

Meriaura Sustainability Report 2023

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Navigating the changing market successfully

The demand for freight transport changed noticeably in 2023, having been unusually strong and stable for the previous two years. It became more erratic and difficult to predict. Even so, we kept our ships busy in both bulk and project business, and the financial outcome was also decent given the market conditions.

It was more difficult to achieve our emission reductions goals. Last year showed how much the market situation currently impacts carbon intensity. Numerous changes in schedules and programmes, the occasionally weak spot market, port congestion, and strikes during the first quarter in Finland increased the share of ballast voyages. This reduced the operational efficiency and made it more difficult to achieve the emissions reduction targets per tonne carried.

We made good progress on the emissions reduction actions over which we had direct control. By investing in fuel production and ship technology, we managed to increase the use of biofuel made by Meriaura's subsidiary in our ships that can run on biofuel. We also improved the EcoVoy contract, our commercial solution for low-emission sea transport, and made it more transparent.

The International Maritime Organization (IMO) has set a target for carbon-neutral shipping by around 2050. Meriaura's climate strategy aims for carbon neutrality as early as in the 2030s. We took a significant step towards reaching these goals in April 2024 as we announced ordering two biofuel powered 6750 DWT cargo vessels from the Dutch company Royal Bodewes Shipyard. The two newly ordered vessels mark the beginning of a newbuilding program through which we will systematically renew our fleet with a series of newbuildings. The use of bio-oil combined with compensation enables us to achieve our ambitious target. With voluntary emission reductions, we aim to achieve a competitive advantage and prepare for future emissions trading systems, and do our part to protect the climate also without obligations.

The significance of shipping for Finland's foreign trade has increased even more since Russia invaded Ukraine. Currently, 90 per cent of our imports and as much as 95 per cent of our exports are carried by sea. Reliable, year-round sea transport is thus a vital link for our society and industry. The weather and ice conditions of the winter of 2023–2024 remind us that operators who are familiar with local conditions and invest in ice-class equipment are still needed.

Beppe Rosin, CEO



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Meriaura in numbers

Turnover 2023

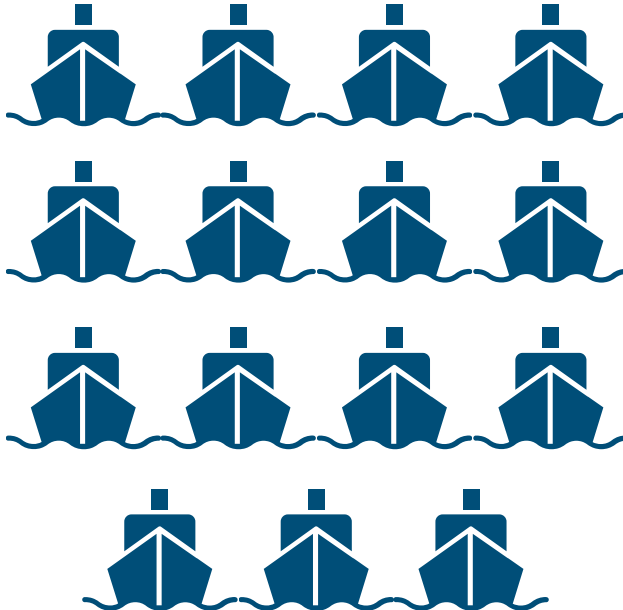
62,8 M€

Cargo volume 2023

2,14 M tons 

CO₂ 16,8 g 

CO2 emission per tonne / km



15 vessels,
operating mainly in the
Baltic and North sea
areas

5 vessels owned by
Meriaura



9 vessels time-chartered and 1
external vessel under Meriaura
management

734 
successful voyages in 2023

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Meriaura Group Plc

Meriaura Group has two business areas: **Marine Logistics** and **Renewable Energy**.

Marine Logistics business is carried out by Meriaura Ltd, which is a major provider of transport for bulk cargo and demanding project deliveries in Northern Europe, especially in the Baltic Sea and North Sea regions. The company provides its customers with competitive and low-emission marine transport services, based on long-term affreightment agreements, modern fleet, and active development of its operational sustainability. In addition, Meriaura has a strong market position in the marine logistics in renewable energy construction projects. The Marine Logistics business also includes VG-EcoFuel Ltd which produces biofuels from bio-oils and recycled oils generated as industrial by-products.

The Renewable Energy business focuses on comprehensive clean energy systems. Meriaura Energy Ltd designs and delivers clean energy production systems as comprehensive deliveries for industrial use and district heating. The energy production is based on large-scale solar thermal systems implemented using high-performance solar thermal collectors manufactured by the company. The Renewable Energy business also includes Rasol Ltd, specialised in delivering high-quality solar power systems for real estates, companies and solar parks.

Meriaura Group's share is listed on Nasdaq First North Growth Market Sweden as MERIS and on Nasdaq First North Growth Market Finland as MERIH.

Meriaura Invest Oy is the main owner of Meriaura Group Oyj with approx. 61 percent ownership of the shares. Meriaura Invest's ownership is divided into:

Jussi Mälkiä approx. 52%, Aura Mare Oy approx. 33% (90% owned by Jussi Mälkiä), Riinu Walls approx. 10% and other individual owners approx. 5%.

Other companies operating near Meriaura are the investment company Aura Mare Oy, which specializes in the bio and circular economy, and its subsidiaries Biolinja Oy Uusikaupunki and VG-Port Oy, which provides port services in Naantali and circular economy collection services all over Finland.

The Board of Directors

Jussi Mälkiä, Chairman
Antti Vehviläinen
Kirsi Suopelto
Jari Varjotie
Patrik Rautaheimo

Management Team

Beppe Rosin, CEO
Mathias Landor, COO
Miiia Peltonen, CFO
Jessica Troberg, CHRO, Crewingr
Jyrki Hentula, CTO

Our values



Innovativeness

We are not afraid to question established practices and find new ways to build cleaner and more efficient shipping.



Cooperation

We nurture the power of collaboration to maximize expertise and success between both co-workers and customers.



Honesty

We handle things sincerely, ethically and fairly, respecting each other and our stakeholders.



Hard work

We persistently and resolutely strive to complete things while renewing old established practices and finding more effective ways of working.



Responsibility

We take proactive responsibility for the impact of our operations on the environment and society. We do not compromise on safety.

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Our mission is

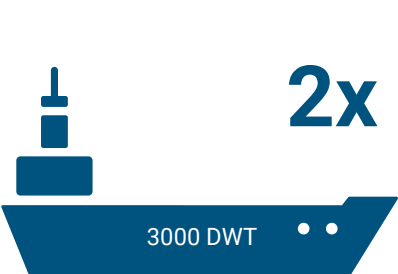
to transport cargo in the Baltic and North Seas sustainably, professionally, to the benefit of our customers.



