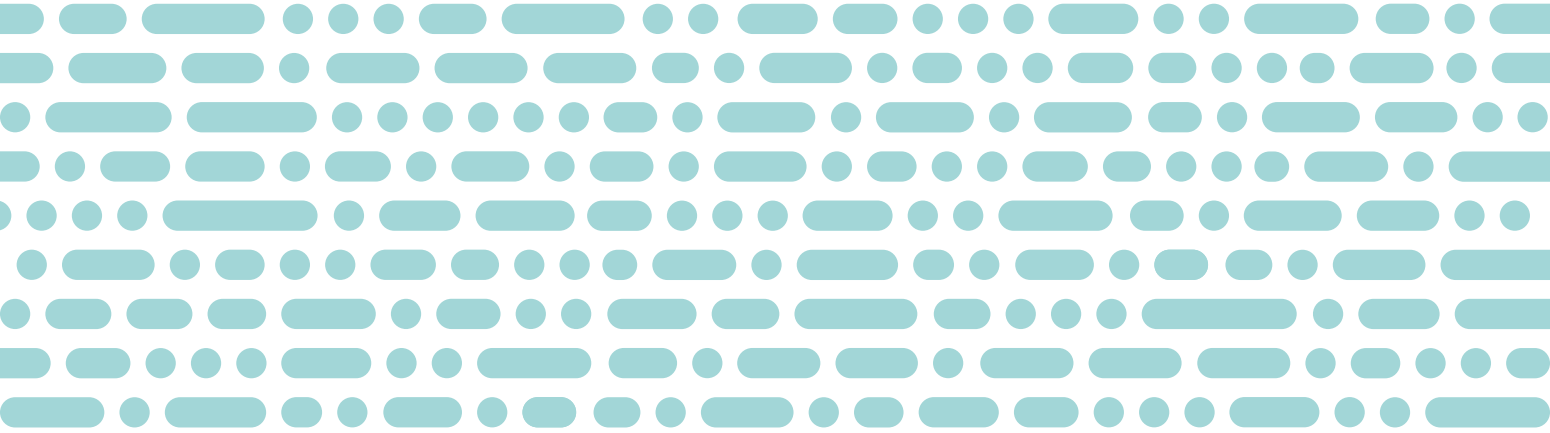




Supporting transport & logistics





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Motus Foundation’s Managing Director & Vice President of the Board*
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Photo: www.pexels.com



Interview with
Emil Arolski,
Motus Foundation's Managing Director
& Vice President of the Board

The right direction

Another year is passing by, gathering all who take care of transport, energy, fuels, and the blue economy. Motus Foundation will continuously support and encourage environmental issues across those, and many other sectors.

- ***What kind of challenges does your foundation want to respond to?***

Motus is a newly-established non-profit organization which has a wide and very active agenda. We are focused on new regulations for transport & shipping in general, particularly we'll be helping to fight climate change, promote new and alternative fuels such as the Liquefied Natural Gas (LNG) and of course we'd like to address a lot of relevant issues around the Sulphur Emission Control Area (SECA) zone in the Baltic and North Seas region. We are also encouraging the idea of SECA's expansion in the rest of the European Union.

- ***Can you share your vision of the future shipping industry?***

Paradoxically, it is really hard to predict the future of the shipping industry in a short term, but if it comes to a long run, I stay positive. Let me just mention more and more ships going into lower CO₂ emissions, and more vessels utilizing alternative fuels, especially LNG which we believe is the fuel of the future, applicable both for land and maritime transport. Definitely we'd like to see more, but I'm confident that everything is moving in the right direction.

- ***What are your plans concerning close future?***

We'd like to stress that Motus is a non-profit organization which is raising the voice of both regional and European business together with the academic sectors and delivers this feedback to the policy makers on a regional and on an EU level. This will efficiently address the legislative issues and the need for change. Talking more concretely on our steps, we're seeing more to be involved with the projects similar to the so-called 'Green InfraPort project,' dedicated to the infrastructure for small scale LNG at ports, onshore power supply and its facilities, as well as the facilities for waste from scrubbers, general waste, and port energy management.

Who are we?

Motus is a non-profit organization helping transport & logistics and all the related sectors in running their business and becoming more sustainable. We conduct research, organise seminars and conferences, deliver opinions, actively participate in projects, and support the legislative process which is in line with our agenda.

