

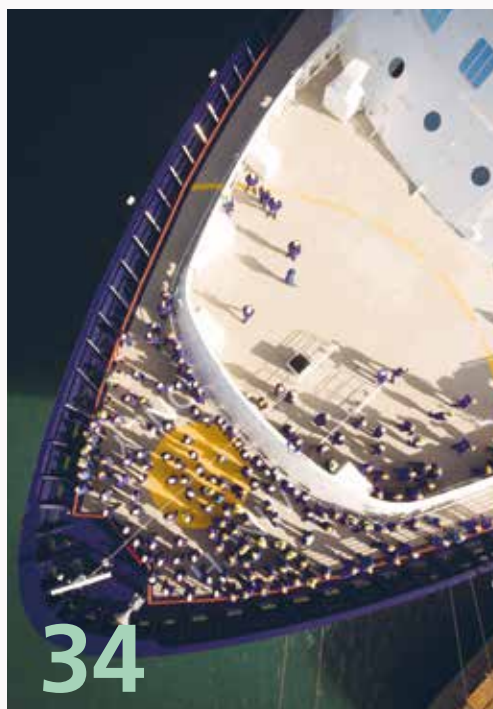




SUSTAINABLE SHIPBUILDING

Sustainability Report

2017



The Meyer Turku Oy shipyard specializes in building highly complex, innovative and environmentally friendly cruise ships, car-passenger ferries and special vessels. Together with its two sister shipyards in Germany, Meyer Werft in Papenburg and Neptun Werft in Rostock, Meyer Turku is one of the world's leading cruise ship builders.

Our biggest customers include Royal Caribbean International, Carnival Cruise Lines, TUI Cruises, Costa Cruises and Tallink-Silja. In 2017, the value of the company's orderbook reached approximately seven billion euros, and Meyer Turku currently accounts for about 20% of the world's cruise ship construction market.

All Meyer Turku Oy operations take place at the Turku shipyard, where ships have been built since 1737. The subsidiaries of Meyer Turku are: Piikkio Works Oy, cabin factory in Piikkiö; Shipbuilding Completion Oy, provider of turnkey solutions to public spaces in ships; and ENG'nd Oy, shipbuilding and offshore engineering company.

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SHIPBUILDING CAN AND MUST BE DONE RESPONSIBLY



This is Meyer Turku's first sustainability report drawn up in accordance with the GRI Standards. In this report, we address themes that our stakeholders particularly highlighted in their responses to our stakeholder survey. We also identify the same issues as important to us.

Meyer Turku wants to be a builder of the world's most advanced and environmentally friendly cruise ships and car-passenger ferries. We are committed to being forerunners in the development of the sustainability of vessels throughout their life cycle, which means that also the construction process must meet the sustainability criteria. This is also an essential part of our competitiveness as European shipbuilders. The development of ships' energy efficiency benefits us all: it gives us a competitive advantage in comparison to builders of less advanced vessels, helps our customers make savings in the ship's operation-phase costs, and benefits the environment via reduced energy consumption. Naturally, we also continuously engage in developing increasingly environmentally-friendly methods for producing energy needed by the ships. The improvement of the energy efficiency of the production process and the use of renewable sources of energy not only reduces our carbon footprint but also affects the production costs. The Turku shipyard has always been at the leading edge of

the development within the shipbuilding sector. Many of the current industry standards were developed in Turku. It is of utmost importance for us that we maintain the Finnish shipbuilding know-how created in Turku and transfer it to the next generations. Therefore, we are currently investing heavily on the training of our own staff and our network employees, and on a controlled transfer of know-how from experienced shipbuilders to newcomers.

The Turku-based shipbuilding tradition is a matter very close to the hearts of local people, the Turku area, South-Eastern Finland and Finland as a whole. Local inhabitants are rightly proud of the shipbuilding ecosystem built around the Turku shipyard – probably every resident in the region has a family member or someone they know who is in one way or another connected to this group of people counted in tens of thousands. Therefore, it is only natural that, as a company, Meyer Turku wants to be part of the life of local people and keep on building vessels everyone can take pride in long into the future. ■

Tapani Pulli

Deputy to the CEO
Meyer Turku



MEYER TURKU



ANNUAL REPORT

Key events during the financial year

During the financial year, the company delivered the Ropax ferry Megastar to AS Tallink Grupp in January and the cruise vessel Mein Schiff 6 to TUI Cruises GmbH in May.

The company's work load situation remained good throughout the financial year. The volume of orders has provided our own employees with a steady workload, and during the year we also recruited 296 new employees. During the financial year, the company continued implementing an investment programme aimed at improving the company's competitiveness and ensuring production capacity for future growth. In 2016, the company's board of directors approved several major investments, the most notable of them being a new crane for hull assembly, storage hall for steel, and a pre-treatment line of steel plates and profiles. These investments were initiated in 2017.

The business activities of the company's wholly-owned subsidiaries Piikkiö Works Oy, Shipbuilding Completion Oy, Technology Design and Engineering ENG'nd Oy, and Länsiviivain Oy reflected the parent company's improved work load situation, and its financial result reached the targets set.

Project funding

As a rule, the funds used for implementing projects consist of the advance payments made by customers, external bank financing, and the company's own capital and funds.

Research and development (R&D)

In the company's R&D, focus was on the measures required by the good order stock aimed at increasing and enhancing engineering and production activities as part of the continuous

improvement efforts, as well as the charting and development of new technologies related to future ships in collaboration with the customers, suppliers and research organisations.

All our engineering and production departments were involved in the R&D efforts. The mapping of development needs initiated by the special experts from the various departments and the implementation of such improvements enables completion of accurately targeted projects and rapid introduction of the results. Major development and investment projects deriving from the needs of production were continued and new ones were launched. More longer-term R&D, on the other hand, was performed by the development department.

The most important themes in R&D included sustainable business activities, safety, environmental friendliness, operating efficiency, operational reliability and digitalisation. Depending on the nature and extent of the activities, the measures were taken together with different stakeholders both within the company and in a national and international scale. In everything we did, we ensured sharing of information and suitable division of duties or collaboration between different sister shipyards and subsidiaries.

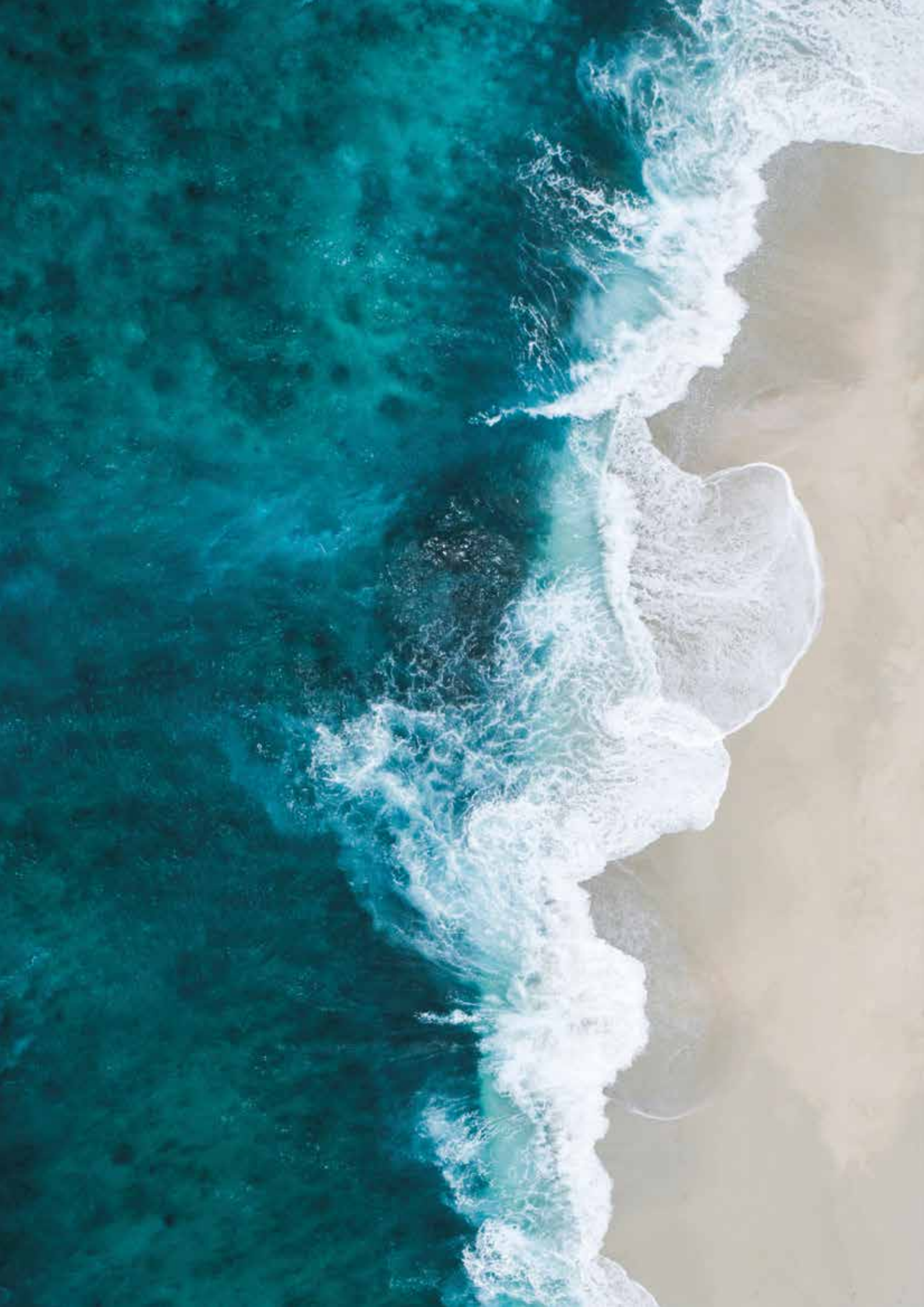
Environmental factors

The company's corporate responsibility is linked with its strategy, which defines operational quality, excellent employees and partners, and economic viability as the focus areas of our operations. The company wants to be the preferred partner for its customers. In addition to financial and social perspectives, we also take care of minimising our environmental impacts both in the immediate surroundings of the shipyard and globally through our products. ■

KEY FINANCIAL FIGURES (million euros)

Meyer Turku	2015	2016	2017
Net sales	591.5	787.5	807.7
Change in stocks of work in progress	-11.1	-0.2	-6.8
Capitalised production	0.0	0.1	0.5
Other operating revenues	3.3	3.3	3.8
Materials and services	440.9	611.7	616.3
Personnel costs	74.4	87.8	95.2
Amortisations and reductions in value	5.4	4.5	4.0
Other operating costs	40.6	57.5	50.6
Operating profit	22.4	29.2	39.1
Financial revenues and costs	5.9	5.3	8.1
Year-end allocations	0.0	2.3	1.3
Operating profit for the period	16.5	26.2	32.2
Investments	3.5	17.9	66.3
Operating profit margin, %	3.8	3.7	4.8
Return on equity, %	10.9	13.8	15.3

Source: Meyer Turku Oy's audit report 2017. PricewaterhouseCoopers



THEMES OF SUSTAINABILITY

Introduction of the report

This is Meyer Turku Oy's first Sustainability Report, covering the company's own operations in 2017. In relation to training and occupational health and safety, the calculations extend beyond this time limit. The training provided by the Shipbuilding School and the work-related accidents that have happened in the shipyard area are also reported separately for the personnel of Meyer Turku's network companies. The framework of the report was provided by the GRI Standard, and the report has been completed in accordance with the core-level requirements of GRI reporting. The selection of the key performance figures reported was guided by the materiality analysis performed by Meyer Turku, defining the following as the most important issues in our sustainability reporting:

- Observation of environmental issues in ship design and technologies
- Fair procurement practices
- Safety of the shipyard area
- Employment
- Development of competences and training
- Employee job satisfaction

In our reporting, we focus on the following issues:

The most notable environmental impacts of a ship are generated during its long service life. Therefore, we design **World-class ships**, where energy efficiency of operation plays an important role. We strive to minimise the environmental life-cycle impacts of the ship not only through technical solutions but also with choices of materials. We want that the choices of materials made by us are sustainable, and we continuously develop the traceability of materials.

We have hundreds of people working at the shipyard on a daily basis – both our own staff and employees from our network. There are a lot of safety-related risks associated with working at a shipyard, and therefore **Risk management and safety at the shipyard** are extremely important for us, and we make continuous efforts to advance them.

The design and building of ships, as well as the management of the large entity requires **World-class competence**, and we need more and more skilled workers all the time. We train

new competent employees at our own shipbuilding school and take care of the transfer of know-how from our retiring shipbuilders to the younger generation. We also take care of the job satisfaction of our employees and offer them interesting work assignments.

Our operations create extensive added value and **Positive waves to society**. The shipyard is a significant employer, and we have a major economic impact particularly on the Turku economic region and Southwest Finland. We also contribute to the increasing attraction of training and education in the sectors of maritime industry and technology.

We grow and develop **Together with our network** and promote the Finnish maritime industry together. In our robust growth, we need an increasingly extensive supplier network both in Finland and abroad. Already in the procurement phase, we ensure that our suppliers are capable of handling their deliveries, and we require that the operators in our network follow responsible business practices.

