ROADMAP TO SUSTAINABLE SHIPPING

WALLENIUS SOL®

This climate and environmental strategy is based on the report: "WALLENIUS SOL strategy and targets for reaching ships with zero impact – Including current environmental performance analysis and roadmap forward". The report (Report number U 6533) is written by IVL Swedish Environmental Research Institute in collaboration with WALLENIUS SOL.

Published: November 2022

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With sights set on a sustainable future

WALLENIUS SOL is an innovative shipping company that aims to strengthen infrastructure in the Gulf of Bothnia and the Baltic Sea. The shipping company was established in 2019 when Wallenius Lines and the Swedish Orient Line formed a joint shipping company.

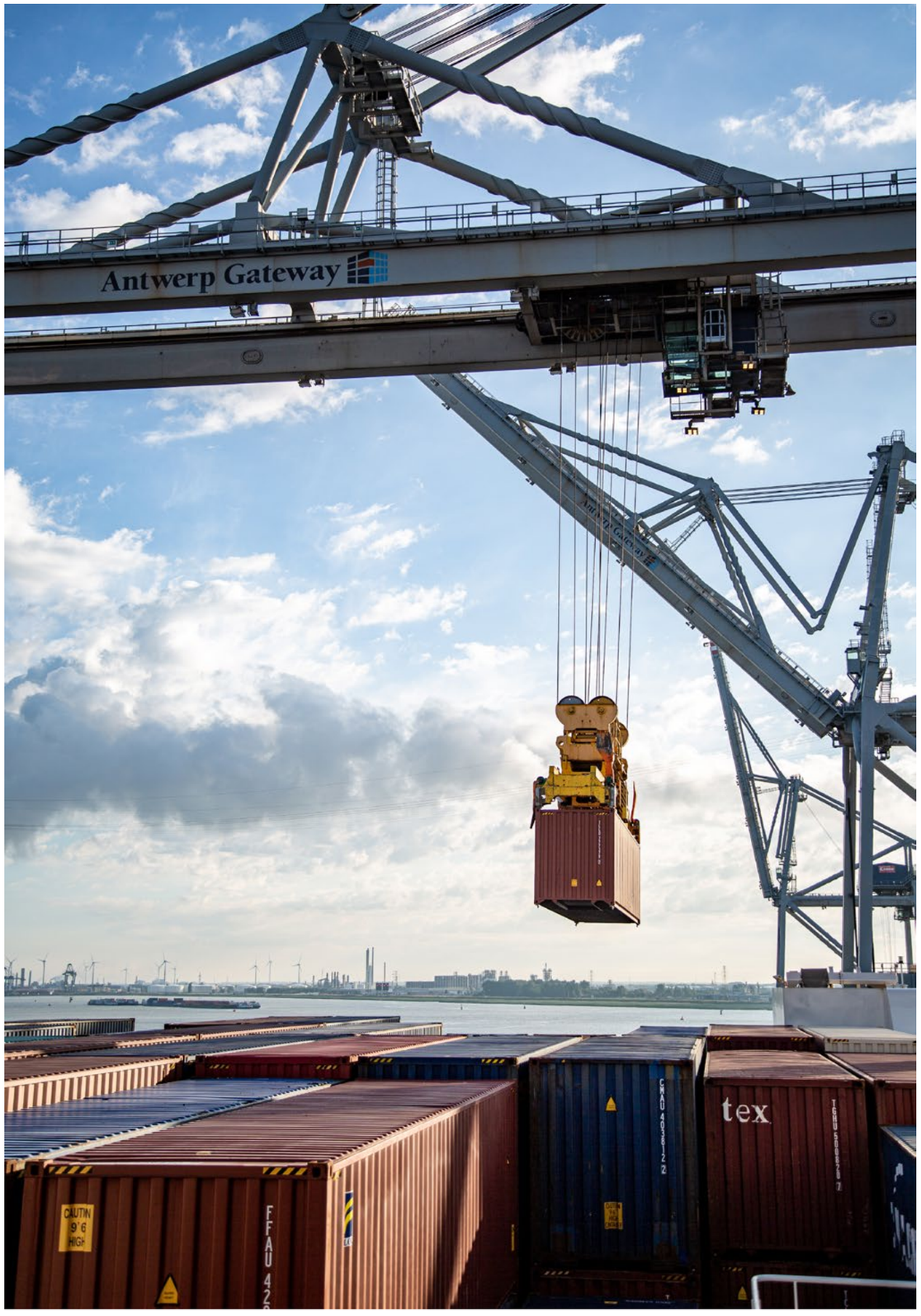
WALLENIUS SOL FOCUSES on true sustainability and seeks precautionary measures that will continuously reduce its environmental impact, such as the substitution of chemicals and technology with more environmentally sound solutions, as they become available. Our ambition goes beyond current laws, regulations and other requirements that are relevant to our operations.

