Job number	**24000114**
Contracting authority	**Elering AS**
Consultant	**Skepast&Puhkim Ltd.** Laki põik 2, 12919 Tallinn Phone: +372 664 5808; e-mail: info@skpk.ee Reg. code: 11255795
Date	20.01.2025

EstLink3 superficies license

EIA program

SKEPAST & PUHKIM

Version	**2 [for public consultation]**
Date	**20.01.2025**
Compiled:	**Veronika Verš, Vivika Väizene, Raimo Pajula, Kaarel Karolin, Ketter Kärp, Kati Kraavi**

Front cover image:	Elering AS

Project No.	24000114

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INTRODUCTION

On 02.02.2024, Elering AS submitted an application for a superficies license to the Consumer Protection and Technical Regulatory Authority for the construction of an additional electricity connection (EstLink3) between Estonia and Finland. The application was completed on 12.03.2024, 25.03.2024 and 21.05.2024.

EstLink3 helps to contribute to the security of electricity supply and decarbonization of the energy system by bringing additional renewable energy produced in Northern Finland to the Baltic region. Estlink3 also provides an opportunity to achieve the European Union's climate and energy policy goals and the increased integration of energy markets to ensure security of supply for countries and the region as a whole.

EstLink3 consists of a DC cable line connecting Estonia and Finland and converter stations located at the ends of the cable. On the Estonian side, the planned Estlink3 consists of a direct current submarine cable, an onshore cable, a converter station with a potential location in the Aulepa region and a new 330kV overhead line on land that connects Estlink3 to the existing 330kV network in Western Estonia.

The object of the Environmental Impact Assessment (EIA) is the EstLink3 submarine cable connection, which consists of up to three undersea electrical cables and one fiber optic communication cable line. The total length of the submarine cable connection is about 130 km, of which about 53 km remains in Estonian waters, cables will be inside the seabed 3 meters deep. The cables are recessed into the sediments on the seabed to a depth of about 1-1.5 m. Elering AS is applying for a superficies license for 50 years. The design lifespan of the submarine cable is 40-60 years.

By decision No 1-7/24-252 of 25.07.2024, the Consumer Protection and Technical Regulatory Authority initiated the superficies license procedure together with the EIA. Pursuant to § 3 subsection 1 point 1 of the Environmental Impact Assessment and Environmental Management System Act (KeHJS), the EIA is mandatory for activities the implementation of which may have a significant environmental impact. At the time of the construction of EstLink3, the estimated volume of works for the draught of cables to the seabed is more than 10,000 m3, which, pursuant to Paragraph 6(1)(17) of the KeHJS, is an activity with a significant impact on the environment. As the EstLink3 route passes through the Nõva-Osmussaare nature and bird area in a section of about 12 km, it is also necessary to carry out an EIA on the basis of § 3 subsection 1 point 2 of the KeHJS. As this is a planned electricity connection between Estonia and Finland, it is also a cross-border environmental impact assessment procedure.

The EIA program was prepared by the EIA expert group of Skepast&Puhkim OÜ (lead expert Veronika Verš, EIA license No. KMH00160, valid until 26.01.2028) on the basis of § 13 of the KeHJS.

1. EIA PARTIES

The parties to the EIA are listed in the following table (Table 1), other parties to the proceedings, including relevant authorities and interested/affected parties, see Chapter 6.1.

Table 1. EIA parties

Party	Authority/institution	Contact person	Contact details
Developer	Elering AS	Viktoria Muske Project manager	Kadaka tee 42, 12915 Tallinn phone 5308 2147 Viktoria.Muske@elering.ee
Decision maker	Consumer Protection and Technical Regulatory Authority	Adeele Vesingi Chief Specialist of the Construction Law of Action Department	Endla 10a, 10142 Tallinn phone 667 2135 adeele.vesingi@ttja.ee
EIA expert[1]	Skepast&Puhkim Ltd.	Veronika Verš Senior Consultant, Environmental Management Unit	Laki põik 2, 12919 Tallinn phone 5454 5252 veronika.vers@skpk.ee

1.1. Expert group on the EIA program

The EIA lead expert at the stage of compiling the EIA program is Veronika Verš (EIA license KMH0160, valid until 26.01.2028). The EIA expert group that prepared the EIA program is presented in the table below (Table 2).

Table 2. EIA Members of the expert group

	Expert	Area	Task in the working group/area of impact
1	Jüri Hion Skepast&Puhkim Ltd.	Project manager	Project management
2	Veronika Verš Skepast&Puhkim Ltd.	EIA Lead Expert	Compiling an EIA program
3	Raimo Pajula Skepast&Puhkim OÜ	Wildlife expert	Natural environment, including Natura 2000 sites and habitat types, protected areas and species, seals, birds, seabed biota and habitats
4	Vivika Väizene Skepast&Puhkim Ltd.	Expert in hydrogeology	Geology, sea water quality, groundwater, cultural monuments, noise, related strategic planning documents
5	Ketter Kärp Skepast&Puhkim Ltd.	Fish and fisheries	Fish and fishing
6	Kaarel Karolin Skepast&Puhkim Ltd.	Climate change	Climate and climate change, floodplain areas

[1] *At the stage of the EIA program, as Skepast&Puhkim OÜ has currently entered into a contract with the developer only for the stage of the EIA program*

7	Kati Kraavi Skepast&Puhkim Ltd.	GIS Specialist	Drawing up drawings for the EIA program

The members of the expert group have been selected on the basis of § 14 (3) and (4) of the KeHJS on the basis of their competence, previous work experience and experience of cooperation with each other. According to § 14 (1) of the KeHJS, the lead expert is responsible for the competence of the members of the expert group.

1.2. Expert group for the preparation of the EIA report

In addition to the studies mentioned in the EIA program (see chapter 5.3) is prepared on the basis of studies in accordance with the requirements of § 20 of the KeHJS. The researchers, the time at which they were carried out and the expert group that prepares the EIA report (so-called consultant of the EIA report) are not part of the EIA program at the moment of preparation, it is still known, since Skepast&Puhkim OÜ has entered into a contract with the developer only for the preparation of the EIA program.

In view of the above, it is not possible to name in the EIA program the experts who carry out the environmental impact assessment and prepare the report. The EIA expert who will carry out the necessary research for the EIA and the EIA expert who will prepare the EIA report will be selected by the developer in the next stage.

For an overview of the studies and expert assessments required for the preparation of the EIA report and the experts involved, see chapter 5.3 Table 5.

2. DESCRIPTION OF THE PROPOSED ACTIVITIES

The following description of the planned activities has been prepared on the basis of the application for a superficies license submitted by Elering AS to the Consumer Protection and Technical Regulatory Authority on 21.05.2024 and its technical input. In addition, the description of the planned activities has been prepared on the basis of additional information received from Elering and previous similar projects.

2.1. Purpose and need

The objective of the planned activity is to create additional electricity transmission capacity (up to 700 MW) between Estonia and Finland in addition to the already existing EstLink 1 (with a capacity of 350 MW) and EstLink 2 (650 MW). In order to achieve the goal, on 28.06.2022 Estonian and Finnish transmission system operators Fingrid Oyj and Elering AS signed a memorandum of understanding for the development of a third additional electricity high-voltage direct current transmission line (EstLink3).

EstLink3 helps to contribute to the security of electricity supply and decarbonization of the energy system by bringing additional renewable energy produced in Northern Finland to the Baltic region. According to the application for a superficies license, Estlink3 also provides an opportunity to achieve climate and energy policy objectives (see chapter 3) and greater integration of markets to ensure security of supply both for countries and for the region as a whole. The current energy transport capacity between the two countries is about 1000 MW. Having regard to the region's common energy market, *Nord Pool* and the growing demand for energy transmission between the two countries (due to the large amount of renewable energy added in the Nordic countries) and the continuing price differences between the two market zones of Estonia and Finland, there is a need for additional electricity transmission capacity.

EstLink3 consists of a DC cable line connecting Estonia and Finland and converter stations located at the ends of the cable. On the Estonian side, the proposed Estlink3 consists of a DC submarine cable, land-basedcable, converter station with a potential location in the Aulepa region and a new 330kV overhead line on land connecting Estlink3 to the existing 330kV network in Western Estonia (Figure 1).

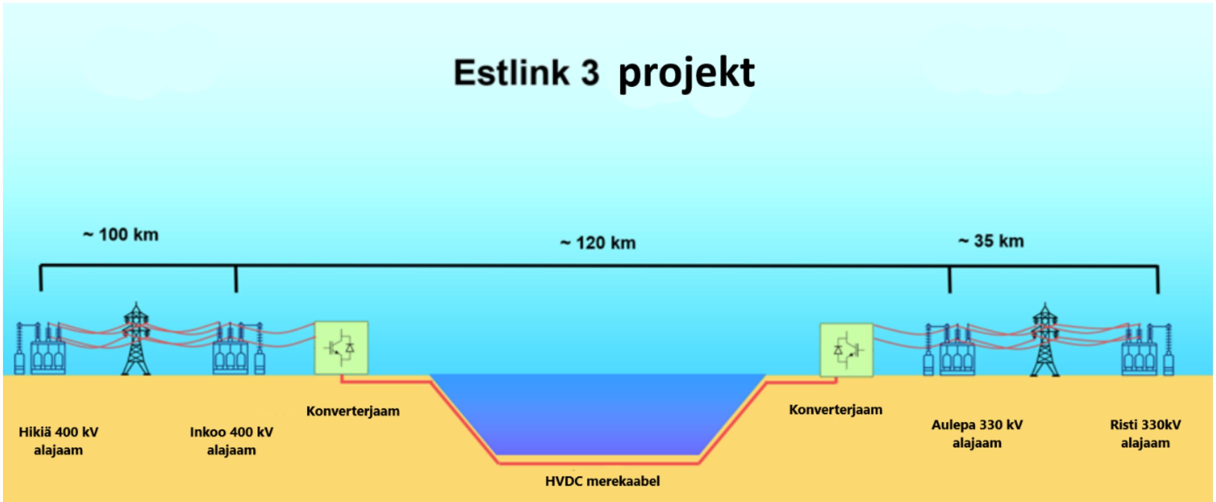


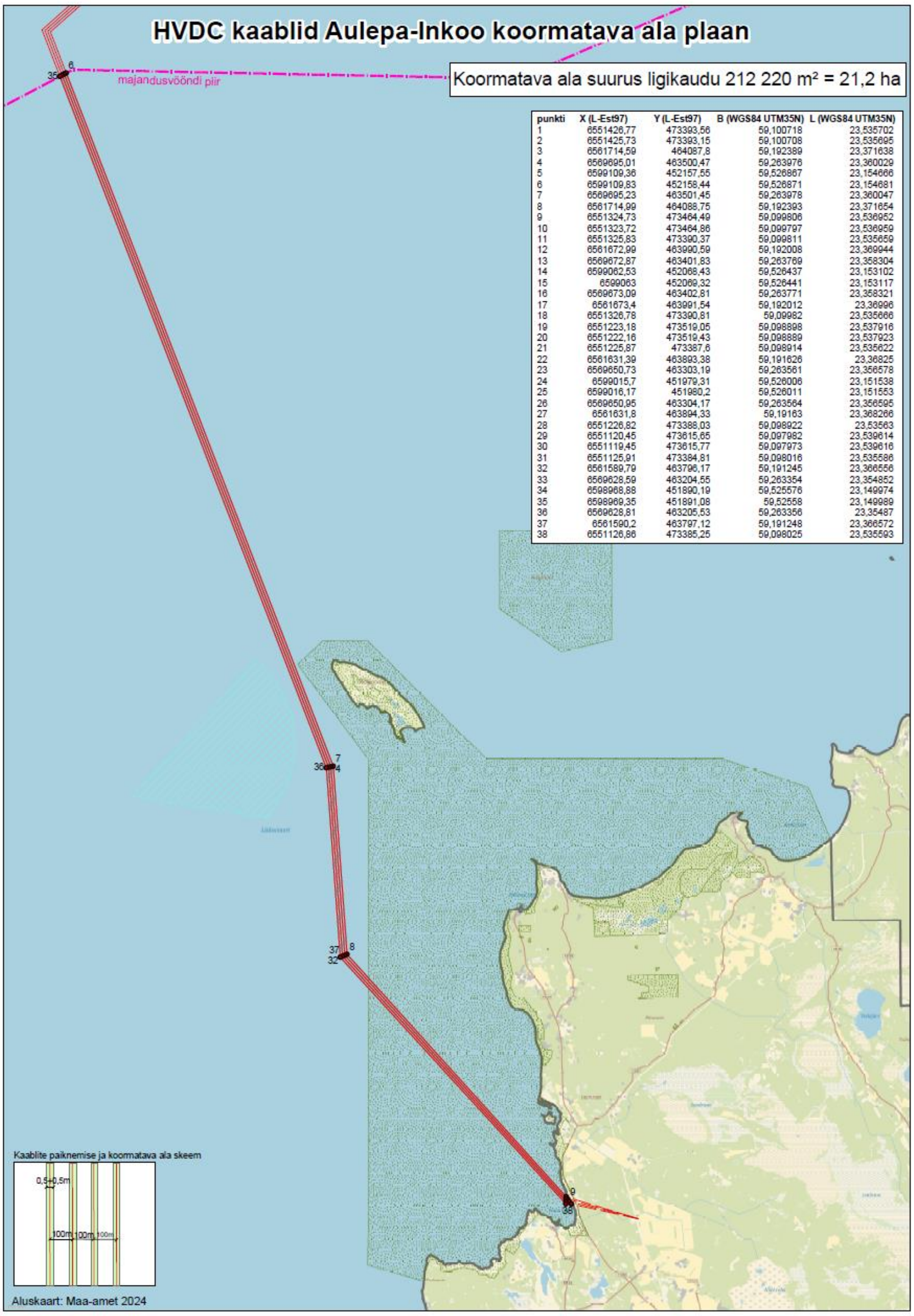
Figure 1. EstLink3 route diagram (extract from Elering AS's superficies license application)

In connection with the construction of EstLink3, the existing network must also be strengthened. To do this, it is necessary to build a new 110kV/330kV substation in Tallinn, which will be connected to Aruküla and Kiisa 330kV substations with the help of new 330kV lines. In addition to the construction of new lines, the existing 330kV overhead lines Kiisa-Rakvere, Rakvere-Püssi, Paide-Sopi and Sopi-Sindi will be reconstructed. During the reconstruction of these lines, 110kV lines running parallel to the common masts will be raised. Joint hanging allows to reduce the impact on the environment and save on the cost of maintaining routes and lines in the future.

The object of the Environmental Impact Assessment (EIA) is the EstLink3 submarine cable connection, which consists of up to three undersea electrical cables and one fiber optic communication cable line.

2.2. Location

The planned starting point of the EstLink3 submarine cable connection in Estonia is located in Estonia On the coast of Hara Bay in the municipality of Lääne-Nigula, near Aulepa (Figure 2). Aulepa's location allows us to take into account prospective production in Hiiumaa and beyond, it is a future-proof investment in the 2040+ electricity system.



punkti	X (L-Est97)	Y (L-Est97)	B (WGS84 UTM35N)	L (WGS84 UTM35N)
1	6551426,77	473393,56	59,100718	23,535702
2	6551425,73	473393,15	59,100708	23,535695
3	6561714,59	464087,8	59,192389	23,371638
4	6569695,01	463500,47	59,263976	23,360029
5	6599109,36	452157,55	59,526867	23,154666
6	6599109,83	452158,44	59,526871	23,154681
7	6569695,23	463501,45	59,263978	23,360047
8	6561714,99	464088,75	59,192393	23,371654
9	6551324,73	473464,49	59,099806	23,536952
10	6551323,72	473464,86	59,099797	23,536959
11	6551325,83	473390,37	59,099811	23,535659
12	6561672,99	463990,59	59,192008	23,369944
13	6569672,87	463401,83	59,263769	23,358304
14	6599062,53	452068,43	59,526437	23,153102
15	6599063	452069,32	59,526441	23,153117
16	6569673,09	463402,81	59,263771	23,358321
17	6561673,4	463991,54	59,192012	23,36996
18	6551326,78	473390,81	59,09982	23,535666
19	6551223,18	473519,05	59,098898	23,537916
20	6551222,16	473519,43	59,098889	23,537923
21	6551225,87	473387,6	59,098914	23,535622
22	6561631,39	463893,38	59,191626	23,36825
23	6569650,73	463303,19	59,263561	23,356578
24	6599015,7	451979,31	59,526006	23,151538
25	6599016,17	451980,2	59,526011	23,151553
26	6569650,95	463304,17	59,263564	23,356595
27	6561631,8	463894,33	59,19163	23,368266
28	6551226,82	473388,03	59,098922	23,53563
29	6551120,45	473615,65	59,097982	23,539614
30	6551119,45	473615,77	59,097973	23,539616
31	6551125,91	473384,81	59,098016	23,535586
32	6561589,79	463796,17	59,191245	23,366556
33	6569628,59	463204,55	59,263354	23,354852
34	6598968,88	451890,19	59,525576	23,149974
35	6598969,35	451891,08	59,52558	23,149989
36	6569628,81	463205,53	59,263356	23,35487
37	6561590,2	463797,12	59,191248	23,366572
38	6551126,86	473385,25	59,098025	23,535593

Figure 2. Location of the EstLink3 transmission line in the territorial sea of Estonia (extract from the application for a superficies license from Elering AS)

The converter station planned for the coast and the further connection (overhead line) to the proposed Cross 330kV substation are outside the scope of this superficies license application EIA. The possible location of the converter station and the course of the overhead line will be determined by drawing up a special plan for the respective country, during the procedure of which the location of the landing of the submarine cable may be specified.

The size of the loadable area of the public body of water applied for by the superficies license is about 21 ha. The coordinates of the submarine cable route are given in Annex 3 to the application for a superficies license (see Annex 1 to the EIA program).

2.3. Technical indicators of the submarine cable

The most important technical indicators of the proposed EstLink3 are as follows:

- the total planned capacity of the submarine cable is up to 700 MW;
- DC voltage (up to 525kV);
- the total length of the submarine cable is about 130 km, of which about 53 km in Estonian territorial waters (3 meters deep);
- The submarine cable is recessed into the sediments on the seabed (ca 3 m deep).
- Construction area from sea cable centre 3-15 meters

The variables that influence the volume of work on the seabed, which will be revealed during the project, are outlined in Chapter 2.4.8. The volume of work on the seabed.

The number of intersections of submarine cables and the technical solutions for crossings must be coordinated with the intersecting party. On the example of the Balticconnector gas pipeline, Elering AS has the experience that the amount of backfill soil required for the crossing of the cable is ca 250 m3 and in the case of pipe crossing, ca 2000 m3. In view of the above, according to the application for a superficies license, the volume of backfilling has been estimated at more than 10000 m3 (see also chapter 2.4.8).

Elering AS is applying for a superficies license for 50 years. The design lifespan of the submarine cable is 40-60 years.

EstLink3 consists of up to three electrical cables and one fiber optic communication cable line. The number of cables depends on the possible technology and cost. The protection zone of the submarine cable route corridor is 100 m from the extreme cable in both directions. The number of cables and the distances between them depend on the characteristics of the seabed and the technology offered, and these will become clear during the design and procurement process.

2.4. Stages of laying the submarine cable

The construction of the submarine cable consists of the following stages:

- preparation of a preliminary project;
- seabed construction studies;
- work design and installation project;
- seabed preparations;
- digging a trench in coastal waters;
- laying of submarine cables;
- post-installation work.

The following is a brief description of the aforementioned stages.

2.4.1. Preliminary design

The aim of the preliminary project is to:

- to determine, on the basis of the available information, the possible passage of the cable line on the seabed and its alternatives, taking into account known restrictions on nature conservation, heritage conservation, geology, possible locations of mines, etc.;
- prepare an initial technical sketch project with possible technology alternatives and a preliminary risk assessment;

- map what data is available on the seabed and what information is needed to carry out the next design stages.

According to the results of the preliminary project, construction studies of the seabed can be carried out (see chapter 2.4.2).

2.4.2. Seabed construction studies

Prior to the installation of the submarine cable, construction studies are carried out on the seabed, including a construction geological survey and a magnetometry survey, which are necessary for determining the exact layout of the submarine cable and for technical design (preparation of a working project).

During the study of magnetometry, the direction, strength and change of the magnetic field on the seabed are measured, with the help of which metal objects can be found, even if they are buried in mud or sand. In particular, this is important in order to determine the presence of possible explosive devices (*Unexploded ordnance* – UXO) on the cable line. If necessary, operating submarines (ROVs) are additionally used, which allow for a detailed inspection of objects. In shallow water, divers may be used.

In addition, construction studies intervene with the aim of taking sediment profiles and conducting static penetration tests (*Cone penetration test* – CPT) to determine the mechanical properties of the soil. During the tests, the soil is moved as much as is necessary to take the sediment profile.

Information on the studies carried out in the framework of the EIA can be found in the chapter of the EIA program 5.3.

2.4.3. Work project and installation project

With the help of preliminary project and seabed research information, it is possible to prepare a work project. On the basis of the work project, it is possible to obtain construction work and apply for a superficies license. After the work project and the procurement of construction work, the company laying the submarine cable during construction also performs an installation project according to the installation bases, during which it is determined exactly how the installation vessel can install the submarine cable. In the process, it may be necessary to conduct additional seabed surveys at certain locations.

2.4.4. Seabed preparatory work

Before starting construction work, the corridor of the submarine cable is cleaned of objects, the presence of which may turn out to be a threat to the cable. These dangers include, above all, the removal of UXOs found, which are removed by the Navy in Estonia's territorial waters and exclusive economic zone. It may also be necessary to raise the boulders, but since it is easy to change the location of the cable, it is highly likely that the cable will be designed past the boulders.

Crossings with other infrastructures are additionally being prepared. In the course of the work project, crossings are solved in cooperation with other infrastructure owners, which are usually solved by covering the infrastructure previously located on the seabed with stones, creating a bridge over an existing submarine cable or pipe. It is also possible to solve crossings with concrete mats and other technical solutions, but this depends on the specific requirements of the owner of the existing infrastructure. For example, when installing the Balticconnector gas pipeline, the volume of stone to be installed at the intersections was from a few hundred to a few thousand m3, depending on the location, type of crossing and geology.

It may also be necessary to refill the seabed in places where the surface profile of the seabed is too uneven to lay a submarine cable. The need for this will become clear during the design process.

2.4.5. Digging a trench

For digging trenches in coastal waters, dredging barges are used, which are not capable of self-movement, and they are mobilized on the object with the help of tugboats. The construction of trenches is carried out at different depths in different ways.

In shallow water, up to *a* depth of about 10 m for sections, a loose or closed method is used. The exact low-water limit is established during the design and installation design process. In shallow water (up to 10 m), ditches with a depth of at least 1.5 m are dug. In places where it is not possible to recess the bottom of the sea to a predetermined depth, rubble bulk ramparts and/or concrete mattresses may be used to protect the submarine cable.

- In the case of a closed method , the excavation cavity of the submarine cable is constructed by directional drilling up to a certain depth and distance from the beach. The use of the closed method depends on the construction technology and geology and other environmental conditions, since in the case of the closed method, a bentonite solution is used throughout the drilling process (3-5 times the volume of soil to be drilled). Bentonite transports excess soil out of the drilling tunnel into an intermediate trench. In addition, bentonite prevents the drilling tunnel from collapsing before the submarine cable or protective pipe is pulled into the drilling tunnel. A solution saturated with soil is sucked out of the intermediate trenches and disposed of. There may be environmental restrictions on the use of bentonite.
- Bulk method in the case of a submarine cable ditch in the sea, either by means of raised excavators or by means of buckets on the barge (Photograph 1). The excavated soil is placed next to the trench, and after the installation of the submarine cable, the soil is placed back into the trench. During the design process, it is determined whether a loose method is possible and technically feasible. Depending on the soil and the location of construction, environmental restrictions may apply. In the case of the loose method, it may be important to create a sand cushion under and on top of the submarine cable, this depends on the geology and the characteristics of the surface.

