

Harbours review

Onshore Power Supply

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red-hot port matters

Photo: www.pexels.com

CMA CGM chooses LNG for biggest ships

CMA CGM has revealed the plan to equip nine of its 22,000 TEU ships with engines using liquefied natural gas (LNG). The new vessels, to be delivered in 2020, will emit 25% less CO₂, 85% less nitrogen oxides, and 99% less sulphur and fine particles compared to vessels running on heavy fuel oil. "We have made the bold decision to equip our future 22,000 TEU vessels with a technology firmly focused on the protection of the environment. By choosing LNG, CMA CGM confirms its ambition to be a leading force in the industry in environmental protection by being a pioneer in innovative and eco-responsible technologies," Rodolphe Saadé, CEO, CMA CGM, said.



Photo: Ulstein

Ulstein to build a polar expedition vessel

The polar expedition vessel ordered by Lindblad Expeditions Holdings at the Ulstein shipyard should be delivered in the first quarter of 2020, with an option for another two ships in the coming years. The ship will have 69 guest cabins and suites, and will include 12 cabins for solo travelers. Its features include X-BOW®, a distinctive bow that provides fuel efficiency and improves guest comfort in rough seas, and a very high ice class for access deep into polar regions. The vessel's expanded fuel and water tanks provide for extended operations in remote areas, while the zero-speed stabilizers will ensure stability underway, whether at zero speed when stopped for wildlife observation, or embarking/disembarking the ship. In addition, the design will allow access to the outside environment from anywhere on the ship, thanks to private balconies in 75% of the cabins, multiple observation decks, and new observation wings. What's more, expedition tools for exploration – such as kayaks, cross-country skis, a remotely operated vehicle (ROV), hydrophones, a video microscope, underwater video cameras, and a helicopter landing platform – will be available. "We are incredibly excited to be working with Ulstein and their brilliant team of engineers and designers on this state-of-the-art vessel as we continue the expansion of our fleet. It is the next step in the long-term growth of the company, and will be the most extraordinary global expedition ship in the world on a multitude of levels," Sven Lindblad, President and CEO, Lindblad Expeditions Holdings, said. "The launch of this ship will mark the 50th anniversary year of the first-ever purpose-built expedition ship, *Lindblad Explorer*, which was built by my father, Lars-Eric Lindblad, and will set another important milestone in the company's commitment to deliver expedition travel at its best," Lindblad added.

Pacific Terminal officially opened

The Port of Southampton, operated by Associated British Ports (ABP), has opened a new vehicle export facility on November 2nd. Pacific Terminal will serve i.a. Jaguar Land Rover cars. "As the UK's busiest vehicle handling port, the launch of the new export terminal will move Britain into fifth gear when it comes to world car exports. This will give a boost to leading British car manufacturers like Jaguar Land Rover by ensuring their cars are able to reach global marketplaces faster," Greg Hands, Minister of State in the Department for International Trade, said. James Cooper CEO, ABP, added; "Southampton is the UK's number one port for exports, handling exports worth some GBP 40 billion, and it is the UK's number one for vehicle exports. The port is a critical part of the supply chain for the British automotive industry, providing essential access to global markets. The opening of this terminal will build on this critical role and support our customers' drive to continue to grow their exports well into the future."



Meyer Werft delivers *World Dream*

Dream Cruises, a subsidiary of Genting Hong Kong, has taken delivery of its newest cruise ship, constructed at Meyer's facility in Papenburg. The 151,300 GT *World Dream* is 335.35 metres long and 39.7 metres wide, offering space for up to 3,376 passengers in 1,686 cabins (including 1,272 outer cabins, the bulk of which have their own balconies). The ship has 20 decks, across which 35 restaurants and bars are available, together with a set of various entertainment facilities, such as theatres (approx. 1,000 seats), a climbing park, space for outdoor activities, and a range of virtual reality applications. Moreover, *World Dream* also carries a small deep-sea submarine, which can take up to four guests to a depth of 200 metres, as well as a motorboat for excursions. The vessel will be based in the Port of Hong Kong from where she'll head for two/five/seven night sailings to Vietnam and China. Artist Jacky Tsai has been responsible for the ship's hull artwork, titled "A Tale of Two Dreams." Tim Meyer, Managing Director of Meyer Werft, commented: "This is the 44th cruise ship we delivered. Our team did a great job. I am proud and thankful for their contribution."



