



2021 Corporate responsibility





Contents

Introduction 3
 Year 2021 in figures 4
 Events in 2021 5
 CEO's review 6

Impacts of Arctia's operations 7
 Customer satisfaction 8
 Product safety 8
 Stakeholder cooperation 9
 New services and products 9

Targets and management of corporate... responsibility 12
 Operating principles that direct corporate responsibility... 12
 Targets 12
 Corporate responsibility management 13

Responsible way of working 15
 Arctia's Code of Conduct 15
 Risk management and corporate responsibility risks 15

Financial responsibility 16
 Financial indicators 16
 Cash flows to stakeholders 17
 Arctia as a taxpayer 17
 Charity and sponsorship 17

Social responsibility 18
 Number and structure of personnel 19
 Reorganisation and dismissals 19
 Collective agreements 19
 Equality and non-discrimination 20
 Professional skills are improved through development of competence and continuous learning 20
 From targets to action 20
 A harmonised operating culture is developed with
 personnel survey 20
 Occupational health and safety 21
 Suppliers and subcontractors 22

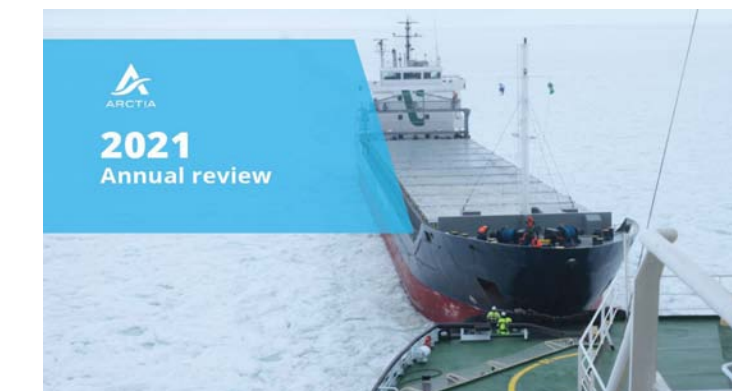
Environmental responsibility 23
 Targets of the environmental programme 23
 Impacts of Arctia's operations – Green handprint 24
 Environmental impacts of operations 24
 Preparedness for environmental risks 24
 Environmental investments 24

Environmental report 25
 Reporting and calculation principles 27

Annual report 2021

The Arctia Group's annual report 2021 consists of the annual review, the corporate governance and remuneration statement, the report on corporate responsibility, and the financial statements. The reports are published on the company's website at www.arctia.fi/en

ANNUAL REVIEW



CORPORATE GOVERNANCE AND REMUNERATION STATEMENT



CORPORATE RESPONSIBILITY



FINANCIAL STATEMENTS





IMPACTS OF ARCTIA'S
OPERATIONS

TARGETS AND MANAGEMENT
OF CORPORATE RESPONSIBILITY

RESPONSIBLE WAY
OF WORKING

FINANCIAL
RESPONSIBILITY


SOCIAL
RESPONSIBILITY

ENVIRONMENTAL
RESPONSIBILITY

Reliable services in challenging conditions

Arctia enables safe, smooth and environmentally friendly water transport. We produce added value for our customers by combining different services into comprehensive service concepts in an innovative way.

The Group has three business areas: icebreaking, fairway maintenance, and hydrographic surveying. The business areas include a huge amount of experience and expertise, e.g. in oil spill preparedness and response, hydraulic engineering, pipe and cable laying, towing tasks, and the manufacture of plastic spar buoys and other buoys.

Arctia Ltd is a limited company wholly owned by the State.





Year 2021 in figures

Personnel in total



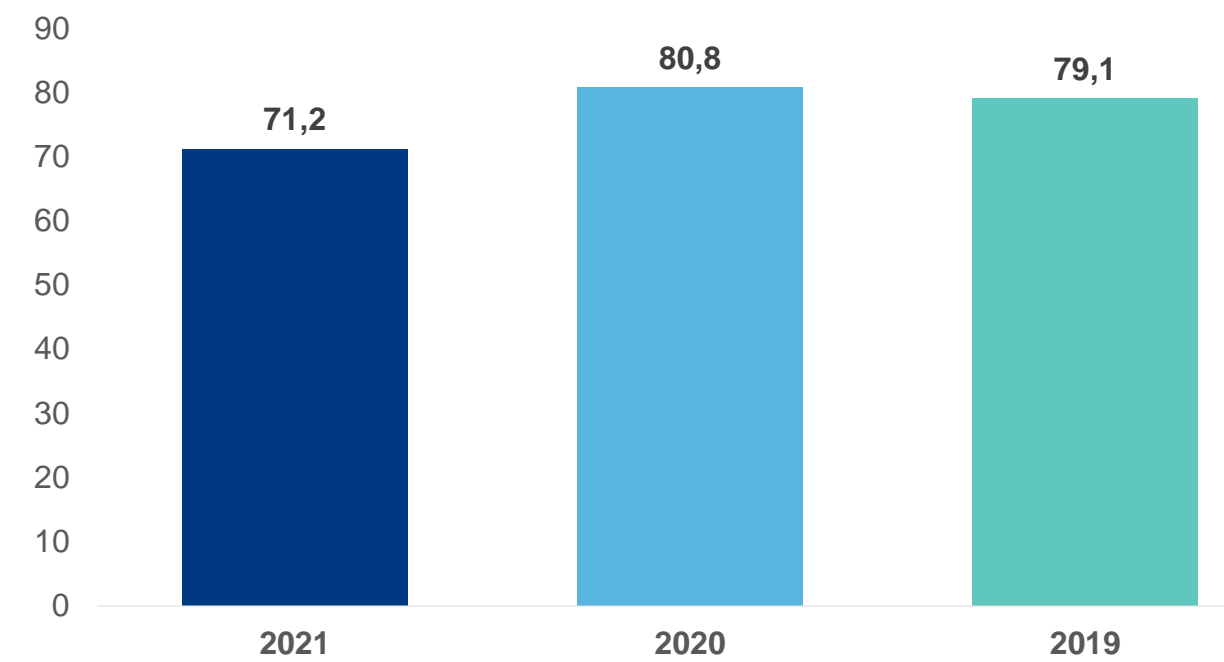
Offshore personnel



Onshore personnel



Turnover MEUR



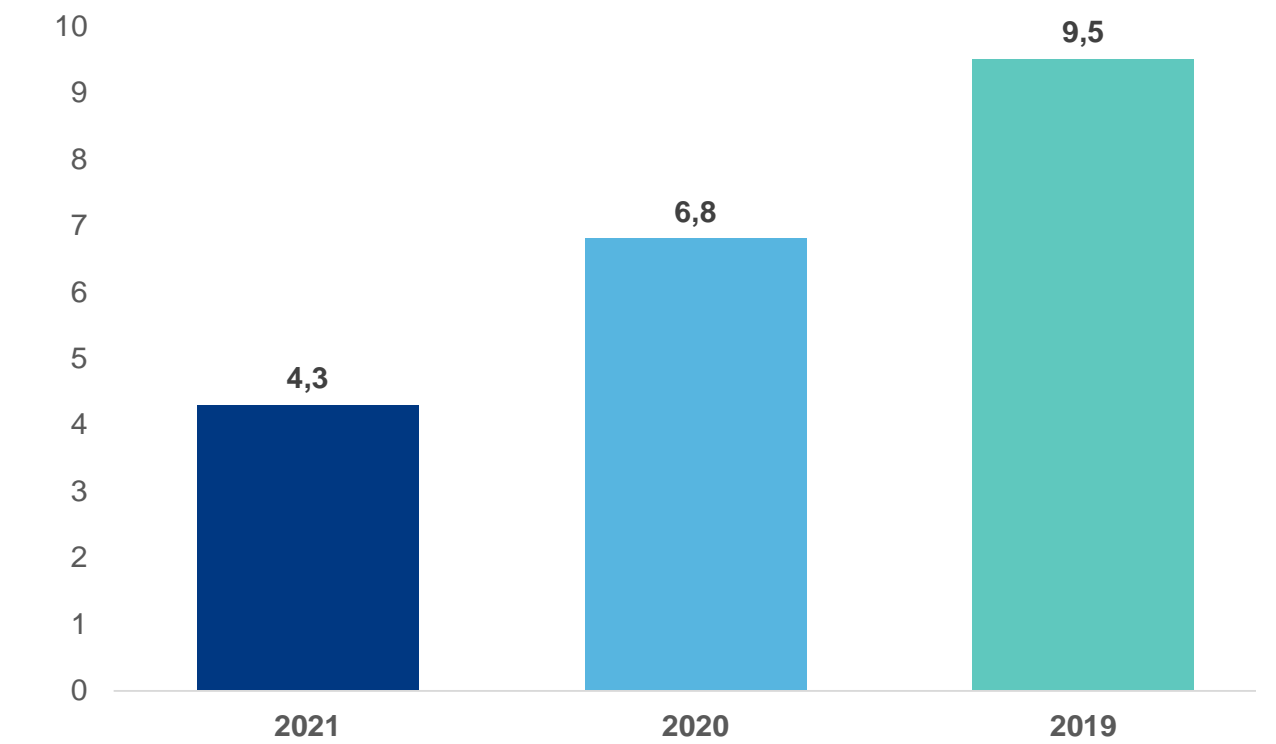
Result for the financial year MEUR



Operating profit MEUR



Investment MEUR



Return on capital invested %





Events during the year

COVID-19 pandemic

Arctia continued to take care of the health and safety of personnel working during the COVID-19 pandemic.

Sniffer buoy measuring SO2 emissions was tested

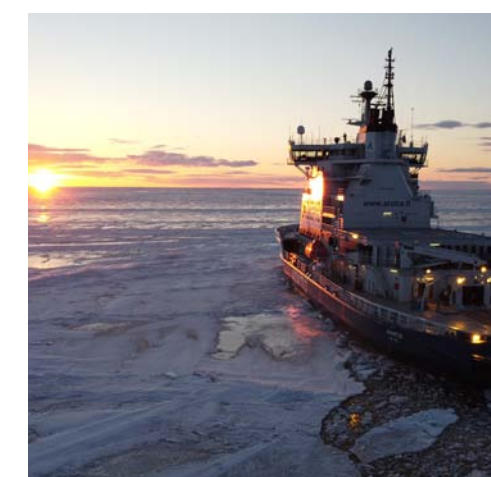


In 2021, flaws in the test version of the Sniffer buoy (SO2) were remedied, and it continued its test phase in the Port of Naantali.

Procurement principles and guidelines

Arctia continued the development of procurement principles and the related processes.

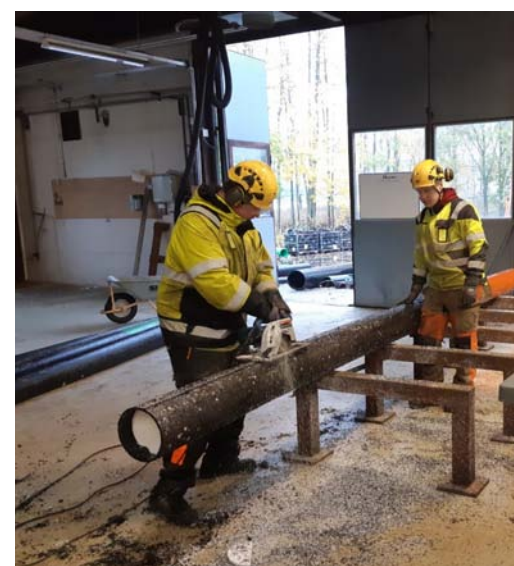
Commissioning of CO2 roadmap



Roadmap for reducing carbon dioxide emissions was introduced. In addition to short-term targets, the roadmap also records guidelines long into the future. It is a living document that is updated as and when data is collected.