Our vision is

to be the leading forerunner in environmentally friendly, innovative and solution-oriented maritime transport services.

Our fleet - owned and time-chartered



Helena VG, Baltic Sailor



Aava VG, Travetal*, Emilie*, Lottaland, Aurelie*, Loraland



Eeva VG, Mirva VG*, Nathalie*, Friendland



Meri, Aura



Research vessel Aranda

In 2023, our fleet consisted of twelve dry cargo vessels, with a capacity of 3000-4500 cargo tons, and two deck cargo vessels designed for special and heavy transports.

*Meriaura Group's main owner and parent company Meriaura Invest Ltd. is a co-owner in Helmer Lundström Ab Oy and Rederi Ab Nathalie (RABN), and Marship Minibulker Flotte GmbH.

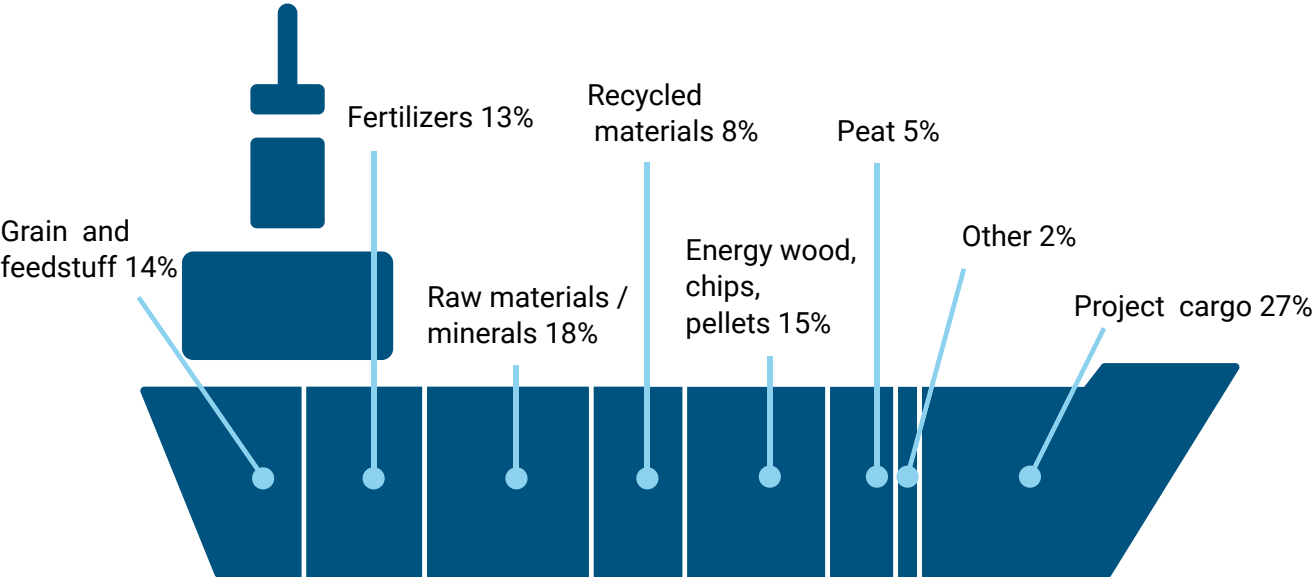
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Cargo flows

Commodities carried 2023 as share of turnover



The most visited ports by Meriaura fleet in 2023

Loading port	no. of port calls
1. Kokkola	54
2. Wismar	49
3. Uusikaupunki	45
4. Inkoo	34
5. Gdansk	28

Discharging port	no. of port calls
1. Naantali	82
2. Muuga	35
3. Klaipeda	28
4. Uusikaupunki	31
5. Rauma	27

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Sustainable financial success with teamwork

Our financial performance in 2023 was at a good level, even though net sales did not reach the exceptional level of 2022. By maintaining our profitability and competitiveness, we can be a good and reliable partner for all our stakeholders, employees and customers. Our bulk business is based on trustworthy and enduring customer relationships. Although the general economic situation worsened, and uncertainty increased in 2023, affecting demand and freight levels to some extent, our cargo volumes stayed relatively steady. In the project cargo sector, the demand for heavy transport grew in most segments, and our project vessels had a high occupancy rate during the year.

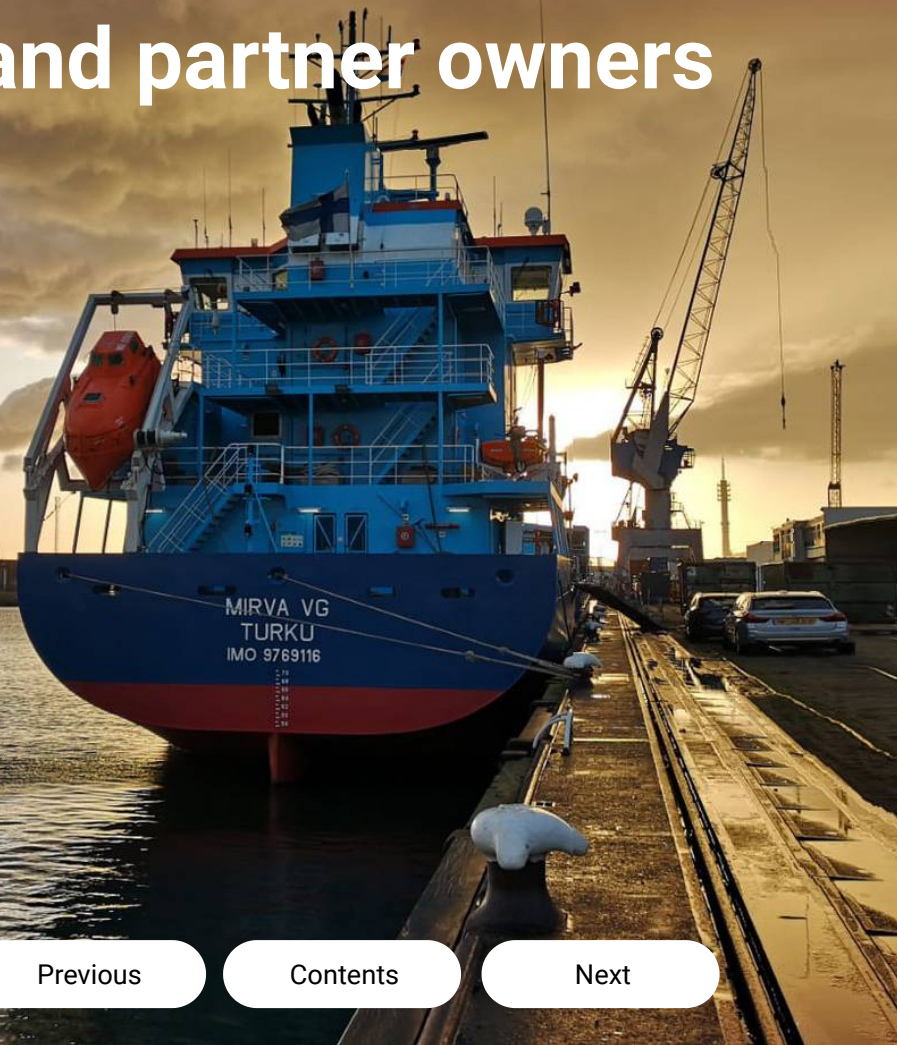
During the year, we continued our strong efforts to reduce the environmental impact of our operations. The development of new ship concepts and fuel solutions continued, and €735,000 was invested during the financial year in the development of a carbon-neutral cargo ship concept.