Objectives and scope of work:

- Promotion of the latest knowledge and advances in the areas of transport, logistics, energy, environment, infrastructure, economic development, utilization of marine resources, and related areas.
- Supporting the development of innovative, environmentally-friendly technologies and solutions for efficient use of natural resources in energy production.
- Advocating management systems to reduce the impact of economic activity on the environment, in particular in the areas of transport and energy, both in the private and public sectors.
- Initiating cooperation and running projects with local authorities, governments, non-governmental organisations, and the private sector.
- Launching the dialogue between the public, private, media, and social environments.
- Boosting economic development and regional labour markets.
- Backing interest groups to governments and legislative bodies whose objectives are in line with the objectives of the Foundation.

2014

LNG in Baltic Sea Ports I and II

January 2012-December 2014

2015

**HEKLA
kick-off meeting**

*18 November 2015
The Port of Helsingborg*

2016

**HEKLA
on-the-road campaign
South-East Baltic
Gdańsk/Gdynia/Sopot
Riga/Ventspils**

'Green InfraPort'

April 2016-March 2017

Go LNG

May 2016-April 2019

**HEKLA
Baltic Ports LNG Forum
in Vilnius**

2 June 2016, Vilnius



2017

'Green InfraPort'
seminar in Kiel
30 June-1 July 2016, Kiel

**Seminar on comprehensive
ports in Helsinki**
*7 September 2016, Helsinki
Baltic Ports Conference*

'Green InfraPort'
seminar in Helsinki
*8 September 2016, Helsinki
Baltic Ports Conference*

Go LNG
Go LNG Polska!
*18 October 2016
The University of Gdańsk*

'Green InfraPort'
seminar in Gothenburg
December 2016, Gothenburg

'Green InfraPort'
seminar in Gdańsk
Transport Week, March 2017

HEKLA
on-the-road campaign
South-West Baltic
Spring 2017

PROJECT
INVOLVEMENT:





Transport – the name of the game

We, at Motus, aim to support all kinds of transport, be it maritime, rail, and road. Together they complement each other ensuring smooth, eco-friendly, and safe freight carriage. Therefore, we initiate cooperation, and actively participate in both Europe- and country-wide initiatives that help make transport more efficient and sustainable.

All transport means are important in the Baltic Sea region (BSR), which has always been known as being at the forefront of developing modern solutions, and establishing completely new development directions. This trend needs to be maintained, since the rest of our neighbours are not resting on laurels, and also develop infrastructure while taking part in the transport race.

This is especially important when one thinks of completely new initiatives in which the BSR will play a crucial role. First of all, new transport corridors were established, creating anew the Trans-European Transport Network (TEN-T), linking the East with the West, and the North with the South. It also aims at bettering the road, rail, and water infrastructure on our continent, by devoting a lot of money to numerous projects at ports, railway lines, fleet, and stations, as well as across roads. The TEN-T will certainly help in gaining more profits from the giant economic and political project of establishing land connections between China and Europe – the One Belt, One Road initiative. The so-called New Silk Road will mean a shift in cargo transportation, and we need to be ready for this. But let us not forget about the ports of the Baltic Sea region, which handled as much as 868.5 mln tn in 2015. This is why foresighted support of transport and logistics is important.

For Motus Foundation the key driving force for transport future transition will be performance, but understood more in a holistic way, encompassing not only the traditional economic perspective, but also new dimensions such as technology, environment, and transnational partnership.



Comment by
Per Olof Jansson,
LNG in Baltic Sea Ports'
Project Leader:

W According to my experience which I have gathered in shipping for many years, containerization has made big progress. We have so many things transported in containers today, unimaginable just a few decades ago. Most of the goods carried between Asia, Europe, and North America come in steel boxes, and this is why the ports must change as well. They need to adapt to such challenges, like for example bigger vessels – of 18 thou. TEU and more. The pace of ships' growth is spectacular, we must remember that some 25 years ago a regular container carrier had a capacity of 1-2 thou. TEU.

Financing is the biggest future challenge to transport. We are observing this right now as many shipping lines are having problems not with their efficiency, but with money flow, Hanjin as the most up-to-date example. Ship-owners have too many vessels because they expected that the market would grow much faster. This challenge is rather short-term, we can see that this situation has impacted shipyards, which have witnessed a big cut in the newbuilds. This is of course just temporary, I have observed similar crises in the past, and after a few years everything was in order again.

Nowadays, there's also much more focus on exhaust emissions from vessels. There are debates on how to build more environmentally-friendly ships, and reduce emissions, therefore I think that transport will go more towards this way. If we look at ocean shipping, fuel consumption will be more efficient, and scrubbers will become more popular. The innovations will go in this direction, I think everybody would like to have clean air and an uncontaminated environment. The focus should be put on the ship-owners so that they can provide good and clean service.