Our shipping company is based on a tradition that consistently aims to reduce the negative impact of its operations. This is achieved by optimization, using cleaner, more energy-efficient technologies and systematically eliminating areas of impact with harmful effects. We seek to contribute to a maritime transport system that makes no negative impact on the environment.

For WALLENIUS SOL the entire supplier chain is of great importance as we recognize that the pursuit of low environmental impact cannot be achieved by one isolated company. We intend to be the obvious choice as a logistics partner in the Baltic region to support the green transition. Our fleet will supply industries in the north with RoRo solutions, that are leading when it comes to environmental performance. The Baltic region is embedded in ice approximately four months a year and thereby have additional infrastructural challenges.

To successfully reach its goals, WALLENIUS SOL must collaborate with its clients and other stakeholders to share expertise, knowledge, and resources in order to research and develop practical solutions. Achieving sustainable shipping will require investment and, possibly, higher costs, compared with standard transport solutions. It is therefore essential to gain the support and long-term commitment of our customers to higher freight rates, in exchange for lower environmental impact and reduced GHG emissions. Only long-term commitments will make investments in sustainable solutions more appealing

This roadmap and its goals have been developed in collaboration with IVL, Swedish Environmental Research Institute Ltd. An imperial organization founded by the Swedish state and national business interest with a vision to develop a sustainable society.



TRANSITION

Environmental impact from shipping

In most contexts, shipping is the most energy-efficient mode of transport. Yet, like all types of transport, it has an environmental impact. As shipping is expected to increase, so will the discharges to air and sea – unless we find solutions to reduce emissions.

THE SWEDISH MARITIME and shipping industries are undertaking proactive and successful efforts to develop and implement measures to improve energy efficiency and reduce environmental impact, the use of alternative fuels and increased training. Continued work is required as well as significant contributions from industry, together with expanded national and international support in the field of research, innovation and implementation.

The sea has unique potentials, and its environment must be protected. Shipping has been recognized as an efficient and environmental form of transport. A ship consumes far less energy than a heavy goods vehicle (HGV) per loaded unit, in fact even less than a train. This makes shipping an attractive alternative bearing in mind the low levels of carbon dioxide emissions. Naturally, all modes of transport are required but increasing transport by sea will contribute to improving the environment and safety.

SHIPPING IMPACTS the environment through emissions into air and water, as well as generating waste and noise. In 2018, shipping accounted for 2.89 percent of global anthropogenic greenhouse gas (GHG) emissions. Our industry is currently dependent on fossil fuels and will face significant challenges in converting to sustainable alternatives. As shipping is expected to increase in the coming decades, total emissions to air and water will also increase unless we find solutions to tackle shipping emissions.

A case study of the Baltic Sea shipping calculated the societal damage costs by establishing a conceptual framework, based on data from marine ecotoxicology, life-cycle analysis, climate information, air pollution and environmental economics. The results showed a total annual damage cost of €2.9 billion in 2010. Addressing shipping emissions is important from both an environmental and financial perspective.

IN THE NORTHERN of Sweden, extensive new industrialization linked to fossil-free production and electrification is underway for the benefit of climate change. Our core customers are in absolute forefront in finding sustainable solutions. The drive and lead the way to a more sustainable tomorrow. Sweden is well ahead in the climate transition, thanks to large green investments and a clear political direction. Our country must take its share of responsibility for reducing emissions, but also show the world how a faster climate transition creates jobs and export opportunities.