Photograph 1. Digging a trench in shallow water[2]

[2] https://www.vlmaritime.com/product/a0606-backhoe-dredger/ (accessed 11/12/2024)

In deeper water , as a rule, the trench is not dug, but the cable is installed under the soil on the seabed with special equipment without digging.

In both of the methods described above, no additional soil backfilling is planned, since the submarine cables are intended to be laid in the existing soil without additional protection. When recessed in deeper water with jets of pressurized water, usually about 2/3 of the soil immediately sinks back into the trench on top of the submarine cable.

Due to the fact that cables need to be protected from outside influences they need to be digged 3 meters deep into the seabed.

2.4.6. Laying of submarine cable

The submarine cable is laid on the seabed using special cable laying vessels. A section of the submarine cable is wound on the drum on the ship, the length of which can be tens of kilometers long, the sea cable is lowered into the water from the stern of the ship (see illustrative diagram in the figure 3). The installation speed of the submarine cable depends on the complexity of the route and weather conditions, but in general it is 2-5 km per day. If the submarine cable consists of more than one section, the cable-laying vessel is in operation (see e.g. Photograph 2) between the installation of two compartments loading a new sectution onto the drum of the ship. It can be found in a nearby port or cable factory.

Depending on the technology, the submarine cable may initially be installed on the seabed and later under the surface of the seabed, or it may be installed immediately during installation. The exact installation time depends on the availability of ships and equipment, but immediate installation under sea level is preferred.

The submarine cable is installed under the surface of the seabed with plough or jet treatment depending on the soil. For softer soil layers such as sand and clay, either the plough plow or jet treatment method is used, where the cable is laid by pressing down the seabed surface with a plow, which can also have an additional jet of water that deflect away from the surface. In this case, the soil is not moved, but pushed aside, creating a certain amount of local suspended matter.

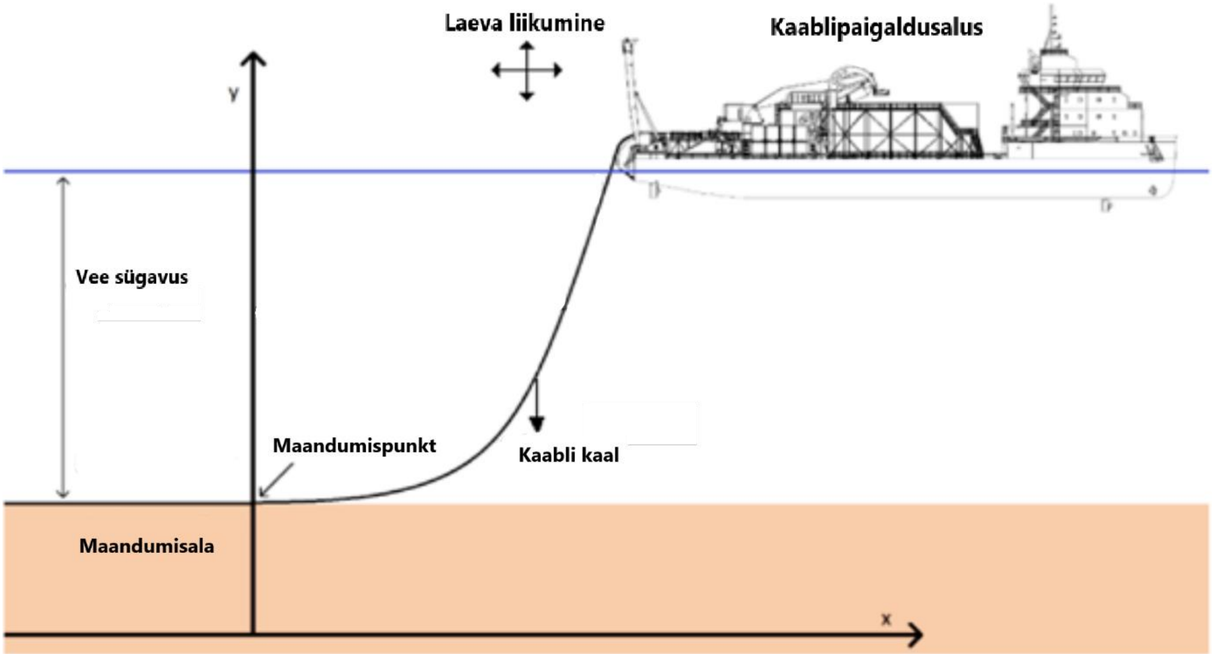


Figure 3. Cable laying scheme

Photograph 2. Cable laying vessel

Theoretically, it may also be necessary to blast the bedrock to remove the rock. If it turns out that it is necessary to protect the submarine cable in a section by recessing it into the surface of the seabed, or if there is such an unevenness on the seabed, the alteration of which is inevitable, then blasting may be necessary. Attempts are made to avoid blasting by changing the route corridor or using concrete mats.

2.4.7. Post-installation work

In the shallow sea area and at landing sites, the submarine cable route is backfilled with excavated soil. If necessary, the protection of the submarine cable is supplemented with rubble stands and/or concrete mattresses. At intersections with other communications, cable protection crusts connecting to each other are installed around the submarine cable. When the work is completed, a post-installation seabed survey is carried out, on the basis of which as-built drawings are drawn up. On the basis of the as-built drawings, a use permit is applied for from the Technical Regulatory Authority.

During the design lifetime of the submarine cable (40-60 years), there are no works on the planned cable with seabed intervention. It may be necessary to overrun the cable line with a side-view sonar and/or sediment profiler in order to determine the location of the cable and whether there have been any changes to the seabed that could damage the cable.

2.4.8. Volume of work on the seabed

When laying the cable on the seabed, plowing or jet dredging is used in the soil. However, if a jet of water or a plow creates a furrow for the cable and partly the soil also remains at the edges of the cable ditch (about 1/3 of the surface), sediment is removed from the bottom of the water body and this is a dredging within the meaning of § 176 (1) of the Water Act – the soil is removed and dumped next to the cable ditch. How much soil is left out of the cable trench will probably depend on the soil and the plow used (some plows also have a higher backfilling capacity).

In the case of plowing, jet dredging, as well as digging a cable ditch, sediment is thrown into the water and suspended solids are formed. Thus, the EIA also models the distribution of suspended solids across different soils and cable placement technologies, as the spread of suspended solids can affect fish and seabed habitats.

Since the exact geology of the seabed is unknown, construction geological surveys are carried out during the design of the submarine cable (see chapter 2.4.2), which indicate how much of the submarine cable route can be placed below the surface of the seabed and whether the submarine cable needs additional protection and how much backfill should be dumped into the sea or protected by concrete mats.

Based on the experience of previous similar works (EstLink1 and EstLink2, Cables of the Great and Small Straits), it has been estimated that the dredging of the seabed is less than 10,000 m3. This is especially the case in the shallow part of the water if a cable trench is built using the open method up to a depth where plowing or jet dredging can begin. Its exact depth depends on the technique used, which will be revealed during construction procurements. In the case of the open method, you can also use a waterfall or plowing when laying a cable right from the beach.

In the worst-case scenario, the total length of the open trenches could be up to 1.5 km, in which case the volume required for the construction of the trench will be as follows:

- trench depth 2,7 m on top of the cable – total depth 3 m;
- trench angle slope 1/2, trench width 4 times deep, provided loose sandy soil – 12 m;
- trench cross-sectional area – 18 m2;
- trench length 1500 m;
- The volume of soil in the trench – 27 000 m2.

The largest possible removal of sediment is if four cables are installed (trench cross-sectional area 18 m2), along the entire length of the route in Estonian waters by the open method. The total volume of soil to be removed from the trenches is 4 320 000 m3. In this case, the soil is lifted next to the trench, and the cable is returned after installation, and there would be no change in the profile of the seabed.

The variables affecting the volume of soil to be removed will be clarified during the project and include:

- the number of cables (depending on the technology, there may be fewer cables, it is also possible to establish a submarine cable connection with one cable);
- the composition of the soil on the seabed (the cross-sectional area of the trench decreases according to the type of soil);
- the technology to be chosen (in the case of plowing or jet dredging, the soil is not moved; the technological solution at the landing site is not yet known and depends on geology and environmental conditions);
- the number of crossings and the technical solutions of the crossings must be coordinated with the intersecting party. On the example of the Balticconnector gas pipeline, it is an experience that the amount of backfill soil required for the crossing of the cable is *ca* 250 m3 and in the case of pipe crossing*, ca* 2000 m3.

Taking into account these variables and certain uncertainties, the volume of backfilling in the superficies license is estimated at more than 10 000 m3.

2.4.9. Construction of a cable on the coast

In order to avoid significant negative impacts on coastal habitats and biota, the EIA shall also address the effects of cable laying in the area affected by the landing site of the submarine cable. Thus, a description of the planned activities on the coast is also given below.

The laying of cables on the coast and at the landing site is possible either by an open or closed method.

The choice of construction method depends on the geology of the location and the environmental impact that a particular construction method has on a particular location. The closed method cannot be used if the geology is very variable or there are stones on the drilling path. Also, when laying a cable line using a closed method, there may be a need to build large drilling shafts that allow drilling, which, in total, may have a greater environmental impact than the construction of a cable using the open method.

2.4.9.1. Loose method

In the loose method of laying the cable, a channel is also dug on the cable with a bucket on the barge, a bucket with floats or a raised bucket, in which the cable will be installed. The cable is laid, either by pulling the cable to the ground, or by flooding the cable into the channel.

When pulling the cable to the ground, the cable is laid as follows:

- the cable is produced at the cable factory and wound on a drum on a cable ship, with an expected total length of up to 20-50 km;
- the cable ship must be as close as possible to the beach;
- a winch is installed at the landing site, the rope of which extends to the cable vessel and the end of the cable is connected to the cable on the ship;
- With a winch, the cable is pulled to the place of disembarkation in a pre-dug cable channel. When constructing a cable channel, the material to be excavated is placed next to the duct, and this material is later used to backfill the same channel. Depending on the technical characteristics of the cable, it may be necessary to install a sand cushion on the bottom of the duct, in the event that the cable duct is located in non-sandy soil.
- When the end of the cable has reached a pre-designed location where the coupling between the ground and the submarine cable is made, the winch is stopped, and the cable ship begins to move along the previously designed cable line by laying the cable.
- The cable installed on the coast is covered with the existing soil next to the cable channel. In the event that the soil that is filled back is not sand, it may be necessary to lay a sand cushion on top of the cable to protect the cable;
- The cable channel with backfilled soil is leveled to the same height (generally +-20cm) as before the construction of the cable channel.

An example of laying a cable at a landing site using the open method is shown in the following photos (Photograph 3, Photograph 4 and Photograph 5.

Photograph 3. Example of an excavator for the construction of a trench[3]

Photograph 4. Installation of the second 110kV submarine cable of the Small Strait on the coast of Muhu using the open method (Skepast&Puhkim OÜ, 21.08.2024)

[3] https://almaahadeng.com/product/elevated-excavator (accessed 11/12/2024)

Photograph 5. Landing of the second 110kV submarine cable of the Small Strait in Muhu (left) and Orissaare (right) after installation (Elering AS, 06.11.2024)

2.4.9.2. Closed method

The closed method, in turn, is divided into the microtunnel and horizontal directional drilling (HDD) method.

When constructing a microtunnel, a remote-controlled microtunnel drilling machine (MTBM) is used to form an underground microtunnel with repressible concrete pipe links, where a cable will be installed.

The construction of the microtunnel includes the following activities:

Extraction of the launch shaft: necessary to ensure the correct alignment of the micro-tunnel. Heavy machinery such as excavators and trucks is used for this operation.

Microtunnel digging: A typical microtunnel mining equipment consists mainly of a hydraulic pushing device for pushing a pipe, a closed mixing system to remove the eruption material from the excavated tunnel, a mixture cleaning system to remove the purplish material from the mixture from the water, a crane to lift concrete elements, and a power supply to supply the aforementioned equipment with electricity.

Pre-digging and removal of MTBM: digging is necessary to remove the head of the cage at exit points.

It is possible to use the technology on different soils, both in dry and wet conditions. For the construction of a microtunnel at the landing site, a temporary work area of approximately 10,000 m2 is required. The maximum feasible length of the microtunnel is about 1.5 km. The diameter of the pipe is about 780-2200 mm.[4]

[4] Microtunnel Technology | UAB "Grunterra" | Sealing of pipes | Microtunnel | Auger conveyor drilling (Auger boring) (accessed 11/18/2024)

Horizontal directional drilling (HDD) is a type of installation in which a pre-made sleeve tube, into which a cable is laid, is pulled through a hole in the ground, created by a directional drill.

A cage rakis is placed on the shore, and a guide tube is inserted into the soil. The hydraulic power supply of the drilling crown is bentonite, which moves along the pilot tube. Bentonite moves the soil away and fills the hole behind the drill crown, preventing it from sinking in. The diameter of the cutting head is larger than that of the guide tube. The latter is surrounded by a drill pipe, and as the drilling crown penetrates through the soil, a pilot tube and a drill pipe are added in succession.

During the construction of the landing site, a pilot hole is drilled in a pre-dug tranche above the exit from the sea. A crane vessel with support equipment for handling drilling pipe and hole openers (friction blades) is placed at sea. The hole opening is passed several times before the drilled hole is large enough to accommodate a stationary protective pipe, and then the cable is installed in the protective tube.

It is possible to carry out drilling by exiting within a radius of a few meters from the destination, which is located at a distance of several kilometers. If the departure point is not suitable, then the pilot tube is pulled back to a certain extent and the route is adjusted.

The success of the horizontal drilling method depends on the soil conditions, with uniform clay being the most suitable, but drilling through solid bedrock rock is also fully possible. Horizontal drilling does not involve activities between the starting and ending points and is therefore the preferred method of traversing areas with numerous buildings or sensitive environments.

In the closed method, the cable is laid, similar to the loose method, by pulling the cable through the established protective pipe. It must be taken into account that when pulling, neither the tensile rope nor the cable would damage the protective pipe when pulling, and this may impose technical restrictions on the maximum length of the cable to be built using the closed method, since due to the long weight of the cable it may be impossible to pull the cable through the protective pipe.

When building EstLink3, up to 4 cables with an external diameter of about 20 cm will be installed. If the cable is fitted with a tube, the inner diameter of the tube would probably be 40 cm, as the cable must not be tightly in the tube and it must be possible to pull the cable. In Estonia, so far, all drillings have been done with directional drilling and the maximum diameters are about 40 cm.

2.5. Alternatives considered when conducting an EIA

In drawing up the EIA program, the developer has not proposed alternative locations for the submarine cable, which should be evaluated and compared during the EIA. The coordinates of the submarine cable route are given in Annex 3 of the superficies license application (see Annex 1 of the EIA program), so the location of the submarine cable route corridor has already been determined on the basis of the information provided in the superficies license notice. The width of the submarine cable route corridor is 500 m. EIA assesses whether and under what conditions it is possible to build EstLink3 submarine cables in the built-up area applied for. In the event that the EIA reveals circumstances (e.g. wrecks) that make it difficult or hinder the laying of the cable at a specific location, it will be considered whether and to what extent it is possible to shift the cable line in order to minimise the effects. If the location of the route changes by more than 33% of the location indicated in the application for a superficies license, it is necessary to submit a new application for a superficies license. The landing site may also be specified as a result of the above-mentioned process of drawing up a special state plan (see chapter 2.2). The final possible location of the cable line will be determined, among other things, as a result of impact assessment and technical design.

The construction of EstLink3 is carried out using an open or closed method (see chapter 2.4.5 and 2.4.9). From a technical point of view, an open method is preferable, but in some locations, e.g. due to environmental restrictions, it may also be necessary to apply a closed method. Thus, both construction methods are evaluated during the EIA (see chapter 2.4):

- laying cables by the open method;
- laying of cables by a closed method.

In order to assess the environmental impact of different technologies on the marine environment, the spread of suspended solids is modelled on the digging of a cable ditch (see chapter 2.4.5), plowing and jet dredging (see chapter 2.4.6)) Alternatively, modelling can also be done in the so-called worst-case scenario, i.e. in a situation where the amount of sediment to be moved is the largest. The volume of modelling shall be agreed on the basis of the results of a geological survey carried out in the framework of the EIA in cooperation with the EIA expert, the developer and the water quality expert. Depending on the results of the geological survey, it may also be necessary to model the dispersion of suspended solids on different soils.

The impact assessment is based on changes in the state of the environment compared to the current situation (the so-called 0-alternative, i.e. if EstLink3 marine cables are not built).

3. RELATED STRATEGIC PLANNING DOCUMENTS

3.1. EU framework and climate targets

The reasons for climate change are primarily considered to be an increase in anthropogenic greenhouse gases (GHG) in the atmosphere. The consequences of climate change include an increase in average temperature, an increase in extreme weather events (storms, droughts, heatwaves, floods, etc.), rising sea levels, water scarcity, loss of biodiversity, changes in land use, loss of habitats and scarcity of resources. In particular, reducing the burning of fossil fuels and using environmentally sustainable renewable energy are considered important for tackling climate change.

In its conclusions of 12/12/2019, the European Council agreed on the objective of achieving a climate-neutral European Union (EU) by 2050, in line with the objectives of the Paris Agreement. This is a net emissions target, which means that anthropogenic GHG emissions and removals are balanced. The EU-wide climate target of reducing greenhouse gas (GHG) emissions by -55% by 2030 compared to 1990 was agreed by the Heads of State at the December 2020 European Council and set out in the EU Climate Law. The Renewable Energy Directive sets an EU-wide renewable energy target of 32% by 2030 and could be further increased under *the Fit for 55* climate package. The Energy Efficiency Directive sets an EU-wide target of a 32.5% increase in energy efficiency in 2030.

3.2. Estonian Energy Development Plan to 2030[5] and 2035[6]

The Energy Management Development Plan to 2030 (ENMAK 2030) describes the goals of Estonia's energy policy until 2030, the vision of the energy economy until 2050, the general and sub-goals of the energy economy and measures to achieve them.

According to ENMAK 2030, the task of the energy economy, as an industry serving other sectors of the economy and the residents of Estonia, is to ensure the availability of energy to consumers at a favorable price and taking into account environmental requirements. The electricity economy contributes to the competitiveness of the Estonian economy through the use of guaranteed security of supply, market-based end-user electricity prices and environmentally friendly solutions.

The development of a market-based energy market based and based predominantly on local and renewable energy sources in the European Union is essential for shaping European energy policy. According to ENMAK 2030, the share of renewable energy in Estonia's final energy consumption will be 50% in 2030.

The most important task of the electricity network is to deliver electricity from sources that generate electricity to electricity consumers. During the period considered in the development plan, the Estonian electricity transmission system will orient itself from the current east-west flows to north-south flows. This process will be facilitated by the planned new connections with the Baltic States and Central and Eastern Europe, as well as between the Nordic and Baltic countries, as a result of which Estonia's connectivity with both Central Europe and the Nordic countries will improve. The strong connection of the Baltic electricity networks makes it possible to disconnect the Baltic electricity system from the current North-West Russian frequency range and synchronize the Baltic electricity system with the Central European or Nordic synchronous area in the period 2025-2030. Investments in the development of the Estonian electricity transmission system must support the achievement of this goal.

[5] Approved by Order of the Government of the Republic No. 285 of 20.10.2017

[6] Homepage of the Ministry of Economic Affairs and Communications https://www.mkm.ee/energeetika-ja-maavarad/energiamajandus/energiamajanduse-arengukava (accessed 15.10.2024)

In terms of Estonia's domestic consumption load, the 110 kV electricity network generally meets the needs of consumers, but according to ENMAK, it is still necessary to contribute to the reconstruction of ageing lines and the optimization of the location of substations and load centers. In order to ensure regional balance, it is important to bring the electricity transmission network to all Estonian counties.

The construction of EstLink3 will help to contribute to the security of electricity supply and decarbonization of the energy system by bringing additional renewable energy produced in Northern Finland to the Baltic region. According to the application for a superficies license, Estlink3 also provides an opportunity to achieve climate and energy policy objectives and greater integration of markets to date, in order to ensure security of supply for both countries and the region as a whole.

The Ministry of Economic Affairs and Communications has prepared a **proposal for the preparation of an Energy Management Development Plan until 2035**. The purpose of compiling the new development plan is to update the trends, goals and activities of the energy economy included in the current energy development plan and to describe the development vision, goals, bottlenecks and policy instruments of the Estonian energy economy in moving towards climate-neutral energy production and consumption and ensuring energy security. According to the schedule, the Government of the Republic will approve the new development plan by the end of 2025.

The development plan includes activities related to energy production and supply and energy efficiency to ensure energy security, transition to renewable energy and increase energy efficiency.

3.3. Estonian electricity transmission network development plan 2024-2033

Pursuant to Article 51 of Directive (EU) 2019/944 of the European Parliament and of the Council, pursuant to § 66 (8) of the Estonian Electricity Market Act, the transmission system operator is obliged to submit a 10-year network development plan based on existing and forecast demand and supply at least every two years[7].

In order to meet the European Union's green goals, Estonia also needs to change its electricity production and switch to green energy production methods. By 2030, Estonia has set a goal to produce electricity from renewable sources at 100% of the annual electricity consumption volume. Elering's role in achieving this goal is to ensure a network with sufficient capacity. Elering annually supplements the investment budget of the power grid and the long-term 10-year investment plan.

Estlink3, the Saaremaa 330kV connection, the Estonia-Latvia fourth connection and investments related to strengthening the network of major consumption centers have a greater impact than the planned investments.

In order to meet its green goals, integrate the electricity market, and ensure security of supply and energy security, Estonia needs to establish additional connections with Latvia and Finland. The additional connection with Finland will reduce the commercial overload between Estonia and Finland and thereby reduce the price difference between the power exchange. The additional connection with Latvia will help to transfer the energy produced from wind farms in the Baltic Sea and will also help to avoid the formation of commercial congestion between Estonia and Latvia after the completion of EstLink3.

In connection with the construction of EstLink3, the existing network needs to be strengthened. To do this, it is necessary to build a new 330/110kV substation in Tallinn, which will be connected to Aruküla and Kiisa 330kV substations with the help of new 330kV lines. As an alternative to the new substation, a 330kV overhead line is being considered between the 330kV substations of Aruküla and Kiisa. In addition to the construction of new lines, the existing 330kV overhead lines Kiisa-Rakvere, Rakvere-Püssi, Paide-Sopi and Sopi-Sindi will be reconstructed. During the reconstruction of these lines, 110kV lines running parallel to the common masts will be raised. Joint hanging allows to reduce the impact on the environment and save on the cost of maintaining routes and lines in the future.

[7] https://elering.ee/elektriulekandevorgu-arengukava-2024-2033 (accessed 10/15/2024)

The planned activities are in line with the transmission network development plan.

3.4. National Energy and Climate Plan[8]

The aim of the Communication to the European Commission in 2019 on the National Energy and Climate Plan (REKK 2030) is to provide the Estonian people, companies and other Member States with as accurate information as possible about the measures with which the Estonian state intends to achieve the energy and climate policy goals agreed upon in the European Union.

REKK 2030 brings together Estonia's energy and climate policy goals and 71 measures developed to meet them. It has been prepared as a joint work of various ministries on the basis of valid development documents, such as the fundamentals of Estonian climate policy until 2050, the Estonian Energy Management Development Plan until 2030, the Development Plan for Adaptation to Climate Change until 2030, etc.