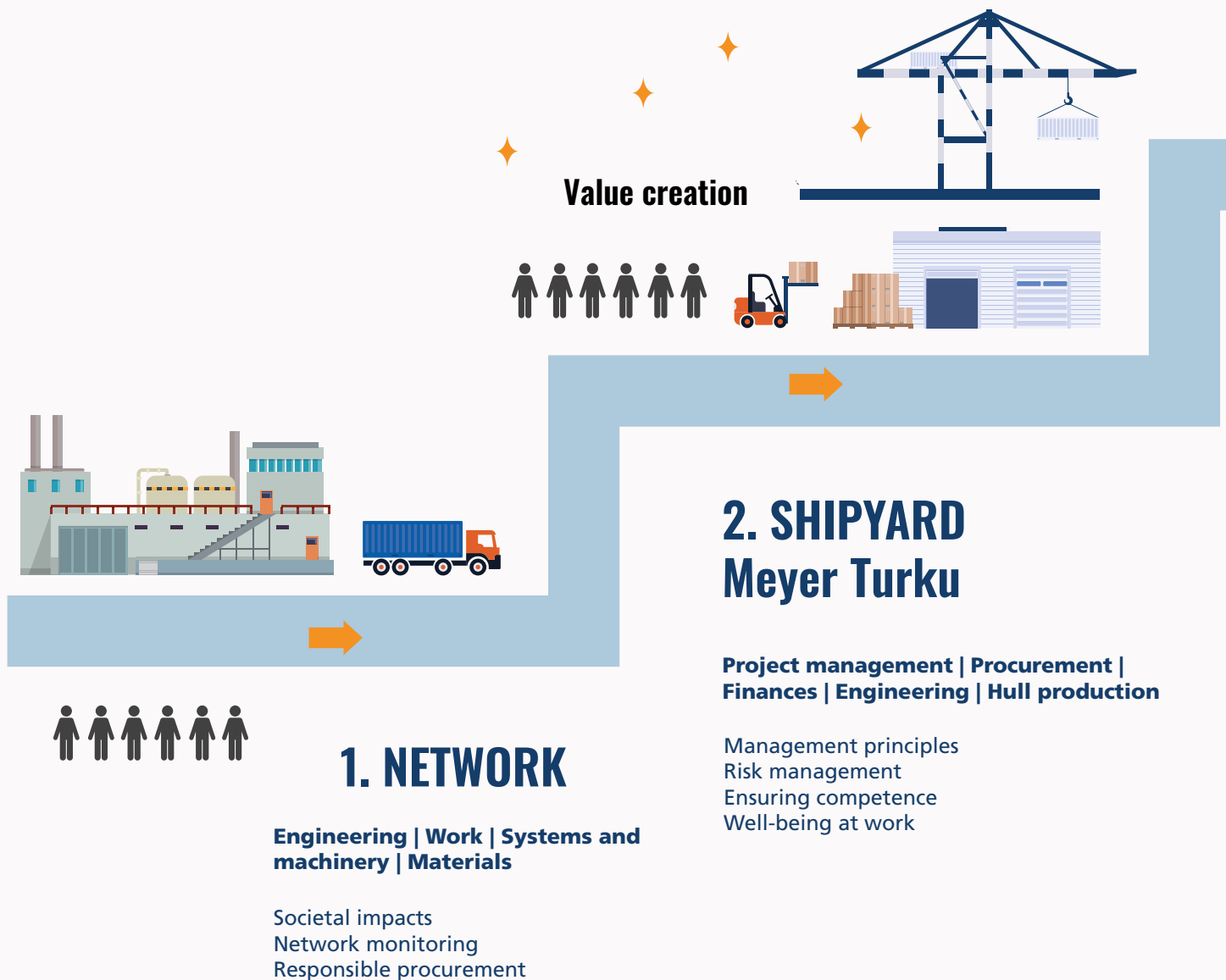
Focus areas of our sustainability efforts in 2018

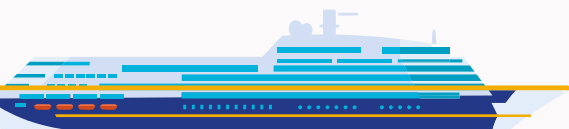
This year, in our sustainability efforts we will focus particularly on developing leadership tools, as well as on setting goals and defining indicators. We will initiate the working group activities by themes of sustainability. The purpose of the working groups is to define the goals and draw up the plans for achieving them, monitor their achievement and communicate on the measures taken.

Another topical issue is updating the shipyard's environmental permit to correspond with the new production methods and volumes. In addition, we are already getting prepared for the dredging of a channel required by our future ship projects. We are currently in the process of preparing an application for a permit to dredge the channel and for the disposal of sediment.

In addition to making our production system more efficient, the new investment projects also have major positive impacts on occupational safety and work satisfaction, reduction of material waste and enhanced energy efficiency in production. ■

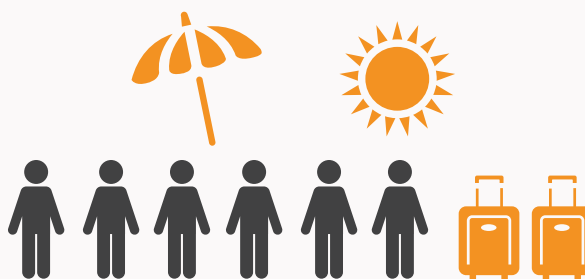
MEYER RESPONSIBILITY TOPICS IN MEYER TURKU VALUE CHAIN





3. CRUISE SHIP

Energy efficiency
Alternative fuels
Hydrodynamics
Materials



4. PASSENGERS

Responsible travel
Impacts on local conditions in target country
Increasing impacts of air travel



01

THE WORLD WHERE WE ARE OPERATING

We are growing and investing heavily

Investments aimed at making us one of the world's most cost-efficient cruise liner shipyards

We are making major investments in the rebuilding of Turku shipyard. At the moment, the total value of public investments extending until the end of 2019 amounts to 200 million euros. The shipyard has a lot of old production equipment the modernisation of which is essential for us. The investments include a new Goliath crane that rose to the height of 120 metres in November 2017, as well as a new plate cutting line, a new profile cutting line, and an adjacent automated profile storage in the steel halls to be completed in 2018–2019. In addition, we have used 17 million euros to modernise the Piikkio Works Oy cabin factory.

The investments significantly boost the productivity of the shipyard, because, once they have been completed, our shipyard will have one of the world's most modern steel production facilities and a digitally controlled laser-hybrid welding line, which will contribute to reducing the cruise ship completion times. In recent years, the shipyard has been completing one ship in the gross tonnage category of approximately 100,000 GT once a year. Now the production rate is already one and a half times faster and, in the future, the annual production will grow up to 300,000 GT, or about two large cruise vessels a year.

From the brink of the abyss to revival

The market for cruise liner construction is booming, while the competition is getting fiercer. We have succeeded in taking advantage of the growing markets and done well in competition particularly with the help of our strong competence and management of our extensive supplier network. Customers and financing institutions also have confidence in both the Finnish shipbuilding competence and the Meyer family as the owner. This has enabled the quick recovery of the shipyard from the brink of the abyss to the prevailing good position.

In addition to new machinery and production methods, we are investing heavily in people. During 2017, we recruited over 296 new employees, and the recruitment rate is not showing any signs of slowing down. We also invite and urge the companies in our network to grow with us. The building of new cruise liners means that the whole maritime industry is growing together in Finland. ■

We are living a boom in cruise liner construction

In the global cruise liner construction business, the main shipyards in addition to Turku are located in France, Germany and Italy. The volume of cruise travel has been growing at the annual rate of approximately 5 % for several decades now and, based on the existing orders, we will be seeing a significant increase in the number of cruise liners in the world until 2020. This creates a steady growth in demand for shipyards building cruise ships.

However, the competition is also getting fiercer, since several new shipyards have entered the market, both in Europa and China. The new competitors, in Asia in particular, are seeking new business to replace the offshore construction that collapsed with the drop in the crude oil price.

At the same time, new important market areas have emerged in cruise travel, such as China and Australia, and the biggest cruise market area in the Caribbean also continues to grow every year. Furthermore, the oldest cruise liners in operation are about to reach the end of their life cycle, which will partly increase demand for new ships. ■

What does GT mean?

Gross tonnage, GT, is a figure describing the volume of the vessel hull. According to the currently applicable measuring rules, gross and net tonnage are logarithmically calculated figures with no measuring unit. ■



MeyChange: Major changes require special measures

After 2014, we got back on track and turned our course towards a new, strong growth. Within only a few years, the work situation and the pace of doing things has changed completely at the shipyard as our orderbook is getting filled at record speed. We continuously need more employees to deliver the new orders, both through our own recruitment and our network partners. As a result of this, the number of employees working at the shipyard area will grow significantly within the next few years. At the same time as the lead-times of ships being completed at the shipyard are getting shorter, the ships are also bigger than they used to be, and new technological solutions are applied on them all the time. Furthermore, the 200-million-euros investment programme we have launched and the introduction of new production methods will significantly change the way many employees do their work – increasing, at the same time, the need to learn new skills.

For us these major changes, accompanied by several big introduction projects of production systems, are positive challenges that we want to meet with honour. Successful implementation of the changes in the way work is done and working methods requires efforts particularly in the areas of communication and management. Therefore, we have launched an internal MeyChange programme to support the process

For us MeyChange is an important management and control entity that will help us coordinate our operations as we are undergoing these major changes. As part of MeyChange, we actively keep our whole staff up to date on the changes taking place at the shipyard and informed about what they mean in practice. In the reform process, we work in close collaboration with our German colleagues, so that we can identify and learn best practices from one another. ■

Efficiency through new technologies and modernisation

Meyer Turku made a considerable investment in crane technology in order to grow its hull production capacity. Konecranes was selected to deliver a Goliath gantry crane with a lifting capacity of 1,200 tons, and to modernize the current Goliath crane, lifting capacity 600 tons, that went into service in 1976. The design, precision drive components, electrical systems, automation system and structural components of the new Goliath crane were supplied by Konecranes, while Meyer Turku manufactured the main girder itself. The new Goliath and the modernized old Goliath will triple the shipyard's lifting capacity per day and help it to reach higher production levels.

As businesses evolve and grow, the technology they depend on must also evolve to handle new demands such as greater speed and lifting capacity – or it needs to be easily replaced by new technology. The need for new energy sources and reducing emissions and waste in the face of resource scarcity is leading to the development of more eco-efficient technology and new business models such as the circular economy. “We see great potential, especially in the circular economy, to design our lifting equipment for re-use and recycling, or to be replaced by services when possible. Our aim is to inspire the market and our customers by offering innovative, eco-efficient solutions. Working together as an industry, we can enable more efficient use of raw materials, increase energy efficiency and increase value through the entire value chain,” says **Hannu Oja**, Director of Port Technology, Konecranes.

Modernizing a first-generation crane

Meyer Turku wanted to extend the lifespan of its current Goliath crane. The decision to modernize this crane was based on the need to have an operating crane available in hull production and the need to avoid excessive environmental impact. During the project, the crane was upgraded by improving operator comfort and by gaining the ability to work in tandem with the new Goliath crane. Maximizing the crane's lifecycle value in this way is an excellent example of a circular economy in practice. The modernization was performed by installing new components and changing worn-out parts and components in order to extend the crane's lifespan by at least 10 years.

Modernizations and retrofits save a lot of resources by reducing the environmental impact for the entire lifecycle of the product, saving raw materials and improving the product's energy efficiency and performance. The old Goliath's entire steel structure is used in the modernized crane. This means considerable raw material, energy and emission savings from steel refining and manufacturing. A Goliath crane can be modernized several times during its lifecycle.

“We collected usage data remotely from the old Goliath starting in 2012,” says **Lasse Merenheimo**, Director of Shipyard Cranes, Konecranes. “We studied the data in terms of usage patterns and anomalies, and found areas that could be improved with retrofitting. The modernization enables the crane to handle the increased production demands.” Konecranes' service concept, Lifecycle Care, will help extend the lifespan of both cranes and keep them performing at their best. The new Goliath is equipped with the latest technologies, having several features built-in to optimize the use of the crane, including regenerative braking, which reduces energy consumption. Both cranes are equipped with LED lighting, which consumes up to 70 % less electricity than conventional lighting. The new Goliath is also equipped with Konecranes TRUCONNECT® remote monitoring, which can help to reduce unplanned downtime while improving maintenance.

The new Goliath is the biggest crane of its type in the Nordic Countries, weighing roughly 3,750 tons. The designed lifespan of the new Goliath's steel structure is 50 years and 25 years for all the other parts depending on usage. The steel for the main girder was supplied from Finland and the steel for the trolleys and bogies from Europe, to minimize transportation. With the modernization of the old Goliath, approximately 4,000 tons of CO₂ emissions were avoided since there was no need to manufacture a new steel structure.

The modernization of the old Goliath will offer highest level performance. It is designed for increased safety, productivity, reliability and usability and less need for repairs and unscheduled maintenance. There will also be more technical and spare part support. ■

The new 120 metres high Goliath crane is an important part of our production growth. In the future, we will build increasingly large ships at a quicker pace than before, and the crane plays an important role in the process.



Trends, risks and opportunities

In shipyard operations, there are always various trends, risks and opportunities of different levels involved. The most important global trends creating new business opportunities for Meyer Turku are climate change and digitalisation.

At the political level, the main risks for the shipyard operations are related to accidents and on-board fire. In addition to these, because of the rapid growth of the shipyard, there are risks related to safety, staff orientation and transfer of competence that we are prepared for.

Climate change and digitalisation as drivers of development

The progress and prevention of climate change are strong drivers that are also steering the development of maritime industry and the requirements set for shipbuilding.

The design and construction of energy-efficient and low-emission ships are at the core of Meyer Turku's operations, and they are important for various reasons. We want to be a responsible operator in society and take care of the prevention of climate change for our own part. On the other hand, building of energy-efficient ships and introduction of alternative, low-emission energy sources on our ships gives us a competitive advantage, since our customers, or cruise companies, require such features from new vessels. The less a ship consumes fossil energy, the smaller its carbon footprint. At the same time, the vessel also has lower operating costs. Cruise passengers are also more interested in the environmental burden their holidays are causing and want information about the emissions of the ships. Read more about the design of energy-efficient ships on page 26.

Digitalisation is significantly changing the way the entire maritime industry operates both in Finland and in global scale. At the moment, there are not that many digital experts collaborating with the shipyard industry, so it is important for us to participate in research and development projects promoting such cooperation. We are currently involved in such projects as

the Ecoprologi R&D project aimed at enhancing the ecological efficiency of maritime industry and sea transport in the Baltic Sea area with the help of digitalisation. The project develops and pilots new digital solutions for enhancing the performance and loading of ships and the shipyard processes.

In everyday work at shipyard, digitalisation enhances our operations in many ways. We have introduced a system that enhances the processing of permits allowing work in the shipyard area on weekends. It significantly expedites the checking of the permits and the passage of employees at the shipyard gate. Furthermore, we are using an electronic Fire Work Licence system, enabling real-time monitoring of fire work situation on board the ship under construction.

Risk management requires careful anticipation

In shipbuilding, one of the key risks is the possibility of a major accident happening within the shipyard gates. Risk management and shipyard safety are described in more detail on pages 36.

The operations of our shipyard are growing rapidly and strongly, which poses potential risks associated with the competences of our employees. It is of utmost importance for us that, even in the middle of the many hundreds of new recruitments to take place in the coming years, the new employees are provided careful orientation to their work. At the same time, we will ensure that the know-how of the experienced employees approaching retirement age is being transferred to the next generation of shipbuilders. You can read more about this on pages 46.