Another innovation on the horizon is Liquefied Natural Gas (LNG), becoming a ship's fuel of the future. Although low oil prices have made the gas not as popular as it could be, I'm sure that there will be more ships running on LNG in the future, particularly new ships with dual-fuel engines. The possibility of selling a ship at any time is very important to a ship-owner, therefore, this is what's going to be on the stage over the next few decades.



Photo: www.pexels.com

Fuelling innovations

Alternative fuels have been on the rise over recent years. Among all of them, Liquefied Natural Gas (LNG) is gaining special attention. It is the elimination of harmful emissions, such as sulphur, nitrogen, and particulate matter that makes it very attractive, specifically in the era of new eco-friendly legislation.

Experienced in EU-funded projects touching many aspects of LNG, we know that this fuel means not only less emissions, quieter engines, and no threat of spills – the economic factors matters as well. The recent technical developments have made its shipment less costly, while the use is more efficient. LNG is also a very safe fuel – be it in the process of storage, transport, and usage. Keeping all those advantages in mind, we at Motus Foundation have been supporting the initiatives encouraging a wider uptake of LNG, both off- and onshore. This is why we actively participated in a series of LNG projects.

First, in 2012 *LNG in Baltic Sea Ports I*, (kicked off in January 2012, ending in December 2014), later followed by its second edition (lasting from 2015-2016), aimed at fostering a harmonised approach towards LNG bunker filling infrastructure in the Baltic Sea region. The ports of Aarhus, Copenhagen-Malmö, Helsingborg, Helsinki, Stockholm, Tallinn and Turku were the project's partners during the first edition, while the ports of Helsingborg, Trelleborg, Rostock, Sundsvall Logistikpark, and Klaipėdos nafta participated in the second stage. The partners managed to i.e. design an LNG & MGO bunker multi-function ship, prepare technical details of the port bunkering facility, and conduct pre-investment studies. Two editions of the project ended successfully, and managed

to unite different parties under one goal, working hard on the project's targets.

Another big undertaking still taking place and to be finished in 2017 is the project *HEKLA – Helsingborg & Klaipėda LNG Infrastructure Facility Deployment*. Its aim is to lower the air pollution in the Baltic Sea region's maritime transport by developing LNG infrastructure facilities in the ports of Helsingborg, and Klaipėda. After the project finishes, a liquefaction plant with a storage tank will be built in the Port of Helsingborg, and an onshore LNG reloading station will be built in the Port of Klaipėda, where the project's partner Klaipėdos nafta operates the Lithuanian LNG import terminal *Independence*.

The third scheme developed with Motus' help is the '*GreenInfra Port*.' Besides port reception facilities for sewage from passenger ships, and scrubber sludge, onshore power supply, as well as energy management in ports and terminals, it also stresses the need for building LNG bunkering infrastructure. This project will last till 2017.

Finally, Motus Foundation successfully integrated the Polish gas-related businesses during the *Go LNG Polska!* seminar dedicated to establishing a country's LNG platform. The initiated cooperation is now carried out in the field of lobbying, knowledge-sharing, communication, as well as education.



Comment by
Andrius Sutnikas,
Cluster Manager at Lithuanian
LNG cluster, and Klaipėda Science
and Technology Park's
Communication Manager:

V V *Liquefied Natural Gas (LNG) projects have changed the market significantly. If we take the last decade, I can say that the growth has been really amazing. In Lithuania we had no such infrastructure, and during a relatively short period of time we have managed to build the import terminal Independence, and the small-scale ports infrastructure. But similar processes also happened on a regional level – in the whole Baltic Sea region growth of the LNG market is visible. If we want to sustain this trend we must provide the market with indispensable infrastructure, which will enable the use of LNG in other sectors than good ol' energy – I mean transport, chemical business, etc. We took the first step, the gas is accessible, but now we need to take another step forward, to popularize LNG among other sectors.*

I believe in a bright future for LNG despite low oil prices. I believe in a future for LNG even now that the oil price plays a huge role in the competitiveness of LNG as a fuel, but we are facing environmental challenges in the world and we need to take the action, so political support for LNG is there; we have environmental regulation zones expanding, and the demand for clean fuel and LNG applications in transport and other industries is growing.