Achieving emissions reduction targets in maritime logistics still requires long-term investments in a more energy-efficient fleet and increasing utilisation of alternative fuels. We firmly believe that investments in emissions-reducing technology create the conditions for expanding our operations and strengthen our long-term competitiveness.

Meriaura Ltd.	2023	2022	2021*	2020*
Turnover (MEUR)	63	69	56	55
Profit (MEUR)	5	10	5	3
Investments (MEUR)	1	5	6	2
Transported tons (Millions of tons)	2,14	2,38	2,31	2,53
Purchases in Finland (MEUR)	30	31	19	22
% of all purchases	56%	56%	44%	48%

* Until end of 2021 VG-Shipping concern

Our stakeholders and partner owners



Owner partners

We own about a third of the vessels we charter, and the rest are time-chartered, i.e. rented from other shipping companies. In recent years, we have deepened and widened our existing charter collaboration with two Finnish partner shipping companies. Meriaura Group's main owner and parent company, Meriaura Invest Ltd, has been a co-owner since 2022 of Helmer Lundström Ab Oy and Rederi Ab Nathalie (RABN). With these strategic partnerships, we secure the availability of suitable Finnish tonnage for our long-term use. The partnership also supports a broader goal: the sustainable development and strengthening of the Finnish maritime industry. Strong relationships between local shipping companies create the foundation for long-term success and support the regional maritime industry sector. Together, we are developing innovative solutions and practices that promote greener shipping and better address the current and future challenges of sustainability.

In 2023, we expanded our collaboration with RABN in the area of our vessels' technical management. For example, daily technical maintenance and ISM have been transferred to RABN's team, which has given Meriaura's team more time to work on the newbuildings and other development projects.

For our other time-chartered vessels, the cooperation is mainly based on long contracts, and we know the owners of the ships well. Most vessels have a master whom Meriaura hires. This ensures excellent and smooth communication between the shipping company, the vessel and Meriaura's land organisation. The cooperation between Meriaura and the Owner aims for the most efficient and economic operation possible.

Meriaura's stakeholders

Our company's key stakeholders are skilled and driven staff and clients. By building a reputation as a good employer, we attract employees who share our values. For our clients, being open, honest and operating responsibly are important ways of creating extra value.

We choose our partners and suppliers carefully to ensure reliability and quality. In addition, our key partners are agents, stevedores, ports, spare part and fuel suppliers, shipyards and classification societies, and partner shipping companies from which we have chartered vessels. We also work closely with the authorities, the Finnish Shipowners' Association and marine nature environmental organisations. Open and direct communication with stakeholders forms the basis for cooperation and helps us adapt to societal changes.

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Environmental policy and sustainability management

Meriaura's increasing concern for the environment and dedication to take good care of our employees are the main foundations of the company's responsibility work. Our aim is to achieve a balance between a healthy work community, eco-friendly operations, and financial success. This requires a new kind of management approach, where the company's values and responsibility goals influence decision-making at all levels.

Meriaura's environmental policy concentrates on practical actions. We have identified the biggest environmental impacts of our operations and developed concrete steps to reduce them.

Our environmental policy

Meriaura's vision is to be the leading forerunner in environmentally friendly, innovative, and solution-oriented sea transport services. We are dedicated to advancing environmental values in our everyday work and constantly searching for cost-effective solutions to environmental challenges.

Our ships operate in a vulnerable sea area, so we need to understand the risks and manage them well. The most significant environmental impacts of maritime transport are caused by air emissions from fuels and waste water. In case of an accident, a potential oil spill can cause considerable damage to nature.






We have addressed the challenges of our industry and operating environment with the development of biofuel made from recycled raw materials, proper waste water treatment and qualified staff. We aim to direct all the waste generated on ships into recycling and further processing. We train and motivate our employees to think about environmental responsibility in their daily operations.

We constantly monitor and aim to reduce the environmental impact of our operations. Our future transport concept strives for a completely carbon-neutral form of transport. The goal is to create a new kind of competitive edge from an operating method that takes the environment into account more.

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The UN Sustainable Development Goals

The **UN Agenda 2030** for Sustainable Development aims at global poverty eradication and sustainable development, where the economy, environment and welfare of the people are considered equally. Our key areas of influence around these goals are included in the following five key areas.

 <p>5 GENDER EQUALITY</p> <p>Gender equality</p> <p>Meriaura Group provides equal opportunities for everyone to participate fully in the operations and management, regardless of gender. We offer flexibility regarding work tasks, according to one's life situation.</p>	 <p>7 AFFORDABLE AND CLEAN ENERGY</p> <p>Clean energy</p> <p>We increase the use of renewable energy in both office and marine operations. Our EcoCoaster vessels are ESI-certified (Environmental Ship Index) to ensure energy-efficient operation.</p>	 <p>9 INDUSTRY, INNOVATION AND INFRASTRUCTURE</p> <p>Industry, innovation and infrastructure</p> <p>We actively monitor the development of technology and promote the introduction of more sustainable shipping technology. We invest in new and more environmentally friendly cargo ships and test new methods and technologies.</p>	 <p>13 CLIMATE ACTION</p> <p>Climate action</p> <p>We use renewable and carbon neutral electricity. We produce biofuel from waste-based material. Waste-based bio-oil is ethically sustainable and its lifecycle CO2 emissions are up to 98% lower compared to the traditional fossil fuel option.</p>	 <p>14 LIFE BELOW WATER</p> <p>Life below water</p> <p>We reduce the nutrient load to the sea by delivering the wastewater from our vessels ashore for proper treatment. Our ships are equipped with ballast water management systems.</p>
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Our environmental program

Meriaura introduced the Ecocompass environmental programme in 2022. The aim from the beginning was to obtain ISO 14001 certification later, and this target was achieved at the end of 2023. In the environmental programme, tangible goals have been set with measurable indicators so that we can apply the principle of continuous improvement and progressively improve our operations.

