

THE FUTURE OF ESTONIA AS A FLAG STATE



**DEVELOPMENT SCENARIOS
UP TO 2040**



FORESIGHT CENTRE
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THE FUTURE OF ESTONIA AS A FLAG STATE

Development Scenarios up to 2040 Summary

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Foreword

This study of Estonia's competitiveness as a flag state is not necessarily what you might expect. It does indeed analyse the developments so far and assess the current situation, but it also includes an extended view of the future. The future sea might not always be calm and may not permit us to sail successfully using current methods and technologies for navigation. The future may be much stormier.

A serious international competition has started between countries vying to attract ships to take their national flag, and it has even seen landlocked countries become seafaring nations. The consequent knock-on effect is not unlike that at a sports event in a major stadium when the crowd standing up in the front rows leave those in the back rows with no choice but to rise as well if they want to see anything at all. This wave of competition is reflected in the context of flag states, and we would like at least the ships that are owned by Estonian capital to be registered here. It would of course also be welcome if they were joined by many foreign-owned ships too, because every ship brings revenue to the country.

The choice of flag is like an investment decision that contains certain deal breaking factors, but played out against the background of the whole business environment. Moreover, the competitive advantages in that environment change over time. What has carried the successful flag states to where they are today might no longer be the best solution in future for those hoping to emulate that success.

This analysis views the competitiveness of Estonia as a flag state more broadly than just through competition over taxation, and it casts its eye much further into the future than has been done before. We must prepare ourselves for environmental requirements to tighten more extensively and rapidly than we earlier expected. This may offer opportunities for Estonia as a flag state, but if it does, then what will they be? The technological development that Ray Kurzweil famously described as overestimated in the short perspective and underestimated in the long perspective could automate ship-to-port communication within the next twenty years, and of course lead to important progress in the use of autonomous vessels. How should a successful flag country prepare for this?

I hope that the scenarios and opportunities outlined in this analysis create a fertile exchange of ideas on the future of Estonia as a flag state.

Happy reading!

Tea Danilov
Head of Foresight Centre



SUMMARY

Estonia passed a reform in the middle of 2020 to encourage cargo ships with a gross tonnage of 500 or more that meet international standards and passenger ships of similar parameters that run regular services outside the European Economic Area to come under the Estonian flag. It also intended to increase the demand for the on-shore services on offer for ships, which would boost Estonia's economy and bring more tax revenue into the state coffers. To this end, the reform:

- reduced significantly the labour tax burden of seamen;
- introduced a tonnage tax system;
- established a dual register for bareboat chartered ships.

A lot has been done but not everything has been completed yet, with the digital register application launching only at the beginning of 2021 for example.

A good start has been made in making Estonia more competitive as a flag state. It is still too early to judge the success of the whole package, but it is apparent that there are certain issues that still need fine-tuning:

- the social tax and unemployment insurance premium have remained too high despite the adjustments;
- the fee for the second bareboat chartered ships register is high;
- the ship registry service is not client friendly;
- there is no regulation of how ships are guarded and how firearms are handled on ships;
- the regulation of fixed-term employment contracts and working time needs to be reviewed;

- the sales strategy for the registers need to be developed fully;
- the on-shore sector has a lack of capacity for servicing ships and there is no strategy for developing it.

One new ship coming under the Estonian flag could generate 45,000–240,000 euros in tax revenue from the on-shore sector. The exact amount would depend on how interested shipping companies are in the products and services offered by our on-shore sector.

The quality of the service is a crucial point in developing the Estonian ship register further. Registration must be quick and the ship owner must feel safe, so the register cannot afford to drag its feet should a ship encounter any problems in a foreign port.

A flag state service should not be prohibitively expensive, and Estonia has room for improvement in social tax, unemployment insurance premiums, and fees for the second bareboat chartered ships register, but whether the register is attractive in cost is determined by more than just taxes and register fees. The total cost of operating a ship is what is important for the ship owner. Technological progress is moving consistently towards ships' crews becoming smaller, and Estonia's ship registry would be well-advised to remain open to discussing technological solutions that would allow a ship to be controlled safely even with a smaller crew. The savings from reducing the crew by just two or three members are considerably bigger than those from a small cut in register fees.

How much the Estonian economy benefits from the ship register depends on the number of ships in the register and the demand for the services

Europe and the wider world are putting increasing emphasis on environmental issues, so some measures could be taken to create advantages for sustainable ships if the Estonian on-shore sector can contribute towards their eco-rebuild.

One ship with net tonnage of 2000 spends some 1.9 million euros on on-shore services a year.

To increase Estonia’s visibility in the International Maritime Organization, we need to choose which topics we want to promote so as not to spread ourselves too thin. Estonia’s strengths lie in ICT, so it might make sense to start working on increasing our visibility by focusing on those skills and targeting for example the digitisation of registers and data exchange.

offered by our on-shore sector. This means that we need to consider carefully both the sales and the development strategy of the on-shore sector.