2021

Piloting of buoy recycling



Project on the recycling of buoys, which was started in 2020, was continued. Arctia started to build infrastructure at Viittatehdas to support recycling.

Updating of oil spill recovery preparedness of Linja

The most significant environmental investment in 2021 was the updating of oil spill recovery preparedness of fairway vessel Linja. The vessel is in oil spill recovery preparedness in the Kvarken area.

Docking of icebreakers

Icebreakers Polaris, Voima and Otso were docked at Turku Repair Yard in Naantali.



Työvire survey

The Työvire survey covering the entire Group was carried out for the second time. The index describing the Group's work efficiency and mood was 3.5 (3.7 in 2020).

3,5



One step at a time towards more responsible Arctia

Arctia's mission is to enable safe, smooth, and environmentally friendly water transport throughout the year. Our mission is clear and tangible in the everyday lives of Arctia's employees. As our work has an impact on smooth and safe maritime logistics in Finland, it is easy to understand the importance of responsible operations. In addition, almost all our operations take place close to vulnerable and precious nature.

During 2021, we continued the implementation of enhanced corporate responsibility on several fronts. Out of the many activities, we

could highlight the first version of Arctia's extremely ambitious CO2 roadmap, which we have already started to implement. We have also continued to develop corporate governance and, for example, the Whistleblow channel is already part of the everyday life within the company. We have invested in oil spill remediation equipment, recycling of buoys, and more eco-efficient use of icebreakers. As a result of the COVID-19 pandemic, health and safety were prioritised throughout the year, and the work succeeded well.

Icebreaking, fairway maintenance and hydrographic surveying has a significant role in enabling water transport in the Finnish and international waters. We are committed to doing our valuable work in an even more responsible way than before. With our corporate responsibility work, we want to contribute to the society in which we all live.

Maunu Visuri
President and CEO





Impacts of Arctia's operations

Together with our stakeholders, we guarantee the functioning of Finnish society throughout the year.

For more than 140 years, winter navigation, fairway maintenance and hydrographic surveying services have secured and streamlined Finland's export trade by sea; 90 per cent of exports and 80 per cent of imports are transported by sea. Together with its stakeholders, Arctia guarantees the orderly functioning of society and continues to develop the infrastructure of winter navigation to meet the needs of the future.

Safe waterborne transport is a sum of many factors. Fairway safety starts already with the quality of hydrographic survey data and fairway planning, and continues in the construction of the fairway, channel markings and fairway maintenance, also requiring icebreaking in the winter. Functioning logistics ensure continuing competitiveness in the region, and low-emission waterborne transport contributes to resolving the environmental impacts of logistics.

Regional presence and our personnel's local knowledge of the water areas are among our many strengths. Arctia serves its customers

locally along the coast and in inland waterways in more than 20 places of business. Maintained by Arctia, the Saimaa Canal is an important waterway from the Gulf of Finland to Lake Saimaa. As the EU and Finland invest in inland waterborne transport, the significance of the Saimaa Canal will increase even further due to its environmental friendliness.

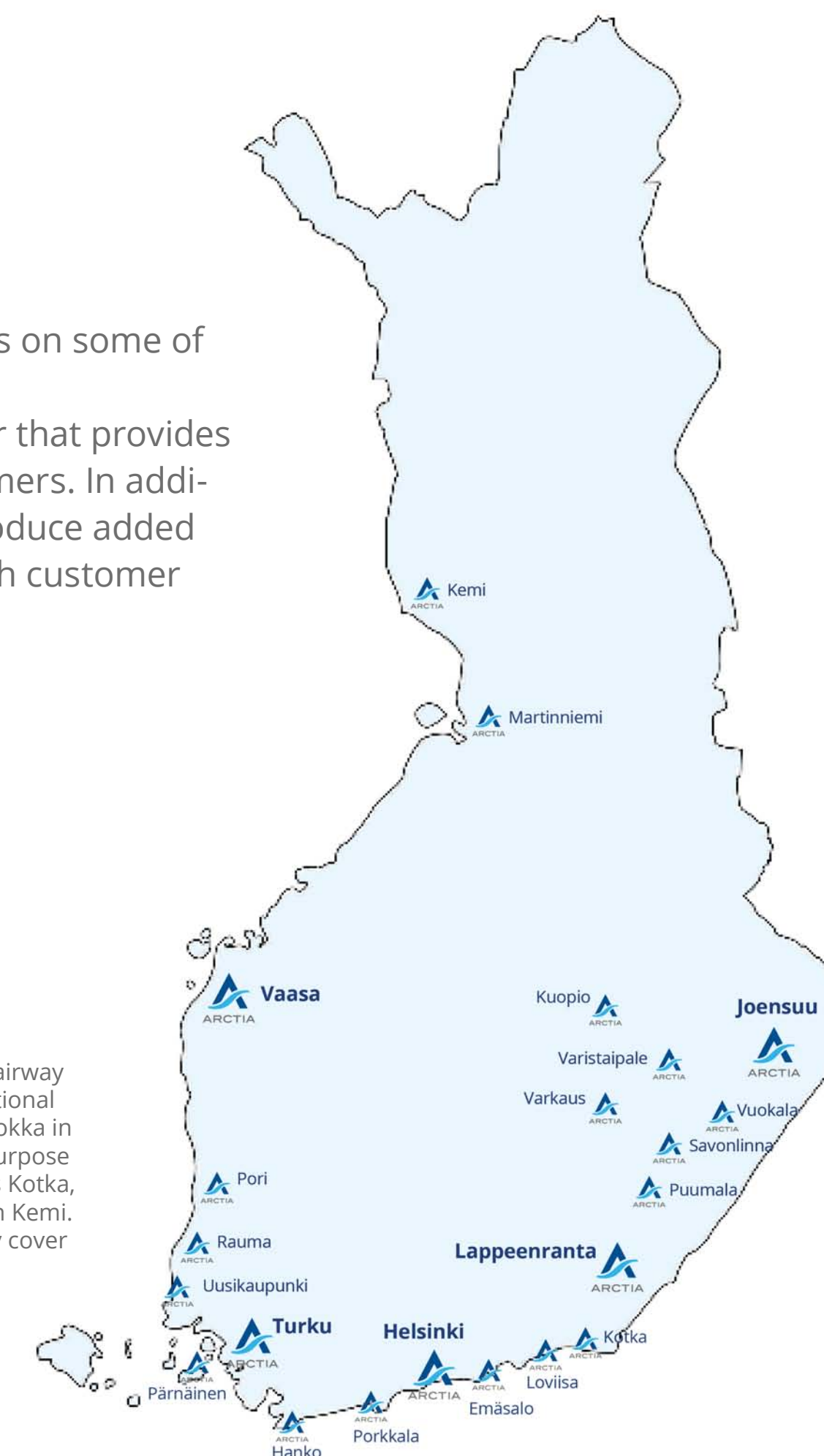
In addition to our own product development, Arctia also contributes to the future of the Finnish maritime industry through research cooperation with universities of applied sciences, universities, and other organisations. Arctia is involved in the activities of the Apprentice Mill, which was established in cooperation with the Finnish Shipowners' Association and nine schools of nautical studies. The Apprentice Mill coordinates and promotes the efficient use of trainee posts on vessels.

As the impact of Arctia's operations is significantly greater than our own size, it is natural that

the State has set strategic interests on some of our operations.

Arctia's vision is to be a partner that provides the most added value to its customers. In addition to work and products that produce added value, this can be assessed through customer satisfaction and product safety.

Arctia's head office, the Helsinki fairway station, and the base for conventional icebreakers are located in Katajanokka in Helsinki. The home port of multipurpose icebreakers Fennica and Nordica is Kotka, and Arctia Karhu Oy is domiciled in Kemi. The services of Arctia Meritaito Oy cover the coast and inland waters





CUSTOMER SATISFACTION

Arctia's most significant customer is the Finnish Transport Infrastructure Agency, which maintains and develops the majority of Finland's fairways and canals and is responsible for organising winter navigation. The Finnish Transport Infrastructure Agency acquires the services mainly through sub-contracts in public procurement.

Icebreaking

The customer of icebreaking services is the Finnish Transport Infrastructure Agency. Close cooperation of several operators is needed in a winter transport system that safeguards winter navigation of Finland's industry and merchant shipping. The Finnish Transport Infrastructure Agency and the Finnish Transport and Communications Agency Traficom act as the authorities for the system and supervise its functioning. The Finnish Transport Infrastructure Agency not only requests the icebreaking, but it also defines the assistance restrictions and exemptions for merchant vessels. The Finnish Transport and Communications Agency Traficom monitors, e.g. with national port inspections that vessels and their crews meet the ice class and regulatory requirements. In addition, the functioning of the system requires regular contacts between pilots, ports, charterers, shipping companies and other actors.

In 2021, we met the quality targets set for icebreaking with regard to the ships' waiting

times, towing speed and the number of empty transits. In addition, the Finnish Transport Infrastructure Agency organises an annual stakeholder survey to assess the functioning of the winter navigation system.

Fairway maintenance

Contract-specific targets have been set for each fairway maintenance contract, which include, e.g. inspections of the location of floating safety devices in the agreed response time. In 2021, the inspections were carried out within the agreed response times.

In the fairway maintenance and hydrographic survey services, customer satisfaction is also assessed with customer meetings and surveys. The monitoring of customer satisfaction has been based on project-specific successes, and it is rated on a scale of 1-5, where 1 meant poor and 5 excellent performance. The customer satisfaction of fairway maintenance scored 4.1 in 2021.

Hydrographic surveying

The largest customer in hydrographic surveying is Traficom, which is responsible for marine surveying. In 2021, hydrographic surveying was also carried out for Kartverket, the authority responsible for marine surveying in Norway. Other key customers are the Finnish Transport Infrastructure Agency; the Finnish Defence Forces; Metsähallitus; the Centres for Economic Deve-

lopment, Transport and the Environment; ports; municipalities; consulting and planning firms; and companies that own hydraulic structures. In 2021, customer satisfaction of hydrographic surveying scored 4.4 on a scale of 1-5.

As part of customer relationship management and to develop a better service, customer satisfaction surveying was updated in 2021. Since the beginning of 2022, we have introduced the NPS metric, as well as regular in-depth interviews.

PRODUCT SAFETY

Safety of services

In terms of all business operations, the safety of seafaring and water transport and Arctia's role in it is one of the most important aspects. With respect to our own operations, this is managed as part of the safety management systems. Arctia maintains and develops the safety management system of its vessels and shipping companies. In addition, Arctia's subsidiary Arctia Meritaito also uses the ISO 9001 quality management system, the 14001 environmental manage-



Picture: Miikka Ylikoski, Arctia Ltd



ment system, and the ISO 45001 occupational health and safety management system.

Safety of Viittatehdas products

Arctia's products include maritime safety devices, plastic spar buoys and navigational aids, which have been manufactured in Viittatehdas in Joensuu for over 40 years. Even at the moment, there are about 27,000 navigational aids manufactured by Arctia in the Finnish fairways. Arctia produces about 1,500 navigational aids each year. The production of navigational aids has always been based on an easy-to-care, low-cost structure that also withstands winter conditions.

We carry on constant development work to enable the manageability and safe use of navigational aids.

The materials used in the navigational aids and buoys manufactured by Viittatehdas are HD and MD polyethylene and polystyrene, which are recyclable materials. The accessories of the navigational aids include steel weights and connectors, lifting lugs, reflectors, aluminium radar reflectors, as well as lights and batteries with their casings.

The navigational aids and buoys have a CE marking and they are manufactured from IALA-specified types. Viittatehdas is the only

company in the world that manufactures plastic spar buoys for ice conditions. The products have been exported to more than twenty countries, especially to areas needing ice-proof qualities. We design and manufacture the navigational aids in-house which, together with continuous product development, also enables tailored solutions for the individual needs of our customers.