Meriaura ISO 14001-environmental program consists of:

Reduction and sorting of waste

- Sorting station at the office
- Waste management plan

Commuting

- Possibility to distance work
- Purchase of an electric company car

Communication

- Sustainability report on a yearly basis
- Staff training

Biodiversity

- Follow-up of the sewage streams

Influencing

- Continuing cooperation with marine nature foundations
- Active participation in working groups of our interest groups

Material efficiency

- Use of waste-based biofuel on vessels
- Follow-up of emissions

Chemicals

- Chemical lists on board, updated yearly



We are committed to saving natural resources.
We have been granted an EcoCompass Certificate.

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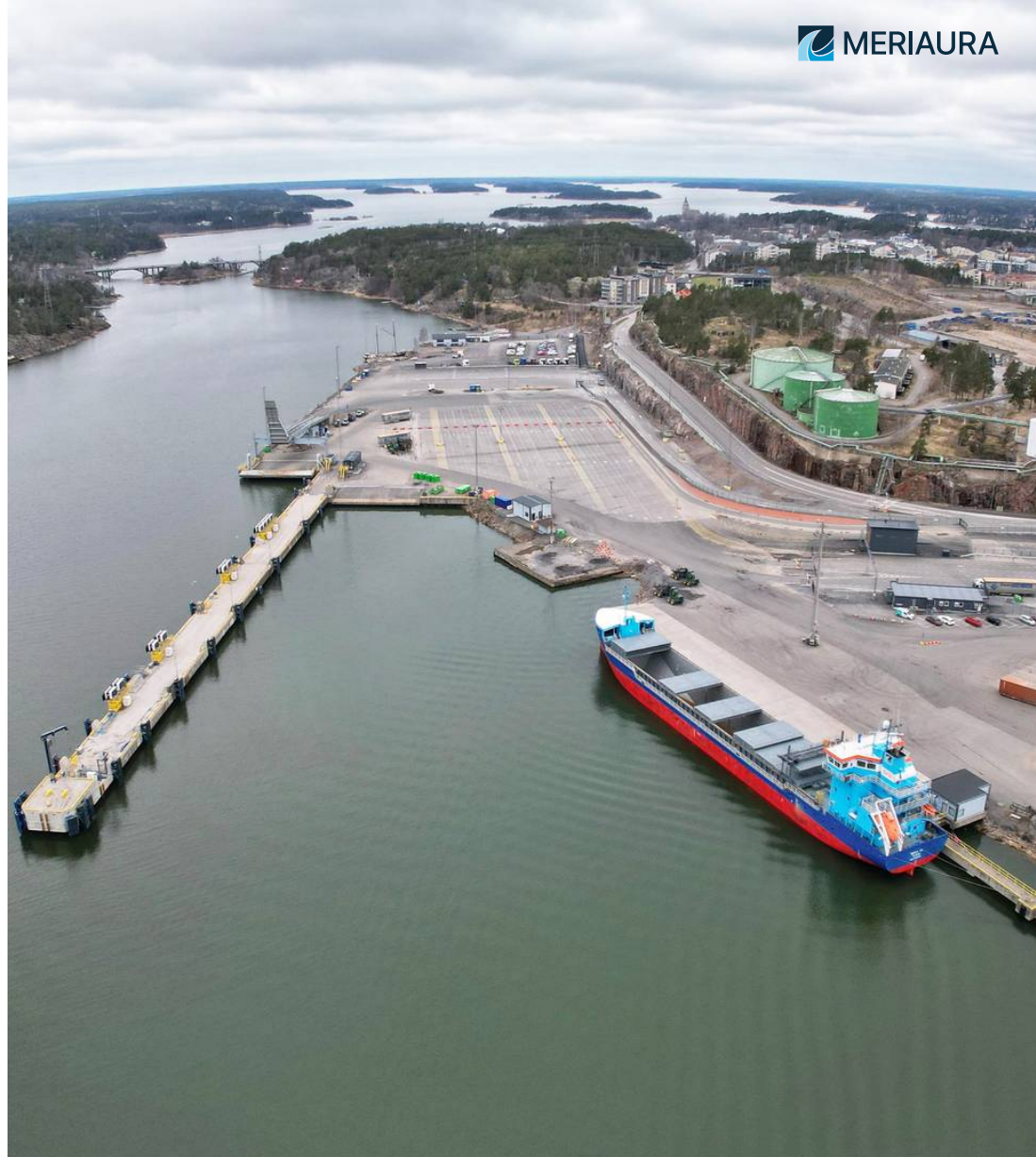
Actions for a cleaner Baltic Sea

One of our main environmental objectives for several years has been the delivery of ships' sewage wastewater to port reception facilities. Wastewater, which is legal to discharge into the sea, contains nutrients, bacteria, fats, and chemicals, even after treatment. We want to prevent them getting into the sea. This is important because our home sea is especially sensitive to any loads.

In our environmental programme, the target for 2023 was to deliver 80% of all wastewater to the reception facilities of ports. The ships monitoring their wastewaters delivered 61% of the wastewater to ports. However, most of the remaining wastewater that was discharged to the sea was treated onboard in the ships' sewage systems. We have identified a need to improve our goals and statistics to meet our reporting needs. Ships from different eras have very different sewage management systems. Modern ships have separate sewage treatment systems, whereas older vessels only have sewage tanks, which may be too small for current needs. Our EcoCoaster vessels Eeva VG and Mirva VG each managed to discharge more than 92% of their waste water into the ports' reception facilities.

We have persuaded several ports to change their practices to support wastewater recovery, thus encouraging other shipping companies to pump sewage wastewater onshore.

If the delivery of wastewater fails, we record the event as a nonconformity and try to prevent the problem in the future. We continue to pay special attention to this, and our goal for 2024 is that no untreated sewage from the ships under our management will be released into the Baltic Sea. We are extending the monitoring to also include our time charter ships.

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Stricter rules and reporting requirements make companies' operations more transparent and easier to compare

Emissions are measured more accurately than before

The GHG protocol is a standard way of reporting the climate impacts of business operations. It divides emissions into three categories: Scopes 1, 2 and 3. Scope 1 includes all direct greenhouse emissions from the company's own activities, Scope 2 includes greenhouse emissions from the energy the company buys and uses, and Scope 3 includes all other indirect greenhouse emissions from the company's activities, but not from sources the company owns or controls. These sources include emissions from the raw materials of the products the company buys, as well as emissions from travel and transport.

We have mainly focused on our biggest environmental impact, shipping emissions, which belong to Scope 1. We are now expanding our 2023 reporting to cover the company's ground vehicles belonging to Scope 1, as well as Scope 2 emissions, even though their role is minimal in the big picture. Regarding Scope 3, we are preparing to report the data in the future.

Maritime emissions need to be reduced quickly to mitigate climate change. The IMO's strategy aims for net-zero emissions by 2050. The EU also has its own targets.

The EU is introducing new rules to cut emissions, and those that matter most for Meriaura are maritime emissions trading and corporate sustainability reporting (the EU's CSRD directive). We expect our ships to join the EU emissions trading system in 2027, based on what we know. We believe this is a positive development for reducing emissions, although we think it is coming too late. Emission monitoring will affect us sooner than that. We think it is important that emissions trading is extended globally.