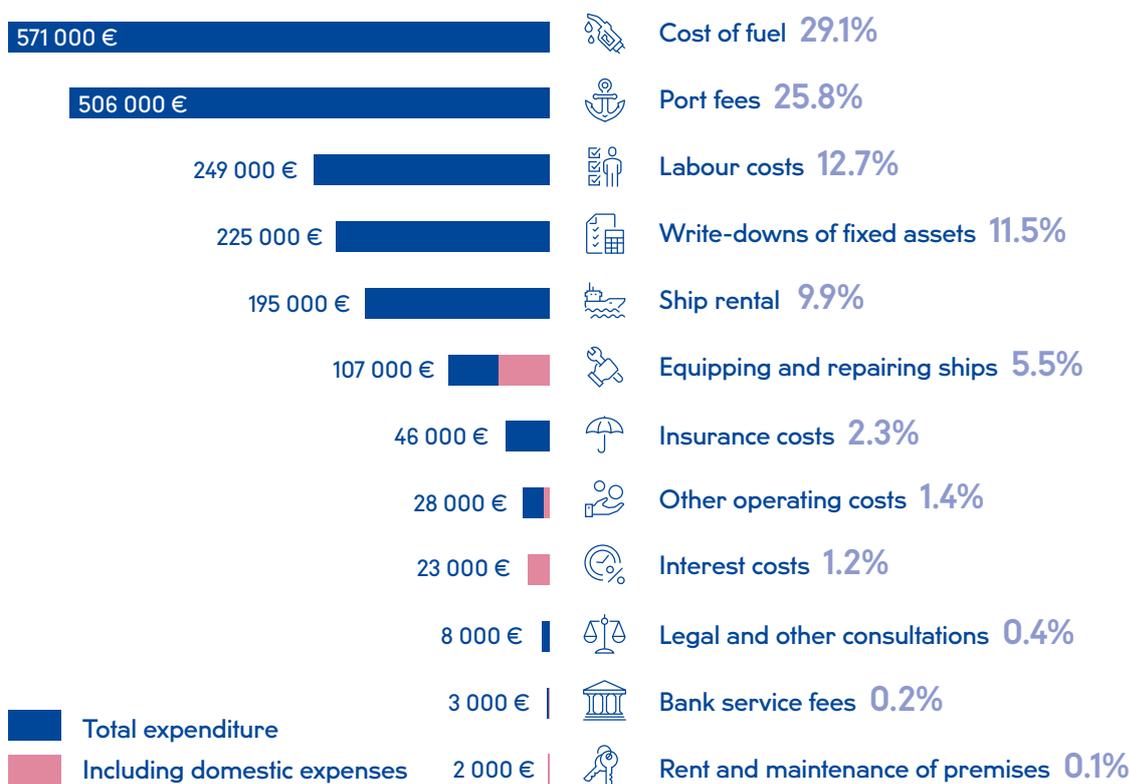


Figure 1. What does a ship with net tonnage of 2000 spend money on?

Sources: Hansa Shipping 2018. Annual report, author’s calculations



1. THE COMPETITIVENESS OF THE ESTONIAN FLAG AFTER THE REFORM



Below we compare the conditions for ships sailing under the Estonian flag with those of our closest competitors. We have chosen Malta and Portugal (the Shipping Register of Madeira) for the comparison, as many Estonian ship owners operate their ships under these flags.

Cost competitiveness

The reform significantly reduced the labour tax burden on seamen as their salaries are no longer subject to personal income tax. There remains though a monthly limit of 750 euros for calculating social tax and unemployment insurance premiums. The tax rules in Malta and Madeira have an advantage here, and our interviews with ship owners indicate that if they were to bring their ships from Madeira or Malta to come under the Estonian flag, they would be hit with a sharp rise in their tax bills that would be some 22,000 euros a year for an owner of a ship with a crew of twelve. Estonia's tonnage tax is competitive though.

Comparing register fees is less simple as registers use different payment schemes that are not directly comparable. This is why we have based our comparison on a hypothetical ship with net tonnage (NT) of 2000 and deadweight (DW) of around 5000 tonnes. The indicators have not been calculated in completely identical ways, and so they should be viewed as approximations.

Estonia's first bareboat chartered ships register seems fully competitive.

The quality of the register service

The electronic and user-friendly register service and other services such as those for paying taxes are the main competitive advantages that Estonia plans to emphasise. There are several convenient register solu-

tions that are easy to use in various places around the world, and Estonia should have something that is at least comparable to them. The final shape of Estonia's ship register is difficult to predict as it is a work in progress and will be completed at the start of 2021.

Estonia's competitive advantage might be its digital signing and remote notarial authentication service, which that is accessible to residents and e-residents; the notarial service allows contracts that require notarial authentication to be signed without the person signing physically travelling to Estonia. Although some experts were sceptical about whether ship owners would be ready to become e-residents and go through the whole procedure for it, this option might turn out to be advantageous.

The quality of the register service is linked to whether the flag state can make sure that the register does not include ships whose owners have a dubious background. It is also important for the register to receive notification as soon as possible about any violations carried out on the ship, such as transporting of illegal weapons. Developing this capability should be a priority when improvements are made to the register service. In addition, we should consider whether there is sufficient guarantee of the right of a register, whether the ship register or the first and second bareboat chartered ships registers, to refuse to provide services to people who have been put under sanctions or who have a shady past.

The quality of the register service would benefit from various adjustments to the Estonian legal environment. We need a regulation on guards on ships and the handling of weapons, and we also need to consider more flexibility in signing fixed-term employment agreements for seafarers and in regulating working time. We should also finalise the legal form of the ship register and whatever solution is chosen, we need to ensure that the process for registering ships is client friendly.