As part of the promotion of digitalisation, remotely monitored and managed navigational aids and buoys developed by Arctia increase fairway safety and reduce the environmental load.

STAKEHOLDER COOPERATION

There are many contributors to ensuring smooth and safe navigation. Arctia carries out stakeholder collaboration with customers, shipping companies, the authorities, ports, charterers, trade and industry, research organisations, training facilities, and other operators in the maritime cluster, as well as with its own personnel. In addition to customers, the overseas stakeholders include, e.g. the authorities, shipping operators, non-governmental organisations, and research institutes.

In 2021, stakeholder cooperation was characterised by the COVID-19 pandemic, due to which safeguarding the health of our employees was the most important target. The stakeholders including their expectations are listed in Table 1. Arctia is a member of the following associations and lobbying organisations:

- The Finnish Shipowners' Association

- The Service Sector Employers Palta
- The Finnish Maritime Society
- The Kotka Maritime Research Centre (Merikotka)
- The Apprentice Mill
- The Association of Finnish Waterways
- Corporate membership of IALA (the International Association of Marine Aids to Navigation and Lighthouse Authorities)

NEW SERVICES AND PRODUCTS

The Intelligent Sea project coordinated by Arctia continued in 2021. In addition to Arctia, the project partners are the Port of Stockholm and the Port of Naantali. The Intelligent Sea is a three-year project looking into the future of maritime fairways from the viewpoint of sustainable development by creating smart digital solutions for the sea, ports and the users of fairways. The project develops a digital network of smart buoys and maritime safety devices, and tests alternative energy sources for buoys and new solutions for monitoring sulphur emissions from ships. The European Commission has granted CEF funding for the project.

Arctia's internal projects include the development of traffic light buoys and the development work of a digital system for the Lake Saimaa area, which are moving from piloting to production. The company has carried on further development of the service concept for water areas, and this has brought significant advantages to many owners of water areas.



Picture: Arctia Ltd



Stakeholders and their expectations

STAKEHOLDERS

EXPECTATIONS

OWNER	Finnish State; the Ownership Steering Department of the Prime Minister's Office	Investment ability, implementation of strategic interests, responsibility and good financial standing
EMPLOYEES	Onshore personnel Offshore personnel	Good financial standing, good long-term HR policy, important and meaningful work
AUTHORITIES AND 3RD SECTOR	<p>International organisations IALA, IHO, PIA, IMO, IMCA HELCOM, EMSA, ECSA</p> <p>Research organizations Schools, instructors, scientists Maritime colleges Maritime research institutes</p> <p>Arctic operators Ministry for Foreign Affairs of Finland Arctic Council Finnish Meteorological Institute Arctic Economic Council</p> <p>Interest organisations The Finnish Shipowners' Association The European Community Shipowners' Associations, ECSA Trade unions and other labour market organisations</p> <p>Authorities Finnish Transport Safety Agency Police of Finland Finnish Border Guard</p> <p>3RD SECTOR: Foundations Associations RALA ry Waterways Association Foundation for Recreation Areas</p>	Responsibility, flow of information, cooperation, development

STAKEHOLDERS

EXPECTATIONS

DIRECT CUSTOMERS	OWNERS OF WATER INFRASTRUCTURE	
	<p>Finnish Transport Infrastructure Agency Towns and municipalities Ports ELY Centres Government of Åland Regional Councils Finnish Defence Forces Finnish Border Guard Metsähallitus Private industrial operators Telecommunications and energy companies Oil and energy companies Offshore construction companies Customers of Viittatehdas</p>	High-quality services that comply with the service descriptions and agreements, production of added value, expertise and professionalism, responsible operations, cost-effective prices, smooth water transport
	DESIGNERS OF THE USE OF WATERS, INFORMATION PROVIDERS AND PLANNERS	
	<p>Traficom Finnish Navy Towns and municipalities Ports ELY Centres</p>	High-quality services that comply with the service descriptions and agreements, production of added value, expertise and professionalism, responsible operations, cost-effective prices, smooth water transport
	CLIENTS AND PROVIDERS OF ENVIRONMENTAL AND NATURAL RESOURCES SERVICES	
	<p>Emergency Service of Lapland Finnish Border Guard SYKE Ministry of the Environment ELY Centres</p>	High-quality services that comply with the service descriptions and agreements, production of added value, expertise and professionalism, responsible operations, cost-effective prices, smooth water transport



Stakeholders and their expectations

STAKEHOLDERS

EXPECTATIONS

DIRECT CUSTOMERS	USERS, CLIENTS AND OPERATORS OF THE WATER TRANSPORT SYSTEM	
	Finnish Transport Infrastructure Agency Saimaa Canal Board of Management Port of Kemi, Port of Tornio Customers of Ice Advisors Ltd Towing and harbour icebreaking customers Direct customers of ice management and icebreaking	High-quality services that comply with the service descriptions and agreements, production of added value, expertise and professionalism, responsible operations, cost-effective prices, smooth water transport
OTHER STAKEHOLDERS	Regional Councils Finnpilot VTS Saimaa Canal Board of Management Finnish Border Guard SYKE Ministry of the Environment Finnish Meteorological Institute Sea cluster Winter transport operators: Veeteede Amet (EMA) Sjöfartsverket Rosmarport Ministry of Transport of the Russian Federation Media	Flow of information, cooperation, maintaining own service level, local knowledge and understanding and supporting regional operations, cooperation, maintaining own service level, development

STAKEHOLDERS

EXPECTATIONS

END CUSTOMERS	Finland's exports and imports Industry Shipping companies Merchant vessels Regional operators Pleasure boaters and citizens	Fast, reliable and quality transport, service, product and information
SUPPLIERS	Dockyards Goods and service suppliers Classification societies Insurance companies Financiers, banks	Good financial standing, responsibility, flow of information, cooperation, development



Targets and management of corporate responsibility

The responsibility of our operations is based on identified essential matters and their implementation as part of everyday work

OPERATING PRINCIPLES THAT DIRECT CORPORATE RESPONSIBILITY

Corporate responsibility and its reporting are based on matters we have identified as essential and on the Government's decision-in-principle concerning the state's ownership policy (VNK/8 April 2020).

TARGETS

Arctia's responsibility is summed up in nine key themes, Figure 1, which are based on the mate-

riality analysis carried out with the stakeholders in spring 2020. The themes are given major targets each year, and these targets are managed as part of normal business operations. Of the targets, the strategic interests set by the State should be highlighted: the company's task is to safeguard winter navigation serving the transport needs of the Finnish trade and industry and to provide hydrographic surveying services related to the contingency planning and preparedness of the Finnish Navy under all conditions.

Through their impacts, the management of the tasks pertaining to these strategic interests is at the core of our responsibility.

Safeguarding winter navigation and the functioning of icebreaking operations

Arctia safeguards smooth winter navigation. The number, width and engine power of our icebreakers ultimately determine the kind of fleet that can be used for entering Finnish ports in the winter season and the kinds of ice restrictions

TARGETS OF CORPORATE RESPONSIBILITY

		2019		2020		2021		2022	
		Realization	Target	Realization	Target	Realization	Target	Realization	Target
Financial	Profit/loss for the fiscal period	-2.0 MEUR	1.5 MEUR	0.9 MEUR	0.1 MEUR	-0.5 MEUR	2.2 MEUR		
Customers	Customer satisfaction	4.1	4.0	4.1	4.3	4.2	NPS 30		
	SLA		According to the agreements	Realization	According to the agreements	Realization	According to the agreements		
Personnel	Sick leave	5.1 %	5.0 %	4.8 %	4.7 %	4.9 %	4.6 %		
	Personnel experience	-	3.6	3.7	3.8	3.5	3.9		
Safety	LTIF	15.8	11.7	12.7	11.7	13.8	10.0		
Environment	Environmental damage	0	0	0	0	0	0		
	CO2 reduction					-3,5 % vs. 2020	-2.5 % vs. 2021		
	Buoy recycling				piloting		100 % recycling rate		

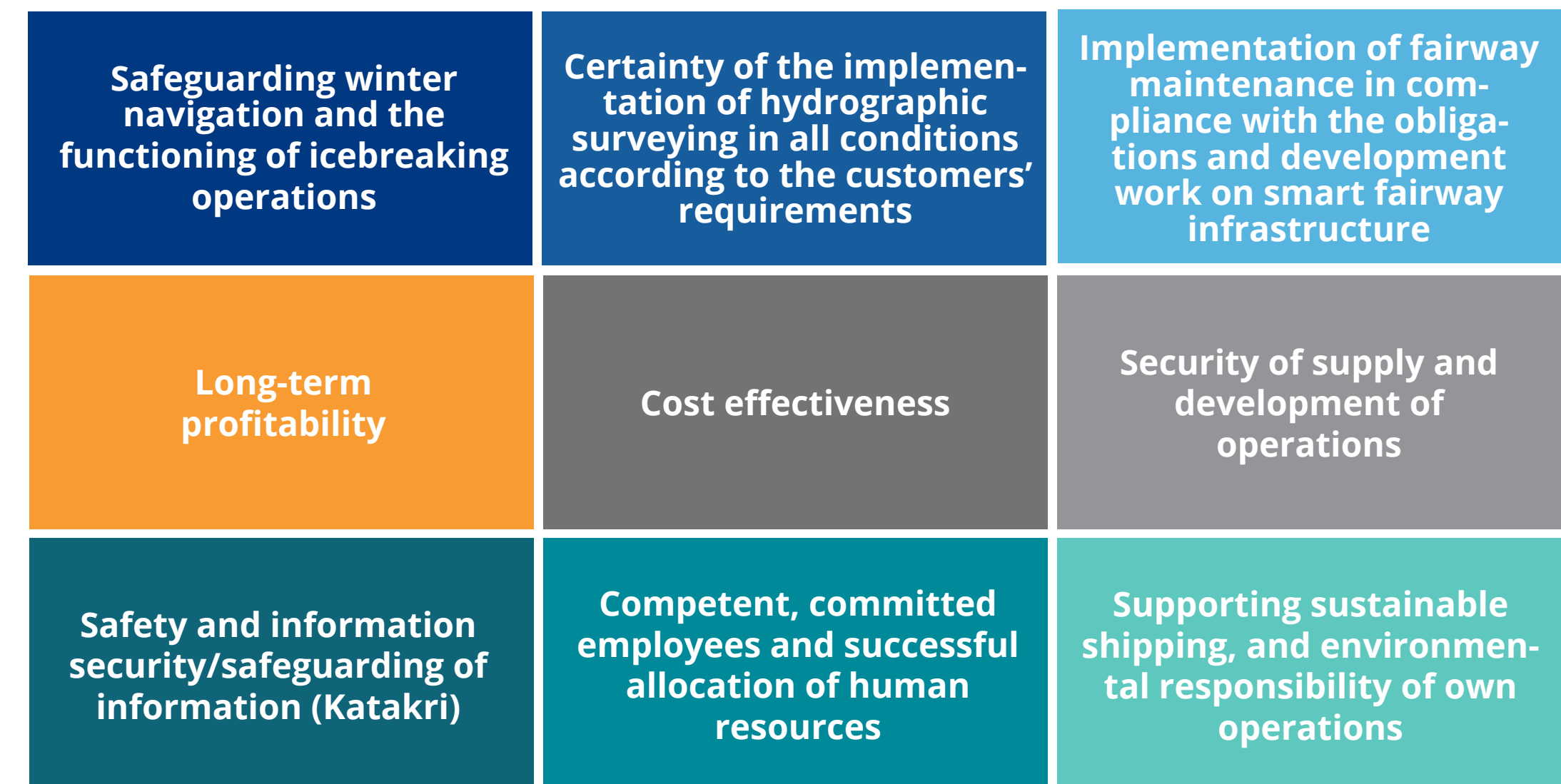


Figure 1. Material targets of Arctia's corporate responsibility



that should be imposed in order to guarantee smooth transport.