The main objectives of REKK 2030 are:

- **Reducing Estonia's greenhouse gas emissions by 80% by 2050 (incl. 70% by 2030):** greenhouse gas (GHG) emissions in 1990 amounted to 40.4 million t CO2ekv (except for the land use, land use change and forestry sector, i.e*. Land Use*, *Land Use Change and Forestry* (hereinafter LULUCF), in 2017 Estonia's GHG emissions were 20.9 million t CO2ekv (incl. 14.7 million t CO2ekv from the energy industry sector), as a result of the measures, GHG emissions in 2030 are projected to be between 10.7 and 12.5 million t CO2ekv (excluding LULUCF).
- **In the sectors covered by the Shared Commitment Regulation** (transport, small-scale energy, agriculture, waste management, forestry, industry) **to reduce greenhouse gas emissions by 13% by 2030 compared to 2005**: in 2005, GHG emissions in the sectors of the Shared Commitment Regulation total 6.3 million t CO2ekk, i.e. in 2030, the sector's emissions could be 5.5 million t CO2ekk.
- **The share of renewable energy in gross final energy consumption in 2030 must be at least 42%**: in 2030, renewable energy will account for 16 TWh or **50% of final energy consumption**, including renewable electricity 4.3 TWh (2018 = 1.8 TWh), renewable heat 11 TWh (2018 = 9.5 TWh), transport 0.7 TWh (2018 = 0.3 TWh).
- **Final energy consumption must remain at the level of 32-33 TWh/a until 2030**: the Estonian economy is growing and therefore important measures are needed to keep consumption at the same level. Cumulative energy savings of 14.7 TWh in the period 2020-2030 would allow to keep final energy consumption at the same level. Reducing energy consumption can be achieved by making primary energy consumption more efficient.
- **Decrease in primary energy consumption by up to 14% (compared to the peak of recent years):** in the period 2020-2030, Estonia has the capacity to reduce primary energy consumption, including through innovations in the oil shale industry.
- **Ensuring energy security by keeping the rate of dependence on imported energy as low as possible**: keeping the use of local fuels as high as possible (including increasing the use of fuel-free energy sources), harnessing the potential for the production and use of biomethane.
- **Meeting the minimum criteria for the interconnection of electricity networks between countries**: strengthening the electricity network connections of the Member States of the European Union (EstLink3 and the fourth connection of Latvia) and synchronizing the electricity network with the Central European frequency band in 2025.

[8] https://mkm.ee/energeetika-ja-maavarad/energiamajandus/energia-ja-kliimakava (accessed 10/15/2024)

- **Use of R&D&I in measures to keep the economy competitive**: the implementation of the R&D program for the energy economy will enable actions to be implemented using research and innovation achievements.

The proposed activities are in line with the above objectives.

3.5. 2030 Climate Change Adaptation Development Plan[9]

The Development Plan for Adaptation to Climate Change until 2030 (KOHAK) and the accompanying implementation plan were adopted by the Government of the Republic on 02.03.2017. The strategic goal of the development plan is to increase the readiness and ability of the Estonian state, regional and local level to adapt to the impacts of climate change.

In order to prepare the development plan, the researchers identified the impact of climate change on Estonia **in eight key areas**. These areas are:

- planning and land use,
- human health and rescue capacity,
- natural environment,
- bioeconomy,
- infrastructure and buildings,
- energy and energy supply,
- economy
- society, awareness and cooperation.

The planned activities are in line with the goals of the Estonian Development Plan for Adaptation to Climate Change until 2030, supporting the achievement of the goals set for ensuring energy and energy supply, through ensuring energy supply.

The development plan for adaptation to climate change will be integrated into the new environmental strategy paper to be prepared Environmental Development Plan to 2030 (SPRING).[10] This means that KOHAK as a standalone document will be abolished. SPRING will include guidelines for the planning and development of policies and measures across climate policy areas.

3.6. Fundamentals of climate policy until 2050[11]

The fundamentals of climate policy until 2050 have been approved by the Riigikogu on 05.04.2017 and updated in 2023.

The vision of climate policy and the nationwide goal are formulated as follows: *By 2050, Estonia will be a competitive climate-neutral country with a knowledge-based society and economy. A high-quality and species-rich living environment will be ensured, as well as the readiness and ability to adapt to climate change in order to reduce the adverse impacts caused by climate change and make the best use of the positive effects. Estonia's long-term goal is to balance greenhouse gas emissions and removals by 2050 at the latest, i.e. to reduce net greenhouse gas emissions to zero by that time.*

In terms of climate change mitigation, the industrial sector and the development of a regulatory environment conducive to the network of large consumers and producers will be fostered. It is important to reduce the share of losses from energy transmission to an economically justified technical minimum. The planning, construction, management and reconstruction of networks in

[9] https://kliimaministeerium.ee/rohereform-kliima/kliimapoliitika/kliimamuutustega-kohanemine (accessed 10/15/2024)
[10] https://kliimaministeerium.ee/kevad (accessed 15/10/2024)
[11] https://kliimaministeerium.ee/kliimapoliitika-pohialused-aastani-2050 (accessed 10/15/2024)

energy systems shall ensure climate security and be based on the economic and energy efficiency of the system as a whole, with the aim of achieving maximum energy and resource efficiency.

The proposed action is in line with the key energy and industry guideline set out in the document: *the need to ensure energy security and security of supply.*

3.7. National plan "Estonia 2030+"

The Government of the Republic established the national plan "Estonia 2030+" (ÜRP)[12] on 30.08.2012.

The main development goal of the UNP is to ensure living opportunities in every inhabited place in Estonia. Based on this, Estonia has a vision for spatial development by 2030: *Estonia is a country with a cohesive spatial structure, a diverse living environment and a well-connected outside world. The sparsely urbanized space binds together compact cities, suburbs and traditional villages, valuing all these ways of living equally much. The human-friendliness and economic competitiveness of sparsely urbanized spaces are primarily ensured by the close-to-nature environment and the network of well-connected settlements.*

In order to implement the vision, the main direction and goal of the UNP is, among other things, the provision of energy infrastructure, which requires focusing on supplying Estonia with energy when developing electricity production capacity, placing new energy production units in space rationally and sustainably, expanding the possibilities of Estonia's energy supply, establishing external connections to the energy networks of the Baltic Sea region and avoiding undesirable effects on the climate, achieving a higher share of renewable energy in the energy supply, ensuring energy-saving measures and reducing the environmental impact of energy production. Good connections to the electricity grids of neighboring countries ensure good energy buying, transit and export opportunities. This is important for Estonia from the point of view of security of supply, energy security and ensuring the most affordable energy for Estonia.

The planned activities are in accordance with the national plan "Estonia 2030+".

3.8. Estonian maritime spatial plan

The Government of the Republic established the Estonian maritime spatial plan[13] on 12.05.2022.

The purpose of the marine spatial plan is to agree on the long-term use of Estonia's marine space in order to promote the maritime economy and contribute to the achievement and maintenance of good environmental status of the marine environment. The established maritime spatial plan is the basis for making various decisions allowing the use of marine space for both ministries and agencies, and also serves as a basis for planning their activities for entrepreneurs, investors, local governments and coastal communities.

According to chapter 5.7 of the explanatory memorandum to the maritime spatial plan, the Estonian maritime spatial plan does not determine the spatial locations of existing and prospective cables and pipelines as a spatial development document at the strategic national level. The exceptions are the fundamental connection corridors of the wind energy development areas planned in the plan. The design and construction of cables and pipelines is permitted taking into account the guidelines and conditions set out in the maritime spatial plan and is not an activity that changes the maritime spatial plan.

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[12] https://agri.ee/regionaalareng-planeeringud/ruumiline-planeerimine/uleriigiline-planeering#eesti-2030 (accessed 10/15/2024)

[13] https://agri.ee/regionaalareng-planeeringud/ruumiline-planeerimine/mereala-planeering (accessed 10/15/2024)

<u>Relevant guidance when planning EstLink3:</u>

- In areas of higher risk (e.g. heavy shipping – crossing with fairways, overlapping with trawling areas, movement of ice in a shallow-water area, etc.), if necessary, the cable must be protected from possible sources of danger, e.g. covered with concrete slabs or recessed to the seabed. In order to mitigate the impact of cables, it is expedient to consider the possibility of burying them, for example, in the case of a sandy slope. For a hard substrate (for example, if it is a "reef" habitat type), it is inexpedient to cover the cable. If possible, the outer surface of the cable should have a neutral reaction and allow the attachment of organisms.

<u>Relevant conditions when planning EstLink3</u>**:**

1. Existing cables and pipelines must be taken into account for all uses of marine space. If necessary, a clarifying study must be carried out to assess the location and condition of the cables and cooperate with the cable owner.
2. The details of the laying of cables and pipelines (location/technical solution, etc.) will be specified in the context of specific permit granting procedures. Based on the details, the need for an impact assessment is also specified, including the nature, extent and scope of the impact at local level.
3. When laying cables, apply best available techniques to avoid potentially significant adverse effects of electromagnetic fields on biodiversity, including fish fauna.
4. Planned submarine cables and pipelines must be protected in the shallow-water area of the coast in such a way that ice cannot break the cable. Installations must take into account the risk posed by ice conditions and be durable.
5. When laying cables and pipelines, it is necessary to exclude significant adverse effects on protected natural sites and adverse effects on Natura 2000 sites through a suitable technical solution and site selection. Cooperation with the Environmental Board is required.
6. When laying cables and pipelines, it is necessary to cooperate with the National Heritage Board at the stage of the application for a superficies license in order to avoid damage to the cultural heritage of the seabed.
7. When constructing cables and pipelines, it is necessary to cooperate with the Ministry of Defence at the stage of the application for a superficies license in order to determine the need to take into account possible historical explosive devices and dangerous objects.
8. When laying cables and pipelines, local government units must be involved at the stage of the application for a superficies license, with a cable or pipeline 3 nautical miles from the sea border.
9. In order to mitigate the impact of cables and pipelines, it is expedient to consider the possibility of, for example, burying the cable in the case of a sandy slope. In the case of a hard substrate (for example, when it comes to the habitat type of "reefs"), it is inexpedient to bury or cover the cable. If possible, the outer surface of the cable should have a neutral reaction and allow the attachment of organisms.
10. Following the laying of cables, the mining, dumping and anchoring of mineral resources is prohibited in the cable corridors.

EstLink3 is planned in accordance with the guidelines and conditions of the Estonian maritime spatial plan.

3.9. General plan of Lääne-Nigula Municipality[14]

On 18.08.2022, the Lääne-Nigula Parish Council established the general plan of Lääne-Nigula Parish by decision No. 1-3/22-36 (except for the 218 ha of Tusari village, which was established on 19.09.2024 by decision No. 1-3/24-49).

The general plan of Lääne-Nigula municipality does not provide for a power line or underground cable route corridor in the area of the EstLink3 landing site.

In its letter No. 7-1/24-17-2 of 23.04.2024 to the Technical Regulatory Authority, the Lääne-Nigula Rural Municipality Government has stated that EstLink3 is of wider interest to the state and it is necessary to carry out the entire location selection process in its entirety together with the planning of the 330 kV overhead power line corridor and the Risti substation and Aulepa converter substation in accordance with § 27 (1) and (2) of the Planning Act.

According to the master plan, the intended EstLink3 landing site will be in the area of the valuable local landscape, the Riguldi seaside beach juniper, and the green corridor area (see chapter 4.4).

[14] Lääne-Nigula parish homepage https://www.laanenigula.ee/uldplaneering (accessed 16.10.2024)

4. DESCRIPTION OF THE ENVIRONMENT EXPECTED TO BE AFFECTED AND SIGNIFICANT ENVIRONMENTAL IMPACTS

4.1. Settlement

The planned EstLink3 submarine cable connection runs from the Gulf of Hara through the territorial sea of Estonia and the exclusive economic zone of Finland. The landing site in Finland is in the process of being specified.

The site of the proposed EstLink3 is located in Lääne-Nigula Parish, Lääne County, on the territory of the village of Riguldi. The following privately owned land plots are located in the area of the landing site: KÜ 52001:001:1502 and KÜ 52001:001:1462. The rest of the coastal properties in the area are also privately owned and land for profit.

About 200 m from the landing location of EstLink3, the state secondary road Harju-Risti – Riguldi – Võntküla tee no. 11230 runs parallel to the coast.

The nearest residential plots are located on the other side of the Harju-Risti – Riguldi – Võntküla highway and these are: Neptune (KÜ 52001:001:0368), Jupiter (KÜ 52001:001:0369), Päikese (KÜ 52001:001:0367), Aspen (KÜ 52001:001:2450), Saturn (KÜ 52001:001:0371), Tailor (KÜ 52001:001:2541) and Mäe (KÜ 52001:001:0042).

The nearest settlements are the village of Hara 1.3 km to the southwest (with a population density of 15 in/km2) and the Vanaküla (11 in/km2) 3 km to the northeast. The EstLink3 route passes 1.4 km from Osmussaare, which has a population density of 3 in/km2. The population density of the village of Riguldi is less than 4 in/km2.[15]

According to the website of Lääne-Nigula parish, the population as of 31.10.2024 was[16]: Riguldi village/Ricul 23, Hara village 39, Vanaküla/Gambyn 16 and Osmussaare village/Odensholm 5 inhabitants.

The construction of EstLink3 may have an impact on local residents primarily due to disturbances during construction (movement of construction machinery and noise on the coast, see chapter 4.19) and operational restrictions (e.g. fishing restrictions in the submarine cable protection zone, see chapter 4.17). An assessment of the potential impact shall be made in the EIA report.

4.2. Ports and shipping lanes

On the opposite shore of the EstLink3 landing site, about 720 m to the southwest, is the port of Hara, which is registered in the port register[17] as a small port where port services are provided only to craft of less than 24 m in overall length. Hara Harbour is an important fishing port in the Läänemaa region[18]. The area is also home to Dirham Harbour and Osmussaar Harbour (Figure 4).

The Transport Administration's web application Nutimeri[19] according to data, the EstLink3 route intersects with shipping lanes No. 240 Norrby (see chapter 4.18 Figure 14). In addition, the EstLink3 route passes through the international shipping lane.

[15] Land Board's 1000mx1000m population square map, as of 13.09.2024
[16] https://www.laanenigula.ee/elanike-arv (accessed 20/11/2024)
[17] https://www.sadamaregister.ee/sadam/2259 (accessed 19/09/2024)
[18] E-mail from MTÜ Läänemaa Rannakalandus Selts 24.04.2024
[19] Transport Administration's web application Nutimeri https://gis.vta.ee/nutimeri/ (accessed 20.09.2024)

When constructing EstLink3, it is necessary to take into account the existing shipping lanes both in the construction and operational phases. When planning construction work on submarine cables, safe navigation must be ensured. The main risk of the operational phase lies in the possible damage to the cables by anchors. In order to minimise the risk, the submarine cable must be recessed to the seabed and the locations of the submarine cables indicated on navigation maps.

In the context of the EIA, the impact of the establishment of EstLink3 on navigation and maritime safety must be assessed (see chapter 5.3).

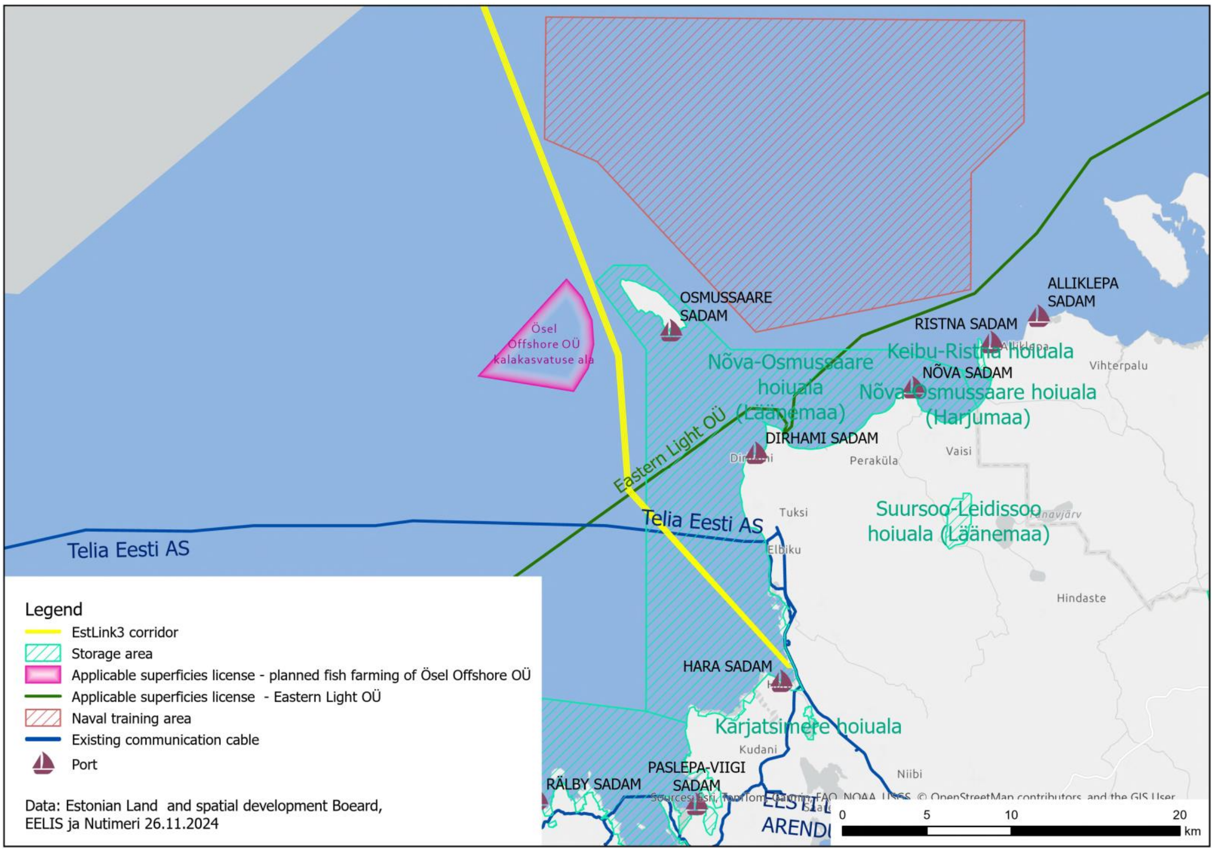

Figure 4. EstLink3 corridor and existing and planned activities in the area

4.3. Existing and planned activities in the region

4.3.1. Navy Training Area

To the east of the EstLink3 route is the Navy Training Area (Figure 4). At the nearest point, the EstLink3 route is about 380 m from the boundary of the training area.

According to the development program "Selection of locations of air defense and artillery sea-oriented training areas and naval training areas", approved by order no. 94 of the Minister of Defense of 14.03.2014,[20] naval training areas allow mine clearance training, diving training, conducting in-flight weapons firing exercises, as well as conducting individual, ship-based and unit-based exercises and conducting international mine countermeasures operations. In addition, the training areas are necessary for the safe and effective conduct of tests and experiments related to the introduction of mine clearance methods, tactical exercises and new technical solutions.

[20] https://kaitseministeerium.ee/sites/default/files/sisulehed/harjutusvaljad/osmaap/arendusprogramm.pdf (Viewed20.11.2024)

Practice areas are marked on navigation maps, physical marking (buoys, etc.) is not required. As an exception, training minefields may be temporarily marked (training mines do not contain explosives).

Training areas are open to civilian vessels (including those engaged in fishing) unless the Navy uses training areas. Differences may occur in the part of the training area where a stationary training/exercise mine, a training/exercise minefield or other underwater artificial object with parameters and position determined by the Navy is launched, which in this case is marked accordingly (both in the real location and in the navigation, information transmitted by the Transport Administration with information containing restrictions).

In its letter No. 12-1/24/112-2 dated 11.04.2024, the Ministry of Defense has stated that no search and remediation of historical mine barrier explosive devices has been carried out in the area encumbered by the superficies license, therefore the presence of some explosive devices cannot be ruled out. It is also possible to find random historical explosive devices (torpedoes, airplane bombs, etc.) in the area. Thus, before the start of construction work on EstLink3, it is necessary to carry out magneto- and gradiometric studies of unexploded explosive devices and other dangerous objects (including the search for and remediation of historical mine barrier explosive devices) in cooperation with the Ministry of Defense (see chapter 5.3).

4.3.2. Aulepa wind farm

2.5 km southeast of the landing site of the EstLink3 submarine cable is the Aulepa wind farm owned by Enefit Green AS, which has 16 wind turbines with a total capacity of 48 MW. According to the website of Enefit Green AS[21] , the annual electricity production of the Aulepa wind farm is ca 80 GWh, which can cover the annual electricity needs of more than 26,600 households.

As the object of this EIA is a submarine cable and its possible area of influence is limited to the coastal area, there is no potential interaction of the proposed activity with the Aulepa wind farm.

4.3.3. Telia Eesti AS communication cable

According to the Land Board's restriction map application, the EstLink3 route intersects with the Telia Eesti AS communication cable about 10 km from the landing point (Figure 4), which runs from the mainland to Hiiumaa (Tahkuna Peninsula). According to § 78 (2) 3) of the Building Code, it is forbidden to carry out dredging work in the protection zone of a communication structure located in the water, anchor the craft and move with thrown anchors, chains, logs, trawls and nets, install traffic signs and cubs on craft, and detonate and store ice. The protection zone of the communication structure has a range of 0.25 nautical miles (463 m)[22] from the central line of the communication building.[23]

As described in chapter 2.4.4 crossings with the existing infrastructure will be resolved during the EstLink3 work project in cooperation with other infrastructure owners. The usual solution when crossing with infrastructure is as follows: infrastructure previously located on the seabed is covered with stones, creating a bridge over the existing infrastructure. It is also possible to solve crossings with concrete mats and other technical solutions.

4.3.4. Other superficies license applications in the area

Eastern Light OÜ communication cable line

[21] https://enefitgreen.ee/tuuleenergia/tootmine (accessed 10/16/2024)

[22] 1 nautical mile = 1.852 km

[23] Regulation No. 73 of the Minister of Economic Affairs and Infrastructure of 25.06.2015 "The extent of the protection zone of a building, the procedure for operating in the protection zone and the requirements for the designation of the protection zone" https://www.riigiteataja.ee/akt/103022022020 (accessed 19.11.2024)

According to the Land Board's superficies license map application, the EstLink3 route intersects with the planned fiber-optic communication cable route at about 13.6 km (Figure 4). The Consumer Protection and Technical Regulatory Authority (TTJA) has initiated the procedure for applying for a superficies license in 2019. A prerequisite for further processing of the application for a superficies license is the conduct of an underwater archaeological survey and a seabed survey (for safety reasons regarding the cable route).

According to the information received from the Technical Regulatory Authority, the deadline for submitting the underwater archaeological survey report and the results of the seabed survey approved by the National Heritage Board to Easternlightestonia OÜ has been set at 02.01.2025. As of the preparation of the EIA program, the aforementioned documents have not yet been submitted to the Technical Regulatory Authority and the superficies license procedure is currently pending.

According to the EstLink3 superficies license procedure and the decision to initiate the EIA,[24] the developer of the communication cable Easternlightestonia OÜ did not express an opinion on the initiation of the procedure of elering AS's application for a superficies license.

If, at the time of conducting the EstLink3 studies and preparing the EIA report, it has become clear that the construction of the aforementioned communication cable is still relevant and the necessary studies have been carried out, then the possible interplay with at least the following environmental aspects must be assessed: underwater cultural heritage, including dangerous objects, seabed biota and habitats, fish fauna.