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Photo: Liebherr

Liebherr ships to Chile

Terminal Pacífico Sur Valparaíso has purchased a mobile harbour crane from the German company. The new mobile harbour crane has a maximum lifting capacity of 154 tonnes and a reach of 64 metres. The additional 9.6-metre tower extension ensures an operator eye level of more than 40 metres. The LHM 800 is able to serve vessels with up to 22 container rows across, depending on the terminal set up. The crane will be mainly used to handle temperature-controlled containers.

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DCT GDAŃSK:

1,138,702 TEU handled in I-IX 2017 (+16.3% yoy)

In September, the Gdańsk's facility noted its best-ever result, handling 159,945 twenty-foot boxes, up by 29.2% year-on-year.

RAIL FREIGHT PORT EXPORTS IN RUSSIA:

215.9 mln tn carried in I-IX 2017 (+5.9% yoy)

Out of the total number, exports handled by Russian Railways and destined for the country's North-West ports added up to 89.7 million tonnes in the reported period, up by 8.3% year-on-year. At the same time, rail-based port exports to Russia's seaports in the Far East amounted to 69.6 million tonnes (+2.1% yoy), and to southern ports – 56.3 million tonnes (+7.6% yoy).

DCT Gdańsk's volumes

Month 2017	TEU	Yoy
January	111,129	+10.4%
February	109,595	+12.4%
March	104,095	-3.7%
Q1 2017	324,819	+6.1%
April	115,044	-0.3%
May	122,871	+7.7%
June	129,217	+23.2%
Q2 2017	367,132	+9.8%
July	145,275	+29.6%
August	141,531	+37.5%
September	159,945	+29.2%
Q3 2017	446,751	+31.9%
Total	1,138,702	+16.3%

Ahoy new world.