The Corporate Sustainability Reporting Directive is new EU legislation that requires companies to disclose their sustainability information in the Annual Report according to the directive's requirements and sustainability reporting standards. Meriaura's reporting obligation starts in 2025.

We follow the development of the regulation and prepare for the upcoming new requirements. We think very positively about regulation that reduces emissions and have long advocated for it. Our goal is to significantly exceed the requirements set by the regulation. We hope that regulation and technological development will make shipping carbon neutral again after a gap of several hundred years. Regulation cannot solve all environmental problems, so there is always a need for voluntary attention to environmental issues.

Emissions measurement and reduction goals

It is already obvious before the double materiality analysis required by the CSRD that the main source of emissions for Meriaura is the fuel of the ships. Meriaura therefore keeps track of the emissions from the ships, and how they relate to the performance (transport work done). In 2021, the company co-developed software for measuring CO₂ emissions and introduced a monitoring system for the whole fleet. The chosen monitoring unit was emissions per tonne of cargo transported per nautical mile. The monitoring was improved in 2023 with more systematic methods, the data from different years was harmonised, the data input for the calculation was standardised, and the used unit was changed to “tonne-kilometre”, which is also used by Traficom (the Finnish Transport and Communications Agency) to facilitate the comparison of the data with other modes of transport. Three full years of data have now been gathered for all the ships.

Sea freight carbon footprint

Sea voyages have four stages: ballast voyage; loading; cargo voyage; and discharging of cargo. On a ballast voyage, the ship carries no cargo as it travels to the loading port. All stages of the freight journey produce carbon dioxide emissions. Time spent in port and anchorages causes lower emissions than when the ship is sailing. Our cargo ships spend about half their time sailing and half in ports. The Carbon Footprint indicator that we use is closely related to the share of ballast miles in the total journey, which reflects the situation of the freight market and the success and efficiency of the chartering.

In our calculation of the carbon footprint for Meriaura, we consider the CO₂ emissions from every stage of each cargo voyage. Emissions from docking and repairs of time-chartered ships are not part of the reported figures.

The carbon footprint of sea freight depends on the amount and type of fuel used. We convert fuel usage data into carbon dioxide emissions using coefficients. For light low-sulphur fuel oil (MGO), we use the number 3.206 (tonnes of carbon dioxide/tonne of fuel), and for bio-oil (LBO) made by VG-Ecofuel, 0.074, as coefficients.

The calculated CO₂ amount is divided by the transport work, which is obtained by multiplying the number of freight kilometres by the amount of freight sailed. The DWT equivalent number is used as the amount of cargo. The equivalent refers to the fact that instead of the weight of the cargo, for light products, the amount of cargo is limited by the cargo hold’s volume. In practice, a DWCC number is defined for each ship, which indicates the maximum weight of the cargo. The ship’s utilisation rate is therefore evaluated in addition to the weight from the perspective of the use of the volume of the cargo spaces. The trip-specific DWT number is obtained by multiplying the ship’s utilisation rate by the DWCC number.

Data reliability

The information affecting the calculation is obtained from the ships’ voyage reports on a trip-by-trip basis. For example, the trip report reports the amount of cargo, the degree of filling of the ship, fuel consumption, the arrival and departure times in ports, and the lengths of ballast and cargo journeys. Among these data that affect the carbon footprint of the journey are the fuel consumption of the entire journey, the length of the cargo journey and the ship’s degree of occupancy (utilisation).

The ship’s filling rate is stated as a percentage of the maximum amount of the cargo in question the ship could load. Fuel consumption during the trip is based on measurements taken at the beginning and end of the trip. The accuracy of individual measurements may suffer in challenging conditions, but the data on total consumption will level off over time. In addition, the consumption data is compared with the bunker delivery data. The length of the freight voyage is obtained with the aid of GPS tracking and can be considered reliable. Data is manually entered into the voyage report and from the voyage reports into the operational system. Typing errors are possible in both phases, and gross errors are noticed in the monitoring of the reporting.

Carbon footprint calculation formula

Carbon Footprint (g/tkm) = CO₂-emission (grams)/Transport work (tn, km)
 CO₂ emission (grams) = 1,000,000 x (MGO tonnes x 3.206 + LBO tonnes x 0.074)
 Transport work (tn, km) = (utilisation rate x ship DWCC x cargo kilometres)/100
 ((utilisation rate /100) x DWCC of ship) = DWT_eq.
 (cargo kilometres = 1.852 x nautical miles loaded)

Our emissions in 2023

Meriaura's short-term goal is to reduce carbon intensity, which means reducing emissions relative to transport performance by 4% each year, or 15% in four years from 2021. In 2023, the total emissions of our shipping fell by about 7.9% compared to the previous year, but the carbon intensity did not improve (18.0g CO₂/tkm 2021, 16.5g CO₂/tkm 2022, 16.8g CO₂/tkm 2023). Achieving emissions reduction depends on a combination of many small factors, the most important of which are minimising ballast trips, maximising ship loading and optimising port times. In 2023, the weaker market situation led to e.g. a slight increase in the share of ballast voyages, which reduced transport efficiency.

Many changes in schedules and programmes, the sometimes-poor spot market, port congestion, and industrial action in Finland during the first quarter posed challenges for operational efficiency and thus for meeting the company's emissions reduction targets. Without the increased use of biofuel, the situation would have been worse. However, we have kept up with our longer-term goals, and we believe that we will again achieve a significant improvement in carbon intensity in 2024.

Customers are essential, as they decide where the ships go. The customer's batch sizes must also fit the ships' cargo capacity as well as possible. Synergy comes from a balanced customer portfolio. The NauticAI Fleetrange digital application is important for planning and optimising ship programmes. A skilled crew ensures economical sailing. Effective port operations shorten the time vessels spend in ports and allow more efficient sailing that saves fuel and reduces emissions.

Our long-term goal is to be carbon neutral in the 2030s, well before the goal set by the IMO.