Ösel Offshore OÜ fish farming area

According to the Land Board's superficies license map application, one of the three applied fish farming areas of Ösel Offshore OÜ is located about 0.5 km west of the EstLink3 route (Figure 4). The procedure for the superficies license for the planned fish farming of Ösel Offshore OÜ and the carrying out of the EIA have been initiated by the Technical Regulatory Authority in 2017 and the EIA program has been declared compliant in 2020.

The EIA report of Ösel Offshore OÜ, which was published in autumn 2024[25], states that in connection with the initial analysis of the suitability of the areas of the superficies license application, the developer has decided to abandon the desire to establish a fish farm in two of the three areas, one of which is the area west of Osmussaare. The reason for the abandonment of sites is the complex conditions of nature conservation and technical (ice conditions) that have appeared.

Since, according to the aforementioned EIA report, the developer is planning to withdraw the application for a superficies license related to the planned area near Osmussaare following the decision declaring the EIA report to be compliant, this activity will not be considered in the current EIA further process.

4.4. Valuable landscape and green network

The general plan of Lääne-Nigula parish established in 2022[26] (see also chapter 3.9), the landing site of EstLink3 will be in the area of the valuable local landscape, the Riguldi seaside coastal juniper (Figure 5). The purpose of the valuable landscape and site-specific conditions are as follows: a beautiful view, develop recreational facilities, ensure and open up views of the sea, provide access to the shoreline, there is a landscape maintenance plan. Explanatory memorandum to the master plan[27] , coastal meadows in valuable landscapes require mowing and grazing, and the overgrowth of bays in the area of valuable terrain must be avoided by consistent cane cutting. In addition, according

[24] Decision No 1-7/24-252 of the Technical Regulatory Authority of 25.07.2024

[25] Ösel Offshore OÜ application for a superficies license for three marine fish farm complexes in the EIA Saaremaa W area. Version of the work 11.10.2024. Lemma Ltd.

[26] General plan of Lääne-Nigula parish https://www.laanenigula.ee/uldplaneering (accessed 16.10.2024)

[27] Lääne-Nigula Master Plan. West County. Lääne-Nigula Rural Municipality Government, AB Artes Terrae OÜ, 2022

to the CAP, the EstLink3 landing location has a beautiful viewpoint, where it is important to preserve the characteristic views (Figure 5).

In the area of the EstLink3 landing site, according to the Lääne-Nigula master plan, the entire coastal area is designated as a green corridor (Figure 5).

The construction of EstLink3 will not have a significant impact on the preservation of the valuable landscape or the functioning of the green corridor. The laying of cables on the coast has a short-term and local impact due to disturbances related to construction activities, there is no operational effect.

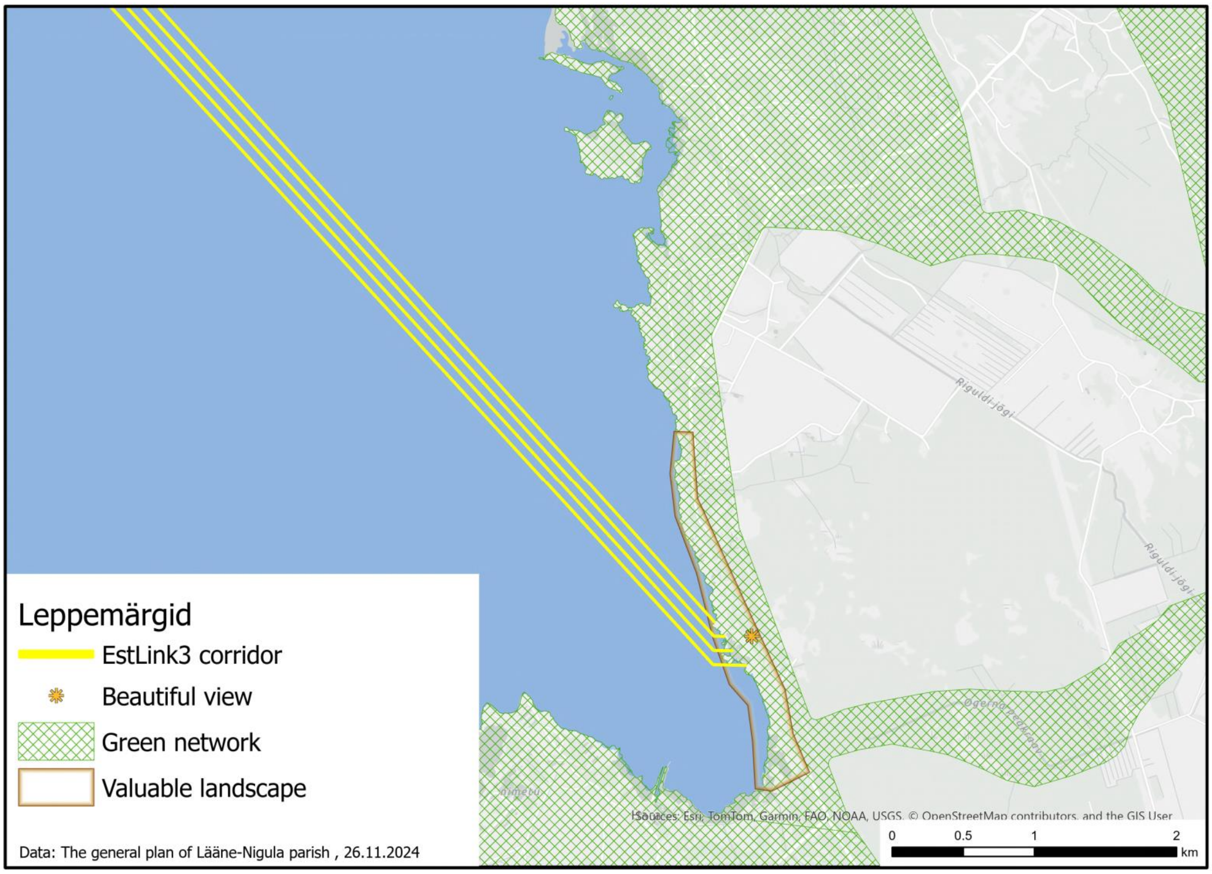

Figure 5. Valuable landscape and green landscape according to the general plan of Lääne-Nigula parish

4.5. Seabed geology

The seabed is up to 120 m deep in the area of the planned activity to the border of the Estonian maritime area. The depth of the seabed increases smoothly to 30 meters from Hara Bay to the southwestern part of Osmussaare, from there to the northwestern part of Osmussaare to 80 meters, and from it in a northerly direction to 100 meters on the border of the Estonian maritime area, meanwhile it is up to 120 m deep.[28]

According to digitized maps of the Estonian seabed in 2009[29], the EstLink3 route corridor forms a quaternary sediment on the seabed surface. In the northern part of the corridor, marine sediments that have settled in the Litoriinamere and Limneamere basins or on the beach – gravel, sand, aleurite, clay sand, sandy loam, sea mud (Q2_Lt-Lm, mIVlt+lm) – are spreading; Sea/lake sediments that

[28] Digitisation of thematic maps of the Estonian seabed. (EGF9144). EGK, 2009

[29] Digitisation of thematic maps of the Estonian seabed. (EGF9144). EGK, 2009

have settled in the pool or on the beach/shore of the Joldiamere and Ancylus Lake – sand, aleurite, clay sand, sandy loam, marine/lake mud (Q2_Yl-An, mIVy+an)[30].

In the southern part of the route corridor, glacial sediments – pebbles and eggs, gravel, sand, aleurite, clay sand, sandy loam, clay (lgIIIjr3\b) – spread in the lower strata of Lake Võrtsjärv; glacial sediments of the substratum of Lake Võrtsjärv – clay sand and sandy loam, pebbles and cobbles (Q1jrVr_g, gIIIjr3); marine sediments that have settled in the Limneamere basin or on the beach near the coast – gravel, sand, aleurite, clay sand, sandy loam, sea mud (mIVlm), see Figure 6[31,32].

In the vicinity of Osmussaare, all the above-mentioned sediments and the bedrock opening, where there is no surface coating, are spread in the area of the route corridor[33].

The thickness of the Quaternary sediments on the seabed is up to 28 m in the south, up to 10 m on the section west of Osmussaar, and 0-80 m in the north[34] up to the distant border of the territorial sea of Estonia, i.e. the beginning of the exclusive economic zone (Figure 6).

The bedrock is formed in the southern part of the proposed route corridor by sediments of the Central Ordovician Deposit (O2), in the central part by sandstones, aleurolites, argillites and clays of the Cambrian deposit and the Lower Ordovician deposit (Ca+O1), in the northern part by the Vendi Deposit (V3), the Lower Proterozoic Crystalline Bedrock (PR1).[35]

[30] Guide to digital geological mapping of Estonia on a scale of 1:50,000. Land Board, 2013
[31] Digitisation of thematic maps of the Estonian seabed. (EGF9144). EGK, 2009
[32] Guide to digital geological mapping of Estonia on a scale of 1:50,000. Land Board, 2013
[33] Land Board Geology Map Application, 1:50,000
[34] Digitisation of thematic maps of the Estonian seabed. (EGF9144). EGK, 2009
[35] Digitisation of thematic maps of the Estonian seabed. (EGF9144). EGK, 2009

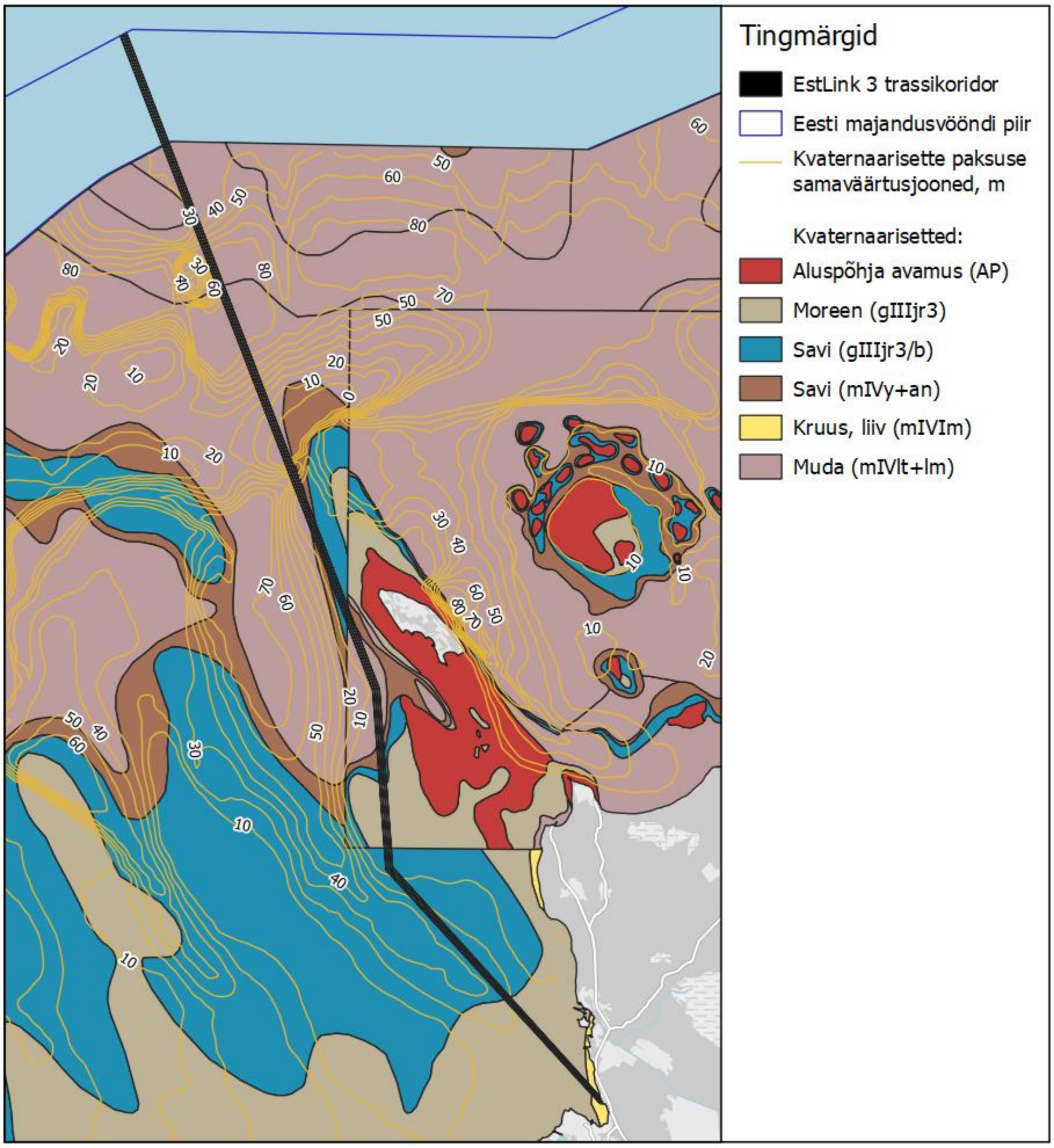

Figure 6. Quaternary sediments and their thickness occur in the area of the proposed EstLink3 route[36]. Basemap: Land Board, 2024

For a more detailed description of the geology of the seabed of the EstLink3 route corridor, it is necessary to carry out geological surveys of the seabed (see chapter Chapter 5.3).

4.6. Current climate and climate change

4.6.1. Temperature and precipitation

Climate change is causing an increase in average temperatures and an increase in rainfall. As the future climate projections[37] are estimated and based on currently existing climate data, the historical climate patterns of the EstLink3 corridor area have been used as a reference station for precipitation

[36] Digitisation of thematic maps of the Estonian seabed. (EGF9144). EGK, 2009

[37] *Climate projections are simulations of the earth's future climate (usually up to the year 2100) based on hypothetical scenarios for concentrations of greenhouse gases, aerosols, and other atmospheric constituents that affect the planet's radiation balance*. Source: https://climate.copernicus.eu/climate-projections#:~:text=soon%20as%20possible.-,Climate%20projections,affect%20the%20planet's%20radiative%20balance (accessed 27.10.2024)

and temperature in order to characterize and illustrate the historical climate patterns of the EstLink3 corridor area (based on data from the Estonian Environment Agency). Although there are weather observation stations closer to the location of the proposed activity in terms of geographical location, a station with a longer series of data has been used to describe trends in precipitation and temperatures, where data from recent decades and climate norms can be compared over a longer time series. In Estonia, 30-year climate norms are used to calculate and show longer-term temperature and precipitation trends, which is also in line with the practice of the World Meteorological Organization (WMO).[38] It is on the basis of such collected data that can be used to assess climate change over the last few decades. Thus, only data from Lääne- Nigula station have been used, since there are no long-term data series from other nearby weather observation stations (hydrological, coastal and meteorological stations).

Data from Lääne- Nigula's climate norms show a growing temperature trend since 1960, and the average of climate norms from the 1961-1990 norm to the last 1991-2020 norm has increased by 1.2°C (Figure 7). This indicates higher temperatures over the years, as well as global warming. Both the Estonian average and the average rainfall in Lääne-Nigula have steadily increased until the average annual norm in 1981-2010, and the last 30-year climate norm shows a slight decrease compared to the norm in 1981-2010 (Figure 8).

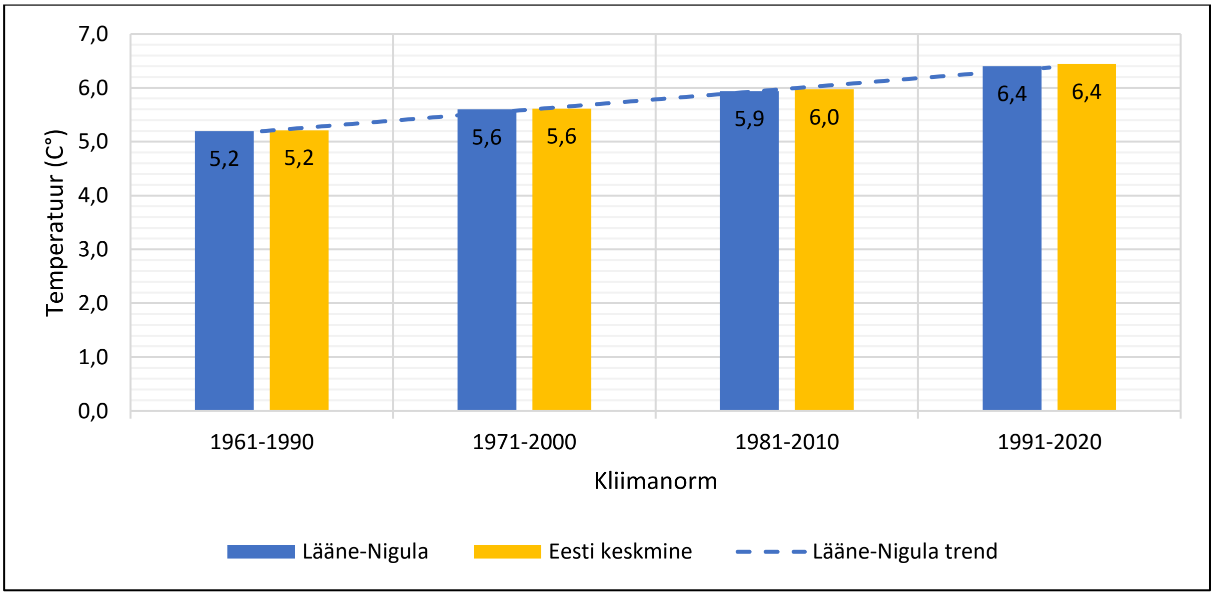

Figure 7. Climatic norms of temperatures at the Lääne-Nigula Observatory from the norm in 1961-1990 to the norm in 1991-2020 with the Estonian averages in the same periods

[38] Updated 30-year reference period reflects changing climate. 2021. World Meteorological Association (WMO). Available: https://wmo.int/media/news/updated-30-year-reference-period-reflects-changing-climate (accessed 30/10/2024)

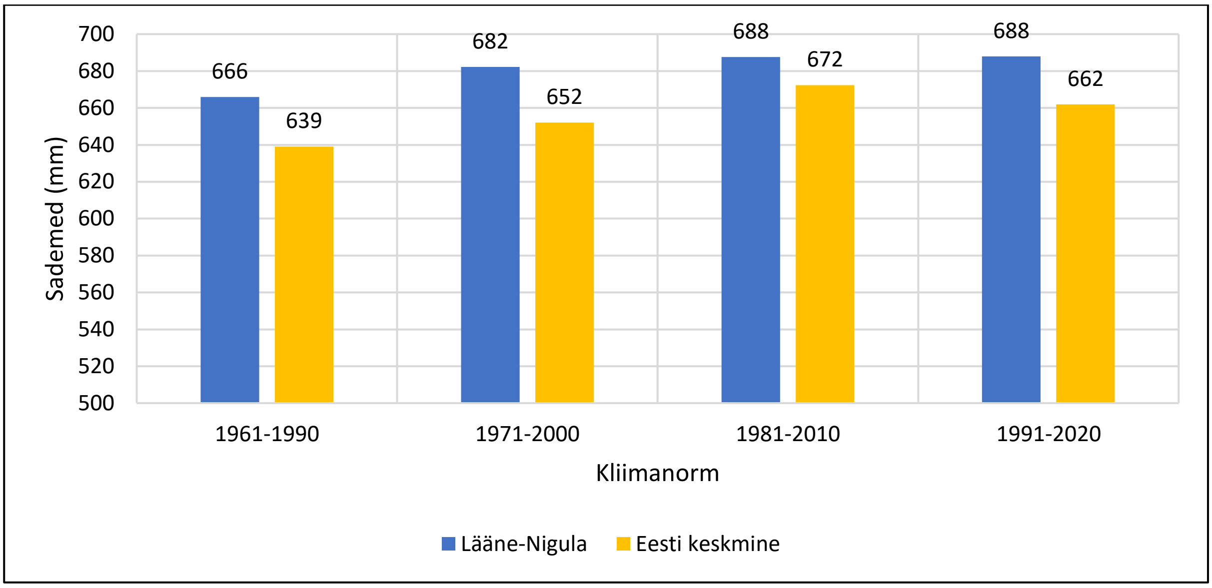

Figure 8. Climate norms of precipitation at the Lääne-Nigula Observatory from the norm in 1961-1990 to the norm in 1991-2020 with the Estonian averages in the same periods

With regard to temperatures, it is worth noting that the temperatures in Lääne-Nigula are essentially the same as the Estonian average in terms of climate norms, while in terms of precipitation, the rainfall in Lääne-Nigula is higher than the Estonian average. Similar upward trends are foreseen in the future in the sixth report (AR6) of the Intergovernmental Panel on Climate Change (IPCC),[39] according to which in Northern Europe (which includes Estonia according to the IPCC classification) there is a very high probability (>95%) that average temperatures will rise, which leads to a higher risk of extreme heat waves. An increase in the amount of precipitation in the future in the Estonian context has also been assessed as likely.

4.6.2. Ice conditions

Climate change will also lead to a reduction in snow and ice cover in the future due to a warmer climate, which has historically also been observed in the coastal sea of Northern and North-Western Estonia[40]. In 2021, the area of ice cover in the Gulf of Finland ranged from about 110,000 to 120,000 km3; by 2100, the estimated ice cover area is about 75,000 km3[41]. The thickness of the ice in the Gulf of Finland is currently about 50 cm as the median, and by 2100 it will decrease to an average of 30 cm[42]. The number of ice-free days in the Gulf of Finland has increased over time since the 1950s[43]. Although general trends in the Gulf of Finland and the northern coast of Estonia indicate a decrease in ice thickness and ice cover area, we also see a large variation from year to year in terms of ice cover and thickness, which means that there may still be years where ice cover is also present

[39] IPCC, 2023: Sections. In: Climate Change 2023: Synthesis Report. Contribution of Working Groups I, II and III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [Core Writing Team, H. Lee and J. Romero (eds.)]. IPCC, Geneva, Switzerland, pp. 35-115, doi: 10.59327/IPCC/AR6-9789291691647

[40] Variability of the thickness of sea ice on the Estonian coast. Bachelor's thesis. K. Juice. 2015. University of Tartu

[41] Luomaranta, A., Ruosteenoja, K., Jylhä, K., Gregow, H., Haapala, J. and Laaksonen, A., 2014. Multimodel estimates of the changes in the Baltic Sea ice cover during the present century. Tellus A: Dynamic Meteorology and Oceanography, 66(1), p.22617.

[42] Luomaranta, A., Ruosteenoja, K., Jylhä, K., Gregow, H., Haapala, J. and Laaksonen, A., 2014. Multimodel estimates of the changes in the Baltic Sea ice cover during the present century. Tellus A: Dynamic Meteorology and Oceanography, 66(1), p.22617.

[43] Sooäär, J. and Jaagus, J., 2007. Long-term changes in the sea ice regime in the Baltic Sea near the Estonian coast. *Estonian Journal of Engineering*, *13*(3).

at the location of the planned activity.[44]. However, general trends are in the direction of decreasing, and ice-free winters will be more and more common in the future[45]. Basic study of ice conditions in the Estonian marine spatial plan[46] , the proposed activity will remain in the western Gulf of Finland region, where the annual ice cover thickness is on average less than 40 days, but in harsh winters the duration of the ice cover can reach 90 days. The ice is mobile in the area and the average drift speeds reach 0.05 m/s. In this region, north-south ice drift is stronger (0.025 m/s) than in other areas of the Estonian maritime area. At the same time, ice drift from east to west (on average 0.02 m/s) along the axis of the Gulf of Finland is also important there. In extreme conditions, the speed of ice drift can be up to 0.23 m/s[47]. Taking into account the ice conditions is important when planning the construction of submarine cables. A more comprehensive description of the ice conditions is given in the EIA report based on the expert assessment to be prepared (see chapter 5.3).