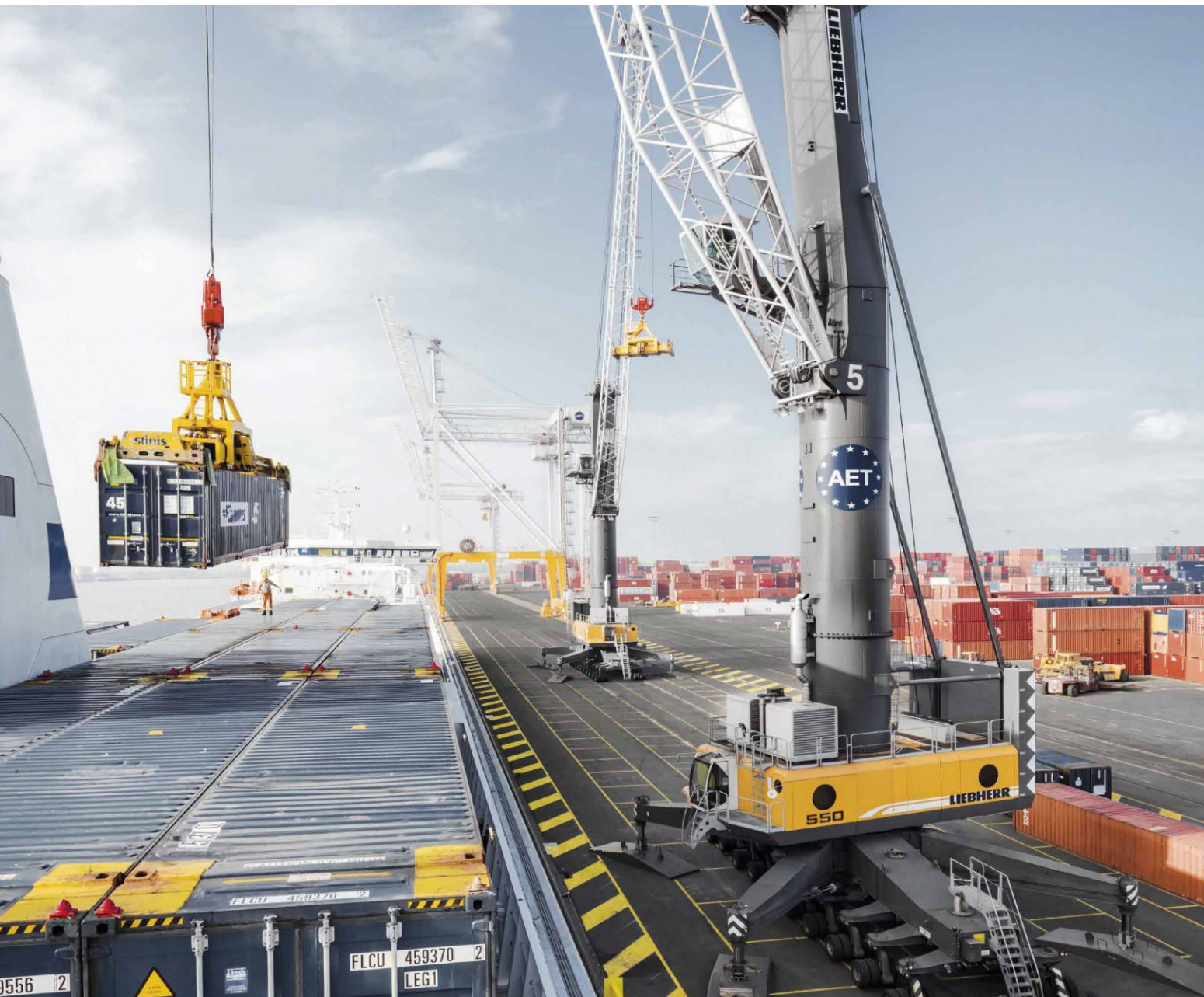


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featured article

Harbours Review Spotlight: Onshore Power Supply,
25-26 October, SE/Gothenburg

OPS on stage in Gothenburg

by Andrzej Urbaś

The meeting gathered a very healthy mix of port representatives, shipowners and technology suppliers, bringing together groups directly involved and highly interested in further development of Onshore Power Supply (OPS). Feasibility of OPS investments was the focal point of the discussion.



The technology itself isn't necessarily a new topic in the maritime industry, but recently it has been garnering more attention from both port authorities and shipowners. This can be attributed to the constant growth of environmental consciousness in the maritime industry. OPS may facilitate port and shipowner compliance with some of the environmental regulations already in- or soon-to-come into force. Then again, just as the discussions held during the seminar showed, it is vital to not see it as a possible universal solution to all environmental maladies plaguing the industry.

Proven experiences

The event proved popular among port authorities, with four European ports holding presentations and sharing their experiences with OPS technology. The seminar kicked-off with Edvard Molitor, Senior Manager for Environment at the Port of Gothenburg, examining OPS investments from a socioeconomic viewpoint.

By running an analysis based on the Swedish Transport Administration's data allowing to put monetary values on emissions, Port of Gothenburg was able to

conduct a feasibility study for possible OPS implementation. The study showed that while it would make sense for OPS to be installed in the ro-ro harbour, installation costs were much higher than external costs avoided in case of the energy and container ports. Pressure from the city was mentioned as one of the factors driving OPS implementation, especially in regard to NOx emissions. However, according to studies, only 5% of those emissions would be avoided if OPS were to be installed all around the port area.

Edvard stressed the need for cooperation between various ports and shipowners, a view shared by Heidi Neilson, Head of Environment at the Port of Oslo. The presentation included an analysis showing that a switch to OPS by only five of the top polluters among the shipping lines calling at the Port of Oslo would result in halving of the total emission numbers. Neilson stressed the need for the OPS modules to be compact, efficient and modular. Future expansion of the installations has to be kept in mind, as well as the possibility to share the energy with busses, trams, cranes etc. Efficiency is key, OPS energy cannot be used only for ships at berth.



Free market – already interested?

