

Photos: World Ports Sustainability Program

Looking ahead into what the future holds for ports is, in many respects, a challenging task, given the rapid pace of evolution in our society. A complex mixture of geopolitical changes, commercial strategies, digitization, and automation, along with the push for a dramatic reduction in greenhouse gas (GHG) emissions and a swift energy transition will shape the future of the sector. To help ports prepare for that future, the International Association of Ports and Harbors (IAPH) established its World Ports Sustainability Program (WPSP) almost exactly one year ago, an initiative that has already borne fruit all around the globe.

The WPSP aims to demonstrate global leadership of ports in contributing to the 17 Sustainable Development Goals (SDGs) of the United Nations. Specifically, it aims to empower port community actors worldwide to engage with business, government, and societal stakeholders in creating sustainable added value to the local communities and broader regions, including the environment and other earthlings, in which their ports are embedded. Since its inception, the WPSP has registered over 70 sustainability-related projects undertaken or implemented by IAPH

member ports. These projects are frequently associated with more than one of the SDGs, and as such, they go well beyond mitigating the impact of climate change or providing for social projects in local communities. In fact, the WPSP covers the entire spectrum of port-related sustainability activities.

At the IAPH Guangzhou World Ports Conference, taking place this year between 6 and 10 May, the IAPH World Ports Sustainability Awards ceremony will recognise the best registered projects from the WPSP. The initiatives have been shortlisted into the five main activity categories by a jury panel comprising of senior figures from the industry, including the World Maritime University, the United Nations Conference on Trade and Development (UNCTAD), Institute of Chartered Shipbrokers, and the University of Antwerp Management School. In this article, we're highlighting numerous examples of WPSP projects that have been

nominated for the Awards. These clearly demonstrate how ports are putting the UN SDGs into practice.

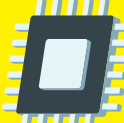






















Resilient infrastructure

The port industry is currently undergoing a transformation. Through the adoption of disruptive technologies and innovations, the way cargo and passenger traffic is handled by ports and their operators has already considerably changed. But there's more to come. Digitisation will provide the impulse towards more resilient infrastructure in ports; it will bring efficiency improvements in terms of just-in-time vessel arrival and departure planning, time at berth, port capacity, loading & discharge productivity, and hinterland mobility and connectivity.

Innovative and cost-efficient use of digital applications to handle major infrastructural and service challenges in ports include the implementation of Port Single

**#Inside
#Ports#UN#IAPH#WPSP#Sustainability
#Future#Challenges/opportunities
#Climate change#Digitalisation
#Resilience#Infrastructure#Energy
#Safety & security#Port-city dialogue
#Governance#Ethics**

Scan the QR codes to find out more details on the port projects in respective categories of the 2019 edition of the IAPH World Ports Sustainability Awards

Resilient infrastructure 	Port of Abu Dhabi: MAMAR 	Port of Barcelona: Port Links 	Port of Hamburg: MoNArch 	Climate and energy 	Ports of Stockholm 
Port of Antwerp 	Port of Amsterdam 	Safety and security 	Port of Antwerp: PIN 	JadeWeserPort and Niedersachsen Ports: RapidReach 	Port of Abu Dhabi 
Community outreach and port-city dialogue 	Civitas Portis 	NEPTUNES 	Ports of Los Angeles and Long Beach: CAAP 	Port of Abu Dhabi 	Port of Busan 
Port of Kobe 	Governance and ethics 	Gladstone Ports Corporation 	Kenya Ports Authority 	Port of Vancouver 	

Window (PSW) systems. These smoothen the handling of both cargo and passengers by efficiently connecting up stakeholders such as port authorities, operators, customs, port agents, shipping lines, forwarders, and shippers. The Port of Abu Dhabi's PSW MAMAR, which currently connects five ports and 54 private jetties, is integrated with 20 shipping lines and covers 100+ shore-to-hinterland services. MAMAR is also integrated with three other PSWs and 11 ports in China, Belgium, and Spain.

A second example is the Port Links online portal developed by the Port of Barcelona, which allows exporters, importers, traders, and forwarders to calculate the optimum route for their cargo from the point of origin to the final destination, including all the Europe-wide inter-modal options to and from the Catalan port. Simple data entry produces a map result with a graphic representation of the best route, and aggregate results for distance, CO₂ equivalent, emissions, variable costs, and transit times.

The 5G Mobile Network Architecture (MoNArch) research project, carried out across the Port of Hamburg, is another

fine example of how digital innovation can upgrade heavy-duty operations. With a transmitter located on top of the Heinrich-Hertz Television Tower, the project covers 8,000 hectares of port area testing ground. This network, which operates at extremely high speeds of 10 gigabits per second, will enable multiple new applications to improve vessel and traffic circulation, real-time environmental measurements, as well as other applications using virtual and augmented reality, thereby creating a safer and interconnected port environment.