CO₂- emission 2023

Scope 1



Vessels
44 267 t



Cars
4 t

Scope 2



Electricity
0 t*



Heat
10,8 t

*100% carbon dioxide-free electricity contract

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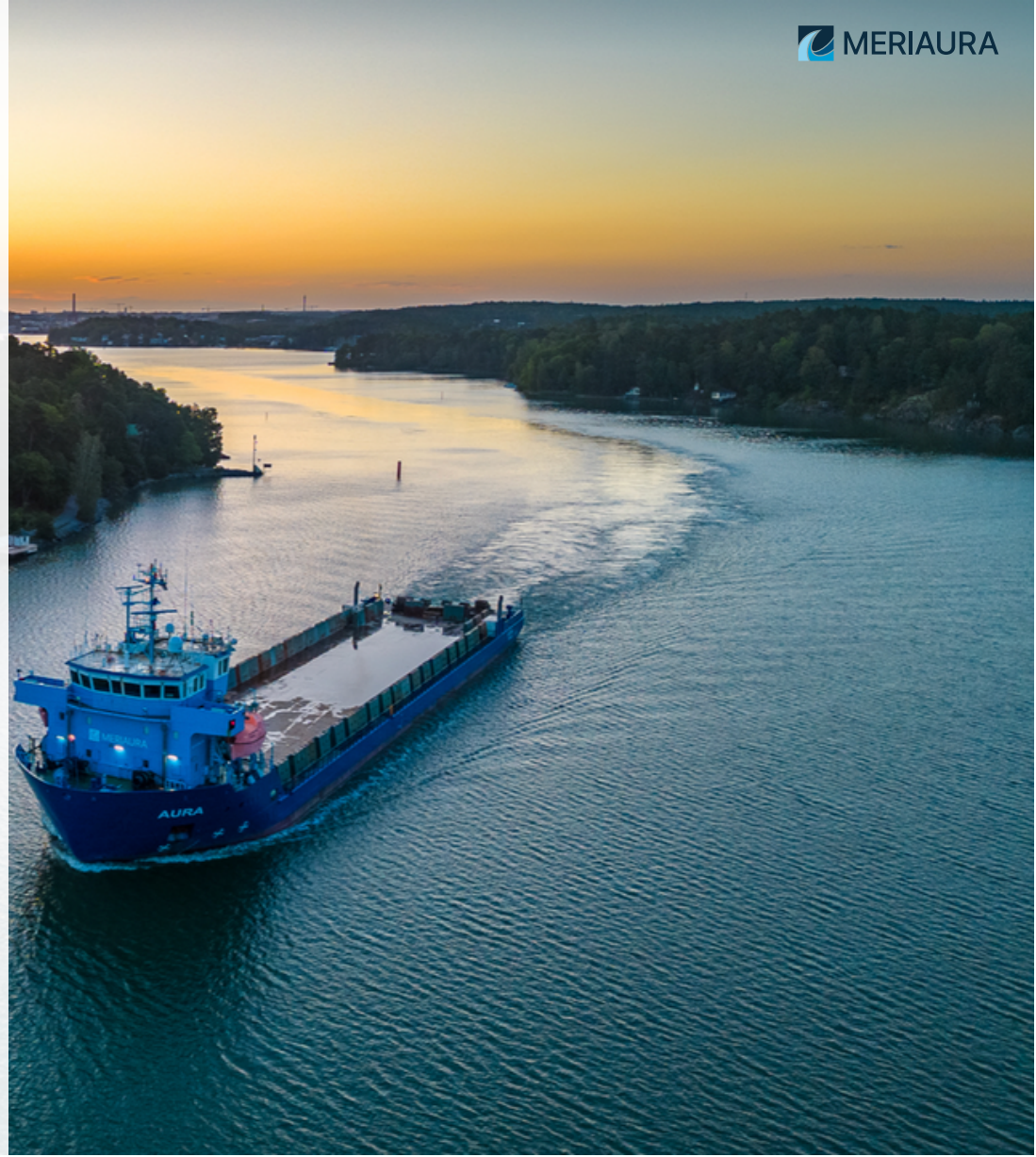
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EcoVoy transport contract – certified emissions reduction

Meriaura is the first sea carrier to offer almost carbon-neutral transport contracts. The EcoVoy Contract is based on the company's biofuel-compliant vessels. Meriaura is committed to sourcing, producing and using EcoFuel in at least an amount corresponding to the total consumption of the voyages executed under the contract. We provide calculations for how much CO₂ emissions are reduced by choosing this contract type.

This data can be used further along the value chain to help our customers create added value for their business. We believe it is very important that the emissions reductions achieved for the customer based on the contract model are unquestionably verifiable. The audit company KPMG therefore performed an audit in accordance with the ISAE3000 standard, which confirms the balance between the emission savings sold to customers and the use of biofuel.

The raw materials of Meriaura's biofuel are 100% waste-based or recycled, which also makes the fuel ethically sustainable, as there is no conflict with land for food production. A significant part of the raw material comes from used cooking oils. The fuel is produced at VG-EcoFuel's production facility in Uusikaupunki. The energy used in production comes from a biogas plant, and both the production process and the fuel have received an international ISCC certificate.

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Our principle is to reduce emissions as fast as possible in each market situation and with the available technologies. Progress often happens in leaps, meaning that emissions go down with certain actions and steps. An example of such a step is switching one ship at a time to bio-oil use.

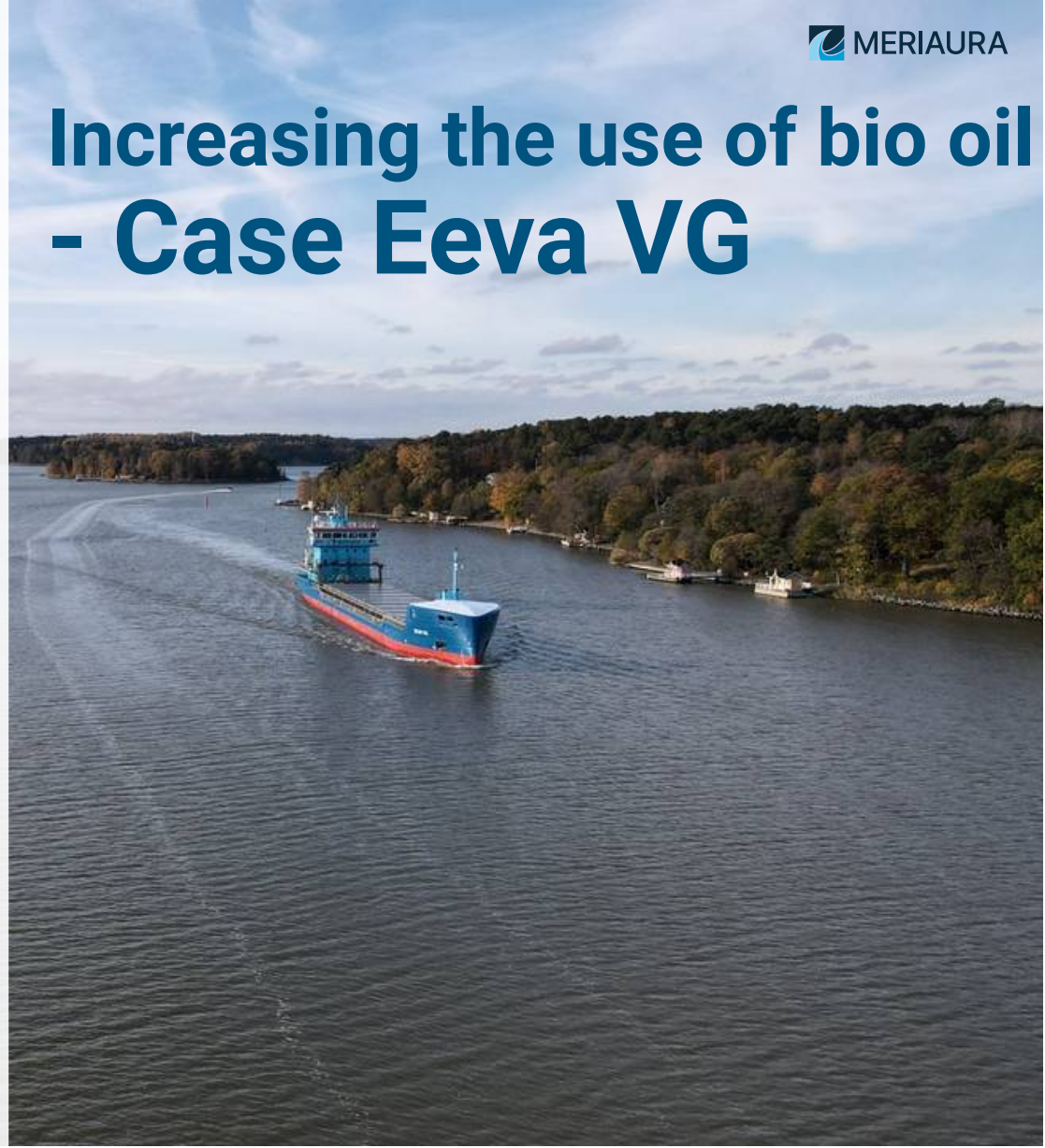
We took such a step in 2023 with M/S Eeva VG. Eeva VG and her sister ship Mirva VG are ships that were originally built for bio-oil use, and they have both been using bio-oil since 2016. In 2020, we started a development project that aimed to improve the quality, quality control and production volumes of bio-oil that would enable us to use biofuel more widely in our fleet. A key factor in the expansion and shift to bio-oil use from the trial phase to normal operation was a technical solution that was installed on Eeva VG to facilitate the use of bio-oil.