Table 1. Taxes in Estonia, Malta and Madeira

			
	Estonia	Malta	Madeira
Personal income tax on a seafarer's salary	Not subject to income tax	Not subject to income tax Additional requirements that the ship may not be operated from Malta and the seafarer may not be a resident of Malta	Not subject to income tax
Social security contributions on the seafarer's salary	Tax base: 750 euros per month Tax rates: Social tax for pension of 20% applied to all, including those from third countries Unemployment insurance contribution of 2.4% for members of the European Economic Area or citizens of Contracting States ¹	No contributions are made to the social insurance system of Malta Additional requirement that the seafarer may not be a resident of Malta	No contributions are made to the social insurance system of Portugal Additional requirement that seafarers must be covered by some other insurance system or private insurance
Tonnage tax	NT tax per year 0: 0 euros 2500: 1292 euros 10 000: 4687 euros 30 000: 9797 euros	NT tax per year 0: 2500 euros 2500: 2500 euros 10 000: 3580 euros 30 000: 5780 euros	NT tax per year 0: 0 euros 2500: 1205 euros 10 000: 4490 euros 30 000: 9600 euros
Corporate income tax	Income tax paid on the profit of the current year is 0% The income tax rate applied to profit at the moment dividends are paid is 20% Additional requirement that tonnage tax is not applied	Tonnage tax applied to shipping companies	Corporate income tax at a rate of 5% applied to shipping companies until 2027 Additional requirement that tonnage tax is not applied

Sources: Income Tax Act, Social Tax Act, Unemployment insurance contribution rates in 2018–2021, KPMG 2017, MALTA – A Guide to Ship Registration, Act on Amendments to the Law of Ship Flag and Registers of Ships Act and Amendments to the Income Tax Act and Other Associated Acts. Bill 722SE, MALTA – A Guide to Ship Registration, MAR – Madeira's International Shipping Register, author's calculations

¹ A Contracting State is a country with which Estonia has a social insurance contract that also covers unemployment benefits, such as Ukraine.

Table 2. Registration fees in Estonia, Malta and Madeira

			
	Estonia	Malta	Madeira
Registration fees and other fees for a ship of 2000 NT	<p>First bareboat chartered ships register: one year: about 6300 euros five-year average: about 2500 euros</p> <p>Second bareboat chartered ships register: 15,000 euros per year, including ISM, ISPS and MLC audits</p>	<p>Initial registration fee in the Malta Ship Registry is 1563 euros</p> <p>Expenses for ships registered in the bareboat chartered ships register, depending on age are around 5000–6500 euros per year</p> <p>If a ship is registered in the Malta Ship Registry and a representative is hired, registration fees with agent’s remuneration depending on age are around 6000–7500 euros</p> <p>Does not include ISM, ISPS or MLC audits</p>	<p>In the fees calculator of Madeira’s Shipping Registry, the initial registration fee is 3600 euros</p> <p>The annual registry fee is 3000 euros, but fees for various certificates seemingly not counted by the calculator may be added to that</p> <p>The annual fee for using a local representative is around 3500 euros</p> <p>The fee does not include ISM, ISPS or MLC audits, nor does it cover the agent’s remuneration</p>

Sources: Act on Amendments to the Law of Ship Flag and Registers of Ships Act and Amendments to the Income Tax Act and Other Associated Acts Bill 722SE, Law of Ship Flag and Registers of Ships Act, MALTA – A Guide to Ship Registration, MAR – Madeira’s International Shipping Register, interviews with Estonian shipowners, author’s calculations

Key conclusions:



- It is always wise to have a user-friendly ship register that supports digital communication between different actors in the shipping ecosystem and can provide data-rich additional services to shipowners
- It is important to resolve the issues that restrict competitiveness in the defence of ships, the handling of weapons, ship registrations, and labour law
- To make costs more competitive, the registration fees and labour taxes of the second bareboat chartered ships register should be revised
- An active partnership with the private sector is crucially needed to search for technological solutions that could cut the size of ships’ crews without making any compromises in safety
- A plan needs to be prepared to develop the sales and on-shore sectors of the ship registers
- To play a role in the International Maritime Organization, it would be best to find a narrow topic like digitalisation to champion and promote



2. TRENDS IN DEVELOPMENT





Flag states operate in a highly competitive and constantly changing world.

Deglobalisation

The constantly deepening process of global economic integration seems to have ended for the time being. There are several reasons for this, like the increasing role of services in economic structures and the growth of trade within regions, but tensions between great powers should equally not be underestimated.

The connections between deglobalisation and the competitiveness of flag states are quite limited as ships travel between ports where goods can be transported and the colour of their flag has no impact on that, but deglobalisation is having a considerable effect on the growth of the global economy and so also on the welfare of shipping companies more generally.

Automation in the marine ecosystem

Automating ships means moving towards solutions where fewer and fewer people are needed to handle a ship. The technology to launch ships that navigate without any human input largely exists already, and it is developing fast. Beyond the technology, which still needs some refinement anyway, international rules must be agreed upon for how automated ships can be used, and safety and cyber security have a central role to play in this. Experts believe it will take the International Maritime Organization at least a decade to produce new rules for this, and so it would be

reasonable to assume that unmanned ships will start to arrive at the end of the forecast horizon.

Rapid technological development is happening not only in shipping, but also in ports. The places for loading and unloading ships have become logistical centres providing a wide variety of services. Ports are becoming increasingly smarter and the future, and partially also the present, of ports lies in systems that allow automatic communication between ships and ports, shorten the waiting time of ships in roadsteads or berths, allow automatic loading and unloading of ships, and communicate between the port and the traffic control systems of the city.