Following the robust growth and modernisation of the shipyard, the shipbuilding process at the shipyard is also undergoing a transformation. For many employees this means a change in the way the work is performed. We have identified these changes that influence the everyday work at the shipyard, and we have responded to the challenges caused by them by increasing communication and training. ■



New Mein Schiff 1 was delivered in the spring of 2018 and New Mein Schiff 2 will be delivered early in 2019. The first Costa Cruises cruise ship operating on LNG, Costa Smeralda, will be delivered in 2019 as well.

Orderbook 31.12.2017

✓ Delivered

Number	Name	Delivery		Owner
NB 1390	Cruise Vessel Mein Schiff 6	2017	✓	TUI Cruises
NB 1391	Fast Ropax Ferry Tallink Megastar	2017	✓	Tallink Grupp
NB 1392	Cruise Vessel New Mein Schiff 1	2018		TUI Cruises
NB 1393	Cruise Vessel New Mein Schiff 2	2019		TUI Cruises
NB 1394	Cruise Vessel Costa 1	2019		Carnival
	Cruise Vessel Carnival 1	2020		Carnival
NB 1395	Cruise Vessel Costa 2	2021		Carnival
	Cruise Vessel Carnival 2	2022		Carnival
	Cruise Vessel Icon 1	2022		RCI
	Cruise Vessel Icon 2	2024		RCI



Stakeholders

Maritime industry as driver of development

We have a responsible societal role, since in Finland Meyer Turku is seen as a bellwether of maritime industry and shipbuilding in particular. We want to be forerunners of maritime industry, in terms of both the development of technology and sustainability.

The most significant aspect of our role is functioning as a unifying force between the customer that orders the ship and our wide supplier network in the development work, and acting as a testing platform for new technologies and their development. We work in active and close cooperation with different equipment and material manufacturers and we engage in continuous dialogue with our customers about the direction in which future ships should be developed. Every new ship completed by the shipyard fosters the development of the Finnish maritime industry as a whole. All of us, those belonging to our network and the customers, need one another, since only together we can develop ourselves and the things around us.

We take part in both Finnish and international development projects aimed at developing the sustainability in maritime industry and shipbuilding. We also collaborate closely with the other operators in the Finnish maritime cluster, as well as research and educational institutions. We are engaged in development cooperation with the other Meyer shipyards on a daily basis.

Active interaction

We have close interaction and cooperation with local administrative bodies in the Turku economic region, such as the City of Turku and regional development companies. In autumn 2017, we launched a new shipyard group with the City of Turku. A similar working group was in operation in 2009–2010 during the shipyard's previous period of growth. The other members of the shipyard group together with Meyer Turku shipyard include City of Turku representatives from the sectors responsible for transport, accommodation and city planning. In the shipyard group, we discuss matters of topical interest, such as the service needs of our network that keeps on growing considerably.

We also want to improve and develop even wider regular dialogue with our network. We have brought companies belonging to our network together to different network events on an annual basis, and we launched the planning of a communications channel targeted to the whole network.

Our main stakeholders include:

- The owner and our employees
- Our network and supplier companies
- Our customers
- Labour organisations and social partners
- Educational institutions and research institutes specialising in the maritime industry and technology, the Finnish Maritime Cluster
- NGOs
- City of Turku and the municipal administrations of the neighbouring areas
- Public administration, authorities and political decisionmakers
- Classification societies
- Financing institutions, banks and insurance companies
- Media

Stakeholder view for materiality analysis

In spring 2017, we conducted an extensive survey of the expectations for the sustainability performance of Meyer Turku. The questionnaire was sent to more than 300 representatives of our internal and external stakeholders. Furthermore, we performed more detailed interviews with 10 people. Their views gave us an overall impression of the current state of the company's sustainability performance and the opportunities available for Meyer Turku to make improvements in its operations and operating environment.

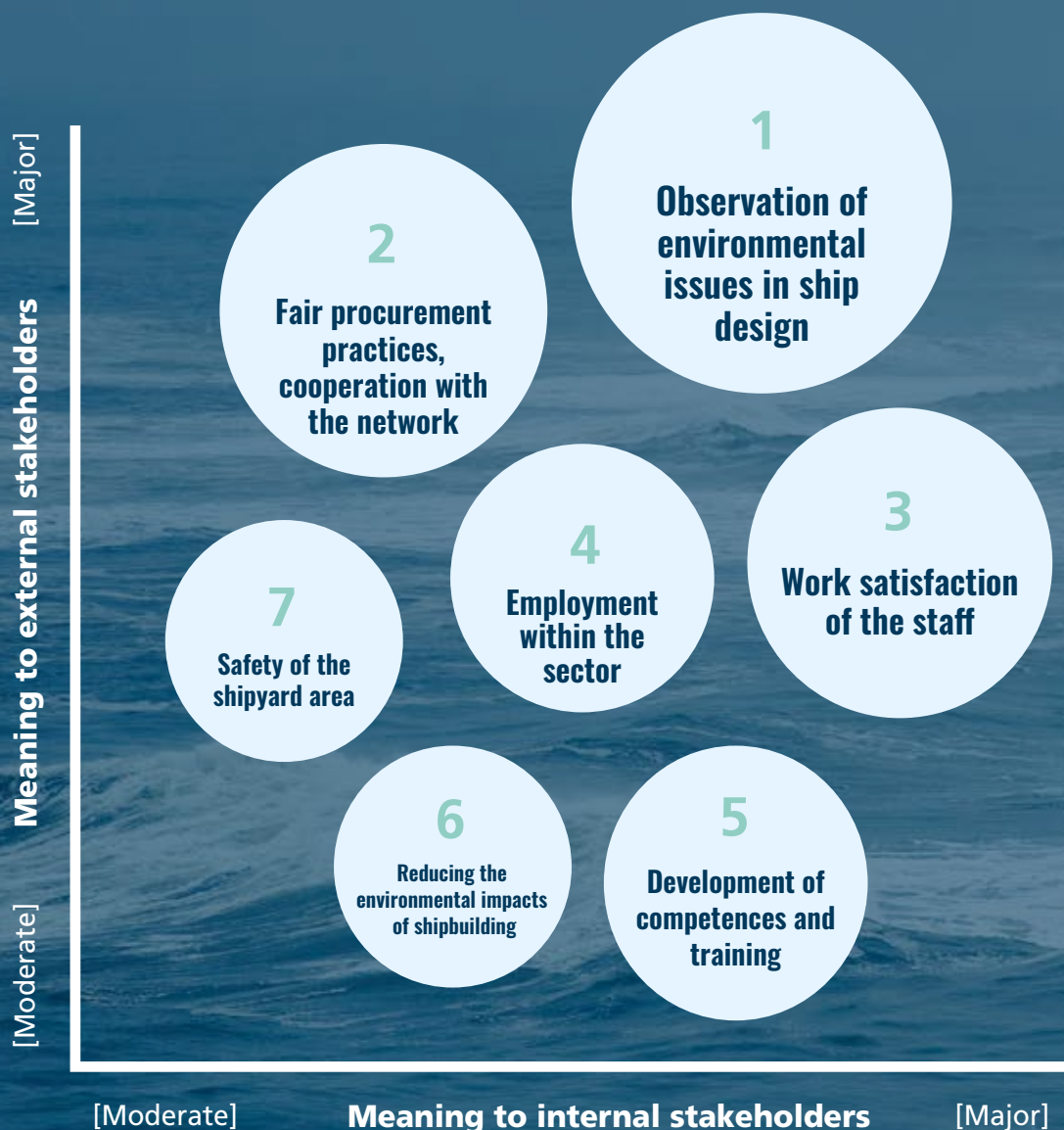
Based on the surveys and interviews, and the estimate of the management's own working group, we identified the key aspect of sustainability at Meyer Turku. They are:

- Observation of environmental issues in ship design
- Fair procurement practices, cooperation with the network
- Work satisfaction of the staff
- Employment within the sector
- Development of competences and training
- Reducing the environmental impacts of shipbuilding
- Safety of the shipyard area

In this and the future sustainability reports we describe how these matters are being developed and about the results achieved. In addition, in 2018 we will continue the work for setting our key performance indicators and goals. ■

MATERIALITY MATRIX

Subjects that interest external and internal stakeholders

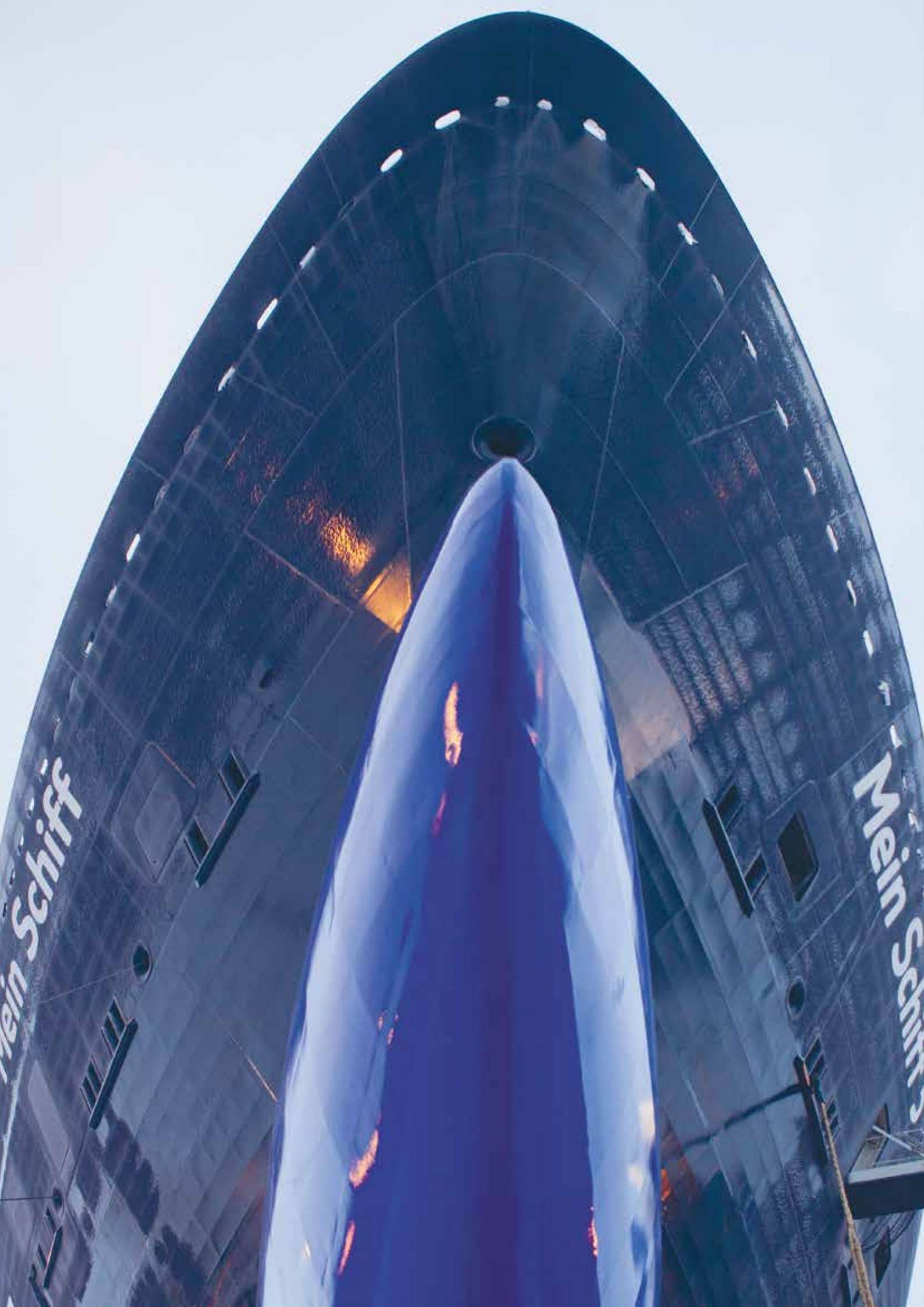


Meaning to external stakeholders



Meaning to internal stakeholders

The subjects selected to Meyer Turku's materiality matrix of corporate social responsibility represent the themes that, based on a stakeholder survey, arose as the most significant. They will be prioritised in our future development work. In addition to the themes highlighted here, the respondents mentioned several other sub-areas of corporate social responsibility they considered important.



02

WORLD-CLASS SHIPS

Sustainable shipbuilding

Modern cruise ships are like small cities sailing on the sea, and building them requires competence not only in heavy metal industry but also in high-standard design, technology and product development. In collaboration with our supplier network we need to master a very complicated entity, where such aspects as steel structures, power sources, waste water treatment, optical cable networks, lighting and furnishing solutions, restaurants and laundries as well as passenger safety all come seamlessly together.

When designing vessels, we focus not only on technical functionality but also on solutions by which we can reduce the vessel's environmental impacts throughout its life cycle.

Most of the ship's environmental impacts are generated by energy consumption. Therefore, we have made major investments in the energy efficiency and hydrodynamics of vessels, as well as introduction of alternative fuels.

We reduce the environmental burden resulting from cruise travel by using as efficient solutions for, for example, waste water treatment and waste management as possible, and by fitting the vessels with scrubbers and catalytic converters to reduce sulphur and nitrogen oxide emissions, if necessary.

We carefully document the materials used on board and engage in continuous development efforts aimed at enhancing the traceability of materials. By means of documentation, we can enable as efficient recycling and utilisation of materials in conversions and dismantling work of vessels as possible, and plan the implementation of such work in a safe manner.

International regulations steer energy efficiency in shipping

The Paris Climate Agreement does not apply to international shipping, but it does create expectations for emission reductions in shipping as well. The International Maritime Organization, IMO, the UN specialized agency regulating and steering shipping, has published an action plan for reducing emissions in shipping and for gradually tightening the Energy Efficiency Design Index, affecting the design and construction of new vessels.