Before the project, bio-oil made up about 15% of the fuel Eeva VG used between 2017 and 2019. The project's actions helped bio-oil become about 30% of all the used fuel on Eeva VG in 2023. The aim for 2024 is to increase bio-oil's share to 50%. Bio-oil will also be used by other ships in Meriaura's fleet, and each ship will have its own targets.

The more bio-oil is used, the lower are Eeva VG's CO₂ emissions. Eeva VG's CO₂ emission number in 2023 was the lowest among Meriaura's ships, about half that of Meriaura's traditional ships of a similar size. Eeva VG had the smallest carbon footprint for each tonne of cargo per km: 7.3 g. This number is very low compared to a Finnish dry cargo ship of roughly the same size trading in Finland (24.4 g).

* Salanne, I. et al (2022): MERIMA - Suomen kansainvälisten merikuljetusten päästöt -mallit. Tulosraportti 2005–2021 Traficom in julkaisuja 2022.

Increasing the use of bio oil - Case Eeva VG

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Development projects

In 2023, Business Finland funded two Meriaura projects related to the development of carbon neutral shipping. The goal of both projects is to create a cargo ship and service concept that is as carbon neutral as possible and sustainable in terms of other ship emissions. The goal is to implement the emissions reduction targets set by the IMO, Finland and the EU for 2050 as early as the 2030s.

The year 2023 was the last implementation year of **VG Marine EcoFuel (MEF)**, a sustainable and circular economy biofuel research and processing project. The project's goal was to develop a uniform quality, standard-compliant, recycling-based biofuel, thus creating the basis for the most carbon-neutral transport concept possible. During 2023, the biofuel pilot production line was deployed, and regular ship trials with the renewed VG Marine EcoFuel started.

The **VG Green Maritime Future (GMF)** project focuses on the technical research and design of a ship concept that enables carbon-neutral operation, in addition to which the purpose of the project is to map opportunities to reduce other exhaust gas emissions produced by the ship. At the same time, the sustainability of alternative fuels and other energy sources and new types of loading and discharging concept solutions are being studied. The purpose is to produce digital and simulation-based solutions that enable optimisation of the ship's operational energy efficiency and more efficient management of the ship's overall operational life cycle.

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Biofuels from recycled oils

VG-EcoFuel Oy collects recycled oils produced as industrial by-products at its production facility in Uusikaupunki and refines them for further use. Recycled oils are used for the production of biofuels, and as raw materials for technical oils and animal feed. The raw materials used are 100% recycled or waste-based, and the life cycle greenhouse gas emission effect of biofuel produced from them is therefore almost 98% lower than with fossil oils and fuels. The recycling of materials continues even after oil production, as the biowaste generated from VG-EcoFuel's process is used as raw material for the biogas plant next door.

VG-EcoFuel has an international ISCC certificate (International Sustainability and Carbon Certification), meeting the requirements of the EU renewable energy RED II directive and national legislation.

VG-EcoFuel's turnover and volume continued to increase in 2023. Long-term work to improve the production efficiency and product quality is beginning to pay off.

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Collection of used cooking oils

In 2023, we improved the collection of bio-oil in the Turku region and expanded the collection in Helsinki area. The vast majority of used frying oils from restaurants and bakeries in Turku and nearby municipalities are recycled to VG-EcoFuel for further processing, either directly from restaurants or through wholesale collection points. Larger batches from our contractual partners are received directly at our production plant in Uusikaupunki. We are constantly exploring other raw material sources.