Ports' role as developers, accelerators, and facilitators of OPS technology implementation has been explored in a presentation by Katrien Van Itterbeeck, representing the Port of Antwerp. "If the job can be done by private sector – let the job be done by private sector" – has been stated, before diving deeper into the subject. This would allow for competition, in turn having a beneficial impact on the quality of services provided and the overall price level. Van Itterbeeck presented a set of questions helping to identify a port's role, whether as a developer or facilitator, including the potential for a positive business case, need for customization, opportunities for cooperation with interested parties, and OPS accessibility along the loop. The necessity for shipowners' willing commitment was a sentiment shared by Even Husby, Head of Environment at the Port of Bergen. A number of external pressure factors for implementation of environmentally friendly solutions was listed, some of them stemming from the Port of Bergen's unique geographical location. Bergen's planned action points include the lowering of costs linked to the grind rent and the energy tax. Incentive arrangements for ships and ports have also been mentioned, among them differentiated port dues, limitations of ships calling and passengers handled as well as the availability of LNG bunkering and OPS stations.

Environmental benefits of OPS implementation were examined by an expert in the field. Emre Aydin, Senior Consultant in Air Quality and Acoustics at WSP, took it upon himself to answer a very bold question. Is OPS the best possible solution for reduction of local air pollution and greenhouse gas emissions? While it is impossible to give a definite answer to this question, Aydin presented a very

clear and thorough assessment of OPS' impact. The overall benefits vary from port to port and from city to city. Certain aspects, such as the source of electricity provided or different methods of energy supply for ships at berth (especially fuel switching to LNG), need to be considered when deciding whether to invest in OPS technology.

Environmental advantage

A no less challenging question was the topic of Cecilia Andersson's presentation, Environmental Manager at Stena Line Group. Is the ferry industry a perfect target for OPS development? Like Emre Aydin, she came to the conclusion that it depends. With challenges such as poor electrical line infrastructure at ports as well as high electricity and investment costs, OPS implementation must be carefully considered. At the same time, the benefits are clear and they contribute a lot to a shipping line's or port's "green" image. A factor not to be underestimated in times of heightened environmental consciousness.

A strong line-up of speakers from the side of technology suppliers allowed for some concrete solutions to be presented as well. Ingemar Gustavsson, Business Unit Manager at Actemium, the conferences main sponsor and host, shared his company's mobile turnkey solution for high-voltage shore connection systems and low-voltage shore connection systems. A need for mobile OPS stations was voiced by many of the port representatives speaking at the seminar. The next project involving Actemium's OPS container solution will take the company to Gothenburg.

Roberto Bernacchi, Shore-to-ship Power Manager at ABB, also sponsoring the event, presented OPS as a key element of a smart port's agenda. Their

solution includes OPS in what they consider a smart grid – operating on a centralized and distributed power generation, with a multi-directional power flow operating on real-time data. Ports becoming smart would enable them to use the power more efficiently, with ships being only one of the recipients, along with electric vehicles and buses.

The trio of technology suppliers was rounded out by Henrik Jevrell, Local Sales Engineer at Cavotec. Henrik gave an overview of Cavotec's OPS portfolio while talking about the various challenges of shore connection to a dynamic ship. Between mooring lines, quay equipment, loading ramps and variables generated by the quay construction, finding the right solution can be a truly daunting process.

Practice & forward

After recharging their batteries and enjoying a brief networking evening, the seminar participants were ready for round two. Luckily, death by PowerPoint was successfully avoided. While day one presentations approached the topics at hand from a theoretical standpoint, day two talks offered a hands-on approach – a change in pace welcomed by all. A study tour prepared by Actemium took the participants on a trip around the Port of Gothenburg, with stops at two OPS stations, located at the Germany and Denmark terminals. A showcase of Actemium's mobile OPS station, currently in use by Stena Line vessels, concluded the trip.

The event gathered around 50 delegates and was very well received, with the audience engaging in lively dialogue with the speakers. The next edition is being planned as you are reading this and the word on the street is that Norway will be the place to be for everyone involved in OPS technology in 2018. ■