The energy efficiency requirements set for ships by IMO will be gradually tightened until 2025, and ships being built in 2025 must be 30% more energy efficient than those built in 2014. ■

BUILDING SUSTAINABLE SHIPS



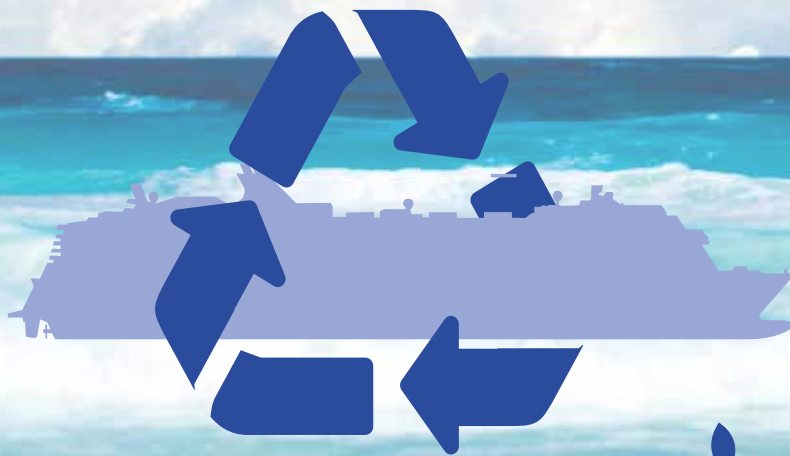
CLEAN AIR

- Energy efficiency
- Innovations and technologies
- Lowering water, electricity and energy consumption
- Reducing noise level
- Cleaner fuels



SMART WASTE MANAGEMENT

Efficient and advanced waste management system onboard



PURE SEA

- Purifying and recycling waste water
- Anti-fouling
- Reducing noise level
- Wave control through advanced hydrodynamics



CONSCIOUS SHIP LIFE CYCLE

Design and production for the whole life cycle of ship

ENERGY EFFICIENCY AT THE CORE OF SHIP DESIGN

The will and need of our customers to develop increasingly energy-efficient ships also encourages the shipyard to develop new and innovative technical solutions to enable the operation of vessels in a more environmentally friendly manner. The shipyard also wants to become profiled as a forerunner in delivering world's most energy-efficient vessels. Today, the energy-efficiency viewpoints are given increased emphasis all the way, beginning with the concept design phase. By this, we want to ensure that energy-efficient solutions are included in the ship design from the very early stages.

We want every new ship to be better and more efficient than the previous one, and the continuous improvement of efficiency requires a lot of work from us and introduction of new technologies. Shipbuilders are used to this cycle of innovation and development that continuously keeps on moving forward. There, the lessons learned from the previous project are fully exploited in the next, even more advanced vessel. We have improved the energy efficiency of vessels by, for example, utilising the waste heat generated on board, introducing alternative sources of energy, such as LNG and fuel cell technology, and investing in the optimization of vessel hydrodynamics.

“Customers require energy-efficient ships from us

laundries, and for heating water and air-conditioning. If more heat is generated than needed for the systems, the excess heat can be transformed into energy.

Thanks to digital solutions, we can gather increasingly exact information on ship functions and put this data to good use in the design of new vessels. We use sensors to monitor the operation and performance of the vessels we have delivered to our customers, and we advise our customers in adjusting the systems to make the operation of vessels even more energy efficient. With the help of these sensors, we also verify the energy efficiency targets set in the supply contract.

The energy efficiency of ships as well as the monitoring methods of energy efficiency have significantly improved over the past decades. The energy consumption of vessels built at the Turku shipyard has reduced by 35-45% over the last decade, and the shift to using cleaner fuel, or LNG, has reduced the environmental burden caused by exhaust emissions even more than that. Using LNG as primary fuel reduces carbon dioxide emissions by ~25-30% and nitrogen oxide emissions by ~80-90%, and the sulphur emissions have fallen to almost zero, since LNG is a sulphur-free fuel.

ALTERNATIVE FUELS

Liquefied natural gas to replace fuel oil in shipping

The targets set for the reduction of transport emissions steer also the shipping sector, and the emission control on various sea areas has increased the requirements and need for efficient and low-emission ships. The fuel oil mostly used as fuel in vessels is being replaced by alternative fuels, such as liquefied natural gas (LNG), with significantly lower emissions than fuel oil. The research for finding new, more energy-efficient and low-emission solutions for alternative fuels, such as biofuels, biogases and hydrogen, continues.

Viking Grace, completed at our shipyard in 2013, is the world's first large passenger ship powered with LNG. After that, the demand for LNG-powered ships has increased significantly, and in September 2017 we launched production of the first cruise liner running on LNG, to be completed in 2019. At the moment, we have a total of six LNG-powered ships in our orderbook.

Unprejudiced approach to fuel cells

Fuel cells are a highly energy-efficient and clean way of generating electrical and heat energy. The fuel cells are twice as efficient as a combustion engine, and they operate on pure hydrogen or a hydrogen-containing fuel, such as methanol, natural gas or biogas. However, the technology and government regulations are not yet ready for enabling the use of fuel cells on ships, and so far no cruise company has implemented a fuel cell concept.

We have signed an agreement on building two new-generation cruise ships for the U.S. company Royal Caribbean Cruises. These LNG-powered cruise vessels will introduce fuel

cell technology as source of energy. We aim to develop fuel cell technology in such a manner that it can be utilised as an important energy source for the hotel functions of the ships to be completed in 2022 and 2024. We will make a shift to using fuel cells gradually. We will begin by installing such systems on a trial basis on the other ships we are building for Royal Caribbean Cruises in the coming years. The first trial installations have already been made.

VESSEL HYDRODYNAMICS PLAYS IMPORTANT ROLE

The hydrodynamic design of the vessel carefully observes what kind of water flows the vessel is subjected to. The underwater parts of the ship form a complex entity with surfaces, projections and openings turning in various directions. Furthermore, the combined effect of all these different forms must also be taken into account. The goal is as efficient use of energy with the help of propeller and vessel design as possible. A well-designed vessel consumes less fuel, operates more reliably under different circumstances, and is safer and more comfortable for passengers.

Here at Meyer Turku, we have top experts in hydrodynamics in our staff. Our expertise is based not only on long-term experience and traditional model testing but also on mastery of computational methods of fluid dynamics and, increasingly, the use of dynamic simulation.

When designing a new ship, we make extensive calculations, modelling and tests to ensure optimization of the ship size, hull shape and all details to comply with the ship's operating conditions. For example, the propeller nozzles are adapted to the ship's operating speed. Even small changes in the hull shape may cause major changes in energy consumption, since approximately 60% of the energy consumed by the vessel is used for moving it. A hydrodynamically optimized hull also minimizes wave-making.



Viking Grace, completed at our shipyard, is the world's first large passenger ship powered with LNG.

Why LNG?

LNG stands for Liquefied Natural Gas, which is used as fuel in a vaporised state.

Compared to fuel oil, LNG has a better coefficient of efficiency, and it is much cleaner fuel than heavy fuel oil because:

- it contains no sulphur.
- the burning generates much less nitrogen oxides and particle emissions.
- carbon dioxide emissions are only one quarter of those of heavy fuel oil.

In addition, the use of LNG as fuel enhances passenger comfort, because the ship has less vibrations and is more silent.

The use of LNG must be taken into account in the ship architecture in a new way. LNG is lighter than fuel oil, and, during transportation, it must be kept in a liquid state, when it is cooled to approximately -160 degrees Celsius. That is why storage of LNG requires a lot of space on board a ship. ■



Computers enable simulation of various hull shapes.

RESPONSIBLE MATERIAL CHOICES

Each ship consists of thousands of different materials, each used in ample amounts. The construction of every Mein Schiff vessel has required, for example, 2,000 km of electric cable, 8,500 m² of windows, 335,000 l of paint, 180 km of pipes and 30 000m² of carpeting.

To be able to choose only responsibly produced materials for our ships, we engage in continuous development work for enhancing traceability of materials. The work is challenging since the amount of materials used for building vessels is big, and we have an extensive supplier network, in terms of both quantity and geography.

One essential criterion for shipbuilding materials is lightness, because the weight of the vessel affects fuel consumption. In addition, when selecting materials, we strive to take account of the life-cycle impacts of materials. This means studying also other criteria, such as the raw materials used, as well as the recyclability, durability and maintainability of the materials.

The Inventory of Hazardous Materials, the IHM document, is an essential part of the documentation of materials used when building a ship. The IHM document describes in detail where on the ship and in which quantities there are materials that could pose an occupational health and safety risk or an environmental risk when the ship undergoes conversion or is dismantled. We provide IHM documentation for all our ships and it follows the ship throughout its life cycle, and it is updated in connection with ship conversion.

SAFE SAILING!

Safety is one of the most important matters in the design and construction of cruise ships. The safety and stability of vessels is a puzzle consisting of various contributing factors, and managing them all requires wide-ranging competence. In case of an accident – for example, if the ship runs aground or collides with another ship – the most important thing is that the ship stays upright and afloat. The safety features of all our vessels are of the highest standard in terms of stability, fire safety and systems, and we test every ship most carefully both on dock and sea trials before delivering them to the customer.

We have been cooperating for a long time with authorities, research institutes, universities and other European shipyards to develop ship safety. We are an active member in the Cruise Ship Safety Forum, the international safety network for cruise vessels, which has been working for a long time to promote, for example, the stability and fire safety of vessels.

We want to be an active forerunner in the area of vessel safety, and we also strive to promote a stricter international regulatory framework that all shipyards building cruise ships should commit themselves to. We design our ships in compliance with stricter safety criteria than international regulations would require. Therefore, we have already applied stability requirements for passenger ships that will not enter into force before 2020 to the design of our ships. ■



Tallink Megastar represents the latest development in ship safety design as well.

More environmentally friendly ships through cooperation

As a young, modern and growing cruise company, environmental protection plays an important role for TUI Cruises. The objective is to keep the impact of our journeys on the environment as low as possible because our business relies on the environment remaining intact. Management, employees at TUI Cruises and the crew on board are aware of their responsibility. We see this responsibility as an important part of the business of our company.

TUI Cruises is mindful of the value of the resources on which we rely to provide our guests with an unforgettable travel experience and we take the responsibility of ensuring that future generations are able to enjoy such travel experiences seriously. Simply protecting nature, the environment and resources with the means available to us enables us to also retain the foundation on which TUI Cruises bases its company concept and on which our industry success is also based, as an important component of our credibility. For this reason, TUI Cruises not only invests in the development and application of the latest technologies, thereby making the Mein Schiff fleet the most environmentally-friendly cruise fleet in the world, we also regularly collect and analyze data that form the basis for further development of these technologies and the processes on board our vessels.

Modern technologies – environmental protection starts at the yard

With the commissioning of the new Mein Schiff 1 this spring, the TUI Cruises fleet will come even closer to the corporate target of operating one of the world's cleanest cruise ship fleets by 2020. With our new arrival, TUI Cruises has again set the focus on measures aimed at environmental protection. Significant investments and a constant implementation of innovative technologies have made all newbuilds – starting with Mein Schiff 3 and going up to Mein Schiff 6 – into particularly energy efficient cruise ships. Each one of them consumes around 30% less energy than cruise ships of a comparable size and class. The innovative combined system for treating exhaust gases, consisting of an exhaust gas scrubber and catalytic converter, lowers sulfur emissions by around 99%, nitrogen oxide emissions by around 75% and particle emission by around 60%. In the desulfurization system, a process of "washing out" the sulfur and the particles from the exhaust

gases takes place. This leaves behind contaminated wash water that is purified in a separate step. The filtered residues from this are collected and disposed of professionally on land.



The most unique thing about this system is that it can be operated in open and closed mode. In closed mode, the waste waters are collected and then disposed of on land. There are therefore no repercussions for the marine environment. For this reason, larger tanks have been built for the wash water. We used this procedure consistently since 2015 in the Baltic Sea, which has a very sensitive eco system. To date TUI Cruises is the only cruise company in the world to have consciously decided to not simply operate these exhaust gas treatment systems inside the special emission control areas according to the regulations. As TUI Cruises believes environmental protection is not subject to geographical borders, the system is deployed on a continuous basis, worldwide and around the clock.

Working with partners

In addition to this, TUI Cruises pursues the concept of continuous improvement in environmental protection through numerous activities. As we are of the opinion that we are able to achieve more through joint efforts, we work in a large number of projects together with partners such as research institutes or environmental organizations.

TUI Cruises was the first cruise company to join the "Futouris e. V." sustainability initiative, in order to commit to the improvement of living conditions, preservation of biological diversity and environmental and climate protection in its destination countries, together with other tour operators and travel companies.

In 2016, we initiated together with Futouris and United against Waste, an NGO, a pilot project to reduce food waste on board. For the first time, we are measuring all the food waste generated on a cruise ship in a comprehensive and systematic way, so that we will then be able to work with our project partner to identify the potential and specific measures that will help to reduce food waste in the long term and give impetus to the industry as a whole. ■

The environmental impacts of shipbuilding process

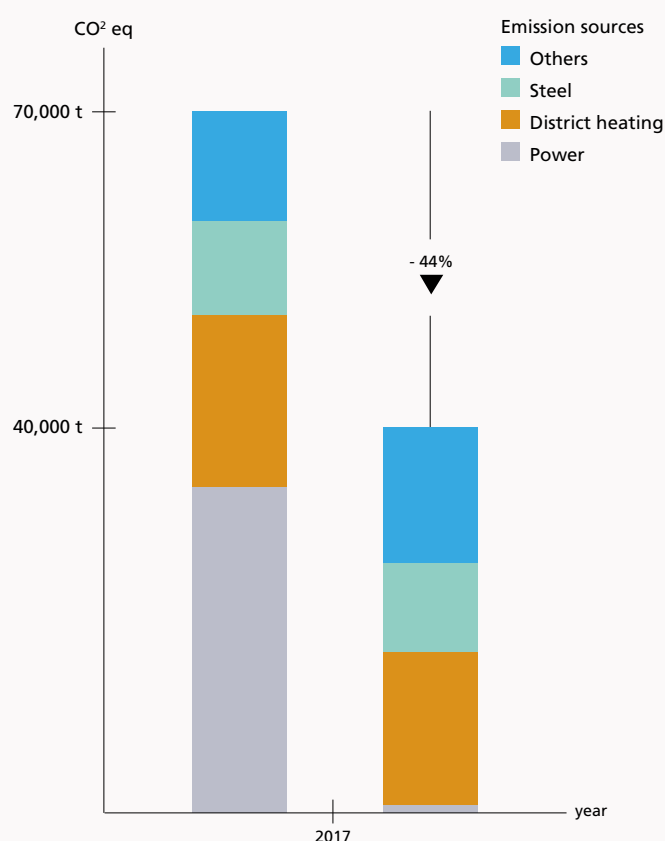
Since 2007, our environmental management has been guided by the ISO14001 environmental standard, which is part of our system of operation. By means of both internal and external audits, the latter being performed twice a year, we ensure that our operations meet the relevant quality, safety and environmental requirements. Furthermore, the shipyard operations are steered by our environmental permit, which provides a strict framework for our everyday activities.

In 2016–2017, we performed an environmental risk assessment on our shipyard covering all our activities. Based on the risk analysis, the main risks and environmental impacts of the shipbuilding process were defined to be: use of energy, material waste and loss, litter spreading to immediate surroundings, and storage and handling of chemicals.

