts, with the pressure to evolve their operations to include renewable energy sources and adapt to regulatory frameworks. While these efforts bring opportunities, such as the potential for green hydrogen its derivatives and other alternative fuels, significant barriers exist, particularly related to infrastructure development, regulatory support, and financing.

Key Fuel Options and Decarbonization Efforts

Linda Styhre from Sweden emphasised that ports are exploring multiple fuel options, including biofuels (biogas, electro fuels like hydrogen), and highlighted the need for better safety measures around technologies like ammonia. She pointed out the significant cost gap between fossil fuels and new green fuels like hydrogen or its derivatives, noting the lack of urgency in addressing the transition to sustainable fuels. Meanwhile, Manfred Lebmeier from Germany noted challenges with transporting hydrogen and CO2, underscoring the need for further regulation and clarity around who is responsible for these logistics. Further, he highlighted the need for electric power in ports to decarbonise port operations, focusing on local production and storage.

Decarbonisation from a Port Operator's Perspective

Jan Jarmakowski from Poland provided a port operator's viewpoint, stressing that decarbonisation measures (in regard to maritime fuels and port operation) would ultimately affect end consumers in terms of cost allocation. He highlighted the importance of cooperation between port authorities, energy grid operators, and port operators to support the transition. Jan pointed out that the increase in energy consumption, alongside regulatory hurdles, requires a concerted effort to ensure energy efficiency and support for carbon-free operations. Similarly, Henning Dierks shared optimism about projects underway in Germany, including hydrogen production and the conversion of fossil fuel infrastructure to be hydrogen and methanol ready.

Stakeholder Cooperation and Financial Challenges

Wojciech Muchlado discussed the critical need for stakeholder collaboration between port operators, customers, and energy providers. He underscored the urgency of securing funding and developing solutions that align with the decarbonisation goals. However, he also noted that only a small percentage (around 5%) of customers (leaders, not implementers) are willing to buy -still more expensive- sustainable solutions, which needs to change. The discussion emphasised that sustainable investments are essential but require substantial financial commitments, with a need for clear stakeholders to take responsibility.

Balancing Traditional Roles with Sustainability

The discussion also touched upon ports' traditional role in handling goods and how that role might evolve with the increasing focus on sustainability. Linda Styhre emphasised the importance of resilient transport systems and the balancing act between energy transition and maintaining the ports' core functions. Manfred Lebmeieradded that while the push for sustainability is essential, ports are businesses that must remain financially viable.

Regulatory Issues and the Need for Action

The session highlighted several regulatory issues, including the need for energy production to be as close as possible to the ports and for clearer regulations around emissions, fuel supply, and waste management. These regulatory barriers are often compounded by the need to align with local and global frameworks.

Audience Groups Discussion

To facilitate further exploration of these issues, the audience was divided into groups to discuss key topics:

- Ports: Traditional Freight Hubs
- Ports: Towards Zero Emissions
- Ports: Sustainable Energy Hubs

Group 1: Traditional Freight Hubs

The group highlighted the increasing challenges decarbonisation poses and geopolitical risks to traditional freight hubs. It was noted that gaps exist in the legal framework, and there is a need to establish (cyber) security measures and risk mitigation for ports. Additionally, there is a demand for increased capacity. The group emphasised that national and European public authorities should prioritise risk and disaster mitigation measures. To foster better port development, it was suggested that private capital, port authorities, and users of maritime transportation should collaborate more, sharing information on ships' movements and innovations. Improving the resilience of ports was also stressed, with a recognition that existing funding schemes are insufficient and additional funding is required to meet these challenges.

Group 2: Towards Zero Emissions

The discussion centred around the adoption of Onshore Power Supply (OPS). However, it was noted that such initiatives are not financially viable for ports without mandatory regulations. In areas where OPS is mandatory such as California, OPS becomes also a business case for the ports. The group recognised significant disparities between small and large ports. For large ports after 2030 the provision of OPS and particularly the investments in grid infrastructure will be economically feasible. For smaller ports and smaller terminals in large ports this will remain challenging. Regulatory issues and challenges in the energy market make it difficult for ports to supply energy effectively. If the ports produce e.g. their own energy they become an energy provider, which is not their core business and thus problematic. There was a call for regulatory adaptation to better suit the needs of ports and for port authorities to align investments with their traditional roles.

A big problem is also the grip capacity, which is not sufficient in many areas. This means that investments in OPS are useless until this is solved.

The group questioned how traditional fuel use will be managed post-2030 based on the regulatory decisions and developments now impacting future investments. Especially it must be ensured that OPS will be used in the future, even if the vessels are operated with emission free fuels.

Group 3: Sustainable Energy Hub

This group focused on three key action points linked to the development of sustainable energy hubs: improving access, investing in infrastructure, and sharing knowledge. They discussed the high costs and risks for infrastructure and the need to share these burdens among various stakeholders. The group highlighted that sharing knowledge is critical, and there should be less competition and more collaboration to enable the energstransition. Open communication and a collaborative environment were emphasised as essential for tackling infrastructure challenges and using synergies. The group also called for rethinking shipping and shipbuilding to align with sustainability goals.

Overall, the discussions underscored the need for cooperation, regulatory adaptation, and greater investment to make ports more sustainable and resilient in changing environmental, geopolitical, and economic pressures.

Conclusion

The session concluded that:

Ports are emerging as critical sustainable energy hubs, helping to facilitate the global energy transition. From supporting offshore wind farms to becoming centers for green molecule production, storage and distribution (e.g. hydrogen, ammonia, methanol), ports are crucial in enabling cleaner energy sources both within port cities and beyond.

At the same time, ports are undergoing a transformation towards zero emission operations. Through the electrification of port handling equipment and the implementation of On-Shore Power Supply solutions, they are reducing their carbon footprint, playing a vital role in the fight against climate change.

Additionally, ports continue to be the backbone of global trade, ensuring resilient transport systems that help maintain international commerce and economic welfare. At the same time they are an important part of new defense strategies in Europe. In a world that is increasingly defined by geopolitical uncertainties, European ports are more essential than ever in connecting countries and regions, stabilizing economies, and ensuring the flow of goods across borders.

The session concluded with clearly recognising the urgency required to move towards sustainable energy hubs in ports. Participants highlighted the importance of collaboration, adequate funding, and regulatory clarity in overcoming the challenges associated with the energy transition and traditional role of ports to fullfill. Ports must continue to evolve, ensuring that sustainability goals align with their business needs while maintaining resilience in their traditional roles.

Also investments in the necessary framework such as the grid infrastructure must be ensured to enable the ports to provide OPS and make a business case out of this.

Overall, the session reinforced that while the challenges are significant, the opportunities for ports to become sustainable energy hubs are substantial, provided that stakeholders work together to address infrastructure, regulatory, and financial issues. It became clear, that existing funding schemes are insufficient and additional funding is required to meet described challenges. Ports are a **strategic geopolitical asset** for Europe, a crucial **pillar of Europe's supply chain sovereignty** and **enabler of the energy transition**.