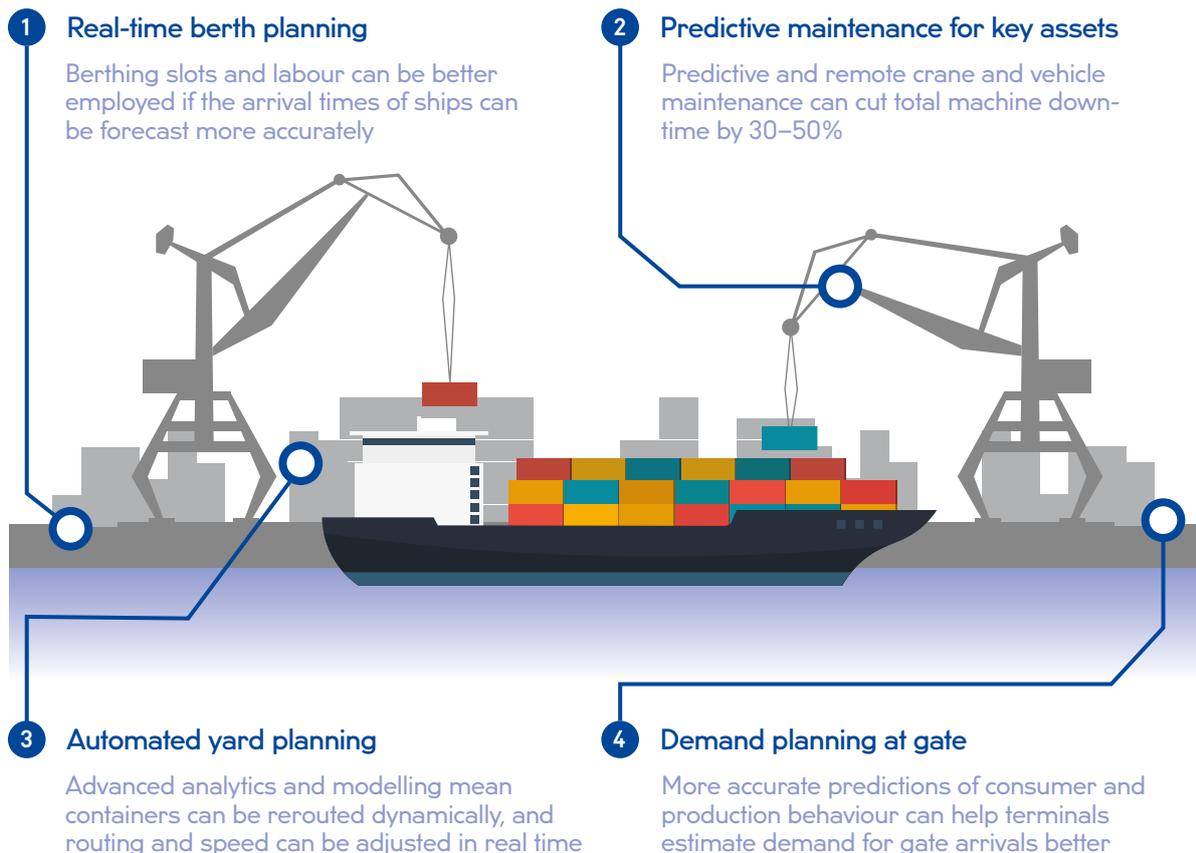


Figure 2. Port 4.0 will be powered by artificial intelligence, optimisation through advanced analytics and dynamic scheduling.

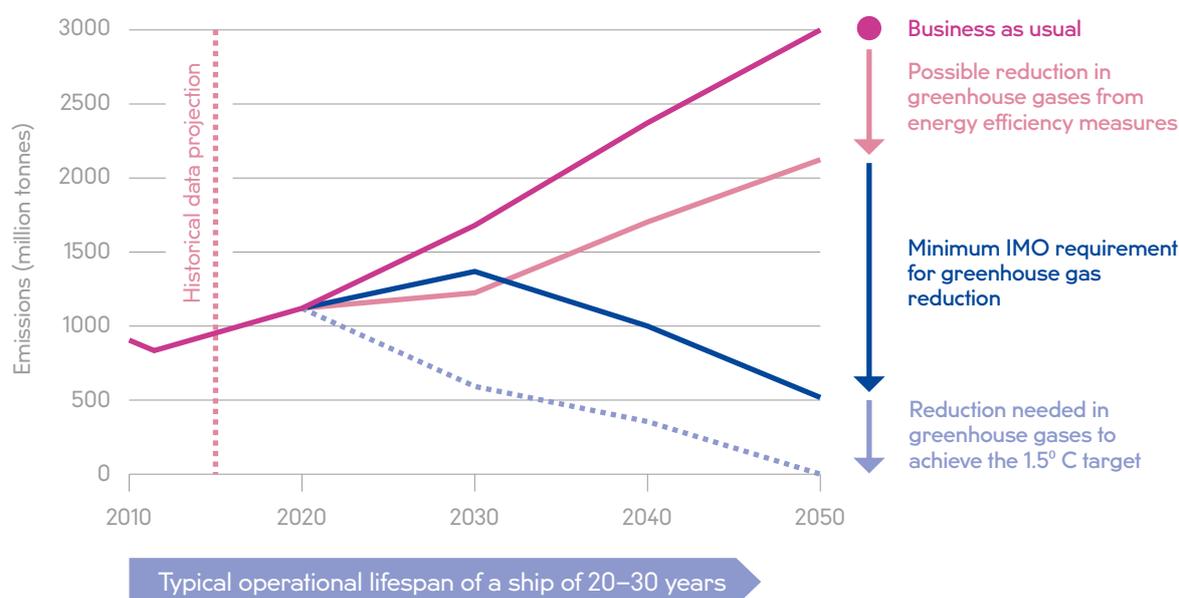
Source: Chu, F., Gailus, S., Liu, L., Ni, L. (2018) *The Future of Automated Ports*. McKinsey&Company

The introduction of electronic management in shipping has so far progressed quite slowly, but this is changing.