In addition to the normal winter conditions (amount of ice, winds, brash ice, ridges and compaction), the utilisation rate and operation of ice-breakers depend on how well merchant vessels can cope independently and to which extent they need assistance or towing. The operation of ice-breakers is also affected by how efficiently other stakeholders, such as ports, are operated and how reliably they provide information about their schedules.

Certainty of the implementation of hydro-graphic surveying in all conditions according to the customer's requirements

We ensure high-quality and reliable hydrographic surveying for marine survey authorities and other customers. Timely, accurate and reliable information about the water areas is most important to the stakeholders.

Implementation of fairway maintenance in compliance with the obligations and development work on smart fairway infrastructure

The management of Finland's waterways in compliance with the quality requirements for fairway maintenance. The fairway infrastructure is developed utilising digitalisation. Oil spill preparedness and response and oil spill recovery are part of fairway maintenance and the management of environmental risks in shipping.

Long-term profitability

It is one of our most important targets to bring the company's profitability to a sustainable level as this will enable long-term development work and investments.

Cost effectiveness

We want to be the most competitive actor in our segment.

Security of supply and development of operations

Security of supply is one of the most essential components in managing strategic interests, and therefore securing and developing the reliability of operations play a key role in both short and long term.

Safety, information security and safeguarding of information

The services and products, such as spar buoys and towings, assistance and locking activities, must be safe. This also applies to the infrastructure itself because the channels must be safe to navigate. The data material gathered in hydrographic surveying must also be processed and stored in a secure way. The occupational safety of employees and suppliers plays an important role due to the challenging operating environment.

Competent and committed employees and correct allocation of resources

Arctia operates in narrow special segments in many respects. We must secure a sufficient

number of competent and committed employees in the long term.

Supporting sustainable maritime transport and environmental impacts of Arctia's operations

Maritime transport is the most environmentally friendly form of transport, with no substitutive alternative form of transport. In the bigger picture, in terms of Arctia's role, it is most important to support and enable environmentally friendly waterway transport. We also strive to constantly improve and develop the management of our own environmental impacts and to reduce the environmental load.

CORPORATE RESPONSIBILITY MANAGEMENT

In corporate responsibility management, it is essential to truly include it as part of the work of all Arctia employees. Every employee can contribute to the development of corporate responsibility through their own work. The primary responsibility for the progress of the entity of corporate responsibility lies with the Board of Directors, the CEO, and the Management Team. Corporate responsibility is integrated in the company's operational activities, management, strategy, targets, policies and guidelines. The measurement of the targets of corporate responsibility is part of the measurement of the Group and the business units.

VALUES

COMPETENT

We want to learn new skills, and we share our competence with our colleagues. Competence and commitment to goals are a requirement for our success.

HELPFUL

Cooperation with our customers forms the foundation of our operations. We aim to satisfy our customers. We provide a good service for our customers and are proud to do so.

EFFICIENT

We create a good working atmosphere by valuing our own work and that of others. We perform our duties professionally and safely. With our efficiency, we ensure the continuity of our operations.



IMPACTS OF ARCTIA'S OPERATIONS

- Role in society
- Managing the strategic interest
- Security of supply and meeting contractual obligations

PRODUCING ADDED VALUE

- Customer satisfaction, product safety

STAKEHOLDER COOPERATION

- Active cooperation and materiality analysis

R&D

- New services and products

PROFITABILITY AND COMPETITIVENES

- Safeguarding the future
- Investment ability

FINANCIAL RESPONSIBILITY

- Laws, regulations, taxation, reporting

- Conduct in accordance with the laws and standards
- Good governance
- Combatting bribery and corruption
- Risk management
- Corporate responsibility management
- Information security



EMISSIONS AND CONSUMPTION

- Impact of Arctia's operations on total emissions in maritime transport in the Baltic Sea
- Own emissions, CO2 roadmap

WASTE

- Reducing and sorting of waste

OTHER ENVIRONMENTAL EFFECTS

- Nature conservation
- Biodiversity

EMPLOYEES

- Health, safety and wellbeing of employees
- Work satisfaction
- Commitment, equality
- Good HR policy
- Development of competence
- Rewarding

SUPPLIERS AND SUBCONTRACTORS

- Responsible procurement, safety

SOCIAL AND REGIONAL IMPACTS

- Good corporate citizenship

RESPONSIBILITIES AND ROLES

Owner

- policies and requirements at the upper level in the resolution on the ownership policy
- monitoring mainly in general meetings and on the basis of the company's reports

Hallitus

- response that responsibility is part of strategy and risk management
- approves goals and monitors implementation

CEO and the Management Team

- coordination, development and reporting of corporate responsibility work in accordance with the Board of Directors' instructions
- the tools used are monitoring of the requirements of corporate responsibility and policies and guidelines, setting and monitoring the indicators, directing and monitoring development projects, stakeholder work, and the materiality analysis

Mainly the following formula is complied with in the reporting of and working on corporate responsibility:

- annual summary to the general meeting
- annual public report on corporate responsibility
- the targets are part of the strategy process and the responsibility targets are part of the reward system
- quarterly report on corporate responsibility to the Board of Directors
- topical issues on corporate responsibility in every meeting of the Management Team
- stakeholder expectations and materiality analysis at least once every three years

Figure 2 Description of Arctia's corporate responsibility



Responsible way of working

The benefits of a responsible way of working can be explained by presenting them in pyramid format where the compliance with laws and regulations and the Code of Conduct create the basis required by successful risk management, occupational safety and resource efficiency.

ARCTIA'S CODE OF CONDUCT

Arctia's Code of Conduct directs the activities of the company and its every employee, director, managing director and member of the Board of Directors. In accordance with the Code of Conduct, integrity, professionalism, commitment to the personnel, health, safety and the environment, and continuous development form the basis of our operations. The Code of Conduct can be [read here](#).

Arctia uses the Whistleblow channel for internal use, and its use will be extended to external stakeholders in spring 2022.

RISK MANAGEMENT AND CORPORATE RESPONSIBILITY RISKS

Risk management is divided at the upper level into strategic, financial and operational risks. Changes taking place in the operating environment which may have a negative impact on turnover constitute a key strategic risk. Risk is managed

by predicting the impacts of changes in the operating environment, by influencing decision-making and with internal changes in operations.

The key operational risks and factors of uncertainty are related to the management and profitable implementation of customer projects. In the management of risk, key factors include risk assessments, efficient processes and a competent project personnel.

The ageing of the company's fleet increases the risk of technical problems and a rise in maintenance costs. Risk is managed with long-term service plans and annual maintenance plans. Accident risks are managed with extensive insurance policies.

The company uses the ISM safety management system, and the certified ISO 9001 quality management system, the ISO 14001 environmental management system and the ISO 45001 occupational health and safety management system are applied to part of the Group's business operations. Hydrographic surveying also complies with the regulations of the Katakri auditing guidelines of the Finnish Defence Forces.

Due to the nature of Arctia's operations, the reduction of operational risks and, further,

taking care of occupational safety take up most of the risk management work. A significant amount of resources have been spent on the development of the safety culture and ways of operation, and this work continues.

Corporate responsibility risks are not managed separately as they are part of normal risk management. Through Arctia's impacts, the implementation of risks usually also means the implementation of corporate responsibility risks.

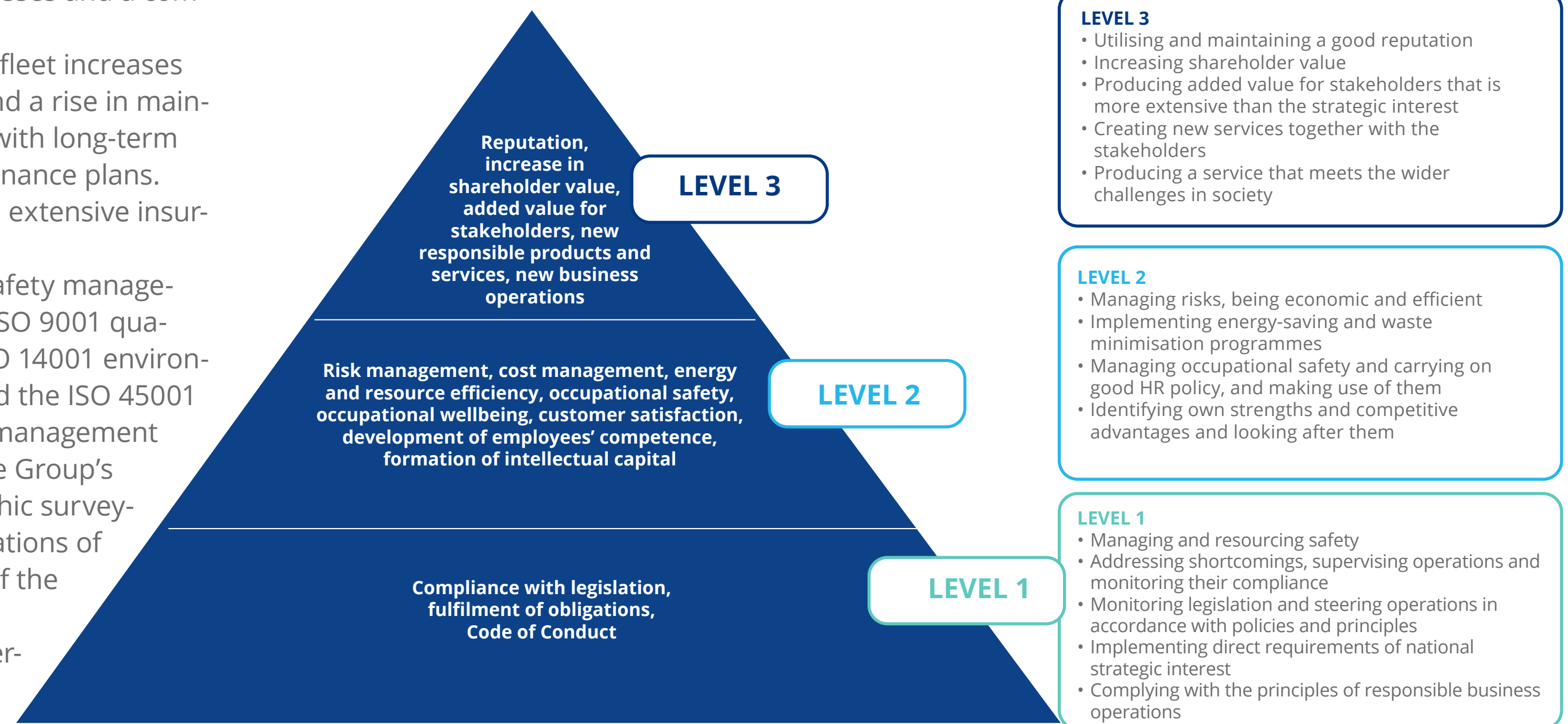


Figure 3 Corporate responsibility pyramid and the building blocks of responsibility



Financial responsibility

At Arctia, financial responsibility means taking care of profitability, efficiency and competitiveness.

Financial responsibility means taking care of profitability, the efficiency of business operations and competitiveness. Economically viable operations enable the competitiveness of our services, continuity of our operations, investment ability and, further, the implementation of corporate responsibility. At the moment, the greatest challenges in the company's profitability are related to the amount of turnover, inflexibility of the cost structure, and the maintenance costs of ageing fleet.