Sweden is one of the world's most innovative countries where climate change lays the foundation for new solutions, export opportunities, strengthens our competitiveness and creates tomorrow's jobs and welfare. Larger company establishments and company expansions play an important role in this transition. When new green industries establish themselves in northern Sweden, the region can become a leader in the climate transition that is now taking place globally.

Our fleet

“When, in the future, the vessels are operated on LBG or synthetic fuels they could completely become climate neutral.”

OUR ROUTE NETWORKS include the most important ports in Northern Finland, Sweden, Germany, the Benelux region, and the United Kingdom. WALLENIUS SOL have five vessels in our fleet. Three of these are so called “T-vessels”: Tavastland, Thuleland, and Tundraland. The remaining two, are called Baltic Enabler and Botnia Enabler, sometimes referred to as “The Enablers”.

The T-vessels was best-in-class when delivered in early 2000 and are still top performers in terms of g CO_2/ton-km compared to other ROROs with same ice class.[1]

Even though they are now getting somewhat old we are continuously working with improving their efficiency. As an example, by thinking outside the box, the container capacity of the T-vessels was improved by 50% by tripplestacking the containers. The Tavastland was designed as a conventional RoRo vessel and the ship still carries cassettes, but since the load is not towed ashore but instead lifted of, we were able to increase the stack from two to three containers.

THE ENABLERS are two newly built (2022) multi-fuel (compatible with LNG, LBG, diesel and synthetic diesel) 242-metre mega RoRo ships with ice class 1A Super. The ships were the world's biggest ice-classed RoRo vessels in terms of cargo capacity and gas tank volume when they entered their service in 2022. Fuel consumption is cut with 57% reduced thanks to their creative design.

When operated on LNG the greenhouse gas emissions are expected to decrease by 63%. When, in the future, the vessels are operated on LBG or synthetic fuels they could completely become climate neutral.

The vessels are prepared for a battery/hybrid solution which will enable us to cut the fuel consumption even further through peak shaving and optimized use of the engines.

The Enablers are also equipped with shore power connection to completely avoid emissions while at berth.

Technical efficiency is very important, but the operational efficiency is also crucial. We monitor our vessels through a state-of-the-art Performance Management System which enables us to ensure an overall high performance.

All in all, step-by-step we are preparing our fleet to be able to enable truly sustainable logistics.

SCHEDULE OPTIMIZATION is a high priority and success factor in our daily operations. To have the most cost effective, energy efficient and environmentally friendly schedule our liner schedule is based on market demands, vessels economic speed and port availability.

We strive for the outmost port efficiency, and it is achieved by close collaboration with agents, stevedores, and other port facilities. This is essential to get the most effective services to shorten port stays as much as possible. All T-vessels are equipped with a shore side electricity system to be used in ports.

WE RECOGNIZE that cooperation between various elements is what creates success and are important cogs in our business. Our employees are constantly working with new innovative ideas in to improve our operations and optimize our ships efficiency to the limit of what can be recognized as reasonable for their basic design conditions.

[1] Based on the 2021 mandatory EU data reporting system registered, THETIS-MRV.

DIRECTION

Truly sustainable logistics

In a future sustainable society, we will enable truly sustainable logistics. This means that it will be sustainable from an environmental, a social and a financial perspective.

OUR AIM IS to transport goods without harming the environment and people by creating truly sustainable shipping operations. Our intent is to limit our harmful impact on the environment and systematically reduce our emissions.

This specifically applies to the areas where shipping and our operations currently make the greatest impact, including emissions of greenhouse gases and air pollutants, consumption of finite resources, emissions into water, use of chemicals, noise emissions, proliferation of invasive species and the generation of solid waste.

WALLENIUS SOL aims to make active improvements to its environmental performance and continuously develop sustainable technology, while adapting its strategy accordingly.

Environmental sustainability
Our activities will have no harmful environmental impact. We understand that by living and acting on the planet we will have an impact, but our logistic solutions shall not contribute to a systematic degradation of the environment. As examples we shall have no harmful emissions to air or water, not use finite resources, not produce waste that is not recirculated nor create sound levels that are adversely affecting life on the planet. We shall have operations in harmony with nature.