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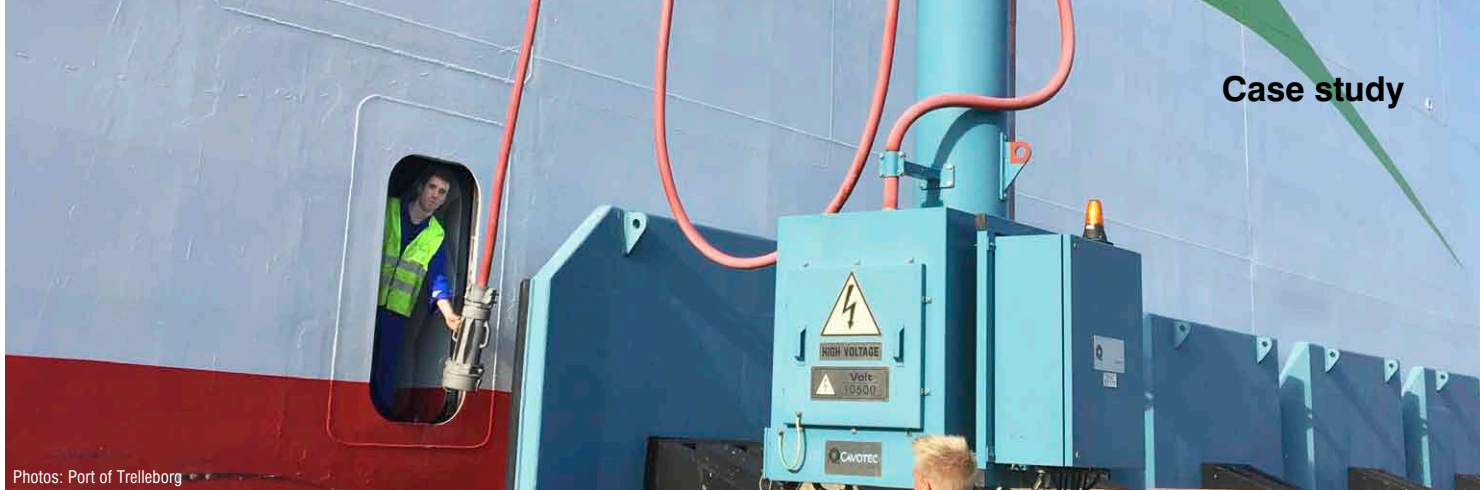
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Photos: Port of Trelleborg

OPS in the Port of Trelleborg

by Jānis Mihelsons

On October 23rd, Anneli Hulthén, Governor of Skåne, together with Christian Pegel, Energy Minister of Mecklenburg-Vorpommern, inaugurated the onshore power supply in Port of Trelleborg. Stena Line is the first ferry company that will now be connecting two of its vessels – *Skåne* and *Mecklenburg-Vorpommern* – to the electricity grid. This is an important step in the sustainability work to reduce emissions and noise when vessels are at berth.



Stena Line is in fact a pioneer in this field, and since 1989 has connected up a number of vessels to the electricity grid when docked. At present, four out of six Stena Line's ports in Sweden use OPS (because of Stena Line's network, 17% of the Swedish ports are connected to the grid). Stena Line's vessels connect to electricity when docked for more than two hours. In Trelleborg, they are docked for more than two hours, 10-16 times per week.

The connection means that the on-board machinery is completely shut down, bringing emissions down to practically zero, and for maximum total environmental gain green electricity is used, which is also the case in Trelleborg. In 2016, all Stena Line's electrical connections in port contributed to a reduction in CO2 emissions of 12,500 tonnes, which equates to the annual consumption of 6,500 average passenger cars.

Installation of electrical connections is a major investment, with the port generally paying for the onshore installation and the shipping company paying for on-board

installation. The onshore equipment is protected against overload for a nominal load of 2.2 MW, which is equivalent to heating around 80 blocks of flats.

"It's really great that Stena Line has decided to connect two of its vessels to the onshore power supply at the Port of Trelleborg. The work and planning for the installation has taken several years and the Port of Trelleborg received a grant from the EU for the investment, which will reduce both emissions and noise from docked vessels," Jörgen Nilsson, CEO, Port of Trelleborg, said.

"We are delighted to have completed yet another onshore power supply connection together with the Port of Trelleborg. Sustainability is one of the

cornerstones of our strategy and this is an important contribution to our efforts by reducing emissions and cutting down on noise in port. On many of our ferry routes our vessels call at locations close to cities and this makes it especially important to be able to shut off the engines when docked. Planning work is under way to enable us to connect vessels in more of our ports. The objective is for 25% of the ports we use to have an electrical connection by 2020 and 75% by 2030," Niclas Mårtensson, CEO, Stena Line, added.

