OÜ UTILITAS WIND

SAARE-LIIVI

AREA ADDITIONAL ENCUMBERED BY OFFSHORE WIND FARM

ENVIRONMENTAL IMPACT ASSESSMENT

of the publication of the draft EIA programme
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ROHE plaan

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1. Introduction

On 18 February 2021, Utilitas OÜ (hereinafter Utilitas Wind[1]) submitted to the Consumer Protection and Technical Regulatory Agency (hereinafter TTJA) an application for superficies licence for encumbering a public body of water for the construction of the Saare-Liivi offshore wind farm in the potential development zone of wind energy in accordance with the county plan adjoining Pärnu County in the Gulf of Riga. According to the application of 18 February 2021, it was desired to build a wind farm with up to 299 turbines. By decision no. 1-7/21-521 of 23 December 2021, the TTJA initiated proceedings on a superficies licence along with an environmental impact assessment (see Annex 1). With its decision no. 16-7/21-02502-095 of 22 December 2022, TTJA declares the OÜ Utilitas WIND Saare-Liivi offshore wind farm in conformity to the requirements of the EIA programme. This EIA programme examined, in the context of the EIA, the primary alternative, which was an offshore wind farm area with up to 160 turbines.

On 30 June 2022, Utilitas Wind submitted to the TTJA an application for increasing the size of the area encumbered in proceeding for superficies licence for the Saare-Liivi offshore wind farm, citing that by that time, environmental investigations initiated in parallel with the EIA process had shown that it was not realistically possible to erect wind turbines in the southern part of the area intended to be encumbered when the proceedings on Saare-Liivi offshore wind farm superficies licence were commenced. Thus, there arose a need to shift or increase by 33% on the basis of subsection 222 (4) of the Water Act the encumbered area referred to in the decision to commence superficies licence proceedings on the Saare-Liivi offshore wind farm. The additional encumbered area of the Saare-Liivi offshore wind farm is located in the wind energy development zone in the Estonian maritime spatial plan established on 12 May 2022. In accordance with the application of Utilitas Wind of 30.06.2022 up to 92 wind turbines would be built in the additional area.

On 9 March 2023, TTJA (decision no. 1-7/23-063) decided to amend decision no. 1-7/21-521 of 23.12.2021 and move the encumbered area of the public body of water in the superficies licence proceedings initiated in the decision. In that same decision (9 March 2023), TTJA merged the initial encumbered area of the public body of water stated in the superficies licence proceedings initiated with decision 1-7/21-521 of 23 December 2021 (omitting the southern unsuitable area) and the additional encumbered area set forth in the OÜ Utilitas Wind application of 30 June 2022 into one integral encumbered area (See figure 2.1 of this EIA programme) and considered the superficies licence proceedings initiated on the basis of this OÜ Utilitas Wind application.

In accordance with decision of the TTJA from 9 March 2023, the environmental impact of the building of an offshore wind farm in a body of water in the **additional encumbered area of Saare-Liivi offshore wind farm** (hereinafter referred to also as "additional Saare-Liivi offshore wind farm area") must be assessed in the EIA proceedings initiated by the TTJA by decision no.

1 On 14 January 2022, Utilitas OÜ and Utilitas Wind OÜ notified the TTJA that the rights and responsibilities of the applicant for proceedings of the Saare-Liivi offshore wind farm building area and EIA and the developer had, insofar as the Utilitas OÜ renewable energy generation plant, passed to another Utilitas group company, OÜ Utilitas Wind. The TTJA confirmed in its letter 16-7/21-02502-036 of 29 March 2022 that it would treat Utilitas Wind OÜ as the applicant in subsequent proceedings on the superficies licence for Saare-Liivi offshore wind farm and EIA.

1-7/21-521 of 23 December 2021, **preparing an additional EIA programme and if necessary additional EIA report accompanied by related additional procedural operations.**

The purpose of the EIA of the Saare-Liivi offshore wind farm additional area described in this EIA programme is to assess the possible environmental impacts that could result from carrying out the planned activity and its alternatives in the Saare-Liivi offshore wind farm additional area and **combined effects as a whole in regard to the planned Saare-Liivi offshore wind farm and related infrastructure.**

Environmental impact is direct or indirect impact on the environment, human health and well-bring, cultural heritage or assets, expected to result from activity. Environmental impact is significant if it is expected to exceed the environmental tolerance of the influence area, cause irreversible changes in the environment or pose a danger to human health and well-being, cultural heritage or assets[2].

The developer of the planned activity is Utilitas Wind OÜ. The EIA is carried out by Roheplaan OÜ and the lead expert on the EIA is Riin Kutsar (EIA licence no. KMH0131).

2 https://www.riigiteataja.ee/akt/103012022010, § 2^1 and 2^2

2. Planned activity

2.1. Objective and need for the planned activity

The objective of Utilitas Wind is to establish an offshore wind farm with up to 92 wind turbines in the additional Saare-Liivi offshore wind farm area. The purpose of use of the structure is to generate power and/or hydrogen via the offshore wind power plant infrastructure.

The need for the planned activities stems from climate goals, to achieve which generation from renewable energy sources, including offshore wind energy, and energy performance and adoption of other sustainable solutions that will help achieve reduction in carbon emissions must be increased. The establishment of an offshore wind farm is also very important for achieving national energy security and security of supply.

2.2. Location of the planned activity

The location of the Saare-Liivi offshore wind farm is the inland maritime waters to the west of the island of Kihnu – the coastal sea region (coastal waters of the north-eastern part of Gulf of Riga and the central part of the Gulf of Riga) and an area partially located in territorial waters (see figure 2-1) in the maritime area adjoining Pärnu County.

The additional Saare-Liivi offshore wind farm area (which is the object of this EIA programme) is located in the eastern part of wind energy development zone no. 1 in the nationwide Estonian maritime spatial plan[3] (established 12.05.2022).

The original encumbered area of Saare-Liivi offshore wind farm is located in the preferred area for establishing an offshore wind farm in the national spatial plan Eesti 2030+[4] and in a potential wind energy development zone in the county spatial plan for the maritime area adjoining Pärnu County[5] (see figure 2-1).

3 https://mereala.hendrikson.ee/dokumendid/Planeeringulahendus/Kehtestamisele/1_MSP_Seletuskiri.pdf

4 https://www.rahandusministeerium.ee/sites/default/files/Ruumiline_planeerimine/eesti2030.pdf

5 https://maakonnaplaneering.ee/maakonna-planeeringud/parnumaa/parnu-mereala-maakonnaplaneering/

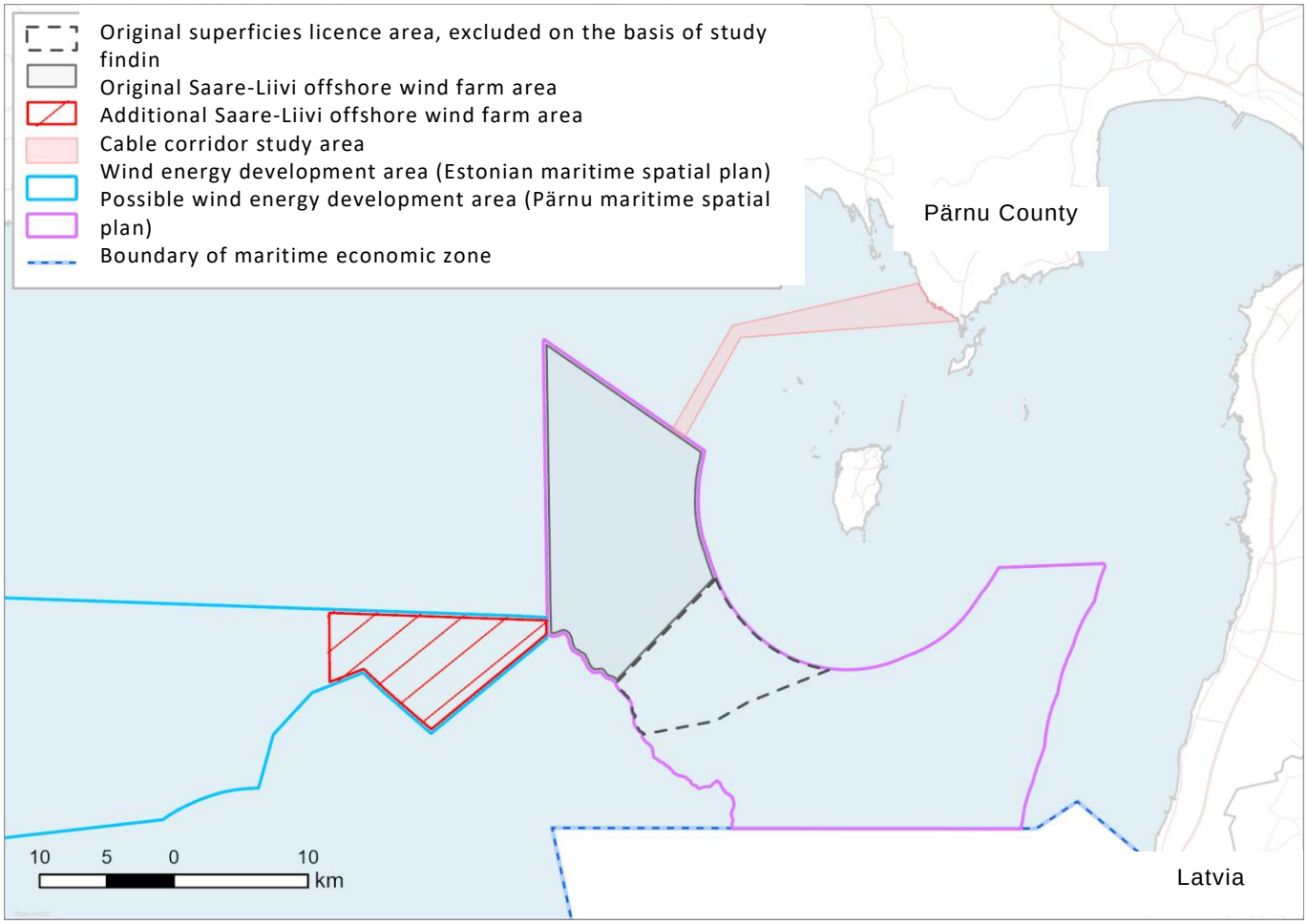

Figure 2-1. *The original location of the planned Saare-Liivi offshore wind farm and additional Saare-Liivi offshore wind farm area dealt with in this EIA programme*

2.3. Brief description of the planned activity and realistic alternatives

According to the superficies licence application submitted for the original Saare-Liivi offshore wind farm area (18.02.2021), Utilitas Wind desired to design an offshore wind farm consisting of a maximum 299 turbines and the spacing between the turbines was put tentatively at 1 km.

According to the EIA programme declared in conformity to the requirements of Saare-Liivi offshore wind farm, up to 160 turbines were planned for the original encumbered part[6] and the distance between the turbines was put tentatively at 1-1.25[7] km.

The number of wind turbines planned for the additional Saare-Liivi offshore wind farm area (dealt with by this EIA programme) is, according to the application of 30 June 2022 from Utilitas Wind, up to 92 (spaced 1 km apart). Alternative technical solutions for various components will be examined and assessed in the course of the EIA as sub-alternatives to the

6 https://saareliivituulepark.ee/wp-content/uploads/2022/09/Utilitas_meretuulepargi_KMHP_EST.pdf

7 1,25 km is a spacing that corresponds to a turbine with a 5 x 250 m rotor

main activity, i.e. the primary alternative for erecting wind farm (part) in the additional Saare-Liivi offshore wind farm area:

- **number of electrical turbines**

The final potential number of turbines and their placement depends on the environmental restrictions found in the course of investigations conducted in the Saare-Liivi additional offshore wind farm area and the exact technical parameters of the wind turbine to be selected. Based on the primary alternative in the EIA, the **maximum number of wind turbines that can be assessed and designed in the additional Saare-Liivi offshore wind farm area is 92**.

- **peak height of the turbine and rotor diameter**

The precise type of turbines to be adopted will become evident during the operational building design documentation stage. **During the EIA, the power rating of the turbines will be evaluated in the range of 14-20 MW and the maximum peak height is 400 m.**

The world's most common and largest offshore wind farm producers at the time the EIA was initiated were Siemens Gamesa, Vestas and GE Renewable Energy. They currently meet the requirements in Europe and are certified as offshore wind farm producers. The largest turbines openly offered by these producers for offshore use are as follows:

- Vestas V236-15.0 MW™, rotor diameter 236 metres and with an output of 15 MW,
- SiemensGamesa SG 14-236 DD, rotor diameter 236 metres and with an output of 14 MW,
- GF Haliade X 14 MW, rotor diameter 220 metres and with an output of 14 MW,

More powerful turbines are being developed by the producers, with an expected power range of 14-20 MW, rotor diameter 250 to 290 m and a peak height of up to 320 m.

In recent years, wind turbine technology has developed in leaps and bounds and based on that, we expect that even bigger and more powerful turbines will be available on market by the construction of the planned offshore wind farm. The EIA is prepared taking into account the maximum measurements for as-yet hypothetical offshore wind turbines that could be in use by the time of the construction of the offshore wind farm, i.e. turbines whose peak height from sea level is up to 400 m (higher than the ones currently under construction).

If, by the time of the offshore wind farm design development, there are additional producers who are certified and meet requirements in force in Europe, the wind turbines provided by them would also be considered on condition that they are not worse than the abovementioned turbines.

- **foundation type**

Various types of foundations are in use for building turbines in offshore use. The most common foundation type is monopile and gravity foundations, with tripod and jacket foundations used less often. See Figure 2-2.

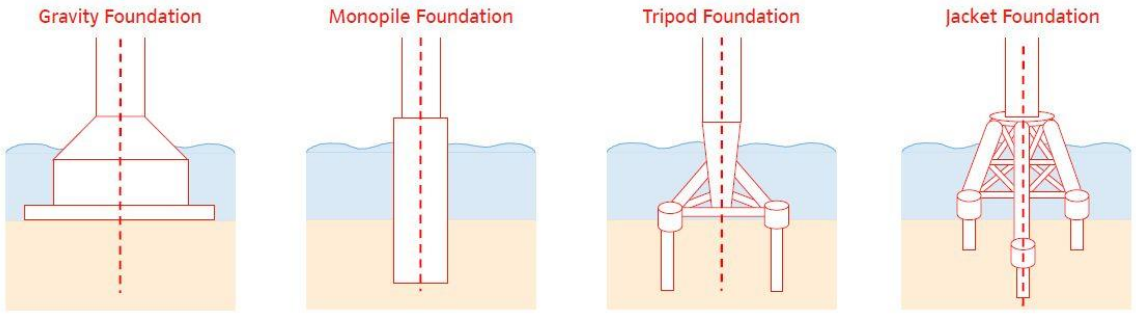

Figure 2-2. *Types of electricity turbine foundations used in offshore wind farms*[8]

the foundation type used for the planned power turbines will be determined after more detailed studies and above all it depends on the geology of the seabed. Since the depth of the sea in the planning area varies 25-40 m, it is **likely that different foundation structures will have to used.**

The chosen foundation types and the impacts from each one are dealt with as part of the EIA report.

- **transmission system and locations of objects (cables)**

To connect Saare-Liivi to the power grid for operating the offshore wind farm and transmitting the electricity generated, the establishment of a submarine cable system and connection to the transmission system is required.

With decision no. 1-7/22-473 of 22 December 2022, TTJA initiated proceedings on the superficies licence and EIA for installation of the planned submarine cable in the Gulf of Riga for connecting the Saare-Liivi offshore wind farm to the grid. The EIA proceedings initiated by decision of the TTJA of 22 December 2022 were merged with the EIA proceedings on establishing Saare-Liivi offshore wind farm in the Gulf of Riga, initiated by TTJA decision 1-7/21-521 of 23 December 2021 on the basis of subsection 11 (7) of the Environmental Impact Assessment and Environmental Management System Act. The location of the submarine cable for connecting Saare-Liivi offshore wind farm to the main grid and possible locations of the cable are shown on Figure 2-1. The location of the connection to the main grid in the sea will be clarified in the course of the proceedings on superficies licence as a result of the investigations in the submarine cable locations and the EIA. The impacts of the connection of submarine cable connecting Saare-Liivi offshore wind farm to the main grid are expected to be covered in the EIA report along with the original area to be encumbered.

It is envisioned that at least one substation will be established additionally in the additional Saare-Liivi offshore wind farm area. The locations of the offshore wind farm's substation(s) and the submarine cables will be clarified in the course of the further process. The power cables within the offshore wind farm will be installed, if necessary, in the seabed soil.

8 Miceli F. Offshore wind turbines foundation types; 2012 (https://www.windfarmbop.com/tag/monopile/)

Analysis and clarification of solutions of the primary alternative and the sub-alternatives will take place in the subsequent EIA report process (including based on data from the studies conducted in the planned additional area) and in development of the technical solution in cooperation with the government bodies and experts from the respective field. Alternative solutions that arise during the EIA process and/or determining of the best alternative solution (including drafts in regard to the locations of wind farms and parameters) will be described in the EIA report.

In the course of preparation of the Saare-Liivi offshore wind farm's EIA report, alternatives to the planned activity are analysed in comparison with the 0-alternative in other words one where the status quo is preserved in the maritime area and no offshore wind farm is planned.

Hydrogen technology. By the time of preparation of this EIA programme, Utilitas Wind is not planning concrete (technical) solutions for dealing with the hydrogen generation, such as generation of hydrogen in the offshore wind farm and transporting it through pipelines to the mainland. At the same time, the planned offshore wind farm will be developed such that it could be connected to hydrogen technology solutions with minimal modifications. The EIA report thus considers specific development options related to the hydrogen topic at the conceptual level (i.e., technical solutions not planned in detail).

Producing hydrogen from the power generated at Saare-Liivi offshore wind farm can be arranged in various ways if it proves upon more detailed design development whether the hydrogen production unit can be cost effectively established in the immediate proximity to the offshore wind farm cable clearance or on the territory of the offshore wind farm. If, during the EIA process, solutions arise that are parts of the offshore wind farm, the planned activities at sea will be evaluated in the context of this EIA.

Initial analysis shows that production of hydrogen on land may prove more cost effective than building a unit for hydrogen production at the offshore wind farm and piping it to the mainland. At the same time, the solutions for production of hydrogen depend on technological development and the hydrogen infrastructure and demand in the region at the time the project is realized. If a connection of the offshore wind farm to a hydrogen plant on e.g. the mainland is considered, a separate project will be drawn up along with an EIA.

3. Connections between the planned activity and strategic planning documents

3.1. Climate and energy policy framework up to 2030

In 2014, the European Union adopted the Climate and Energy Policy Framework up to 2030[9], which was prepared based on the principle that goals are to be fulfilled collectively and using measures that are as cost effective as possible.

The three main goals of EU climate and energy policy up to 2030

- Increasing the share of renewable energy to 27% of energy end consumption by 2030;
- Increasing energy efficiency by 27%;
- Reducing GUG emissions by 40% by 2030 compared to 1990.

The planned activity is in direct concordance and contributes to achieving the goals of the climate and energy policy framework.

3.2. The European Green Deal

On 11 December 2019, the European Commission adopted the "European Green Deal"[10].

The European Green Deal is an umbrella strategy aimed at achieving a resource-efficient and competitive economy in Europe where by 2030 climate neutrality will have been achieved along with sustainable use of resources along with sufficient economic growth. The goal must be achieved while preserving the natural environment and protecting citizens from dangers and impacts related to environmental pollution.

At the core of the Green Deal are three primary principles for the transition to clean energy, which will help to reduce GHG emission and improve quality of life for the population:

1. ensuring stable and affordable EU security of supply;
2. achieving an EU energy market that is fully integrated, mutually cross-connected and digitalized;
3. making energy performance the priority, Improving energy performance in buildings and developing an energy sector that is largely renewable-based.

The goals set for achieving the abovementioned principles that are relevant in the context of this EIA are:

- creating interconnected energy systems and better integrated power grids to support use of renewable energy sources;

9 https://energiatalgud.ee/Energiatalgud.ee%3A_EL-i_kliima-_ja_energiapoliitika_raamistik_aastani_2030

10 https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal_et

- promoting innovative technologies and contemporary infrastructure;
- promoting EU energy standards and technology at a global level;
- tapping Europe's full offshore wind energy potential.

The planned activity will directly contribute to achieving transition to pure energy – a goal at the core of the European Green Deal.

3.3. The European Union's biodiversity strategy up to 2030

On 20 May 2020, the European Commission adopted the "European Union Biodiversity Strategy up to 2030"[11], which attempts to contribute to European biodiversity being able to recover by 2030, generating benefits for humans, climate and our entire planet.

The most Important topics in the context of this EIA are set out in Chapter 2.2 of the strategy. (EU nature restoration plan: restoring land and marine ecosystems):

- 2.2.5. Win-win solutions for energy generation. To achieve climate neutrality and EU recovery after COVID-19 crisis and to achieve long-term well-being in the EU, it is extremely important to reduce carbon dioxide emissions from the energy system. More sustainably procured renewable energy is very important for fighting both climate changes and reduction of biodiversity. The EU prioritizes solutions connected to, e.g., ocean energy, offshore wind farms (which also enable fish stocks to recover), solar parks (which support the growth of vegetation cover that promotes biodiversity) and adoption of sustainable bio-energy.

- 2.2.6. Restoring the good environmental status of marine ecosystems. Restored and properly protected marine ecosystems bring substantial health and socio-economic benefits, notably to coastal communities and the EU as a whole. The need for stronger measures is all the more urgent considering that global warming is greatly increasing the reduction of biodiversity in marine and coastal ecosystems. Achieving good environmental status of marine ecosystems, including through creation of strict protection areas, must include restoration of carbon-rich ecosystems and key spawning and nursery areas. Some of today's sea uses are recognized as endangering food security, fishers' livelihoods, and fishery and seafood sectors. Marine resources must be harvested sustainably, and there must be zero-tolerance to illegal practices. The full implementation of the EU's Common Fisheries Policy, the Marine Strategy Framework Directive, and the Birds and Habitats Directives will deliver an important part of these objectives and benefits.

The planned activity is in harmony with the EU Biodiversity Strategy.

11 https://ec.europa.eu/environment/strategy/biodiversity-strategy-2030_et

3.4. National strategy "Sustainable Estonia 21"

The national strategy Sustainable Estonia 21, adopted by Parliament on 14 September 2005, defines sustainable development principles.[12] Estonia's objectives up to 2030 were articulated in conformity with global (Agenda 21) and the European Union's long-term development visions. Among other things, the need to plan steps for a transition to a post-oil shale energy sector was mentioned.

The planned offshore wind farm is in conformity with the national strategy.

3.5. "Estonia 2035" national strategy

Adopted by Parliament on 12 May 2021, "Estonia 2035"[13] is a long-term development strategy that aimed to grow and support Estonian people's wellbeing to make Estonia the best place to live and work 20 years from now. "Estonia 2035" is a strategic management tool for coordination of the country's long-term strategic planning and financial management, taking into accounts the possibility of state finances. It is a strategy that facilitates cooperation between Parliament and the Cabinet for ensuring common management of Estonia's development and strengthens the connections between various strategic policy documents. "Estonia 2035" is implemented mainly through sectoral development plans and programmes in the corresponding fields. "Estonia 2035" sets five long-term strategic goals that are values-based targets and are a basis for making the country's strategic choices, with implementation supported by all of Estonia's strategic development documents:

- The people of Estonia are smart and active and care about their health.
- Estonian society is compassionate, cooperation-minded and open.
- The Estonian economy is strong, innovative and mindful of its responsibilities.
- Estonia is considerate of everyone's needs, safe and secure and a high-quality living environment.
- Estonia is an innovation-minded, trustworthy and human-centred country.

To stay on course in terms of the core principles of Estonia, achieve strategic aims and meet development needs, changes are needed in various fields.

The following is relevant in the context of this EIA:

- Transition to climate-neutral energy generation while guaranteeing energy security. The transition to climate-neutral energy generation that ensures good air quality requires alternatives to be weighed and choices made. We must ensure continuity of energy security and security of supply both during and before transition to climate neutral energy generation. We will find solution for increasing the share of renewable energy

12 https://www.riigiteataja.ee/akt/940717

13 https://valitsus.ee/strateegia-eesti-2035-arengukavad-ja-planeering/strateegia/materjalid

that takes into account security; environmental protection and the interests of the population. We are open to and support new solutions such as offshore wind energy.

- We will adopt a safe, environmentally clean, competitive, need-based and sustainable transport and energy infrastructure. We are open to and support new technologies such as hydrogen use. Transition to climate-neutral energy generation requires the establishment of support infrastructure. To do so, we will synchronize the power grid with the continental Europe frequency area, create the necessary network connections for generation of renewable energy and adopt smart networks, short and long term energy storage possibilities.

Based on the above, the planned offshore wind farm will directly contribute to fulfilling the set goals of ensuring sustainable and climate-neutral energy generation.

3.6. "Estonia 2030+" national spatial plan

On 30 August 2012, the Cabinet established the national spatial plan, "Estonia 2030"[14]. In accordance with the spatial plan, among the most important fields for increasing the local renewable resource based energy generation capacity are wind energy and bio-energy. In accordance with the plan; the share of other energy sources in the country's energy balance will have to be increased. The Western Estonian coastal sea is suitable for establishing offshore wind farms. The main objectives of "Estonia 2030+" in the energy sector are:

1. In developing electricity generating capacity, it is necessary focus on supplying Estonia with energy. New energy generating units must be positioned in space rationally and sustainably. It is noted that power generation in Estonia has thus far been based mainly on oil shale, which will not be competitive in the long term (e.g. because of higher environmental charges). Due to energy security and environmental considerations, it is not expedient for one fossil energy source to have such a high proportion in the country's energy balance, because it is connected to security of supply, the energy market and environmental protection risk. Because of that, other energy sources must also be increased in proportion and infrastructure developed to trade more extensively with other European Union member states in the energy field.
2. The possibilities of Estonian energy supply Must be broadened, creating international connections with energy networks in the Baltic Sea region.
3. Undesirable impacts for the climate must be avoided. Renewable energy must make up a higher proportion of energy supply, and implementation of energy efficient measures must be ensured. Attention is drawn to the fact that "possibility and need to establish new land or offshore wind farms must be considered, because Estonia's good wind potential allows a noteworthy part of electricity to be generated using turbines."

The planned offshore wind farm is in conformity with the energy goals in the national spatial plan Estonia 2030+.

14 https://www.rahandusministeerium.ee/et/ruumiline-planeerimine/uleriigiline-planeering

3.7. Fundamentals of climate policy up to 2050

The "Basic Fundamentals of Climate Policy up to 2050",[15] adopted by the Parliament on 5 April 2017, is a vision document in which the principles and policy directions are implemented through sectoral development plans. The fundamentals set a goal to achieve, by 2050, a competitiveness low-carbon-emissions economy in Estonia. On 8 February 2023, the Riigikogu passed the renewal to the Basic Principles of Climate Policy, whereby Estonia's long-term goal became achieving climate neutrality by 2050. Estonia's long-term goal is to transition to a low-carbon-emissions economy, meaning gradually and purposefully making the economic and energy system into a more resource-efficient, productive and environmentally cleaner one. By 2050, Estonia will be a competitive climate neutral country with a knowledge-based society and economy.

The planned activity is in harmony with the goals of the Basic Fundamentals of Climate Policy up to 2050.

3.8. Estonian environmental strategy up to 2030

The "Estonian Environmental Strategy up to 2030"[16] is an environmental development strategy that is based on the principle of sustainable Estonia 2021 and is the overarching strategy for all sectoral development plans in the field of the environment, which must, when prepared or supplemented, be based on the principles given in the environmental strategy.

The purpose of the "Estonian Environmental Strategy up to 2030" adopted by Parliament decision of 14 February 2007, is to define the long-term development areas for maintaining the good status of the natural environment, proceeding from the connections between the environmental field and the economic and social field and their impacts on the surrounding natural environment and humans. The objective of the environmental strategy in regard to climate change and air quality is as follows: generate electricity in a volume that satisfies Estonian demand, and develop diverse sustainable production technologies that are based on various energy sources and have low environmental load and which allow electricity to be generated for export as well.

The environmental strategy implementation plan, "Estonian Environmental Action Plan for 2007-2013" envisioned the following activities for alleviating climate change and improving air quality in regard to wind farms: establishing compensating equipment for increasing the potential for harnessing wind energy and establishing additional wind farms for achieving Estonia's renewable energy objective.

The planned activity is in harmony with the goals of the Estonian Environmental Strategy up to 2030.

15 https://envir.ee/kliimapoliitika-pohialused-aastani-2050

16 https://www.riigiteataja.ee/aktilisa/0000/1279/3848/12793882.pdf

3.9. Estonian Climate Change Adaptation Development Plan up to 2030

On 2 March 2017, Parliament adopted the "Climate Change Adaptation Development Plan 2030" [17], the strategic objective of which is to increase the Estonian state regional and local level readiness and capability for adapting to the impacts of climate change.

For preparing the climate change development plan, researchers determined the impact of climate changes in eight key fields for Estonia: planning and land use, human health and rescue capability, natural environment, bio-economy, infrastructure and structures, energy and energy supply, economy, society, awareness and cooperation.