Social sustainability
Our logistics solutions will contribute to thriving societies. It will contribute to fulfilling people's needs and ensure that society is preparing for future generations. We will strive to enable sustainable development close to our business and we are aware that we directly or indirectly, affect what happens to our people, customers, and local communities, and it is important to manage impacts proactively.

Financial sustainability
While reaching our environmental and social ambitions, our business will prosper and yield reasonable financial profits.

ROADMAP

A fleet with no harmful environmental impact

WALLENIUS SOL has clear objectives for the next nine to 24 years. We are also aware that the road forward will contain innovations and solutions not yet known. As new technologies are developed, our strategy will be improved and adapted accordingly.

WE WILL IMPLEMENT technical and operational measures to the greatest extent possible within in reason to reach our vision. Performance management system is to be implemented on the entire fleet and the operations of the vessels will be closely monitored. We will measure energy efficiency in terms of transport work to ensure our performance. The data is collected to optimize and analyze the future needs and deepen our understanding of what the next step is to reach our goal of truly sustainable shipping.

We will continue our ambitious work with terminal efficiency through schedule optimization and electrification solutions. We strongly believe that our operations team makes a difference through planning and continuous analysis of our performance.

THE ENABLERS will produce 63 percent less greenhouse gas (GHG) load per transport work than the T-vessels. Our next generation of vessels (estimated to be built in 2027) is estimated to be 20% more energy efficient than the multi-fuel vessels delivered in 2022.

THE INTRODUCTION OF renewable fuels, such as LBG/RME, between 2023 and 2026, will be replaced between 2030 and 2035 with 100% renewable fuel in combination with electrifications. WALLENIUS SOL will always be open to what innovative research can offer and are prepared to change or change tracks if better solutions arise.

The retrofitting of wind assistance (around 2028) will make our multi-fuel vessels 10% more fuel efficient. Future generations of ships, delivered from 2030 onwards, will use fuels that significantly reduce their effect on global warming. Step by step we are following our roadmap towards sustainable shipping.

No discharges – supporting healthy seas

OUR AIM IS that no harmful emissions will enter the sea from vessels owned by WALLENIUS SOL. This will be achieved by depositing discharges, including solid waste, bilge, grey water, sewage/black water, and sludge at ports for treatment. We will also evaluate the potential to retrofit technology to our vessels, in terms of how large storage tanks or recycling areas would be necessary. It is equally important to assess on shore waste treatment and the costs it would incur.

The aim for our new vessels is that they should be equipped with all the operational and technical solutions necessary to ensure low environmental impact and to evaluate how these capabilities can be improved in the future.

OUR GOAL to close the loop – making sure that there are no emissions into water and prioritizing on board waste and sewage treatment, as well as the recirculation of grey water on board

Reduced underwater noise emissions

RESEARCH ON UNDERWATER noise is currently underdeveloped, in comparison to the environmental impact of shipping in other areas. However, it is accepted that noise emissions make a significant impact on the marine environment and the relevant authorities are advocating reductions. Newly built ships will be designed to minimize overall underwater noise emissions and specifically to reduce cavitation caused by propellers. Design measures that will achieve this goal include the use of several propellers or alternative propulsion devices, switching to diesel-electric propulsion, adding sails, and further optimizing the hull/propeller for optimal wake and flow. Regular propeller and hull cleaning are necessary to maintain low-level noise emissions throughout the operational life of ships. Continuous onboard monitoring of hull vibration and noise may potentially be used to predict and monitor radiated noise levels during operation.

Newly built vessels aim for noise emissions of 170 dB re 1 µPa @ 1 m or less. The first step in achieving this target is to understand noise emissions and identify relevant mitigations, from both a technical and operational perspective. Standardized measurements, coupled with the collection of onboard data, are vital to achieving noise emissions targets. In the future, onboard noise and hull vibration monitoring may be used to measure emissions and identify mitigations throughout the life of ships.

Responsible management of chemicals

IT'S OUR AIM that chemicals are used in a responsible manner on the vessels of WALLENIUS SOL. This includes substituting chemicals for less harmful alternatives, where possible, and constantly striving to reduce the number and amount of chemicals used on board. It is equally important to ensure the active involvement from crew and management.