Working conditions on our vessels

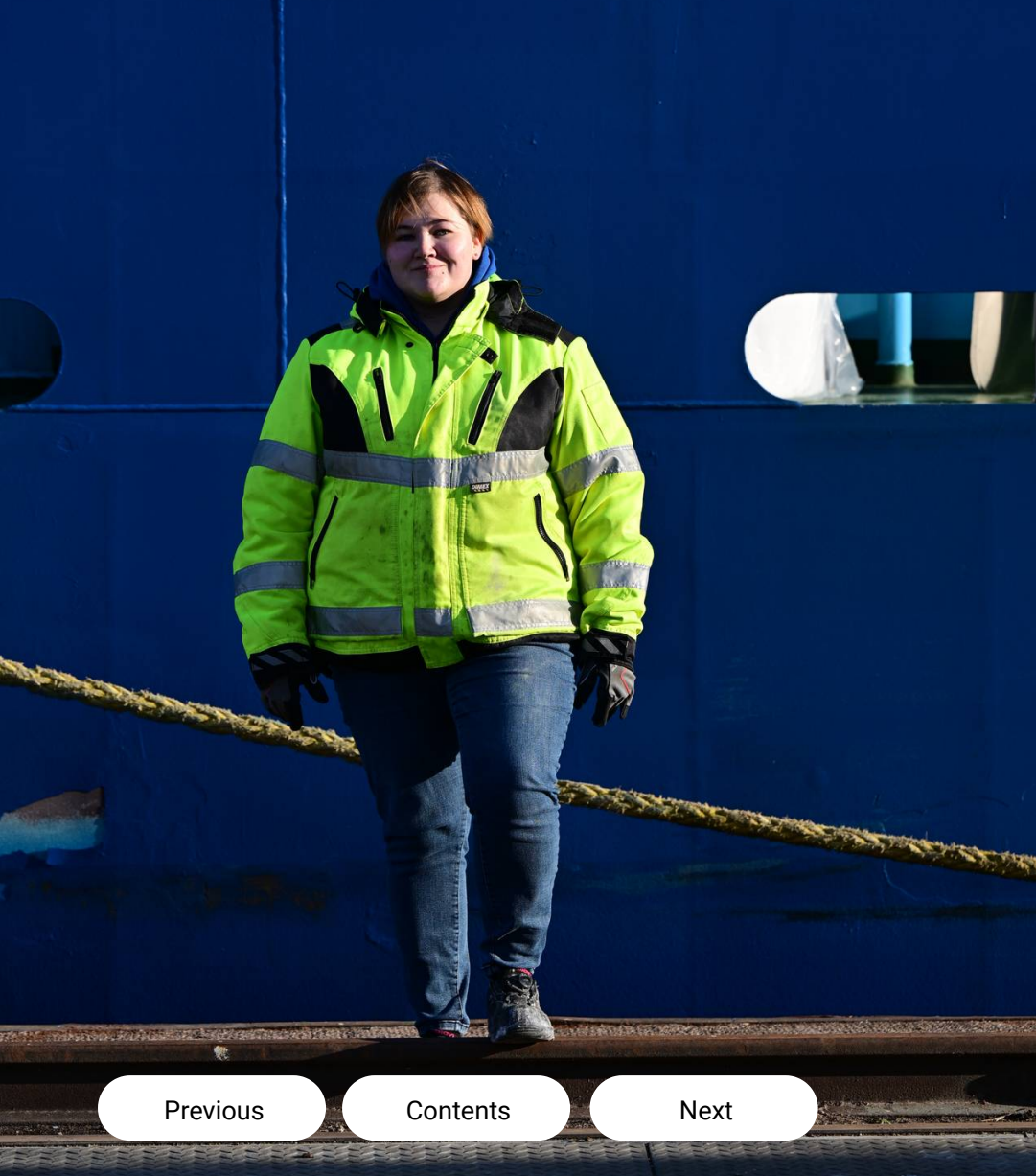
At the end of 2022, Meriaura employed 78 seafarers on its vessels. In addition to our cargo ships, we man the research vessel Aranda. Many of Meriaura's time-charter vessels also have a pilot-exempted master employed by Meriaura. In general, we work in five-week shifts. Working at sea requires adaptation to special conditions such as rough seas and nightshifts for some personnel. The professional qualification and health requirements of maritime personnel have been defined more precisely than the norm by international agreements and national legislation.

We survey job satisfaction annually

The annual job satisfaction survey of sea personnel is an important tool for monitoring working conditions and striving for continuous improvement. The working atmosphere, living, working and leisure conditions on board, management, communication, and smoothness of cooperation between the operational functions of the ship and the office are surveyed annually.

The main theme of the survey carried out in January 2023 was welfare at work. We are actively seeking ways to support the well-being and coping of our sea personnel at work, e.g. by exploring cooperation with our pension insurance company and the Finnish Seamen's Service. In the autumn of 2023, we decided to offer the opportunity to apply for the ForMare wellness programme, as well as the sporting and cultural benefits of ePassi to maritime personnel, from 1 January 2024 onwards.

The results of the 2023 job satisfaction survey also showed that many seafarers would like a more varied diet, and many wanted vegetarian food as an alternative. We responded to this wish with the aid of MEPA (the Finnish Seamen's Service), and in November 2023, MEPA organised a vegetarian food course tailored for seafarers, in which three of Meriaura's ship's chefs participated. The aim is to continue diversifying the food offering in the current year as well. The updating of fitness equipment has been continued on some of our ships.


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Occupational safety in the maritime environment

Occupational safety is an ongoing process that aims to achieve a year without any accidents. The year 2023 altered how we operate; currently, only one vessel is under our own management safety-wise. Despite the changed situation, we will continue to work on the existing measures to ensure and improve occupational safety for all our staff. We pay close attention to the progress of occupational safety and the accident rate; Meriaura still handles and records accidents and near misses with its subcontractors.

Accidents at Meriaura

	2023		2022		2021		2020	
	Incidents Frequency		Incidents Frequency		Incidents Frequency		Incidents Frequency	
Working hours total	192 299		259 491		234 168		256 020	
Total recordable case frequency	1	5,20	9	34,68	3	12,81	7	27,34
Lost time injury frequency	1	5,20	7	26,98	3	12,81	6	23,44
Medical Treatment/ case frequency	0	0	2	7,71	0	0	1	3,91
Fatal Accident frequency	0	0	0	0	0	0	0	0

When calculating the accident frequency, the number of employees, the average number of hours worked and the number of accidents that occur are taken into account. $\text{Accident frequency} = \frac{\text{Number of accidents at work} \times 1,000,000}{\text{Hours worked}}$

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Our personnel at sea and on land

In 2023, we have given officers the opportunity to participate in **Deep Lead training (LOBAS)**, which is a programme for developing maritime leadership skills. Both land and sea staff from Meriaura can join the training. The programme is based on a 360° feedback profile, which allows feedback to be received from different groups. The course helps you collect feedback from the people around you and enables you to grow and improve your interaction skills.

Meriaura joined the **ForMare wellness programme** in the autumn of 2023. ForMare is a two-year wellness programme for seafarers carried out by MEPA and MEK in collaboration with Merimieskirikko and the occupational health company Mehiläinen, which offers a way to enhance balance and well-being in life. Each participant sets their own goals in the programme, which is suitable for supporting a worker who needs a change in life, and who will benefit from individual support and guidance to make it happen.

We use the extensive expertise of our land and sea personnel flexibly through a job rotation system. Working in both land and sea assignments increases understanding of the purpose, challenges and solutions of the work performed in different environments, improving cooperation across the organisation.



Meriaura*	2023	2022	2021	2020
Staff ashore	36	36	24	28
Staff at sea	78	101	106	112
Staff altogether	114	137	130	140
Women	24	24	14	21
Ment	102	113	116	119
Average age of staff ashore	42	41	43	41
Average age of staff at sea	41	41	40	41

Staff at the end of the year.
 *Until end of 2021 VG-Shipping and Meriaura together

1986-2023: Environmental milestones