We also calculated the carbon footprint of cruise ship production, which helped us identify the most important sources of greenhouse gas emissions and, therefore, the areas we should focus on to reduce our carbon footprint.

ENERGY CONSUMPTION

In the shipbuilding process, energy consumption plays the most significant role among environmental impacts. In 2017, we shifted to using hydroelectric power only, which reduced our carbon footprint by more than 40%. Furthermore, the shipyard has implemented or is in the process of carrying out several projects aimed at energy savings and energy efficiency, such as the replacements of the automation system of shipyard properties, the heat recovery system of the compression station and the heat recovery of the air conditioning system of the block halls, as well as the steering of waste heat to heating of coating halls. In addition, the shipyard pays special attention to energy-efficient solutions in its investment projects.



In 2017, we shifted to using hydroelectric power only, which reduced our carbon footprint by more than 44%.

Shipyard's power consumption/MWh

	2015	2016	2017
District heating	37,343	49,656	48,839
Specific consumption MWh/hour worked	0.0092	0.0089	0.0081

Shipyard's power consumption/MWh

	2015	2016	2017
Power consumption	52,033	59,649	61,447
Specific consumption MWh/hour worked	0.013	0.011	0.010

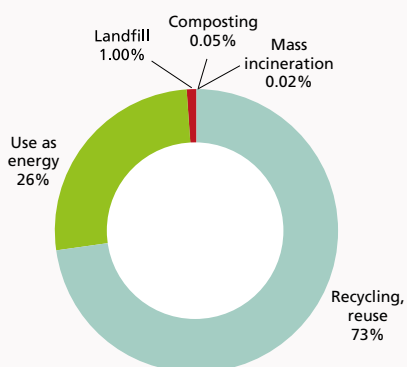
AIR EMISSIONS

At the shipyard, direct air emissions are mainly caused by coatings and the solvents used in them. The new pre-treatment line of steel plates will be equipped with a VOC incinerator, which will significantly reduce the shipyard's VOC emissions from solvent-borne coatings. In addition, we are engaged in continuous development work with coating manufacturers. In the future, we aim to make a shift to using water-borne coatings, where possible.

WASTE

Wherever possible, we sort waste where it is generated. Wood, cables, metals and hazardous waste are separated from other waste in the whole shipyard area. In waste management, our focus is on minimizing material waste and enhancing reuse. We actively cooperate with our partners to find new reuse opportunities for waste. A significant share of our waste is steered to reuse (73%) and energy (26%). Only 1% of our waste ended up in landfills last year. In 2017, since we were building new office premises, we exceptionally generated contaminated masses of soil and demolition waste.

Reuse and recycling rate of waste materials in 2017



LITTER

The most challenging and visible environmental impact of the shipbuilding process is littering of the shipyard's immediate surroundings. In building stages performed outdoors, wind carries litter and plastic intended for protecting the ship from the external decks into water, from where they are carried outside the shipyard area as well. On external decks, we have started using waste bins with lids, wherever this is possible. In addition, we have tested on board and on dock areas different alternative methods for preventing litter from spreading, including nets and putting barriers around the dock area. So far, we have failed to find technically and economically feasible solutions that would significantly reduce the spreading of litter, but we will continue our efforts to have the problem solved.

We regularly clean the shores around the shipyard and organise common cleaning bees with the Keep the Archipelago Tidy Association. ■



Work clothing and plastic reels from the shipyard were turned into recycled benches in collaboration with Touchpoint and Dutch Awareness.

Shipyard's water consumption/m³

	2015	2016	2017
Water consumption	173,010	168,730	154,940
Specific consumption m ³ /hour worked	0.043	0.030	0.026



The shipyard is located just outside the archipelago of Turku, with vulnerable nature around it. We are constantly making efforts to reduce the environmental impacts of shipbuilding on the surrounding areas

Recycling and disposal of waste (tonnes)

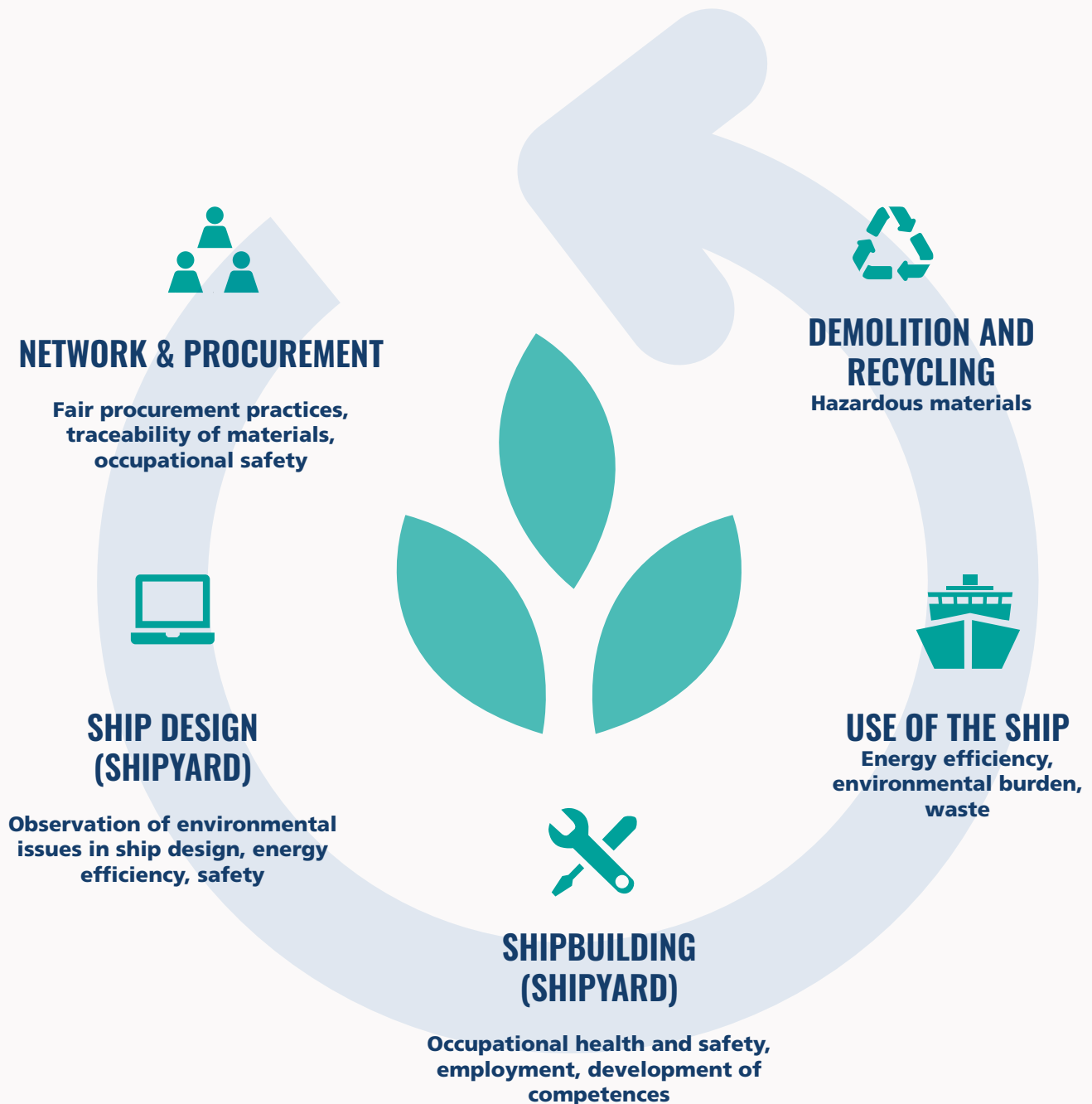
	2015	2016	2017
Recycling	10,049	10,988	16,869
Composting	23	18	11
Energy waste	3,015	4,817	6,142
Incineration	11	3	8
Landfill (contaminated soil and demolished concrete)	40	202	5,565
Total	13,137	16,028	28,595

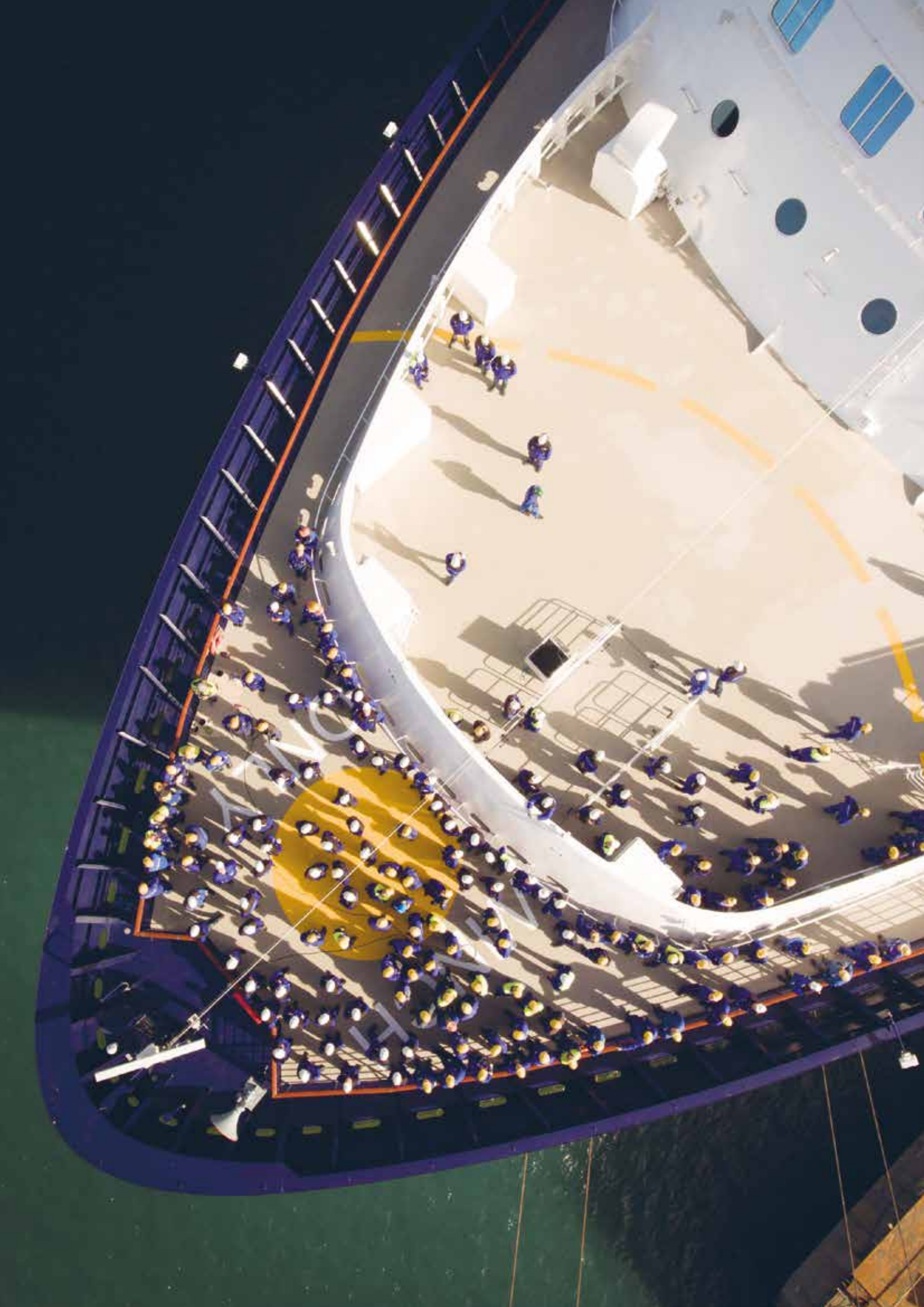
Waste by fraction (tonnes)

	2015	2016	2017
Metals	9,474	9,653	14,236
Mixed waste from shipbuilding	1,805	2,810	2,988
Wood	704	1,068	1,992
Welding and cutting slag		783	1,316
Waste to be incinerated and energy waste	324	454	543
Sludge	138	313	396
Other waste	281	350	1,537
Hazardous waste	412	598	330
Contaminated soil and demolished concrete			5,257
Total	13,138	16,028	28,595

A SHIP'S LIFECYCLE

Sustainability aspects in the various phases of a ship's lifecycle





03

RISK MANAGEMENT AND SAFETY AT THE SHIPYARD

HSE risk management and safety at the shipyard

The assessment of HSE (health, safety, environment) risks is aimed not only at preventing accidents but also at ensuring the delivery of the ships under construction to our customers according to agreed schedule. In the coming years, the number of people working at the shipyard will increase significantly, and we will build increasingly large vessels at a quickening pace. In addition, new suppliers, some of whom have never operated at a shipyard, will enter the area. Therefore, risk assessment and management as well as preventive work will play an increasingly important role in the future.

Shipyard operations are a very demanding subject area in terms of safety. In addition to all the risk factors related to metal and construction industry, we must take account of the fact that work is performed not only on dry land but also on floating ships under construction, where a fire could cause major human and material damage. In 2015–2017, we performed an extensive risk assessment update at the shipyard, striving to go through all risks related to our operations in every department.

Safety is our priority number one

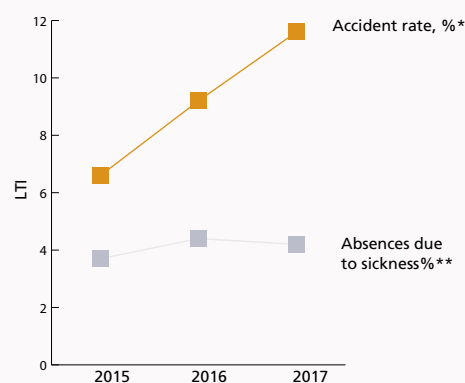
The safety regulations at the shipyard are strict and we take compliance with them very seriously. The penalty for breaking the regulations is a prohibition to enter the shipyard area. We carefully observe the safety of our employees and potential risks in the whole shipyard area, in every stage of ship construction. Before launch of production, we prepare a safety plan for each ship being built, including plans for arrangements during construction regarding, for example, logistics and fire safety systems. The risk of fire is high at a shipyard, since fire work is performed at a cruise ship construction site all the time (read more about fire safety on page 38).

The development of production methods has improved shipyard safety – for example, the use of modular structures has helped reduce fire work being done on board. We also pay a lot of attention to the order of production and tidiness. In addition to fire risks, tidiness also prevents accidents resulting from, for example, tripping. With every new ship project, we also estimate the ship-specific risks and methods for managing them, such as the use of novel fuels and the personnel training it requires.