When using oils that claim to be environmentally adapted, it is important to check that they are biodegradable. In the planning of new vessels, it is vital to use capped systems for the stern tube, external hydraulic fluids, thrusters, and controllable pitch propellers, as well as carefully selecting on board cleaning equipment. It is also our aim to actively seek partnerships and joint solutions, in order to share knowledge on how chemicals impact the environment and new technologies, and solutions can be implemented between ship owners.

Responsible recycling of vessels

RECYCLING IS THE most environmentally and economically sound method of handling the waste products from the dismantling of a vessel that has reached its operational end. It ensures the reuse of valuable resources such as aluminum, steel, and plastics.

WALLENIUS SOL only sells ships, to owners who can guarantee use a European Union approved ship recycling facility when the vessel reaches the end of its operational life. The same can be done if WALLENIUS SOL decides to end the life of a vessel.

THE WAY FORWARD

2030

We will reduce our emission of nitrogen oxides, sulfur oxides and particular matters with 98% compared to 2021 levels from WALLENIUS SOLs owned vessels.

2035

All vessels in our fleet will use 100% renewable fuels and have zero fossil emissions.

2045

The impact from our operation is not harmful for our planet.

Figure 1. Summary of the three targets over the coming nine to 24 years for WALLENIUS SOL.

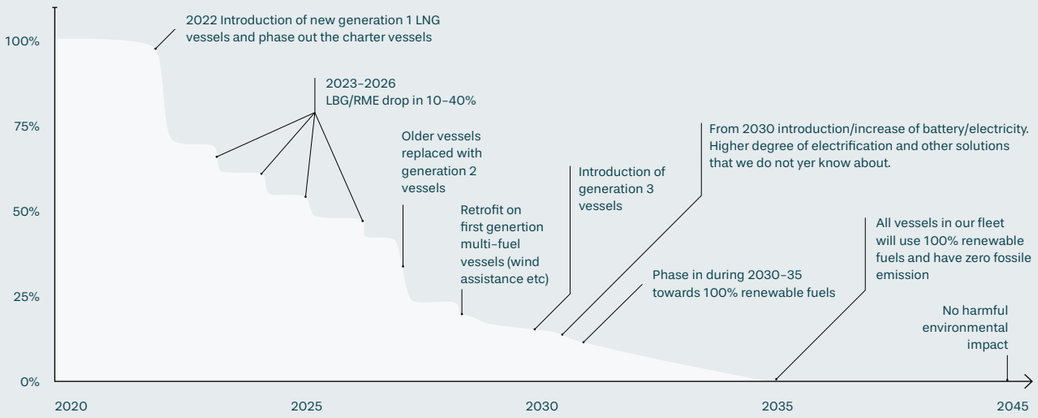


Figure 2. This illustration shows the path to reduced net greenhouse gas emissions for the fleet as a whole. The timing of these initiatives will depend on future decisions but represents initiatives seen as the most important factors as per today's knowledge.

CLOSING WORDS

Enabling a sustainable future

THE SEA has unique potentials, and its environment must be protected. In most contexts, shipping is the most energy-efficient mode of transport but, like all transport, has an environmental impact. Our wanted state is to enable truly sustainable logistics through a fleet with no harmful environmental impact by 2045.

WALLENIUS SOL will always be open to what innovative research can offer and are prepared to change or change tracks if better solutions arise. Our ambition goes beyond current laws, regulations and other requirements that are relevant to our operations.

Sweden is well ahead in the climate transition, thanks to large green investments and a clear political direction and we are on our way to enable a sustainable infrastructure in gulf of Botnia.

WE ARE PROUD to have our ENABLERS leading the way, at sea, for a green industrial transition for Sweden. With our ENABLERS in full service with the potential of being climate neutral, we are taking great steps in the right direction of our roadmap. We expect to accompany the sister vessels in the future with even more environmental performance and energy efficient family members to traffic the seaways of northern Europe. We are convinced that through systematic upgrading of our fleet, strategic partnership, dedication combined with a lot of passion we will enable truly sustainable shipping in the seaways of northern Europe.

WALLENIUS SOL®