Our turnover fell on the previous year, standing at EUR 71.2 million (EUR 80.8 million). Profit for the fiscal period came to EUR -0.5 million (EUR 0.9 million). The Group's equity ratio remained at a healthy 50 per cent level. The Group's cash flow was positive and liquidity remained at a good level. The Group's cash assets at the end of the year totalled EUR 27.5 million (EUR 33.5 million). In 2021, investments totalled EUR 4.3 million (EUR 6.8 million). The greatest investments were made in maintaining the operational condition of icebreakers.

FINANCIAL KEY FIGURES DESCRIBING THE OPERATIONS OF THE ARCTIA GROUP

	2021	2020	2019	2018	2017
Turnover, MEUR	71.2	80.8	79.1	50.9	48.9
Operating profit/loss, MEUR	0.2	2.4	0.0	2.2	0.1
% of turnover	0.3	3.0	0.0	4.4	0.3
Profit/loss for the fiscal period, MEUR	-0.5	0.9	-2.0	1.4	-1.4
% of turnover	-0.7	1.1	-2.5	2.7	-2.1
Equity, MEUR	141.6	142.1	141.2	147.3	137.2
Equity ratio, %	53.5	50.2	49.1	49.2	50.1
Net gearing, %	53.1	60.2	72.6	70.4	70.4
Interest-bearing liabilities, MEUR	102.8	119.3	125.3	130.0	121.4
Return on capital invested, %	0.1	0.9	0.1	0.8	0.1
Return on equity (ROE), %	-0.4	0.6	-1.4	1.0	-1.0
Investments, MEUR	4.3	6.8	9.5	12.7	5.7
% of turnover	6.0	8.5	12.0	25.9	11.6
Balance sheet total, MEUR	265.1	283.7	288.0	300.1	274.5

The figures for 2017–2018 are not comparable with years 2019 and 2021 due to the merger of Meritaito with the Group on 13 December 2018.



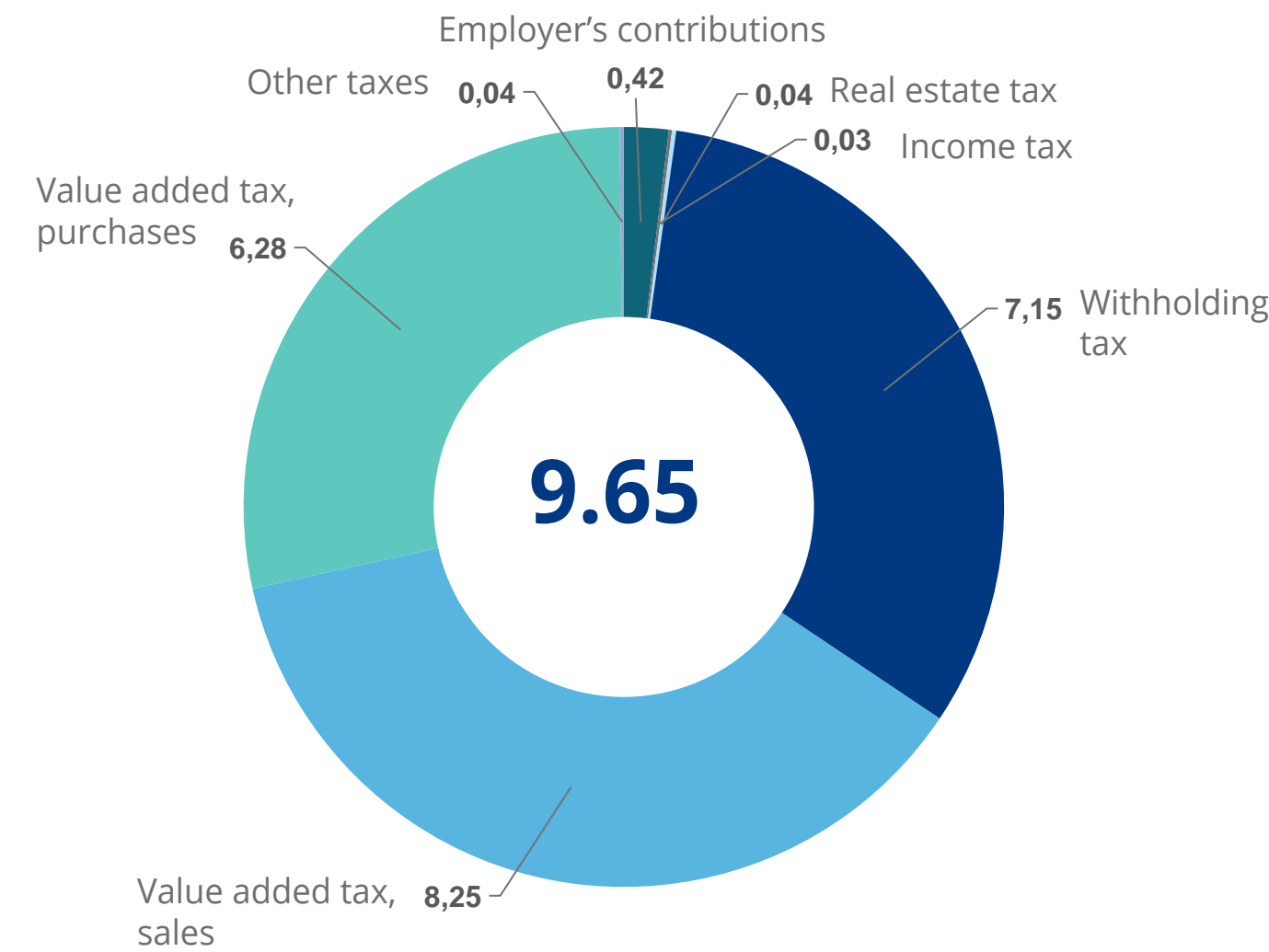
Picture: Arctia Oy



CREATING FINANCIAL ADDED VALUE FOR STAKEHOLDERS, EUR MILL.

ADDED VALUE PRODUCED	2021	2020	2019
Turnover	71.2	80.8	79.1
Other operating income	1.2	1.6	0.4
Financial income	0.0	0.0	0.2
Total	72.4	82.4	79.7
DISTRIBUTED FINANCIAL ADDED VALUE			
Suppliers			
Materials and supplies, services, and other operating expenses	22.4	31.4	30.4
Investments	4.3	6.8	9.5
Employees			
Salaries, wages and pension expenses	31.9	29.5	32.2
Payments to owners and lenders			
Dividends	0.0	0.0	1.6
Financial expenses	1.7	1.6	1.6
Public sector			
Income taxes and real estate taxes	0.1	0.1	0.1
Social insurance contributions	1.0	1.3	0.8
Total	61.4	70.7	76.2
FINANCIAL ADDED VALUE RETAINED IN THE DEVELOPMENT OF OPERATIONS			
	11.2	11.7	3.5

TAX FOOTPRINT IN 2021



PAID AND REMITTED TAXES, EUR MILL.

TAXES PAID, EUR MILL.	2021	2020	2019
Employer's contributions	0.42	0.33	0.24
Income tax	0.03	0.03	0.01
Real estate tax	0.04	0.04	0.04
Taxes paid in total	0.49	0.40	0.29
TAXES REMITTED, EUR MILL.			
Withholding tax	7.15	6.34	8.04
Value added tax, sales	8.25	11.46	7.92
Value added tax, purchases	-6.28	-7.56	-5.78
Other taxes	0.04	0.00	0.00
Taxes remitted in total	9.65	10.64	10.47

ARCTIA AS A TAXPAYER

In 2021, the companies in the Arctia Group paid a total of EUR 9.65 million (EUR 10.64 million in 2020) of taxes and tax-like payments. We also have an indirect impact on the tax revenues of the state and several municipalities by employing a total of some 430 people. All Arctia Group companies are incorporated in Finland. All taxes are paid and remitted in Finland.

CHARITY AND SPONSORSHIP

Arctia does not support or sponsor political parties, politicians, political institutions, sports or the arts, and it does not sign cooperation agreements related to them. In 2021, we made a donation to the Good Holiday Spirit campaign* of the Mannerheim League for Child Welfare and the Finnish Red Cross, and we paid a membership fee to the Kotka Maritime Research Centre. **

Charity and sponsorship, €	2021	2020	2019
Children and youth	0	0	0
Science, research and education*	7,500	7,500	7,500
Arts	0	0	0
Sports and exercise	0	0	0
Political subsidies	0	0	0
Civic and environmental organisations**	1,000	1,000	1,000



Social responsibility

We ensure a healthy and safe workplace and take care of our suppliers and subcontractors.

Maintenance and development of the competence of employees and engaging our employees in the development of the company's operations play a strategically important role at Arctia. During 2021, Arctia further developed the performance management system where unit-level targets derived from the Group's targets are put into practice as targets of individual employees in the performance review with the line manager.

In 2021, we conducted the Työvire survey for the second time in partnership with Ilmarinen Mutual Pension Insurance Company. As a whole, Arctia's employees find that the meaningfulness of their work is important. Further information about the Työvire survey is provided later in this report.

Supervisory work and its development are a key element of management. We organised joint supervisor training for all supervisors during autumn 2021 in cooperation with the Service Sector Employers PALTA and Terveystalo. The topics of the training courses were "Supervisor's rights and obligations", and the participants included representatives of both offshore and

onshore personnel, which created the preconditions for identifying common issues and interfaces.

The optimal allocation of personnel use and dialogue with the employees are part of responsibility. During 2021, negotiations on the collective agreements concerning the offshore personnel of the entire Group were carried out, and they were completed in a spirit of good cooperation. One of the key elements in these negotiations concerning different collective agreements and business units was to achieve better matching of work and workers. In-depth familiarisation with matters, mutual respect, and finding common solutions that are in the interests of both parties were key factors in this cooperation. A great deal of negotiations have also been carried out on the basis of a so-called principle of continuous negotiation, which has made it possible for Arctia, e.g. to make provisions for the harmful effects of COVID-19 by agreeing exceptions in the arrangement of shifts in icebreaking during winter 2021–2022.

In autumn 2021, hydrographic surveying introduced its own personnel on hydrographic

survey vessels when the subcontracting cooperation of many years with VG-Shipping was terminated. Thanks to Arctia's group structure and the high level of competence of offshore personnel, by having our own crew we can offer our own employees interesting job opportunities and possibilities to learn new things, taking account the seasonal variations of operations.

Although the Group's operational activities have continued as before despite COVID-19, important meetings of employees and, for example, the opportunities for the administration, supervisors and management to go out to the operational field have been few and far between due to the pandemic. In December, we held a joint virtual



Picture: Arctia Ltd



Shipping Company Day for the employees of the entire Group, with a theme of “doing together”.

REORGANISATION AND DISMISSALS

In spring 2021, Arctia conducted cooperation negotiations concerning the business units of

fairway maintenance, hydrographic surveying and administration due to the weaker economic outlook, low order books and structurally high costs. The cooperation negotiations applied to a total of 135 employees. The reorganisation resulted in, e.g. combining and substantial

NUMBER AND STRUCTURE OF PERSONNEL

	2021	2020	2019	2018	2017
Number of personnel (31.12.)					
Onshore personnel	193	198	219	32	31
Offshore personnel	235	219	223	243	237
Employment contract distribution (31.12)					
Onshore personnel, permanent	181	186	203	31	29
Offshore personnel, permanent	216	217	223	220	217
Temporary	31	14	16	24	22
Share of full-time and part-time employment contracts (%)					
Onshore personnel, part-time	1.4	5.6	2.6	3.1	3.2
Offshore personnel, part-time	0	0	0	0	0
Average length of employment contract / years (31.12.)					
Koko henkilöstö	13.7	12.9	13.3	11.5	12.5
Average age of personnel / years (31.12.)					
All employees	49.9	48.7	48.5	47.5	48.1
Offshore personnel, men	51.9	50.3	50.3	48.0	48.4
Offshore personnel, women	49.9	48.3	48.0	44.3	44.3
Onshore personnel	46.0	47.6	48.1	48.0	48.0
Retired employees	14	8	22	12	11
Average age of retirement	64.4	61.5	62.1	62	60.3

The figures for 2017-2018 are not comparable with years 2019-2021 due to the merger of Meritaito with the Group on 13 December 2018. All members of personnel employed by Arctia in 2021 were Finnish nationals.

changing of job specifications, and the termination of a total of ten job specifications in administration and fairway maintenance. In addition, a new operation and working time model was introduced in the fairway maintenance business in the autumn in order to aim for improved cost competitiveness.

