

# GREEN CRUISE PORT

## Sustainable Development of Cruise Port Locations

### Workshop “Modern Cruise Port Architecture ” for the Green Cruise Port project

in Tallinn, Estonia 18.-19. May 2017

*Organized by the Port of Tallinn*

**The third workshop seminar organized under the Green Cruise Port project of the EU Interreg BSR Programme 2014 – 2020 was held in Tallinn, Estonia, on Thursday 18<sup>th</sup> and Friday 19<sup>th</sup> of May 2017 on “Modern Cruise Port Architecture”.**

**The first day of seminar, held at the Estonian Centre of Architecture, focused on topics of smart city, smart buildings and smart terminals. The second day’s focal points were various smart solutions of cruise industry and expectations to ports and destinations from cruise lines’ perspective.**

During the seminar, different maritime industry and architecture experts presented case studies and best practices in port development and planning with a modern, sustainable and smart approach. The participants, which totaled of 75 experts and stakeholders, also visited the Tallinn Cruise quay area, where a new and smart cruise terminal is planned.

The seminar was opened by introductory note by the Head of City Office of the City of Tallinn, Mr. Toomas Sepp, who stressed the importance of digital and smart solutions for any modern city wishing to offer its citizens and visitors the most urban environment for living, work and leisure. He stressed the importance of providing as much public services as possible through digital channels thus reducing any potential bureaucratic bottlenecks for citizens and businesses alike. As noted by Head of City Office of Tallinn – a city recognized as among the 7 most innovative cities in the world five times – today’s challenge lies not anymore in providing the public with smart solutions but instead building an intelligent city – city whose citizens actively use the smart solutions provided to them.

## Smart Solutions and Infrastructure

The CEO of Port of Tallinn, Mr. Valdo Kalm named innovation as one of the main drivers in the Port's current and future development plans. Being a bit unconventional to many of its peers in port industry, Port of Tallinn's biggest business volumes are related to passenger traffic infrastructure, together with two cargo ports, industrial parks in port territories and shipping operations with 4 ferries and one icebreaker.

For managing a passenger port infrastructure with over 10 million passengers annually (and increasing), the focal point lies in finding smart solutions for efficiency gains. For example, in the Old City Harbor of Tallinn, by the end of 2017 a smart boarding system with automatic license plate recognition system will be implemented for smooth and fast boarding.

Another keyword, according to Mr. Kalm, is sustainability. "Being 'green' is not merely a fad word, but a clear business goal that gives a definite competitive advantage and, consequently, contribute to success in business," he noted.

The new cruise terminal in Tallinn, the project of which is finalised during 2017, will apply the principles of sustainability and innovative solutions so that the port area will be both welcoming and convenient to the approximately 500 000 visitors of Tallinn arriving on cruise ships as well as luring the residents of Tallinn to the port area.

Port of Tallinn together is currently also in the midst of generating a Master plan of urban development to the huge 10ha area surrounding the Old City Harbour in the centre of Tallinn. Together with representatives of Estonian architects, City government, local business and tourism sector, a grand vision Master plan 2030 aims to create an urban area which connects the needs for port development, tourists and local citizens in an integrated approach.

## Keynote – Ecofriendly City Design

Following the host from Port of Tallinn, the globally acclaimed ecological architect Vincent Callebaut stressed in his keynote presentation the need to adopt the core principles of sustainability in architectural planning – using renewable energies, valuing biodiversity, fostering urban agriculture etc.

As per current predictions, the Earth in 2050 hosts 9-10 billion people in 2050 of which 70 per cent live in the cities. At the same time, 80 per cent of all global pollution is created in cities, thus the cities have virtually no other option than to make a shift towards post-carbon, -nuclear and -coal future. In short – future urban areas must be biological cities.

There are three main pillars of a future city that can be described by the term of **fertile city**, noted Mr. Callebaut:

- Ecology
- Organic Food
- Energy and Mobility

Some of the projects already under construction that are designed by Vincent Callebaut Architectures include a 25-floor carbon-absorbing green skyscraper TAO ZHU YIN YUAN in Taipei and The Gate Heliopolis multi-use residential and commercial complex in Cairo. Both of the projects emphasize heavily on recycling used CO<sub>2</sub> from the building, while using novel architectural solution for energy efficiency, resulting in 50% less energy consumption in Taipei and 80% less cooling energy using in Cairo.

According to Mr. Callebaut, it is true that using renewable energy sources and sustainable solutions may increase the initial building costs by as much as 20 per cent, but the return of that investment is achieved in 10 years or less. Combining this return period with new energy self-sufficiency solutions developed, the project developers should follow the principle – today's investments will be tomorrow's circular economies.

