

Roads to port sustainability

Of all the challenges ports face – from digitalisation to coping with the new breed of 20,000+ teu ships – environmental regulations and sustainability are perhaps the most significant. *DPC* looks at current and future programmes

Tony Slinn, correspondent

Port associations are playing a major role in determining sustainability plans, with the American Association of Port Authorities (AAPA) highlighting the need for investment and pointing out that USD66 billion of federal cash over the next decade is vital to renew port-related infrastructure.

This will come in handy, as public affairs director Aaron Ellis told *DPC*, “Ports are subjected to a variety of environmental regulations – air emissions caps, habitat mitigation, and sediment monitoring. To demonstrate compliance, ports collect and provide regulators with reams of data. An interested stakeholder could access this information, but making sense of it requires time, context, and training.

“AAPA member ports recognise that being a good neighbour means more than complying with environmental laws. It means transparency and increasingly it means presenting sophisticated information in an easy-to-digest way. Such information is taken to the community at meetings, hearings, and port-sponsored events. That’s one way many ports are building trust with port communities and outside stakeholders.”

The European Sea Ports Organisation (ESPO) takes a similar line, as secretary general Isabelle Ryckbost explained to *DPC*. ESPO has been the voice of European port managing bodies since 1993 but representing port interests is only one pillar of its work. “The second is to be a knowledge network of, and for, port professionals through which we encourage ports to do better in different fields: environmental performance, port city relations, and in the cruise and ferry business. We’ve developed codes of good practice in these three fields and give an annual award to a port project that aims at closing the gap between port and city,” she said.

In addition, “We have a strong environmental port network – Ecoports – which currently has 114 members. A third have a specific certification, the port environmental review system. We also publish an environmental report that lists European ports’ performance and includes a top 10 of ports’ environmental concerns annually. And since last year we’re also a part of the World Ports Sustainability

Programme [WPSP], a global platform initiated by the International Association of Ports and Harbors [IAPH].”

That programme, an IAPH representative clarified for *DPC*, “Looks into a variety of ways ports can implement practical changes that lead to a more sustainable future. WPSP is specifically concerned with five goals: resilient infrastructure; climate and energy; port community outreach and port city dialogue; safety and security; and governance and ethics.”

At this stage, WPSP has three projects: Environmental Ship Index (ESI); Port Call Optimisation (PCO); and Adaptation to Climate Change (ACC). “With the ESI system, environment-friendly ships can obtain financial awards. Today, the system covers nearly 7,000 ships and more than 50 incentive providers are registered,” the IAPH stated. The representative added, “PCO aims to optimise ship arrival timings by providing real-time data on ships’ schedules and berth availability to find solutions for a cleaner environment and lower costs. ACC looks to clarify ways ports can effectively adapt to climate change – such as sea level rise – through risk assessment and adaptation planning.”

At the IAPH World Ports Conference 2019 in Guangzhou, China, the very first World Ports Sustainability Award went to Antwerp for two projects: Safety & Security and Civitas Portis, the latter dedicated to cleaner, better transport in Europe and beyond, working with the port cities of Aberdeen, Constanza, Klaipeda, and Trieste.

Also working together, the International Maritime Organization and the EU have launched a global initiative to help cut port and shipping emissions through five regional maritime technology co-operation centres covering Africa, Asia, the Caribbean, Latin America, and the Pacific.

The World Association for Waterborne Transport Infrastructure (PIANC) is doing its bit too and has just published a report on *Carbon Management for Port and Navigation Infrastructure*. “Lifecycle analysis and other assessment methods supported this investigation and provided insights into opportunities for improved carbon management,” a representative explained to *DPC*.

Finally, in this section, Alex Ruijs, senior consultant electrical power and energy of engineering consultancy Royal HaskoningDHV (RHDHV), told DPC, “Based on our years of experience, we’ve identified three ways to reduce ports’ energy use and environmental impact:

- Renewable energy generation locally
- Moving to cleaner energy carriers, and
- Improving energy efficiency.