In terms of the energy and energy supply field, which is relevant for this EIA, the following is set as a sub-objective: despite climate change, energy independence, energy security, security of supply, and suability of renewable energy resource shave not decreased and the volume of end consumption of primary energy will not increase. The overarching idea of energy independence is autonomy from import of energy carriers, relying on domestic fuels and above all renewable fuels for producing energy, and use of renewable energy source and diversification of the energy generation portfolio. Energy security of supply is best ensured by the existence of sufficient and responsive generating capacities and dispersion of energy generation. It is important that the planning the long-term future of energy sector factor in not only the existence of resources, the cost of technologies and energy and other aspects that impact the energy sector, but also changing climate conditions and their impact on energy generation and delivering electricity to consumers also be considered.

The planned activity is in harmony with the goals of the Estonian Climate Change Adaptation Development Plan up to 2030, supporting the fulfilment of goals set for ensuring energy and energy supply.

3.10. Estonian National Energy and Climate Plan up to 2030

On 19 December 2019, the Cabinet approved the "Estonian National Energy and Climate Plan up to 2030"[18] (REKK 2030), which consists of the Estonian energy and climate policy goals and the 71 measures developed for implementing the goals. The broader goals of REKK 2030 is to give Estonian people, companies and other EU member states as detailed as possible information about the measures the Estonian state intends to use to achieve the energy and climate policy goals agreed in the European Union.

The main objectives of REKK 2030 that are significant in the context of this EIA are the following:

- Reduction of Estonian GHG emissions by 80% by 2050 (including by 70% by 2030)
- By 2030, renewable energy must make up at least 42% of total end consumption: in 2030, renewable energy will make up 16 TWh – 50% – of final <consumption. Of this, renewable

17 https://valitsus.ee/strateegia-eesti-2035-arengukavad-ja-planeering/arengukavad/muud-arengudokumendid

18 https://www.mkm.ee/et/eesmargid-tegevused/energeetika/eesti-riiklik-energia-ja-kliimakava-aastani-2030

electricity is 4.3 TWh (2018 = 1.8 TWh), renewable heat 11 TWh (2018 = 9.5 TWh), and transport 0.7 TWh (2018 = 0.3 TWh).

- Guaranteeing energy security, keeping the level of dependence on imported energy as low as possible: the use of local fuels will be kept as high as possible (among other things, the use of fuel-free energy sources will be increased), and biomethane production and use potential will be harnessed.

The planned activity makes a direct contribution to fulfilling the Estonian national energy and climate goals by supporting an increase in the proportion of renewable energy.

3.11. Energy Sector Development Plan 2030

6 October 2016 The "Energy Sector Development Plan 2030" approved by the Cabinet on 6 October 2016 (ENMAK 2030)[19] consolidates future activities related to heat, power and fuel economy, energy use in the transport sector and housing sector. In addition, ENMAK 2030 determines the points of departure for the following development plans that must be submitted to the European Commission:

- Renewable energy action plan on the basis of the renewable energy directive 2009/28/EC.
- Energy savings action plan on the basis of the energy conservation directive 2012/27/EU.
- Building renovation plan on the basis of the energy conservation directive 2012/27/EU.

The general objective is to ensure for consumers a market-based price and available supply of energy that is in harmony with the European Union's long-term energy and climate policy goals, while contributing to improving the Estonian economic climate and environmental status and long-term competitiveness growth. According to the development plan, the state's main activities in ensuring energy security infrastructure and ensuring current and future cross-border electricity and gas supply connections, ensuring the liquid fuels and gas stocks for Estonia set forth in legal requirements, the existence of heat production capacity to cover base and peak demand, ensuring legislative drafting for promoting dispersed and micro generation. Energy supply for vital services must be guaranteed. Power generation takes place in conditions of an open electricity market. New power generation capacities are established based on the conditions of the electricity market, where government intervention takes place for fulfilling the power generation capability criterion or for incentivizing the market launch of new innovative technologies.

The share of fossil-fuel-free energy sources in end consumption will be at least 10% by 2030. Wind energy may cover one-third of the country's electricity demand by 2050. As a general trend in power generation, it can be forecasted that the share of renewable energy sources as wind and biomass will increase in future depending on technologies coming down in price and the price of CO_2 allowances rising. The renewable energy sources that see the most use for power generation in Estonia today are biomass and wind.

19 https://www.mkm.ee/sites/default/files/enmak_2030.pdf

The planned activity is in harmony with and makes a direct contribution to fulfilling the Energy Sector development plan's goals by supporting an increase in the proportion of renewable energy.

3.12. Estonian Maritime Strategy

The Estonian Maritime Strategy[20] and the Estonian Marine Strategy's Programme of Measures were prepared at the behest and under the auspices of the Ministry of the Environment in order to achieve and maintain the good environmental status of the Estonian maritime area. The first phase included an initial assessment of the environmental status of the Estonian maritime area, socioeconomic analysis, definition of good environmental status of the maritime area and the targets set for 2020 for achieving a good environment status for the maritime area. The first stage was ready in September 2012.

The second phase of the maritime strategy included preparation of a monitoring programme. The objective of maritime monitoring is to gather data for the periodic assessment of the environmental status of the Estonian maritime area, including on achievement or non-achievement the environmental targets established on the basis of the framework directive and for assessing the effectiveness of the plan of measures to be established. The objective is to gather data on human activities that directly or indirectly impact the maritime environment, including use of wind energy.

As the third stage, the Estonian Maritime Strategy plan of measures was prepared, and approved by the Cabinet on 23 March 2017. The Ministry of the Environment initiated, by directive no. 1-2/21/390 on 15 September 2021, the preparation of the Estonian Maritime Strategy plan of measures 2022-2027 and strategic assessment of the environmental impact.

The updating of Estonia's maritime strategy took place in 2020-2023, and in the process, a plan of measures for the updated Estonian maritime strategy. The plan of measures was approved by Minister of the Environment directive no. 16-7/23/5 of 22 February 2023.

In the context of this EIA, it is important to note that a number of the measures proposed in the first plan of measures were in the implementation phase, including measure D11 (Undersea noise and energy), the goal of which was expressed as the following: directing energy into the environment, including undersea noise, is at a level that does not harm the maritime environment. There is a recommendation for assessing underwater noise through two indicators: (1) Distribution of strong, low and medium frequency short-sounds in time and space; (2) Constant low-frequency noise. The proposed measure is in turn related to other impacted criteria and by the measures and investigations planned there, e.g. the conducting of priority studies has been cited for D3 (fish), "Experimental assessment of the impact of noise generated by wind farms on Baltic herring migration and functioning of spawning areas".

20 https://envir.ee/keskkonnakasutus/merekeskkonna-kaitse/merestrateegia

The new plan of measures notes that offshore infrastructure may exert an impact on the Estonian maritime area, accompanied by habitat loss and disruption and any additional infrastructure results in potential rise in underwater noise. Thus, in addition to the abovementioned, this EIA process should devote attention to the other criteria potentially impacted by offshore wind farms during this EIA process, such as D1, D4 (biological diversity and food network), D6 and D7 (integrity of the seabed and hydrographic changes), D8 (hazardous substances) and planned measures related thereto for achieving a good environmental status for the maritime area.

The planned activity is in harmony with the Estonian Maritime Strategy.

3.13. The Estonian maritime spatial plan

The Estonian maritime spatial plan is the most recent and strategic spatial planning document that includes all sectors[21]. The Cabinet established the maritime spatial plan by order no. 146 of 12 May 2022 [22] (https://www.riigiteataja.ee/akt/317052022002). Subsequent management of activities at sea takes place on the basis of the plan. The spatial plan governs actions in different fields, imposes principles of shared use and opens perspectives on new ways of using the sea.

The objective of the planning of the maritime area was to agree on principles for use of the Estonian maritime areas in the long term in order to contribute to achieving and preserving good condition of the maritime environment and promoting the maritime economy. The spatial plan determined which parts of the maritime area activities can be implemented and on what conditions. In the course of preparing the maritime spatial plan, the combined effect of the activities already taking place in the maritime area and still in the planning stage were treated. Their impact on the maritime environment and economy and the activities' social and cultural impact were also assessed. Among other things, the spatial plan also determines the suitable areas, guidelines and conditions for developing wind energy.

The additional Saare-Liivi offshore wind farm area is in an area selected in the Estonian maritime spatial plan as being suitable for developing wind energy. The guidelines and conditions set forth in the Estonian maritime spatial plan were taken into consideration in preparation of the EIA programme and planning the content of the EIA as a process. The planned activity is thus in conformity and harmony with the Estonian maritime spatial plan.

21 https://www.fin.ee/riik-ja-omavalitsused-planeeringud/ruumiline-planeerimine/mereala-planeering

22 (https://www.riigiteataja.ee/akt/317052022002)

4. Description of the environment expected to be impacted

4.1. Natural environment

4.1.1. Geological conditions

In describing the initial general geological situation in the Gulf of Riga, maps consolidated based on archive materials can be considered, e.g. those in the EMODnet system[23]. No recent broad-based geological investigations have been performed in the Gulf of Riga.

According to the analysis performed and classification used in the EMODnet project, muddy sediments are the most common in Estonian maritime areas, and this is also the case in the planned additional Saare-Liivi offshore wind farm area[24].

23 https://emodnet.ec.europa.eu/en/emodnet-data-layers-catalogue-within-atlas

24 Tallinn University of Technology Institute of Marine Systems, OÜ Alkranel. The Estonian Marine Strategy plan of measures for achieving and maintaining the good environmental status of the Estonian maritime area, strategic environmental impact assessment. Report 2015-2016.

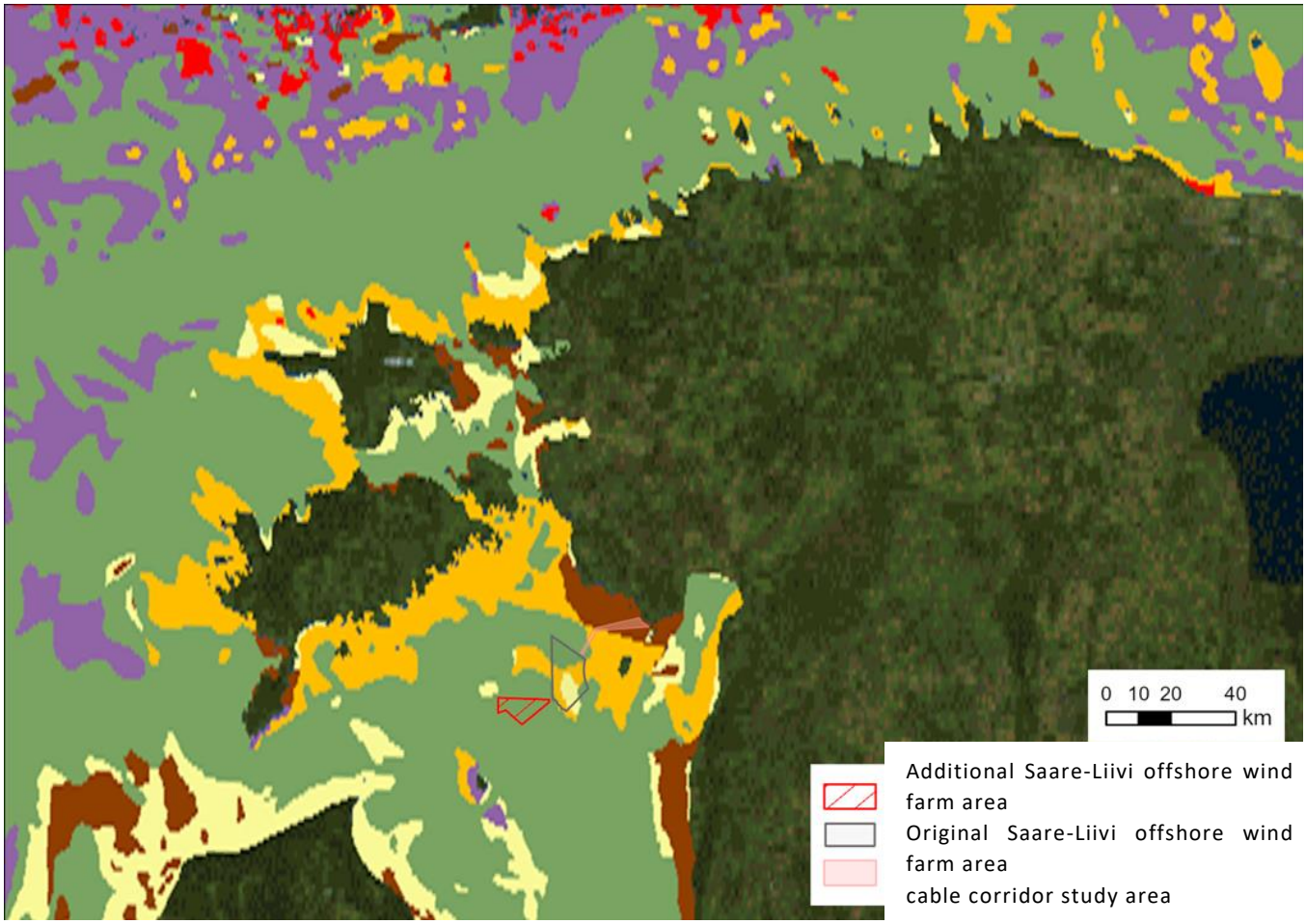

Figure 4-1. *Estonian maritime area and neighbouring areas seabed substrate based on data from the EMODnet pilot project [25]. Categories:* ***green – mud to sandy mud;*** *light yellow – sand to muddy sand; brown – coarse-grained sediment; violet – mixed sediment; dark yellow – till; red – bedrock.*

The upper part of the bedrock in the planned additional Saare-Liivi offshore wind farm area has Devonian rock – in the southern part, dolomites, domerites and aleurolites of the Narva Stage and in the northern part, sandstones of the Pärnu Stage. The bedrock is covered by various Quaternary sedimentary layers, of which the most widespread are mud, till, sand and pebble, with varved clay as well.

4.1.2. Climatic conditions

Temperature and salinity. Of the seas of the world, the Baltic Sea has one of the lowest exchange of water, which causes low salinity that decreases as distance from the Straits of Denmark increases. The average salinity of the world's oceans is 35 parts per 1000, the Baltic is generally less than 10 parts per thousand. Salinity also varies by depth. Saltier water is found in deeper layer of water, and the more sudden change in salinity occurs in the 50-80 metre zone –

25 The map was published by the University of Tartu Marine Institute (2012), and it was used in the Estonian Marine Strategy plan of measures for achieving and maintaining the good environmental status.

the halocline The more saline water migrates to deeper layers due to its higher specific gravity. The less saline surface water flows out of the Baltic Sea.[26]

In the open parts of the Baltic Sea, salinity can reach 10 g/kg while in smaller inlets of bays, the water is essentially non-saline. At the same time, the variation of salinity in this specific maritime area over time is relatively low, and generally not more than a few units.

Water temperature values in the Estonian coastal sea are usually highest at the end of July and August. In calm and sunny weather, the shallow near-coastal areas can warm quickly and the water temperatures can occasionally reach 25 degrees, but with higher winds, the coastal water mingles with cool open-sea water or is replaced completely with water from the open sea. In the autumn, when the sea loses warmth to the atmosphere, the opposite occurs: calm and cool weather cool the coastal water faster, but over a certain period of time, currents bring in warmer water again to the coast. In the coldest month, the water temperatures in the coastal water generally remain under 5 degrees.[27]

Wind. Estonia's wind climate is determined by the frequent alternation of low pressure and high pressure systems that characterizes the northern part of the temperate zone – cyclonal activity that causes windy weather. The intensity of cyclonal activity in the Baltic Sea area depends on the general circulation of the atmosphere above the Atlantic Ocean and Eurasia, determining the primary speed and direction of the wind in Estonia as well as the seasonal variability – stronger winds and more frequent storms characterize the period from October to January while the period from May to August has lighter winds and more days of calm.

In the Gulf of Riga, southwest winds are predominant an in the open central gulf, the annual average wind speed is 8–8.5 m/s, with gusts up to 26–28 m/s.

The long-term wind energy (energy density, W/m^2) at an elevation of 150 m in the central part of the Gulf of Riga averages 700–780 W/m^2 and to the west of Saaremaa in the open sea, 810–880 W/m^2, near Hiiumaa Island 800–840 W/m^2, while in the Gulf of Finland, the energy density decreases in the western part (750 W/m^2) going east (550 W/m^2).[28]

The planned additional Saare-Liivi offshore wind farm area has good wind conditions. South-westerly winds are most common, and this direction is also the most energy-dense.

Waves and currents. The wind climate also determines the nature of waves and currents. The flow of water along the coast of Estonia is most frequently eastward. The typical speed of the current in the surface layer of the Estonian maritime area is 10–20 cm/s. The maximum current speeds, which exceed 1 m/s, were registered in the straits (e.g. Suur Väin strait) and along the

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26 The Estonian Marine Strategy's Programme of Measures for achieving and maintaining the good environmental status of the Estonian maritime area, strategic environmental impact assessment, 2015 (editors: Tallinn University of Technology Institute of Marine Systems, OÜ Alkranel)

27 Aquaculture in the Estonian maritime area, basic data and studies, University of Tartu Marine Institute (https://pta.agri.ee/media/2129/download)

28 Estonian maritime area spatial plan impact assessment report, to be established in 2021 (https://mereala.hendrikson.ee/dokumendid/Planeeringulahendus/Kehtestamisele/4_MSP_M6jude_hindamise_aruanne.pdf)

coast (e.g. in the Gulf of Finland) in the event of periodically occurring strong coastal jets. Wave height is mostly 1–2 m, while in the open sea, the wave height during a storm is 5–6 m, and up to 10 m during an extraordinary western storm. Wave height ranges up to 6 metres in the Gulf of Finland and 3–4 metres in the Gulf of Riga.[29]

Ice conditions. In the Estonian maritime areas, ice cover forms each year at least in Pärnu Bay and Väinameri Sea. In extremely mild winters (such as 2007/2008) ice is found only in Pärnu Bay and Väinameri Sea bays. In cold winters (e.g. 2010/2011) the entire Estonian maritime area is covered with ice and even the western coast of Hiiumaa and Saaremaa experience ice for 30 days.

The open part of the Gulf of Riga is characterized by dynamic ice conditions (0.02-0.045 m/s) and a shorter duration of ice cover (averaging less than 60 days). In cold winters, the entire gulf may be ice-covered for 3 months and ridge ice can be found throughout the open part of the Gulf of Riga. Damage caused to stationary offshore infrastructure by drifting ice is most likely in the western and central Gulf of Finland and the open part of the Gulf of Riga. In these areas, ice fields tens of square kilometres can drift 30–40 km within 48 hours at a speed of 0.23 m/s.[30]

4.1.3. Quality of seawater

Quality off seawater is the aggregate values and status assessments used for assessing the status of seawater. The composite status used to characterize coastal water consists of two components: ecological status and chemical status.

Transparency is an important indicator of the quality of the marine environment. The availability of light determines the initial possibility of photosynthesis in water. In general, transparency is greater in the open sea (in the Estonian maritime area, this includes the East Gotland basin and the northern part of the Baltic Sea) and lowest in the Gulf of Riga and Gulf of Finland.

The ecological status of the three coastal bodies of water in 2020 was deemed moderate and the chemical status as poor (Environmental Agency, 2021). The reason for the moderate ecological status is the concentrations of nutrients and phytoplankton parameters, while the reason for the poor chemical status is the mercury concentration in fish.

According to Ministry of the Environment data, most of the Estonian maritime area has not, pursuant to the most recent maritime area environment status assessment, attained good Environmental status level. Good environmental status level has been achieved only with regard to the criteria for "Seabed habitats" and "Change in hydrographic conditions"[31]. Data from the Estonian national maritime environment monitoring show that both the winter anorganic

29 Aquaculture in the Estonian maritime area, basic data and studies, University of Tartu Marine Institute (https://pta.agri.ee/media/2129/download)

30 "Analysis of ice conditions and preparation of maps", TTÜ Institute of Marine Systems, 2016 (https://www.rahandusministeerium.ee/et/system/files_force/document_files/mrp_jaaolud_final.pdf)

31 Environmental status of the Estonian maritime area 2019 (https://envir.ee/keskkonnakasutus/merekeskkonna-kaitse/merestrateegia#i-etapp-eesti-merea)

nitrogen and phosphorus compound concentrations and the summer average total nitrogen and total phosphorus levels are far above the desired level.

Prior to planning of the Saare-Liivi offshore wind farm, no water quality measurements were made in earlier years in the area planned to be encumbered by the wind farm (including the Saare-Liivi offshore wind farm additional area) or in nearby areas.

In the period from 10 June 2022 to 1 November 2022, a seawater quality study was conducted in the original Saare-Liivi offshore wind farm area[32] in three different sample taking sites (UTIL083, UTIL140, UTIL433). On the basis of the chlorophyll values measured in the original Saare-Liivi offshore wind farm area in the Gulf of Riga (median 3.7 µg l-1), the area's environmental condition is poor, but somewhat better than the respective figure for the coastal water body in the north-eastern part of the Gulf of Rigs measured during the same period as part of national environmental monitoring (4.2 µg l-1). The monitoring stations in the north-eastern part of the Gulf of Riga are located closer to shore. For example, station K21 is at the mouth of the River Pärnu, where the nutrient load is generally higher than the average level for the water body. On the basis of total nitrogen measured in all three sites, the area's environmental condition is poor. On the basis of the values for total phosphorus, the environmental condition at UTIL083 and UTIL140 is poor but good at point UTIL433. The transparency values measured using a Secchi disk showed the condition to be poor in all three points.

4.1.4. Habitats and biota

Seabed habitats and biota[33]

Marine habitat types. In the European Union, key habitat types for nature conservation were listed in Annex I to the nature directive (92/43/EEC on the conservation of natural habitats and of wild fauna and flora), which includes habitat types on land, sea and freshwater bodies. Annex I to the nature directive lists a total of eight habitat types related to the sea, of which six are found in the Estonian marine area (the code of Annex I to the nature directive in brackets):

- Sandbanks which are slightly covered by sea water all the time (1110, hereinafter "sandbanks"),
- Estuaries (1130),
- Mudflats and sandflats not covered by seawater at low tide (1140, hereinafter "flats"),
- coastal lagoons (1150),
- large shallow inlets and bays (1160),
- reefs (1170).

32 "Seabed study, artificial substrate colonization study and water quality study in the Saare-Liivi 5 offshore wind farm area report; Annex 3 Gulf of Riga UTILITAS wind farm area water quality study" (report version 1, 16 February 2023; compiled by University of Tartu Estonian Marine Institute, 2020)

33 The chapter draws on the Estonian maritime area spatial plan study entitled "Benthic biota and habitat study for assessing range of Natura and HELCOM habitat types and determining the CO2 sequestration potential of the sea ", University of Tartu Estonian Marine Institute, 2020

Of the ones mentioned, sandflats and reefs can be considered wholly benthic habitat types, as their definition is not in any way related to the shoreline or mainland. It is impossible for estuaries, flats, lagoons and large shallow inlets and bays to be present far from the coast, in the open sea, as all these habitat types are directly connected to the shoreline.

Mapping of benthic habitats started in Estonia in 2005 and as of spring 2019, inventories cover approximately one-third (38%) of the entire Estonian maritime area.

No previous species and habitat inventory had been conducted in the additional Saare-Liivi offshore wind farm area. The range of benthic species and habitats has been modelled on two occasions in the course of a nationwide modelling (University of Tartu Marine Institute 2018; University of Tartu Marine Institute 2021). On the basis of these model studies, the possibility of the range of two HELCOM HUB level 5 habitat types in the planned wind farm area was described (Figure 4-2 and Table 4-1).

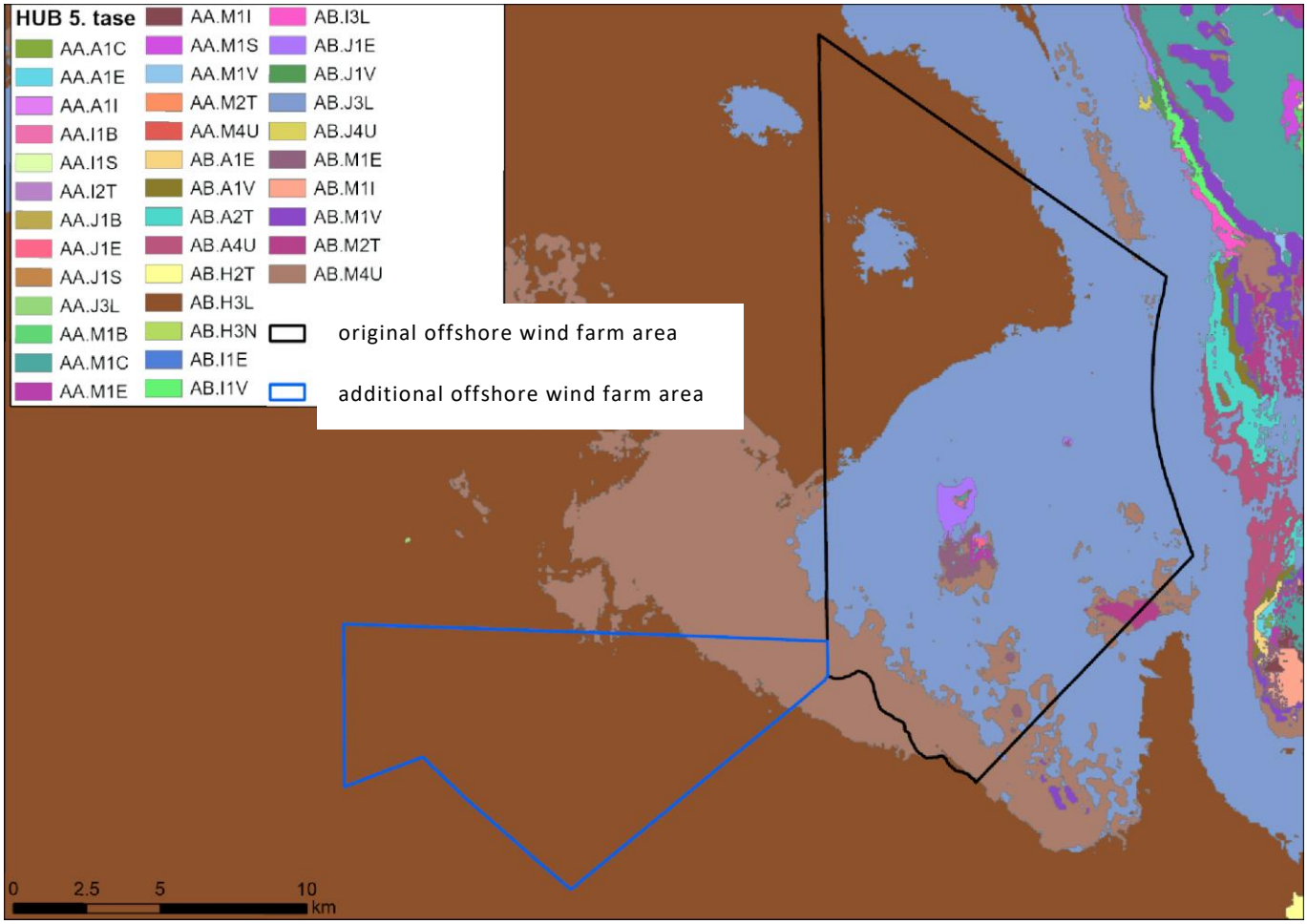

Figure 4-2. *Modelled range of HELCOM HUB level 5 benthic habitats in the additional Saare-Liivi offshore wind farm area and near it (University of Tartu Marine Institute 2021)*

Table 4-1. *Forecast of range of HELCOM HUB level 5 benthic habitats in the additional Saare-Liivi offshore wind farm area based on 2021 modelling work*

Code	*Name*
AB.H3L	Baltic aphotic muddy sediment characterized by infaunal bivalves
AB.M4U	Baltic aphotic mixed substrate characterized by no macroscopic biotic structures

Based on known information, HELCOM Red List habitats have not been described in the additional Saare-Liivi offshore wind farm area.

Benthic biota and vegetation. The vegetation in macroscopic benthic biota (macroalgae and higher plants) and zoobenthos make up benthic biota in the Estonian maritime area. In terms of species, the biota is quite varied, with both marine origin and freshwater species.

On basis of data for 1992–2018, 60 macrophyte taxons have been recorded in the Estonian maritime area (including 57 species and taxons *Ulotrix*, *Pseudolithodermaja Fontinalis* designated up to genus level). The most common species in the Estonian maritime area are *Vertebrata fucoides*, *Cladophora glomerata* and *Ceramium tenuicorne*. The greatest number of species/taxons in the Estonian maritime area are in the brown algae phylum. The differences between HELCOM marine subbasins in regard to species/taxons of plants are relatively minor, with the species-richest basin being the Gulf of Riga.

There are no previous quality data on the species composition of benthic flora and fauna in the planned additional Saare-Liivi offshore wind farm area. Some individual data originate from the second half of the 20th century. There are no state maritime environmental monitoring stations in the planned additional Saare-Liivi offshore wind farm area.

Invertebrates. On basis of data for 1992–2018, 92 zoobenthos taxons have been recorded in the Estonian maritime area (including 73 species and 19 taxons).

The invertebrate most frequently found in the Estonian maritime area is bay mussel (*Mytilus trossulus)*, the Baltic macoma (*Limecola balthica*), and the *bay* barnacle (*Amphibalanus improvisus*). A total of 59% of the zoobenthos species/taxons are in the phylum Arthropoda. Species diversity is highest in the Gulf of Riga sub-basin and lowest in the Eastern Gotland Basin[34].