4.6.3. Wind conditions

Data from Dirham Coastal Station and Osmussaare coastal station observation stations have been used to describe wind direction and average strength in the area of the planned activity, data from the Environment Agency's observation stations have been used for Dirham from 2011 to June 2024 and Osmussaare station from 2013 to June 2024[48].

According to Dirham Station, southeast and southerly winds are predominant. Winds are of medium strength, in the range of 4-8 m/s, but in winter the average wind speed can reach more than 10 m/s. Spring and summer are dominated by southerly winds, with an average strength of 5-7 m/s. In autumn, wind strengthening is observed and south-east winds dominate, with average wind speeds rising to 6-8 m/s. In winter, the strongest winds, mainly from the southeast and south, often blow at speeds above 8 m/s.

According to Osmussaare Station, southwest and southerly winds prevail. Winds are medium in the range of 7-9 m/s, but in winter the average wind speed can reach more than 10 m/s. Spring and summer are dominated by southerly winds, with an average strength of 7-9 m/s. In autumn, wind strengthening is observed and southwesterly winds dominate, with average wind speeds increasing to 8-10 m/s.

The two stations show the prevailing wind direction from the southwest, south and southeast, and during the autumn-winter period, the average wind strength of both stations increases by nearly 10 m/s.

Due to its location on the southwest coast and at sea, the location of the proposed cable is more open than mainland Estonia and is therefore also more affected by the mainly west and southwest winds coming from the Baltic Sea. Therefore, in the context of climate change, windier and stormier conditions must also be taken into account than in mainland Estonia. The strengthening of winds seasonally is difficult to estimate, but in the future one can count on some increase in the speeds of winter winds, it is difficult to make a forecast of extreme winds. Nevertheless, it can be assumed that the trend of increasing rainfall and storms may also be accompanied by extreme winds[49].

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[44] Haapala, J.J., Ronkainen, I., Schmelzer, N. and Sztobryn, M., 2015. Recent change—Sea ice. *Second assessment of climate change for the Baltic Sea basin*, pp.145-153.

[45] Haapala, J.J., Ronkainen, I., Schmelzer, N. and Sztobryn, M., 2015. Recent change—Sea ice. *Second assessment of climate change for the Baltic Sea basin*, pp.145-153.

[46] Basic study of marine planning: analysis of ice conditions and preparation of maps. 2016. TalTech. Commissioned by: Ministry of Finance. Can be found here: (accessed 27.11.2024)

[47] Basic study of marine planning: analysis of ice conditions and preparation of maps. 2016. TalTech. Commissioned by: Ministry of Finance. Available: https://www.agri.ee/sites/default/files/documents/2023-06/uuring-2016-j%C3%A4%C3%A4olude-anal%C3%BC%C3%BCs.pdf (accessed 27/11/2024)

[48] Historical weather data. Weather Service. 2024. Environment Agency. Available: https://www.ilmateenistus.ee/kliima/ajaloolised-ilmaandmed/ (accessed 03/10/2024)

[49] Luhamaa et al., (2014) Estonia's future climate scenarios until 2100. Environment agency. Available: https://kliimaministeerium.ee/kliimamuutustega-kohanemise-arengukava (accessed 27/11/2024)

The construction of the submarine cable does not affect wind conditions, nor does there be any impact during the operation of the submarine cable, and therefore the issue does not need to be addressed in the future within the framework of the EIA.

4.7. Sea levels and floodplain areas

Flooding is the temporary overlap of land not normally covered by water with water, including flooding caused by an increase in the water level of a watercourse or an increase in sea level in a coastal area. Flood-related risk is the possibility of flooding occurring that can lead to adverse impacts on human health and property, the environment, cultural heritage and economic activities[50].

Global warming and climate change are also accompanied by an increase in global sea levels. The global sea level increase compared to 2014[51] is likely to be between 0.7 and 1.2 m in 2100[52].

Variations in sea levels in the Baltic Sea are mainly caused by the process of water exchange through the Danish Straits[53], as a result of which the water exchange process with the ocean is slow, since the Danish straits are narrow and have a low water permeability between the Baltic and Atlantic Oceans, the sea tide (tidal and tide) in the Baltic Sea is relatively small – rarely exceeds the value[54] of 10 cm. Apart from the short-term variability of sea levels, in the Baltic Sea the impact of tides is less on sea level rise and the effects of possible storm waves and floods are smaller than globally. In addition, Estonia is located on the Fennoscandian Shield, where the earth's crust and ground rise after the loss of ice masses after the last ice age[55]. Thus, the projected increase in the water level in the Baltic Sea and in the coastal areas of Estonia will be lower than the global sea level rise by 2100, estimated at about 87% of the global sea level rise, thus remaining in the range of 61-104 cm by 2100[56]. According to the Development Plan for Adaptation to Climate Change until 2030[57], the rise in sea level in Estonia's coastal areas for 2100 years will be in the range of 20-60 cm according to various scenarios.

The Estlink3 landing site is located in an area with a recurring flood risk (Figure 9). Rising sea levels due to climate change and more frequent storm waves increase the risk of flooding at landing of submarine cables located in coastal areas of the Baltic Sea. Rising water levels and waves that increase storm pressure can cause coastal erosion, exposing cables, making them more susceptible to physical damage. Particularly at risk are cables in shallow water and their disembarkations, which are exposed to coastal erosion and changing coastal conditions.

The EIA report assesses the potential impacts of climate change (sea level rise, flood zone increase, coastal erosion) in the EstLink3 corridor area.

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[50] VeeS § 106. eRT: https://www.riigiteataja.ee/akt/122022019001?leiaKehtiv (accessed 31.10.2024)

[51] Luhamaa et al., (2014) Estonia's future climate scenarios until 2100. Environment agency. Available: https://kliimaministeerium.ee/kliimamuutustega-kohanemise-arengukava (accessed 27/11/2024)

[52] NASA. https://earthobservatory.nasa.gov/images/148494/anticipating-future-sea-levels (accessed 27/11/2024)

[53] Suursaar, Ü. and Kall, T. (2018) Decomposition of Relative Sea Level Variations at Tide Gauges Using Results from Four Estonian Precise Levelings and Uplift Models. *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing*, vol. 11, no. 6, pp. 1966-1974DOI: 10.1109/JSTARS.2018.2805833

[54] Mälkki, P. and Tamsalu, R. (1985) *Physical feature of the Baltic Sea,* Finnish Marine Research, Helsinki, p86-87. http://hdl.handle.net/10138/167788 (accessed 27/10/2024)

[55] Ågren, J., Svensson, R., (2007) Postglacial Land Uplift Model and System Definition for the New Swedish Height System RH 2000 (LMV-Rapport 2007:4). Lantmäteriet. Available: https://www.lantmateriet.se/contentassets/4a728c7e9f0145569edd5eb81fececa7/lmv-rapport_2007_4.pdf (accessed 27/10/2024)

[56] Meier, H.M., Dieterich, C., Gröger, M., Dutheil, C., Börgel, F., Safonova, K., Christensen, O.B. and Kjellström, E., 2022. Oceanographic regional climate projections for the Baltic Sea until 2100. *Earth System Dynamics*, *13*(1), pp.159-199. Available: https://esd.copernicus.org/articles/13/159/2022/ (accessed 27/10/2024)

[57] Climate change adaptation development plan for 2030. Ministry of Climate. Available: https://kliimaministeerium.ee/rohereform-kliima/kliimapoliitika/kliimamuutustega-kohanemine (accessed 31/10/2024)

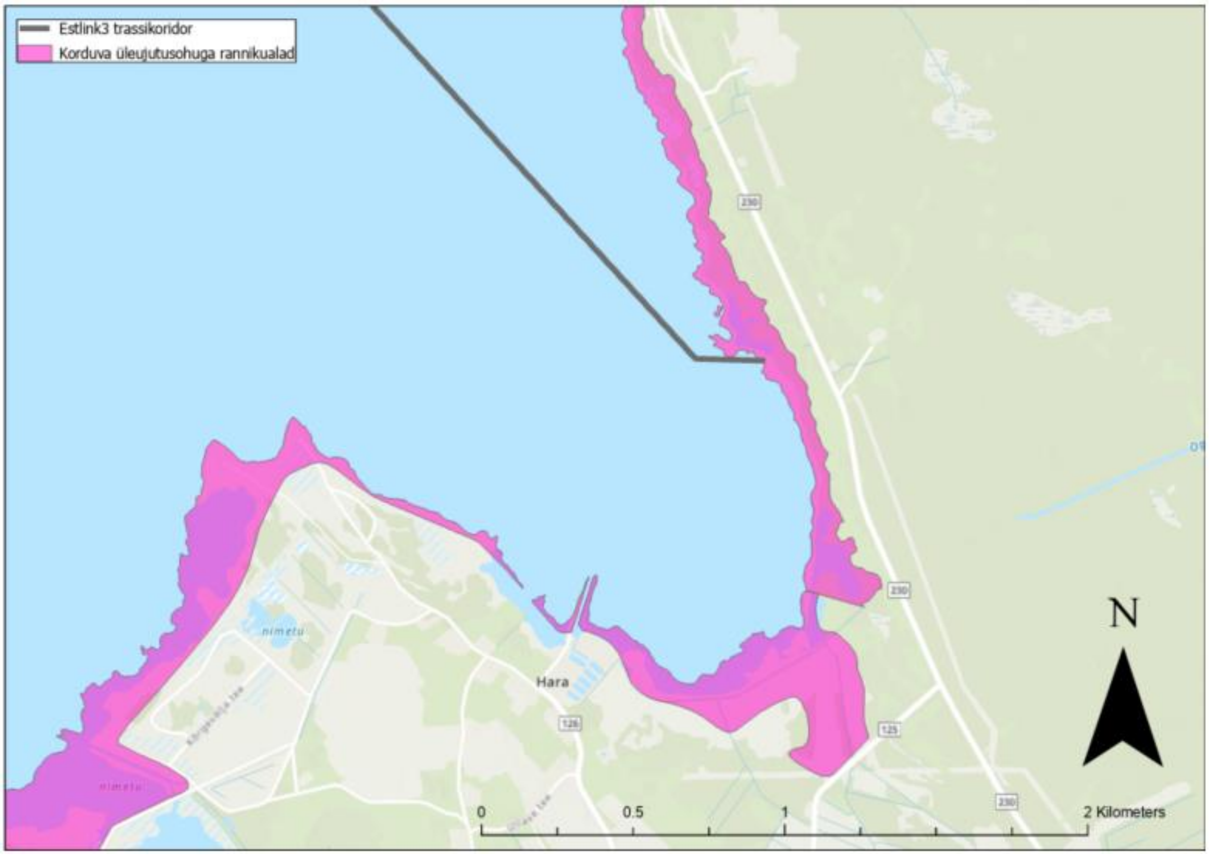

Figure 9. Coastal areas at risk of recurrent flooding in the Estlink3 landing area

4.8. Sea water quality

4.8.1. Status of hiiu shallow coastal water body

The EstLink3 route corridor is located in the Hiiu shallow coastal water body of the West Estonian river basin (EE_7, Hiiu low r_v), which in 2023[58] had a poor overall condition, poor chemical status (KESE) and poor ecological status (ÖSE).[59]

The non-good element of the poor condition of ÖSE in 2023 is FÜKE, FÜPLA;[60] non-good indicator Chl *a*, depth distribution of the cheekbladder, N-general, P-general, Secchi[61]; non-good reason "Nutrients from the past, eutrophication". As an exception, in achieving the objective of good status of the water body, a less stringent objective is allowed FÜPLA, MAFÜ,[62] FÜKE – poor; ÖSE's more lenient goal has been achieved.

The bad indicator of the CENTER in 2023 is Hg in fish[63]. The KESE exception is Hg in fish – bad, cause long-distance transfer, precipitation from the atmosphere. KESE's more lenient goal has been achieved.

[58] West Estonian River Basin Management Plan 2022-2027, approved on 07.10.2022 by decree No. 357

[59] Surface water and groundwater status – Interactive map, as of 02.10.2024

[60] FÜKE – physico-chemical quality characteristics, FÜPLA – phytoplankton

[61] Chl a – chlorophyll a, N-total – total nitrogen, P-total – total phosphorus, Secchi – water transparency according to Secchi disk

[62] MAFÜ – large plants; Northern vegetation in the coastal sea: depth distribution of elk and higher plants, percentage of perennial species

[63] Hg in fish – mercury and its compounds

In order to achieve a good overall status, the RBMP 2022-2027 has set a less stringent target with an exemption. The exception is ÖSE: poor, CENTER: bad (Hg). The more lenient objective of the aggregate position has been achieved.

The category of hiiu shallow coastal water body is terrestrial coastal water body (MV), the subcategory of the water body is natural water body (LV), the type is the offshore coastal water of the Western Islands (R4), the water mirror area is 136,575,207 ha. The nature conservation status of the water body is formed by 9 natural areas and 3 bird sanctuaries. Natura 2000 sites account for 44% of the water catchment area and Natura habitat types are coastal lions (1150*) and rivers and streams (3260).[64] Coastal lions (1150*) (habitat group coastal habitats) are shallow, occasionally connected to the sea, coastal lakes formed by the separation of shallow coves and bays from the sea[65]. Rivers and streams (3260) (habitat group freshwater habitats) habitat type includes those sections of rivers and streams in Estonia that have remained in a natural or close to natural state[66]. Natura sites affected by the proposed activity are covered in Chapter 4.16 and Natura habitat types in chapter 4.13.

In 2023, the hydromorphological status of hiiu's shallow coastal water body has been assessed as very good. Hydromorphological quality indicators for determining the ecological status class of a coastal water body are the area load index of the bottom of the coastal water body (abbreviated as PÕKI) and the coastline load index of the coastal water body (abbreviated as RAKI), which are calculated using the following indicators: the naturalness of currents, the alternation of water depths and its naturalness, the naturalness of the bottom in different ecological zones and the rate of anthropogenic changes in the coastline[67]. Hiiu's shallow coastal water body has a BLUSH of 0.87 and a RAKI of 1.42.[68]

In order to achieve the objective of good status, the RBMP's program of measures identifies[69] an action: *compliance with international agreements or conventions fulfilling water protection objectives*, which is cooperation to achieve good status of transboundary water bodies in the Baltic Sea region. In addition, close-to-source measures are planned for terrestrial surface water pools associated with the coastal water set.

4.8.2. Dangerous substances in seabed sediments

During the geological survey of the seabed in 2021[70] SedGoF has been analyzed[71] sludge sample SLM 6 taken in 2014-2015, the sampling location of which is close to the EstLink3 route corodore (Figure 10). Analyses of organic matter showed that layered dark sea mud was present in the sedimentary drill core SLM 6 at a depth of 0-6 cm; at a depth of 6-20 cm black loamy mud, in places thick layering; At a depth of 20-57 cm gray savialeurite.

In the Baltic Sea, the vast majority of organic matter deposited in sediments originates from the primary production of the water body's own vegetation. The content of organic matter in sedimentary

[64] West Estonian River Basin Management Plan 2022-2027, approved on 07.10.2022 by decree No. 357. Program of measures

[65] Environmental portal nature web https://loodusveeb.ee/et/themes/elupaigad-nimekiri/rannikuloukad-1150 (accessed 25.11.2024)

[66] Environmental portal nature web https://loodusveeb.ee/et/themes/elupaigad-nimekiri/joed-ja-ojad-3260 (accessed 25.11.2024)

[67] Regulation No. 19 of the Minister of the Environment of 16.04.2020 "List of surface water bodies, procedure for determining the status classes of surface water bodies and territorial sea, values of ecological status classes for surface water bodies and values of quality indicators for bodies of water not covered by a surface water body"

[68] Assessment of the hydromorphological status of Estonian coastal water bodies 2023, https://keskkonnaportaal.ee/et/teemad/vesi/pinnavesi/pinnaveekogumite-seisundiinfo

[69] The West Estonian River Basin Management Plan 2022-2027 was approved on 07.10.2022 by decree No. 357. Annex 1 to the program of measures. https://envir.ee/keskkonnakasutus/vesi/veemajanduskavad (accessed 04/10/2024)

[70] Seabed geology: geophysical remote sensing methods and sediment surveys. Tallinn University of Technology Department of Geology, Estonian Geological Survey, 2021

[71] Suuroja, S., Heinsalu, A., Alliksaar, T., Tõnisson, H., Lips, U., et al., 2016. Assessment of the ecosystem-based management of the marine environment on the example of the seabed and sediments of the Gulf of Finland (SedGoF). Geological Survey of Estonia, report.

cross-sections indicates that the content of organic matter in sediments formed from the beginning of the 19th century to the middle of the 20th century is stably low and can be defined as a good environmental status close to natural for this parameter. The values of the content of organic matter are below 10%. Over the past 70 years, a 2-3-fold steady increase in sediment organic matter has been observed, which is a clear sign of continued eutrophication in the Baltic Sea.[72]

The higher element content of toxic heavy metals is 5-25 cm in the sediment depth and exceeds the pre-industrial natural background level by 2-5 times. Over the past few decades, there has been a decline in the heavy metal content of Pb, Zn, Cd and others, largely to pre-industrial levels (Figure 11).

Thresholds for the good environmental status of toxic heavy metals in the sediments of the Estonian marine area have not yet been established. The only toxic heavy metal for which standards have been established for marine sediments in Estonia is lead. The environmental quality limit value for lead in marine sediments is 53 400 µg/kg[73] or 53,4 ppm.

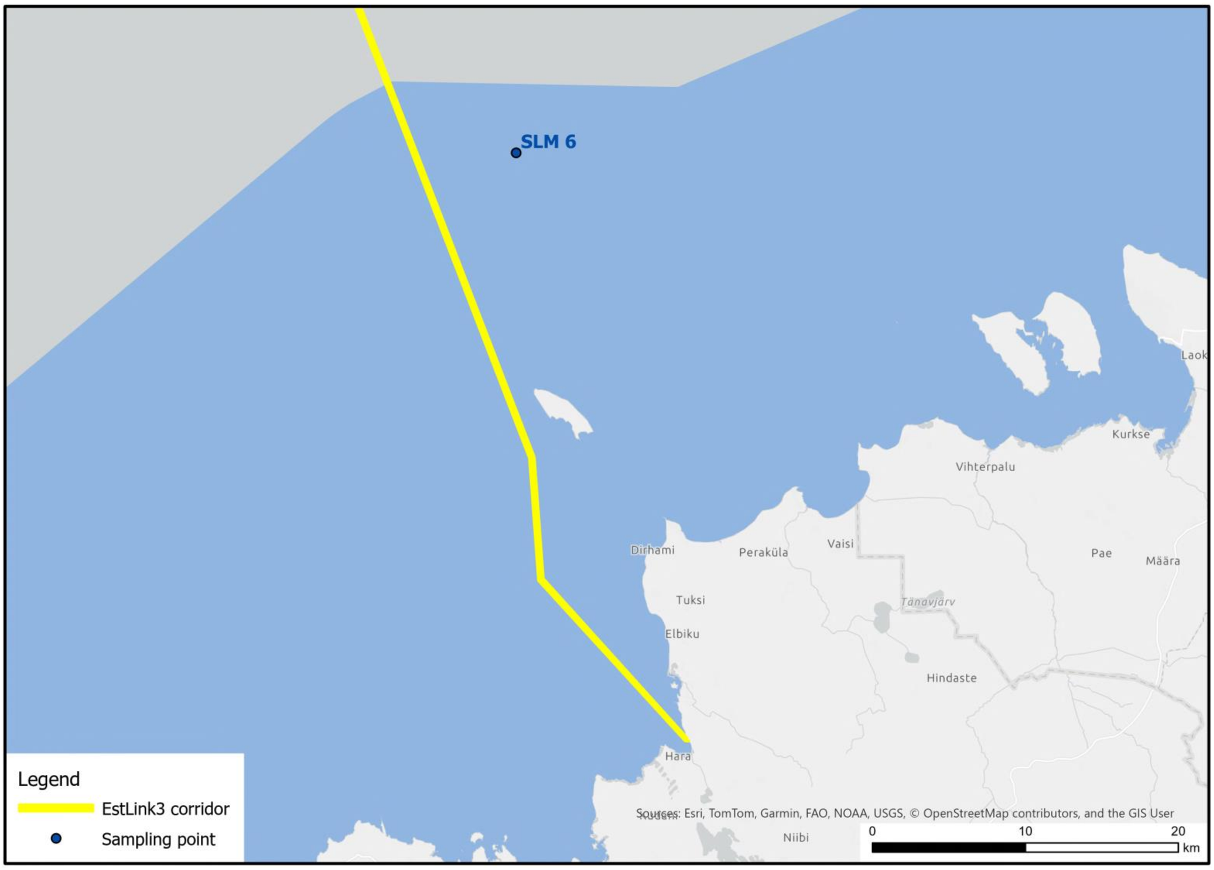

Figure 10. Location of sampling point SLM 6 in relation to the EstLink3 route corridor

[72] Seabed geology: geophysical remote sensing methods and sediment surveys. Tallinn University of Technology Department of Geology, Estonian Geological Survey, 2021

[73] Regulation No. 28 of the Minister of the Environment of 24.07.2019 "List of priority substances and priority hazardous substances, environmental quality limit values for priority substances, priority hazardous substances and certain other pollutants and methods of their application, environmental quality limit values for river basin-specific pollutants, activities related to the watch list of substances"

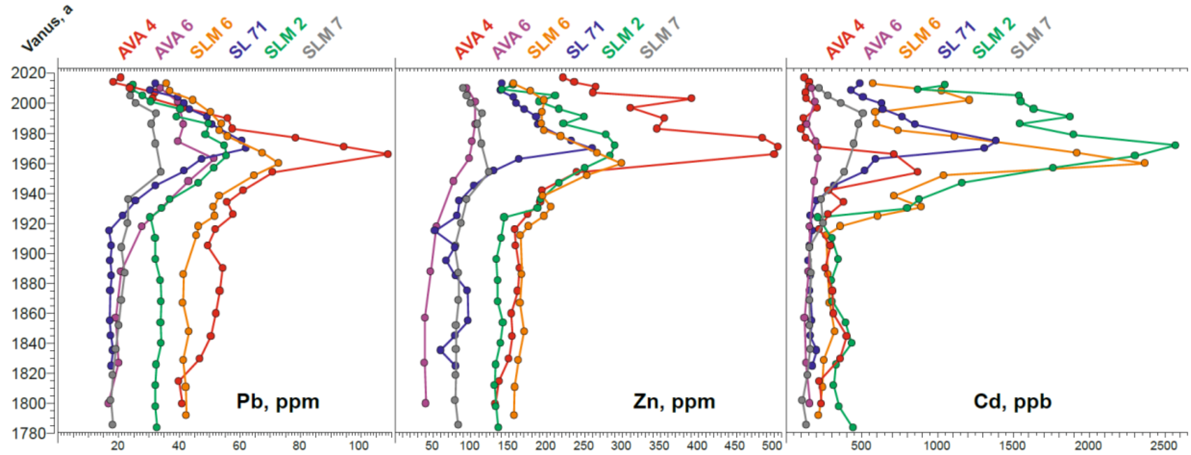

Figure 11. Concentrations of lead, zinc and cadmium in the dated sediment cross-sections of the Estonian marine area. In the vicinity of the proposed EstLink3 route corridor, there will be a sampling point SLM 6[74]

In the course of the planned activities, preparatory work on the seabed and installation of submarine cables will take place (see chapter 2.4), during which sediments are moved to the seabed. Thus, in the course of the EIA, sediment and water quality studies must be carried out on the seabed (incl. modelling the dispersion of suspended solids, see chapter 5.3) and to assess the potential impact on the status of hiiu's shallow coastal water body.