Other important aspects of shipyard safety include working at height and safety of lifting work. We perform hundreds of lifts

every day using different cranes both indoors and outdoors, and we must have very precise control of the centres of gravity of the loads being lifted. The cruise ships being built as well as the cranes are high structures, and it requires special attention and competence to work on them. For example, special safety orientation was provided for those participating in the erection work of the 120-metre-high Goliath crane in November 2017.

Accident rate and absences due to sickness

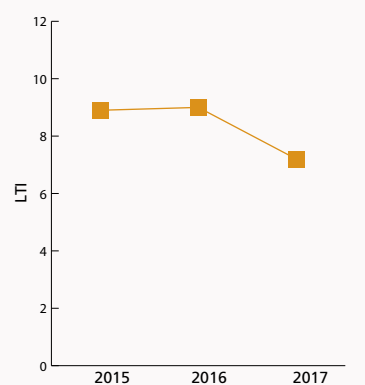


*LTI (lost time injuries) = accidents causing an absence of

*LTI /million working hours

**absence due to sickness in hours/theoretical regular working hours

Accident rate, network companies*



*LTI (lost time injuries) = accidents causing an absence of

*LTI /million working hours



Safety related to shipyard logistics requires particular attention from us. Our shipyard area is like a small town, where we have not only 3,500 employees but also a lot of vehicles, such as lorries, cranes, forklifts and even trains, moving around. We try to keep the flows of people and materials separated from each other by means of fences and traffic control.

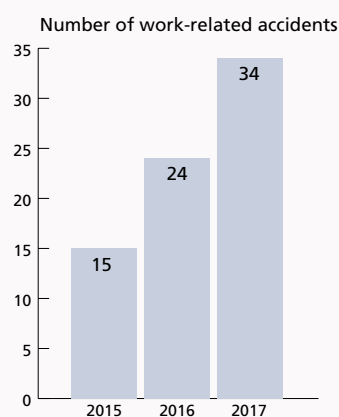
The maintenance and operational reliability of machinery and equipment is also an important part of safety. Some of the production equipment we are using at the shipyard is becoming obsolete, and we are replacing them with modern technology as part of the investment programme we have launched. The introduction of these new investments requires that we also make a significant investment in safety to ensure that we can identify and manage the risks related to their use.

Safety is part of everyday work

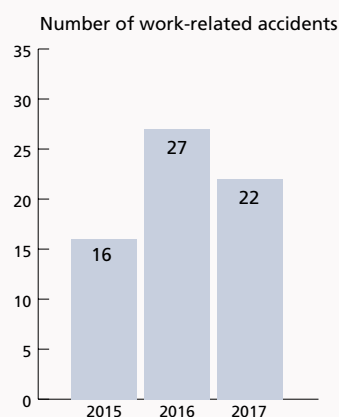
We work continuously for the prevention of accidents and preparedness for potential accident situations. We take all accidents and near miss situations very seriously and investigate the causes of all damages and define the remedying measures in detail. To improve safety, we have authorised all supervisors working at the shipyard to intervene if someone is performing some work in a dangerous manner, regardless of whether the employee works under him or her or someone else.

We encourage everyone working at the shipyard to always report any observations they have made related to safety and any proposals for improvements they may have. At the

Work-related accidents



Work-related accidents at the shipyard, network companies



moment, the challenge we are facing is how to produce and up-to-date compilation of the observations put on paper during safety rounds and how to monitor them. It is our goal to introduce a digital system which would make reporting and monitoring of the observations quicker.

Thanks to systematic safety work the accident rate at the shipyard has improved significantly over the past 10 years. In 2017, with all people working at the shipyard included (the staffs of both Meyer Turku Oy and network companies), the shipyard had 9.3 accidents per million working hours, which is very good in comparison with the general level in the construction and industrial sector. We also received recognition for the work we have been doing for safety, when we won the Safe Organisation of the Year 2016 award at the Finnish Security Awards.

FIRE SAFETY

Shipyard's own fire brigade is a significant investment in fire safety

In terms of risk management and safety, one of the most important issues at the shipyard is fire safety. Firefighting on board a ship is in many ways more challenging than in an ordinary property, and the biggest risk in an on-board fire situation is related to the evacuation of employees from an unfinished ship. Evacuation, as well as locating the scene of fire and getting the fire brigade there in cramped, unfinished and labyrinthine spaces is very demanding. That is why the shipyard has its own fire brigade, on call 24 hours a day every day of the year.

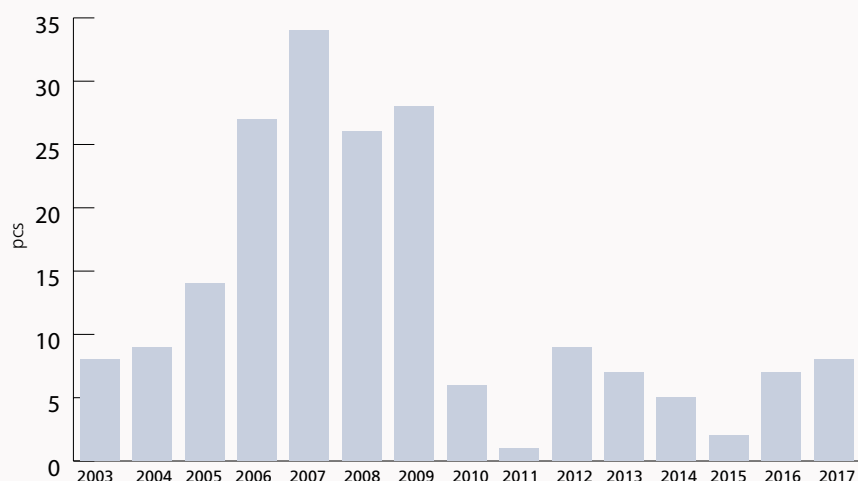
The firefighting and rescue skills of our fire brigade are maintained and developed on a continuous basis. During every ship project, we organise at least one full-scale rescue exercise, where we stage a fire emergency requiring evacuation of people.

Solutions for preventing on-board fires

Approximately 75% of fires on shipyards begin from welding or flame cutting, and litter and packaging materials are often the reason why the fire spreads. Therefore, worksite tidiness is one of the key fire prevention measures at our shipyard. We also improve fire safety with different solutions used during the project, such as firefighting water mains and smoke detectors. Our goal is to significantly reduce the amount of fire work performed on board by means of new production techniques, materials and working methods. This means, for example, bringing large prefabricated entities into the ship.

An on-board fire poses a high risk of human damage and significant material damage. The price of an on-board fire is approximately 2,000–3,000 euros a minute, and the total costs may rise to tens of millions of euros. In an on-board fire, combustion gases, which may spread over several decks along the corridors, usually cause greater damage than the fire itself. In such a case, the already installed surfaces must be replaced, because smoke sticks to the structures. In addition, the fire may affect the building schedules, which may lead to a significant adverse chain reaction in the schedules of future ship projects. In 2017, we saw a total of eight fires about to start that required the use of a fire extinguisher on board ships under construction. ■

Starts of fires onboard / year







SAFETY IN SHIPYARD



Unguarded machinery



Fire



Tripping / slipping



Unsafe electrical equipment and connections



Danger of getting crushed



Excessive strain



Overloaded vehicles and forklifts



Unsafe working at height



Falling objects



Confined spaces



Unsafe lifting operations



Stuck by foreign body



Handling of chemicals



Internal traffic



Unsafe loading bays



Open shafts and edges



Unsafe working platforms



Poorly supported structures



Unfinished scaffolding



04

WORLD-CLASS COMPETENCE

Highly-skilled shipbuilders

Modern cruise ships are like small cities sailing on the sea, the building of which requires not only heavy metal industry specialists but also competence in state-of-the-art design, project management, technology and product development. Therefore, it is important for us to recruit competent people, keep their professional skills at the top level and take care of the transfer of the shipyard's know-how to new shipbuilders.

The secret behind the good functioning capacity of the shipyard is the well-being of the employees that we support in many ways, both at work and at leisure. The shipyard's own occupational health clinic supports supervisors in the comprehensive management of the working capacity of the staff, with an aim that all our employees could maintain their working capacity and fitness for work until retirement.

We need passionate shipbuilders

The Finnish maritime industry, ourselves included, is undergoing a major change of generation as the veterans of shipbuilding are retiring. At the same time, due to the strong growth of the shipyard, we constantly need new skilled employees. Cruise ship construction has transformed from a traditional metal industry sector to a demanding technological industry,

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Passionate approach to shipbuilding, solid professional competence and employee well-being are the building blocks of our success.

which exploits the continuously developing digital solutions. In addition to metal workers and their supervisors, Meyer Turku shipyard also employs such professionals as engineers from various fields, technology experts, financial and HR administration specialists, and architects specialized in not only shipbuilding

but also, for example, interior design. In the future, it may become a challenge for us to find sufficient numbers of skilled labour. Therefore, we support the transfer of shipbuilding skills to new generations and introduction to what it is like to work at a shipyard by offering traineeships to young people and students. In addition, we arrange practical work and competence tests in collaboration with upper secondary vocational education and training institutions and universities of applied

Unique educational institute

The Meyer Turku Shipbuilding School is one of its kind in Finland, and having operated since 1962, it has a long tradition of training professionals for the shipbuilding sector. The school organises both continuing and conversion training for our staff, and labour political recruitment training courses.

Vocational education and training and the authorisations to provide it were reformed in Finland in 2017. We are very pleased that the continuation of the Shipbuilding School as a supplier of further vocational training was confirmed. In the future, following the reforms we will provide training aimed at an official vocational qualification in sheet-metal work and welding, and a vocational qualification of production technician. ■

sciences, and 20–30 students complete their final projects or theses at the shipyard every year.

The employees have a strong faith in the future

Many of our employees have long working careers at the shipyard behind them, so their faith in the future has also been tested over the past years. The current owner of the shipyard, the Meyer family, is committed to shipbuilding in Turku and the long-term measures by which the family develops the shipyard and makes investments on it are strongly reflected on the work motivation, commitment and well-being of the staff. The latest survey that studied the well-being of our employees, conducted in 2016, showed that people enjoy working at the shipyard and they have a positive feel about their work. The results of the newest survey will be ready in the early summer 2018.

In the personnel survey, particularly the enthusiasm and the sense of meaningfulness that the staff feel towards their work came up clearly. The positive results tell about the commitment of our employees and their confidence in the shipyard as an employer. Our employees are committed not only to the shipyard but also to the state-of-the-art final product they are building, and they are genuinely proud of the unique, world-



class ships they are building, and for a good reason. Thanks to the survey, now we also know that we need to invest in the development of our supervisory work in particular.

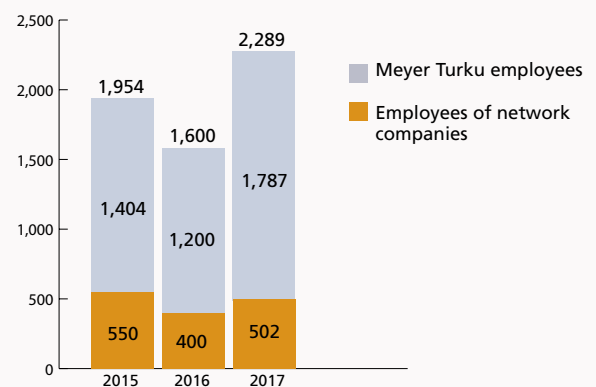
OWN SCHOOL SECURES COMPETENCE AT THE SHIPYARD

The shipbuilding environment is a unique workplace and requires excellence. Even certified welders are given further training in, for example, position welding techniques to be able to work in the demanding shipyard duties. To ensure that we always have competent employees specifically trained to their duties build our ships, we have our own Shipbuilding School operating in the shipyard area.

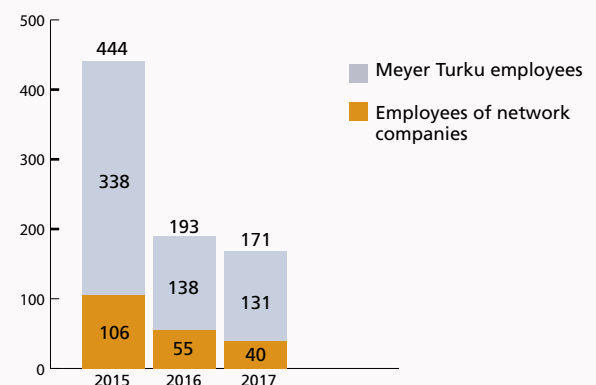
The annual calendar of the school includes hundreds of trainings and courses tailored to the shipyard's needs, with lengths ranging from a few hours to several months. The most common trainings include the Occupational Safety Card and Fire Work Licence trainings, shipbuilding technology, training courses in software used in ship design, first aid courses and language courses in such languages as English and German. In 2017, the training and courses were attended by a total of 2,000 people, 400 of whom represented companies in our network.

The Shipbuilding School collaborates closely with the shipyard supervisors, since the aim of the training provided is to keep the know-how of the shipyard employees at the top of the shipbuilding industry. We have invested in the development of web-based training so that increasing numbers of employees

Short-term training, number of participants



Labour political recruitment training, number of trainees



can participate in the training according to their own schedules. As a result of the major investments being made at the shipyard, the job descriptions of many employees will change, so there is continuous need for conversion and further training for the employees. With the help of training, we also harmonise our modes of operation with other Meyer shipyards, so that cooperation and sharing of shipbuilding phases between the shipyards would go smoother than before.

The Shipbuilding School organises also labour political recruitment training for unemployed job seekers suited to shipbuilding and design tasks. The recruitment training plays an important role in increasing the labour force at our shipyard, and the goal of each training course is that those trained would find employment at Meyer Turku. In the practical training lasting 4–6 months, a significant part of the time is used for on-the-job training with an experienced professional. Recruitment training provides such qualifications as sheet metal welder, pipe fitter and engineer fitter for ships, and we are also training increasing numbers of naval engineers, who find employment at Meyer Turku shipyard, and some also in the companies belonging to our network. In 2017, we trained 131 people for our own needs and 40 people for the needs of our network.