Fish[35]

The Baltic Sea, including the Gulf of Riga, has low and variable salinity, thus curtailing the range of both marine and freshwater fish and resulting in a number of species lower than in a sea with normal salinity. Yet Baltic Sea fish populations are numerous. A major share of the fish caught in

34 "Compilation of species lists of macrophytes and invertebrates", Georg Martin, University of Tartu Estonian Marine Institute, 2018.

35 The chapter was compiled using the Estonian maritime spatial plan impact assessment report, version: to be established 2021 (https://mereala.hendrikson.ee/dokumendid/Planeeringulahendus/Kehtestamisele/4_MSP_M6jude_hindamise_aruanne.pdf)

the Estonian Baltic Sea is caught in the Gulf of Riga. Coastal fisheries yields from this region make up over 80% and close to 50% of Baltic herring trawl yields are caught in the Gulf of Riga.

Approximately 30 fish species of marine origin are found in Estonia's Baltic Sea waters, 10 species of diadromous fish and about 20 species of freshwater fish. All these species can also be found in the Gulf of Riga. The preferences of fish when it comes to habitats and spawning sites vary widely by species: some of the fish in the Gulf of Riga require deeper areas of the Baltic to spawn, needing the oxygen and salinity levels found there, while other species are dependent on free access to spawning areas in freshwater or spawn in coastal areas of different depths, with different temperature, salinity, substrate preferences among others.

Similarly to the rest of the world and the Baltic Sea as a whole, Estonian fish stocks are also impacted mainly by human activity, as a result of which species richness and the abundance of most fish species is down. Alongside fishing, other human activities likewise impact the abundance of fish in the Baltic Sea: for example, migratory barriers in rivers that flow into the Baltic Sea and pollution of rivers. The anoxia that extends in the Baltic's deeper areas is mainly impacted by the influx of nutrients from land use, but the percentage of pollution load from use of the marine area is this far small.

In general, shallower (less than 15 m) coastal waters and marine shoals are the most important marine areas for fish. Shallower coastal areas (max. 5 m) are where the majority of dish species' spawning areas and nurseries are found, and are crossed by anadromous species heading to fresh water to spawn. Deeper parts of the Gulf of Riga are not suitable for spawning since they lack the conditions suitable for marine fish (cod, European flounder, sprat): the necessary salinity and temperature regime.

The HELCOM PanBalticScope project[36] gathers for a number of fish species, with contributions from scientists from countries on the Baltic Sea on the basis of existing data and mapping of the major habitat and spawning areas for the major fish species using models[37], that take into account species-specific criteria such as salinity, depth, exposure to wave action, scope of the photic zone, transparency of the water etc. (see figures 4-3 and 4-4). These are modelled map payers that indicate the potential spawning areas, based on existing studies and knowledge that these places have the natural preconditions for spawning.

Major spawning sites for fish are not expected to lie within additional Saare-Liivi offshore wind farm area.

36 https://helcom.fi/helcom-publishes-maps-on-fish-habitats/

37 The maps compiled on the basis of the models were validated by experts on the respective species and from the respective countries.

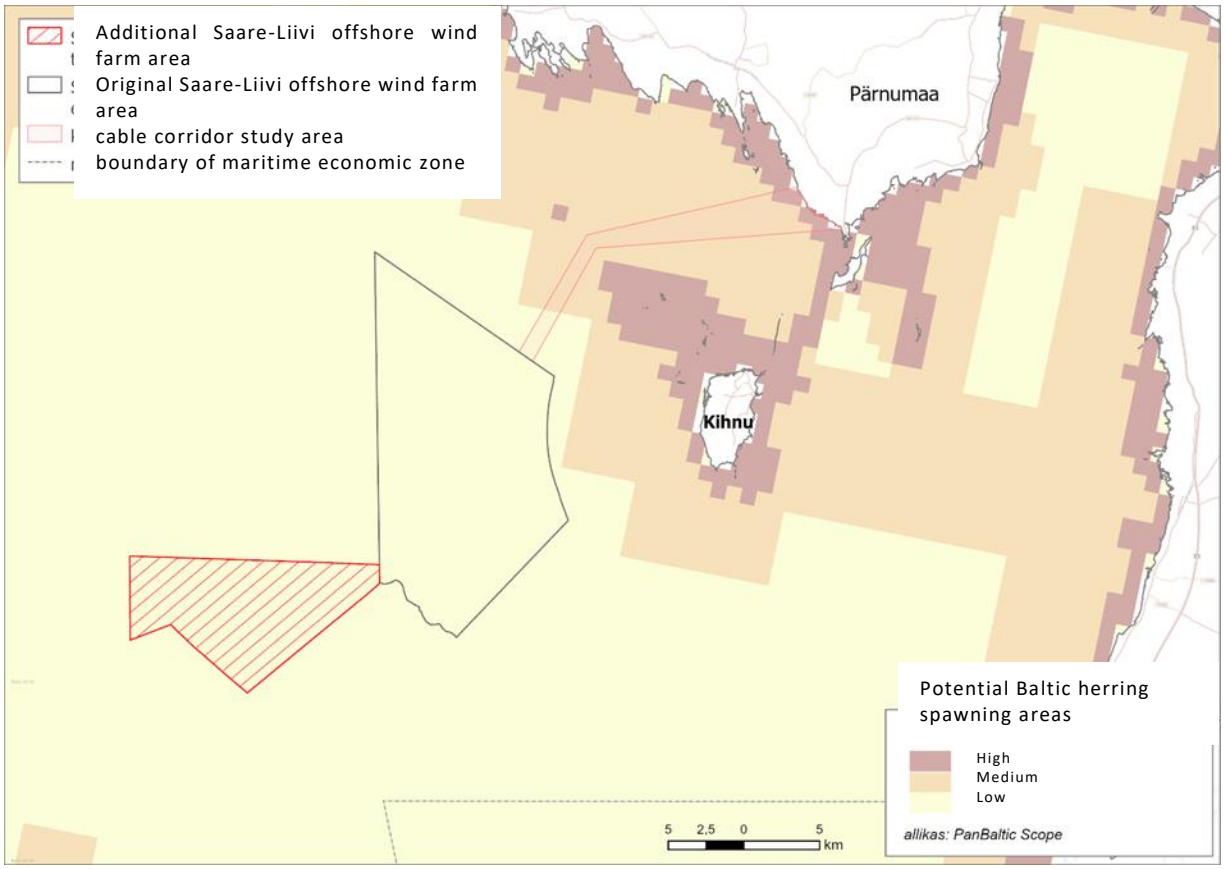

Figure 4-3. *Potential Baltic herring spawning areas (source: Pan Baltic Scope)*

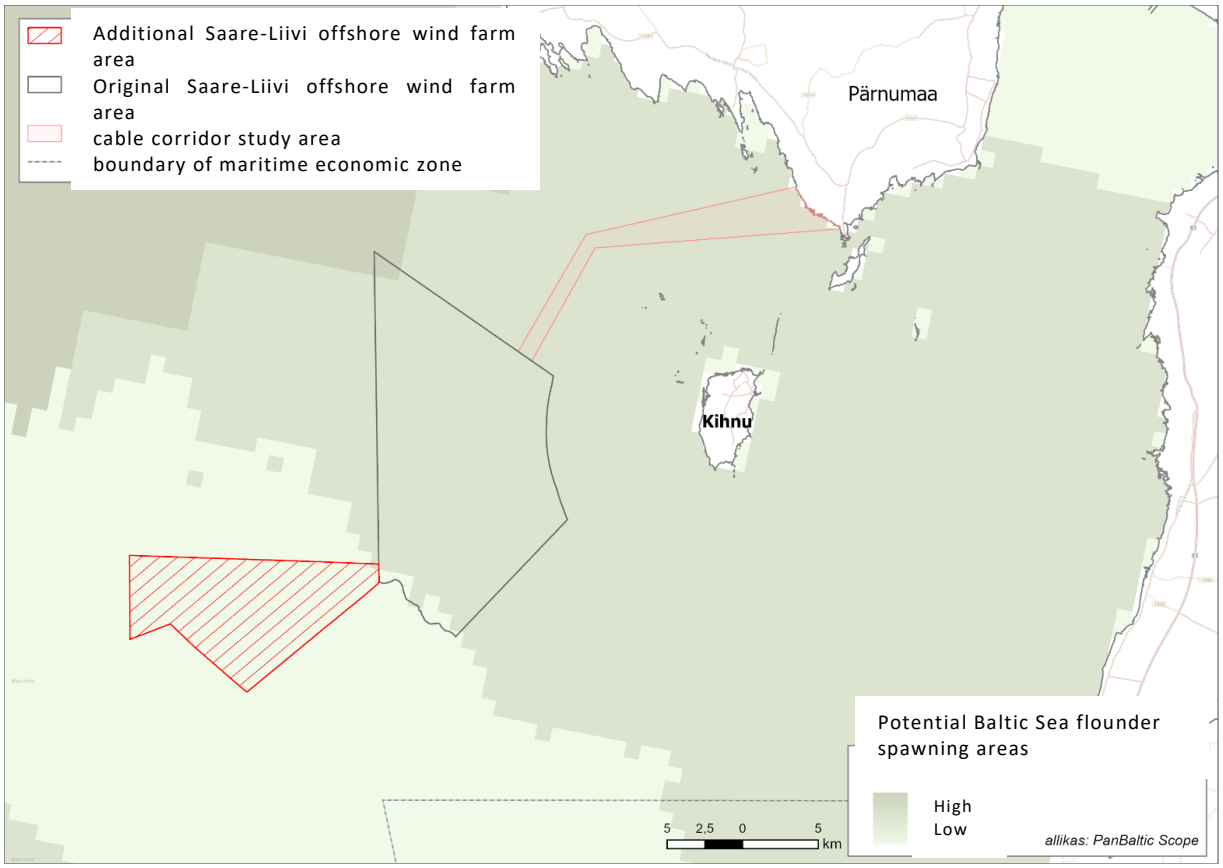

Figure 4-4. *Potential Baltic herring spawning areas (source: Pan Baltic Scope)*

At the initial Saare-Liivi inventory of fish and spawning areas conducted in the first, 2022 study year, no key spawning areas or fish habitats of key importance were found. the autumn migration studies showed that there were autumn Baltic herring hatchlings and autumn Baltic herring in the original Saare-Liivi offshore wind farm area, but far less than in the known spawning areas on the Kihnu shoals outside the original area.[38]

Major spawning sites for fish are not expected to lie within additional Saare-Liivi offshore wind farm area.

Marine mammals

The Gulf of Riga is a semi-enclosed marine area populated by two seal species – the grey seal (*Halichoerus grypus*) and ringed seal (*Pusa hispida*). Due to the gulf's geography, the main rest areas for seals north of the line running between Kolka (Latvia) and Kihnu Island, but both species are abundant in the entire gulf. In the Kihnu shoals/Sangelaid area, the north-eastern part of the gulf has the only resting areas permanently inhabited by seals. Both grey and ringed seals are found there.

Telemetry has identified the use of the southern part of the gulf as an important feeding area for ringed seals.

38 "Programme of offshore wind farm fish studies in the Gulf of Riga; Interim report" (compiled by University of Tartu Marine Institute)

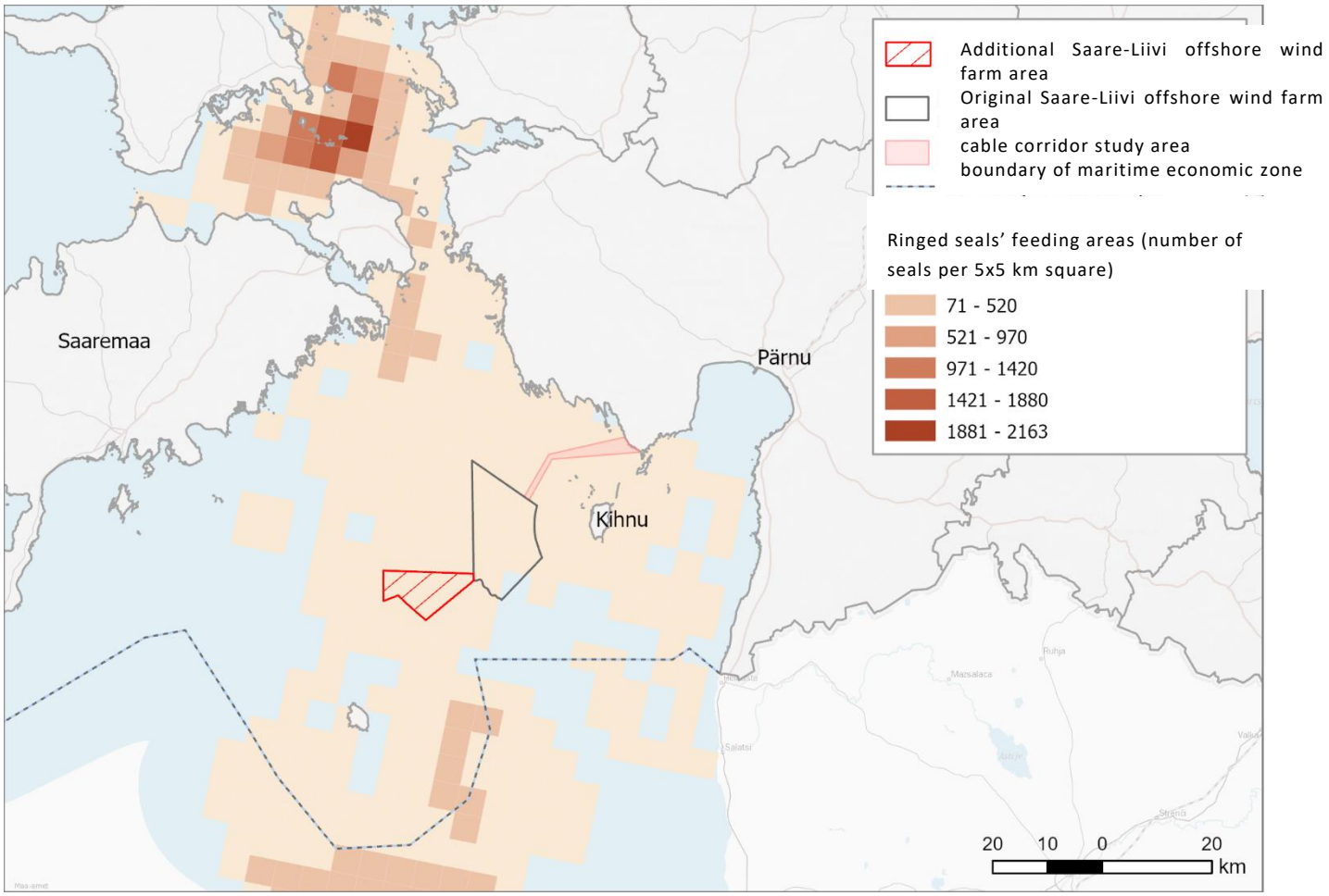

Figure 4-5. *Ringed seals' feeding areas in western Estonia. Intensity of feeding behaviour in a 5x5 km network, according to telemetry data*[39].

Both seal species are ice-breeding. Ringed seals can indeed only give birth on ice while for grey seals it is a preferred platform. When Gulf of Riga ice forms, telemetry data indicates the vast majority of the Väinameri Sea's ringed seal population and even individual seals from the Gulf of Bothnia breed on the ice. An important winter habitat is Pärnu Bay, since ice cover forms there even in warmer than average winters and there are abundant ringed seals on the spring ice. In winters with ice, observations of seal offspring from the icebreakers that serve the port of Pärnu are frequently reported.

39 "Estonian maritime spatial plan: Range of seals and assessment of sea use". Mart Jüssi, MTÜ Pro Mare, 2019

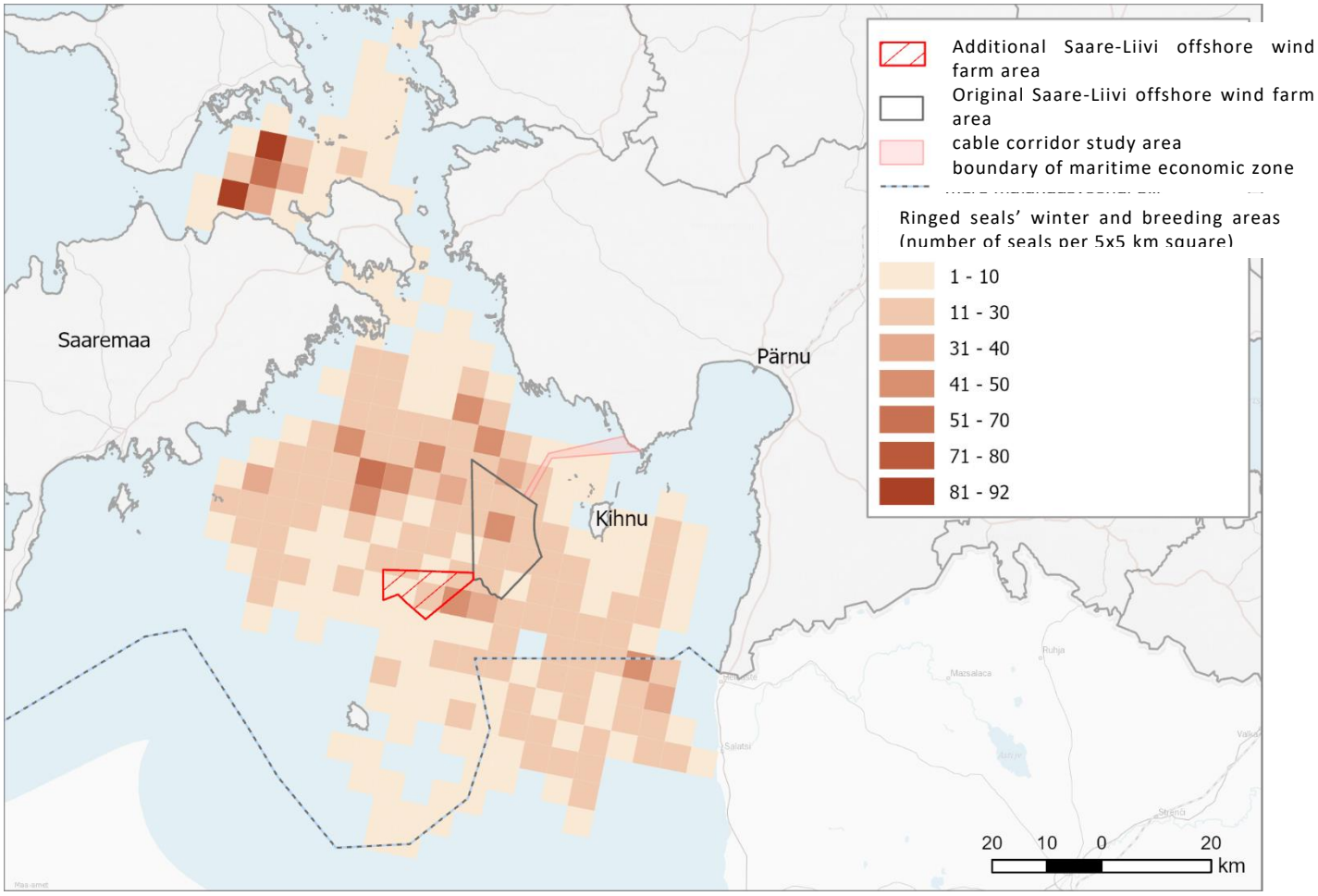

Figure 4-6. *Winter and breeding areas for ringed seals. Winter and breeding areas in a 5x5 km network, according to telemetry data*[40].

During the ice-free period, the main rest areas for these species are in the Väinameri Strait and the southern outlets of the Väike väin and Suur väin straits and the Kihnu islets. Regular migration takes place between these areas, above all from Suur Väin southward, where a significant migration corridor has developed.

40 "Estonian maritime spatial plan: Range of seals and assessment of sea use". Mart Jüssi, MTÜ Pro Mare, 2019

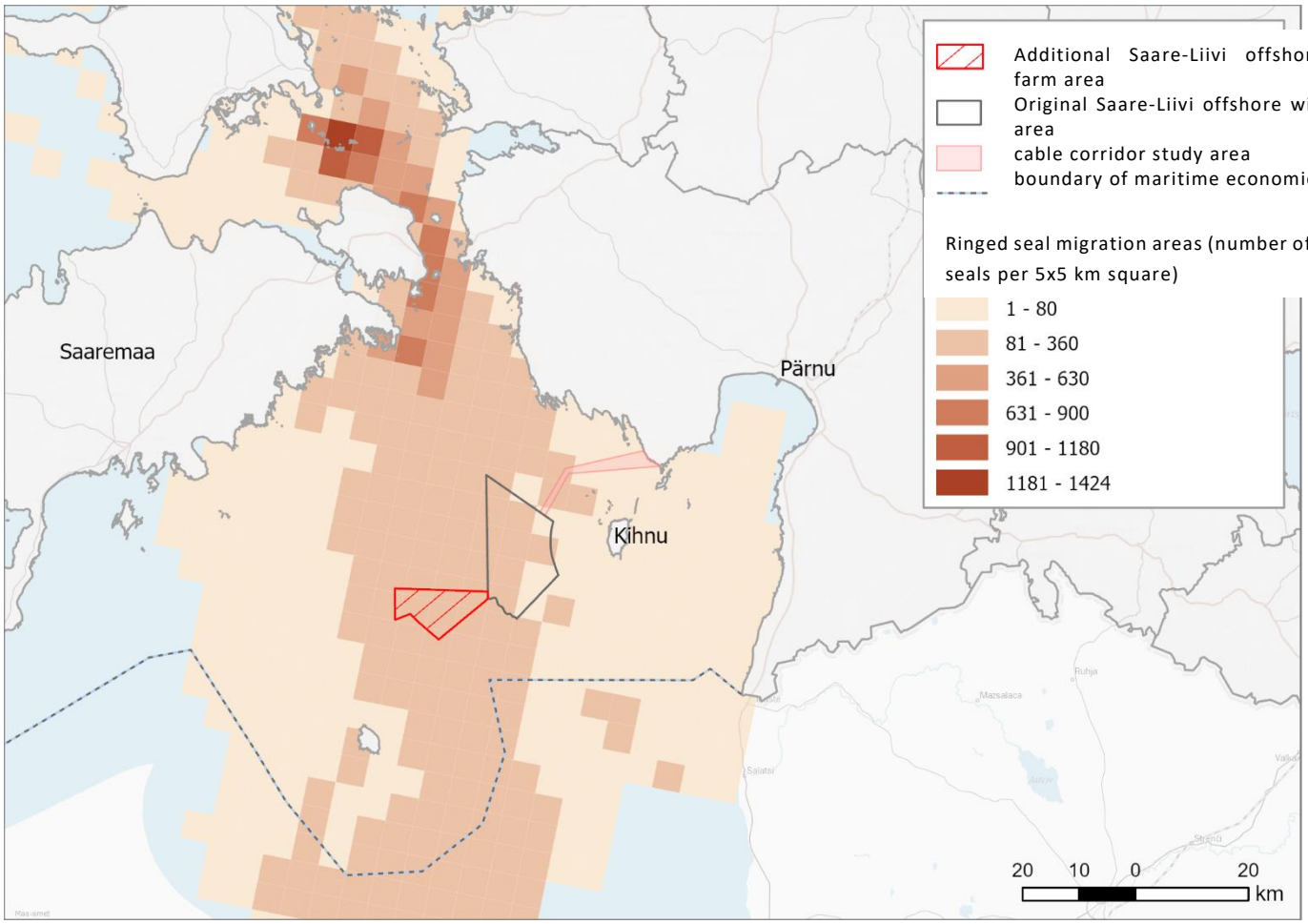

Figure 4-7. *Migration areas of the ringed seal. Migration areas in a 5x5 grid based on telemetric data*[41].

With regard to grey seals, there is largely a lack of data, but the northern part of the Gulf of Riga is home to Estonia's biggest grey seal resting area, where as many as 3500 grey seals have been counted in springtime monitoring, which is over 60% of the spring grey seal population counted in the entirety of Estonia's coastal sea. As to how many grey seals are in the bay in summer, it is not known. A limited telemetry study showed that one of every two tagged grey seals in the Gulf of Riga used two clearly defined feeding areas, one of which was the Kihnu shallows.

The good environmental status of the Baltic Sea grey seal has been achieved, considered according to abundance, range and distribution pattern criteria. Good environmental status has not been attained for the ringed seal[42].

Birds

The significance of the Estonian coastal sea for waterfowl comes primarily from the fact that it is a stop on one of the most important migratory routes in the region, which is called the Eastern Atlantic migratory route. It is used by the majority of Arctic waterfowl en route from Arctic

41 "Estonian maritime spatial plan: Range of seals and assessment of sea use". Mart Jüssi, MTÜ Pro Mare, 2019

42 "Environmental status of the Estonian maritime area 2018" (https://envir.ee/keskkonnakasutus/merekeskkonna-kaitse/merestrateegia#i-etapp-eesti-merea)

nesting areas in Eurasia to wintering areas, which may extend all the way to southern Africa (e.g. for the Arctic tern). Estonian marine shallows are known to be suitable migratory stopovers for waterfowl, where they replenish fat stores for the onward migration. Many Arctic waterfowl use the Estonian coastal sea to overwinter. Some parts of the Estonian coastal sea have become important waterfowl moulting areas (e.g. eider and scoters). In addition, a number of bird species whose habitat is the coast and coastal sea nest on the coast and sea islands. In addition to waterfowl, many mainland birds are also connected to the maritime area through migration.

Two thorough overviews of marine-related bird life and potential impacts from various uses of the sea were conducted as part of preparations for the Estonian maritime spatial plan[43]. The following figure shows, as an example, schematic migratory routes for all migratory birds, and "bottlenecks" and sensitive areas for water and land birds based on information gathered in the Estonian maritime spatial plan.

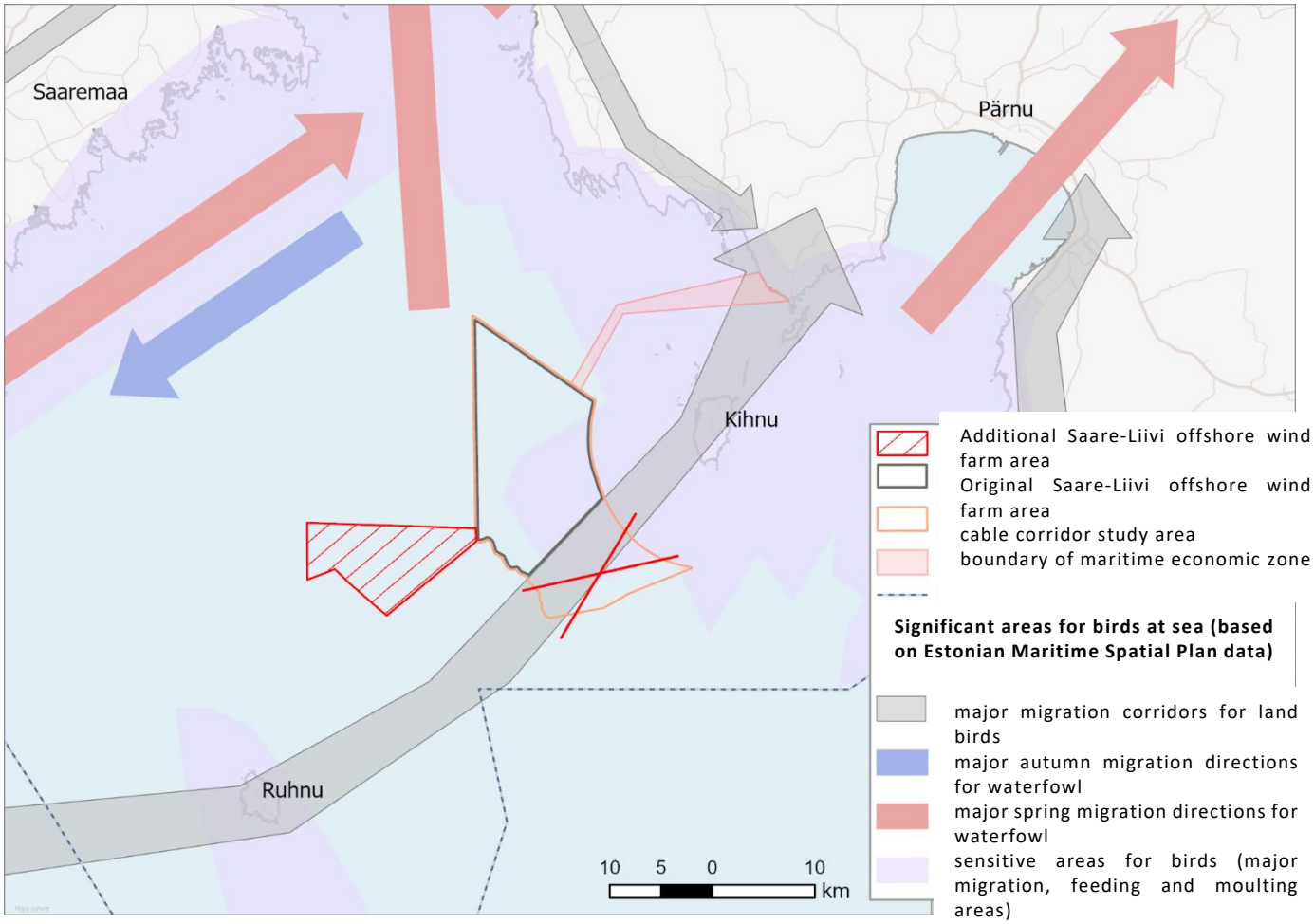

Figure 4-8. *Sensitive areas for birds*

One of the most important migration trajectories for Estonian land birds, on the Munalaid-Kihnu-Ruhnu-Kolka route, lies in the southern part of the original Saare-Liivi offshore wind farm area

43 „Consolidation of existing data on migration corridors of birds located in the Estonian maritime area and preparation of an analysis of the impact of wind farms on birds' feeding areas" Estonian Ornithological Society 2016 and "Analysis of birds' stopover areas" Estonian Ornithological Society 2019.