In Lithuania we are now trying to develop the basis we have built, and apply business models. It's a complex and challenging process, because you cannot cater to the market with a product, you must come with a solution. Just to give you an example – if I were to sell LNG-powered trucks, I would need to provide the whole value chain – the gas, the bunkering infrastructure, and finally the trucks. Otherwise it would not work. This is the goal for Lithuania, but this is also a task for Poland, as it will soon have its own LNG cluster. This is my advice for all parties intended, and I'd also like to stress that a cross-sectoral approach helps a lot while working on the LNG spread.

motus 
foundation



Photo: www.pexels.com

Environment – the world around us



Nowadays it is obvious to take particular care of our natural surroundings. And although the transport sector is not the biggest air pollutant, we all look with special attention on what can be done to reduce harmful emissions, and other negative impacts by greening the business.

Sea and inland waterways shipping is still at the top of environmentally-friendly modes of transport. Carrying goods by water is responsible for approx. 1.8%-3.5% of greenhouse gas emissions, but according to the International Maritime Organization, ships' CO₂ impact can be further axed down by as much as 75%! The situation on land is different, rail places at the top (provided green electricity in the grid), trucks being the biggest polluters. Here we also see a field for improvement, especially with the use of new technologies which help to reduce the disadvantages, while bringing a lot of economic positives.

A lot has been done in the field of environmental protection in recent years, just to mention setting up the Sulphur Emission Control Area in 2015. Motus has participated in the process of preparing the market for such a change, by for instance taking part in EU co-financed projects. Looking more into the future, one can expect that similar regulations will be in power, just to mention ballast water management convention entering into force in 2017. As a result, certain practices will become a standard – for instance special systems for eliminating water organisms, which have so far travelled throughout the world deteriorating the local ecosystems. However, supporting activities which are not a must is also high on our agenda, for example, onshore power supply. Thanks to the use of electricity while being at port, a ship does not need to use its engines, and is therefore quieter and cleaner. We touch upon many aspects of cold ironing in the 'Green InfraPort' project, and what's more, they were the topics of a specialized seminar in which we participated at the Port of Hamburg in October 2016.

In our view, working towards a cleaner environment will not go far without smooth incorporation of ports in this process. The Baltic Sea sets high standards in terms of ports infrastructure, and is well-known for good green practices, so we wish to promote it outside as our common, regional brand.

The awareness of this is systematically growing. We, at Motus, embrace this trend and are therefore ahead of this need, by supporting all actions aimed at making transport more sustainable.



Comment by
Ulrika Roupé,
Project Manager at SSPA Sweden:

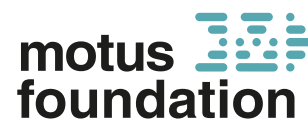


W Sea transports of the European Union account for more than 90% of external and over 40% of the internal cargo traffic. On the one hand, ships have the lowest energy demand of all transport modes per one tonne of carried goods, but on the other, criticism is directed towards the shipping industry for being a source of pollution, and not working hard enough to minimize emissions. In the ongoing discussion on climate change, the sector must therefore join forces to minimize its environmental footprint, keeping in mind the economic gains, and avoiding the heaviest criticism. Ports play a crucial role here as well, by providing support, and facilitating the environmental adaptation of shipping. Caught by the spell of the myth that these solutions imply extra costs, SSPA has shown, from many years of experience of environmental issues within the maritime industry, that the opposite is very likely to be true instead.

Carbon dioxide is the primary source of global warming. About 30% of it comes from the transport sector. Out of this number, sea shipping is responsible for a relatively small portion – at about 1.8%-3.5%. However, it has an impact on many other aspects of the environment. Human health is affected by many of the substances found in the emissions, such as particulate matter (PM), ozone, volatile organic compounds (VOCs), and nitrogen oxides (NO_x). Exposure to such substances can lead to severe public health problems. The local flora, such as trees and plants is also damaged by ship emissions. Buildings, and materials can be negatively impacted as well. Ecosystems and freshwater quality are affected by acid rain which comes from emissions of sulphur and nitrogen oxides.

There are several reasons why the Baltic Sea region and its neighbouring countries can be seen as good examples of eco-works. First of all, they have a long tradition of environmental protection. The Baltic Sea countries have a well-developed infrastructure for port waste reception facilities, supporting the ships and giving incentives for eco-friendly improvements. Secondly, the implementation of the SECA regulation in the Baltic Sea was the start for further green investments, and shifts towards alternative fuels for shipping.