In general, with such sci-fi technologies becoming more and more a fact of life we may reach the point where automation and real-time data handling between port players converge. Using big data via smart devices located throughout the port, the application of Artificial Intelligence (AI) and predictive forecasting will ultimately provide a new type of infrastructure where the line between software and hardware will become blurred.

Climate and energy

The International Maritime Organization's 2050 target for GHG reductions heralds the

start of a structured approach towards capping harmful emissions that will ensure a very necessary adjustment to shipping's status as the world's 6th largest emitter (were it to be a country; read more in BTJ 6/18's *The rub of the green. Zero-emission shipping by 2035*). With UNCTAD's *Review of Maritime Transport* predicting compound annual growth of 3.2% for seaborne trade between now and 2022, the port industry must act.

There are many interesting examples of energy transition in IAPH member ports, many of which are striving towards carbon-neutrality in the long term to achieve global climate goals. Ports are more frequently using renewable energy sources like wind, solar, and tidal power. They are also setting up possibilities for vessels to be bunkered using alternatives to heavy fuel oil such as liquefied natural gas (LNG), methanol, or hydrogen.

As an early adopter, the Ports of Stockholm authority has taken significant strides toward its ambition to reduce its own total emissions by 50% between 2005 and 2025. It has done so by offering port fee reductions to ships with reduced nitrogen



oxides emissions and above-standard GHG footprints, such as LNG-powered vessels, along with offering eco-friendly onshore power supply at several quays, changing truck fuel composition, installing LED lighting, as well as energy monitoring of vessels and buildings.

Meanwhile, the Port of Antwerp has successfully tested the prototype model of a three-bladed vertical axe water-turbine mounted in the existing infrastructure of a lock on its left bank which produced far more wattage using tidal waters than anticipated. The Belgian port is continuing to explore this avenue by using a further four turbines within the vicinity of its other main locks, employing for the task 3D design, virtual reality, and computed fluid dynamics.

There are a growing number of initiatives in the field of the circular economy, whereby port authorities work together with their industrial clusters to generate their own energy and give new economic purpose to waste products. One example is wastewater being used to cool industrial installations, which can be deployed for urban heating purposes. Another example in this arena includes the construction of a plant in the Port of Amsterdam which transforms plastic to diesel. The goal is to process 35,000t of plastic – resulting in a reduction of approx. 57,270t of CO₂ emissions – as the fuel produced emits 80% less carbon dioxide compared to regular diesel.

Safety and security

Regulatory measures, standards, and industry procedures exist to ensure that safety and security of ship and cargo operations aren't compromised within ports. However, the environment in which enforcement of these applicable laws and regulations are applied have completely changed. The threat of global terrorism,

cyber security breaches, piracy, illegal smuggling of humans and illicit materials have required ports to rethink their health, safety, security, environment, and quality strategies.

Ports have addressed these challenges with an ever-increased focus put on implementing various ISO and other health and safety-related norms. Technology is being used to innovate in the field of control and inspection, as well as to monitor activities in and around ports, such as the Port of Antwerp's Port Information Network (PIN) project. This has brought together companies located and working within the port area of 130 km² to jointly report on any suspicious activities. To make it more practicable, the system works with geographical clusters, so that companies can share and receive in real-time selected messages about relevant events in their immediate vicinity.

In a similar move to simplify information sharing, the German JadeWeserPort together with Niedersachsen Ports, the latter having 15 ports under its authority, introduced an online emergency notification system called RapidReach in 2016. It allows operators to react quickly in an emergency situation without using expensive hardware or special devices. Users can alert everyone using a cell phone or a simple PC with a web browser and Internet access. The system was installed throughout Lower Saxony, significantly reducing alert response times from hours to minutes.

The Port of Abu Dhabi has also taken the safe, secure, and sustainable values to heart. The port has implemented a smart health, safety, and environment policy that encompasses not only key performance indicator measurements but also internal initiatives such as an annual award scheme for employees, departments and partner suppliers, with certificates and prizes.

Community outreach and port-city dialogue

Port community actors can develop synergies to solve collective issues in- and outside the port area, including the elimination of hinterland bottlenecks, the improvement of port-city integration, as well as dealing with environmental and conservation issues, and transport-caused externalities like reducing pollution or providing greater mobility.

Civitas Portis is testing innovative and sustainable urban mobility solutions in several European port cities as well as one Chinese port. The participants serve as living labs and implement integrated mobility measures, such as introducing low-emission waterborne passenger services, building safe bike lane networks, and migrating public transport services from carbon fuels to electric power.

The Noise Exploration Program To Understand Noise Emitted by Seagoing Ships (NEPTUNES) is a two-year research project that has been undertaken by several ports around the world to establish benchmark measurements, propose a labelling standard, and to ultimately reward ship owners that take steps to mitigate noise emitted by their ships when entering, berthing at, or leaving the ports.