After the inauguration the guests participated in a guided tour on board *Skåne*, to look the onshore power connection room, the bridge, and the control room. ■



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Interview with Poul Woodall,
Director, Environment & Sustainability, DFDS

Photo: www.pexels.com

Talking OPS

by Andrzej Urbaś



Poul Woodall joined A.P. Møller-Mærsk as a Management Trainee in 1974 and until 2010 worked there in various positions, mainly within the container and ro-ro segments. Since 2010, Poul has been with the DFDS Group. In June 2013, he was appointed the company's Director Environment and Sustainability. He has a degree from the Copenhagen Business School, supplemented with management education at Insead and the Stanford University. Poul is an affiliate Member of the UK-based Institute of Environmental Management & Assessment (IMEA), as well as is active in a number of other industry organisations, like Interferry, the Trident Alliance, and Green Ship of the Future.

In the lead up to the Onshore Power Supply seminar in Gothenburg, our moderator, Mr. Poul Woodall, carved some time out of his busy schedule to share with us his insight. There is no better way to set the stage for the rapidly approaching event!

- **How should the costs of OPS implementation be divided between ports and shipping lines? Who should play a driving role in the investment process?**

The easy answer is that shore side is a port cost and the cost on the vessel is the owner's cost. Naturally, the vessel also needs to pay for the actual consumption. But life may not be so simple. Who is responsible for the delivered electricity corresponds to the electrical systems on the ship? I am mainly referring to the current and the ship-shore connection. One must also remember that a vessel owner has more options to select from when it comes to emission control and perhaps OPS is not the preferred one. In that case, there will be a reluctance from ship owners to invest in a solution that is seen as suboptimal.

- **Which types of vessels can be seen as the main beneficent of OPS implementation?**

From the environmental and climate perspective, the largest users of power while alongside should generate the most benefits – but what is a

„large” user? One that has big power consumption per hour or one that uses most power due to a longer port stay? The former category would typically be cruise vessels and container vessels with many running reefers on board. The latter category could be bulk carriers and tankers.

- **Could you give us a short rundown of pros and cons of OPS implementation?**

That depends on the reason for wanting OPS. A question that must be answered first. OPS can have a positive effect on GHG, local pollution or noise, or a combination of these. Once you have determined which of these drivers are applicable, or the priority of a combination of them, you will then have different pros and cons. A key feature with OPS is that it only works when a vessel is alongside. Vessels at anchorage and those manoeuvring within port limits cannot make use of this feature. Another feature that must not be forgotten in the discussion is the mechanism of international shipping. I am referring to the owner/charter relationship and who pays for what under the contract.

voices



Photo: www.pexels.com



Grant Brown

Vice President Marketing, PBES

PBES has received orders from ports in China to power on-shore equipment such as hybrid rubber tyred gantry cranes (RTG). More recently, ports expressed some interest in the idea of using large scale energy storage to provide shore power to ships. The biggest advantage is the fact that a battery can supply large amounts of power at lower installed cost than modifying and building the infrastructure required to provide the same level of power using traditional transmission methods. The battery can be charged at night or during off-peak times and in certain locations the off-peak power is extremely inexpensive. The use of energy storage in an RTG crane can reduce fuel burn by up to 70% and achieve payback in under two years! These operational savings are very attractive and only get better if the government can offer some environmental breaks. A similar case could be made for OPS using energy storage