(which in accordance with TTJA decision of 9 March 2023 was omitted from the area to be encumbered by superficies licence proceedings).

Flight censuses conducted in the Saare-Liivi offshore wind farm research area (which covers both the original area and some of the additional area) in 2022 (figure 4-9) showed that the bird-richest period is the spring migratory period, when the predominant species in the area is the velvet scoter. The predominant species in the moulting period is the common scoter. The flight censuses taken in the autumn and winter period were low in bird life in the area. The major abundance of birds was found outside the planned Saare-Liivi offshore wind farm areas to the north and around the Kihnu islets[44].

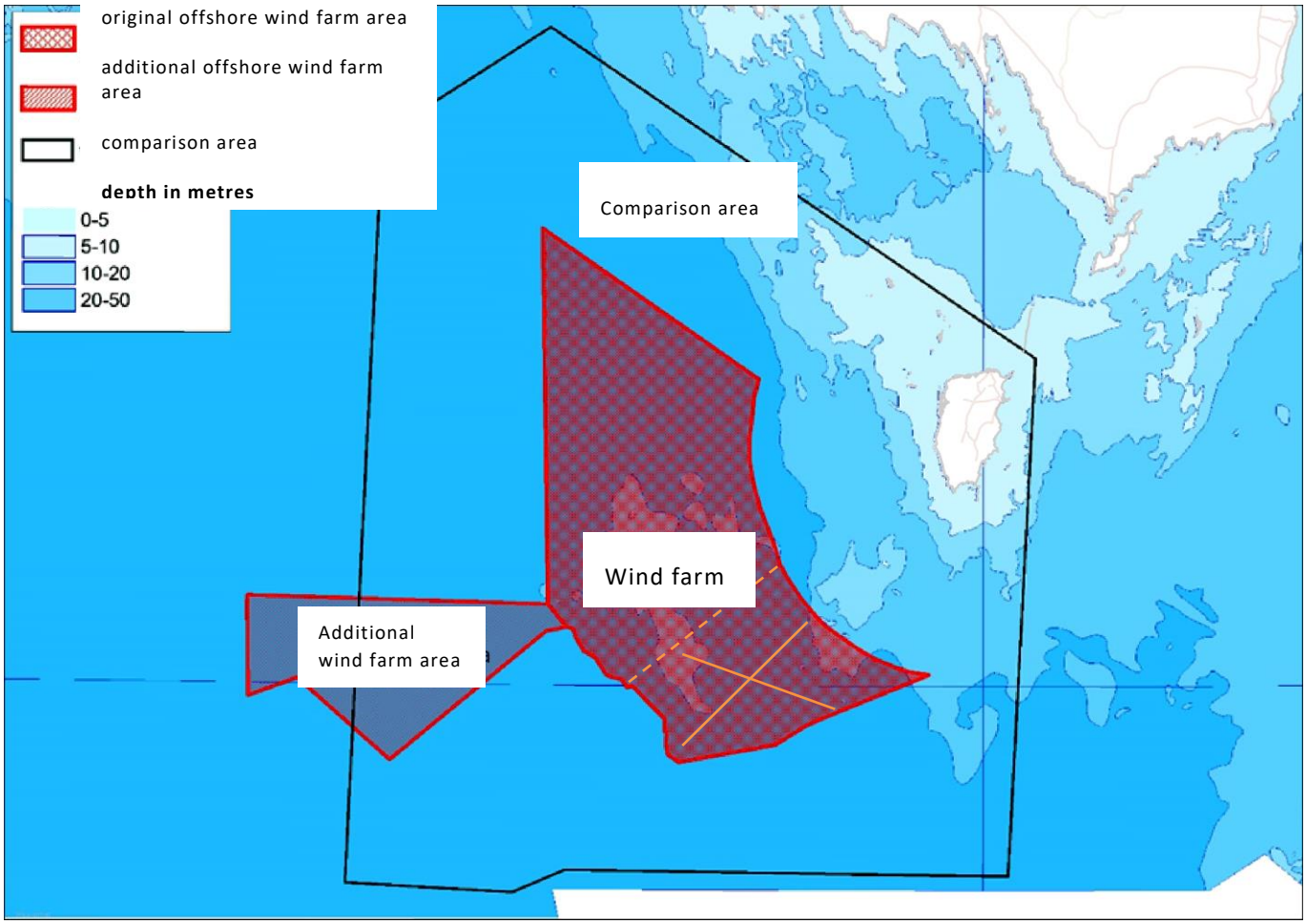

Figure 4-9. *Boundaries of the 2022 flight census area in the vicinity of the original and additional Saare-Liivi offshore wind farm area (EOÜ, 2023). The southern part of the wind farm marked by orange boundary line and an X is ruled out on the basis of the studies.*

On the basis of the first-year bird survey conducted as part of the EIA for the Utilitas Wind Saare-Liivi offshore wind farm, it can be said that the major stopover areas for the scoter are found in the southern part of the original offshore wind farm area and to a limited extent to the northern boundary. Location-based studies in the study area confirmed that the southern part of the original area to be encumbered by the Saare-Liivi offshore wind farm is unsuitable for building

44 „Linnustiku uuring Saare-Liivi 5 tuulepargi merealal; Vahearuanne" (prepared by Estonian Ornithological Society - EOÜ)

an offshore wind farm (both in due to the bird migration corridor and stopover areas). This area was omitted from further studies and development activity and the encumbered area was moved by TTJA decision of 9 March 2023 (see above). The move to the west – toward the central part of the Gulf of Riga – is the most suitable alternative for bird life compared to the original position of the area (approved by the expert opinion of 13 February 2023, "Saare-Liivi meretuulepargi 2022. aastal läbiviidud elustiku uuringute kokkuvõte" – Summary of the studies of biota conducted in 2022 on the Saare-Liivi offshore wind farm).

Bats

Estonia has 14 proved species of bats, seven spend the winter here and are considered non-migratory. The following species have been proved by investigations to be found in the open sea part of Estonia: *Eptesicus nilssonii*, Nathusius's pipistrelle and the common noctule (Lutsar, 2016; Lutsar, 2019).

Near the planned additional Saare-Liivi offshore wind farm area, there is a potential bat migration corridor between mainland Estonia and Latvia (Figure 4-10).

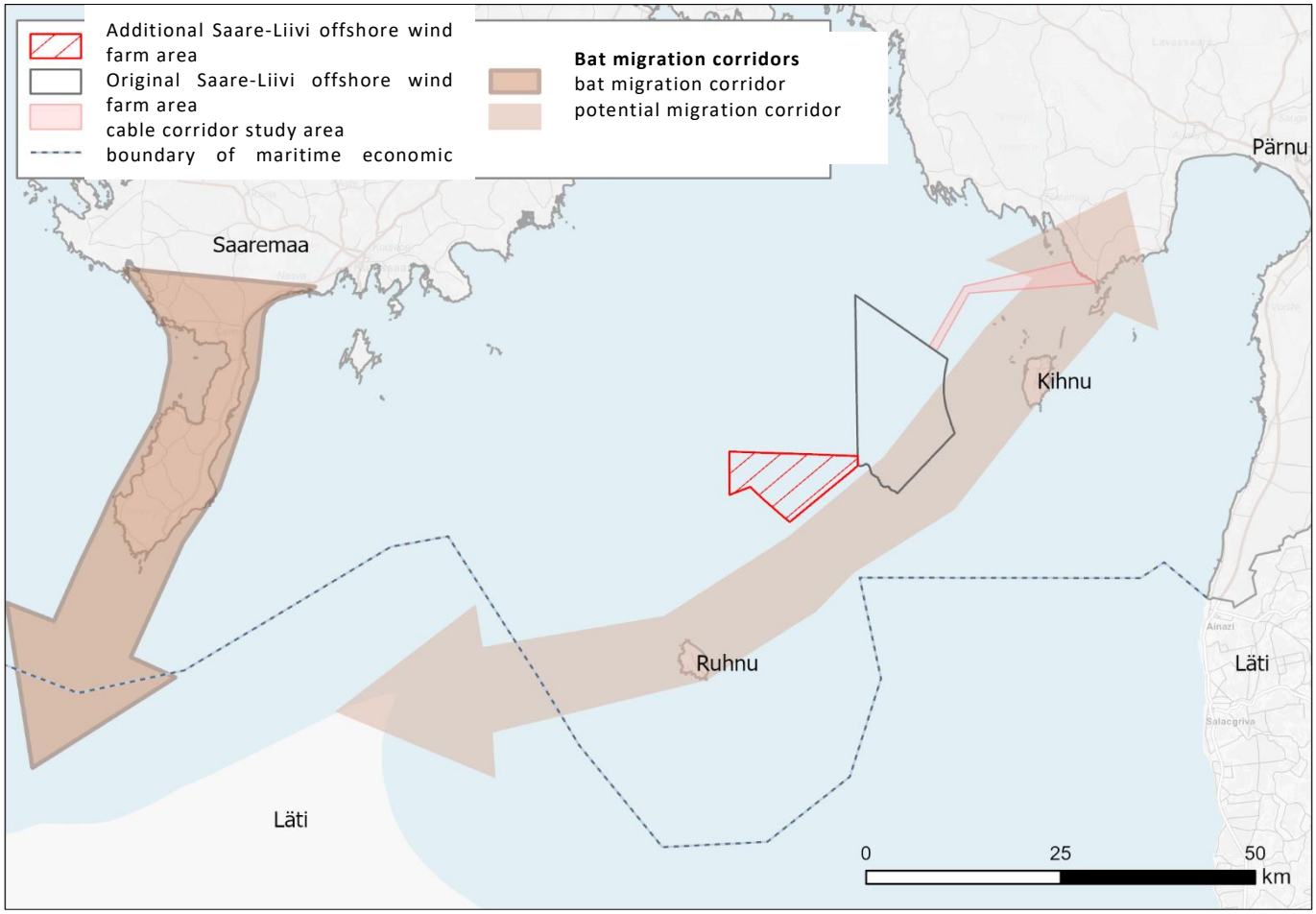

Figure 4-10. *Sensitive areas for bats*[45]

45 Draft Estonian maritime spatial plan impact assessment report. OÜ Hendrikson & Ko, version 3 July 2020

Based on currently known data, Kihnu Island may be a stopover for migrating bat species. It is also known that the migration may be across the sea. Of migratory bat species, the *Nyctalus noctula*, *Pipistrellus nathusii*, *Pipistrellus pipistrellus* and *Vespertilio murinus* were encountered on Kihnu in 2022 during the autumn migratory period. It is not currently known whether the species inhabit the island in the summer period as well. To this point, bats have been registered at sea during the autumn migration period. It was determined that *Pipistrellus nathusii* was present by the southern buoy of Kihnu shoal in autumn 2020, and flight of *Pipistrellus nathusii* was found to the west of Kihnu in the course of the Saare-Liivi offshore wind farm study carried out in 2022.[46]

In the case of bat migration, it is important to note that bats usually fly up to 10 m above the surface, but when approaching objects at sea (masts, wind turbines etc.) bats rise much higher, also flying around the turbine blades. Bats, especially migratory species, may gather in certain places near the coast where they await better weather for crossing the sea. Migration is possible only during relatively calm weather and favourable wind direction. On the basis of the bat study[47], bats flew above the sea when the wind speed was 0.3–7.7 m/s (the 2020 study reported 0.4...7.1 m/s). The study also established that bats flew above the sea mainly at a wind speed of less than 5–6 m/s.

4.1.5. Protected natural objects, including Natura 2000 network areas

Protected natural objects

Pursuant to the Nature Conservation Act (Section 4) protected natural objects include protected areas, limited-conservation areas, protected species and fossils, species' protection sites; individual protected natural objects, natural objects protected at the local government level.

There are no protected areas or species protection sites directly in the planned additional Saare-Liivi offshore wind farm area (Figure 4-11).

Incidence of various species have been found in the influence area of the additional Saare-Liivi offshore wind farm area (e.g. grey seal (category III), ringed seal (category II), tundra swan (category II) bird species etc.).

46 „Overview of bat study works in 2022 in Saare-Liivi offshore wind farm" (compiled by Elustik OÜ)

47 "Study of bats at sea in the area of Saaremaa from July to October 2018", Estonian Fund for Nature, 2019

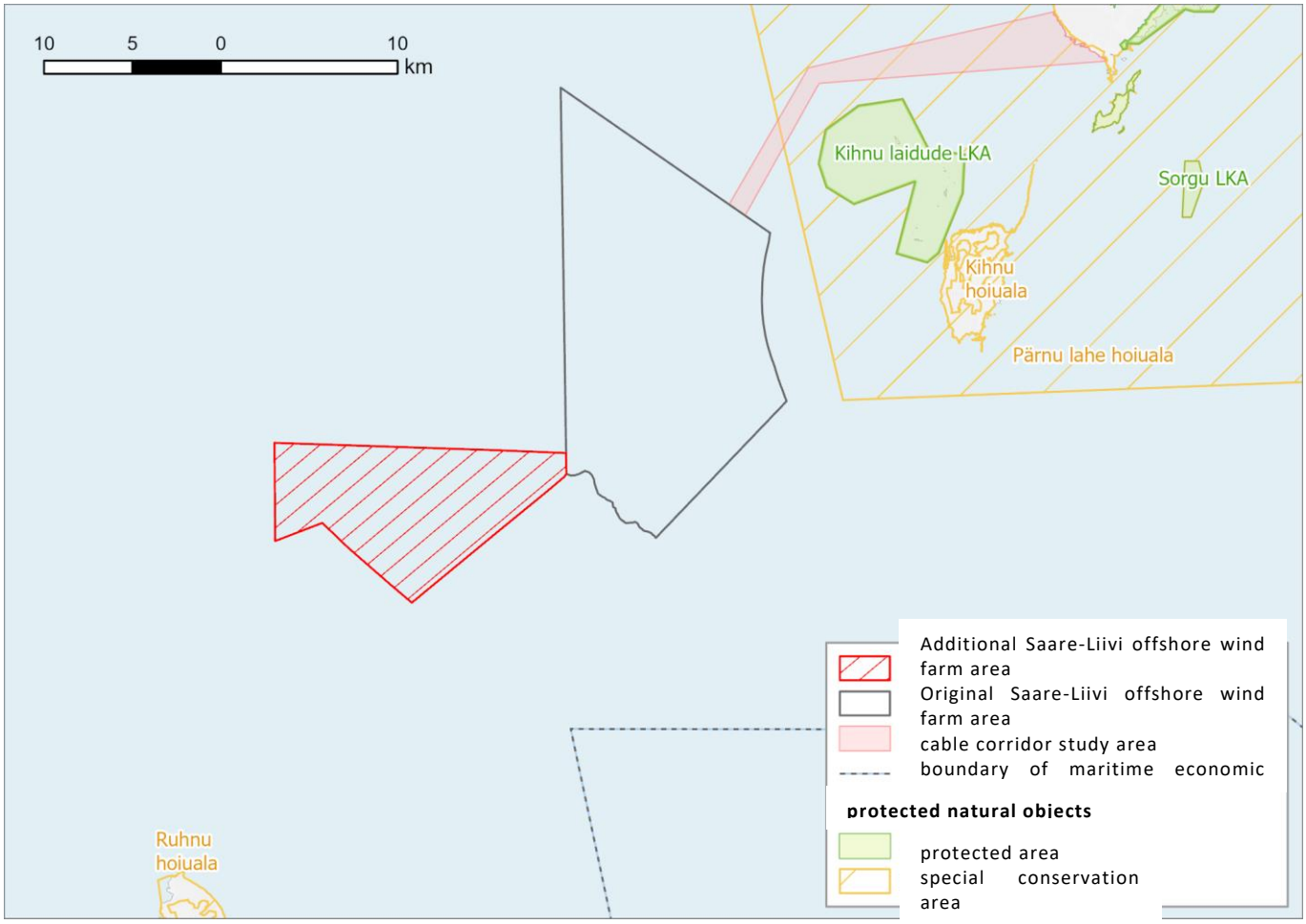

Figure 4-11. *Overview of protected natural objects in connection with the planned additional Saare-Liivi offshore wind farm area (Basis: Land Board and EELIS, 2022)*

The Natura 2000 areas are covered in more detail in chapter 6 of the EIA programme, Natura preliminary assessment.

4.2. Cultural environment

4.2.1. Underwater cultural heritage

The Estonian maritime area contains shipwrecks registered as cultural monuments, as well as ones that lack cultural monument status. At the same time, all of the objects have a significant role in Estonian maritime cultural heritage.

Based on Transport Board hydrographic database, there are no shipwrecks in the additional Saare-Liivi offshore wind farm area, but there are two underwater obstacles (see Figure 4-12).

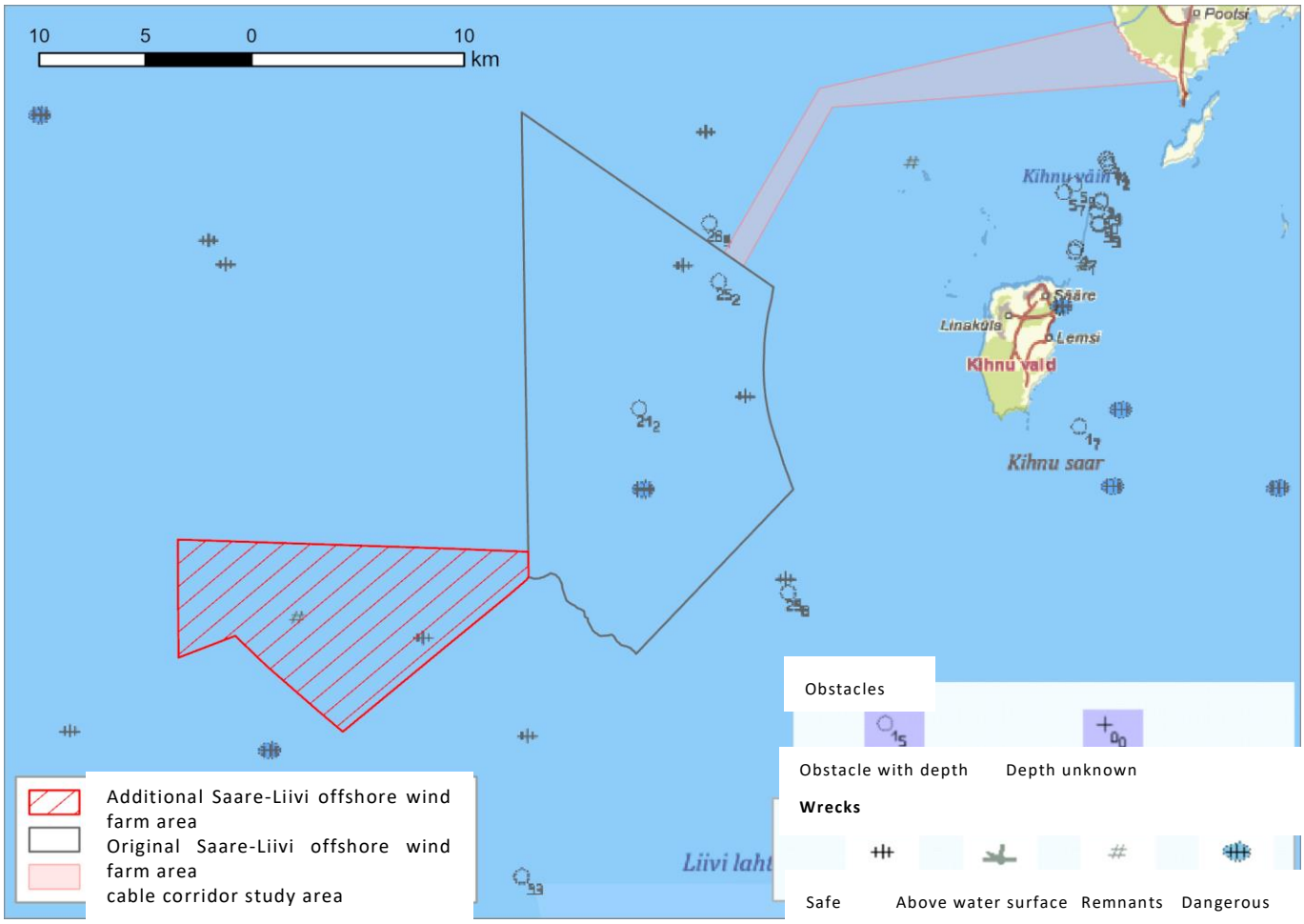

Figure 4-12. *Identified shipwrecks and obstacles in proximity to the additional Saare-Liivi offshore wind farm area*[48]

4.3. Social and economic environment

4.3.1. Settlement

Activities related to the planned additional Saare-Liivi offshore wind farm area is completely at sea and the nearest populated land areas are Ruhnu Island 19.4 km away and Kihnu Island 22.8 km away.

4.3.2. Land use

The maritime area is used in many different ways – for recreation, tourism, fishing and transport. There are no water traffic areas in the additional Saare-Liivi offshore wind farm area.

48 Basic map Transport Board (former Maritime Administration) hydrographic database

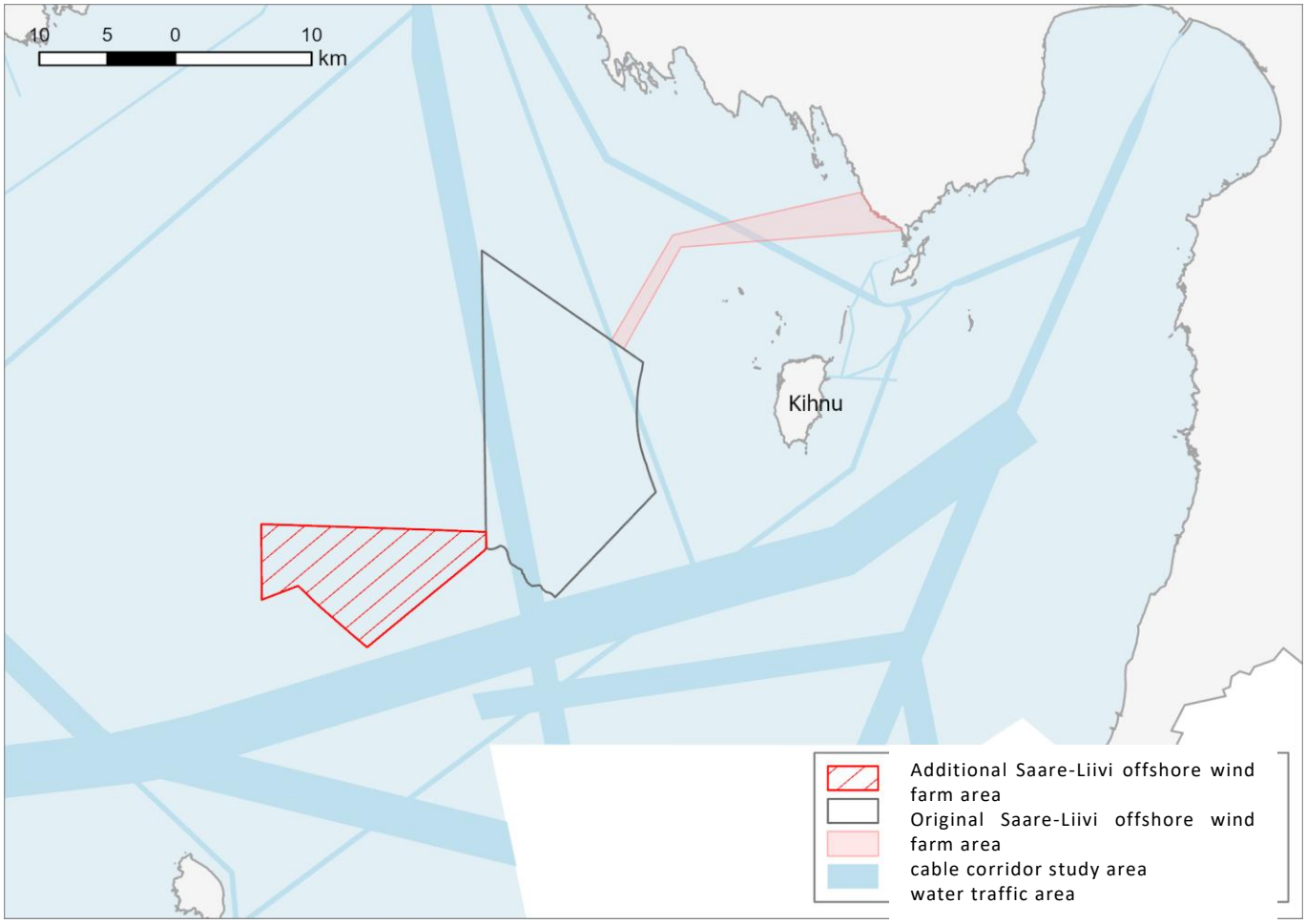

Figure 4-13. *There are no water traffic areas in the additional Saare-Liivi offshore wind farm area.*

4.3.3. Fishery

Fishing, which has been an important source of subsistence for coastal dwellers throughout history, takes place in the entire Estonian maritime area, except for areas with fishing restrictions. Fishing in the Baltic Sea can be divided into trawling and coastal fishing. Coastal fishing at sea generally takes place in a 12 nautical mile zone or up to the 20 m isobaths and fishing is served by small fishing harbours and loading places with significance on the local level Pursuant to Cabinet regulation no. 65 of 16 June 2016, Fishing Rules, trawling can only take place in waters deeper than 20 metres.

Information on, among other things, coastal and trawl fishing areas and their intensity is presented in the maritime spatial plan portal (http://mereala.-hendrikson.ee/) set up as part of the said plan.