SSPA currently manages several maritime environmental projects. Our role is to advise stakeholders in the maritime sector, and provide environmentally-compatible improvements and solutions. In recent years, we have published a lot of expertises on different measures and concepts, and their respective increase in efficiency or reduction in emissions. It is often difficult for a decision-maker to decide on the concept of choice. Therefore, we provide advice and suggestions on how to improve the environmental performance of ships in operation, and on the construction of new ships.



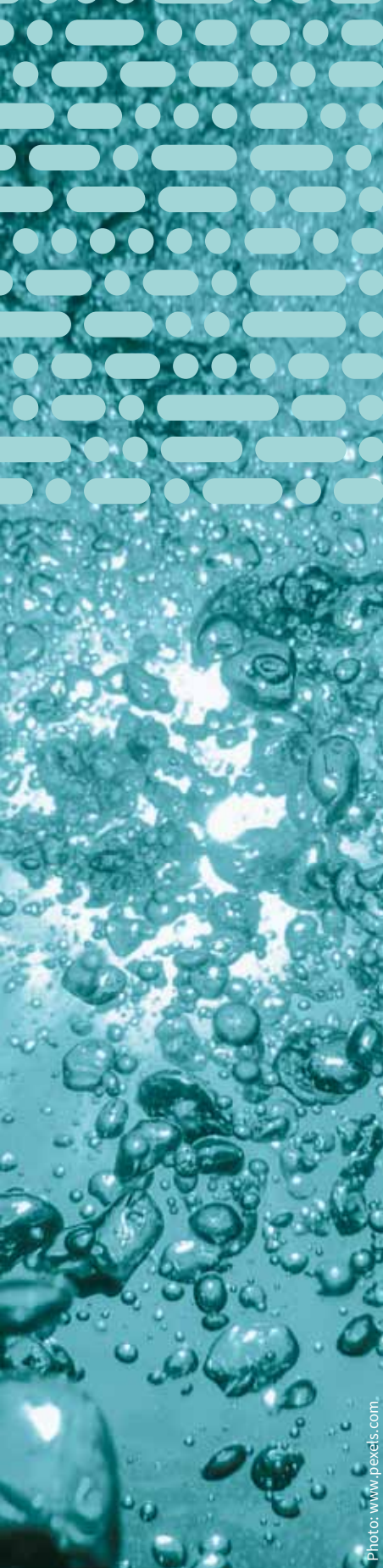


Photo: www.pexels.com

Blue Baltic Economy

The concept of the Blue Economy is quite new. It came as a reflection after the first steps of saving the environment were made. This is not about something which is very costly, like some super-handmade eco-products that many people simply cannot afford. Its aim is to smartly make use of everyday resources, utilizing even the things which may at first glance be redundant or designed to be thrown away. Blue as the sea, this idea also has its implementations across the maritime sector.

The phrase itself consists of two words, and each of them can be understood in two ways. First – blue – meaning our planet in general, and water in particular, while the second word – economy – represents the sphere of business on the one hand, and savings on the other. As an example of what the concept really is, the Blue Economy portal (www.blueeconomy.eu) provides an example of re-using coffee grounds for mushroom farming.

One can point out, perhaps, that an individual is indeed able to decide on his or her own, but what about the wider context? Can a big international company or a whole country act like single people do? This is where Motus Foundation comes in.

The Baltic Sea region is famous for its green initiatives. Keeping in mind all the success stories that are already behind us, we would like to further integrate the whole area around another concept.

The Blue Economy can support the Blue Growth strategy (i.e. the long-term plan to support sustainable growth in the marine and maritime sectors as a whole), especially in the field of shipbuilding & ship-repair, transport, offshore oil & gas, as well as fisheries. Our aim is to help in not only saving the environment, but also making money – the core of future sustainable economics, as we see it. Setting mutual goals for the whole region will definitely improve business and the environment. Another advantage is that the Blue Economy can truly be a stimulus for business growth in so-far-unknown areas. Therefore, Motus Foundation fully supports and actively participates in Blue Economy initiatives, serving them through our expertise, and experience, including i.e. EU co-financed projects, implementation of new technologies & alternative fuels, as well as organizing events & conferences.



Comment by
Wim Stubbe,
the Port of Oostende's Business
Development Manager:

W What I can see from our perspective is that especially smaller and medium-sized ports can specialize, taking care of all activities that can be done in water, and at sea. And this is not only things done in a shipyard or ship-repairs, which is very traditional, but also aquaculture, subsea constructions, new technologies applied at sea, so there are many things that can be taken into account. Based on my own experience from the Port of Oostende, I can say that this is a success factor especially for smaller and medium-sized ports – we can play a major role in giving all kinds of services to the local industry, as we'll never be able to compete with Rotterdam, Hamburg, or Le Havre on the freight flows side.