Flag states and classification societies have started to issue electronic certificates and have set standards for them. Different documents still have to be checked individually at present, and when they are issued, it is assumed that they will be verified by humans. In the future though, machines will take over routine checking and humans will only have to deal with problematic cases. Introducing digital solutions could also facilitate communication with the flag state in buying and selling a ship or in transferring it under the flag of another state.

Tightening of environmental requirements

Shipping impacts the environment in several ways, but drastically reducing greenhouse gas emissions by 50% by 2050 will most probably be the key environmental issue of the next 20–30 years. Reducing carbon emissions by so much will require new technologies and ship fuels. It has not yet been decided whether the new ship fuel will be hydrogen, ammonia, methanol, LNG or some other source of energy, but whatever the outcome, the investment needed will be very large, reaching at least 50 billion dollars a year in 2030–2050. Most of the investment will go not into rebuilding ships, but into creating the capacity to produce fuels.



Note: The highest line marks carbon emissions if everything continues as usual. The next line shows what carbon emissions will be if energy efficiency measures are used without any significant changes in ship fuels. The third line shows what carbon emissions should be to reach zero by 2070, and the bottom line shows what the emissions should be to achieve carbon neutrality by 2050.

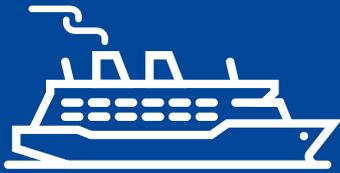
Figure 3. Decarbonisation. Emissions (million tonnes of CO₂)

Source: Carlo, R., Marc, J. M., de la Fuente Santiago, S., Smith, T., Sogaard, K. (2020) *Aggregate Investment for the Decarbonisation of the Shipping Industry*, UMAS, p. 2

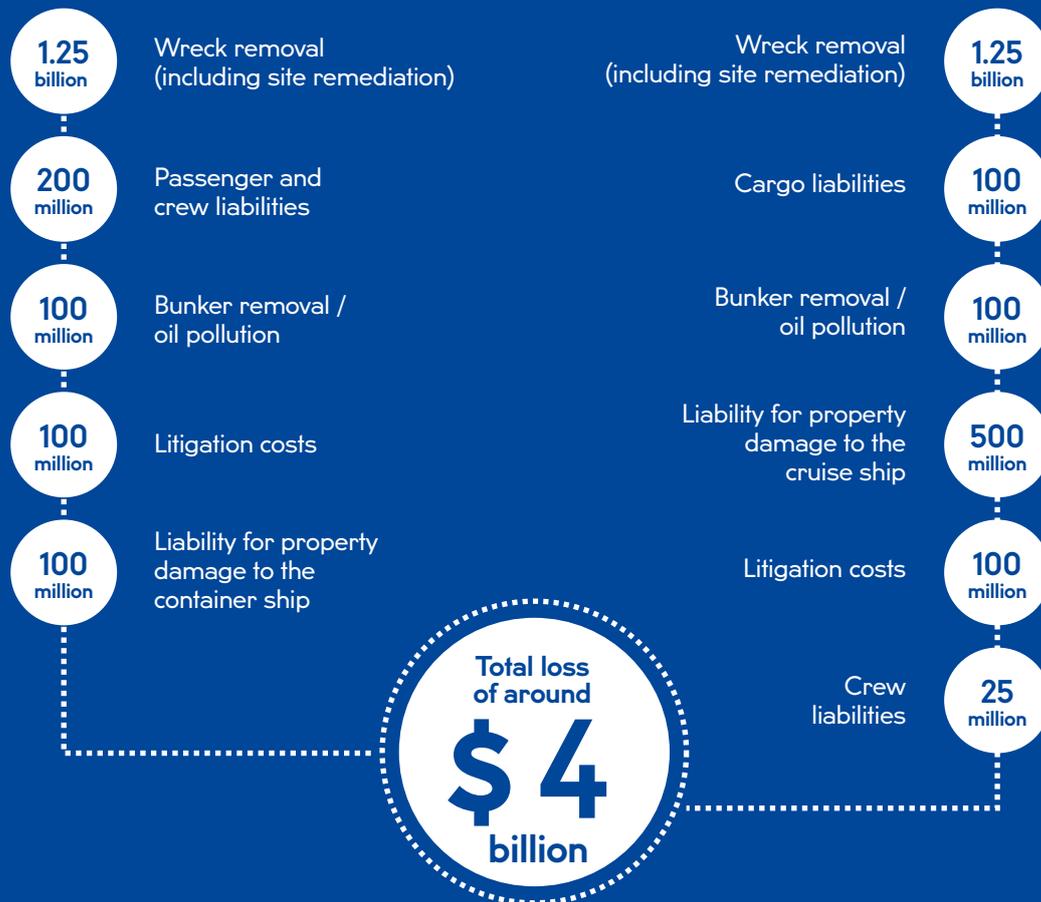
HOW THE SCENARIO OF A LOSS COSTING FOUR BILLION COULD OCCUR

The increasing size of vessels has raised fears about the potential for massive losses if a major accident occurs, particularly one involving two large vessels such as a cruise ship and a container ship. There are many factors to consider in an estimate of the potential costs of such an incident. Below, we consider a worst-case scenario of a collision followed by the grounding of both vessels and pollution in an environmentally sensitive area. In this scenario, both vessels are then deemed constructive total losses. The potential exposure could be:

VESSEL A (CRUISE SHIP)



VESSEL B (CONTAINER SHIP)



This does not take into account any possible limitation funds or any cross liability calculation and possible offset.