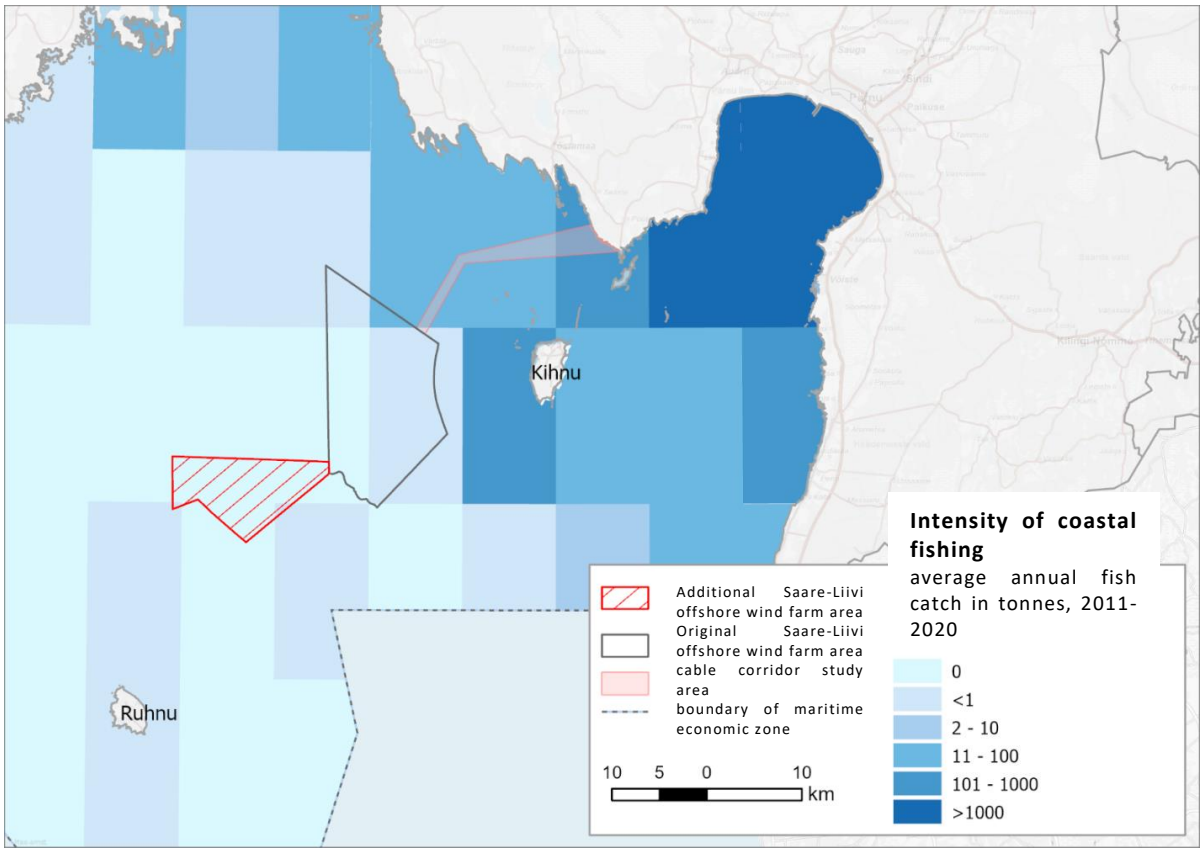

Figure 4-15. *Location of the Saare-Liivi offshore wind farm additional area and intensity of coastal fishing in 2011-2020*

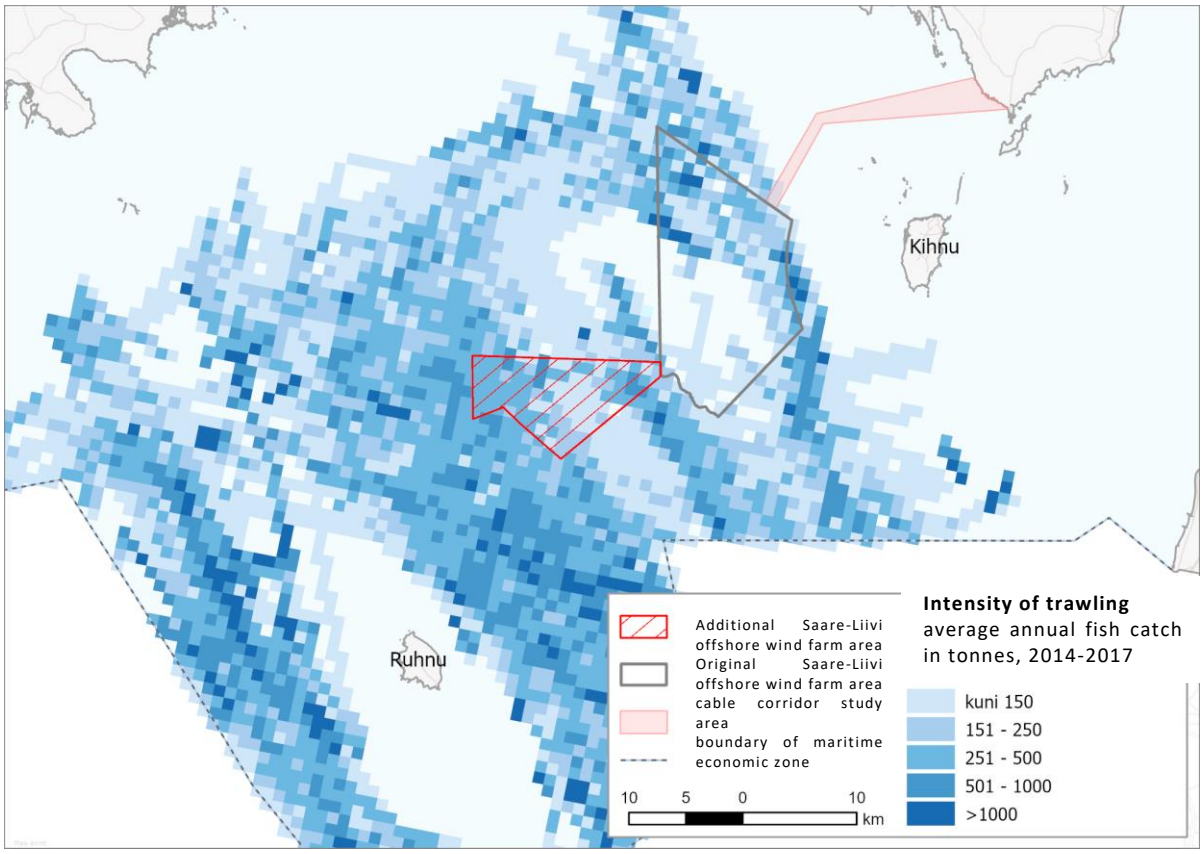

Figure 4-16. *Location of the Saare-Liivi offshore wind farm additional area and intensity of trawling in 2014-2017*

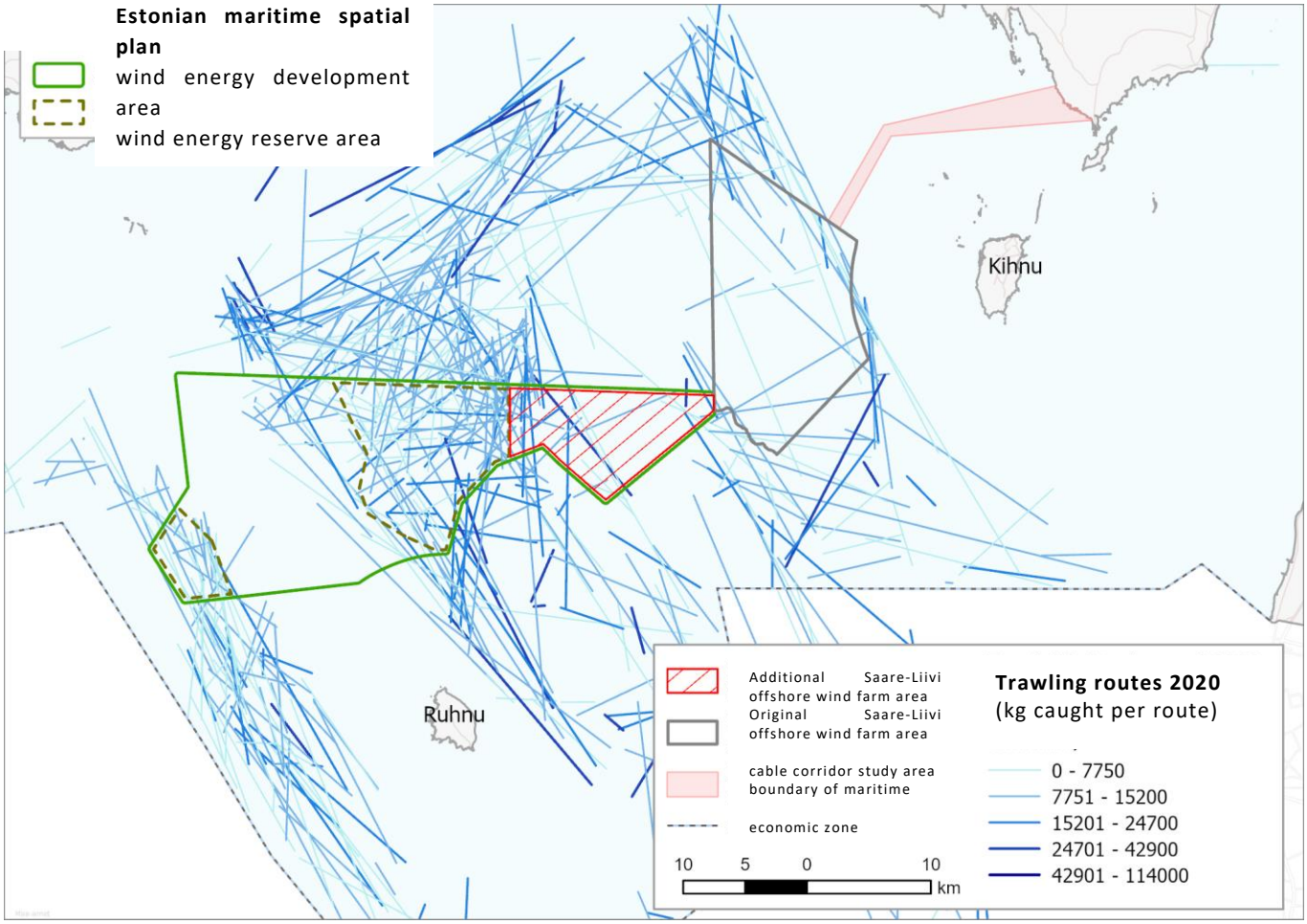

Figure 4-17. *Intensity of trawling in Saare-Liivi offshore wind farm additional area in 2020*

The additional Saare-Liivi offshore wind farm area partially coincides with areas actively used for trawl fishing and thus the wind farm is to be planned in cooperation with associations representing fishermen's interests (see table 9-1). The additional Saare-Liivi offshore wind farm area does not include the wind energy reserve area specified by the Estonian maritime spatial plan – i.e. the part of the wind energy area that coincides with the historically most intensive trawl fishing area.

5. Significant environmental impact expected to result from the planned activity

5.1. Assessment methodology

In assessing environmental impact and preparing the report, the expert group proceeds from the Environmental Impact Assessment and Environmental Management System Act currently in force (EIAEMSA) and its implementing acts and follows good practices for environmental impact assessment[49]. Valid environmental legal acts and the restrictions provided for therein are taken into consideration in carrying out the EIA.

The environmental impact assessment process has two phases: Preparation of the EIA programme; and carrying out the EIA and preparation of the report. The stages of the process arising from the Environmental Impact Assessment and Environmental Management System Act are set forth in Chapter 7.

The environmental impact of the Saare-Liivi offshore wind farm original and additional area will be assessed in the course of the same EIA (with which the EIA for the submarine cable line used for the connection to the main grid has been merged).

This (additional) **EIA programme** will be prepared for the additional Saare-Liivi offshore wind farm area. This is a planning stage, i.e. a plan that will specify how the environmental impact assessment is planned to be conducted. Among other things, expected key fields of influence, schedule for completion and plan for communicating with different parties to the process of impact assessment will be set out.

The environmental impact report is the final document that summarizes the whole process. The report will be prepared taking into account the requirements of the EIAEMSA and the EIA initiation decision.

If possible, a full EIA report will be prepared during the EIA proceedings (*regarding the original Saare-Liivi offshore wind farm area, additional area and submarine cable*). Since this EIA programme for the additional area is prepared later than the EIA programme for the original area (which covered the submarine cable) it may also affect the timeframe for carrying out studies in the additional area. Therefore, in order to speed up the procedure, if necessary separate EIA reports will be prepared for the original and additional areas of the Saare-Liivi offshore wind farm (the earlier EIA report also deals with the submarine cable line connecting to the main grid in such a case). The later EIA report will assess the cumulative impacts related to the Saare-Liivi offshore wind farm as a whole, also cumulatively with other similar projects.

If separate EIA reports are prepared, both EIA reports will be processed pursuant to the EIAEMSA, with all required procedural acts conducted in regard to both EIA report (including eliciting

49 Good practices for environmental impact assessment personnel. Estonian Environmental Impact Assessment Association (www.iaea.eu). Annex 1.

opinions from relevant institutions, publication, verifying conformity to requirements along with making the decision to declare it in conformity).

The purpose of the EIA is to assess and describe significant environmental impacts expected to result from the implementation of the planned activity, analyse possibilities for avoiding and/or alleviating its impact and make a proposal for the selection of a more suitable alternative (including for size of area, volume and technological aspects). The alternatives covered are described in the EIA report. Environmental impact is a direct or indirect impact expected to result from the planned activity, to the environment, human health, cultural heritage or assets.

The following table, 5-1, shows the Saare-Liivi offshore wind farm additional area and the environmental elements that will be impacted when the related infrastructure is realized, sources of influence, material impacts expected to result (if necessary, the sizes of the zones of influence will be clarified) and the methods used to forecast these impacts, including the need to prepare the studies/expert analysis necessary for the assessment and the methodologies thereof.

The expected environmental impact will be assessed in the EIA report in connection with construction and use of the offshore wind farm and the impact of removal of the turbines as a theoretical assessment will also be examined to the extent allowed by current information.

The principle for impact assessment is that changes in the environment resulting from carrying out the activities in the additional area of the Saare-Liivi offshore wind farm must be assessed. To do this, it is important to know the consequences (aspects) related to the activity that may lead to changes in environmental elements. The spatial extent of the environmental impact is additionally assessed in the area surrounding the planned activity area – in so doing, it is assessed in regard to various impacts in differing spatial extent where a specific impact can be considered significant.

Both a quantitative and qualitative (comparative) analytical method are used to assess environmental impact, according to which activities and alleviatory measures are analysed by each of the various environmental elements (e.g. conformity to a specific standard). If no goals or indicators exist for environmental elements, subjective experience-based (EIA expert group members' opinions and expert opinions) and objective assessments (results of studies etc) will be used.

The EIA methodology consists of comparing the forecasted environmental impacts (including alternative solutions) with the limits established in legal acts and giving recommendations for implementing the optimum/best option. In the preparation of the EIA report, data sources are used, among other things, from the Map application of the Land Board and EELIS (Estonian Nature Information System, Environmental Agency) data, specialized and scientific literature, previously collected research data, analogies, strategic documents and legal acts of the Republic of Estonia and other available (relevant) information that allows to ensure adequacy of conclusions. Consultation takes place with various relevant institutions, organizations and persons.

The environmental impact assessment report presents a description of the environmental measures, including monitoring, in terms of all impacts of the planned activity (and its real

alternative options), where it turns out to be necessary, in terms of the stages of construction, use and termination (including an assessment of the expected effectiveness of their use).

Additional studies and modelling will be performed in the course of the superficies licence and EIA, and expert opinions described in Table 5-1 will be prepared. Carrying out studies/expert analyses and dealing with the topics that arise can also take place in the context of other projects or activities (such as merger with other development projects, national study and monitoring etc.) and as an integrated part of the EIA (i.e., not as a standalone study). In carrying out various studies, cooperation between scientists and research groups takes place for creating interdisciplinary value added and achieving higher-quality research results.

A Natura assessment will be carried out as part of the EIA report preparation process and this EIA will proceed in carrying out the assessment mainly from the guidelines for conducting Natura assessments upon implementing Article 6 (3) of the Nature Directive in Estonia"[50]. Chapter 6 describes in more detail the process of Natura assessment and the methodology used.

The environmental impact assessment is a public process. All parties who feel that their interests may be impacted by the planned activity can intervene and present reasoned recommendations, proposals and comments. At minimum, interested parties can participate in the public release of the EIA programme, the assessment process and the public release of the report. The decision-maker, developer and environmental impact assessment staff can be contacted with proposals, objections and questions.

5.2. Environmental elements impacted and studies conducted

The methods used to forecast the impacts in each field of impact and of all environmental elements (that the planned activity may impact through impact sources) are described in Table 5-1.

TTJA decision no. 1-7/21-521 of 23 December 2021, amended by decision 1-7/23-063 of 9 March 2023, provides for a number of studies and/or expert analysis. In this EIA programme for the additional Saare-Liivi offshore wind farm area, the studies specified in the abovementioned decision have been considered, updated, and the methodology and volume of the studies and expert analyses have been set out in as great a scope as is known by the time of the preparation of this EIA programme.

50 Kutsar, R.; Eschbaum, K. and Aunapuu, A. 2019. Instructions for carrying out a Natura assessment in regard to implementation of Article 6 (3) of the nature directive in Estonia. Customer: Environmental Board. https://www.envir.ee/sites/default/files/KKO/KMH/kemu_natura_hindamise_juhendi_uuendus_2020.pdf

Table 5-1. *The expected material impacts of the planned activity (additional Saare-Liivi offshore wind farm area (part) offshore wind farm), their forecasting and assessment methods and studies to be carried out*

No.	*Impact field (i.e., environmental elements impacted)*	*Expected significant impacts (including zone, sources of the impact)*	*Impact forecasting and assessment methods and description of the necessary studies*
1	**Impact on the natural environment**		
1.1	Impact on hydrodynamics (including currents) and wave action, risks related to icing	The Impact that establishing a wind farm will have on hydrodynamics lies in changes in the wind and wave regime. The impact may also manifest on currents and vertical intermingling. This is expected to be an insignificant impact. Ice-related risks may manifest both during the wind farm construction and usage phase. To buffer the impacts, ice conditions must be taken into account when selecting and designing the foundation type. In addition, the impact of the planned activity and possible icebreaking operations on the changes in ice cover and the mobility of sea ice will be assessed. The impacts are related to the additional area of the Saare-Liivi offshore wind farm and its near vicinity.	In regard to the impact of hydrodynamics, theoretical modelling will be carried out. The work is being carried out by Tallinn University of Technology (TalTech), person in charge Taavi Liblik. An expert analysis will be prepared for assessing the impact on sea ice and risks related to ice, based on earlier fundamental data and studies conducted, such as the study of ice conditions conducted as part of the Estonian maritime spatial plan. In addition, previous experience, studies and research literature from other countries.
1.2	Impact on seawater quality, including suspended solids	The impact of the offshore wind farm on seawater quality may be manifested mainly in the course of Installation of wind turbine foundations and submarine cables by way of suspended solids introduced into water columns from marine sediments. The amount of suspended solids depends mainly on the natural state of the seabed (geotechnical conditions) followed by the number, size, type and installation technology used for foundations as well as on the length of submarine cables and installation technology. The impact on seawater quality and marine organisms may also materialize upon re-contamination of the marine	In 2022, a seawater quality study was conducted at three study points in the original Saare-Liivi offshore wind farm area. The results showed that the water quality data gathered from stations in the original Saare-Liivi offshore wind farm area coincided very well with the data obtained from national monitoring stations. Water quality studies thus will not be conducted in the additional offshore wind farm area, since data exist for characterizing the marine area and assessments will be made based on data from existing studies and national monitoring stations. As the basis for making an assessment, numerical modelling of the water quality

No.	*Impact field (i.e., environmental elements impacted)*	*Expected significant impacts (including zone, sources of the impact)*	*Impact forecasting and assessment methods and description of the necessary studies*
		environment, i.e. release of nutrients and hazardous substances into the water column, if such compounds are present in the sediments in significant quantity. During operation of the offshore wind farm, more of a theoretical impact is the impact on the seabed sediments stemming from warming of submarine cables and thereby on water temperature. The cables will be buried in the seabed and the amount of heat given off from the cables is expected to be insignificant even at the local level. Seawater quality can also be impacted if a potential emergency situation occurs, which could lead to the risk of an oil spill. The risk of an oil spill exists both in the wind farm construction and usage phase. To prevent an oil spill, safety rules must be followed during construction and maintenance work. The impacts are related to the additional Saare-Liivi offshore wind farm area and its vicinity.	parameters; and water column's physical (temperature, salinity, stratification; currents) and biogeochemical (nutrients, chlorophyll a, oxygen) parameters will be compiled. The work is being carried out by Tallinn University of Technology (TalTech), person in charge Taavi Liblik. Modelling of the incidence of suspended solids (and potential oil pollution, see also 5.3) will be carried out (formation of suspended solids related to establishment of the wind farm and installation of interior cables and range in the surrounding marine area is modelled). The work is being carried out by Tallinn University of Technology (TalTech), person in charge Taavi Liblik. A composite expert opinion will be prepared for the EIA report on the basis of previous studies, scientific literature, and studies carried out during the EIA proceedings.
1.3	Impact on habitats and biota on the seabed	The impact of the offshore wind farm on seabed habitats may manifest above all through the wind turbine foundations and submarine cables. The biotic communities and habitats in the immediate vicinity of the wind turbines will be destroyed in the construction phase. Construction activity will impact the communities on the seabed above all through spread of dislodged sediment and changes in water transparency. In addition, benthic species and habitats will be impacted if dredged sediment is placed on top of them. As a measure that will reduce and alleviate the impact, the turbine foundations	A benthic life and habitat study will be conducted in the additional Saare-Liivi offshore wind farm area (conducted by: University of Tartu Estonian Marine Institute, person in charge: Georg Martin), the objective of which is to map the range of the species and communities on the seabed of the additional offshore wind farm area (phyto- and zoobenthos) and of the benthic habitats and biotopes found in the area (Nature Directive Annex I habitat Types, MSRD broad habitat types, HELCOM HUB biotopes, HELCOM Red List biotopes). The objective of the study is to gather *in situ* information on the range of benthic species and communities and habitats in the project area and use that

No.	*Impact field (i.e., environmental elements impacted)*	*Expected significant impacts (including zone, sources of the impact)*	*Impact forecasting and assessment methods and description of the necessary studies*
		must be installed where possible in places where there is no or little (valuable) seabed biota and habitats. The wind turbine foundation will be placed on the seabed, and the existing natural seabed in the seabed and foundation area (and if necessary, material placed for protecting it) will be transformed into an anthropogenic one. The significance and magnitude of the impact depends above all on the number, measurements and type of the foundation (the gravitational foundation of the same type of turbine has a much bigger area on the seabed than a pile foundation) and on the natural state of the seabed (type of seabed). A method frequently used for installing submarine cables on soft seabed substrates is burying the cable in bottom sediments using special equipment that will help to avoid potential damage (economic impact) and which also alleviates the materialization of environmental impacts (reduced transmission of electromagnetic radiation and heat around the cable). Establishing a wind farm involves placing an artificial substrate throughout the entire water column, which creates an opportunity for various communities of sessile species to arise. Colonization of the free artificial substrate depends on very many different local environmental factors and it is not possible to transpose experience from other maritime areas for assessing the impact of the specific wind farm. To assess the environmental impact of establishing and operating the wind farm, it is	information to describe (model) range of species, habitats and biotopes in the planned area. The study results will allow to assess the precise impact of the technology and choice of selection on benthic communities and if necessary propose measures for minimizing potential negative impact. Basic measurements of the seabed will be carried out in the additional Saare-Liivi offshore wind farm area by way of acoustic remote monitoring (such as fan sonar), gathering depth data and backscatter data, combining them with semi-quantitative (coverage assessment, video systems or diving) and quantitative (biomass estimates) point observation. An artificial substrate colonization study/experiments will be conducted in the original Saare-Liivi offshore wind farm area (conducted by: University of Tartu Estonian Marine Institute, person in charge: Georg Martin) to determine the impact on the surrounding environment related to artificial substrate colonization arising from wind turbine foundations. The trial/study experiment will not be extended to the additional Saare-Liivi offshore wind farm area and assessments will be made based on the study data already in process, insofar as it is the same body of water and it is not necessary to repeat the experiment in environmental conditions expected to be similar. The field experiment will be conducted in the original offshore wind farm area in a station with a depth of 25-30 m. Substrates tested – concrete and metal (steel). A composite expert opinion will be prepared for the EIA report on the basis of previous studies, scientific literature, and studies carried out during the EIA proceedings.

No.	*Impact field (i.e., environmental elements impacted)*	*Expected significant impacts (including zone, sources of the impact)*	*Impact forecasting and assessment methods and description of the necessary studies*
		necessary to know the local peculiarities of the "reef effect" and assess the importance of the wind farm in promoting the spread of non-native species. In addition, the impact of removal of turbine on the seabed and species there will be assessed. The influence area can be defined as above all the additional Saare-Liivi offshore wind farm area and locations of the cable corridors within the wind farm.	
1.4	Seabed, seabed sediments	The impact of the wind farm may be manifested in the storm wave regime and dynamics of sediments through changes in the seabed structure. It is not expected to be a significant impact: since the nature of the relief of the seabed will not be modified in the course of the construction for establishing the wind farms (lowering/raising the relief), no significant changes are expected in the hydrodynamic regime that could impact the nature of waves on the surface in the near-coastal area. Bathymetric data (seabed depth data) in the area of the planned offshore wind farm and possible cable lines exist and they are sufficient for ordinary navigation and for providing environmental-related assessments carried out as part of the EIA (fisheries, seals, bird life, water movement and sediment dynamics etc.) Bathymetric data more detailed than the existing information are necessary for the precise technical solution of the offshore wind farm (design and final choice of technology) – i.e. in the post-EIA stage. In the course of construction of the foundations and embedding the	Measurements of the seabed will be performed in the additional Saare-Liivi offshore wind farm area using different equipment (e.g. sonar etc.) during which more precise bathymetric and geophysical data will be gathered. In addition, geotechnical site investigations will be conducted if the existing information is insufficient for drawing conclusions about the structural engineering solution and technology used (e.g. foundation type) and give information about environmental impacts that may become manifested. Conducting a detailed geotechnical site investigation is necessary only in the stage of developing a precise technical solution (engineering and final selection of technology). A geotechnical site investigation with this level of detail (which includes, among other things, core samples of the seabed) is generally conducted outside the scope of the EIA and after the EIA and superficies licence process. Among other things, samples of sediment will be collected from the additional Saare-Liivi offshore wind farm area to determine the concentration and structure of hazardous substances. The EIA report will assess the impact related to different foundation types and if

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		cables in the seabed, the sediments will be moved and resuspension will take place. Its impact will be felt in a limited area and for a short term. The estimated volumes of dredging (including dumping or placement of solid materials) depend on both the number of turbines and their foundations, dimensions and the length, location of the submarine cables and the technology selected for installing them. The EIA report will specify the estimated volumes of dredging, digging and/or solids deposition in the body of water. The impacts are related to the additional Saare-Liivi offshore wind farm area and its near vicinity. Establishing a wind farm about 20 km from the coast will not impact the nature of coastal processes, their intensification or abatement, since the planned additional offshore wind farm area is sufficiently far.	necessary, environmental measures will be developed (including monitoring). A composite expert opinion will be prepared for the EIA report on the basis of previous studies, scientific literature and studies carried out during the EIA proceedings.
1.5	Impact on fisheries	During construction of the offshore wind farm, ship traffic in the area will increase and the installation of offshore wind farm foundations and sea cables in the water environment will take place. Depending on the nature of the seabed, type of foundation and installation technology, the installation of the foundation will involve noise emissions and introduction of seabed sediments into the water column (resulting in suspended solids). Disturbance of the seabed sediments and noise topics are also important when it comes to installation of submarine cables. During operation, a positive impact from offshore wind farms has also	A fish inventory and Baltic herring studies will be held in the additional Saare-Liivi offshore wind farm area (conducted by: University of Tartu Estonian Marine Institute, person in charge: Redik Eschbaum), and the results will be compared to the results of other relevant Marine Institute fisheries studies in open sea and coastal waters. The fish inventory will be conducted in spring, summer and late autumn 2023. The Baltic herring studies will be held from February to June 2023. Based on the findings, an analysis of potential contraindications to the need for protection of protected species and material interests of the fishing sector will be prepared for (part of the) wind farm in

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		frequently been noted. Foundations offer a habitat for marine life, which are a food source for various fish. The level of underwater marine noise from operating turbines and their impact on fish have not proved significant or negative based on the studies conducted on existing operating offshore wind farms. The impact during construction and operation can be avoided and significantly reduced through implementing suitable measures. Technical and organizational techniques that have been used include adapting the construction period to fish spawning, use of noise-mitigating measures when installing foundations (such as avoiding pile-driving or use of noise-dampening measures during foundation installation), embedding the submarine cables in the seabed sediments, etc. It is expected that the influence area can be delineated directly with the additional Saare-Liivi offshore wind farm area.	the additional offshore wind farm area. Baltic herring migration will be analysed in the context of a hydroacoustic study. The fisheries and spawning area inventory will involve collection and analysis of fish samples pursuant to HELCOM guidelines* and meets the requirements of water quality assessment standard EVS-EN 14757:2015. The study will use gillnet series (14, 17, 21,5, 25, 30, 33, 38, 42, 45, 50, 55, 60 mm eyelet increments) and standardized (EVS-EN 14757:2015) section gillnets. The objective of the study is to determine the state of fish species in the planned additional Saare-Liivi offshore wind farm area, i.e., seasonal incidence, abundance, significance of the area as a spawning, migration or feeding area for different species. To assess the impact of the electromagnetic field around the connecting cables both within and outside the offshore wind farm, an expert analysis will be prepared considering similar projects, studies conducted in their regard, and existing data. In 2023-24, it is planned to hold a project funded from the state budget that determines how noise impacts Baltic herring biology, above all migration and reproductive behaviour. The EIA report relies on this topic on the findings of the nationwide study. The findings of this study will determine whether an additional underwater noise model (including infrasound model) should be carried out. In the course of the EIA, the impact of noise and vibration during installation associated with different foundation types (and other technical solutions will be assessed and if necessary environmental

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			measures (including monitoring) developed. A composite expert opinion will be prepared for the EIA report on the basis of previous studies, scientific literature, and studies carried out during the EIA proceedings.
1.6	Impact on marine mammals (seals)	The main aspect of offshore wind farm development that may impact seals is underwater noise, above all from construction of the offshore wind farm. A disturbance for seals may also be a temporary change in seawater quality stemming from disturbing of marine sediments upon installing foundations and submarine cables. The quantity of suspended solids generated depends on the geology of the seabed, the foundation type used and the technological process of installation of the foundation and submarine cable. During the offshore wind farm park operating phase, a disturbance for seals may stem from regular ship traffic used for maintenance. In particular, there are risks related to icebreaking. In conditions of limited ice, seals may congregate for birthing along the shipping lanes maintained by icebreakers, or in the wind farms with stationary ice as a habitat with suitable ice. In ordinary conditions, suitable ice is found in very large areas in the open-sea area or seals reproduce on the islands, which are covered by the existing protection regime. It is expected that the influence area can be delineated directly with the area encompassing the specific	A seal study will be conducted in the additional Saare-Liivi offshore wind farm area (work conducted by MTÜ Pro Mare, responsible implementer Mart Jüssi) in the following parts: 1) Seal abundance monitoring to be conducted as a point census in significant seal resting areas in the Gulf of Riga: Allirahu, Kerju and Vesitükimaa resting areas for the grey seal, and in the Väinameri mouth (Viirelaid-Kübasssare) and Kihnu islets nature conservation area for the ringed and grey seal. 2) Sea use study using telemetric markings, with the goal of marking 10 seals. The priorities are to apprehend seals of both species in the Kihnu area or tagging grey seals in the northern part of the gulf. 3) Acoustic applied research study on habitat used, conducted in collaboration with the Tallinn University of Technology's Mechanics and Fluids and Structures research group (prof. Aleksander Klauson). 4) Seal birthing and ice use applied research study, the method of which is ice and/or islet monitoring and aerial photography in the Gulf of Riga. Field studies will cover one full year, since there are significant seasonal differences in seal locations and activity patterns. The study will be carried out in 2023. In the course of the EIA, the impact of noise and vibration during installation associated with different foundation types (and other technical solutions will be assessed and if necessary environmental