“We generally apply a combination of all three in our projects – in addition to reducing emissions, that can also save money. Ports offer several renewable power generation options, such as solar, wind, or wave power. The most appropriate depends on factors, including local circumstances and spatial conditions. It can be used to reduce grid power intake but can also be used as a replacement for polluting energy carriers,” he continued. “Shore power from a renewable source, for example, can replace diesel power. Applying energy storage, either centralised or incorporated within equipment, also contributes significantly towards cleaner, cheaper operations,” Ruijs said. “Brake energy, for instance, can be re-used such that the power demand profile becomes more continuous, allowing for the derating of electrical components and leading to a reduction in investment costs and system losses.”

Port reports – The Americas

Air quality is one factor that will be improved when ports reduce emissions. The port of Los Angeles has declared clean air to be paramount, a representative told DPC. “In 2018, California Air Resources Board awarded us USD41 million dollars for the Zero and Near Zero-Emission Freight Facilities (ZANZEFF) project, which is a part of California Climate Investments, a state-wide initiative to reduce greenhouse gas emissions, strengthen the economy, and improve public health and the environment. The initiative will help reduce emissions by 465 tonnes of greenhouse gases and 0.72 tonnes of NOx, ROG, and PM10.

“Supported by Toyota, Kenworth, and Shell,” the representative continued, “ZANZEFF provides a large-scale shore-to-store plan and hydrogen fuel cell electric technology for freight facilities to structure operations for future goods movement. The first Kenworth/Toyota fuel cell electric truck under ZANZEFF will begin drayage operations later this year.”

In New York and New Jersey, the port authority (PANYNJ) has signed a sustainable fuel initiative MOU with international renewable fuels producer Neste to use

such fuels in port equipment, including the vehicle fleet. “As the first US transportation agency to embrace the Paris Climate Agreement, PANYNJ is committed to reducing its carbon footprint – especially in operations where electrification is not yet viable,” environment and energy programmes director Christine Weydig stated. “Our goal is to reduce emissions by 80% by 2050.”

Apart from air quality, San Francisco is also looking at climate change in general, as the port’s executive director Elaine Forbes explained to DPC. “San Francisco’s waterfront is visited by more than 24 million people annually and as stewards of 7.5 miles [12 km] of waterfront, we take into account increasing vulnerabilities of sea level rise.

“Individual programmes, such as the Embarcadero Seawall, the Downtown Ferry Terminal Expansion, and Mission Bay Ferry Landing, are helping the port preserve its working waterfront as a safe, vibrant location. We’re also working with the US Army Corps of Engineers to conduct a flood study to identify vulnerabilities and recommend strategies to reduce current and future flood risk.”

Latin America’s biggest container port, Santos in Brazil, already has existing environmental programmes, port authority spokesman Paulo Silveira told DPC, “and we’re looking to create new programmes to comply with upcoming regulations. These will include integrated monitoring of Santos’ environmental health, including evaluating air pollution, water quality, sediments, as well as of fauna and flora.

“They will underpin audits of trash management, synanthropic animals and plants, and more. Finally, initiatives and publicity involving the community surrounding the port area will continue as part of our social and environment responsibility programme.”

Part of these programmes are annual reports, which the Port of Virginia publishes too, spokesman Joe Harris pointed out to DPC. “For us, sustainability has several meanings, though we primarily see it as following through on our commitment to advance the health of our environment, our communities, and our port.”

Virginia’s USD350 million Wider, Deeper, Safer project to deepen its Norfolk Harbor and channels is an integral part of the programme and includes habitat creation, oyster reef restorations, and environment-friendly intermodal transport such as the Richmond Express barge service. That thrice weekly service moved 31,500 containers in 2018, removing 31,500 trucks from roads. The port also won its 16th consecutive River Star Business Award from the Elizabeth River Project for environmental excellence as it cut emissions by more than 90%.

Europe

In Finland, the strategic Port of Turku is preparing several roads towards sustainability, spokeswoman Marita Anstead told DPC. “Since 2006, we’ve applied environmental port charges. Since 2015, the discount has been tied to vessels’ NOx emissions. Such discounts are also applied to waste management. We’ve also decided to end disposal of dredged material into the sea by 2024.

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Alex Ruijs, senior consultant of Royal HaskoningDHV



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Port of Brisbane: 5117504

Brisbane cadets on the Marine Cadetship Programme

“Simultaneously, the port has reduced operational emissions and noise impacts,” she said, “and improved its energy efficiency by investing in low-emission vehicles and using outdoor LED lights”.