### Urban Case Studies - Estonia

Two presentations followed Vincent Callebaut's keynote that showcased already finalized projects in Estonia that have followed the modern and sustainable approach in real estate development.

A 6-story residential- and commercial space building Navigator near to the Old City Harbor was awarded the most widely recognized green building certificate LEED – Platinum level. As described by developer Capital Mill's representative Mr. Marko Uueda, the certificate's prerequisites are amongst other criteria – location, transport possibilities, water efficiency, energy consumption, reuse of construction materials, indoor climate quality etc.

As a developer, the aim to achieve a LEED certificate was also one of main drivers in looking for eco-friendly and sustainable solutions that would have been otherwise overlooked, noted Mr. Uueda. Such solutions include, among others:

- special glass façade offering lower cooling needs
- specially designed layout, offering greater utilization of rental space
- light-grey coloured roof to avoid overheating
- all rooms controlled by CO<sub>2</sub> sensors by a smart system, where the energy consumption for ventilation in unused rooms is kept to a minimum.

The benefits, as highlighted by Capital Mill's representative, can be described in both in efficiency gains as well as pleasantness for the users. By its effective layout, the lessees' expenditures are kept at lower level. Moreover, by creating a pleasant working environment, a higher competitiveness and thus greater staff loyalty is achieved through pleasant working environment

One of top Estonian architects Mr. Ülar Mark in turn, presented the seminar participants his Allianss Architects project of "movable residential unit" – a 28 sq. meters sea-container shape based residential or commercial space, that accommodates all necessities for smart living and working.

Not to be confused with sea-container based pop-up venues set on urban festivals or temporary areas – or *fast-food* venues as described by Mr. Mark – the KODA micro-units offer an opportunity to create prime quality living area or business center. The house is suitable for 1–2 dwellers or 2+2 visitors hotel room solution; it's office or meeting room has space for 3–7 team members. By modularity, mixed-use commercial and residential areas can be created, in not too distant perhaps also by self-driving cars creating the concept of “self-driving-units”.

With its solar panel roof, high quality design, movability and production near-site, the €85K per unit KODA project was recognized in 2016 amongst the 10 most innovative homes in the year.

## Energy Sustainable Port Solutions

Seminar's first day drew to a close with presentations from Ms. Sacha Rougier from Cruise Gate Hamburg GmbH and Mr. Johannes Schmidt from Hamburg Port Consulting.

Dr. Johannes Schmidt from the leading port and transport sector consultancy Hamburg Port Consulting listed the main drivers for going green for any port in the world:

- Threat of climate change
- Increase of cost-effectiveness and savings
- Improvement of “green” image amongst stakeholders and public
- Regulatory requirements

For example, noted Mr. Schmidt, in one of Hamburg Port's terminals the energy consumption was reduced up to 30% after detecting energy waste, which contributed in overall cost savings as well as meeting the sustainability goals. The next steps a port should undertake would be looking for solutions, if and how it's possible to cover the rest of energy needs with renewable and more eco-friendly sources.

A port which is looking to undertake a “green shift”, a 4-step approach is recommended that defines:

1. Energy benchmarks
2. Energy policy with specific achievable and realistic targets
3. Suitable energy sustainability measures
4. Energy sustainability plan with cost estimates, resources analyzing, energy savings

Hamburg Port Consultancy outlined also one unnamed Asian customer, who took this approach to for creating a five-year \$100M green initiative. For creating a sustainability plan, a total of 9 ports in different locations over the world were

benchmarked (with 3 providing feedback [regarding cruise terminals](#)). Various energy sustainability measures – operational processes, technical resources, behavioral aspects – were evaluated and again benchmarked. On those scorecards the port was provided a policy recommendation with outlook until 2020, with required efforts, impact and specific Key Performance Indicators (KPI).

By such a comprehensive methodology, noted Mr. Schmidt, the port has the chance to improve its profitability, meet stricter national and international environmental regulations and improve its climate resilience.

The managing director of one of the Europe's largest cruise terminal operators Cruise Gate Hamburg, [Sacha Rougier](#) noted that the development of a port infrastructure with the use of smart solutions and with regard to the needs of tourists and operators will contribute to the substantial saving of energy and infrastructure use as well as the passengers' and operators' time.

Key drivers for a future port are efficient use of energy resources and infrastructure facilities that allow sustainable growth. For servicing the cruise industry, infrastructure must be developed that provides the opportunities of new technologies and alternative energy solutions.

An ever more important aspect for cruise operators is the availability of alternative energy solutions, in Hamburg's case in the form of LNG from both truck-to-ship and from barge-to-ship bunkering as well as landside power transmission. Rethinking energy resources usage applies to the whole industry, as there's a global need to:

- reduce dependency on conventionally generated energy
- reduce energy consumption and energy costs
- reduce emissions

For passengers' convenience, the keyword is "smart guest experience" that ensures smooth and clog-free transport to-and-from vessels. This is especially key factor given that cruise ships are getting ever bigger and today already half of the new ships built are meant for 4000 passengers.