This can be seen as an alternative to traditional logistics and the credo of simply “putting containers from one side of the port to the other.” So what I want to stress is that ports can and should find their niche, a space for development independent of mainstream logistics. This will positively impact traditional, local industries, because there will be a different economic scenario for endless queues of trucks waiting to enter the port. More precisely, I think of boosting the metal and textile sectors, construction companies, or all kinds of businesses that can divert and switch themselves towards the sea and maritime sector. Finally, I must underline the importance of the energy sector, offshore wind farms as the most obvious example, where ports can play a constructive role in offering specialized services.

Speaking of the traditional maritime sector, I can see a huge shift, especially when it comes to fuelling the ships, and I mean both ship propulsion, as well as the production of energy within the ports, aiming at a zero emission strategy. Quite recently news was spread around that the biggest Norwegian cruise line – Color Line – is going to build a zero emission hybrid ferry. In my view, this is a revolution. Investments in LNG-powered engines are not fantasies, they are something obvious. But not only ships have cleaner energy – there is also a growing need for green energy in ports. They are more and more electricity-independent, which means that they will produce their own electricity out of wind, sea or sun, and what's more they deal with their waste as well. In turn, shipping operators also try to make shipping cleaner. In general, something which was extra years ago is a standard nowadays.

For instance, I can refer to our project which kicked off in Denmark in November 2016, (Dual ports, find more information on www.northsearegion.eu/dual-ports), dedicated to small and medium-sized ports in Denmark, Germany, Scotland, the Netherlands and Flanders. We are going to promote low carbon management, so it touches upon LNG – not only for ships but also for trucks – but also with others the Blue Economy matters, namely a focus of the project is on re-using waste. Instead of carrying it hundreds of kilometres away from the port, we are going to make use of it at ports. It can be a good source of energy and, of course, will lead to further development of the regional port sector. And what to think about changing the skin of fish into fish leather?

When I think of the Blue Economy's challenges, I can definitely point to the national and international legislation, not recognizing that the sea is a major source of development. The sea is far away from the capital cities, as well as from the decision-makers, and it seems to them that it is not worth spending time and money on the sea. Second, financing schemes are mostly defined for short terms, but the sector needs to have a long-term financial support. The reason is that working on the sea is more difficult and 3-5 times more expensive than doing the same things inland. The third challenge is valorising the quality of the products. This is also a part of the Blue Economy concept – why buy bad quality products anyway, it's better to do it in your neighbourhood! This will support such sectors as retail. There's no point in giving money to some big companies or, for example, buying fish in China – you farm better ones in Poland.

The Blue Economy has a lot of opportunities ahead for both ports and the neighboring industries. Let's just mention what I highlighted before – the development of traditional industries: metal, textile, construction, or some other very special sectors – just what's going on in the Port of Oostende. Here, some companies work both on land and sea, making use of their experience – for example using the technologies from land in the sea, because even land engineering in Belgium (sometimes below sea level) enforces the engineers to work with water. A revolution is also going on in the electricity, energy, and IT sectors, and although the sea is never the same, there are certain points that are shared, this is why cooperation is good: Industrial organizations like Flanders Maritime Cluster, Belgian Offshore Cluster, and research centers like VLIZ and ILVO have their headquarters at the Port of Oostende. They all add value to local industry.



Energy-to-ports bridge

The modern economy is energy-intensive, and so is logistics. Considering the supply chain as a whole, ports and terminals are one of the biggest energy consumers, some of them consuming as much power as a relatively big city. It's no wonder then that they strive to upgrade their efficiency both economy- and ecology- wise.

But this is all part of a wider trend. The advantages of having energy-efficient equipment are obvious, as thus they attract more and more companies because of financial and ecological benefits. But a bigger shift in using different energy sources can be observed – diesel is displaced by electric motors or by Liquefied Natural Gas (LNG) as ships' fuel. This solution is especially becoming popular in areas where the law enforces emission reduction, namely the Sulphur Emission Control Area (SECA) zone. We can see that renewable energy is more and more popular – some have already turned towards solar energy – a good example is the 250 m² big photovoltaic installation at the Port of Gothenburg Authority's head office, able to generate approx. 55 MWh of electricity per year.