In the cooperation negotiations, the principles of cross-using of onshore personnel of the entire Arctia Meritaito Oy were also agreed, which will make it possible to temporarily employ personnel in another business unit. The objective of cross-use is to develop multiple skills of the employees, to improve the efficiency of operations and to reduce the need to cut down the number of employees as a result of the seasonal nature of operations.

Cooperation negotiations concerning all canals managed by Arctia were launched in December on the basis of the seasonal nature of operations, and they were concluded in January 2022. If the winter season 2021/2022 turns out to be long and no new extra tasks are introduced for the canals, the company will have to consider layoffs, which would take place in the early part of the year/spring 2022.

COLLECTIVE AGREEMENTS

The following collective agreements were in force in 2021:

1. The collective agreement applying to the deck, engine and catering personnel of the Arctia Group

2. The collective agreements applying to the engineering officers of the Arctia Group's conventional and multipurpose icebreakers
3. The collective agreement applying to the deck officers of the Arctia Group's icebreakers
4. The collective agreement applying to the off-shore operations of Arctia Icebreaking Ltd
5. The collective agreement applying to the deck officers, engineering officers and crew of harbour icebreakers
6. The collective agreement applying to the personnel of fairway maintenance
7. The collective agreement between Meritaito Ltd and the Public and Welfare Services Union applying to blue-collar workers
8. The collective agreement between Meritaito, the Public and Welfare Services Union, the Confederation of State Employees' Unions Pardia and the Federation of Professional and Managerial Staff YTM applying to salaried employees
9. The collective agreement applying to merchant vessels in international transport
10. The collective agreement applying to ships' crew serving on Meritaito's fairway vessels
11. The collective agreement applying to the salaried employees of Palta.

During 2021, one co-operation committee meeting was held in icebreaking and one joint meeting in icebreaking, fairway maintenance and hydrographic surveying. The meetings dealt with topical issues in addition to matters related to



cooperation. Members of the Management Team and experts took part in the meetings to represent the employer. Shop stewards and members of the occupational safety and health organisation took part in the meetings as employee representatives.

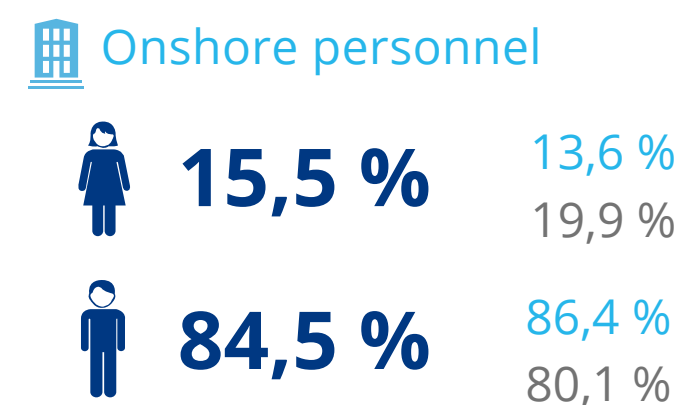
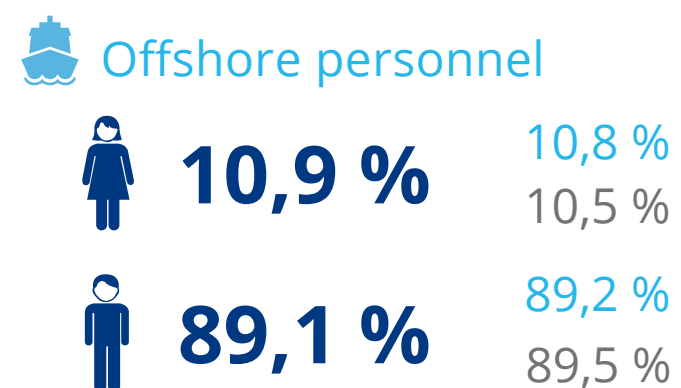
EQUALITY AND NON-DISCRIMINATION

In its operations, Arctia follows an equality plan approved by the Ombudsman for Equality. The equality plan includes information about personnel structure and pay surveys. In addition, a list of measures to promote non-discrimination and an assessment of the implementation of non-discrimination have also been included in the equality plan. No issues have been detected by the Ombudsman for Equality that would suggest unjustified differences between men and women. The plan was updated in 2019. Arctia monitors the structure and salaries of its employees.

PROFESSIONAL SKILLS ARE IMPROVED THROUGH DEVELOPMENT OF COMPETENCE AND CONTINUOUS LEARNING

Training events related to the maintenance of professional qualifications play a key role in the development and maintenance of the professional skills of our employees. Arctia's training plan for 2021 was successfully implemented despite the exceptional circumstances due to the COVID-19 pandemic. The number of training days during the year was 897, including mainly

GENDER DISTRIBUTION



refresher training in the fire, rescue and medical services, as well as other training related to occupational safety, such as occupational safety card, hot work card and first aid training. In addition to safety training, among the most extensive training packages of the year included training relating to the responsibilities and obligations of managers from various professional groups and other key personnel and members of the Management Team. Training in support of special competence of IB Polaris and training in icebreaking competence to new navigating officers was carried out as planned in late autumn.

Board of Directors' gender distribution*

Women	3	Men	3
	3		3
	3		3

Gender distribution in senior management (Management Team)*

Women	1	Men	4
	1		3
	2		2

2021 2020 2019 *Members at the turn of the year

In addition to training, on-the-job learning also has an important role in the development of our employees' competence. Diverse tasks, projects and development projects offer opportunities to constant learning and development of competence. Induction programmes and job orientation safeguard the requirements for safety and health at work for both new employees and in relation to new or changing tasks.

FROM TARGETS TO ACTION

The performance review model was developed in 2021 by including the Group's strategic targets even more than before in addition to unit-specific

targets. The objective of the renewed appraisal model is to improve the awareness and role of every Arctia employee as part of the implementation of the organisation's targets. The monitoring of the progress of targets and providing feedback, as well as taking into account factors related to the development of competence and wellbeing in support of successful work performance and achieving the targets will still be an important part of the review model.

It is our target that every Arctia employee conducts the performance review every year. The reviews could not be implemented in all professional groups as planned in advance, for example, due to the practical challenges presented by COVID-19. In future, we will aim to pay even more attention to ensuring suitable times for the reviews.

A HARMONISED OPERATING CULTURE IS DEVELOPED WITH PERSONNEL SURVEY

Arctia monitors the development of personnel experience with a personnel survey that includes questions on themes related to occupational wellbeing from the viewpoint of the organisation level and the close work environment of the employees, as well as individual performance requirements. The results will help to focus development measures in a planned way on areas that promote achievement of the targets.

In 2021, the personnel survey was carried out with the same concept as in the previous year. A total of 257 Arctia employees responded to the



survey, and therefore the response rate (2021 62%, 2020 70%) gave a fairly extensive picture of the personnel experience. The index describing the Group's work efficiency and mood, 3.5, was at a good level compared with the previous year (3.7 in 2020). The objective of the 2022 personnel survey was to increase the response rate to be able to assess the impact of development and future development needs on the basis of an even higher number of responses.



Based on the survey, the meaningfulness of work, personal health in terms of working capacity, as well as competence that sets you apart from others continued to be the most significant strength factors in the same way as in the previous year's survey. These strength factors play an important part in support of achieving the organisational and business targets, and therefore their maintenance and safeguarding continue to be of utmost importance also in future.

In the same way as in the previous year's survey, themes related to leadership, communication by the management, and the company's capacity to reform itself were raised as the most significant development areas in the 2021 survey. Based on the previous survey results, a number of development measures that increase interaction and communications and the entire personnel's strategic understanding have been implemented. The development work will be continued with a long-term approach, e.g. by increasing reviews by the management and the spearhead projects, by organising joint Group-level events COVID-19 permitting, and by including a development theme of cooperation and dissemination of information in the projects implemented during the year and in the activities of every Arctia employee.

The survey results were presented to the personnel via intranet because due to the exceptional circumstances it was not possible to organise a joint event for all employees to attend. In addition, the results were dealt with in team- and vessel-specific meetings where also individual development plans were drawn up. The objective of common debate and development planning is to strengthen every employee's awareness of their own role as a member of the working community and in the development of comprehensive occupational wellbeing and operations.

*The index describing the Group's work efficiency and mood.

OCCUPATIONAL HEALTH AND SAFETY

Arctia's Safety Programme for 2021–2022 was published at the beginning of 2021. The Safety Programme is an implementation plan for Arctia's annual safety targets complying with the HSSEQ policy. With the programme, Arctia's most important safety-related targets will be included as part of the normal practice by setting concrete measures for achieving the targets, as well as metrics to monitor the outcome. The Safety Programme is based on the company's strategic targets, and the programme became one of the company's spearhead projects based on the company strategy. The target of the spearhead project "Safe operations" is to improve the different areas of the Group's safety, however, with the targets focusing strongly on occupational safety.

In terms of occupational safety, our targets are zero serious occupational accidents, zero occupational diseases, and a reduction in the Group's lost time incident frequency rate to below ten. With respect to other safety areas, we are developing vessel safety, and corporate safety focuses on the development of cyber security.

During 2021, Arctia carried out internal and external audits on the company's operational activities and places of business. Due to the COVID-19 pandemic, some of the internal audits were carried out through remote connections, and the shipping company audit of the Finnish

Transport and Communications Agency Traficom was carried out on the spot.

The two-year Kompassi project focusing on occupational safety was closed at the end of the year. Within the project, the organisation's awareness of the significance of predictive risk management was increased, and employee training was conducted, e.g. in drawing up risk assessments of tasks. During the project, two



Picture: Juha Kuronen, Arctia Ltd



surveys on the occupational safety culture were conducted, on the basis of which measures for the development of an occupational safety culture in the company were planned. Finally, line managers attended a training course in the performance of Safety Walk. The Safety Walk activities will be introduced throughout the company in early 2022.

In 2021, the number of occupational accidents resulting in absence from work was 9 in the entire Group (13 in 2020). The lost-time incident frequency (LTIF) of the Arctia Group was 13.8 (12.7 in 2020). In icebreaking and hydrographic surveying, as well as in the management, the lost-time incident frequency rate was at the same level as in the previous year. In icebreaking, LTIF was 8.0. The management and hydrographic surveying deserve a special mention: their LTIF rate was zero for the third year running. The hardest work in reducing the LTIF rate is again carried out in fairway maintenance, which works under extremely challenging conditions. There, the LTIF rate grew by 30% to 32.5 (25.2 in 2020).

During 2021, Arctia continued the measures related to the monitoring and management of work disability risks in a systematic way. The target level of absences due to sickness at Arctia is 4.7%. The percentage of absence due to sickness in the Group was 4.9%.

Arctia's COVID-19 coordination team convened regularly, and it drew up guidelines for the company and monitored the general COVID-19 situation and the guidance of the Finnish Insti-

Number of accidents	2021	2020	2019
	Accidents resulting in absence from work	9	13
Other accidents	3	3	14
Accident frequency / million working hours	13.8	12.7	15.4

Sick leave	2021	2020	2019
	Absence rate due to illness, all personnel	4.9	4.8
Number of suspected cases of occupational illness	0	0	1

tute for Health and Welfare. The coordination team also planned operations in an exceptional situation and in case of infections. The National Emergency Supply Agency has monitored the Group's operations; the company reports regularly on the impacts of the exceptional situation on business operations.