Thus any future new terminal facilities built must accommodate a minimum of 5000 passengers at one time. The buildup of terminal should follow the "single-service" model for multiple brands similar to the airports. Another common business touch point with the airline industry is the minimization of overlapping operations by introducing centralized customs and immigrations checks, backhouse functions, baggage screening etc.

## Day 2: Smart Solutions of Cruise Industry and Expectations to Ports and Destinations from Cruise Line Perspective

The second day of the Green cruise port seminar started with a presentation from the Vice President of Royal Caribbean International, Mr. Ukko E. Metsola, who talked about the company's solutions towards a more environmentally friendly cruise industry and their expectations to ports and destinations.

Since 2010, the company has taken on challenging measures to meet or exceed the European environmental standards. The company has implemented Advanced Emissions Purification (AEP) systems, also known as scrubber systems, that use water to clean (or scrub) Sulphur dioxide, and oxides of nitrogen emissions before they are released into the air.

In 1992, the company launched the "Save the waves" program that started off as a wide recycling program but is now working on more ambitious environmental goals such as emissions reduction and waste water treatment. They are committed to significantly reducing the greenhouse gases intensity of its operations. The company has partnered with the World Wildlife Fund (WWF) to achieve their targets for sustainable seafood, seafood procurement, destination stewardship, etc.

Turning his attention to the expectations to ports and destinations, the speaker raised a question regarding the poor phrasing of the current Port Reception Facilities Directive. To his opinion, ships should not be obligated to deliver all waste in all ports when the ships have enough holding capacity to sail into next ports. Changes in this regulation would allow cruise lines to add new interesting destinations and routes that would otherwise be inaccessible due to lack of waste treatment possibilities at all ports.

### Meeting Ship operator's Needs from Cruise & Ferry Line Perspective

In her presentation, Ms. Marina Jõgi, the Sales and Marketing Director at AS Tallink Group, presented a cruise line's main needs and expectations to ports. She divided those needs into three primary categories: operational, customer and marketing cooperation needs.

The operational needs include sewage disposal from ship to shore, smart mooring arrangements and shore power availabilities, and separated garbage and waste receiving facilities.

In terms of meeting customers' needs, it is of utmost importance to ensure a safe and comfortable beginning and end of their travel, and make good impression about both the cruise line and port. To do that, cruise and ferry lines expect ports to be easily accessible, have a proper and clear signage system throughout the port area, provide a comfortable waiting area, have quick and easy boarding solutions, etc.

Marketing-wise, the following needs were brought out for the support of any PR campaigns to celebrate special occasions or opening of new routes: assistance

with planning of maiden voyage; allowing of advertising and promotions within the terminal and gangways.

### User case of CMP and Visby Port: new port infrastructure solutions for cruise ships

Mr. Arnt Møller Pedersen, COO of Copenhagen-Malmö Port gave a brief overview about the company's current position in the cruise market and its ongoing project – Visby Port.

The company has a very good position in the cruise market due to its ports' ideal geographical positions that form a very busy gateway to the entire Baltic region, and their proximity to two international airports. The two ports, located in Copenhagen, Denmark and Malmö, Sweden have the capacity to hold 11 ships simultaneously. Since 1990, the company has recorded a 7% average annual passenger growth rate – in 2016, ~24 million cruise passengers estimated. On April 2nd, 2018 the company puts a new cruise terminal into operation in Visby. The port that in the past served mainly as a tender port, is in a very good location – it is passed by numerous cruise ships and is at the right distance from the other two ports. CMP sees the following three advantages of the new port among others: it is a potential new "berth" port for larger vessels in the region, it provides an opportunity for local service providers to expand business, and it has the potential to expand seasonal ferry traffic from mainland Sweden.

### Green terminal – "Värta terminal" case

Ms. Anna Lindblad presented the project of Port of Värtan in terms of sustainability of the development. The project results in a rebuilt infrastructure, new complex of buildings and the new port covers an area of 85 000 sqm. Environmentally speaking, the port's focus areas are climate; ecological, social and economic sustainability. The project has received the Swedish Green Building Council Certification that follows 3 criteria in 3 grades. The project of Port of Värtan has received the highest grade (gold) in all three criteria: energy, indoor environment and choice of materials.

For example, the use of solar power results in 40% lower energy use, and the use of glass helps the project meet the daylight requirements.