Basing on what has happened over the last few years in Oostende, it is worth reverting conventional thinking of a seaport being only an energy consumer. The Port of Oostende nowadays specializes in all kinds of services for offshore wind farms. This shows that a harbour can also make some money out of energy production, by promoting renewable energy sources. And on top of that, the port authority is investigating the economic opportunity of installing a prototype of a mid-sized 100 kW Xant wind turbine to provide the site with electricity.

Motus is actively participating in this shift. Just to mention our most recent action – we received feedback from both ports and shipping operators that the concept of onshore power supply (OPS) is worth disseminating. Therefore, we organized a technical seminar in Hamburg dedicated to this topic, entitled: “Harbours Review Spotlight: Onshore Power Supply.” The one day meeting gathered both sides of the wire – those who connect and those who are connected to the grid. The Spotlight led to a general conclusion that development of a sustainable energy mix makes the business case and cost-benefit analysis more attractive, not to mention reducing air pollution to the benefit of port-city dwellers. Another innovation is also out there for taking, namely alternative fuels, with LNG on the top, both for shipping as well as for overland transport (road & rail).



Comment by
Przemysław Myszkowski,
Baltic Transport Journal's Editor-in-Chief:

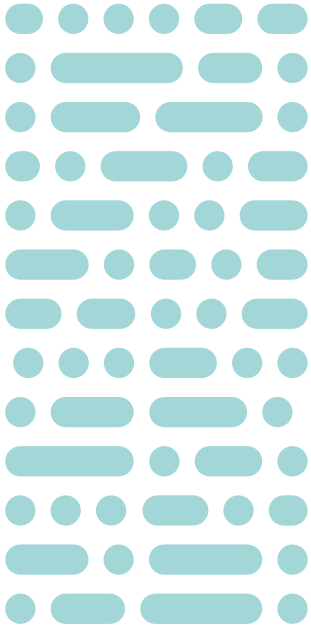
W On the one hand, the fossil fuel lobbyists portray renewable energy as costly and erratic, while on the other, it would be impossible to turn off all coal-, oil-, and gas-powered plants virtually overnight. Neither is true nor possible. However, the man-made nature of the current climate change is being acknowledged more and more broadly, along with fairly high social acceptance for changing the business practice as usual. The question is: Can we afford (not to afford) a green transition?

Further aggravating climate change will backfire with severe weather events and alternations, bringing about a change for the worse both for us past our prime as well as for future generations. And while some may benefit in the short-term from e.g. better sun and vegetation cycles or year-long safe passage through the Northern Sea Route, it's highly probable that the world as a whole will face nature-caused damages, including a reduction in crop productivity (leading in turn to famine); water-related extremes (floods and droughts); rises in sea level (hence forced mass population displacement, not to mention numerous new Atlantis with architectural heritages lost under water); losses in biodiversity (e.g. due to ocean acidification); increased poverty and mortality, and the like.

Luckily, there are several bold and enterprising individuals, organizations, and companies out there, standing against the unsustainable practices of overconsumption or taking advantage of "cheap" oil prices. What distinguishes them from business as usual is not technology embrace per se – as gas fracking or tar sand extraction also putting in use the latest tech achievements – but a completely new focus. Some of them are real revolutionists, pursuing disruptive ideas like autonomous overland or sea fleets overseen by Artificial Intelligence, whereas others are evolutionists, grabbing inches of what was polluting or wasteful in the past,

and turning it into new eco-assets, such as installing Flettner rotors on-board a ship to cut bunker consumption via free wind power or inventing handy waste heat recovery equipment which converts hot water into electricity. One of the main advantages of such innovations is its productivity increase and/or cost-savings potential, meaning that we don't necessarily have to sacrifice one thing in exchange for some green gains, but we can have our cake and eat it too. Clearly, such breakthroughs need time, patience, and money to make their way onto the sometimes stubbornly conservative market of transport and logistics, but when widely adopted they can change the way we play the game of moving goods from one place to another.

Ports, both sea- and inland, can switch on to this greening trend. Energy from photovoltaics installed on buildings' rooftops, from wind turbines mounted anywhere possible, as well as from tidal waves can be stored in next-gen batteries, and distributed all over the ports' terminals through a local smart grid, hence avoiding region- or country-wide blackouts. Extensive automation (robots in warehouses, truck platooning, kilometres-long unmanned trains, intelligent cranes and other cargo handling equipment, etc.), cold ironing from renewables, 3D printing manufacturers on the spot (producing among others lightweight extra durable sections for absolutely new electric or energy cell-powered ships, which after many years can be recycled without harm caused to people or the environment), all of these interconnected via the Internet of Things and the Internet of Energy. It is now up to all involved parties to decide how they will use their own energy and resources. Positively, in being a proactive and foreseeing leader that motivates others to keep ahead of the pack, or negatively, in doing nothing or only what the new regulations impose reproachfully.