In France, the port of Dunkirk also looks out for efficient dredged sediment handling. Having joined IAPH’s Environmental Ship Index, port spokeswoman Marie-Elizabeth Bogucki told *DPC*. “Implemented in 2014 by the roll-out of our structural and sustainable development plan – which defines and supervises more than 150 operations – it has resulted in the use of good environmental practices, especially in terms of dredged sediment management and preserving biodiversity. The mature strategy recently developed into an environmental management system, which obtained port environmental review system certification in 2018 as part of ESPO’s Ecoport network.”

Energy efficiency is another theme related to sustainable practices. The Port of Dover is therefore, enhancing its solar power via new roofing. Environment manager Liz Fagg told *DPC*, “It contributes to our aim of reducing the port’s carbon footprint by 5% annually, working towards a zero-carbon future. We’ve reduced that footprint by 41% since 2008, exceeding the EU and the UK targets to achieve a 20% reduction in carbon emissions by 2020.”

DP World Southampton joined these efforts and is aiming to halve NOx emissions by 2020 and has bought 12 new hybrid straddle carriers that use 20% less fuel to help. “We’ve also placed an order for another 12 hybrids to be delivered by the end of 2019,” spokeswoman Claire Anwyl told *DPC*. “This will mean that more than 25% of the company’s operational fleet will be hybrids.”

Owner Associated British Ports (ABP) is looking to rail investment to accelerate air quality improvements due to emission reductions, as project engineer Andrew Hallam and Solent Stevedores operations director Tom Dynes explained to *DPC*. “The project has lengthened tracks at Southampton’s Solent Rail terminal so that two 645 m container trains can be serviced simultaneously – and aims

to reduce lorry movements by 180,000 annually,” Dynes stated. “This project is a key part of our Air Quality Strategy,” Hallam said.

The UK’s largest container port, Felixstowe, is not to be outdone and added yet another new rail destination to its intermodal portfolio in 2019. “The new service, operated by GB Railfreight, links Felixstowe with a new multimodal logistics park – iPort Rail in Doncaster,” Felixstowe CEO Clemence Cheng said. “Increasingly, companies are looking for sustainable transport options: Felixstowe is uniquely placed to meet those demands.”

Across the English Channel in Germany’s largest port, Hamburg, rail is an established path to sustainability. “Hamburg clears more than 135 million tonnes of seaborne cargo annually, and a major share reaches or leaves the port by rail,” a representative told *DPC*. “If you look at the various modes of overland transport, rail is in pole position with 48.2%, ahead of trucking with 41.4%, and inland waterways with 10.2%. In the first quarter of 2019, 12.5 million tonnes of freight was transported by rail to destinations within Europe – an increase of 7.7%.”

Finally, to the Netherlands and Rotterdam, which as *DPC* June 2019 reported, is to build the country’s largest floating solar farm – circa 100 MWp with work starting in 2022/2023 – at De Slufter, the 250 ha-area that contains contaminated dredging material.

The project complements Rotterdam’s energy transition and is part of the Renewable Energy on National and Rijkswaterstaat Sites. Recently published figures from the Dutch Emissions Authority confirm the port’s industrial sector is also succeeding in slashing emissions – by 13.6% over the past two years, totalling 4.2 million tonnes.

“Rotterdam is committed to combating climate change and playing a leading role in global energy transition. Reduction of CO₂ emissions and efficient use of raw and residual materials are vital tasks,” a port spokesman said.

Not surprisingly, the Middle East is home to numerous similar solar projects, one of the most recent being GAC Dubai’s installation of more than 15,000 solar panels by Total Solar Middle East to generate electricity for two logistics facilities in Jebel Ali Free Zone. “The 6 MW generated will avoid 112,800,000 kg of CO₂ emissions,” stated TSME Managing Director Marin de Montbel.

Australia

Integral part of working sustainably is to be inclusive. The Port of Brisbane in Queensland, Australia, has launched a marine cadetship programme for women, port CEO Roy Cummins told *DPC*. “On successfully completing the 24-month paid employment and training programme, the women will receive qualifications allowing them to command a commercial vessel up to 24 m long.

“We’ve had enormous interest, receiving 150 applications for four positions. Over the previous decade, the port only received six applications in total from women for marine positions. The programme is one of a number of initiatives we’ve recently introduced to help build a more resilient and sustainable workforce,” he concluded. □