In its letter No. 6-2/24/6065-2 dated 15.04.2024, the Environmental Board has stated that the placement of a cable with a water jet is not a dredging in the sense of the Water Act, if the surface is not moved, it is made into a pedestal under the influence of a jet of water and the cable sinks into place under its own weight. However, if a jet of water or a plow creates a furrow for the cable and partly the soil also remains at the edges of the cable ditch (ca 1/3 of the surface), sediment is removed from the bottom of the water body and this is a dredging within the meaning of § 176 (1) of the Water Act – the soil is removed and dumped next to the cable ditch. How much soil is left out of the cable trench will probably depend on the soil and the plow used (some plows also have a higher backfilling capacity[75]). In the case of plowing, jet dredging, as well as digging a cable ditch, sediment is thrown into the water and suspended solids are formed. According to the available information, the suspended matter that occurs when laying cables with a jet of water may be greater than when placing a cable with a plow or recessing a cable ditch with a bucket[76,77].

Based on the above, the dispersion of suspended solids is modelled across different soils and cable placement technologies, since the spread of suspended solids can affect the fish population (roes and larvids, as well as spawning grounds, see chapter 4.10) and seabed habitats (see chapter 4.14). When modelling the distribution of suspended solids, also take into account the results of geological surveys of the seabed carried out in the framework of the EIA, see chapter 5.3).

4.9. Groundwater and registered wells

The uppermost groundwater body on land in the area of the EstLink3 landing site is the Silurian-Ordovician Matsalu groundwater body The wells closest to the landing site are located in a northerly

[74] Seabed geology: geophysical remote sensing methods and sediment surveys. Tallinn University of Technology Department of Geology, Estonian Geological Survey, 2021

[75] https://www.smd.co.uk/our-products/ploughs/

[76] Environmental Impact Assessment Report for the Baltic Power Offshore Wind Farm, 2022. Available: environmental-impact-assessment-report-for-the-baltic-power-offshore-wind-farm.pdf (accessed 08/04/2024).

[77] Kraus, C. & Carter, L. 2018. Seabed recovery following protective burial of subsea cables - Observations from the continental margin, Ocean Engineering, 157(March), pp. 251–261.

direction about 380 m from the Mäe property (22 m deep well No. PRK0022445) and about 720 m from the Pääsusilma property (12 m deep well No. PRK0057738). Wells feed on the aforementioned groundwater body.

As the present EIA does not address land-based activities, the aforementioned wells are not within the scope of the proposed activity and the topic is not covered in the EIA report.

4.10. Hara Bay and fish fauna

The water of the Baltic Sea has a low salinity, which makes it possible to live on both freshwater and marine waters.

Hara Bay (VEE3204000) is connected to the Möldr Sea (Menarsvae VEE2038900) by an extensive network of ditches. This area is home to salt-fed lakes (Belt Sea or Bysholmsvike; Saaremõisa Bay VEE3317060, Karjatse Bay or Bäckesjoen VEE2039000, Sutlepa Sea or Sutlepsjön VEE2039710) are relics that separated the mainland and Noarootsi Island from the Silmen Strait, which in recent centuries has been replaced by a continent land as a result of a soil crust. In order to drain this area, which was originally very humid, an extensive network of ditches has been established, leading the spring "excess water" from the Möldr Sea and the Karjatse Sea from the area of the system formed by the Hara Sea to the Gulf of Hara. This network of ditches flows into Hara Bay via the Hara Harbour Basin and directly into Hara Bay 730 m east of Hara Harbour. Although very heavily influenced by land reclamation, this system of water bodies is suitable for pike spawning grounds.[78]

The main fish species in Hara Bay are perch *(Perca fluviatilis*), pike *(Esox lucius),* koger *(Carassius carassius),* flounder *(Platichtys flesus),* roach (Rutilus rutilus), alfalfa *(Lota lota)* and sea urchin *(Coregonus lavaretus).*

In the Gulf of Finland, in an area that coincides with the Gulf of Hara, there is a diverse range of fish. The area is mainly home to herring *(Clupea harengus membras),* sprat *(Sprattus sprattus),* pike *(Esox lucius),* spot *(Sander lucioperca)* and wind pike *(Belone belone).*[79]

The most important influence on the fish population is the spread of suspended matter that accompanies the laying of submarine cables. In order to clarify the possible extent of the dispersion of suspended solids, the EIA will carry out modelling of the dispersion of suspended solids across different surfaces and cable placement technologies (see chapter 5.3).

In order to assess the impact of the proposed activity on the fish population, according to the decision to initiate the EIA, it is necessary to carry out a fish population survey (see chapter 5.3). The study will identify the most important species of fish in the affected area, their spawning grounds and migration routes. The assessment of the impact on fish fauna, based on the results of the study, shall consider, inter alia, the effects (in-service effects) of the electromagnetic field of the proposed submarine cables and whether and to what extent restrictions during construction (effects during construction in relation to noise disturbance and dispersal of suspended matter).

4.11. Seals

Two species of seals live in Estonian marine areas, the grey seal (*Halichoerus grypus*) and the ringed seal (*Pusa hispida*). Both species widely use both coastal seas and offshore areas as habitats.

As for the distribution and abundance of the gray seal, it is known that at the end of May, during the hair change, there are about 1000 gray seals in the northern part of the Straits Sea, in the spine

[78] Modernisation of regional fishing restrictions and fish catch-up sizes. UT Estonian Marine Institute 2020 To be found: Project Modernisation of regional fishing restrictions and fish limits lõpparuanne_0.pdf (accessed 26.11.2024)

[79] Semi-migratory fish spawning grounds in the Straits Sea and the Gulf of Riga in the north: status and quality improvement opportunities. UT Estonian Marine Institute 2015. Available: https://hiiukala.org/wp-content/uploads/2022/10/uuring-2015-kudealad.pdf (accessed 27/11/2024)

reef and in the area of the Hari Gorge. This is about 23% of the total herd counted in Estonia. The average census result for five years (2015-2019) places the northern part of the Väinamere and the northern part of Hiiumaa (Osmussaar - Vormsi N - Ristna) in an order of magnitude comparable to the west coast of the Estonian islands, but if you also compare the areas of different sea areas, the result is almost equal to the Gulf of Riga, where half of the Estonian grey seals are[80] counted. As a result, it can be concluded that the northern part of the Väinamere and the sea area of the Osmussaare region is a very important living area for grey seals in Estonia. Gray seals use the sea areas of the EstLik3 cable corridor area for both nutrition and migration, while in colder winters, calving on sea ice can also occur in the area.

The grey seal is also the conservation objective of the Nõva-Osmussaare conservation area located in the area, while the marine area of the conservation area is a feeding and migration area for grey seals. The closest important lesila to the storage area is the island of Kräss (Gräsgrund), which is located about 10 km east of the storage area and is about 25 km from the cable line.

In the case of the ringed seal, several sub-populations are distinguished in the Baltic Sea. In the western part of the Gulf of Finland, the boundaries of the three main baltic viigria populations meet: the Straits Sea, the Gulf of Finland and the North Bay/Åland Sea. The Turku archipelago has a small population of ringed seals of vague status, which seems to have a connection with the North Bay. It is possible that animals from Estonia and Finland may form a spatially distinct group that is not covered by previous studies and whose behaviour cannot be described by the available data.[81]

There are no more detailed data on the abundance of ringed seals in the EstLink3 cable corridor area, but several telemetry studies have shown the presence of ringed seals in the entire area of the route corridor located in the territorial sea of Estonia. Ringed seals use marine areas in search of food and migrations, in harsher winters it is also possible to calve seals on sea ice.

When laying the submarine cable, the seals are affected by disturbances. The throwing and spreading of suspended solids into the water can affect the feeding conditions of seals in the area of cable installation. Indirect effects on seals can also occur through effects on fish populations, i.e. the seals' food base.

The EIA report assesses the significance of the impact of the laying of submarine cables on seals, based on, inter alia, an assessment of underwater noise and the results of a study on water quality and fish fauna (see chapter 5.3). It analyses which time- and location-based mitigation measures are necessary for the implementation of the proposed activities.

4.12. Birdlife

The proposed EstLink3 cable route passes between the mainland and Osmussaar into an area of great importance for birds, which is located on the Eastern European migration route of arctic waterfowl. The relatively narrow Gulf of Finland lies on the southwest-northeast East Atlantic migration route, which is used by a large part of the tundra and taiga zones of northwestern Europe and northern Russia. Their autumn migration largely follows the northern coast of Estonia, with the concentration of birds becoming more and more intense in the western Gulf of Finland. The concentration of migration for many species is the 7 km wide strait between Osmussaare and Bushhead.[82]

It is estimated that at least 20% of the waterfowl migrating along the Baltic Sea pass between Põõsasepea cape and Osmussaar. Põõsaspea cape is one of the best observation sites to observe the migration of arctic waterfowl in the northern part of the Baltic Sea. It is estimated that up to 50,000

[80] Expert assessment of the EIA report of the Northwest Estonian Marine Fire Park: seals. Jüssi, M., 2023
[81] Expert assessment of the EIA report of the Northwest Estonian Marine Fire Park: seals. Jüssi, M., 2023
[82] Nõva-Osmussaare conservation management plan 2019-2028. Environmental Board, 2019

auls hibernate in the coastal waters of the Nõva-Osmussaare storage area in the region. The rarest wintering plant is the globally endangered woodpecker.[83]

Already during nesting (June-July), local nesters develop feathering aggregations (common hawthorn, knead, cormorant and others). Feathering aggregations can be located separately from nesting areas, in this case, the so-called feathering migration is also observed. Seabird feathering aggregations are located both in the open sea (black whale, hawk) or in the coastal sea and sea bays (warblers, swimming ducks, humpback swan, grey goose, etc.). Already in midsummer, the so-called autumn migration of birds begins from arctic nesting areas, which, depending on the species, lasts until the end of October. A number of species migrate through here without stopping, while many form migratory aggregations. The autumn migration pools that occur on the Estonian coast and in the open sea are either temporary, depending on the species, i.e. the birds migrate to wintering grounds after fattening or persist – i.e. they hibernate in our waters, forming wintering aggregations. In connection with warm winters, the importance of the northern part of the Baltic Sea for wintering seabirds has gradually increased. According to the results of the 2016 flight census, the area is an important concentration area for the aul, the coastal areas for the warbler and the Capricorns. A significant concentration of seabirds in the waters of the region occurs in the spring (collections of spring migration) after the ice has passed, when, in addition to the birds wintering in Estonia, species that winter elsewhere are also fattening themselves in the Estonian sea areas, especially auls, whales, swans, geese and voles that go to nest in the Siberian tundra and taiga zones. A large proportion of the birds that migrate in the region nest in the Arctic – predominantly in the tundra areas of Russia from the Kola Peninsula in the west to the Taimyr Peninsula in the east.[84]

The marine habitats of the Nõva-Osmussaare conservation area and cable route area are suitable for many species, offering good nutrition and recreation opportunities. The most numerous migrants are the aul, the black and pulling whale, the lake and red-throated kaur, the white-cheeked and black-cheeked kaur, the warbler, the grasshopper, the marsh rye, the bow duck and the sea stalk. The peak of migration is from the beginning of April to the end of May, and in the autumn from mid-September to the end of October. The migration stops suitable for Arctic waterfowl are precisely the sea lowlands; The same lowlands are also often important areas for feathering and wintering. As the depth of diving of waterfowl is limited, they mainly inhabit shallow sea areas and lowlands with a depth of less than 30 m; Fish-eating waterfowl do not have depth as a limiting factor as those that feed on the bottom, but they also do not spread to marine areas deeper than 50 m.[85]

The coastal area of the Nõva-Osmussaare storage area, which is crossed by the beginning of the cable line, is an important stopping and feeding place primarily for colored, curvy and birds of prey.

All in all, in the area between the mainland and Osmussaar, the cable route passes through a very important bird migration area.

When laying a submarine cable, waterfowl stopping at sea are accompanied by disturbances during construction. The suspended matter emitted into the water during the laying of the cable may worsen the feeding conditions of waterfowl in the area of work. Indirect effects on birds can be caused by effects on benthic fauna and fish fauna, i.e. the bird's food base.

The EIA report assesses the importance of the impact of laying submarine cables on birds based on, among other things, the results of a survey of water quality, fish fauna and seabed biota and habitats (see chapter 5.3). It analyses which time- and location-based mitigation measures are necessary for the implementation of the proposed activities.

[83] Nõva-Osmussaare conservation management plan 2019-2028. Environmental Board, 2019
[84] Luigujõe, L., Auninš, A. 2016. International Flight Census of Wintering Birds
[85] Luigujõe, L., Auninš, A. 2016. International Flight Census of Wintering Birds

4.13. Protected species and Natura habitat types

Protected species

In the coastal sea area of the cable route area, the habitat (KLO9121476) of the bird species Polysticta stelleri *of protection category II has been recorded*, which is traversed by the cable line over a section of about 9 km. The habitat is a wintering area for arctic waterfowl, where birds stop and feed.

The habitats of three protected category III bird species have been recorded at the cableway landing site along the Hara Bay: the red-legged tilder (*Tringa totanus*) (KLO9134588), the sandpiper (*Charadrius hiaticula*) (KLO9134547) and the hawk (*Motacilla flava*) (KLO9134579). The habitats of the protected species are located in the coastal meadow area and line the cable route to the landing site for the most part.

The habitat (KLO9339778) of the tuberous root (common tuber root) of a protected category II plant species (Herminium monorchis*) has been recorded near the northern part of the landing site of the cable line (the easternmost cable landing site).* The habitat is located at a distance of 120 m from the sea and is mapped in a circle with a diameter of 10 m.

About 150 m to the southeast of the landing site of the cable route, the habitat (KLO9334920) of the pyramidal dog-paw (*Anacamptis pyramidalis), a plant species of protection category II*, with an area of 2.4 ha, has been recorded. In the same area, but about 250 m from the place of disembarkation, the habitat of the tuberous root (KLO9345764) has also been recorded.

At the landing site of the cable route on the coast, the habitat (KLO9334921) of the protected category III plant species marsh maidenhead (*Epipactis palustris) has been recorded*, bordering the entire area of the landing site. In the same area, but a little further from the sea (80-130 m), the habitats of six other protected category III plant species have been recorded: the common cuckoo (*Gymnadenia conopsea*), the gray paw (*Orchis militaris*), the striated lip-finger paw (*Dactylorhiza fuchsii*), the large cuckoo (*Listera ovata*), the two-leaved cuckoo tongue (*Platanthera bifolia*) and the crimson warbler (*Dactylorhiza incarnata*)). The habitats of these species border the area of the landing site throughout.

The EIA report assesses the significance of the impact of the proposed activity on the protected species affected by the chapter 2.4.9 described by the technology of laying cables in the coastal sea and on the coast.

Natura habitat types

At the landing site of the cable line on the Gulf of Hara, a Natura habitat type is spreading <u>coastal meadows (*1630)</u>, which borders the sea area throughout the landing site in a zone of 80 to 130 m wide (Figure 12). The coastal thread is registered in the ADVANTAGE database (id 1 420 245 540). A habitat type has been mapped from the coastal meadow inland <u>dry meadows on calcareous soils (*6210)</u> (ADVANTAGE id 1 410 945 540) situated in the whole area of the disembarkation point as a zone 80 to 120 m wide (Figure 12). Both habitat types remain in the Nõva-Osmaussaare conservation area and the Nõva-Osmussaare nature reserve, and both habitat types are also the conservation objective of the natural area (see chapter 4.16). The purpose of the conservation area is only to provide coastal meadows from these habitat types (see chapter 4.15).

The EIA report assesses the significance of the impact of the proposed activity on the nature conservation values within the coastal zone in the light of the chapter 2.4.9 described by the technology of laying cables (laying of a cable on the coast in the case of an open and closed method).

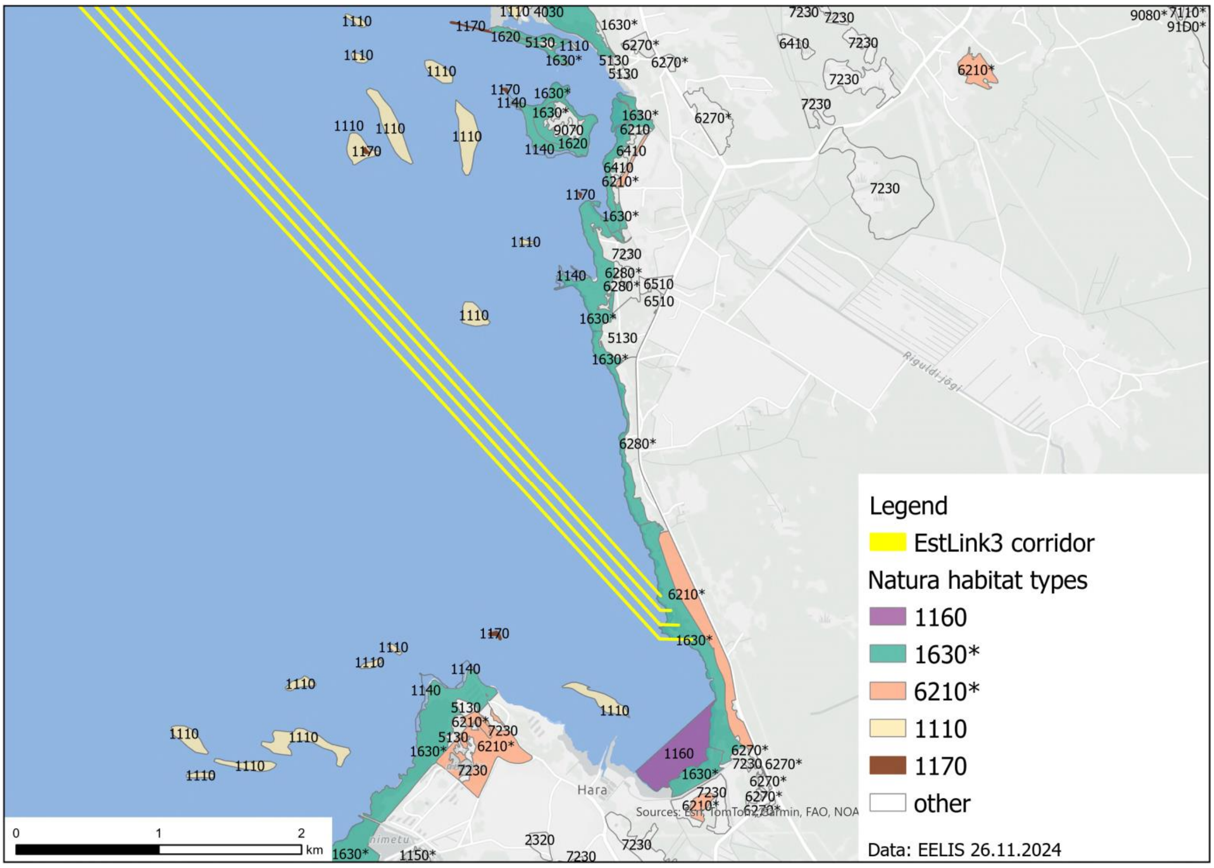

Figure 12. Natura habitat types in the EstLink3 corridor area

4.14. Marine life and habitats

4.14.1. Seabed habitat types

The treatment of seabed habitat types is based on the habitat dataset modelled by the Estonian Marine Institute of the University of Tartu and entered into the ADVANTAGE database.[86]. The area of the submarine cable route includes areas of two seabed habitat types: underwater sandbanks (1110) and reefs (1170). Areas of both habitat types remain on the route in the area between the mainland and Osmussaare. Both habitat types are also the conservation objective of the Nõva-Osmussaare Nature Reserve (see chapter 4.16). Underwater sandbanks (1110) are the conservation objective of the Nõva-Osmussaare conservation area (Läänemaa) (see chapter 4.15).

Underwater sandbanks (1110) are a habitat type in which the seabed with the dominance of sand in the footy zone permanently submerged is inhabited by some characteristic species of habitat type. A feature of the habitat typespecies are species that attach to the seabed or have low mobility and require a sandy bottom substrate as a breeding ground: pine algae, higher plants and clams living inside the sediment. In the bottom substrate of the habitat type, the total share of various sand fractions (fine sand, medium sand, coarse sand) is more than 50%. The minimum depth of the habitat type is not limited, the maximum depth is the maximum depth of the footy zone.[87]

[86] Modelling of habitats and species on the seabed of the Estonian territorial sea. Estonian Marine Institute, University of Tartu, 2014

[87] Methodology for monitoring the conservation status of marine habitat types under the Habitats Directive. Estonian Marine Institute, University of Tartu, 2016

Reefs (1170) are a type of habitat in which the rocky seabed is inhabited by some characteristic species of habitat type. The hallmark species of the habitat type are species attached to the seabed that require a hard bottom substrate as a breeding ground. In the bottom substrate of the type, the total proportion of different types of hard substrates is more than 50%. Hard substrate types include small stones (6.4-20 cm), large stones (>20 cm) and rock. The depth of the sea is not limited in defining the habitat type. In terms of biota, the criterion is the total coverage of one or all of the characteristic species ≥10%.[88]

Underwater sandbanks (1110) remain in the cable line area as two major areas. The larger areas of the sandbanks are located in the coastal sea at the beginning of the route corridor (on section 0-1.3 km) and on the section 7.1-13.2 km, small habitat areas also remain on the route in the area of 2.4-3.3 km and 5.2-5.6 km. In total, the cable line passes through a habitat type on a section of 8.8 km, and its area (four parallel cable corridors 1 m wide) includes sandbanks in an area of 2.9 ha.

The reefs (1170) remain in the cable line area as two larger areas and a few small areas. The reef distribution areas are traversed by the route corridor on sections 4.5-5.9 km, 9.4-10.1 km and 15.3-18.1 km. In total, the cable line passes through habitat-type reefs on a 2.7 km section and its (four 1 m wide cable corridors) area includes an area of habitat type 0.79 ha.

4.14.2. Marine life

The submarine cable route is located in the area of the Hiiu shallow coastal sea water body on a 28 km stretch starting from the Estonian coast. The ecological status of this body of water has been assessed as poor, due to the high values of the plankton content[89]. In the case of benthic vegetation, which is assessed on the basis of the depth distribution of the benthic vegetation, the depth distribution of the elk and the proportion of perennial species, the status of the coastal water body is good. For benthic fauna, which is assessed on the basis of the Large Invertebrate Community Index (ZKL2), the status of the water body is very good.

In terms of benthic vegetation, one of the most important and characteristic species in Hiiu's shallow coastal water body and probably also in the cable line area is the cheekbone (*Fucus vesiculosus*), which mostly also accounts for the largest part of the biomass of the benthic vegetation. In the shallow water body of Hiiu, the maximum depth distribution of the elk was 3.3-7 m, depending on the transect, in comparison, the distribution of the species in the water body of Pakri Bay reaches a depth of only 1.8-3.9 m[90], which reflects the better lighting conditions prevailing in the cable line area, i.e. better water transparency than in the more isolated from the open sea and in the lower Pakri Bay.