Figure 4. The scenario of a four billion dollar loss

Source: Allianz Global Corporate and Specialty. (2019) Safety and Shipping Review 2019, p. 21

Relocation of ship building out of Europe

At the beginning of the 1980s, the European ship building industry ranked among the most successful in the world for its production capacity. Today though, most ship building has moved to three Asian countries, China, South Korea and Japan.

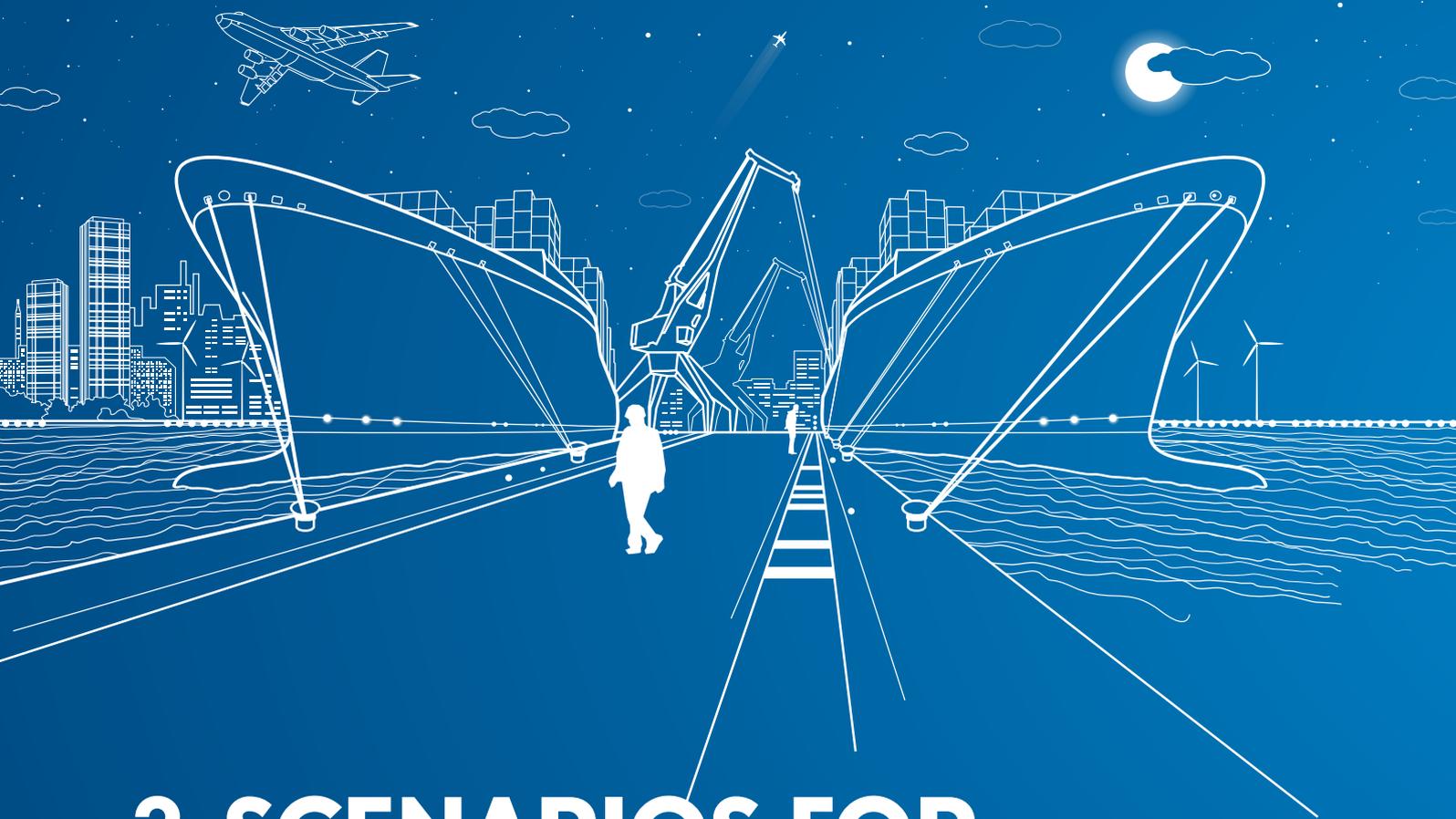
More expensive ships like smaller passenger ships are still built in Europe, but the technological ability of Asian shipyards to build more complicated vessels is also very good, and it may be assumed that their skills will increase even more in the coming decades.

Increased risks in maritime transport

Ships have become considerably bigger, and the potential damage that a single incident could cause has also increased. This concerns both ships and the goods that they transport. Climate change will also play an important role in raising costs through rescue and clean-up operations following any accident on the new Arctic trade routes. Cyber risks should not be forgotten either and the threat of such risks will increase as ships become smarter.

Pressure to use crew from outside the EEA

The more liberal approach to the composition of crews in recent times has increased the number of sailors from third countries in the crews of ships operated by the Estonian shipping companies, and experts say in interviews that this is happening not only at Estonian shipping companies, but also at other shipping companies transporting goods in the Baltic Sea region.



3. SCENARIOS FOR THE FUTURE OF ESTONIA AS A FLAG STATE



What should be done for Estonia to be a competitive flag state in 2040? Quite evidently, nobody can know what the world will be like in twenty years from now as many different developments are possible. In what follows we combine major trends to propose three scenarios that are realistic but quite different, so that we can consider future problems and be better prepared for them.