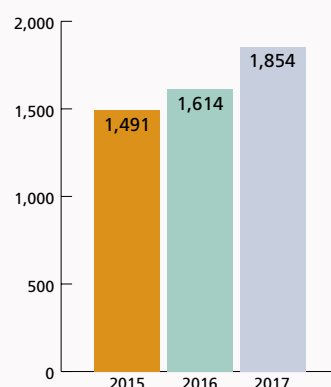
We take care of the transfer of know-how and long careers

Alongside training, on-the-job training plays a key role in introduction and transfer of shipbuilding know-how to new employees. For a long time now, we have been putting the competences of experienced shipbuilders to good use under an activity called Paasi, where an experienced expert, a Paasi, trains and guides his or her younger partner towards becoming a skilled worker. The Paasi activities are performed at the shipyard on a continuous basis, since, for example, a newly trained sheet metal welder needs several years of work experience to gain full professional competence in shipyard work. During 2017, 17 new employees were trained through Paasi activities for ship hull assembly.

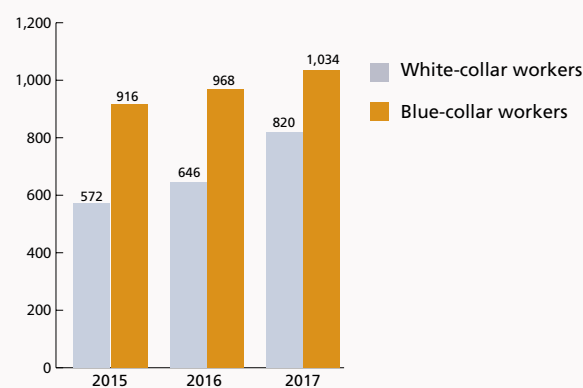
Apprenticeship training is also a widely used method for training new skilled employees at the shipyard, and, with the growth of our order backlog, the number of those in apprenticeship training has begun to increase again. We use apprenticeship training to educate both supervisors and employees, and apprenticeship offers even adult learners an opportunity to study for a new profession while working. We also encourage our apprentices to apply to international exchange programmes at our German sister shipyards. For us, apprenticeship is an important method for continuing the careers of our staff in situations, where an employee may not be able to continue performing physically demanding duties due to disability. Through apprenticeship, an experienced shipbuilder



Number of employees (total) in 2015-2017



White-collar workers/blue-collar workers



Meyer Tuku offers versatile job positions in shipbuilding.



may transfer to, for example, supervisory duties and continue his or her career at the shipyard until retirement age. In autumn 2017, the Turku Apprenticeship Training Centre awarded us with a diploma for our work as a committed, long-term provider of apprenticeship training.

WE TAKE GOOD CARE OF OUR STAFF

Shipbuilding is very physical work, and working at a shipyard involves different occupational safety risks. The work of the shipyard's clerical employees may sometimes be busy and mentally taxing, which may cause exhaustion among the employees. It is important for us to take care of the working capacity of our employees in a comprehensive manner, which means identifying, preventing and managing the hazardous and stressing factors in the shipyard work, and supporting the well-being of our employees and, if necessary, their rehabilitation, so that they would remain capable of working and fit for work until retirement age.

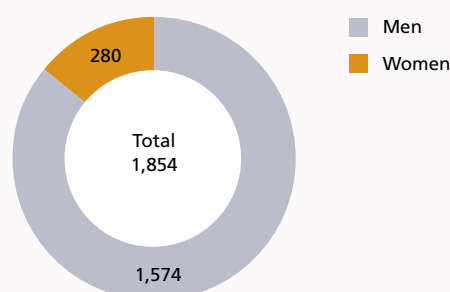
In the management of working capacity, our focus is on proactive services and measures by which we reduce the risks of accidents and illness and strive to prevent musculoskeletal problems and the development of psychological problems by means of early treatment and support. We support the well-being of our employees by offering them opportunities to pursue different personal interests, and benefits related to physical exercise and culture.

Aiming at good working capacity and long careers

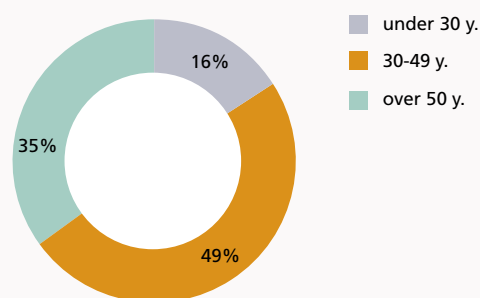
We are one of the few Finnish companies with its own occupational health clinic. The occupational health clinic at the shipyard makes the everyday life of employees easier and lowers the threshold of seeking treatment, since employees can stop by at the clinic in the middle of the workday. In addition, the occupational health care is familiar with the operating environment at the shipyard with its risks and can thus better identify the factors behind the symptoms. The shipyard's own occupational health clinic enables close and uncomplicated cooperation between employees, the occupational health and safety, HR administration and supervisors, which plays a major role in the management of the working capacity of the staff.

If our employee falls ill or gets injured, it is our aim that everyone would always be able to return to his or her work. From our side, return to work, particularly after a lengthy absence, requires careful planning and support measures, and close cooperation with different parties. An illness or injury may cause disability that weakens the employee's working capacity, as a result of which the employee may not be able to return to, for example, the physically demanding duties of a sheet metal

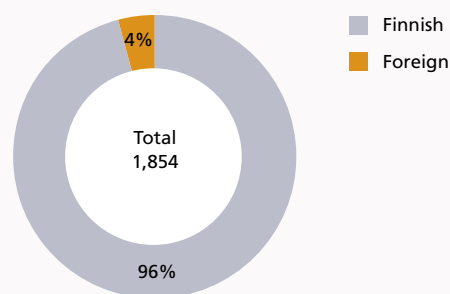
Number of employees 2017



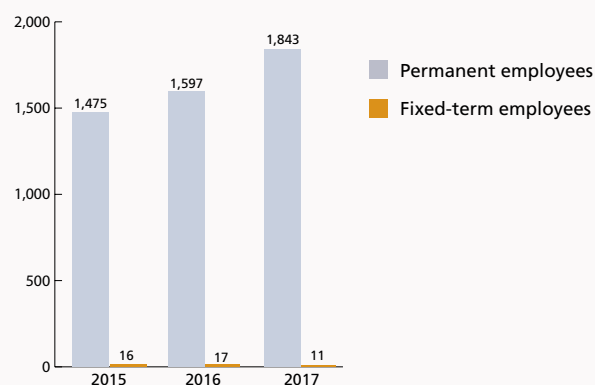
Age distribution



Share of foreign employees at Meyer Turku



Permanent/fixed-term employees





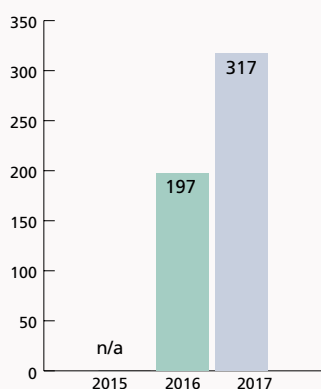
welder. In such situations, we consider different alternatives together with the employee, his or her supervisor and the occupational health care so that the person could continue to work. In most cases, we either adjust the person's job description by lowering the requirements of the duty to comply with his or her working capacity or we retrain him or her to other tasks. This way we strive to ensure that our employees will be able to continue at their work instead of having to transfer to invalidity pension. The maintenance of working capacity and avoiding the invalidity pension has major consequences both for the employee's personal well-being and finances, and the national economy. Long and uninterrupted careers are in everyone's best interest.

By good management of working capacity, we can achieve significant results in the well-being of the staff and major savings in the cost of undone work. With long-term efforts, we have succeeded in reducing significantly the cost of undone

work at the shipyard, i.e. costs caused by absence due to sickness, occupational accidents and invalidity pensions. We have also received national recognition for the good working capacity of our employees, since our shipyard's accident, absence and early pension figures are at an excellent level in comparison with other Finnish industrial companies.

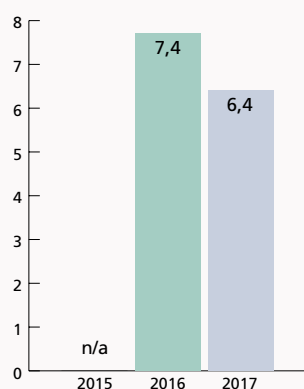
As the number of employees at the shipyard is growing rapidly, it is important for us to take good care of the orientation to work and ergonomic counselling of new employees starting their strenuous work at the shipyard. New employees are a critical group for us and it is important to introduce them to a proactive approach to the maintenance of their own working capacity, so that new employees will manage at work and can make long careers at the shipyard. We also develop the ergonomics and maintenance of personal working capacity of clerical employees by means of counselling and guidance, and with the help of an office exercise application, for example. ■

Number of newly recruited employees*



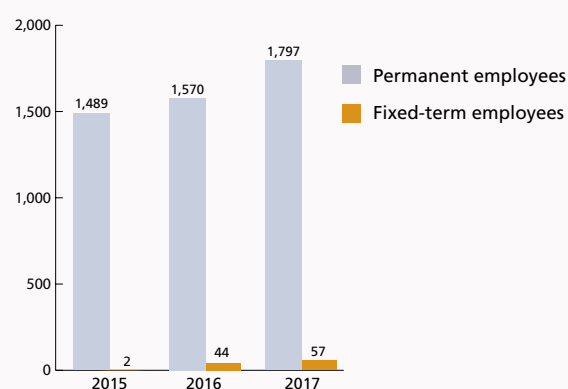
*excluding summer/seasonal employees.

Employee turnover, %*



*excluding summer/seasonal employees and those on part-time pension

Full-time/part-time employees





05

POSITIVE WAVES TO SOCIETY

About financial impact

Our ship projects are extensive, and the employment impact of our operations is significant. During 2017, the shipyard and its network companies employed approximately 7,000 employees and by 2023 their number will increase substantially, to even 20,000. At the end of 2017, 96 per cent of the shipyard's own personnel were Finnish.

The economic impacts of the shipyard reach far

The regional economic impacts of the Meyer Turku shipyard were studied in a survey conducted by Brahea Centre at the University of Turku and published in autumn 2017. According to the survey, the economic impacts of the shipyard are very significant in the Turku economic area and Southwest Finland and significant also in the scale of the whole of Finland. The positive impacts of the shipyard reach far within the network, partly all the way to foreign countries, since approximately 80% of the ship's value consists of work performed by network companies and 20% of the work performed by the shipyard.

We are building ships with the support of a strongly Finnish network: more than 75% of our suppliers are Finnish companies. The direct and indirect economic impacts are the biggest in Southwest Finland and Uusimaa areas, where almost 80% of our network companies are located and where most of the people working at the shipyard live.

The turnover of our shipyard and our network's shipyard-related activities totals approximately 1.3 billion euros. We are big also in terms of export income, since the value of a single ship delivery accounts for about 1% of the value of the annual exports of Finland as a whole. In recent years, the companies in our supplier network have implemented investments of ap-

proximately 70 million euros in total, and by the end of 2017, the sum was estimated to rise to 100 million euros.

Most of our impacts on tax revenues are gained by the municipalities located in the Southwest Finland region. The shipyard-related corporation taxes paid by our supplier network amounted to about four million euros in 2017. In addition to this, the municipal taxes paid by our employees increase the positive tax revenue impact in the area.

Positive feel in educational establishments and tourism

The growth in shipyard operations requires skilled labour, and to ensure provision of such manpower, Turku continues to need training and education focused on the maritime industry sector, in the field of technology in particular. The positive feel at the shipyard and other industries has already increased the interest in machine and metal industry studies. For example, in Southwest Finland the number of applications to upper secondary vocational education and training in naval and technological studies has clearly increased. The shipyard is also of great importance for the tourism in Turku, and the guided tours of the shipyard are very popular in summer.

The strong growth of the shipyard also affects housing and transport in the region. The growth in the number of people working at the shipyard increases the demand for rented flats in the Turku region. In addition, the goods transport and commuting traffic to and from the shipyard is massive, and the traffic on the main routes is forecast to grow by 30–50%. We strive to reduce the adverse effects of the traffic flows in the near-by areas by means of production planning. ■



Map of Finland showing
Turku + the division of the
value of the shipyard's
domestic deliveries by region.