There is a permanent coastal monitoring station 23a in hiiu's shallow coastal water body, where material is collected every year of exploration. This monitoring station is located just 0.5 km west of the submarine cable route (13 km from the coast along the cable line). At the North Fauna Permanent Monitoring Station 23a, in previous years (2018-2021) it was characteristic that the maximum number of species per year is 5-10. Between 2022 and 2023, the species richness of the region increased significantly – a total of 18 and 14 species and groups were recorded, respectively. It is likely that the increase in the salinity of the water in recent years will have a positive impact on the species composition of the northern fauna of the region, as brackish-water and marine species – the very salt-loving armourworm and the stray bristleworm Pygospio elegans, the marine round-leaved and flat-leaved water snail (*Peringia ulvae*, *Ecrobia ventrosa*), the edible mussel (*Mytilus trossulus*), the Baltic flatcarp, the common cylinder-bellied shrew (*Halicryptus) – are spreading at the monitoring station: spinulosus*), brackish-water monkfish (*Saduria entomon*), common coyote crayfish (*Corophium volutator*), common bristle-bellied (*Monoporeia affinis*) and virginian corkscrew

[88] Methodology for monitoring the conservation status of marine habitat types under the Habitats Directive. Estonian Marine Institute, University of Tartu, 2016

[89] Maritime Surveillance 2023, Part 2 Coastal Sea Surveillance. Estonian Marine Institute, University of Tartu, 2024

[90] Maritime Surveillance 2023, Part 2 Coastal Sea Surveillance. Estonian Marine Institute, University of Tartu, 2024

(*Marenzelleria neglecta*). No major quantitative changes in the composition of benthic fauna compared to previous years were observed. The exception is the large decline in the biomass of benthic fauna in the region in 2023.[91]

For the seabed habitat type 1170 in the cable route area, the hallmark species of benthic vegetation are the cheekbone (*Fucus vesiculosus*), *Fucus radicans*, agaric (Furcellaria lumbricalis) and a number of filamentous algae. The hallmark species of benthic fauna is the edible mussel (*Mytilus trossulus*) common thymus crayfish (*Amphibalanus improvisus*) migratory mussel (*Dreissena polymorpha*).[92]

For the underwater sandbanks (1110) of the seabed habitat type present in the cable route area, the hallmarks/groups of benthic vegetation are pine algae (*Chara spp.*) pesajas tolypell (*Tolypella nidifica*), higher plants tall seagrass (*Zostera marina*) cardinal (*Ceratophyllum spp*.) spotted water spruce (*Myriophyllum spicatum*) sea mermaid (*Najas marina*) genus penikeel (*Potamogeton spp., Stuckenia pectinata*) roach-eye (*Ranunculus spp*.) genus heinmuda (*Ruppia spp*.) common goosegrass (*Zannichellia palustris*). In terms of benthic fauna, the characteristic species are infauna clams (clams living inside the sediment of the seabed), baltic flat carp (*Macoma balthica*) sand turf mussel (*Mya arenaria*) edible cockle (*Cerastoderma glaucum*).[93]

According to the EIA initiation decision, it is necessary to carry out a seabed biota and habitat survey, during which the benthic flora and fauna present in the route corridor area and the distribution and status of seabed habitats are specified (see chapter 5.3). The potential impact of the proposed activity on seabed biota and habitats will depend on both the technology used to build the submarine cable and the habitat type (see also chapter 4.16.5.1). A possible impact assessment is made in the EIA report based on the results of a seabed biota and habitats and water quality study.

4.15. Nõva-Osmussaare storage area

The Nõva-Osmussaare storage area (Läänemaa) (KLO2000166) covers the coastal sea areas of the EstLink3 corridor area. The cable line passes through the storage area on an 11.7 km section starting from its disembarkation point, as well as the storage area includes a landing site and from there a cable running on land on a section of at least 200 m.

The conservation objective of the Nõva-Osmussaare conservation area (Läänemaa) (KLO2000166) is the conservation of the habitat types listed in Annex I to Council Directive 92/43/EEC, namely underwater sandbanks (1110), sandy and muddy pagurandas (1140), wide shallow bays (1160), small islands and islets (1620), coastal meadows (1630*), sandy beaches with permanent herbaceous vegetation (1640), junipers (5130) and alvars (6280*), as well as the species mentioned in Annex II and the species mentioned in Annex I to Council Directive 79/409/EEC and not listed in Annex I to Council Directive 79/409/EEC conservation of habitats of migratory bird species.

The species whose habitat is protected are: sea stalk (*Aythya marila*), aul (*Clangula hyemalis*), black whale (*Melanitta nigra*), warbler (*Bucephala clangula*), cat owl (Bubo bubo), nightjar (*Caprimulgus europaeus*), heath lion (*Lullula arborea*), woodpecker (*Somateria mollissima*), ice osprey (*Mergus merganser*), grasshopper (*Mergus serrator*), blacklagle (*Branta bernicla*), pulling whale (*Melanitta fusca*), white-tailed eagle (*Haliaeetus albicilla*), marsh laurel (*Circus pygargus*), heath owl (*Anthus campestris*), chipmunk (*Bonasa bonasia*), black stork (*Ciconia nigra*), gray seal (*Halichoerus grypus*), hairy mary alder (*Agrimonia pilosa*), heath carnation (*Dianthus arenarius ssp. arenarius*).

[91] Maritime Surveillance 2023, Part 2 Coastal Sea Surveillance. Estonian Marine Institute, University of Tartu, 2024

[92] Methodology for monitoring the conservation status of marine habitat types under the Habitats Directive. Estonian Marine Institute, University of Tartu, 2016

[93] Methodology for monitoring the conservation status of marine habitat types under the Habitats Directive. Estonian Marine Institute, University of Tartu, 2016

The area of the storage area is 22081.6 ha, of which the land area is 355.7 ha and the water part (mainly marine area) is 21725.9 ha. The conservation area is part of the Natura 2000 network as the Nõva-Osmussaare Nature Reserve and the Nõva-Osmussaare Bird Sanctuary.

The installation of a submarine cable in a storage area is accompanied by an impact on the habitat types of the seabed in the area of the cable line. Depending on the method of laying the cable and the nature of the seabed, there may be a loss of habitat types or an impact on the structure and condition in the area of cable wells. Cable laying may have implications for conservation bird species and for grey seals. The dispersion of suspended solids resulting from installation work may have an impact on the feeding conditions of the protected bird species and the grey seal. The EIA report provides an assessment of the impact of the proposed activities on the storage area based on the results of related studies and expert assessments (see chapter 5.3).

4.16. Ex ante Natura assessment

Natura 2000 is a Europe-wide network of protected areas that aims to ensure the conservation of rare or endangered birds, animals and plants and their habitats or, if necessary, to restore endangered species and habitats to a favorable status across Europe. Natura 2000 Nature Reserves and Special Protection Areas (SPAs) have been established on the basis of European Council Directives 92/43/EEC and 2009/147/EC. When planning activities, possible direct and indirect impacts on Natura sites must be taken into account.

The Natura assessment, including ex ante assessment, is important that the likely negative impacts are assessed solely on the basis of the site's conservation objectives and that other aspects of the activity (e.g. economic social etc.) are not taken into account. The effects of an activity shall be considered to be significant if, as a result of the implementation of the activity, the state of the conservation objectives deteriorates or the implementation of the activity does not make it possible to achieve the conservation objectives set out in the management plan for the site.

The methodological basis for Natura assessment is the following guidance materials: "Guidance on carrying out Natura assessment in the implementation of Article 6(3) of the Habitats Directive in Estonia" (2019)[94] and "Management of Natura 2000 sites. Provisions of Article 6 of the Habitats Directive 92/43/EEC' (2019).[95]

4.16.1. Relationship of the proposed activity with the management of Natura sites

The planned activity is the construction of a high-voltage direct current transmission line (EstLink3) between Estonia and Finland. The proposed activities are not related to the management of Natura sites and do not contribute to the achievement of conservation objectives.

4.16.2. Information on the proposed activities

The planned activities are the construction of EstLink3 submarine cables between Estonia and Finland.

A description of the proposed activities is given in the chapter 2.

Alternatives

The construction of EstLink3 is carried out using an open or closed method (see chapter 2.4.5 and 2.4.9). From a technical point of view, an open method is preferable, but in some locations, e.g. due

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[94] A. Aunapuu, R. Kutsar, K. Eschbaum, 2019. "Guidance on carrying out Natura assessments in the implementation of Article 6(3) of the Habitats Directive in Estonia"

[95] Management of Natura 2000 sites. Provisions of Article 6 of the Habitats Directive 92/43/EEC (2019/C 33/01) https://eur-lex.europa.eu/legal-content/ET/TXT/PDF/?uri=CELEX:52019XC0125(07)&from=ES

to environmental restrictions, it may also be necessary to apply a closed method. Thus, the alternatives to be assessed are the construction of cables using the open method and the construction of cables using the closed method (see chapter 2.5).

4.16.3. Determination of the scope of influence

The proposed submarine cable is a long-line object that will affect marine areas as well as land areas along the coast of Hara Bay, where the landing site of the cable line is planned. As the cable line is located on an 11.7 km stretch in the Nõva-Osmussaare bird and nature area, the area will also have direct impacts.

In connection with the installation of the submarine cable, there are also effects outside the cable line area, which are disturbances to marine mammals and birds that accompany the works, as well as the release of suspended solids into the water and the transfer away from the cable line area. Taking into account the modelling of the distribution of suspended solids in other similar works, the effects of elevated suspended solids on the marine environment reach a maximum of up to a few kilometers. The maximum range of noise and other nuisances is of the same order of magnitude, but it is likely that significant effects will have a smaller extent. The closest Natura area besides the Nõva-Osmussaare bird and nature area through which the cable line passes is the Väinamere bird and nature area, which is about 7 km from the cable line. From a given distance, negative effects on this Natura site are very unlikely. The Krass Nature Reserve is located 24 km from the cable line and any effects on the area can be excluded due to the large distance.

All in all, the Nõva-Osmussaare Nature Reserve and the Nõva-Osmussaare Bird Sanctuary (Figure 13).

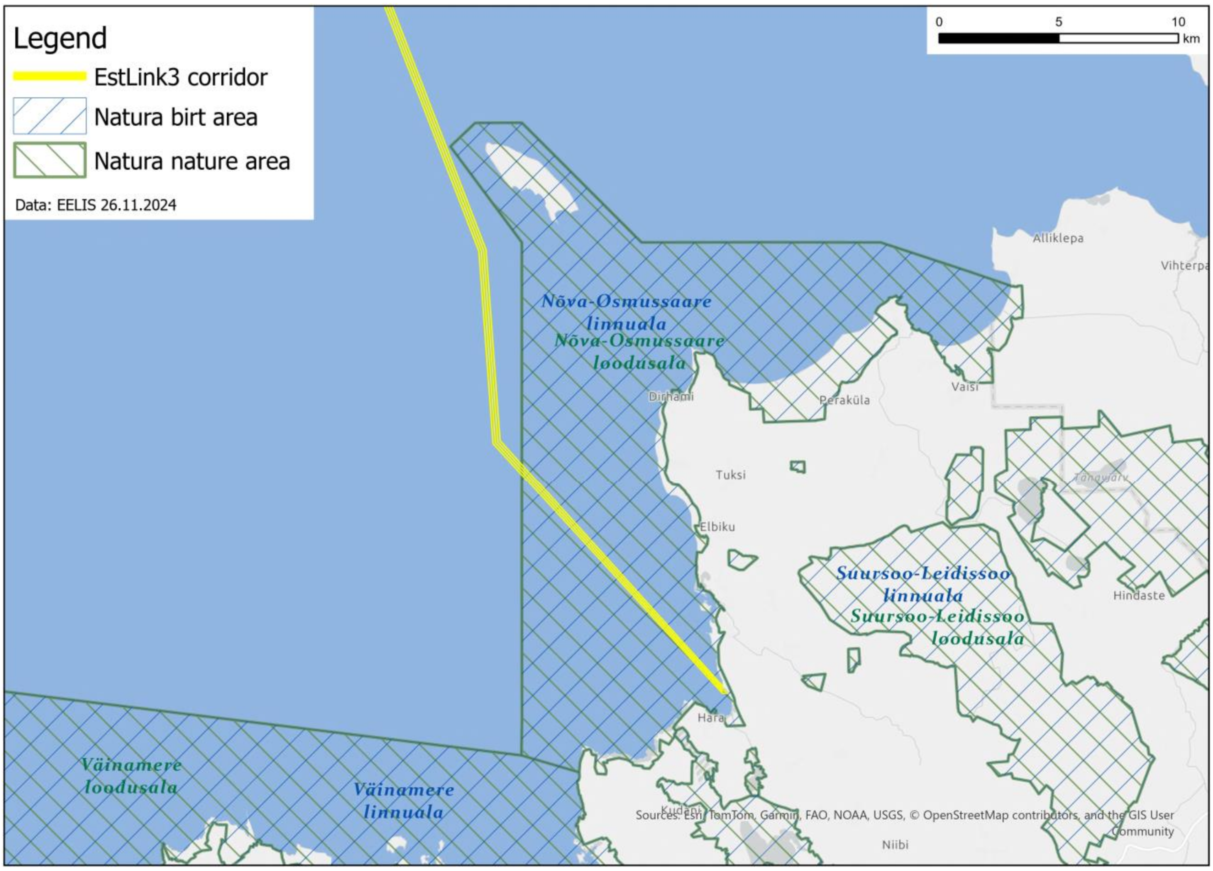

Figure 13. Natura sites in the area of the EstLink3 corridor

4.16.4. Description of Natura 2000 sites

Nõva-Osmussaare Nature Reserve (RAH0000480) covers an area of 24745 ha. The cable line remains in the natural area on an 11.7 km stretch starting from its landing site.

The protected habitat types listed in Annex I for the conservation objective of the nature reserve are underwater sandbanks (1110), sandy and muddy beaches (1140), coastal lions (1150*), wide shallow bays (1160), reefs (1170), primary coastal ramparts (1210), rocky beaches with permanent vegetation (1220), cliffs open to the sea (1230), small islands and expanses (1620), coastal meadows (1630*), sandy beaches with permanent vegetation (1640), prehistoric meadows (2110), white dunes (mobile coastal dunes – 2120), grey dunes (entrenched coastal dunes – 2130*), rusked dunes with cockerels (2140*), wooded dunes (2180), wet cousins between dunes (2190), low- to medium-nutrient calcareous lakes (3140), rivers and streams (3260), junipers (5130), dry meadows on calcareous soils (*important orchid growing areas – 6210), species-rich meadows on lime-poor soils (6270*), stories (alvars – *6280), blue-bead communities (6410), moisture-tolerant high grasslands (6430), transitional and hollow swamps (7140), calcareous lowlands with western swordgrass (7210*), species-rich lowlands (7230), old-growth natural forests (9010*), old broadleaf forests (9020*), swampy and marshy deciduous forests (9080*), transitional swamp and bog forests (91D0*) and floodplain forests (91E0*).

The species listed in Annex II for the conservation purpose of the site and whose habitats are protected are the otter (*Lutra lutra*), the common shrew (*Cottus gobio*), the river lamprey (*Lampetra fluviatilis*) and the heath carnation (*Dianthus arenarius subsp. arenrius*).

At the national level, the nature area in the cable line area is protected as the Nõva-Osmussaare conservation area (Läänemaa).

Nõva-Osmussaare Bird Sanctuary (RAH0000100) covers an area of 24745 ha. The cable line remains in the bird sanctuary on an 11.7 km stretch starting from its landing site.

The species that are the conservation objective of the site, the habitats of which are protected, are the heath stork (*Anthus campestris*), the sea stork (*Aythya marila*), the chipmunk (*Bonasa bonasia*), the black grouse (*Branta bernicla*), the cat owl (*Bubo bubo*), the warbler (*Bucephala clangula*), the nightjar (*Caprimulgus europaeus*), the black stork (*Ciconia nigra*), marsh laurel (*Circus pygargus*), aul (*Clangula hyemalis),* white-tailed eagle (*Haliaeetus albicilla*), heath lion (*Lullula arborea*), pulling whale (*Melanitta fusca*), black whale (*Melanitta nigra*), ice osprey (*Mergus merganser*), grasshopper (*Mergus serrator*) and woodpecker (*Somateria mollissima*). .

At the national level, the Bird Sanctuary is protected as the Nõva-Osmussaare storage area (Läänemaa) in the area of the cable line.

4.16.5. Forecasting the impact of the proposed activity on Natura sites

4.16.5.1. Nõva-Osmussaare Nature Reserve

<u>Impact on Nõva-Osmussaare Nature Reserve</u>

The route of the proposed submarine cable passes through 11.7 km of marine areas of the natural area. The cable is laid in the form of up to four parallel wires. The construction of a cable pit or the recessing of a cable using the jet method involves direct intervention on the seabed of a natural area, which has an impact on the physical characteristics of the seabed as well as on the benthic life. Depending on the nature of the seabed and the method of laying the cable, the effect of seabed intervention is either more permanent or partially reversible. The release and spread of suspended solids resulting from the works also have a temporary impact on the marine environment and related biota.

The landing site of the cable line may also have negative effects on the coastal area and the plant communities (coastal meadows) spreading there. The given effects are manifested by the open method when laying the cable. With the closed method (laying the cable with horizontal directional drilling), it is likely that negative effects on the natural area can be avoided.

In summary , the proposed activity will have direct physical impacts on the marine environment and the seabed of the natural area and on the habitat conditions of the natural area, leading to a direct loss or transformation of biota habitats in the cable pit area.

Impact on habitat types and species that are the conservation objective of the Nõva-Osmussaare Nature Reserve

The seabed habitat types listed in the ADVANTAGE database are underwater sandbanks (1110) and reefs (1170), which are the conservation objective of the natural area.

The habitat type underwater sandbanks (1110) are located in the natural area on a section of the cable line for a total length of about 8 km, and the area of 1 m wide cable wells includes an area of 2.6 ha of habitat type. Laying the cable changes the structure of the seabed and mixes the bottom sediments and can bring coarser material to the surface, which is not characteristic of the habitat type. Depending on the installation method and the nature of the sediments, there may be either a permanent loss of the habitat type or a temporary loss (the habitat type will recover over time) and transformation in the cable line area. Laying a cable using a closed method would allow the effects to be reduced, but this is unlikely to be feasible in marine areas beyond the coast. Since the proposed activity may result in the loss of underwater sandbanks of a habitat type (1110) or a significant loss in the cable line area, adverse effects on that habitat type cannot be ruled out.

The habitat type reefs (1170) remain in the area of cable wells in an area of 0.21 ha. In the area of reefs, the cable may be covered with stones, as it can be difficult to recess it. Covering with stones changes the structure of the habitat type. If the rocks are of a similar material to those spreading on the seabed, there may be no loss of habitat type but transformation. Since the installation method and its effects are currently unknown, the loss of the habitat type cannot be ruled out either. Thus, the occurrence of adverse effects on the habitat type reefs cannot be ruled out (1170).

At the landing site of the cable route, the marine habitat type is bordered by coastal meadows (1630*), a habitat type that is the conservation objective, and a little further from the sea, the habitat type is dry meadows on calcareous soils (6210). In the case of the open excavation method, at least a temporary loss of habitat type areas occurs in the cable line area. In the event that the growth layer is removed and subsequently retracted, and the management of meadow areas takes place, then most likely the habitat types will recover. An alternative to closed excavation (horizontal directional drilling) is unlikely to have significant effects on meadow habitat types if a habitat type zone about 200 m wideis traversed by a single drill. However, since the alternative and technology of cable laying is unknown, adverse effects on meadow habitat 1630* and 6210 cannot be ruled out.

The habitats of species that are the conservation objective of the natural area have not been recorded in the cable line area. The species of fish river lamprey is a migratory fish that spends part of its life in the sea. Suspended solids emitted by cable installation may have some temporary effect on the loops living in the area, but this effect is temporary short-term and does not lead to adverse effects on the species. The only plant species that is the conservation objective of the natural area is heath carnation, whose habitats have not been registered in the area where the cable route lands. As a rule, heath carnations grow on sandy dry soils, and coastal meadows and meadows with calcareous soils spreading in the area are unlikely to provide suitable habitats for the species. In the summary, adverse effects in relation to the proposed activity on species which are the conservation objective of the site may be excluded.

In conclusion, in relation to the proposed activity, adverse effects on the habitat types that are the conservation objective of the Nõva-Osmussaare Nature Reserve, underwater sandbanks (1110), reefs (1170), coastal meadows (1630*) and dry meadows on calcareous soils (6210) cannot be ruled out. The species targeted by the conservation objective of the site are unlikely to be adversely affected.

4.16.5.2. Nõva-Osmussaare Bird Sanctuary

Impact on Nõva-Osmussaare bird sanctuary

The route of the proposed submarine cable passes through the bird sanctuary for 11.7 km, located in the sea areas of the bird sanctuary. The cable is laid in the form of up to four parallel wires. The construction of a cable pit or the recessing of a cable using the jet method involves direct intervention on the seabed of the bird sanctuary, which has an impact on the physical characteristics of the seabed as well as on the benthic life. Depending on the nature of the seabed and the method of laying the cable, the effect of seabed intervention is either more permanent or partially reversible. The release and spread of suspended solids resulting from the works also have a temporary impact on the marine environment and related biota. The disturbances caused by the work in the form of noise and the movement and operation of ships and other equipment affect the bird population. The impact of disturbances depends on the time of execution of the work and the abundance of waterfowl in the area during the period of work.

The landing site of the cable line can also have negative effects on the coastal area and the bird population nesting there. The given effects are greater when laying cables using the open method. In the case of the closed method (laying the cable with horizontal directional drilling), it is likely that significant effects on the bird area can be avoided.

All in all, the proposed activities will have direct physical effects on the marine environment and the seabed of the bird sanctuary and on the habitat conditions of the biota, as well as the associated effects during construction in the form of suspended solids and disturbances.

Impact on bird species that are the conservation objective of the Nõva-Osmussaare Bird Sanctuary

The cable route passes through the sea areas of the bird sanctuary on an 11.7 km section. Cable installation work may cause disturbances to bird species that are the conservation objective of the bird area, which use the marine area as a wintering area, a migration staging point and a feeding area. Species that may be negatively affected by disturbances are sea stalk, warbler, aul, pulling whale, black whale, ice oscillator, grasshopper and woodpecker. The disturbances that accompany the work force the birds to move away from the area. The suspended matter emitted into the water by the works and carried further away can reduce the transparency of the water and worsen the feeding conditions of the birds. Due to the impact of the northern communities in the cable line area, the feeding conditions of the birds may also change, but this impact is likely to be insignificant, since the area of cable wells represents a very small part of the seabed of the region. The impact of disturbances and the spread of suspended solids is short-lived and its significance depends on the time of execution of the work, i.e. the number of disturbed birds in the area. Adverse effects on birds due to disturbances and the spread of suspended solids are rather unlikely, but they cannot be completely excluded on the basis of the information available at the ex ante assessment stage.

The coastal meadows at the landing site of the cable route are a suitable migration stop for the mustlagle that is the goal of protection. When carrying out work during the migration period of the ceilings, the birds may be disturbed and scared away from the area. However, as the impacts are limited in scale (occurring on a short stretch of coast), they are unlikely to lead to adverse effects on the species.

In conclusion , due to the disturbances and the spread of suspended matter associated with the laying of the submarine cable, adverse effects on waterfowl (sea stalk, warbler, aul, pulling whale, black whale, ice oscillator, grasshopper and woodpecker) stopping and feeding in the area of the cable line cannot be ruled out.

4.16.6. Other known significant impact activities in relation to Natura 2000 sites and possible synergies with the proposed activities

Other existing and planned activities in the area of the proposed EstLink3 route corridor are described in chapter 4.3. As of the preparation of the EIA program, no significant cumulative negative environmental impacts are expected from them. If necessary, the assessment must be specified when preparing the EIA report.

4.16.7. Results and conclusion of the ex ante Natura assessment

The ex ante Natura evaluation established that the installation of the submarine cable has negative effects on the seabed and the aquatic environment of the Nõva-Osmussaare bird and nature reserve, nor can effects on coastal areas be excluded. The activity also involves disturbances and the spread of suspended matter in the marine environment. In connection with the proposed activity, it is not possible to exclude adverse effects on the habitat types that are the conservation objective of the Nõva-Osmussaare Nature Reserve, underwater sandbanks (1110), reefs (1170), coastal meadows (1630*) and dry meadows on calcareous soils (6210). In the case of the Nõva-Osmussaare bird sanctuary, adverse effects due to disturbances and the spread of suspended solids on waterfowl (sea stalk, warbler, aul, pulling whale, black whale, ice osk, grasshopper and woodpecker) that stop and feed in the cable line area cannot be ruled out.