No.	*Impact field (i.e., environmental elements impacted)*	*Expected significant impacts (including zone, sources of the impact)*	*Impact forecasting and assessment methods and description of the necessary studies*
		offshore wind farm and the near vicinity.	measures (including monitoring) developed. A composite expert opinion will be prepared for the EIA report on the basis of previous studies, scientific literature, and studies carried out during the EIA proceedings.
1.7	Impact on birds	The potential impact of offshore wind farms (and associated submarine cables) on birds primarily is that birds are driven out of the preferred stopover sites, birds are killed in collisions with turbines and the barrier effect on bird flight paths. The impacts are related to the Saare-Liivi offshore wind farm area and its vicinity.	To determine impacts on birds, a study of bird migration and feeding will be conducted (work to be performed by Estonian Ornithological Society, responsible implementer Kaarel Võhandu). Due to the expected impacts on birds, it is important to regard the planned Saare-Liivi offshore wind farm as a whole and carry out the following studies in both the original and additional area: 1) A study of observations of waterfowl that make stopovers will be conducted over two years 2022-2023 (considering the major variation of migration from one year to the next). In 2022, observations were conducted from a ship that lay at anchor at one point in the middle of the original Saare-Liivi offshore wind farm area. The studies will be continued in 2023 from the same observation point. In addition, a new observation point will be added in the middle of the additional Saare-Liivi offshore wind farm area. The observations include visual and radar observations and night-time audio recording of the stopover birds. The studies will be conducted in spring and autumn. 2) Censuses of waterfowl that make stopovers. This will be conducted as a flight census. The census itinerary will cover the entire planned wind farm area along with the near vicinity for obtaining comparison data (see figure 4-9). The scope of the census itinerary will be expanded westward in 2023. Ten censuses a year will be conducted. Considering the major variation from year to year in the number of waterfowl making stopovers,

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			the flight censuses will be repeated over two years, 2022-23. 3) Telemetry study of birds nesting in the Kihnu archipelago (in 2023). A telemetry study with suitable GPS transmitters will allow to determine how much the range of the feeding flights of major species nesting in Kihnu archipelago extends to the planned offshore wind farm area. Telemetry studies will also make it possible to obtain additional information on the birds' flight heights, which is an important input for assessing risks of collision. The following birds will be fitted with transmitters: sandwich tern (10 individuals, if they nest on the Kihnu islets in the study year); common tern (15 individuals); Arctic tern (15 individuals); common gull (15 individuals, if they nest on the Kihnu islets in the study year); cormorant (10 individuals, if they nest on the Kihnu islets in the study year). A composite expert opinion will be prepared for the EIA report on the basis of previous studies, scientific literature and studies carried out during the EIA proceedings.
1.8	Impact on bats	The impact of the offshore wind farm wind farm on bats may materialize if the offshore wind farm is located in a bat feeding area or migratory route. The impacts are related to the entire Saare-Liivi offshore wind farm area and near vicinity.	A bat study (conducted by Elustik OÜ, responsible expert Oliver Kalda) will be conducted. As a result of the study, potential bat feeding areas, migration corridors and movements in the additional Saare-Liivi offshore wind farm will be determined. The study methodology envisions collection of bioacoustic data as stationary observation points in the additional Saare-Liivi offshore wind farm area by placing 2 buoys at sea (in addition, there will be 5 buoys in the original Saare-Liivi offshore wind farm area). Field work will cover spring and autumn bat migration periods, and stationary observation points will also be in

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			operation in the summer period; the study period will be 2023. A composite expert opinion will be prepared for the EIA report on the basis of previous studies, scientific literature, and studies carried out during the EIA proceedings.
1.9	Impact on protected natural objects	There are no protected natural objects or protected area in the additional Saare-Liivi offshore wind farm area. There may be an impact on marine species that constitute a protection objective, such as seals and seabirds.	Analysis of map layers and expert assessment on the basis of previous studies, Estonian Nature Information System (EELIS), inventories conducted, species protection action plans, scientific literature and studies carried out in the EIA proceedings.
1.10	Impact on Natura 2000 areas – Natura assessment	The majority of the protected objects in the maritime area are also internationally protected, being part of the Natura 2000 network of nature and/or bird areas. The Natura 2000 nature and bird areas potentially in the influence area of the planned additional offshore wind farm area are set out in Chapter 6. The impact on Natura areas will be separately assessed in the relevant Natural assessment expressed as a separate chapter of the EIA report.	Analysis of map layers and expert opinion on the basis of previous studies, the Estonian Nature Information System (EELIS), inventories conducted, species protection action plans, scientific literature and studies carried out in the course of EIA assessment. A Natura assessment will be conducted for all protection objectives of Natura 2000 area within the influence area of the additional Saare-Liivi offshore wind farm area. See Chapter 6 on the Natura preliminary assessment.
1.11	Impact on climate	The impact of the wind farm on the climate is positive. The magnitude of the positive impact depends on the final rated output of the offshore wind farm and the amount of electricity this generated. Impacts related to local climate changes such as currents, waves, changes in ice cover are treated in the EIA report.	An expert assessment will be compiled based on previous studies, scientific literature, professional literature and expert knowledge. Fundamental climate change issues will not be analysed as part of the EIA. The official position of the European Union and therefore also of the Republic of Estonia will used as the basis in the matter of the existence of climate change, the need to mitigate changes and adapt to changes.

No.	*Impact field (i.e., environmental elements impacted)*	*Expected significant impacts (including zone, sources of the impact)*	*Impact forecasting and assessment methods and description of the necessary studies*
2	**Impact on cultural heritage**		
2.1	Impact on objects under heritage conservation, including shipwrecks	According to data from the Transport Board, 2 underwater obstacles are in the area of the additional Saare-Liivi offshore wind farm area. An impact may also be manifested through potential destruction, damage or impeded access to cultural heritage and the spread of sediments on to heritage conservation assets. The impact is directly related to the additional offshore wind farm area (above all, the area underlying a specific infrastructure).	First, sonar will be used to determine whether underwater objects exist in the additional Saare-Liivi offshore wind farm area, including potential underwater objects of cultural value and the cultural stratum (at least in the near vicinity of foundations of planned turbines and potential cable corridors). Where possible, areas that do not coincide with potential objects of cultural value will be preferred for locations of turbine foundation and cable corridors. Prior to construction (during the design development), a separate underwater archaeological investigation is to be performed – if the planned construction activity (establishment of wind turbine foundations and cables) and/or their influence area coincides with objects with cultural value and/or cultural layer determined in advance, and could jeopardize the survival of the underwater cultural heritage (subsections 32 (2-3) of the Heritage Conservation Act, section 10 of the Minister of Culture regulation no. 25 of 15 May 2019). In the course of the underwater archaeological investigation, objects of cultural value will be documented and their condition and scope of their preservation will be assessed. The work will be performed by Ivar Treffner, who is the responsible person. In addition, impacts conditioned by possible change in the condition of environmentally hazardous historical wrecks will be assessed, if necessary (environmental pollution). The information collected by sonar investigations will be used if possible in

No.	*Impact field (i.e., environmental elements impacted)*	*Expected significant impacts (including zone, sources of the impact)*	*Impact forecasting and assessment methods and description of the necessary studies*
			investigations by other disciplines: determining seabed habitats and initial identification of potential historical UXO (and other hazardous objects). An expert opinion will be prepared based on previous studies, scientific literature, and studies conducted during the EIA proceedings.
3	**Social and economic environment, including impact on human health, well-being and assets**		
3.1	Noise (including infrasound, low-frequency sound) and vibration	Impact on human health from the standpoint of noise and vibration is expected to be insignificant as the nearest turbines in the additional Saare-Liivi offshore wind farm area are about 20 km from the coast of Kihnu and Ruhnu islands, due to which it is not foreseeable that levels of noise and vibration in excess of the limits or noise levels within the limits but which cause nuisance would reach the closest homes. During the use of the wind farm, infrasound and low-frequency noise can be expected as well. Infrasound is a term for acoustic waves with a frequency of less than 20 Hz. Infrasound is not predominantly audible to the human ear. Low-frequency sound is a term for acoustic waves with a frequency of 10-200 Hz.	To assess noise during operation of the turbines, modelling will be performed in the planned additional Saare-Liivi offshore wind farm area and a noise map will be compiled on the basis of the principles contained in Minister of the Environment regulation no. 71 of 16 December 2016, "Normal noise levels transmitted in ambient air and methods for measurement, determination and assessment of noise level. The impact of infrasound, low-frequent sound and vibration is described on the basis of scientific literature and previous investigations.
3.2	Visual impact	It is not possible to establish an offshore wind farm that is not visible at sea. The planned offshore wind farm area is about 20 km from Kihnu and Ruhnu. The large offshore turbines are also visible in good weather from a 20 km distance, so the visual impact of the turbines extends to Kihnu and Ruhnu. Thus, there will be a change in sea views.	To determine visual impact more objectively and creating additional information, a visualization of the additional Saare-Liivi offshore wind farm area will be performed from various points on Kihnu Island and the mainland as well as a ZTV – Zone of Theoretical Visibility. The EIA report will assess the visual impact of the colour of the turbines (e.g. whether turbines of a colour other than white would be preferred) and the

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		The magnitude of the visual impact depends on the physical size of the offshore wind farm, location, spatial solution (e.g. positioning wind turbines in rows etc.) and technical solutions (e.g. the colour of the wind turbines and marking the turbines with lights). The extent of the impact is the closest coastal areas to the entire Saare-Liivi wind farm area (above all Kihnu Island and Ruhnu Island).	restriction of light from aviation safety beacons reaching shore. The assessment of visual impacts will rely on the guidelines and methodology developed in the course of the Estonian Maritime Spatial Plan. Work to be carried out by Kerttu Ots, WSP Global Inc. A static visualization from different viewpoints and assessment of the impacts on changes in the views will be prepared for the EIA report.
3.3	Impact on human health and well-being or property Social and economic aspects – employment, fisheries, impact on the local community, tourism, electricity supply.	<u>Impact on human health and well-being.</u> The impact of the planned wind farm on human health and welfare can be associated with potential noise and visual disturbance from the wind turbines, described in advance in 3.1 and 3.2 of the table. <u>Impact on (property) economy and employment, including the fisheries sector</u>. The planned offshore wind farm may exert an impact on fisheries and thereby on fisheries both during construction and operation of the offshore wind farm. The territory of the offshore wind farm may also overlap with trawling areas and thus also have an impact on fishermen's income (yet will be outside the part of the wind energy reserve area that coincides with the historically most intensive trawl fishing area). The impact on fisheries during operation may lie in restrictions to be established on ship traffic in the offshore wind farm area. It will be important to find possibilities of shared use for purposeful sharing of space in the same maritime area, using the offshore wind farm area also for farming of fish, seaweed and/or molluscs (such as the use of	The expert analysis on the basis of scientific literature sources and previous research data, combined with data gathered in the course of focus group encounters and interviews with and surveys of stakeholders. Cooperation with various interest groups and local governments (Kihnu, Pärnu, Lääneranna etc.) will take place during the superficies licence and throughout the entire EIA proceedings. Additional input information will be obtained from suggestions received in the course of the publication of this EIA programme and during meetings with local communities. Cooperation will take place with the Ministry of Rural Affairs in regard to mapping and assessing the impacts on the fishing sector.

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		the turbines for fastening aquaculture infrastructure or for developing new infrastructure solutions), which may have a positive impact on the economy and employment. In addition, there will be a need in both the wind farm construction and operation stage for service (or maintenance) centres and ports that could be developed on the basis of some existing harbour (in addition to the existing functions) and thereby contribute to port development by generating additional value added (workforce and sharing of watercraft). In regard to infrastructure that may be needed for developing the wind farm, cooperation will take place with local governments and companies in the area, and various possibilities will be considered in the course of the superficies licence and EIA process. A solution that generates benefits at the local level is the fees flowing into the municipality budget through the local benefit model. Impact on the local community, including tourism. The tourism sector makes up a significant part of the Kihnu Island economy. The offshore wind farm may impact the tourism sector in a number of ways and the impact may be both negative and positive.	
4	**Other impacts**		
4.1	Cumulative impacts	Cumulative impacts refer to the combined effect of one or more activities that may manifest through an accumulation of similar impacts, where there may be many different activities and where a change occurring as a consequence of	During preparation of the EIA report, combined impacts will be assessed throughout impacts resulting from the planned Saare-Liivi offshore wind farm and its infrastructure.

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		addition of activities is an important aspect[51]. The cumulative impact may appear if due to the spatial plan(s) and its planned activities, a territorial or temporal overlap between impacts take place, resources are repeatedly removed or added, or the landscape is altered repeatedly[52]. In addition, the Eesti Energia Gulf of Riga offshore wind farm is being planned in the southeast-south direction from the entire Saare-Liivi offshore wind farm area. The natural environment may come under cumulative impacts in the vicinity of the Gulf of Riga maritime area, where a number of large-scale activities are planned close together. Simultaneous extensive wind farm construction activity is undoubtedly one of the greatest risks to birds and bats, as well as for other species (seals, fish) as well as to marine habitats and biota. The people of Kihnu Island may incur a cumulative visual impact as several different wind farms are planned around Kihnu island.	In addition, combined impacts will be assessed with other similar implemented and, where possible, spatial plans and projects in the planning, to prevent cumulative impacts, including to marine life, and the creation migration bottlenecks and/or obstacles. In preparing the EIA report, it is possible when assessing cumulative impacts to consider similar projects or other planned projects that will lead to accumulation of similar impacts from multiple activities, which have by the time of the preparation of the EIA report have reached at least the same assessment stage – in other words, it is possible to consider the study data gathered and published regarding the other project. Cumulative impacts cannot be assessed in the EIA report in regard to spatial plans and projects that are still in the superficies licence proceeding Initiation or EIA programme stage – i.e. where the realistic and feasible alternative solution and volume have not been clarified. A composite expert opinion will be prepared for the EIA report on the basis of previous studies, scientific literature, and studies carried out during the EIA proceedings.
4.2	Cross-border impacts	The entire planned Saare-Liivi offshore wind farm development area is a minimum of ca 7 km from the boundary of Latvian territorial waters. Thus, it is an activity that may have cross-border impact and a cross-border environmental impact assessment must be carried out.	A description of cross-border impacts and proceedings are described in more detail in chapter 9.2.

51 Peterson, K., Kutsar, R., Metspalu, P., Vahtrus, S. and Kalle, H. 2017. Strategic environmental impact assessment manual. Ministry of the Environment, 137 pages.

52 Cooper, L. M. 2004. Guidelines for Cumulative Effects Assessment in SEA of Plans. EPMG Occasional Paper 04/LMC/CEA. imperial College London.

No.	*Impact field (i.e., environmental elements impacted)*	*Expected significant impacts (including zone, sources of the impact)*	*Impact forecasting and assessment methods and description of the necessary studies*
5	**Other aspects**		
5.1	Impact of historical underwater ordnance	This topic will be covered in the EIA as much as necessary.	In regard to known locations of historical underwater ordnance and determining the locations, there will be cooperation in the course of the superficies licence and EIA proceedings with the Ministry of Defence (including the Estonian Navy).
5.2	Impact on navigation systems and impact on ship traffic and navigational safety	Use of the wind farm may have an impact on air and ship traffic as well and cooperation will take place with the Transport Board and the Police and Border Guard to map and assess it.	A ship traffic navigation risk analysis will be conducted (by TalTech EMERA), in which, as the relevant impacts, an assessment will be made of topics such as the wind farm's impact on ship traffic, including during construction works and operation, on marine communication and marine monitoring systems (including ESTER radio communications), AIS equipment, ship radar, potential impact caused by changes in ice conditions on water traffic, risks of marine pollution will be identified (locations of potential marine accidents), and the suitable ship traffic access location and width will be determined. The impacts of (part of) the planned additional Saare-Liivi offshore wind farm area on air traffic from Kuressaare, Ruhnu, Kihnu and Pärnu airfield will be assessed. This work will be performed by the Estonian Aviation Academy. Cooperation will take place with the Transport Board and Police and Border Guard in preparing the analyses. The methodology will be introduced to the Transport Board and the Police and Border Guard. Specialized literature and expert opinions are the basis for the assessment.

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5.3	Potential emergency situations	Impact on seawater quality can also be altered in the event of a potential emergency situation, which could lead to the risk of an oil spill or release of elegas into the environment. The risk of an oil spill exists both in the wind farm construction and usage phase. To prevent an oil spill, safety rules must be followed during construction and maintenance work.	Modelling of the potential spread of oil slick will be performed. The work is being carried out by Tallinn University of Technology (TalTech), person in charge Taavi Liblik. An expert assessment on the potential impact of elegas on the environment and the measures needed to avoid it.

6. Natura preliminary assessment

Natura 2000 is a pan-European network of protected areas, the goal of which is to ensure protection of rare or endangered birds and other animals, plants and their habitats or, if necessary restore favourable status of species and habitats that are endangered Europe-wide. Natura 2000 nature areas and bird areas were formed based on Council of the European Union directives 92/43/EEC (known as the nature directive) and 2009/147/EC (known as the birds directive).

A Natura assessment will be conducted as part of the EIA. The Natura assessment is a procedural process carried out pursuant to Article 6 (3) and (4) of the nature directive, 92/43/EEC. This work draws on European Commission guidance entitled "Assessment of plans and projects significantly affecting Natura 2000 sites. Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC"[53], to the "Instructions for carrying out a Natura assessment in regard to implementation of Article 6 (3) of the nature directive in Estonia"[54] and the guidance on "Wind energy developments and Natura 2000" (European Union, 2021)[55].

On the basis of the Environmental Impact Assessment and Environmental Management System Act and the Nature Conservation Act, a Natura assessment will take place as part of the proceedings on the environmental impact assessment. In accordance with clause 3 (1) 2) of the Environmental Impact Assessment and Environmental Management System Act, environmental impact shall be assessed in planning an activity that can be expected, by itself or in combination with other activities, to have an unfavourable impact on Natura 2000 network area protection objectives. When it comes to Natura assessment, it is important that assessment is of the impact likely to materialize based solely on the protection objectives of the area. The impacts of an activity are considered unfavourable if as a result of carrying out the activity, the state of Natura 2000 area(s') protection objectives becomes worse or as a result of carrying out the activity it is not possible to achieve the protection objective.

The first stage in the Natura assessment is the preliminary Natura assessment, which is aimed at forecasting the likely impacts of the planned activity, as a result of which it can be decided whether and to what extent it is necessary to progress to the full assessment stage. In the full assessment, a detailed assessment of the likely significant impact on the Natura area is conducted and if necessary, alleviatory measures will be designed.

This preliminary assessment is prepared based on existing information. Existing materials are used regarding the Natura 2000 network area and protection objectives (Natura area standard data form information, Environmental Register databases etc.).

Linkage between planned activity and protection management

53 Assessment of plans and projects significantly affecting Natura 1 sites. Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC. Brussels, 28 September 2021

54 Kutsar, R.; Eschbaum, K. and Aunapuu, A. 2019. Instructions for carrying out a Natura assessment in regard to implementation of Article 6 (3) of the nature directive in Estonia. Customer: Environmental Board. https://envir.ee/media/4372/download

55 https://op.europa.eu/en/publication-detail/-/publication/2b08de80-5ad4-11eb-b59f-01aa75ed71a1

The planned activity is not associated with the protection management of any Natura 2000 network area and does not contribute directly or indirectly to achievement of the protection objectives of the areas.

Information on the planned activity

As part of preparing this EIA report on the additional Saare-Liivi offshore wind farm, the planned activity or primary alternative being viewed is the additional Saare-Liivi offshore wind farm area to the northeast of Ruhnu Island with up to 92 turbines. The objective, location and detailed description of the planned activity can be found in chapter 2 of the EIA programme (figure 2-1 and figure 6-1 of the activity location map).

Description of the Natura 2000 areas within the influence area of the planned activity

The following Natura 2000 network areas are in the potential influence area of the planned additional Saare-Liivi offshore wind farm area: Kihnu nature area, Bay of Pärnu bird area, Väinameri bird area, Kahtla-Kübassaare bird area and the Kura kurk bird area (see figure 6-1).

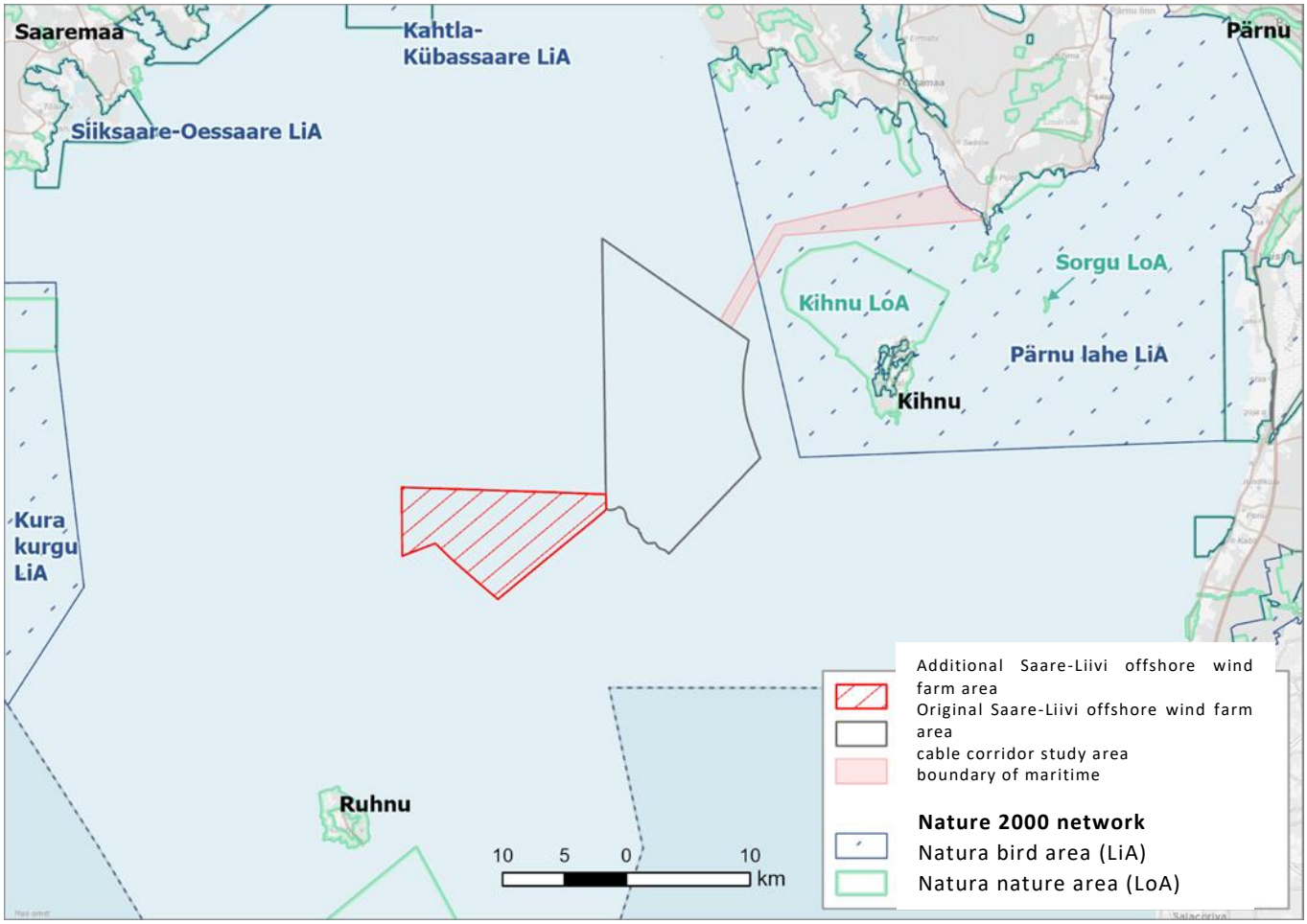

Figure 6-1. *Overview of the Natura 2000 network areas in the planned additional Saare-Liivi offshore wind farm area's influence area (Basis: Land Board and EELIS, 2022)*

A more detailed description of areas along with forecasting the expected impact for Natura 2000 protection objectives is provided in Table 6-1.

Forecasting likely significant impacts for Natura area(s)' protection objectives

The following table, 6-1, sets out the protection objectives for the Natura areas and a forecast of the impact expected to be manifested.

Table 6-1. *Protection objectives for the Natura 2000 areas and forecasting the impact expected to be manifested.*

Name of Natura area	*Protection objectives for the area*	*Forecasting impact*	*Results of the Natura preliminary assessment*
Kihnu nature area (EE0040313)	Habitat types: sandbanks (1110), coastal lagoons (*1150), annual vegetation of drift lines (1210), Boreal baltic islets and small islands (1620), boreal baltic coastal meadows (*1630), boreal baltic sandy beaches with perennial vegetation (1640), Shifting dunes along the shoreline with Ammophila arenaria (white dunes) – 2120), fixed coastal dunes with herbaceous vegetation (grey dunes) – *2130), Wooded dunes of the Atlantic, Continental and Boreal region – (2180), Juniperus communis formations on heaths or calcareous grasslands (5130), semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) – 6210), Fennoscandian lowland species-rich dry to mesic grasslands (*6270), Nordic alvar and precambrian calcareous flatrocks – *6280), Molinia meadows on calcareous, peaty or clayey-silt- laden soils (Molinion caeruleae) (6410), hydrophilous tall herb fringe communities of plains and of the montane to alpine levels (6430), Fennoscandian wooded meadows (*6530), alkaline fens (7230), Western taiga(*9010), Fennoscandian wooded pastures (9070) and Fennoscandian deciduous swamp woods (*9080). Species: grey seal (*Halichoerus grypus*), ringed seal (*Phoca hispida bottnica*), marsh angelica (*Angelica palustris*) and fen orchid (*Liparis loeselii*).	The planned additional Saare-Liivi offshore wind farm area does not coincide with a Natura nature area or its protection objectives (including marine habitats), which rules out direct physical impacts on the nature area and its protection objectives. The building of the planned turbines in areas near the nature area may in certain instances have temporary/indirect impacts, such as temporary impacts during construction on the nature area's protection objectives (suspended solids in water etc.), disruption to grey and ringed seals. These are likely to be temporary and insignificant for the nature area.	A full Natura assessment on grey and ringed seals has to be carried out as part of the EIA report.

Name of Natura area	*Protection objectives for the area*	*Forecasting impact*	*Results of the Natura preliminary assessment*
Pärnu Bay bird area (EE0040346)	Species: great red warbler (*Acrocephalus arundinaceus*), northern pintail (*c*), northern shoveler (*Anas clypeata*), Eurasian teal (*Anas crecca*), Eurasian wigeon (*Anas penelope*), mallard (*Anas platyrhynchos*), garganey (*Anas querquedula*), gadwall (*Anas strepera*), greater white-fronted goose (*Anser albifrons*), greylag goose (*Anser anser*), bean goose (*Anser fabalis*), ruddy turnstone (*Arenaria interpres*), short-eared owl (*Asio flammeus*), tufted duck (*Aythya fuligula*), greater scaup (*Aythya marila*), barnacle goose (*Branta leucopsis*), common goldeneye (*Bucephala clangula*), dunlin (*Calidris alpina schinzii*), common ringed plover (*Charadrius hiaticula*), western marsh harrier (*Circus aeruginosus*), long-tailed duck (*Clangula hyemalis*), Bewick's swan (*Cygnus columbianus bewickii*), whooper swan (*Cygnus cygnus*), mute swan (*Cygnus olor*), common gull (*Larus canus*), lesser black-backed gull (*Larus fuscus*), black-headed gull (*Larus ridibundus*), black-tailed godwit (*Limosa limosa*), velvet scoter (*Melanitta fusca*), black scoter (*Melanitta nigra*), common merganser (*Mergus merganser*), red-breasted merganser (*Mergus serrator*), cormorant (*Phalacrocorax carbo*), ruff (*Philomachus pugnax*), great crested grebe (*Podiceps cristatus*), common eider (*Somateria mollissima*), little tern (*Sterna albifrons*), common tern (*Sterna hirundo*), Arctic tern (*Sterna paradisaea*), sandwich tern (*Sterna sandvicensis*), spotted redshank (*Tringa erythropus*), common redshank (*Tringa totanus*) and northern lapwing (*Vanellus vanellus*).	The planned offshore wind farm's additional area does not coincide with a Natura bird area, but rather is at least 15 km away from it at its closest point. There are thus no direct physical impacts to the area's protection objectives. The mobile nature of the life of birds (e.g. migrations, feeding flights) must also be considered, however, due to which significant impacts (obstacles/bird deaths during migration etc.) on bird areas, their cohesiveness and bird life can in certain cases also emerge in the case of wind turbines planned outside the Natura areas. A potential impact factor is impacts materializing upon migration with regard to the bird species constituting the protection objectives of the bird area, which cannot be ruled out in the current Natura preliminary assessment stage.	A full Natura assessment has to be carried out as part of the EIA report.