### Modern Cruise Terminal Architecture – design of new cruise terminal in Tallinn

Mr. Ralf Lööke from Salto Architects presented the ongoing project of Tallinn Port. While maintaining the functional purpose of a cruise terminal, the aim of this architectural project is to reduce traffic in the area, make it more customer-

friendly for both locals and visitors by creating a more unique and a greener public space.

## Conclusions of Tallinn workshop

The two-day seminar in Tallinn drew a lot of positive feedback from participants as several very important topics were covered – ranging from more general and visionary approaches to smart and sustainable planning to very specific case studies of both small and larger scale.

Main topics over the two days all circled around the concept of utilizing today's smart and digital tools for the benefit of port and shipping industry, while doing it in a sustainable manner with the sight on the future of the industry as well as to the environment and the whole ecosystem.

In broad terms, the overall conclusions drawn from the presentations as well as subsequent forum discussions outline four key aspects that are essential for modern cruise industry development and enhancement.

### Green and sustainable

Being green is not merely a trendy slogan, but vital part of all development plans and operational management in the industry. By fostering sustainable solutions the ports and operators can gain considerable efficiency gains and thus improve cost-effectiveness ratio. Opting for eco-friendly and sustainable approach – from energy sources and chosen materials to transport and waste management solutions – will prepare the industry meet more stringent regulatory requirements and climate change control targets as well as reduce dependency on fossil fuel.

What requires extra attention is the very sensitive ecosystem of the Baltic Sea and the need for all industry parties' to appreciate the environment we're operating in. Last but not least – being green and acting green improves the industry's image amongst all stakeholders and general public thus directly contributing to long-term business success.

### Digitalization

Effectiveness and smooth operations are key hygiene factors for all members of the cruise industry value chain from port authorities to cruise operators and passengers alike.

Digital tools and solutions reduce considerably time and effort put into fulfilling all required regulations and filling the necessary paperwork. Digital data exchange provides smoother customer experience to every party in an era of

even larger vessels and increased traffic – faster registration processes in cross-border maritime travel, clog-free transport both people as well as vehicles.

### Participative planning and development

In the 21st century, maritime industry as any other has fully realized the importance of appreciating the interests of all stakeholders benefiting from or affected by the sector. This creates the need for open and honest dialogue not only amongst direct beneficiaries or affected parties, but also the local communities and businesses. In development projects, careful consideration needs to be on not only the needs of tour operators, regulatory bodies, direct business partners, but also general public through involvement of urban planners, representatives of local communities and civil society to name just a few. Whilst such dialogue may at first sight put considerable constraint on timing and schedule, engaging all stakeholders will ensure that all interests are considered and weighed and the most comprehensive final solution is found.

### Infrastructure fitting to urban landscape

All ports having the experience of conducting open dialogue with local communities and municipal authorities stressed the need to make port facilities as integral parts of the cities as possible. By engaging urban architects alongside technical experts, being open to thoughts and suggestions from city planners and population trend experts, a modern and green cruise port must not only create a convenient entry and leaving point for the passengers and seamlessly working infrastructure for the operators. Of similar importance is the need to create port areas that are attractive also to local population. Naturally this has to meet all safety and regulatory requirements, but inviting the locals into the port areas not only engages host cities' communities but also makes the guests feel more welcome and thus again contributing to the business success of the cruise industry.

### Modern Cruise Port Architecture should consider following:

- Providing public services through digital channels are helping to reduce potential bureaucratic bottlenecks
- Smart boarding system in port area will enable smooth and fast boarding
- Innovative solutions and the principles of sustainability in port area welcoming cruise tourists and luring residents as well
- Modern port architecture's aim is to meet port's development, tourists and local citizens needs in an integrated approach

- There is a need to adopt the core principles of sustainability in architectural planning – using renewable energies, valuing biodiversity, fostering urban agriculture etc.
- Using renewable energy sources and sustainable solutions will increase the initial building costs, but the return of that investment is achieved in 10 years or less
- To achieve the LEED certificate for a building, there are some smart solution: special glass façade, specially designed layout, light-grey coloured roof, CO2 sensors by a smart system in all rooms
- Detecting the energy waste could lead to reduce the energy consumption up to 30%
- Key drivers for a future port are efficient use of energy resources and infrastructure facilities using the opportunities of new technologies and alternative energy solutions.
- Important aspect for ports is the availability to offer alternative energy solutions like LNG bunkering and onshore power supply
- New cruise terminals must consider that cruise ships are getting even bigger and the terminal facilities must accommodate a minimum on 5000 passengers at one time
- The cruise and ferry lines operator expect from ports to be easily accessible, have a proper and clear signage system throughout the port area, provide a comfortable waiting area, have quick and easy boarding solutions
- High grade port's environmental focus areas are: climate, ecological, social and economic sustainability