On the West Coast of the US two ports that usually compete with each other, Los Angeles and Long Beach, have teamed up to create and implement the San Pedro Bay Ports Clean Air Action Plan (CAAP). Since its adoption in 2006, diesel particulate emissions from mobile sources in and around both ports have decreased by 87%. The CAAP 2017 update involved over 70 local community stakeholder meetings and resulted in 14 strategic goals, assigning concrete projects to decrease port-equipment emissions to zero or investigate whether energy for port usage can



through appropriate tools and methodologies and to boost the integration of SDGs in port governance and strategies.

For an example of applying business ethics in practice, the Gladstone Ports Corporation has worked closely with local first nation communities in establishing an Indigenous Land Use Agreement covering the activities across the ports of Gladstone, Bundaberg, and Rockhampton. This agreement on the use of land for port development generates benefits with supporting applications made by the local community to, i.a., fund education and training, and to support overall community welfare.

In Africa, the Kenya Ports Authority has allocated a percentage of its bottom line to its Tunashusika Corporate Social Investment Program, which aims to fund and support school infrastructure in the many surrounding coastal communities from which its present and future employees will come. The fund also works with local counties in the construction of healthcare facilities and hosting on-site medical camps.

A fine example of integrated governance can be found in Vancouver. The Vancouver Fraser Port Authority has engaged in a dialogue with other stakeholders to identify the long-term future vision of the port. It is now actively weaving in sustainability into the port's business processes. Proper measurement tools are being developed to make sure the initial ambitions can be truly realized. For instance, the port not only publishes comprehensive annual sustainability reports but has also set up a publicly available online dashboard that covers all aspects of the supply chain, including live monitoring data of the environment in and around the port.

The World Ports Sustainability Program warmly welcomes initiatives from ports all around the world to add their own sustainability projects to the initiative. Anybody can do so by presenting their project on the WPSM website www.sustainableworldports.org/submit-your-project. □

be drawn from more environmentally-friendly sources.

Constructive dialogue with local communities and other stakeholders is a vital success ingredient in bringing ports closer to their neighbourhoods, be they urban, local, or rural. Several case studies in port cities around the world have demonstrated that such dialogue, combined with appropriate investments in infrastructure, can make a genuinely positive impact, whether they are destined for public use or regeneration of natural habitats.

The Abu Dhabi port's three-year-long plan to invest over \$100m into four ports along the Al-Dhafrah coastline has generated opportunities for the local businesses, including fishing, whilst the construction of a cruise beach destination alongside the wildlife reserve at Sir Bani Yas Island has resulted in this part of the Emirates becoming a highly popular tourist destination. Several environmental studies were carried beforehand out, which showed that the water quality in the surrounding lagoons, home to mangroves and several species of migratory birds, would benefit from the beach as well.

The South Korean Port of Busan has embarked on an ambitious decade and a half-long unused waterfront space renovation project. It has started as a citizen-led advisory committee initiative, where the valueforbusan.com website has been used to brainstorm the best ways of using the space for the community. To this date, the project has resulted in the creation of a 7,400 m²-big swimming pool complex, a campsite that spans over 8,900 m², and a free outdoor foot spa which provides low price access and free events to low-income families and has generated local employment for the youth and the elderly.

The Port of Kobe in Japan has five man-made islands, all of which have been the focus of various environmental and sustainable

economic development projects to improve water and air quality, increase biodiversity, and lower noise reduction. Environmental initiatives include the creation of an artificial lagoon on the airport island and a beach for public use. Programmes encouraging the growth of algae and marine organisms in the bay have been initiated, too, establishing green zones in the urban zone on the Rokko island and growing tree populations along the seawalls. In addition, a 15m³ of capacity offshore reclamation disposal site has been created for dredging soil, industrial, and general waste. The port itself has introduced onshore power for visiting ships, converted rubber tyre gantry cranes so that they could use hybrid power and is currently installing LNG bunkering facilities, with additional plans for a hydrogen plant for future ships.

Governance and ethics

Principles of good corporate governance are increasingly being introduced by various port authorities. IAPH intends to take a leading role as to how ports integrate the 17 UN SDGs into their business principles. A recent UNCTAD-hosted workshop of IAPH member ports in Geneva has already established a reference baseline for a roadmap. The ultimate aim is to provide guidance



Founded in 1955, the International Association of Ports and Harbors (IAPH) is a non-profit-making global alliance of 170 ports and 140 port-related organizations covering 90 countries. Its member ports handle more than 60% of global maritime trade and around 80% of world container traffic. IAPH has consultative NGO status with several United Nations agencies.. For more about the organisation, please visit www.iaphworldports.org



In 2018, IAPH established the World Ports Sustainability Program (WPSM). Guided by the 17 UN Sustainable Development Goals, it aims to unite sustainability efforts of ports worldwide, encouraging international cooperation between all partners involved in the maritime supply chain. WPSM covers five main areas of collaboration: energy transition, resilient infrastructure, safety and security, community outreach, and governance. For more info, please check www.sustainableworldports.org