as the backbone. In comparison to mobile generators or LNG-fired generators, there is no additional carbon footprint. I believe this is an important note. LNG in particular has been touted as a clean fuel, but due to methane slip (the escapement of unburned gas during production, handling, transportation and use), natural gas is actually far more polluting than previously thought. A completely clean power system will be an advantage in the future. With this in mind, PBES has developed an integrated solar and energy storage solution as a package that can provide 100% clean power to all types of applications. In northern climates this could be used with wind or hydro power. We are currently deploying systems to hurricane ravaged Barbuda and Puerto Rico to help rebuild their infrastructure, including a small port. The power they produce using the new system will cost roughly one-half of what it cost before the hurricane destroyed their infrastructure. It is a demonstration of how energy storage is helping to further move power generation away from fossil fuels and the associated cost and pollution. As mentioned above, Chinese ports are already implementing hybrid technology and have been doing so for at least four years. Rotterdam is also working on other forms of emissions reduction technology. Norway is leading the way with shore power in the form of power banks that supply battery power to all-electric ferries. There is a lot going on in the sector (more than I could possibly follow) and it seems to be a global trend. The leader is Norway and others will follow; the same as we have seen in the use of energy storage in ships. I personally only see upside to using battery powered OPS in commercial ports, especially those that are near sensitive environmental areas or that have a large number of ships in a contained area such as a fjord. The reduction in pollutants for the residents of the area will benefit the people and the environment. It is important that it be done in a thoughtful manner using a clean technology that allows not only environmental benefits, but also financial ones as well.



Roberto Bernacchi

Shore-to-ship power & Smart Ports Global Product Manager Power Grids, ABB

For ABB, the leading shore-to-ship power technology provider, the Onshore Power Supply Seminar held in Gothenburg was the perfect opportunity to discuss the latest trends and developments to enhance port sustainability with ship-owners and port operators. It is well known and accepted by shipowners, port authorities and terminal operators that clean energy provision and elimination of diesel emissions (as well as noise) will improve the working condition, transit, and living environment in and around ports. Although an exponential increase in shore-to-ship power installations is currently happening in some regions, such as Norway and China, where local governments are facilitating the introduction of this breakthrough technology, the adoption of OPS in Europe is still selective. To facilitate a wide-scale implementation of the technology, a provider can play a fundamental role: starting from the project inception

phase where an optimization of capital expenditures and total cost of ownership can be performed looking at the specific needs of ports and shipowners, to the concrete realization of a stronger, smarter and greener port grid that allows the integration of e-mobility both on the blue side (electric or hybrid vessels) and on the land side (e-vehicles), as well as integration of renewable power sources such as wind farms or photovoltaic plants. A 360° approach will allow ports to become sustainable business entities wholly integrated with the surrounding community, while playing a key role as economic engines, as transit hubs for people and goods, and in a modern way.

Photo: all-free-download.com/BEWI



P A Ingman

Electrical Engineer, Silja Serenade

Since I had the privilege to participate in the OPS seminar in Gothenburg, I think I've got a clearer view now, especially on where the shipping industry can find a reason to choose shore power when staying at port (although that the ship-in-port emissions are just a very small part of the total amount). As we don't always know how electricity is produced, there might be even more harm coming from e.g. coal-fired power stations, than from the ships' own generators. But as the ports often are situated near or in the cities where the emissions and noise are a problem even without ships, it is understandable that they must reduce the total emissions of CO₂ (and NO_x together with SO_x) by forcing the ships which stay more than two hours in harbor to invest in this kind of expensive equipment. From the vessel's "point of view" there is also one advantage during the cold ironing time – quiet and

more friendly work of the engine room with better temperatures, which leads to savings the so-called running hours on auxiliary engines and other equipment. The best (and only) solution any port/town I've heard of is a port in Norway where the price of the consumed electricity was so low that the investments to build the OPS possibility on the vessels was paying itself back in a reasonably short time! I'm sure that such solution would surely work out everywhere, where the same ships come often and stay for several hours, instead of doing the opposite by trying to cover own costs by overcharging for the same. The OPS at this time might be more on the agenda in the Nordic and Western Europe, some areas of North America, Japan and Australia, but I'm sure there is a big challenge to get to the places in the world where the big smokers are still using bad fuel. Another point is the fact that the most of the ships stays only a short while in port and changing berth and port all the time and the OPS-equipment is quite unique for each vessel and do not normally suite many ships. When you look at the total emissions in a big harbour city, cargo transports on road is a bigger part of the cake. This probably means that a clean ship that e.g. uses LNG and will be able to reduce the total emissions only if other transport modes will do the same. I also think it's possible that the two sisters of Silja Line sailing between Helsinki and Stockholm can be provided with OPS in the future if only the participants come up with an acceptable conclusion.

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