Väinameri Sea bird area (EE0040001)	Species: northern pintail (*Anas acuta*), northern shoveller (*Anas clypeata*), Eurasian teal (*Anas crecca*), Eurasian wigeon (*Anas penelope*), mallard duck (*Anas platyrhynchos*), garganey (*Anas querquedula*), gadwall (*Anas strepera*), greater white-fronted goose (*Anser albifrons*), greylag goose (*Anser anser*), lesser white-fronted goose (*Anser erythropus*), bean goose (*Anser fabalis*), grey heron (*Ardea cinerea*), ruddy turnstone (*Arenaria interpres*), short-eared owl (*Asio flammeus*), common pochard (*Aythya ferina*), tufted duck (*Aythya fuligula*), greater scaup (*Aythya marila*), Eurasian bittern (*Botaurus stellaris*), brant (*Branta bernicla*), barnacle goose (*Branta leucopsis*), Eurasian eagle-owl (*Bubo bubo*), common goldeneye (*Bucephala clangula*), red-backed sandpiper (*Calidris alpina schinzii*), redknot (*Calidris canutus*), little ringed plover (*Charadrius dubius*), sand tull (*Charadrius hiaticula*), black tern (*Chlidonias niger*), white stork (*Ciconia ciconia*), western marsh harrier (*Circus aeruginosus*), hen harrier (*Circus cyaneus*), long-tailed duck (*Clangula hyemalis*), corn crake (*Crex crex*), Bewick's swan (*Cygnus columbianus bewickii*), whooper swan (*Cygnus cygnus*), mute swan (*Cygnus olor*), dendrocopos (*Dendrocopos leucotos*), ortolan bunting (*Emberiza hortulana*), Eurasian coot (*Fulica atra*), great snipe (*Gallinago media*), Eurasian pygmy owl (*Glaucidium passerinum*), common crane (*Grus grus*), white-tailed eagle (*Haliaeetus albicilla*), red-backed shrike (*Lanius collurio*), common gull (*Larus canus*), black-backed gull (*Larus fuscus*), black-headed gull (*Larus ridibundus*), broad-billed sandpiper (*Limicola falcinellus*), bar-tailed godwit (*Limosa lapponica*), black-tailed godwit (*Limosa limosa*), velvet scoter (*Melanitta fusca*), common scoter (*Melanitta nigra*), väikekoskel (*Mergus albellus*), common merganser (*Mergus merganser*), red-breasted merganser (*Mergus serrator*), Eurasian curlew (*Numenius arquata*), cormorant (*Phalacrocorax carbo*), ruff (*Philomachus pugnax*), grey-headed woodpecker (*Picus canus*), grey plover (*Pluvialis squatarola*), great crested grebe (*Podiceps cristatus*), little crake (*Porzana parva*), spotted crake (*Porzana porzana*), pied avocet (*Recurvirostra avosetta*), common eider (*Somateria mollissima*), little tern (*Sterna albifrons*), Caspian tern (*Sterna caspia*), common tern (*Sterna hirundo*), Arctic tern (*Sterna paradisaea*), sandwich tern (*Sterna sandvicensis*), barred warbler (*Sylvia nisoria*), black grouse (*Tetrao tetrix*), spotted redshank (*Tringa erythropus*), wood sandpiper (*Tringa glareola*), common greenshank (*Tringa*	The planned offshore wind farm additional area is more than 40 km away from the Väinameri bird area. There are thus no direct physical impacts to the area's protection objectives. The mobile nature of the life of birds (e.g. migrations) must also be considered, however, due to which significant impacts (obstacles/bird deaths during migration etc.) on bird areas, their cohesiveness and bird life can in certain cases also emerge in the case of wind turbines planned outside the Natura areas. A potential impact factor is impacts materializing upon migration with regard to the bird species constituting the protection objectives of the bird area, which cannot be ruled out in the current Natura preliminary assessment stage.	A full Natura assessment has to be carried out as part of the EIA report.

Name of Natura area	*Protection objectives for the area*	*Forecasting impact*	*Results of the Natura preliminary assessment*
	nebularia), common redshank (*Tringa totanus*) and northern lapwing (*Vanellus vanellus*).		
Kahtla-Kübassaare bird area (EE0040412)	Species: northern shoveller (*Anas clypeata*), Eurasian wigeon (*Anas penelope*), mallard (*Anas platyrhynchos*), garganey (*Anas querquedula*), gadwall (*Anas strepera*), greylag goose (*Anser anser*), common pochard (*Aythya ferina*), tufted duck (*Aythya fuligula*), barnacle goose (*Branta leucopsis*), common goldeneye (*Bucephala clangula*), sand tull (*Charadrius hiaticula*), Western marsh harrier(*Circus aeruginosus*), long-tailed duck (*Clangula hyemalis*), Bewick's swan (*Cygnus columbianus bewickii*), mute swan (*Cygnus olor*), Eurasian coot (*Fulica atra*), common crane (*Grus grus*), white-tailed eagle (*Haliaeetus albicilla*), common gull (*Larus canus*), lesser black-backed gull (*Larus fuscus*), little gull (*Larus minutus*), black-headed gull (*Larus ridibundus*), black-tailed godwit(*Limosa limosa*), velvet scoter (*Melanitta fusca*), smew (*Mergus albellus*), common merganser (*Mergus merganser*), red-breasted merganser (*Mergus serrator*), cormorant (*Phalacrocorax carbo*), European green woodpecker (*Picus viridis*), horned grebe (*Podiceps auritus*), great crested grebe (*Podiceps cristatus*), pied avocet (*Recurvirostra avosetta*), common eider (*Somateria mollissima*), little tern (*Sterna albifrons*), Caspian tern (*Sterna caspia*), common tern (*Sterna hirundo*), Arctic tern (*Sterna paradisaea*), common redshank (*Tringa totanus*) and northern lapwing (*Vanellus vanellus*).	The planned offshore wind farm's additional area is more than 35 km away from the bird area at its closest point. There are thus no direct physical impacts to the area's protection objectives. The mobile nature of the life of birds (e.g. migrations) must also be considered, however, due to which significant impacts (obstacles/bird deaths during migration etc.) on bird areas, their cohesiveness and bird life can in certain cases also emerge in the case of wind turbines planned outside the Natura areas. A potential impact factor is impacts materializing upon migration with regard to the bird species constituting the protection objectives of the bird area, which cannot be ruled out in the current Natura preliminary assessment stage.	A full Natura assessment has to be carried out as part of the EIA report.

Name of Natura area	*Protection objectives for the area*	*Forecasting impact*	*Results of the Natura preliminary assessment*
Kura kurk bird area (EE0040434)	The species whose individuals' habitats are protected are the razorbill (*Alca torda*), northern pintail (*Anas acuta*), northern shoveller (*Anas clypeata*), Eurasian teal (*Anas crecca*), Eurasian wigeon (*Anas penelope*), mallard duck (*Anas platyrhynchos*), gadwall (*Anas strepera*), greylag goose (*Anser anser*), grey heron (*Ardea cinerea*), ruddy turnstone (*Arenaria interpres*), greater scaup (*Aythya marila*), brant (*Branta bernicla*), barnacle goose (*Branta leucopsis*), common goldeneye (*Bucephala clangula*), dunlin (*Calidris alpina schinzii*), redknot (*Calidris canutus*), little stint (*Calidris minuta*), black guillemot (*Cepphus grylle*), sand tull (*Charadrius hiaticula*), long-tailed duck (*Clangula hyemalis*), Bewick's swan (*Cygnus columbianus bewickii*), mute swan (*Cygnus olor*), red-throated loon (*Gavia stellata*), white-tailed eagle (*Haliaeetus albicilla*), lesser black-backed gull (*Larus fuscus*), bar-tailed godwit (*Limosa lapponica*), velvet scoter (*Melanitta fusca*), smew (*Mergus albellus*), common merganser (*Mergus merganser*), red-breasted merganser (*Mergus serrator*), cormorant (*Phalacrocorax carbo*), grey pllover (*Pluvialis squatarola*), horned grebe (*Podiceps auritus*), great crested grebe (*Podiceps cristatus*), pied avocet (*Recurvirostra avosetta*), common eider (*Somateria mollissima*), Caspian tern (*Sterna caspia*) and spotted redshank (*Tringa erythropus*).	The area of the entire planned offshore wind farm is about 25 km away from the bird area at its closest point. There are thus no direct physical impacts to the area's protection objectives. The mobile nature of the life of birds (e.g. migrations) must also be considered, however, due to which significant impacts (obstacles/bird deaths during migration etc.) on bird areas, their cohesiveness and bird life can in certain cases also emerge in the case of wind turbines planned outside the Natura areas. A potential impact factor is impacts materializing upon migration with regard to the bird species constituting the protection objectives of the bird area, which cannot be ruled out in the current Natura preliminary assessment stage.	A full Natura assessment has to be carried out as part of the EIA report.
Ainazi-Salacgriva nature area (LV0900700)	The habitat types specified in Annex 1 that are the area's protection objectives are coastal lagoons (*1150), reefs (1170), annual vegetation of drift lines (1210), boreal baltic coastal meadows (*1630), boreal baltic sandy beaches with perennial vegetation (1640), Shifting dunes along the shoreline with Ammophila arenaria (white dunes – 2120). The species named in Annex 2 whose individual' habitats are protected are the spined loach (*Cobitis taenia*) and river lamprey (*Lampetra fluviatilis*).	There is no direct unfavourable impact on Natura area protection objectives. The Natura area is about 20 km to the southeast of the planned wind farm area Potential indirect impact through operation of the wind farm may manifest for fish.	An additional Natura preliminary assessment must be conducted as part of the EIA report and if necessary, appropriate assessment continued.

Result of Natura assessment and conclusions

The technical solution for the offshore wind farm will be clarified in the subsequent EIA process and in technical design development in cooperation with experts in the relevant field. The

objective is to establish an offshore wind farm and related infrastructure such that it lacks a significant impact on achieving the protection objectives of the Natura areas.

An additional full Natura assessment will be carried out as part of the EIA in regard to the likely impacted Natura areas and their protection objectives.

7. The environmental impact assessment process and timetable

It is hard to pinpoint the precise course of the EIA process in time as of the preparation of this EIA programme, and thus the times listed in the schedule for each activity must be considered estimates. Further details on public engagement and the exact time of the public discussion on the EIA programme and report shall be given in accordance with legislation.

The stages of carrying out the EIA are given in the following table.

Table 7-1. *Stages in carrying out the EIA and expected timetable*

EIA stage[56]	*Content of stage and duration*	*Expected term for carrying out the stage*[57]
Initiation of EIA	TTJA decision no. 1-7/21-521 of 23 December 2021 on the initiation of Saare-Liivi offshore wind farm proceedings and EIA, which decision was amended (the area to be encumbered was moved) by TTJA decision no. 1-7/23-063 of 9 March 2023.	With TTJA decision no. 1-7/23-063 of 9 March 2023
Preparation of the EIA programme.	The EIA expert group will prepare the EIA programme.	March 2023
	The EIA programme will be submitted to the decision-maker.	April 2023
Verification of EIA programme and eliciting comments	The decision-maker shall within 14 days verify that the EIA programme is in conformity and submit it to the institutions for eliciting comment.	April 2023
	The relevant institutions submit their comments within 30 days.	April-May 2023
	The decision-maker shall within 14 days review the comments from the relevant institutions and give its opinion on the relevancy and sufficiency of the EIA programme.	May 2023
	The EIA expert group will if necessary make corrections and addenda to the EIA programme.	May-June 2023
	The decision-maker verifies the improved and supplemented EIA programme within 14 days and involves in the proceedings, if necessary, any relevant institution whose position has not been considered.	June 2023

56 It should be considered that in accordance with chapter III of the Government Office's document of 2 March 2023, "Taastuvenergia kasutuselevõtu kiirendamine. Eelnõu põhialused", amendment of the Environmental Impact Assessment and Environmental Management System Act is planned so that the separate requesting of positions from relevant institutions in the context of public exhibits and the separate EIA report endorsement phase are abolished. In the case of EIA proceedings in progress, the amended procedure will be applied to procedures launched after the amendments enter into force. Thus, these stages of the process may change in the course of the EIA proceedings (if the Environmental Impact Assessment and Environmental Management System Act changes).

57 The optimum duration of the stage arising from the Environmental Impact Assessment and Environmental Management System Act valid on the date on which the EIA was initiated is taken into account for each stage in the EIA process.

EIA stage[56]	*Content of stage and duration*	*Expected term for carrying out the stage*[57]
Public disclosure of the EIA programme.	The decision-maker provides notification within 14 days regarding the public display and public discussion.	June-July 2023
	The public display of the EIA programme will last at least 14 days.	July 2023
	Public discussion of the EIA programme will take place.	August 2023
Supplementation of the EIA programme and submission for verifying conformity to the requirements	The EIA expert group will, on the basis of proposals and objections made regarding the EIA programme, make the necessary corrections and addenda, clarify that the proposals and objections have been taken into consideration, or provide reasoning for why they were not considered, and respond to questions submitted.	August-September 2023
	The corrected EIA programme will be submitted to the decision-maker for verifying conformity to the requirements.	September-October 2023
Verification and declaration of the conformity of the EIA programme to the requirements	The decision-maker shall, within 30 days, verify the conformity of the EIA programme, relevancy and sufficiency of the programme for assessing the environmental impact of the planned activity. The decision-maker shall make the decision to declare the EIA programme in conformity to the requirements.	October-November 2023
Preparation of the EIA report	Based on the EIA programme, the EIA expert group shall prepare the EIA report.	2024-2025
	The EIA programme shall be submitted to the decision-maker.	
Verification of EIA report eliciting comments	The decision-maker shall, within 21 days, verify that the EIA report is in conformity and submit it to the relevant institutions for eliciting comment.	
	The relevant institutions submit their comments within 30 days.	
	The decision-maker shall within 21 days review the comments from the relevant institutions and give its opinion on the relevancy and sufficiency of the EIA report.	
	The EIA expert group shall if necessary make corrections and addenda to the EIA report.	
	The decision-maker verifies the improved and supplemented EIA report within 21 days and involves in the proceedings, if necessary, any relevant institution whose position was not considered.	
Publication of the EIA report	The decision-maker provides notification within 14 days regarding the public display and public discussion.	
	The public display of the EIA report will last at least 30 days.	
	Public discussion of the EIA report will take place.	
Supplementation of the EIA report and submission for verifying conformity to the requirements	The EIA expert group will, within 30 days, on the basis of proposals and objections made regarding the EIA report, make the necessary corrections and addenda, clarify that the proposals and objections have been taken into consideration, or provide reasoning for why they were not considered, and respond to questions submitted.	

EIA stage[56]	*Content of stage and duration*	*Expected term for carrying out the stage*[57]
	After the public discussion, the report will be submitted to the decision-maker for verifying conformity to the requirements.	
Verification and declaration of the conformity of the EIA report to the requirements	The decision-maker shall submit the EIA report to the relevant institutions for endorsement, and they shall either endorse or withhold endorsement within 30 days.	
	Based on the endorsements, the decision-maker shall, within 30 days, verify the conformity of the EIA report to the requirements, the relevancy and sufficiency of the report and also whether proposals and objections submitted should be considered or not considered.	
	The decision-maker shall make the decision to declare the EIA programme in conformity to the requirements.	

8. Parties to the EIA and composition of the expert group

The parties to the EIA process in accordance with the Environmental Impact Assessment and Environmental Management System Act are the developer, expert and decision-maker (table 8-1).

Table 8-1. *Parties to the EIA*

Decision-maker, processor of superficies licence	*Developer*	*EIA carried out by:*
Consumer Protection and Technical Regulatory Authority	**Utilitas Wind OÜ**	**Roheplaan OÜ**
Contact: Liina Roosimägi E: liina.roosimagi@ttja.ee T: +372 667 2004	Contact: Kristiina Nauts E: kristiina.nauts@utilitas.ee	Contact: Riin Kutsar E: riin@roheplaan.ee

The environmental impact assessment is carried out under the direction of environmental consultancy Roheplaan OÜ in cooperation with other experts involved in the studies. The lead expert of the EIA is licensed EIA Riin Kutsar (EIA licence no. KMH0131). The expert group includes at least the members listed in Table 8-2.

Table 8-2. *Members of the EIA expert group*

Member of the working group	*Field/competence*	*Institution*
Riin Kutsar	EIA lead expert (licence KMH0131), BSc University of Tartu, environmental technology speciality (equivalent of a master's degree); MBA Estonia Business School Role: Process and team management, impact on natural environment, Natura assessment, assessment of the social and economic environment Member participating in preparation of the EIA programme	Roheplaan OÜ
Kaile Eschbaum	Environmental specialist; zoologist. BSc University of Tartu biology, zoology speciality (equivalent of a master's degree) Role: Impact on marine life, protected natural objects, Natura assessment. Cartographer Member participating in preparation of the EIA programme	Hendrikson & Ko OÜ

Member of the working group	*Field/competence*	*Institution*
Georg Martin	Expert on benthic life and habitats. PhD, University of Tartu, marine biology speciality Role: Impact on phytobenthos, zoobenthos, marine water quality, impact on plankton communities	University of Tartu, Estonian Marine Institute
Redik Eschbaum	Fisheries expert. MSc, University of Tartu, ichthyology and fisheries speciality Role: Impact on fisheries and fishing, including spawning areas	University of Tartu, Estonian Marine Institute
Leho Luigujõe	Bird expert, MSc, University of Tartu, zoology and animal ecology speciality Role: Impact on birds	Eesti Ornitoloogiaühing MTÜ / Taevasikk MTÜ
Kaarel Võhandu	Bird expert, MSc, University of Tartu, zoology and animal ecology speciality Role: Impact on birds	Eesti Ornitoloogiaühing MTÜ
Mart Jüssi Ivar Jüssi	Expert on seals. PhD, University of Tartu, zoology and animal ecology speciality Expert on seals. MSc, University of Tartu, biology speciality Role: Impact on seals	MTÜ Pro Mare
Oliver Kalda	Expert on bats. MSc, University of Tartu, zoology and hydrobiology Role: Impact on bats	Elustik OÜ
Kerttu Ots	Landscape architect. University of Life Sciences, MSc and the University of Edinburgh, MSc Role: Assessment of visual impact	WSP Global Inc.
Taavi Liblik	PhD, Tallinn University of Technology, marine physics speciality Role: Impact on hydrodynamics, wave action, wind conditions, spread of suspended solids, volume of sediments and hazardous substance content, ice-related risks, potential oil spill spread forecast	Tallinn University of Technology (TalTech)
Veiko Kärbla	Environmental specialist, BSc University of Tartu, environmental technology (equivalent of a master's degree) Role: Ambient air noise, vibration	Hendrikson & Ko OÜ

Member of the working group	*Field/competence*	*Institution*
Ivar Treffner	MA, University of Tartu, archaeology Role: Submarine archaeology	
Inga Zaitseva-Pärnaste	PhD, TalTech, civil engineering and environmental technology Role: impact of wind farm on ship traffic, maritime communication and maritime monitoring systems, AIS equipment, ship radars, impacts on water traffic due to changes in ice conditions.	TalTech EMERA
Anu Varblane	Analysis/study of social impacts	Kantar Emor AS
Olavi Grünvald	Analysis/study of economic impacts	Finantsakadeemia OÜ

In addition, those preparing studies to be conducted in the course of the EIA process (see list in Table 5-1) provide their own input to the EIA report. If necessary, additional experts/specialists are involved in the course of the EIA process.

9. Public engagement and overview of the publication of the EIA programme

9.1. Relevant institutions and stakeholders

Under legislation, publication of the EIA is in the remit and the task of the decision-maker. Parties to the proceedings, and information channels through which the notifications will presumably be sent out in the course of the EIA:

- *Ametlikud Teadaanded* (initiation, public display of programme and report, approval of programme and report).
- Newspaper (public display and discussion of programme and report).
- The public display and public discussion of the EIA programme and report are announced by letter pursuant to subsection 16 (3) of the EIAEMSA.

A list of the interested institutions and persons is provided in Table 9-1. The definition of relevant institutions was initially based on the specifications of the decision to initiate EIA and supplemented upon preparation of this programme. The list submitted is the proposal on the part of the EIA programme compiler regarding, at minimum, the parties to be notified by letter. The decision-maker shall make the final decision on who is to be notified.

Table 9-1. *A list of the interested institutions and persons.*

Institution or person	*Reason for involving them in the proceedings*	*Notification form*
Ministry of Finance	Is responsible for spatial planning in the country and is involved in projects as the representative of their area of responsibility and representative of the area of competence. Organizes preparation of the maritime thematic plan	To be notified by email
Ministry of Economic Affairs and Communications	Maritime policy, ports, port infrastructure. Energy sector	To be notified by email
Ministry of the Environment	Involved in projects as the representative of their area of responsibility and representative of the area of competence.	To be notified by email
Estonian Environmental Board	Administrator of protected natural objects	To be notified by email
Ministry of Defence	Involved in projects as the representative of their area of responsibility and representative of the area of competence.	To be notified by email
Ministry of the Interior	Internal security	To be notified by email

Institution or person	*Reason for involving them in the proceedings*	*Notification form*
Ministry of Rural Affairs	Fisheries and aquaculture	To be notified by email
Transport Board	Ports, waterways, port basins, anchorages and navigational markings; aviation safety	To be notified by email
Heritage Board	Cultural assets, including underwater cultural heritage	To be notified by email
Police and Board Guard	Performing search and rescue in Estonian rescue district	To be notified by email
Navy	Maritime border guard and security, discovering marine pollution, organizing localization and cleanup	To be notified by email
Environmental Agency	Organizer of national environmental monitoring	To be notified by email
Agriculture and Food Board	Organization of professional fishing	To be notified by email
Health Board	Health protection and safety	To be notified by email
Kihnu Municipality Government Pärnu City Government Ruhnu Municipality Government Lääneranna Municipality Government Häädemeeste Municipality Government Saaremaa Municipality Government	Local governments in the wind farm's influence area or local governments potentially impacted by cable connections	To be notified by email
Chamber of Estonian Environmental Associations	Association of NGOs Promoting Environmental Protection	To be notified by email
Eesti Kalurite Liit MTÜ (non-profit fishermen's association) Liivi Lahe Kalanduskogu MTÜ (non-profit fishing council) Läänemaa Rannakalanduse Selts MTÜ (non-profit coastal fishing society)	Fishermen's lobby groups	To be notified by email

Institution or person	*Reason for involving them in the proceedings*	*Notification form*
Area inhabitants	The planned activity may impact inhabitants in the region	Notified through the newspaper and local media.

Cooperation

The community will be engaged continuously in the course of planning the additional Saare-Liivi offshore wind farm area (part).

9.2. Cross-border impact and cross-border engagement

Considering the size and location of the planned Saare-Liivi offshore wind farm, this activity may have a cross-border impact and a cross-border environmental impact assessment must be conducted.

The impact from the Saare-Liivi offshore wind farm may manifest as follows:

- The potential unfavourable cross-border impact on birds during construction and operation in the form of migration obstacles and loss of key feeding and stopover areas.
- Potential unfavourable cross-border impact in the construction phase of the planned activities (noise, spread of sediments etc.) on fish and seals.

The cross-border impact assessment is organized in accordance with procedure set forth in international agreements, cross-border environmental impact assessment convention (Espoo convention) and the EIAEMSA. The cross-border impact assessment process and engagement will be led by the Ministry of the Environment, all relevant notification and feedback documents are set out as annexes to this document.

9.3. Positions of the relevant authorities and how they will be considered

Pursuant to Section 15[1] of the EIAEMSA, prior to publication of the EIA programme, a position must be elicited from all relevant authorities. TTJA presented the EIA programme to institutions for comment on 18 April 2023 (letter no. 16-7/21-02502-126).

The Health Board, Rescue Board's Western rescue centre, Transport Board and Ministry of Economic Affairs and Communications informed the TTJA in a letter that they lack additional positions and recommendations in regard to the draft EIA programme.

The Saaremaa Rural Municipality Government, Lääneranna Rural Municipality Government, Häädemeeste Rural Municipality Government, Ministry of the Environment, Ministry of Rural Affairs, Police and Border Guard Board, Environmental Board, Heritage Board, Ministry of Finance and Environmental Agency sent their positions to the TTJA. The positions form the relevant institutions (see the full letters attached to Annex 2) and responses to them are set out in Table 9-2 below.

Table 9-2. *Positions submitted by relevant authorities to the EIA programme and responses from the EIA expert group in cooperation with the developer*

Positions received	*Response of the EIA expert group in cooperation with developer*
Lääneranna Municipality Government (no. 2023/8-1/566-2, 3 May 2023)	
The Lääneranna Municipality Government does not have suggestions and comments in regard to the content of the draft EIA programme for Utilitas Wind	On the basis of the proposal, the EIA programme table 9-1 was updated. List of interested institutions and persons.

Positions received	*Response of the EIA expert group in cooperation with developer*
OÜ's Saare-Liivi offshore wind farm but we propose to add to the list of persons engaged MTÜ Läänemaa Rannakalanduse Selts (email info@lrs.ee, telephone:+372 5301 9815, https://lrs.ee/). All of Lääneranna Rural Municipality is within the non-profit's operating area.	
Saaremaa Municipality Government (no. 8-5/2462-2, 5 May 2023)	
The draft EIA programme does not make evident the total power output of the wind farm, will the total number of turbines remain the same as originally planned.	The total power output from the wind farm depends on the number of wind turbines and the power output of each turbine. During the EIA, the power rating of the turbines will be evaluated in the range of 14-20 MW. Chapter 2.3 of this EIA programme notes that under the EIA programme for Saare-Liivi offshore wind farm declared in conformity with the requirements, up to 160 electric turbines are being planned for the original part encumbered. The number of electrical turbines planned for the additional area is up to 92. The precise number of turbines and parameters thereof will become evident during the EIA process, once the area-specific studies have been performed, showing the environmental sensitivity/tolerance of the planned superficies licence area. On this basis, it will become evident what the parameters will be and how many turbines can be actually placed in the area. This information will be set out in the EIA report (reports).
For clarity, the original superficies area – whose southern part will be moved under the new application – should be indicated on Figure 2.1.	The original area to be built up has been added to figure 2-1 based on the proposal.
Hydrogen generation has been mentioned, but not what part of the electricity is planned for hydrogen generation	The passage dealing with hydrogen technology can be found in chapter 2.3 of this EIA programme. As of the time of preparation of this EIA programme, Utilitas Wind does not plan specific (technical) solutions at the offshore wind farm for dealing with the hydrogen topic, e.g. production of hydrogen in the wind farm and transport via pipeline to the mainland (in other words, hydrogen pipe). At the same time, the planned offshore wind farm will be developed
Is hydrogen fuel production planned for the wind farm territory and has a hydrogen pipe been planned next to the power cable	

Positions received	*Response of the EIA expert group in cooperation with developer*
	such that it could be connected to hydrogen technology solutions with minimal modifications. The EIA report thus considers specific development options related to the hydrogen topic at the conceptual level (i.e., technical solutions not planned in detail). Producing hydrogen from the power generated at Saare-Liivi offshore wind farm can be arranged in various ways if it proves upon more detailed design development whether the hydrogen production unit can be cost effectively established in the immediate proximity to the offshore wind farm cable clearance or on the territory of the offshore wind farm. Should solutions that are parts of the offshore wind farm emerge during the EIA process, the planned activities at sea will be assessed in the framework of this EIA and if connecting the offshore wind farm to a hydrogen plant on e.g. the mainland is considered, a separate project will be prepared along with assessment of the environmental impacts.
Since the Tuuletraal OÜ wind farm is already planed next to the adjoining maritime area, we believe that the EIA processes could be combined, or the combined effect of the wind farms be considered if the EIA is done separately for both wind farms.	The marine area set out in Tuuletraal OÜ's application for superficies licence is not listed as a suitable area for wind energy in the Estonian maritime spatial plan and the Ministry of finance has asked TTJA to analyse whether achieving the objective desired by the Tuuletraal OÜ application for superficies licence is even possible (the details are described in Ministry of finance letter no. 15-1/3653-2 p2 of 25 May 2022 sent in the Tuuletraal OÜ superficies licence proceedings process). In the letter no. 16-7/19-3332-070 of 7 July 2022, the TTJA has recommended that Tuuletraal OÜ withdraw the application for superficies licence. In addition, combining EIAs may take place only with the consent of the developer(s) (subsection 11 (7) of the EIAEMSA). The Tuuletraal OÜ offshore wind farm is not currently all that realistic for EIA processes to be combined and the combined effects of the offshore wind farm to be taken into consideration. If the circumstances related to Tuuletraal OÜ developments change during this
What are the possibilities in cooperation with Tuuletraal OÜ for establishing joint transmission lines, as transmission lines on the seabed also have electromagnetic impacts on sea life.	