The occupational health service had a strong role in the management of the COVID-19 situation, such as with the rapid availability of COVID-19 test results, the inspection of coronavirus guidelines and the implementation of training lectures on remote work ergonomics. In addition to statutory preventative occupational health-care, Arctia offers its employees GP-level medical care. The health insurance policy taken out by the company for its employees complements the occupational health care services.

Arctia's central occupational safety organisation and Arctia Meritaito's occupational safety

organisation convened regularly during 2021. Matters related to the operational activities were dealt with extensively in the meetings. Matters that are monitored constantly include, e.g. any needs for changes in the operational guidelines and, currently, the impacts of the COVID-19 pandemic on the employees.

SUPPLIERS AND SUBCONTRACTORS

In 2021, we continued the development of procurement principles and the related processes. Procurement guidelines were updated, and they were put into practice through training, and supplier assessments were carried out. The procurement processes were harmonised between Group companies and the sharing of responsibilities was clarified. In the procurement guide-

lines and operations, responsible procurement principles are highlighted even more than before. The updated approval process of suppliers was put into practice.

During the year, e.g. the repair and maintenance needs of properties were assessed, and the deployment of the maintenance and procurement system was extended to fairway maintenance vessels.

In the selection of suppliers, we will increasingly emphasise the environmental aspects. We instruct our suppliers and subcontractors with regard to the company's safety principles and require commitment to the company's Code of Conduct. The suppliers must comply with Arctia's safety, occupational safety and environmental practices.



Picture: Sampo Tammiala, Arctia Ltd



Environmental responsibility

Arctia's operating environment is sensitive and vulnerable. Operating practices that respect nature and the environment are important to us.

In terms of Arctia's operations, the key environmental aspects are the indirect impacts of our operations, the most significant of which is the smooth winter navigation and that way the reduction of total emissions from merchant shipping; direct CO2 emissions of icebreaking, and the clean-up and recovery of environmental damage.

During 2021, we continued measures complying with the environmental programme and the CO2 roadmap. The most important achievements in terms of the environmental programme launched in 2020 were the calculated reduction of CO2 emissions by about 3.5% (2021 vs. 2019) due to the technical improvements on icebreakers, and the Group changing its electricity contract to electricity produced with renewable energy. We also invested in oil spill recovery equipment, organised recycling for plastic spar buoys, launched a project on more eco-efficient use of icebreakers, continued the development of measures complying with the CO2-free waste management contract, and carried on risk management work on the prevention of environmental damage.

Arctia did not cause any environmental damage in 2021.

TARGETS OF THE ENVIRONMENTAL PROGRAMME

Like other shipping companies, Arctia is committed to the IMO, EU and national reduction targets although legally they do not apply to icebreakers directly.

In 2021, we set an extremely ambitious CO2 reduction target: 20% lower CO2 emissions in 2030 in comparison to the 2020 level. Achieving this target means substantial investments and close cooperation with the Finnish Transport Infrastructure Agency and other stakeholders. The renewal of the icebreaking fleet and the start of using biofuels play a key role in this, although both still involve significant uncertainties. However, the direction has been set and it is clear. In the longer term, digitalisation on board vessels will enable real-time monitoring of fuel consumption and the optimisation of total emissions in transport. In the service contracts on fairway maintenance, the responsibility of and possibilities for energy-efficient operation and produc-

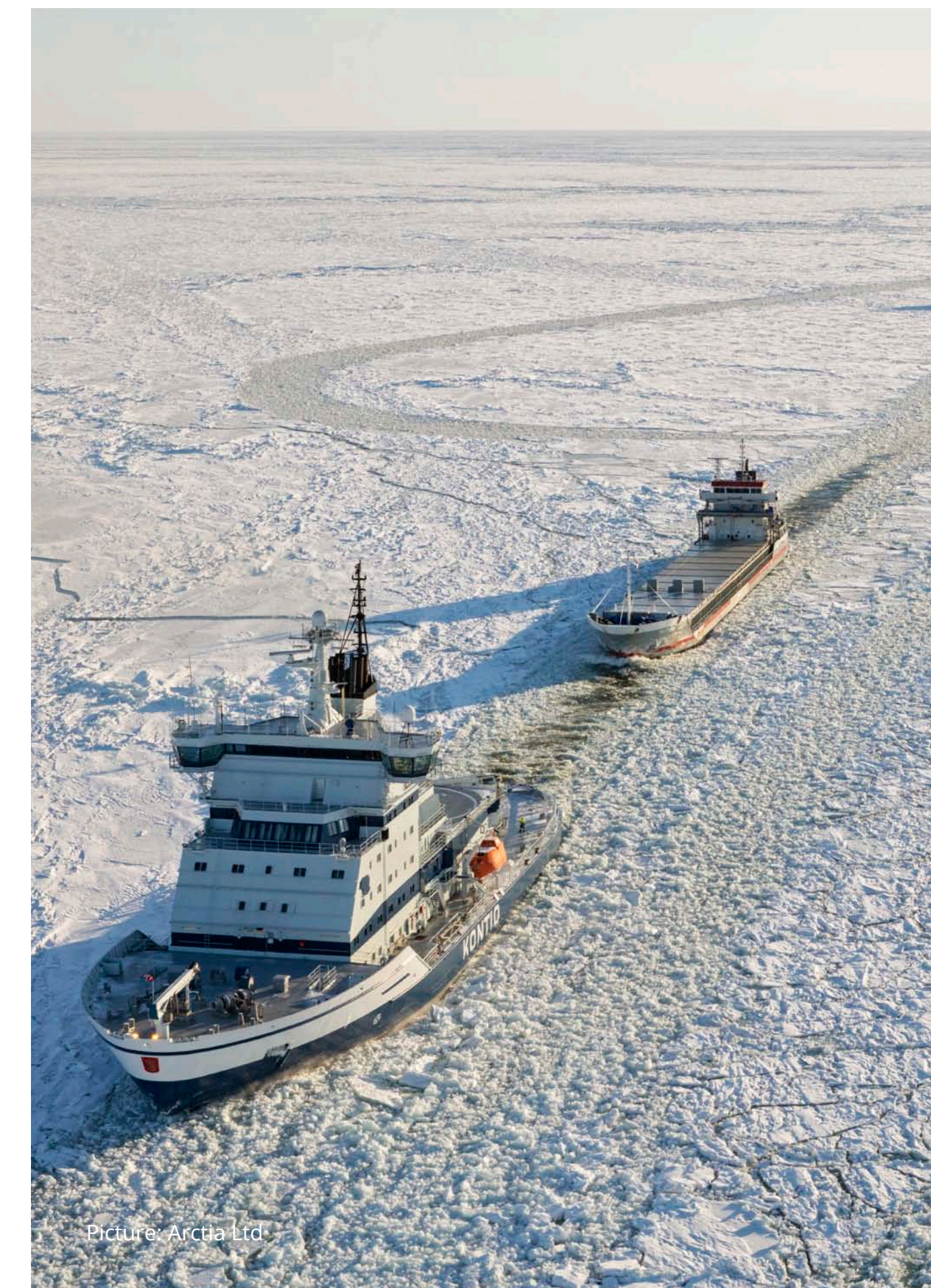
tion are well managed in comparison to individual purchases.

In addition to CO2 reductions, the programme focuses on supplier management, reduction of waste and energy consumption, and diminishing environmental risks.

IMPACTS OF ARCTIA'S OPERATIONS – GREEN HANDPRINT

The positive environmental impacts of a well-functioning and disturbance-free navigation in the sea areas and in inland waterways are considerably more significant than Arctia's direct negative impacts. The shipping industry in Finland corresponds to about 90 per cent of all import and export transport, but only 2.6 per cent of all emissions. This ratio helps to illustrate Arctia's positive net impacts on the environment.

The most important environmental impact of icebreaking is enabling winter navigation. In the future, emissions from merchant vessels will be reduced due to environmental efficiency requirements (EEDI/EEXI), which will result in a diminished ability to navigate in ice and in an



Picture: Arctia Ltd.



increasing the need for icebreaking assistance. All in all, emissions will be reduced.

Oil spill preparedness and response and oil spill remediation services prevent environmental accidents and restore nature after accidents. Our product range also includes buoys designed for the monitoring of environmental emissions, for example, sulphur emissions or oil spills. In 2021, flaws in the test version of the Sniffer buoy (SO₂) were remedied, and it continued its test phase in the Port of Naantali. The Sniffer buoy is part of an EU-funded project, which also includes investigation of alternative energy sources and battery solutions for the buoys.

Increasingly accurate information about the seabed produced by hydrographic surveying, good channel planning and a high standard of fairway maintenance prevent maritime accidents,

improve maritime safety, speed up traffic in the channels and that way increase the pass-through capacity of the channels.

ENVIRONMENTAL IMPACTS OF OPERATIONS

In terms of icebreaking, the most significant impact is the CO₂ emissions, see Environmental report. Emissions are reduced through correct use of the fleet, and when the icebreakers are berthed at the Katajanokka icebreaker pier, they are connected to district heating, shore-side electricity and municipal technology. Icebreaker Polaris also uses the overflow of its LNG system for heating.

In addition to consumption by vessels, the most significant environmental load of fairway maintenance comes from the batteries and accu-

mulators required by the safety devices. Arctia is working on the development of improved buoy batteries. When at berth, the fairway vessels, harbour icebreaker Ahto and the other tugs are connected to shore-side electricity and their waste water is discharged into a collection vehicle.

Travel resulting from the rotation of sea personnel contributes to other carbon dioxide emissions of operations. In 2021, rotation trips were made by train due to the COVID-19 situation.

The materials used by Arctia in the provision of its services are primarily related to the operation and maintenance of vessels and the services in fairway maintenance and hydraulic engineering. Arctia uses, for example, construction materials, paints, solvents, detergents and cleaning agents each year.

We manufacture about 1,500 plastic spar buoys and navigational aids in Viittatehdas in Joensuu. During their durability and life cycle, they are considerably less harmful to the environment than, for example, iron buoys. In order to reduce emissions from production, Arctia has launched extensive recycling of materials from old navigational aids and buoys.

PREPAREDNESS FOR ENVIRONMENTAL RISKS

In terms of Arctia's own operations, environmental risks are prepared for with risk assessments, development of operational guidelines, technical modifications, and investments.

On a wider scale, we provide oil spill recovery services, of which Arctia Meritaito has extensive experience, expertise and equipment.

Arctia Meritaito uses the ISO 45001 environmental management system to manage the numerous environmental aspects pertaining to its branch of industry. The safety management system for icebreakers and other larger vessels includes a separate environmental section.