Comment by
Fabio Ballini (Ph.D.),
Lecturer at the World Maritime University:

W *Energy management is becoming a top priority for governments and decision-makers. Seaports must face significant challenges impacting competitiveness, and this is why port authorities in Europe are the key players in the process of energy management plans implementation. We need to see the perspective of a 20% power savings target by 2020, set by the European Commission in 2014.*

The United Nations General Assembly has furthermore adopted the 2030 agenda for sustainable development listing a bold set of global goals. In this respect, number seven aims at ensuring wider access to affordable, reliable, sustainable, and modern energy. In addition, its consumption has risen to the second position in the European Sea Ports Organisation's ranking of environmental priorities, published in the spring of 2016.

Harbours are increasingly aware of the importance of efficiency in reducing greenhouse gases and carbon dioxide. Therefore, energy management plans have further potential to increase ports' competitiveness. One key measure will involve raising the environmental profile of European terminals by providing guidelines and promoting the exchange of good practices and innovations. Energy efficiency should not be a one-off project, but a continuous, ongoing process where the planning and monitoring phases have a crucial impact not only on reducing externalities (congestions, air pollution, noise, etc.), but also result in the reduction of energy consumption, transit times, social cost, manpower, etc.

Savings in ports can be achieved as well with the support of new technologies, and by educating and training personnel. Among the different technological improvements that can improve energy management and therefore reduce costs are lighting technologies and control systems (LEDs). Other aspects include energy-efficient buildings, terminals and warehouses, the use and operations of machines and vehicles, eco-driving, and shore-to-ship power systems.

A good example of such sustainability may be the Port of Hamburg. In June 2015, the authority launched its smartPORT concept, which targets developing a sustainable energy solution, and profile. The port has adopted an ambitious plan in terms of increasing the efficient use of energy, the expansion of networks, and in particular the use of renewables, such as wind farm sites and solar panels in the port areas, as well as the assessment of biomass potential.

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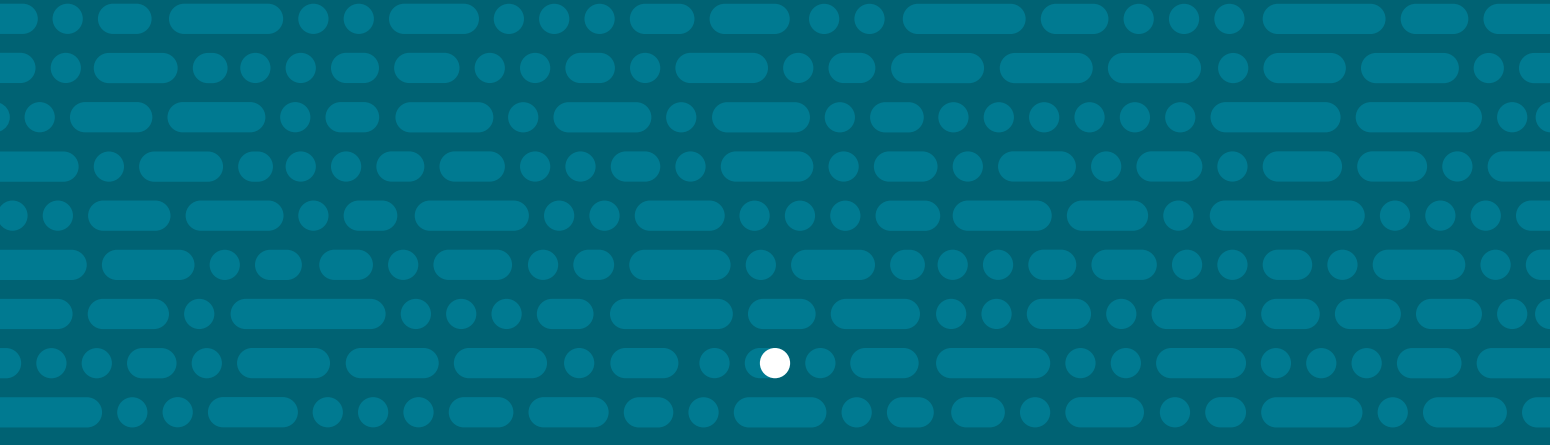
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