The scenarios were created with two main driving factors, which are the pace at which the maritime transport ecosystem becomes automated, and the pace at which environmental requirements are tightened. Combining these factors gave us three future scenarios that we have named

- Calm sea
- Green sea
- Silver sea

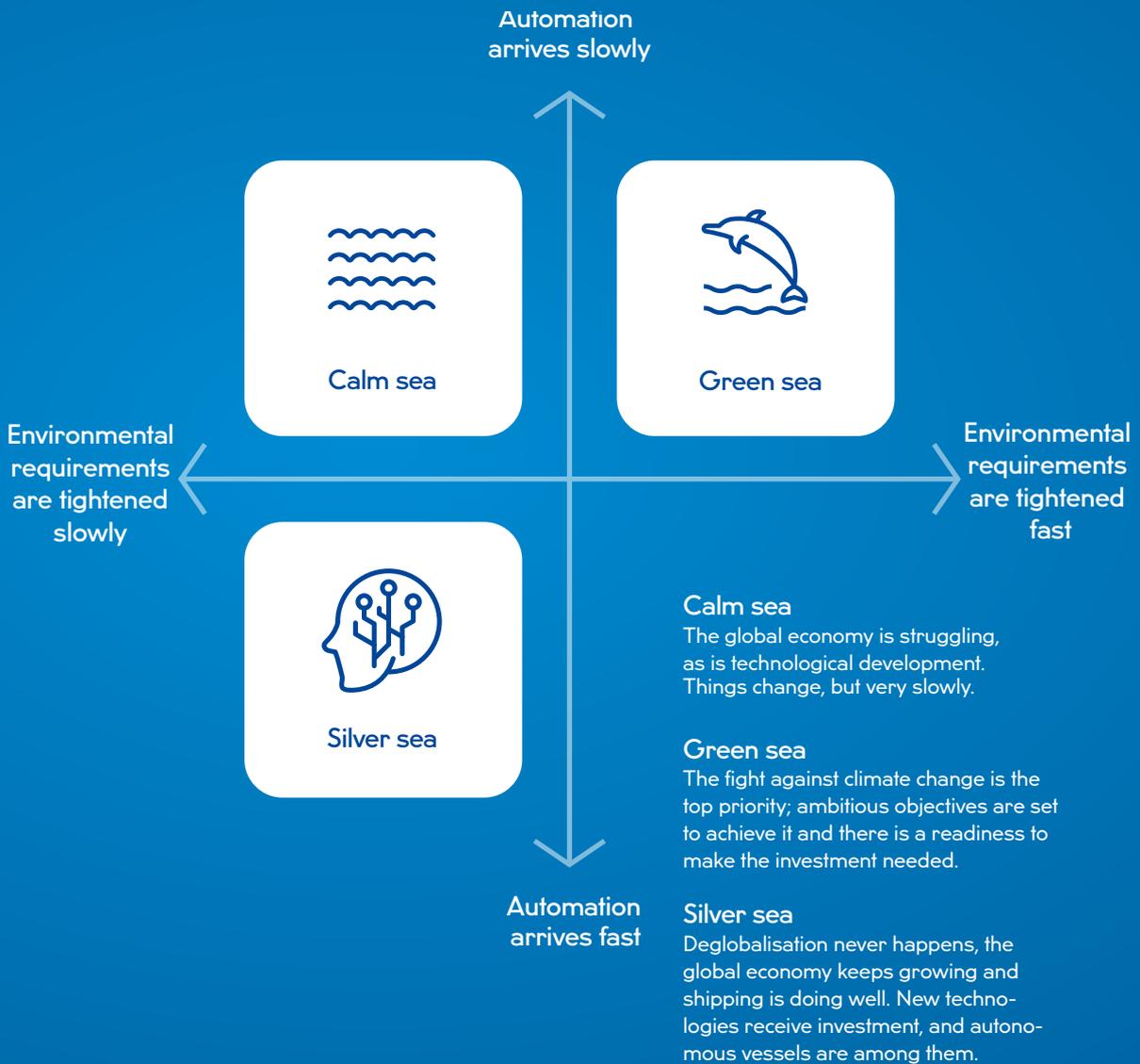


Figure 5. Framework for the future scenarios for Estonia as a flag state



Scenario: Calm sea



The global economy is fragmenting and regionalising. International agreements on environmental and technological standards prove difficult to sign. Technology develops more slowly in maritime affairs than expected. Growth in the global economy and consequently in maritime transport is struggling. Information is now exchanged digitally in the maritime transport ecosystem, but the development of autonomous systems has been sluggish, so ships are generally still operated as they are today even though they are more modern. The environmental requirements have tightened a little but no new carbon-free ship fuel has emerged, and it is unrealistic to think that CO₂ emissions will be reduced by 50% by 2050.

What does this mean for Estonia?

The Estonian ship register needs to be user-friendly in any case, even if it remains directed mainly at Estonian ship owners. Registration needs to be swift and the advice from the registry needs to be effective. Being able to transact remotely in the register, which e-residents also can, is important primarily for Estonian citizens, as the rest of the world and the shipping community are very likely to have certain reservations about becoming e-residents, at least for now. Nevertheless, it would be sensible to make this possible and it would be sensible for Estonia to contribute towards doing so.

Information can be exchanged more effectively between the registers of the flag state and the registers of the port state carrying out checks than it is now. At a minimum, the flag state could use machine-processable register information to advise operators and owners of ships and to predict and prevent potential problems that may appear in the future. Separate services to run in addition to the flag state registers should be developed for this. There are other areas where information exchange could be improved, such as automatic information exchange between the state performing port control

and the flag state, but they would require an agreement on international standards.