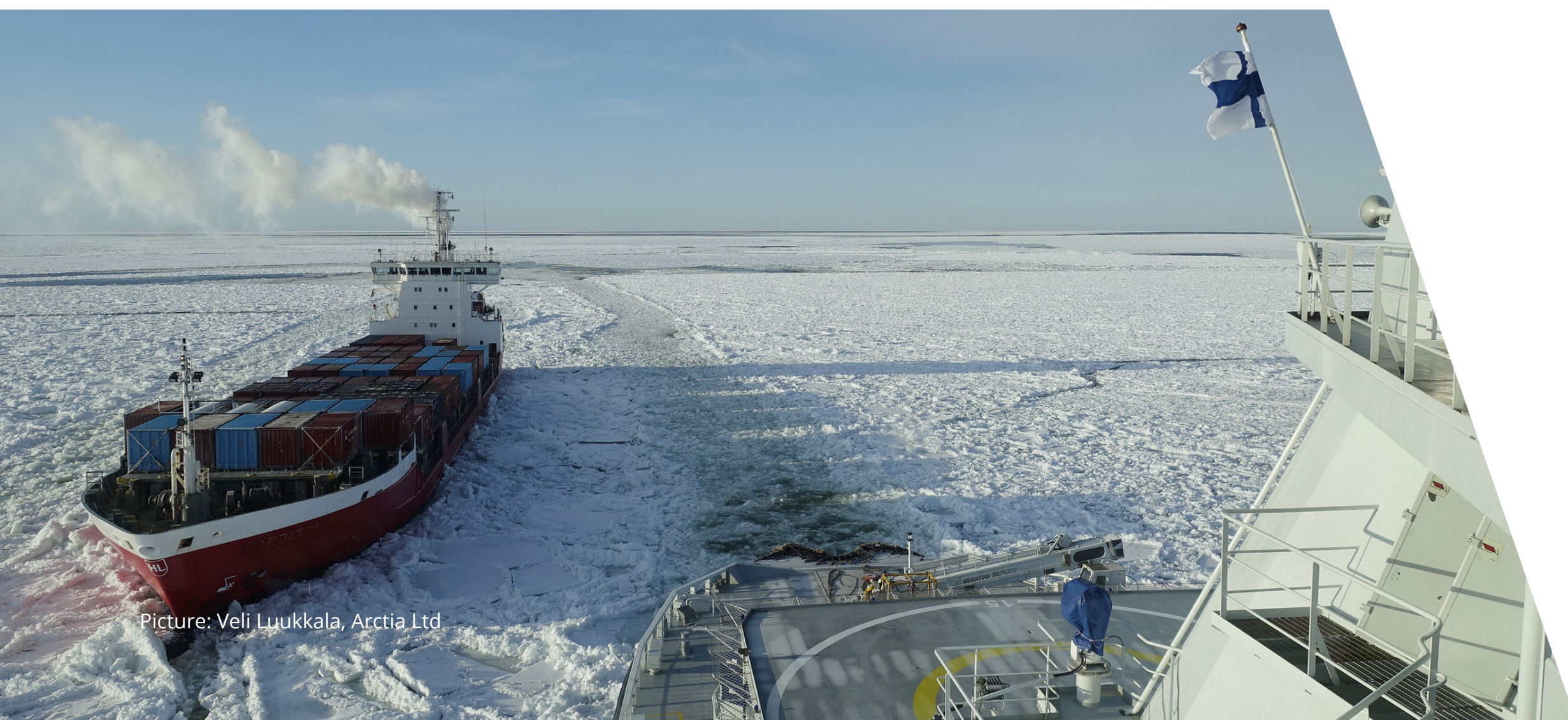
ENVIRONMENTAL INVESTMENTS

The most significant environmental investment was the updating of oil spill recovery preparedness of fairway vessel Linja. The vessel is in oil spill recovery preparedness in the Kvarken area.

In the Joensuu buoy factory, we invest in the facilities and tools that enable recycling of plastic spar buoys with as few environmental emissions as possible.

Modern sensors and displays for fuel consumption monitoring were installed in two icebreakers. Based on the experiences gained from using the systems, installations on other icebreakers will be continued. The aim of the project is to obtain more accurate information about fuel consumption during navigation and assistance tasks for the development of less consuming operations.

In terms of our smaller fleet, we continued, e.g. installation of oil troughs that prevent oil from entering the water in potential fault situations.



Picture: Veli Luukkala, Arctia Ltd



Environmental report

AIRBORNE AND GREENHOUSE GAS EMISSIONS

At Arctia, airborne emissions consist of carbon dioxide (CO₂), carbon monoxide (CO), hydrocarbons (HC), nitrogen oxides (NO_x), methane (CH₄), nitrous oxide (N₂O), and particulate matter (PM). The consumed resources consist of fuel, water, electricity, spar buoy accumulators and batteries, their manufacturing materials and heating oils, as well as district heat.

By far the largest individual source of emissions is the fuel consumption of icebreakers. The absolute emissions in different years are not comparable with each other. Emissions are impacted by, e.g. the severity of winter and the number of icebreakers in operation. The increase in absolute CO₂ emissions in 2021 is explained by the exceptionally mild winter of 2020 (3 icebreakers in operation) in comparison

Other aerial emissions (tonnes)	2021	2020	2019
CO	65.1	26.5	61.9
HC	32.5	18.0	31.9
NO _x	704.4	386.0	688.9
Particulates	12.9	7.1	12.6
CH ₄	4.3	2.4	4.2
N ₂ O	0.9	0.5	0.9

with the average winter of 2021 (7 icebreakers in operation).

ELECTRICITY CONSUMPTION

Outside the icebreaking season, traditional icebreakers are connected to the electricity network of the City of Helsinki. Their engines are switched off to avoid emissions and noise. In Kotka, Nordica and Fennica correspondingly rely on shore-side electricity, as do the tugs in Kemi and Tornio and the fairway vessels along the coast. Naturally, the annual electricity consumption of the icebreaker base is impacted by the severity of winter conditions, i.e. how many vessels are at berth during the winter months. In spring 2021, we signed a carbon-neutral electricity contract where electricity is produced with 100% renewable energy.

DISTRICT HEAT

District heat is used in buildings and, in Helsinki, on icebreakers. When icebreakers arrive in port, they are connected to district heating and their boilers are shut down. In addition, icebreaker Polaris has a heat recovery system that utilises the vaporisation of LNG gas in heating.

OTHER MATERIALS

Paints, solvents, detergents and cleaning agents are used each year for the maintenance, service and repairs of the vessels. Plastics and metal are used in the manufacture of spar buoys, and buoy batteries are imported and used. Paints, solvents, detergents and cleaning agents are used each year for the maintenance of properties. The amounts of materials used are monitored by cost unit.

TRANSPORTATION AND TRAVEL

The overall environmental impacts of transportation and travel are minor. Travel resulting from the shift rotation of sea personnel creates the

	2021	2020	2019
Arctia Group's CO₂ emissions according to the GHG standard (tonnes)			
Scope 1, Direct emissions	42 381	21 547	41 132
Scope 2, Purchased energy, district heat	752	1 104	930
Scope 2, Purchased energy, electricity	178	726	1 072
Scope 3, Travel	3	10	738
Total CO₂ emissions	43 314	23 387	43 872

* The emissions have been calculated according to the emission coefficient notified by Fingrid.
 ** During 2021, Arctia started using electricity produced with renewable energy, which is calculated to be CO₂-free, as from the beginning of March.

	2021	2020	2019
Fuel oil consumption of vessels and boats (tonnes)			
Ultra-light	-	-	778
Icebreakers, light fuel oil	10 696	5 340	9 143
Other vessels, light fuel oil ³⁾	848	1 021	1 258
Icebreakers, LNG ⁵⁾	1 364	70	1 206
Boats and other fleet	506	300	617
Total CO₂ emissions of fuel consumption	42 381	21 547	41 132

Purchased energy: Electricity (MWh) ^{*, 1)}

Katajanokka icebreaker pier	4 885	4 437	3 994
Kotka icebreaker pier ²⁾	2 408	2 575	2 931
Other ships ³⁾	1 204	876	335
Other places of business	3 209	2 198	3 353
Calculated total CO₂ emissions of purchased electricity	**178	726	1 072

District heat, weather-adjusted (MWh)

Katajanokka ⁴⁾	4 133	6 064	5 109
Calculated total CO₂ emissions of district heat	752	1 104	930

Icebreakers' CO₂ tonnes per operating day and per assisted merchant vessel

Vessels, tonnes/operating day (icebreakers)	68	67	75
Vessels, tonnes/assistance (icebreakers)	28	31	24

1) Directly purchased electricity
 2) Annual consumption measured of the ships
 3) MPV Pohjanmeri, MSV Seili, HIB Ahto
 4) The figure for 2021 includes Laivastokatu 3 energy consumption
 5) Includes LNG. Calculated with the factor IMO Resolution MEPC 245 (66) 2014



most environmental impacts in terms of transportation and travel. Air travel and consequent carbon dioxide emissions in 2021 were lower than in the previous year due to the COVID-19 pandemic.

WASTE

In 2021, Arctia introduced carbon-neutral waste management. The Group aims to further reduce waste and to increase its sorting and utilisation rate in all its operations. Our waste management agreement enables accurate monitoring and reporting of our waste volumes by waste type and place of business. Waste is collected and sorted at our places of business in accordance with the waste management regulations. During the operating periods of icebreakers and fairway maintenance and hydrographic survey vessels, waste is delivered into the collection receptacles in ports, from where it is transported further mainly for recycling or for other utilisation. Icebreakers keep a garbage record book and report waste removed from the vessel in accordance with international regulations. That way also waste that has been processed by third-party waste management service providers will be reported without gaps in the data.

Hazardous waste is always sorted and delivered into the appropriate collection receptacles or points in all places of business. Waste produced by the machinery of vessels is removed from the vessels in an appropriate way in compliance with the regulations (MARPOL). The most

significant forms of hazardous waste are bilge water and waste oil. Accurate records of these wastes are kept on board the vessels. The refrigerants most commonly used in the refrigeration equipment on vessels are potent greenhouse gases that are harmful to the ozone layer. Arctia has given up the use of such gases and switched to alternative refrigerants. Authorised service companies carry out the servicing of Arctia's refrigeration equipment.

WASTE MANAGEMENT TRAINING AND PLANS

New employees are introduced to the shipping company's waste management system during their general orientation. Waste is sorted in fixed places of business and on vessels in accordance with the company's instructions. Waste management reporting is audited internally and externally each year.



Picture: Tamas Soki



Reporting and calculation principles

This report on corporate responsibility is based on issues that Arctia has identified as essential. The reporting complies with the Government Resolution on State Ownership Policy and its requirements with regard to corporate responsibility reporting of state-owned enterprises (VNK/8.4.2020).

The calculation of the financial key figures complies with the Accounting Act of Finland, and the reporting of the tax footprint is based on the guidelines provided by ownership steering by the State. The calculation of personnel key figures is also directed by the Accounting Board's general guidelines on the calculation of personnel key figures in annual reports.

PERSONNEL INDICATORS

The reported figures represent the situation on the indicated date (31 December 2021). The total number of personnel also includes part-time employees, as well as fixed-term employees with valid employment contracts on the day in question.

Lost-time incident frequency

The number of lost-time injuries, i.e. LTIF (Lost-Time Injury Frequency), has been calculated by including all workplace accidents resulting in a minimum of one day of inability to work. The lost-time incident frequency has been calculated by dividing the above-specified LTI by the work-

ing hours and multiplying the result by one million.

The daily working time used in the formula is eight hours in the onshore organisation and twelve hours on the vessels. Accidents sustained by both onshore and offshore personnel are included in occupational accidents, and the total number of working hours in the organisation was used as the basis of division.

CARBON DIOXIDE AND PARTICULATE EMISSIONS

The carbon dioxide emissions of vessels have been calculated in accordance with the calculation formula presented in the IMO publication IMO Resolution MEPC 245 (66) 2014 "Guidelines

on the method of calculation of the attained Energy Efficiency Index (EEDI) for new ships".

The carbon dioxide emissions of air traffic have been calculated with the coefficient 0.129 kg CO₂/km (DEFRA). Rail transport in Finland carbon-neutral; electrified track, the electric energy of which is produced with emission-free hydropower, the emissions of diesel-based transport have been offset (VR).

Other airborne emissions of the vessels have been calculated with VTT's MEERI calculation systems and, where applicable, with the emission coefficients of the EMEP/EEA air pollutant emission inventory guidebook 2019 published by the EEA (European Environment Agency).



Arctia Ltd

Laivastokatu 9, FI-00160 Helsinki, Finland

Tel. +358 30 620 7000

arctia.fi/en