Positions received	*Response of the EIA expert group in cooperation with developer*
	EIA process, the assessment of combined effects will be based on table 5.1, under 4.1. According to Table 5.1, point 1.5 in the EIA programme, the impact of the electromagnetic fields inside and outside the wind farm will be assessed.
The quantities of lessened air pollution from realization of the project compared to power generation based on oil shale should also be assessed as part of the EIA.	EIA programme Table 5.1, point 1.11 describes the principles for assessing the impact on the climate and specifies that the offshore wind farm's impact on the climate will be positive. The magnitude of the positive impact depends on the final rated output of the offshore wind farm and the amount of electricity this generated. The EIA report gives a report on how much less CO2 is emitted per kwh of power generation from the offshore wind farm than is given off by a power plant running on fossil fuels.
Ministry of the Environment (no. 16-3/23/1640-2, 11 May 2023)	
We propose to consider the topic "impact of climate change on the planned activity" during the EIA. For example, is the planned activity affected by the risk of storms and strong winds, is there a risk of freeze-thaw damage, etc. The aim is to map the risks arising from climate change and, if necessary, to plan risk mitigation measures.	Ensuring climate resistance is important when planning development activities. When designing technical solutions (including when preparing detailed project solutions and performing strength calculations after preparation of the EIA, but before construction of the wind farm), it is natural and in the developer's interests to consider the best available knowledge about possible extreme weather conditions. The EIA report takes into account, among other things, the work prepared by the Environmental Agency in 2014 "Estonian future climate scenarios up to 2100" and highlights the risks associated with climate change occurring in the development area. The planning of risk mitigation measures is part of the development of the technical solution, so it is not dealt with during the environmental impact assessment.
The EIA programme states that "an additional EIA report will be prepared for the additional area of the Saare-Liivi offshore wind farm (with related additional procedural actions) if necessary." For the sake of clarity, please specify what is meant by this approach.	The possible alternatives of the further EIA procedure are specified in points 3-4 of the resolution part of TTJA decision no. 1-7/23-063 of 9 March 2023. We provide another explanation below. The environmental impact of the original and additional area of the Saare-Liivi offshore wind

Positions received	*Response of the EIA expert group in cooperation with developer*
	farm is assessed during the same EIA procedure (with which the EIA procedure of the submarine cable line connected to the main grid has also been merged under TTJA decision no. 1-7/22-473 of 22 December 2022). Clause 3 of the resolution part of TTJA decision of 9 March 2023 stipulates that an additional EIA programme (this EIA programme) will be drawn up for the additional area of the Saare-Liivi offshore wind farm and, if necessary, an additional EIA report with related additional (procedural) actions. Please note that, if possible, one comprehensive EIA report *(regarding the initial area of the Saare-Liivi offshore wind farm, the additional area and the submarine cable line connecting to the main grid)* will be prepared in the EIA procedure, but at the moment the possibility and feasibility of preparing one comprehensive EIA report is unknown. Namely, since this EIA programme for the additional area of the Saare-Liivi offshore wind farm will be prepared later than the EIA programme for the original area of the Saare-Liivi offshore wind farm (which also included the submarine cable line connecting to the main grid), it may also affect the timing of the studies for the additional area of the Saare-Liivi offshore wind farm. Therefore, in order to speed up the procedure, if necessary separate EIA reports will be prepared for the original and additional areas of the Saare-Liivi offshore wind farm (the earlier EIA report also deals with the submarine cable line connecting to the main grid in such a case). In turn, the later EIA report will assess the cumulative effects related to the Saare-Liivi offshore wind farm as a whole, including cumulatively with other similar projects. In the event that separate EIA reports are prepared, both EIA reports will be processed in accordance with the Environmental Impact Assessment and Environmental Management System Act, by carrying out all the required procedural actions for each EIA report (including asking for the opinion of the relevant authorities, publication, verifying compliance with the requirements and making a decision to recognize it as meeting the requirements). A broader-based involvement can be pointed out as a positive side

Positions received	*Response of the EIA expert group in cooperation with developer*
	of this. In such a case, if necessary, it is possible to grant a superficies licence for the initial and additional area of the Saare-Liivi offshore wind farm as partial management acts (point 4 of the resolution of the TTJA decision of 9 March 2023).
Häädemeeste Municipal Government (no. 5-1/604-1, 16 May 2023)	
We note that Häädemeeste municipality does not support the construction of offshore wind farms in the Gulf of Livonia on the scale currently being planned through various superficies licence applications. If, during the preparation of the EIA programme for the Saare-Liivi offshore wind farm or in the EIA report, it turns out that the Saare-Liivi offshore wind farm has a synergistic effect with the offshore wind farms planned closer to the coast of Häädemeeste Municipality, we would definitely want a visualization to be prepared. If, during the preparation of the EIA programme or in the report, it becomes evident that in the environmental impact assessment programme of the additional area to be encumbered by the Saare-Liivi marine wind farm, the connection to the main grid in Kilingi-Nõmme must be considered as an alternative to the proposed land connection, the position of the Häädemeeste Municipality must currently be considered to be expressed in letter no. 5-1 sent by the municipality to the Ministry of Finance on 16 February 2022 /197-1, in which we presented our own explanations as to why we do not support the planning of a land-based electricity connection through Häädemeeste Municipality.	Positions noted.
Ministry of Rural Affairs (no. 6.2-15/772-13, 16 May 2023)	
The Ministry of Rural Affairs has no objections to the EIA programme. At the same time, we consider it important that the encumbering of the planned area with infrastructure and the protection zones resulting from them not have a significant impact on commercial fishing activities taking place in these fishing areas and on the vessels going out to sea for fishing, which is why we ask that the Estonian Fishermen's Association be included in the procedural process of granting a superficies licence.	The position will be taken under advisement. Table 9-1 of the EIA programme. The Estonian Fishermen's Association is one of the entries on the list of the interested institutions and persons.
Police and Board Guard (PPA) (no. 2.1-3/9570-3, 18 May 2023)	
The document states that cooperation with the Transport Board will take place in preparing analyses and the methodology will be introduced to the Transport Board. Since the PPA is responsible for	The proposal will be taken into account and cooperation will be made when preparing the analyses, and the methodology will be presented to, among others, PPA.

Positions received	*Response of the EIA expert group in cooperation with developer*
conducting search and rescue operations in the Estonian rescue area, it would be important to cooperate in preparing the analyses and introduce the methodology to the PPA as well, because the additional area of the planned offshore wind farm may affect search and rescue operations by surface vessels and aircraft and medical flights from small islands	
Changes should be made to Table 9-1 as a result of the changes in the main functions of the institutions on 1 January 2023 as follows: Police and Border Guard Board – conducting search and rescue operations in the Estonian rescue area. Navy – maritime border guard function and security, organization of marine pollution detection, localization and cleanup.	Based on the proposals, corresponding corrections have been introduced in Table 9-1.
Environmental Board (no. 6-3/23/7880-2, 18 May 2023)	
Please review the EIA programme and specify how many EIA reports will be prepared to deal with the environmental impacts of the planned Saare-Liivi offshore wind farm and related infrastructure, and if several EIA reports are prepared, how the EIA procedures will be carried out and how a comprehensive assessment of the environmental impact of the planned offshore wind farm in Saare-Liivi and related infrastructure will be presented. /.../ It remains unclear whether the EIA reports of the initial and additional area of the Saare-Liivi offshore wind farm and the construction of the undersea cable line will be formalized as one or more reports, how they will be processed and what it depends on. Please review the EIA programme in this regard. We also note that one joint EIA report provides a more comprehensive picture of the environmental impacts of the planned Saare-Liivi offshore wind farm than several reports.	The possible alternatives of the further EIA procedure are specified in points 3-4 of the resolution part of TTJA decision no. 1-7/23-063 of 9 March 2023. We provide another explanation below. The environmental impact of the original and additional area of the Saare-Liivi offshore wind farm is assessed during the same EIA procedure (with which the EIA procedure of the submarine cable line connected to the main grid has also been merged under TTJA decision no. 1-7/22-473 of 22 December 2022). Clause 3 of the resolution part of TTJA decision of 9 March 2023 stipulates that an additional EIA programme (this EIA programme) will be drawn up for the additional area of the Saare-Liivi offshore wind farm and, if necessary, an additional EIA report with related additional (procedural) actions. Please note that, if possible, one comprehensive EIA report (regarding the initial area of the Saare-Liivi offshore wind farm, the additional area and the submarine cable line connecting to the main grid) will be prepared in the EIA procedure, but at the moment the possibility and feasibility of preparing one comprehensive EIA report is unknown. Namely, since this EIA programme for the additional area of the Saare-Liivi offshore wind farm will be prepared later than the EIA programme for the original area of the Saare-Liivi offshore wind farm (which also included the

Positions received	*Response of the EIA expert group in cooperation with developer*
	submarine cable line connecting to the main grid), it may also affect the timing of the studies for the additional area of the Saare-Liivi offshore wind farm. Therefore, in order to speed up the procedure, if necessary separate EIA reports will be prepared for the original and additional areas of the Saare-Liivi offshore wind farm (the earlier EIA report also deals with the submarine cable line connecting to the main grid in such a case). In turn, the later EIA report will assess the cumulative effects related to the Saare-Liivi offshore wind farm as a whole, including cumulatively with other similar projects. In the event that separate EIA reports are prepared, both EIA reports will be processed in accordance with the Environmental Impact Assessment and Environmental Management System Act, by carrying out all the required procedural actions for each EIA report (including asking for the opinion of the relevant authorities, publication, verifying compliance with the requirements and making a decision to recognize it as meeting the requirements). A broader-based involvement can be pointed out as a positive side of this. In such a case, if necessary, it is possible to grant a superficies licence for the initial and additional area of the Saare-Liivi offshore wind farm as partial management acts (point 4 of the resolution of the TTJA decision of 9 March 2023).
Chapter 3.7 of the EIA programme: We ask you to update the goals specified in chapter 3.7 of the EIA programme, as the Riigikogu approved the renewal of the "Principles of Climate Policy up to 2050" on 8 February 2023 set Estonia's long-term goal of achieving climate neutrality by 2050. The full text of this document can be found in the Riigi Teataja (State Gazette), and additional information can also be found on the website of the Ministry of the Environment.	The information in Chapter 3.7 has been updated.
Chapter 4.1.5 of the EIA programme and point 1.9 of Table 5-1: Please make a correction reflecting that there will be no protected natural features in the additional area of the proposed Saare-Liivi offshore wind farm, as protected species such as seals and seabirds are mentioned in the EIA programme. According to clause 4 (1) 3) of the Nature Conservation	Based on the comment, the text has been corrected.

Positions received	*Response of the EIA expert group in cooperation with developer*
Act, protected species are included among protected natural objects.	
Chapters 4.1.5 and 6 of the EIA programme: Chapter 4.1.5 of the EIA programme deals with the protected natural objects located in the additional area of the Saare-Liivi offshore wind farm and its zone of influence. Chapter 6 of the EIA programme specifies the areas of the Natura 2000 network that lie within the zone of influence of the planned activity. To clarify, during the EIA, based on the data of the conducted studies, the potential influence area of the planned activity must be determined and the impact of the planned activity must be assessed based on the protection goals of all areas of the Natura 2000 network and domestic areas within the influence area. In the course of the EIA, the list of Natura 2000 network areas and domestic areas within the influence area of the planned activity may also change, and the impact on these must then be assessed during the EIA.	Chapter 6 deals with the areas of the Natura 2000 network within the possible influence area of the additional area of the Saare-Liivi offshore wind farm. If, based on the studies carried out during the EIA, it turns out that the influence area turns out to be larger than assumed in this EIA programme, then the respective additional protected areas not mentioned in this EIA programme (including Natura areas) will be discussed either in the respective subsections of the EIA report of the evaluation of nature protection objects or of the Natura assessment.
The Estonian Ornithological Society has submitted proposals for IBA candidate areas and areas that still need to be studied in this context ("Upgrading of marine bird areas of international importance", Estonian Ornithological Society, 2023), several of which fall within the influence area of the additional area of the Saare-Liivi offshore wind farm (as well as the initial Saare-Liivi offshore wind farm area and influence area). These areas have already been approved by Bird Life International. We ask that this work be taken into account when carrying out the EIA. The Estonian Ornithological Society is currently preparing a proposal for national protection on the basis of these areas, which will be submitted to the Ministry of the Environment in the near future to initiate the procedure.	As far as we know, the IBA candidate areas mentioned in the proposal do not fall within the proposed offshore wind farm areas. The IBA candidate area lies in the area between the initially proposed offshore wind farm and Kihnu Island. If the proposal of IBA candidate areas reaches the Estonian nature information system, the planned protected area will be taken into account when preparing the EIA report.
Description of the planned activities of the EIA programme, table 5-1: During the EIA, we ask for an estimate of the approximate volume of material that will be dredged, dumped and/or deposited in the body of water.	In a subsection of point 1.4 of Table 5-1, coverage of the topic has been expanded and made more specific.
Point 1.3 of Table 5-1 of the EIA programme: For clarity, add that the seabed biota and habitat are also affected when dredged soil is placed on them.	Based on the proposal, the wording has been supplemented.
Clause 1.4 of Table 5-1 of the EIA programme: According to Table 5-1, one of the influence areas to be assessed is the seabed and seabed sediments; among other things, studies are planned. We ask that a	The list of experts and/or their areas of responsibility in Table 8-2 has been updated.

Positions received	*Response of the EIA expert group in cooperation with developer*
member of the expert group responsible for the relevant field be identified in the EIA programme. The same proposal in terms of point 3.1 of Table 5-1, because unlike table 8-2 of the EIA programme for the initial area of the Saare-Liivi marine wind farm, the corresponding expert is not named in the EIA programme for the additional area.	
Clause 1.7 of Table 5-1 of the EIA programme /.../ Please add to the EIA programme which species (the list of important breeding species in the Kihnu Archipelago is lengthy) for which telemetry research will be carried out and how many years it will take to obtain reliable results. We note that the impact on feeding flights and nesting birds is not mentioned in Chapter 6 of the EIA programme (preliminary Natura assessment). We ask that the Natura preliminary assessment be updated in this regard, including specifying the study's methodology.	The telemetry survey will be carried out in 2023, during which it is planned to equip the following species with transmitters: tufted tern (10 individuals if nesting in Kihnu's islets during the survey year); tern (15 individuals); tern (15 individuals); cormorant (10 individuals if nesting on Kihnu's islets during the study year); herring gull (up to 10 individuals, if nesting on Kihnu's islets during the survey year). A corresponding supplement has been added to the research methodology. In Chapter 6, a clarification has been added that the impact on the birds of the bird area can affect, among other things, the birds' feeding flights. The research methodology will not be repeated, because in accordance with points 1-10 of Table 5-1, the Natura assessment relies, among other things, on the studies carried out during the EIA procedure.
Clause 1.8 of Table 5-1 of the EIA programme: /.../ We ask you to explain why ship censuses were not necessary for the additional area. /.../	The reason that ship censuses were waived was the experience gained during the autumn migration season of 2022. In autumn 2022, the aim was to conduct bat censuses from ships over the course of 14 nights on the original Saare-Liivi wind farm area, but due to the weather conditions, it could only be done over 8 nights. In the areas to the west and south-west of Kihnu, strong winds arose mostly at night. Further out to sea, weather conditions are generally even worse. In addition, the experience of 2022 suggests that ship censuses are probably not an effective method for identifying bats at sea.
Clause 1.9 of Table 5-1 of the EIA programme: In addition, according to the EIA programme: "*Analysis of map layers and expert assessment on the basis of previous studies, Estonian Nature Information System (EELIS), inventories conducted, species protection action plans, scientific literature and studies carried out in the EIA proceedings*." We ask you to specify in the EIA	It is not necessary to make an update, as the last part of the sentence referred to in the proposal already does so: "...studies carried out in the EIA proceedings."

Positions received	*Response of the EIA expert group in cooperation with developer*
programme that according to the other points of Table 5-1 of the EIA programme, it is planned to carry out various studies (e.g. to assess the impact on birds, seals), and therefore the impact on protected natural objects will not be assessed solely on the basis of map analyses or action plans. As stated in point 3 of this letter, protected species are also included as protected natural objects.	
Clause 1.11 of Table 5-1 of the EIA programme: According to the EIA programme, the EIA report addresses the effects of local climate change such as currents, waves, and changes in ice cover. An expert assessment will be compiled based on previous studies, scientific literature, professional literature and expert knowledge In doing so, we ask you to use the so-called climate impact assessment guidelines being prepared by the Ministry of the Environment (when completed), which will probably provide for a more detailed impact assessment than that specified in this EIA programme (i.e., how to more precisely analyse the impact of the planned activity on the climate and the impact of the changing climate and natural environment on the planned activity).	No update will be made to the EIA programme at the moment. The mentioned guidelines is still in the preparation stage and has drawn sharp criticism and response, so relying on it is questionable at the moment. The position presented in the proposal has been noted. If climate impact assessment guidelines recognized by all participants in the EIA procedure have been accepted by the time of the preparation of the EIA report, it will be relied upon in the preparation of the EIA report.
Clause 4.1 of Table 5-1 of the EIA programme: When preparing the EIA report, it is planned to assess the combined effects of the entire planned Saare-Liivi offshore wind farm and the effects stemming from its infrastructure. For clarity, we propose to take into account, among other things, the cumulative impact during construction, e.g. cumulative impact of noise during ramming, cumulative impact of suspended solids during dredging, if several wind power plants are built at the same time.	The expert group does not consider it justified to supplement the EIA programme in this case. In point 4-1 of Table 5-1 of the EIA programme, it is clearly stated that "During preparation of the EIA report, combined impacts will be assessed throughout impacts resulting from the planned Saare-Liivi offshore wind farm and its infrastructure." At the moment, it is premature to name the expected resulting impacts, if the evaluation stage of the EIA report has not yet been reached and an assessment of all impacts has not been carried out.
Table 5-1 of the EIA programme: At some points in the table (e.g. in points 1.4, 1.5 and 1.6), it is stated that environmental measures (including monitoring) will be developed during the EIA if necessary. In the course of the EIA, environmental measures, including monitoring, must be developed in regard to all impacts where it proves necessary, e.g. impact on water quality, impact on seabed habitats and life, impact on birds, etc. (basis: Section 7 of Minister of Environment regulation no. 34 of 1 September 2017, "Detailed requirements applicable to content of environmental impact assessment reports"). We ask that Table 5-1 of the EIA programme be updated accordingly or that part of the	Chapter 5 has been supplemented with the general principle of environmental measures. The coverage in Table 5-1 is up-to-date in the places mentioned.

Positions received	*Response of the EIA expert group in cooperation with developer*
table be deleted and that the general principle of the aforementioned regulation be set out in Chapter 5 of the programme.	
Table 5-1 of the EIA programme: We propose that the impact assessment part of wind turbine removal (the last paragraph of page 41 of the programme) should also be included in table 5-1 of the EIA programme, which summarizes the impact that will be assessed during the EIA and how this will be done.	The expert group does not consider it justified to update the EIA programme at the moment, or reasonable to repeat the part about the assessment of the impact of the removal of wind turbines in Table 5-1. In the general part of the methodology in Chapter 5, it is stated: "The expected environmental impact will be assessed in the EIA report in connection with construction and use of the offshore wind farm and the impact of removal of the turbines as a theoretical assessment will also be examined to the extent allowed by current information."
The link in footnote 53 (page 58) is out of date. Natura assessment guidelines (Kutsar, R.; Eschbaum, K. and Aunapuu, A. 2019. Instructions for carrying out Natura assessment in the implementation of Article 6(3) of the Nature Directive in Estonia. Customer: Environmental Board) link is: https://envir.ee/media/4372/download The reference to the Environmental Impact Assessment and Environmental Management System Act on page 58 is also out of date, the right one is: Clause 3 (1) 2) of the Environmental Impact Assessment and Environmental Management System Act	Corresponding corrections have been made in the EIA programme.
The environmental register is referred to in the EIA programme. We note that the Environmental Register Act is no longer in force as of 6 June 2022 and the Environmental Register as such no longer exists. On the basis of § 395 of the General Part of the Environmental Code Act, the database "Estonian nature information system" has been established, i.e. please refer to "EELIS (Estonian nature information system), Environmental Agency" when using the data in the future.	Noted; a corresponding correction has been made to the EIA programme.
Heritage Board (no. 1.1-7/871-9, 18 May 2023)	
The coverage of underwater cultural heritage is inadequate in the draft EIA programme and not relevant in regard to underwater archaeological investigation. Cultural heritage is a non-renewable resource. Destroyed or ruined cultural heritage – the status quo ante – cannot be restored. Thus, the expected risk to cultural heritage is significant in the case of all	We confirm that in the course of the EIA, impact on underwater cultural heritage will be assessed to ensure its preservation and condition as the Heritage Board has set as an objective in its position. In the course of the EIA, the direct and indirect significant environmental impact of the planned activity will be determined for cultural heritage as well, and the impact is described and assessed in EIAEMSA subsection 3[1] (2)).

Positions received	*Response of the EIA expert group in cooperation with developer*
activities related to establishment of the offshore wind farm that endanger the preservation or good status of heritage. Underwater cultural heritage must be considered when building a wind farm, among other things, the locations of turbines and antiquities must not overlap, and preservation of underwater cultural heritage located in the influence area related to the wind farm must be preserved and measures taken for alleviating potential negative impacts.	The EIA is intended for assessing the impacts of the planned activities, not for abstract studies. The specific planned activities in this case are the erection and operation of offshore wind farm structures (turbines, substation, cables). It should be taken into account that, on a large part of the area covered by the superficies licence proceedings, no buildings will be erected (nor will indirect impacts of construction activity be manifested). Underwater cultural heritage will not be damaged in areas unaffected by construction activity (and its impact/influence area), i.e. there is no reason to conduct full-scale underwater archaeological research in these areas. Under the current rules, the superficies licence proceedings will be followed by design development and application for a building permit. The locations of wind turbines and cables will not be set during the EIA. They will only be established in the preliminary building documentation that serves as the basis of the building permit. In other words, the granting of a superficies licence by itself cannot damage the cultural heritage in any way. Due to the aforementioned circumstances, during the preparation of the EIA, it will first be determined, using sonar, whether at least in the area of the offshore wind farm there are any underwater cultural heritage objects that may require more detailed studies in the next stage. This is in the event that the wind turbine foundation or cable is planned during the design process in such a way that there may be a negative impact on potential cultural heritage. Before potential objects are mapped in the first stage, the extent of the objects' influence area cannot be determined more precisely in the EIA programme. If such objects have been identified as a result of the study, their potential influence area will be defined during the EIA, and it must be taken into account in designing the wind turbines. If, in the design development phase, the influence area of the planned construction/building extends to these objects and may endanger them, an underwater archaeological investigation will be carried out in accordance with Section 10 of Minister of Culture
Due to the expected impacts on underwater cultural heritage, it is important to conduct an underwater archaeological investigation in the area of the Saare-Liivi offshore wind farm, including the additional area. (Section 32 of the Heritage Conservation Act, clause 13 (1) 6) of the Environmental Impact Assessment and Environmental Management System Act). The environmental impact assessment programme must define the expected impact area and sources of impact on underwater cultural heritage; among other things, the scope of the influence area may be different during construction, maintenance and removal. The expected impact associated with the establishment of a wind farm is greater than the "area under a specific infrastructure" mentioned in the draft. The underwater archaeological investigation must be carried out in the entire area expected to affect the underwater cultural heritage, not limited to the area under the structures. It must be taken into account that some historical wrecks may pose a threat to the environment, and a change in their condition during the construction of a wind farm may lead to environmental pollution. An underwater archaeological investigation must be carried out as part of the EIA to ensure an appropriate impact assessment and to identify the direct and indirect significant environmental impact of the proposed wind farm on the underwater cultural heritage. In the draft EIA programme, the time for conducting the underwater archaeological survey is defined as "before construction", which is not appropriate, because in this case the impacts on the underwater cultural heritage will go essentially unassessed, i.e. the important elements of the affected environment have not been identified and the superficies licence issuer does not have relevant information to determine the conditions of the superficies licence.	

Positions received	*Response of the EIA expert group in cooperation with developer*
The underwater archaeological investigation consists of two stages: 1) high-resolution sonar study in the corridor of the submarine cable line and its influence area. As a result of the study, any objects of human origin must be identified starting from one metre; 2) for the purpose of determining the origin, documenting and assessing the condition of any objects of cultural value, use of video or photo documentation using photogrammetry or other technology or method with equivalent result, and in the case of a wooden wreck, dendrochronological study if the age of the wreck cannot be confirmed by other methods. The study results will be the basis for the EIA of underwater cultural heritage.	Regulation no. 25 of 25 May 2019 and in accordance with the requirements in sections 46-48 and 68-69 of the Heritage Conservation Act, as requested by the Heritage Board as well. Thus, the objective set by the plan presented in the EIA programme is to ensure that it is impossible for the foundations and cables of the wind turbines to harm underwater cultural heritage in the actual construction and influence area. The claim that only the "area under a specific infrastructure" will be taken into account for the expected impact is not accurate. We also do not agree that the impacts on underwater cultural heritage will essentially go unassessed - the impacts of the planned activity will be appropriately assessed before implementation and the negative effects mitigated if necessary. The studies will be carried out as a sequence of logical steps, pursuant to the degree of accuracy of the procedural phase. The EIA programme has considered all of the expected impacts (in addition to the location of the specific structure, also anchoring, erosion etc.). Therefore, not only the area specifically under the structures (the EIA programme states that the area of the structures will be affected "primarily"), but also the immediate surroundings of the foundations and the area of the cable corridors in a broader sense (that is, the area where the effects of anchoring and erosion can appear in the first place) are considered the influence area. In contrast to immovable property, i.e. specifically demarcated plots of land *(where an archaeological survey must already be carried out during the EIA if the prerequisites of Section 31(3) of the Heritage Conservation Act are met, i.e. the existence of cultural heritage is justified)*, Section 32(2) of the Heritage Conservation Act unequivocally stipulates that a study/investigation must be conducted in internal waters, territorial seas, border water bodies or economic zones before construction, including the installation of infrastructure and equipment or the planning of other activities that may threaten the preservation of underwater

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	cultural heritage. Therefore, current law is also based on an approach according to which the underwater archaeological investigation must be carried out before construction, i.e. during the design process, when the impact of a specific construction/building may pose a threat to underwater cultural heritage. For the same reason (i.e., a specific object is involved) the expense on the research is not subject to compensation (clause 32 (3) 2) of the Heritage Conservation Act). We draw your attention to the fact that the same approach is also recognized as meeting the requirements of TTJA decision no. 16-7/21-02502-095 of 22 December 2022 in the Saare-Liivi offshore wind farm EIA programme.
The underwater archaeological investigation may be carried out by a company which employs a person with competency certificates in the respective area and who has submitted a notice of economic activity regarding operating in the heritage conservation field (pursuant to Sections 68-69 of the Heritage Conservation Act). Before carrying out the study, the competent person must submit to the Heritage Board a research plan and notice, and after carrying out the research, a research report (sections 46-48 of the Heritage Conservation Act). The sonar study intended as a part of the underwater archaeological investigation may be combined with other planned sonar investigations. It is also possible to use data from high-res sonar studies already performed if they were collected regarding the area earlier and meet the requirements. In either case, the competent person must analyse the data and submit a report to the Heritage Board.	Taken under advisement.
Ministry of Finance (no. 15-7/2783-2, 18 May 2023)	
Point 3 of the programme addresses how the planned activity is linked with strategic planning documents: a. 3.12. Estonian maritime strategy. Considering that the action plan of the Estonian marine strategy has been updated and it has been approved by Minister of the Environment directive no.	Based on the proposal, sections 3.12 and 3.13 have been supplemented and updated.

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16-7/23/5 of 22 February 2023, this point should be updated in the EIA programme. b. 3.13. Estonian maritime spatial plan. In the previous points of the programme, the dates of adoption, establishment, etc. of strategic planning documents are indicated, but this has not been indicated for Estonian maritime spatial planning. Nor is it stated how the planned activity is in harmony with the maritime spatial plan.	
Chapter 5.6.5 of the Estonian Maritime Spatial Plan contains guidelines and conditions for wind energy. Point 12 of the conditions contains the points that must be evaluated at the level of the permit procedure/EIA for resolving wind turbine locations and technological issues. The following conditions are missing or insufficiently covered in the submitted program: a. Condition 12 h – assess the impact of the planned activity and possible icebreaking operations on the changes in ice cover and the mobility of sea ice; b. condition 12 t – to cooperate with the Ministry of Rural Affairs in the placement of wind turbines in areas that coincide with trawl fishing, to analyse the economic effects of trawl fishing on the fishing sector; c. condition 12 l – to set the conditions for the demolition of wind turbines, including considering the additional damage to benthic biotopes caused by removal of foundations of wind turbines.	The EIA programme was updated accordingly: a. An addendum was added to Table 5-1 p 1.1 to assess the impact on the ice cover, including the assessment of the impact of the planned activity and possible icebreaking operations on changes in ice cover and sea ice mobility. b. Based on point 3.3 of Table 5-1, the economic impacts on the fishing sector are assessed. An addendum was added stating that cooperation with the Ministry of Rural Affairs is carried out in the thematic mapping and assessment of the fisheries sector. c. A clarification was added to point 1.3 of Table 5-1 that, among other things, the impact of removal of wind turbines on the seabed and benthic biota will be evaluated.
Environmental Agency (no. 6-6/23/876-2, 19 May 2023)	
The Environmental Agency proposes, in addition to the assessment of the expected impacts related to the construction phase of the wind farm, to supplement the draft environmental impact assessment programme with coverage of the expected impacts of the post-construction phase, including possible risks during its operation such as wind turbines falling or collapsing, as well as post-use disposal and/or renewal of the park's infrastructure. At the moment, only one aspect is highlighted in the report as a risk during operation – the risk of oil spills. We ask that you consider addressing the above-mentioned potential risk	In the general part of the methodology in Chapter 5.1, it is stated: "The expected environmental impact will be assessed in the EIA report in connection with construction and use of the offshore wind farm and the impact of removal of the turbines as a theoretical assessment will also be examined to the extent allowed by current information." Thus, the EIA report assesses all relevant impacts associated with operational activities.

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assessment together with the corresponding planned measures that would allow to avoid the related potential additional burden on the marine environment.	
Consumer Protection and Technical Regulatory Agency (no. 16-7/21-02502-142, 31 May 2023)	
We ask that Figure 4-9 be corrected so that the unsuitable southern part is excluded from the original area of the offshore wind farm or to distinguish the two areas.	Figure 4-9 has been updated. The unsuitable area to the south excluded from the initial offshore wind farm area has been differentiated accordingly.
Chapter 5.1 states: The EIA programme states that "an additional EIA report will be prepared for the additional area of the Saare-Liivi offshore wind farm (with related additional procedural actions) if necessary." Please provide a brief explanation in which case an additional EIA report will be prepared for the additional area and in which case a joint EIA report is prepared, so that it is understandable to all parties.	Chapter 5.1 has been updated with an explanation about when it is necessary to prepare a separate EIA report.

9.4. Publication

Publication is made on the basis prescribed by the EIAEMSA. The chapter will be supplemented during the EIA process.

Annexes

Annex 1. Decision on initiation of superficies licence procedure and EIA (added as a separate file directory)

Annex 2. Positions of authorities concerned in regard to the EIA programme (to be added as a separate directory)