Division of the value of deliveries
390
million euros

Varsinais-Suomi
51%

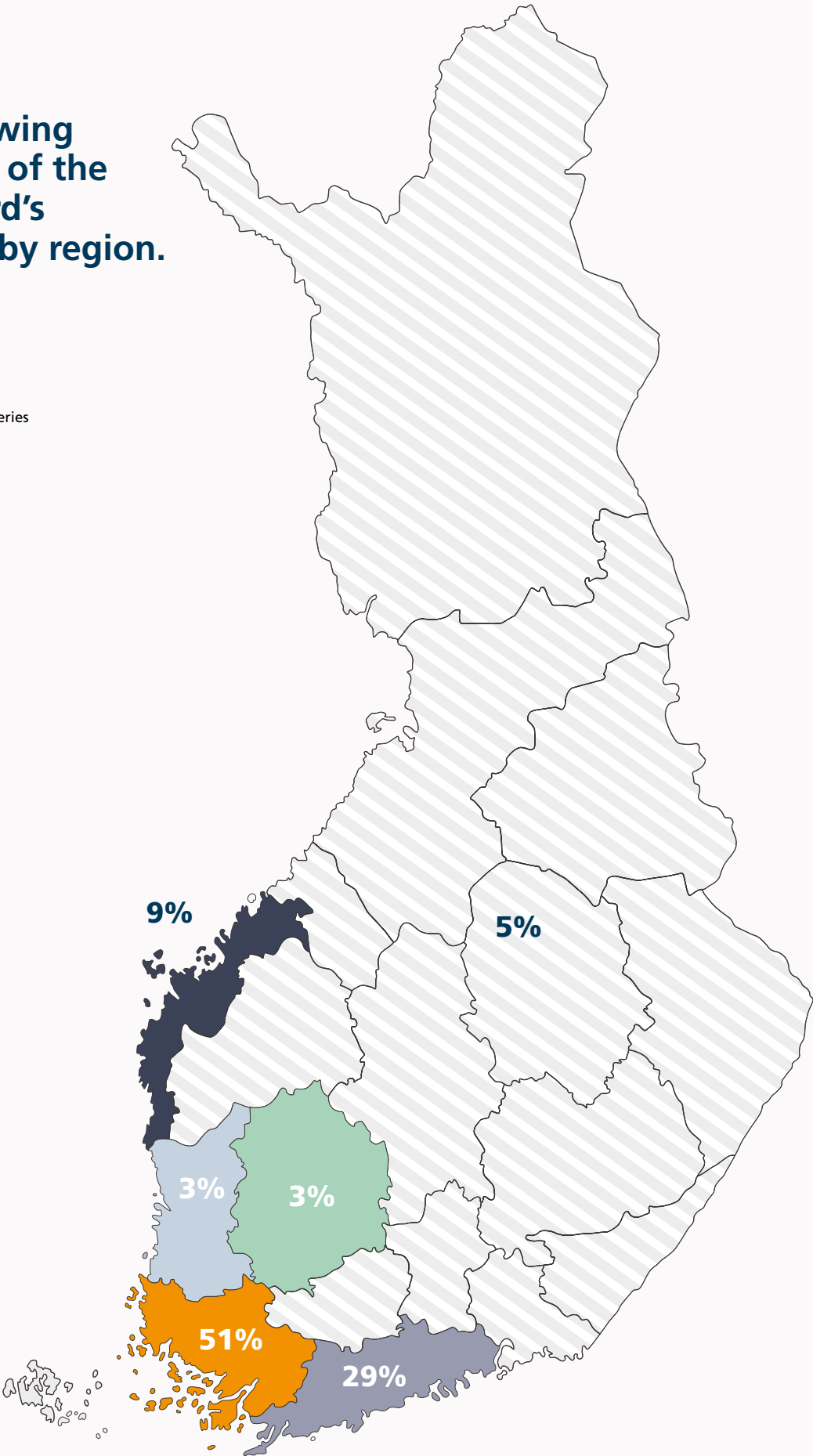
Uusimaa
29%

Pohjanmaa
9%

Pirkanmaa
3%

Satakunta
3%

Other
5%



Sustainable growth together

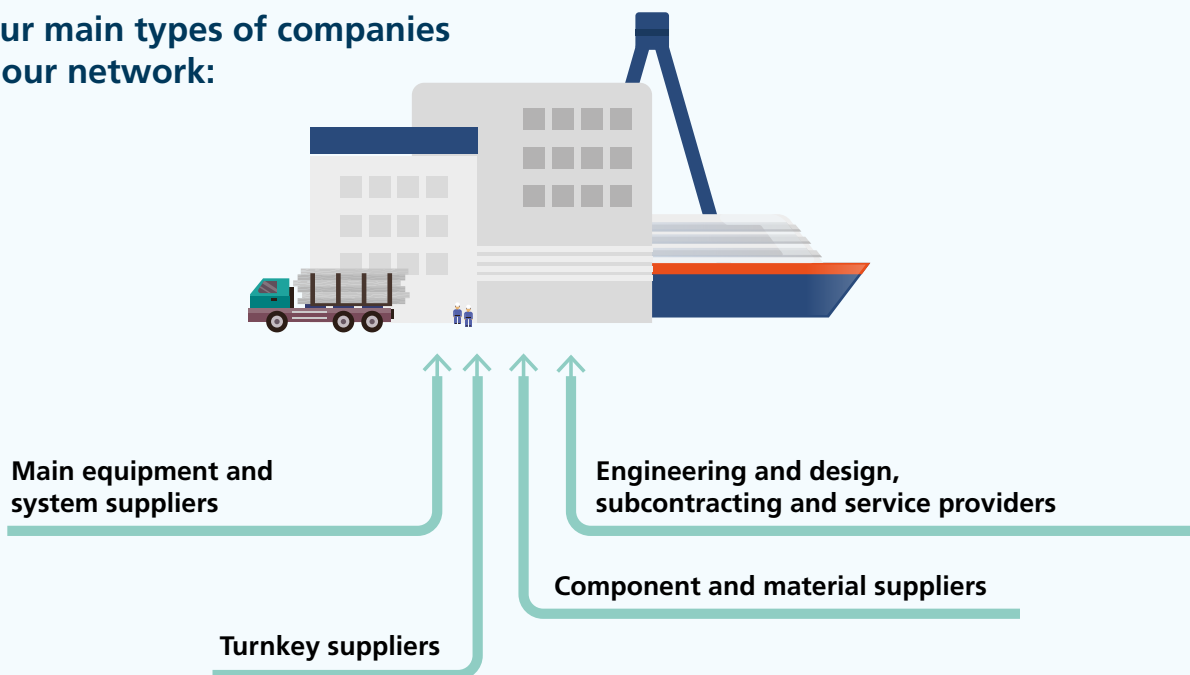
Our ship projects are considerable in size. We as a shipyard may have a contractual relationship with more than 1,500 companies, and 600–800 companies may participate in the building of a single cruise ship, some of them for a few days only and others for as long as two years. Our network companies account for more than 80% of the share of each ship's value, so good cooperation and management of the entity is of vital importance to us. Our network consists of such operators as engineering companies; equipment, material and system suppliers; turnkey suppliers; subcontractors and service providers.

In practice, we procure all the equipment and materials needed on the ships and most of the design work from our network. We order approximately 80% of the prefabricated components from external workshops, and our network implements about 80% of the outfitting of the ships, mostly on turnkey contracts. We place almost 30,000 orders every year, with

the value ranging from quite small repeat orders to individual orders of a really high value. In 2017, our network consisted of more than 1,500 supplier companies, 75% of which were Finnish. Our suppliers have subcontracting networks of their own, through which our sphere of influence is extensive, even outside Finland.

We require high quality, reliable deliveries and responsible practices from all our suppliers. We have invested a lot in the functioning and management of our network. We provide orientation and training to safe modes of operation at the shipyard to the employees of our network companies, and we monitor carefully the practices and the performance of our suppliers. Our network can expect a whole lot more work from us, since our production will grow strongly within the next few years. Therefore, the management of the network will play an increasingly important role in the future.

Four main types of companies in our network:



A highly-competent, international network is of vital importance to us

Previously, shipyards built ships almost entirely on their own but today, alongside ship design and shipbuilding, our shipyard acts as a project manager uniting an extensive network of operators. Modern ships are like small, smart cities sailing on the sea, the building of which requires a network of top experts and technology suppliers.

As our pace of delivery and production volume grow, we need more operators in our network, both in Finland and abroad. Approximately 25% of the network companies working at the shipyard are foreign, and, for example, in 2017 there were almost 300 foreign companies, from 29 different countries, operating at the shipyard. Foreign suppliers have also been very important to us, and that is why we invest in their orientation, including an introduction to the Finnish work culture and working life rules. For example, in the summer of 2017, we held an information day for the network operators working at the shipyard and provided information related to such matters as taxation, residence permits, recruitment and training. We invited more than 100 of our network companies to the event.

Effective prevention of grey economy

As buyers, we and all our network companies have the duty to combat the grey economy that supports unfair competition. Already some 10 years ago, we established a networked monitoring group with such key objectives as combating the grey economy and grey labour market, monitoring how the suppliers meet their social obligations, such as payment of taxes and social security contributions, and supervising issues related to employment relationships, regarding both our Finnish and foreign suppliers. The operation of the working group has contributed to the fact that the audits performed by the authorities in recent years have not produced notifications to more than 1–2% of the operators working at the shipyard. We process all notifications given by the authorities in the working group, and if the notifications are serious or they recur, we ban the operator in question from the shipyard area for a fixed period of time. In 2017, we placed about 10 operators on the list of companies not desired in the shipyard area.

We are responsible for monitoring whether the supplier meets the requirements of the Act on the Contractor's Obligations

and Liability when Work is Contracted Out and the Occupational Health Care Act only in reference to the 150 companies with which we have a direct contractual relationship. However, we have decided that we will monitor how all the about 800 companies working at the shipyard fulfil these obligations, also those with no direct contractual relationship with Meyer Turku. We also require that all our network companies draw up an occupational health and safety plan of their own.

Responsible procurement from responsible suppliers

It is very important for us that our suppliers operate in an ethical and sustainable manner, and that every operator in our network is capable of performing its duties.

We have published our own Code of Conduct for Suppliers to which every supplier we do business with must commit itself. In the future, the commitment to the Code of Conduct will also be registered in all our new supplier contracts. The operating principles, covering the social responsibility, fundamental rights of workers, environmental protection and ethical business principles, are the same at all Meyer shipyards in Germany and Finland, as well as in all our subsidiaries.

When selecting suppliers, we assess the impacts of the procurement as a whole. In addition to price, quality and security of supply, in competitive bidding we also assess, for example, how the supplier takes care of its social obligations. In the future, we will pay closer attention to the supplier's capacity to comply with our ethical principles, and how it fulfils its obligations related to occupational health and safety and environmental protection. During 2018–2019 we will launch the "Supplier RelationShip" function, the purpose of which is to make the audits of our suppliers more efficient and to monitor more closely the operations, performance and financial position of our suppliers.

Before any contracts are signed, it is important that both parties understand the entity being ordered and the requirements posed by it. We want our suppliers to succeed, and we have a strong common objective with our suppliers to have the agreed entity delivered according to contract. ■

Supplier of the Year: Metalliasennus Huuhka Oy



Our cooperation with trusted network partners often continues for years, and it is built upon strong confidence and joint development work. We want to thank our network for their good work, and in spring 2017 we granted our first Supplier of the Year award. It was awarded to Metalliasennus Huuhka Oy, with whom the shipyard has been working together for 27 years.

Granting the Supplier of the Year award is a tradition followed at Meyer's Papenburg shipyard, and it was now extended to Turku shipyard for the first time. The award gala was held at Logomo arena in Turku and it was attended by a large gathering of maritime industry experts from both Finland and Germany.

"Huuhka welcomes challenges, and they are always prepared to innovate and to solve any problems we are facing. Furthermore, Huuhka has a very well-functioning and versatile own production and skilled staff," Meyer Turku gave as ground for the choice. ■

Blue Industry Park coming next door to the shipyard

The Blue Industry Park, being built in the immediate vicinity of the Turku shipyard in stages between 2019 and 2030, will respond to the growth needs of the shipyard and the entire maritime and technology industry in Southwest Finland. The objective is that the Blue Industry Park would become a production and innovation hub for the maritime industry, bringing together up to 100 companies and 10,000 employees, with no counterpart anywhere in Europe.

"Meyer Turku considers the Blue Industry Park a very important project. The building of cruise ships relies strongly on the contribution of a network, and the Blue Industry Park enables making this collaboration even closer than before and launching totally new initiatives," says **Tapani Pulli**, Deputy CEO of Meyer Turku ■



ResponSea – responsible maritime industry



We are strongly involved in the development of sustainability within the Finnish maritime industry by means of the ResponSea commitment introduced by the Finnish Marine Industries. ResponSea defines common sustainability goals for the maritime industry and encourages companies within the sector to develop their corporate responsibility and challenges them to make their own sustainability commitments. The topic is important to the maritime industry, since the sector is characterised by an extensive supplier network, where the whole network's operations contribute to the level of sustainability of the final product.

The ResponSea focus area themes are:

- Reduction of emissions in shipping with the help of new solutions
- Circular economy and reduction of material waste
- Maritime industry companies seen as good and fair employers
- Transparency of the supply chain

To fulfil their commitments, companies define concrete measures and describe in their reporting how they monitor the implementation of these goals. The Finnish Maritime Industries will compile a yearbook on the implementation of the ResponSea commitments, providing information on the progress of the commitments and good examples of the development of sustainability within the sector. Furthermore, the Finnish Maritime Industries will monitor the sector's environmental and societal impacts. ■



06

OPERATIONAL AND LEADERSHIP PRINCIPLES

Our guiding principles

The business policies of Meyer Turku define the company's ethical principles, the generally approved practices and our commitment to compliance with laws and other regulatory provisions. Our operational policies cover such topics as anti-corruption, conflicts of interest, fair competition and procurement, labour rights, occupational safety and environmental protection. We do not accept any infringements of laws or regulations, or unethical practices. We require that all our employees and supervisors show sound judgement, comply with our ethical principles and follow fair practices in all business operations.

The expectations we have for our employees and partners have been described in our business policies and in the Code of Conduct for Suppliers document. All our suppliers must commit to these principles, and, in the future, this commitment will also be written down in all our new supplier contracts.

GUIDING PRINCIPLES AND POLICIES

- Personnel policy
- HSE policy
- Rules and Regulations for Procurement
- Leadership principles
- Code of Conduct

The responsibility for the co-ordination of the shipyard's occupational health, safety and environmental affairs belongs to the HSE steering group. In addition to its statutory tasks, the group is in charge of the adoption of action plans and the monitoring of relevant measures. The Meyer Turku management group discusses HSE affairs in all its meetings and conducts HSE management reviews. ■



OUR LEADERSHIP PRINCIPLES

The purpose of our leadership and supervisory work is to provide support for the employees so that they can successfully perform their tasks and reach the goals set for our operations. Supervisory work is challenging and requires discretion and situational awareness. We help people succeed in this demanding task by means of common leadership principles.

ACT AS A ROLE MODEL

As supervisors, we serve as role models to our team members. In addition to this basic principle, we also need to ensure that the members of the team comply with our operational policies and agreed rules.

LEAD CHANGE

The world around us is changing all the time. Similarly, the requirements for the products, processes and capacity as well as our opportunities are also changing. A supervisor must have a vision of the future work processes and capabilities in his or her working group. We discuss the changes with the team members and engage them in the changes, and we personally lead the change!

GIVE FEEDBACK

It is our task to put together the best teams and to lead both the teams and their individual members effectively and in a proper manner. By combining the strengths of each individual in the best possible way and by assigning them suitable tasks we can best create added value.

We value and respect our employees, give recognition for good work, and give fair and immediate feedback on work results and conduct.

BEAR RESPONSIBILITY

All activities must be in compliance with the principles of sustainable development. Supervisors have special responsibility for monitoring the occupational health and safety of their employees and the environment, and for taking necessary steps and proactive precautions. We pay special attention to accidents at work and eliminate their causes in a systematic and sustainable manner.

COMMUNICATE

Our operations are transparent, and we communicate with each other regularly, openly, honestly and showing respect to one other. We see conflict situations as an opportunity to improve our operations, and the feedback we give is always constructive.

SET THE GOALS AND ASSIGN RESPONSIBILITIES

We want the employees to show initiative, take responsibility and work independently. We lead by agreeing on clear rules and goals with the employees, and we provide them support so that they can reach the targets set. We aim to assign clear



and specific responsibilities to individual employees or teams. The responsibilities are assigned in such a manner that employees and teams have the freedom to find and implement the solutions independently.

SEEK SOLUTIONS, MAKE DECISIONS

We help the teams find the best solution to each problem – by discussing things openly and not shying away from conflicts, if necessary. Therefore, the people who are subject to the decisions are involved in the dialogue. We aim to maintain a positive atmosphere and to focus on finding solutions.

DEVELOP YOUR TEAM

We ensure that the competence and skills of our employees comply with the continuously changing requirements. This promotes the success of both the company and the employees. It is our task to encourage and support the team members in their learning processes and to offer them opportunities to take up new, challenging tasks.

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