How affordable a register is depends primarily on the price of flag services and the state's tax policy. A change is needed to the current legal space for the social tax and the unemployment insurance premium paid on the remuneration of people from third countries, as this puts Estonia in a worse position than competing registers like Malta and Madeira. Fees for the second bareboat chartered ships register are also generally too high.

At the same time it is important to remember that taxes and register fees alone do not determine how affordable a register is, as the total cost to the operator of a ship of running that ship is what matters in the end. The Estonian ship register should discuss with operators of ships what technological solutions would help them to operate their ships safely with smaller crews, and it should allow for smaller crews on this basis. Reducing a crew by two or three members will save much more than a small discount on register fees could.

How much the ship register benefits Estonia's economy depends on how many ships are in it and how interested they are in using the services offered by Estonian businesses. This means for the Estonian state that the sales strategy of the ship register needs to be thought through thoroughly. It is in any case important that the ship owners brought to the Estonian register be directed to use systematically the services of the Estonian private sector.

If Estonia wishes to stand out more in the International Maritime Organization (IMO), we should make use of our strength. It might be sensible to start working on increasing our visibility by building on the skills and the image of the ICT sector by targeting digital solutions for registers and data exchange for example, and beginning to lead discussions about them.

What we could do to enhance competitiveness in this scenario is described on page 13.



Scenario: Green sea



The fight against climate change is the top priority. It has been decided to cut carbon emissions from ships to zero by 2050. All new ships sail on carbon-free fuel and older ships are being rebuilt. The maritime transport ecosystem is digitalising like in the *Calm sea* scenario. There is less focus on developing autonomous systems because the investment pressure is on meeting the environmental requirements, but the development is still faster than in the *Calm sea* scenario. Even so, the great majority of ships are still human-operated in 2040.

What does this mean for Estonia?

The introduction of a new carbon-free fuel, which must be largely hydrogen-based if the result is to be zero carbon emissions, requires at a minimum that such fuel can also be bunkered in Estonian ports.

A broader strategy of using hydrogen will need to be considered, of which creating bunkering capacity for hydrogen or ammonia, which indirectly is hydrogen, is just one part. Creating facilities to produce hydrogen could also be considered.

Estonia can give discounts on register fees to environmentally-friendly ships, though the benefit from the reduction in register fees will be quite small next to the total cost of the investment needed. The Estonian economy would benefit from introducing green subsidies, especially if environmentally-friendly ships could be built in Estonia, which in itself would need a national industrial policy to help create and develop the industry.

Decisions on Estonia's positions in international organisations should consider what policy Estonia would like to see for reducing carbon emissions from national shipping in the European Union. A greater opportunity to pay subsidies to shipping companies for reducing carbon emissions is in the interests of the Estonian state, especially if Estonian companies could benefit from the increased demand for on-shore services that such subsidies would create. If we cannot do this, it would be in our economic interest either not to have such subsidies at all, meaning that shipping companies would need to raise their prices in order to meet environmental requirements or find money from the markets, or to have uniform support measures throughout the European Union to mitigate the investment needs of shipping companies while still ensuring that countries with more shipbuilding capacity do not profit from their advantage to support their shipping companies more than countries that lack such capacity.

Key conclusions:



A broader strategy of using hydrogen should be considered, in which bunkering capacity in ports for hydrogen or ammonia, which is indirectly hydrogen, is just one part.

Reductions could be considered for environmentally-friendly ships in the form of lower register fees or loan guarantees say, provided that the Estonian on-shore sector can benefit from this.



Scenario: Silver sea



Deglobalisation never happens and after some temporary disruptions, the world moves on again, a little more slowly perhaps, but still following a course of integration. The economy is thriving and automation has increased in the maritime transport ecosystem. The communication between the parties in the ecosystem is digital, and some autonomous ships, both human-operated from the shore and fully autonomous, are used in both short sea and ocean shipping. They form a growing part of the fleet, and more and more ports are capable of receiving, unloading and loading them with little human intervention. A more moderate schedule for reducing carbon dioxide emissions has been agreed on than that in the *Green sea* scenario, with a cut in the level to 50% of that of 2008 by 2060. Several different lower-carbon emission ship fuels and engine solutions are in use.

What does this mean for Estonia?

Autonomous ships and related issues need to be defined in the legal space.

If this scenario were to play out, the ship register should have a broader scope than it does now. The functioning and security of autonomous systems would require additional work.

Issues of cybersecurity would be significantly more prominent than they are now. Estonia might be well advised to use its strength in IT and develop the capability for auditing cybersecurity and providing secure data exchange between autonomous ships.

Labour taxes will be significantly less important for the cost-effectiveness of the register service than they are today, but shipping should be more capital-intensive than it is now, which means that how profit and tonnage are taxed will be more important in determining how cost-competitive a register is.

The security and safety of ships will most definitely need an international agreement, and instructions approved by the IMO. Like in the *Calm sea* scenario, Estonia could try to benefit from our competitive IT-sector and specialise in the digitalisation of registers and possibly in cybersecurity for ships.

Key conclusions:



Autonomous ships and related issues need to be defined in the legal space. Attention should be paid in the development of the services of the ship register to creating a capability for auditing the cybersecurity of ships and the functioning of autonomous systems. The Estonian private sector should be more actively encouraged to look for partnership with businesses developing autonomous systems outside Estonia. The role of labour taxes is less important and the role of capital taxes is more so.

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