In order to identify the effects, an appropriate Natura assessment of the Nõva-Osmussaare Nature Reserve and the Nõva-Osmussaare Bird Sanctuary must be carried out within the framework of the EIA, specifying the possibility of adverse effects and, if necessary, planning measures to mitigate the effects. Natura assessment takes into account the results of studies carried out in the framework of the EIA (see chapter 5.3).

4.17. Fisheries

The EstLink3 route is within Sub-division 32 of *the International Council for the Exploration of the Sea* (ICES), which carries out both trawling and commercial fishing. More active trawling and commercial fishing will remain in the Gulf of Finland area, while more passive commercial fishing will remain in the Hara Bay area.

The most important fish species caught in Hara Bay are pike, roach, perch and, to some extent, flounder. The main fishing gear for commercial fishermen is edge traps, but gillnets and open-water traps are still used.

Fishing for herring and sprat in the Baltic Sea is carried out on a quota basis. The most important fish species in subdivision 32 are baltic herring and sprat. As of 2023, 14509 tonnes of sprat, 4651 tonnes of herring and 0.276 tonnes of spear (*Gasterosteus aculeatus) were caught during trawling.*Under the fishing permit, 141 tons of herring were caught.[96]

According to the Building Code, in connection with fishing and trawling, it is not allowed to anchor a craft in the protection zone of the submarine cable and move with thrown anchors, chains, logs, trawls and nets.

In order to assess the impact of the proposed activity on fishing activities, according to the decision to initiate the EIA, it is necessary to carry out a fisheries study (see chapter 5.3). When conducting a study, the proposed activity is clarified impact on the state of fish stocks (based on chapter of the EIA program 5.3 of the results of the survey of these fishes) and commercial fisheries in the area.

[96] Catch statistics. Agriculture and Food Board 2023 (accessed 26.11.2024)

4.18. Cultural ruminations and objects of cultural value

There are no underwater cultural monuments in the route corridor of the EstLink3 submarine cable. The nearest cultural monuments are four shipwrecks (Figure 14).[97]

- 730 m to the east of the proposed EstLink3 route is the wreck of the **mine trawler No. 4** (Reg. No. 27768). A monument is a shipwreck, its cargo and other contents, along with an archaeological and natural context. The protection zone of the monument is 300 m from the outer contour of the shipwreck.
- 830 m to the east of the proposed EstLink3 route is the wreck of the **steamboat Royal Mistrel** (monument reg. No. 30730). The monument is the wreck of a steamship with cargo and other contents and archaeological and natural context. The cargo steamer has suffered significant injuries, and various parts of the wreck are scattered along the seabed. Larger details are located in an area 79 m long and 15 m wide. It is likely that much of the damage has occurred during trawling operations. The depth at the site is 22-28 m. The height of the wreck from the seabed is more than 5 m. The protection zone of the monument is 335 m in the east and west direction, and 370 m in the north and south direction.
- 3.3 km to the west of the proposed EstLink3 route is the wreck of the **submarine U 479** (Reg. No. 30234). The monument is the wreck of a World War II-era German VIIC class submarine and the remains of human remains, along with an archaeological and natural context. The depth at the site ranges from 93-94 m. When determining the protection zone, it is taken into account that the tomb at the site and the protection and preservation of the archaeological historical source, together with the archaeological and natural surroundings, are ensured. The protection zone of the monument is 370 m.
- 5 km to the west of the proposed EstLink3 route is the wreck of the **cargo ship Kimolos** (Reg. No. 30962). The monument is the wreck of a merchant ship of the early 20th century with an archaeological and natural context. The depth at the site is about 77-78 m. The protection zone of the monument is about 400 m.

The Transport Administration's web application Nutimeri [98] one wreck (Nameless-401) remains in the EstLink3 trail corridor and two wrecks near the trail (Nameless-426 and Avely, see Figure 14), which has not been protected as a monument at the time of the preparation of the EIA program and for which no further information is available. In order to clarify whether objects of cultural value may remain in the proposed EstLink3 route corridor (including more detailed information about the Nameless-401 wreck), an underwater archaeological survey must be carried out within the framework of the EIA (see chapter 5.3).

Conducting an underwater archaeological survey also helps to prevent damage to or destruction of possible finds in the course of works that have already begun and the subsequent suspension of the construction of the submarine cable in the event of a cultural find (§ 31 (1), § 60 of the Heritage Act).

[97] Register of cultural monuments, as of 10.10.2024
[98] The Transport Administration's web application Nutimeri https://gis.vta.ee/nutimeri/ (accessed 27.11.2024)

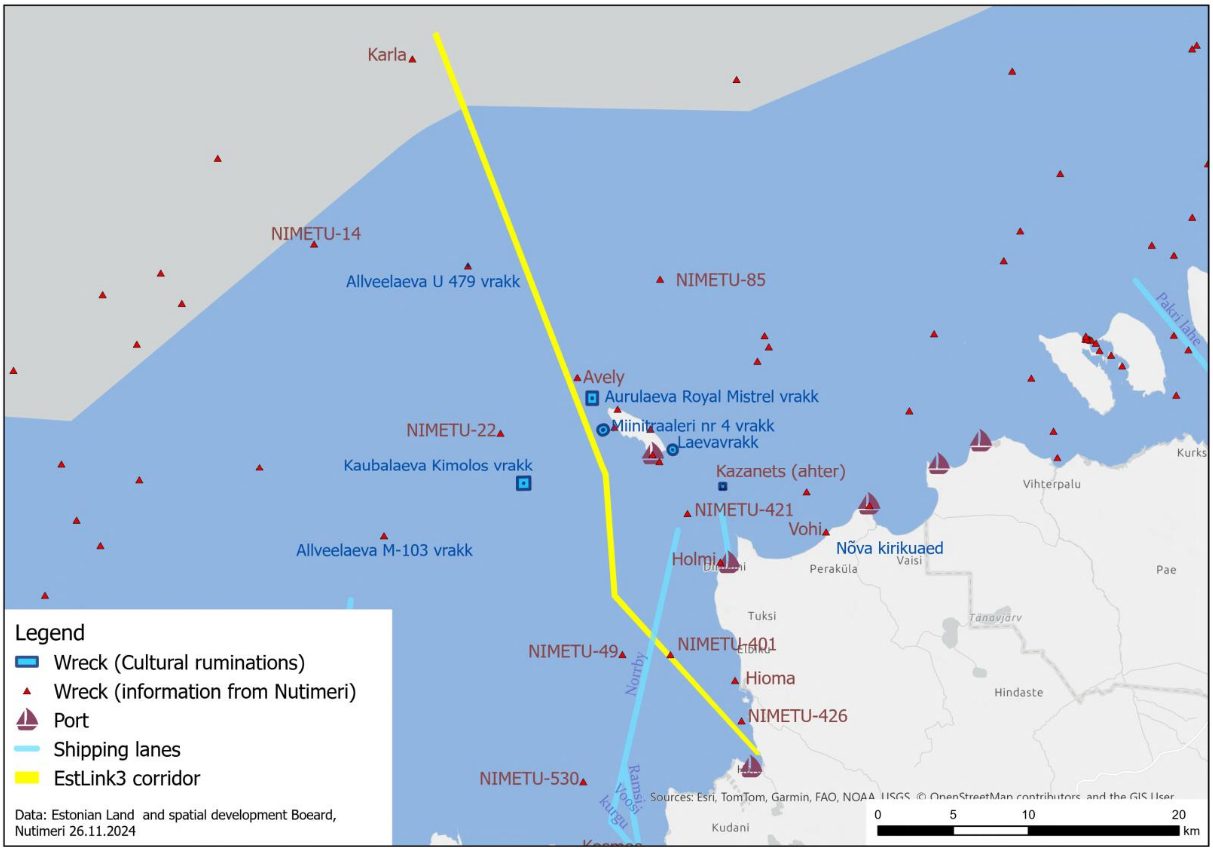

Figure 14. Shipping lanes and wrecks in the EstLink3 area

4.19. Noise, vibration and electromagnetic field

During the construction of submarine cables, noise disturbances can be caused by shipping related to the construction of cables and the operation of machinery both at sea and on the coast. Underwater noise can disturb marine life (seals, fish). Severe noise disturbance (impulse noise) is caused, for example, by blasting work, which may be necessary in the route corridor of submarine cables to defuse the unexploded explosive devices found there or by blasting to remove bedrock rock (see chapter 2.4.6). In its letter No. 12-1/24/112-2 dated 12.04.2024, the Ministry of Defence has stated that the search for and remediation of historical minesweeper explosive devices has not been carried out in the area encumbered by the superficies license, therefore the presence of some explosive devices cannot be ruled out. It is also possible to find random historical explosive devices (torpedoes, airplane bombs, etc.) in the proposed area.

Ambient noise

For the purposes of the Atmospheric Air Protection Act, ambient noise means unwanted or harmful sound caused by human activity and transmitted in ambient air and produced by stationary or mobile sources.

The reference levels for ambient airborne noise are:

- 'noise limit value' means the maximum permissible noise level, the exceeding of which causes significant environmental disturbance and above which noise abatement measures must be taken;
- "target noise value" means the maximum permissible noise level in areas with new master plans.

According to the land use control purpose of the master plan, the noise categories are determined as follows:

- category I: areas of the remediation installation;
- category II: land areas of educational institution, health and social care institution and residential building, green areas;
- category III: the Centre's areas;
- category IV: land areas for public buildings;
- category V: production areas;
- Category VI: traffic areas.

The noise-sensitive area is defined in the Regulation No. 71 of the Minister of the Environment of 16.12.2016 "Standard levels of ambient airborne noise and methods for measuring, determining and assessing noise levels"[99] as an area designated by the control purpose of the general plan, for which standard noise levels have been established.

Noise-sensitive buildings are defined in the Regulation No. 42 of the Minister of Social Affairs of 04.03.2002 "Standard noise levels in residential and recreational areas, residential buildings and shared buildings and methods of measuring noise levels"[100] as residential buildings, care facilities, health, children's and educational institutions and other buildings for which the same regulation imposes increased noise requirements.

The normative values for environmental noise are set out in Annex 1 to the Regulation no. 71 of the Minister of the Environment of 16.12.2016.

For the purposes of the Traffic Noise Regulation, noise is noise caused by regular road, rail and air traffic and waterborne traffic, which takes into account the average traffic volume throughout the year (automobile, rail and air traffic) or regular traffic over a period. For the purposes of the Industrial Noise Regulation, noise is noise caused by stationary noise sources, including wind turbines and ports.

Table 3. Normal levels of traffic noise. The noise descriptor is the estimated noise level *L* [dB]

Category	Period	Limit value for traffic noise [dB]	Target value for traffic noise
I	day (*Ld*) night (*Ln*)	55 50	50 40
II	day (*Ld*) night (*Ln*)	60 (65[1]) 55 (60[1])	55 50
III/IV	day (*Ld*) night (*Ln*)	65 (70[1]) 55 (60[1])	60 50

[1] - *allowed on the side of the roadway of noise-sensitive buildings*

The maximum sound pressure level of traffic noise in areas with noise-sensitive buildings *LpA,max* shall not exceed 85 dB during the day and 75 dB at night.

Table 4. Normative levels of industrial noise. The noise descriptor is the estimated noise level *L* [dB]

Category	Period	Limit value [dB] for industrial noise	Target value for industrial noise
I	day (*Ld*) night (*Ln*)	55 40	45 35
II	day (*Ld*)	60	50

[99] https://www.riigiteataja.ee/akt/121122016027?leiaKehtiv (accessed 11/10/2024)

[100] https://www.riigiteataja.ee/akt/163756?leiaKehtiv (accessed 11/10/2024)

	night (*Ln*)	45	40
III/IV	day (*Ld*)	65	55
	night (*Ln*)	50	45

The maximum noise level shall not exceed the reference level established for the type of noise in the case of industrial noise in an area with the appropriate noise category by more than 10 dBA.

The target value for industrial noise is applied as the limit value for noise emitted by technical equipment and commercial and commercial activities.

According to Annex 1 to regulation No 71 of the Minister of the Environment of 16.12.2016, equivalent noise limit values related to construction activities are standardized only in the evening and at night (between 21.00 and 7.00). From 21.00 to 7.00, the limit value for construction noise shall be the industrial noise reference level for the relevant noise category. During the daytime (7.00-21.00) no reference levels have been set for noise from construction works.

The reference level of industrial noise for the relevant noise category shall be applied as the limit value for pulsed noise. Work that causes impulse noise, such as blasting, ramming, etc., can be performed on weekdays from 7:00 to 19:00.

Although according to the Atmospheric Air Protection Act, there are also noise categories V and VI, there are no environmental noise requirements for them.

Underwater noise

Underwater noise is recognized as a type of marine pollution that has a detrimental effect on marine biota. Sources of continuous underwater noise include, for example, shipping and dredging. Pulsed underwater noise is caused by explosions, etc. Sound-sensitive marine animals use sound, for example, for hunting, communicating and perceiving dangers. Underwater noise has harmful effects both as direct physiological damage, and by masking sounds, disrupting vital activities and increasing stress.[101]

During the construction of the Balticconnector gas pipeline between Estonia and Finland (dredging, pipe installation, trench filling works), underwater sound monitoring was carried out in Lahepere Bay. According to the monitoring report[102], the adverse effects of underwater sound on biota were assessed with the following limit values and the following evaluation results were obtained:

<u>Seals (exposure level)</u>:

- permanent increase in hearing threshold - 203 dB re: 1 μPa2s[103]
- temporary increase in hearing threshold - 183 dB re: 1 μPa2s
- sound pressure level for behavioral reactions 110 dB re: 1 μPa
- communication masking sound pressure level 20 dB re: 1 μPa above the natural background

<u>Pisces</u>:

- sound pressure level for behavioral reactions 150 dB re: 1 μPa

<u>Risks to gray seals</u>:

- It can be inferred from sound cards that exposure levels likely to be accompanied by permanent or temporary increases in the threshold of hearing during construction work. Level

[101] The terms of reference for the study of underwater noise in the Great Straits fixed link Annex 13 to the special state plan for the Great Straits fixed link and the infrastructure necessary for its functioning and the strategic environmental assessment Annex 13
[102] Environmental monitoring of the undersea part of Balticconnector in Estonia's territorial waters and exclusive economic zone prior to construction and during construction. Final report of monitoring during construction. Skepast&Puhkim OÜ, Maves AS and Tallinn University of Technology. 2019
[103] *dB re: 1 μPa - decibel, decimal logarithmic ratio of measurement in water, baseline value of 1 μPa*

189 dB re: 1 μPa2s occurred during dredging only in the immediate vicinity of the ship carrying out the work.

- June is a period of hair loss for grey seals, so their movement in the assessment area is unlikely. However, the sounds associated with the construction work do not spread to the island of Krass, where the nearest widow of gray seals is located. Exposure levels near Krass Island exceeded the natural background by only a few decibels.
- Seals in the dredging area may have experienced behavioural reactions related to noise avoidance (exposure levels greater than 110 dB re: 1 μPa2s), which, however, do not pose a higher risk to the population.

Risks to fish:

- It is possible that the work related to the installation of the gas pipeline interfered with spawning and the development of juveniles in Lahepere Bay. At the same time, for an adequate risk assessment, there is no information about the sound sensitivity of juvenile fish stages.
- During the period of pipe laying work, herrings in Lahepera Bay may have experienced behavioural reactions related to noise avoidance. Although the noise exposure levels in the sea area are less than 150 dB re: 1 μPa, given that the actual noise is not continuous, but largely consists of impulse sounds, behavioral reactions can also occur at lower exposure levels. Flounder and perch are likely to be less sensitive fish, and their reactions may have occurred less frequently.

Based on the above, the above-mentioned monitoring report on anthropogenic underwater noise caused by the construction of Balticconnector concludes that it does not pose significant risks to grey seals and fish, but may temporarily affect the abundance of fish in Lahepera Bay.

Although the EstLink3 submarine cable is smaller compared to the Balticconnector gas pipeline, it must be taken into account that it is planned to install up to 4 cables and the cables will be recessed to the seabed sediments *Ca* To a depth of 1-1.5 m (see chapter 2). Thus, when carrying out the EIA, the impact of noise related to the planned activity on residential buildings near the landing site of submarine cables and the impact of underwater noise on seals and fish fauna must be analyzed. When assessing the impacts, also take into account the possible synergies with other activities in the region, see chapter 4.2 and 4.3.

Vibration

Vibrations can be generated by the laying of the cable by a closed method (drilling) and by the traffic of related heavy equipment such as excavators and trucks in the coastal area. This is a short-term and limited-area activity.

Vibration levels are regulated by the Decree of the Minister of Social Affairs of 17.05.2002 No. 78 "Vibration limit values in residential and shared buildings and methods for measuring vibrations"[104], which establishes limit values for whole-body vibration in residential and shared buildings. For the purposes of the Regulation, whole-body vibration is a mechanical oscillation transmitted to a standing, seated or lying person through supporting surfaces. The construction work must be carried out in accordance with the requirements of the aforementioned regulation.

During use, the formation of vibrations is not foreseen. In the case of cable repairs, additional car traffic is short-term and local. All in all, vibrations do not constitute a significant environmental impact.

Electromagnetic field

Working electrical cables installed on the seabed create an electromagnetic field around them, which can affect the fish population. However, according to the fish survey study carried out as part of the

[104] https://www.riigiteataja.ee/akt/110061?leiaKehtiv (accessed 11/10/2024)

EIA superficies license for an offshore wind farm in the Gulf [105] of Riga, the magnetic field strength of the submarine cables decreases relatively quickly when moving away from the cable, e.g. in the case of a cable buried to a depth of 1.5 m with a pitch of 10 μT/m, and therefore the potential area of influence is within a few, maximum up to a few tens of meters. Thus, the impact of electromagnetic radiation generated during the operation of a submarine cable recessed to the seabed on the local fish community should be minimal or absent.

In order to clarify which fish communities are present in the area of the proposed EstLink3, a fish survey must be carried out within the framework of the EIA, the results of which will be used to assess the possible impacts of the proposed activity on the fish fauna, including an assessment of the possible impact of the electromagnetic field of the submarine cable on the fish population during construction and operation (see chapter 5.3).

4.20. Possibility of cross-border effects occurring

Considering that this is the planning of an additional electricity connection between Estonia and the Finnish state, due to the nature of the project, it is already a cross-border EIA procedure, in which case, among other things, the requirements set out in international agreements regarding the exchange of information and the involvement of authorities and the public must be taken into account.

When carrying out the EIA, it must be analyzed whether the implementation of the planned activities in Estonian waters may have a significant adverse effect (e.g. on shipping, fishing stock, seals) on the territory of the Republic of Finland. In order to implement the EstLink3 project, it is also necessary to plan a project on the Finnish side and carry out an environmental impact assessment. The best result can be achieved if the necessary studies and impact assessments take place in both countries at the same time, so that it would be possible to analyze the effects on the complete solution of the EstLink3 project.

For an overview of the EIA procedure, including cross-border notification, see chapter 6.

[105] The impact of the Liivi Offshore OÜ offshore wind farm and cable line on the fishing community. Report. Estonian Marine Institute of the University of Tartu 2024

5. OVERVIEW OF EVALUATION METHODOLOGY AND NECESSARY STUDIES

5.1. Evaluation methodology

The impact assessment is based on the requirements of the relevant legislation in force in Estonia and the European Union. The main legal act guiding the procedure is the Environmental Impact Assessment and Environmental Management System Act (KeHJS). In preparing the EIA report, the requirements set out in § 20 of the KeHJS are followed.

The EIA is carried out on the basis of the relevant guidance materials published on the website of the Ministry of Climate[106]. The environmental impact assessment shall also take into account knowledge of the EIA and generally accepted assessment methodologies.

When preparing the EIA report, changes in the existing situation that occur when the planned activities are implemented are assessed. To this end, the EIA predicts consequences (e.g. diffusion of suspended solids) that may cause changes in the elements of the environment (e.g. sediments, water quality, etc.). It is important to look at changes in environmental elements in the context of receivers (e.g. fish fauna).

The assessment methodology shall be based on a qualitative and quantitative assessment, including:

- elaboration of literature and other relevant documents on the topic;
- elaboration of previous studies, analyses and reports on the area;
- Conducting studies and expert assessments to clarify the significance of the impact in the framework of the EIA (see chapter 5.3);
- consultations with authorities with relevant information;
- consultations with the public and third parties.

During the EIA:

- describe the activities planned and compare possible alternative solutions;
- an assessment of the potential significant environmental impacts of the proposed activity (an ex ante assessment of the potential significance of the impact is carried out within the scope of the EIA program, the significance of the impact is specified during the preparation of the EIA report), the extent of the impacts is defined;
- an assessment of possible cumulative effects;
- recommendations are given to prevent and mitigate possible negative effects.

The EIA identifies planned activities that are expected to have a significant negative impact. The determination of the significance of the effects is based primarily on the norms set out in the legislation. Under Paragraph 22 of the KeHJS, the effects on the environment are *significant* if they are capable of:

- the environmental tolerance of the affected area is expected to be exceeded,
- cause irreversible changes in the environment, or
- endanger the health, well-being and property of a person or cultural heritage.

The direct impact is manifested in the direct consequences of the action at the same time and place as the action. Both operational and emergency effects shall be taken into account and both unintended negative and positive effects shall be addressed.

[106] Homepage of the Ministry of Climate https://kliimaministeerium.ee/keskkonnamoju-hindamine#kmh-juhendmaterjalid (accessed 05.12.2024)

Indirect effects are formed through chains of cause-and-effect relationships between environmental elements. This may occur away from the immediate site and may only develop over a longer period of time.

There are a number of factors that affect the specific direct, indirect and cumulative effects of the proposed activity and the interactivity of the effects. Accordingly, practical and appropriate methodology(s) or combinations thereof shall be selected in the course of the work, which can take into account the nature of the impact, the availability and quality of the data available, and the availability of time and other resources.

5.2. Sources of impact, extent of impact and environmental elements affected

5.2.1. Sources of influence

The following sources of influence are possible for the construction and operation of EstLink3 submarine cables:

- the formation and spread of suspended solids in the construction of submarine cables;
- noise and navigation caused by construction work;
- installation work at the point of disembarkation of submarine cables;
- disturbances to biota;
- climate influences.

5.2.2. Scope of influence

The scope of influence is considered more broadly in the EIA than the route corridor of the submarine cable (e.g. impact on birds, fish, seals, objects of cultural value). The size of the area of influence depends, among other things, on the spread of the suspended solids, and this becomes clear as a result of modelling. The amount and distribution of suspended solids also depends on the installation technology used (open trench, jet dredging, plow plowing). The potential impacts at the landing site of the submarine cables are expected to be local and will be considered in terms of the extent of the environmental elements affected (e.g. coastal meadows, protected species, nearest residential buildings).

The extent of the impact area can vary considerably from one impact factor to another and is therefore assessed separately for each of the environmental elements affected.

5.2.3. Environmental elements affected

Based on the location and nature of the proposed activity and in the chapter 4 from this description, the EIA report discusses the potential impact on the following aspects:

- impact on sea water quality and hiiu shallow coastal water pool status
- Impact on seabed biota and habitats
- Impact on fish fauna
- Effects on seals
- Impact on birds
- impact on Nõva-Osmussaare conservation area and protected species
- impact on Nõva-Osmussaare bird sanctuary and nature reserve (Natura assessment)
- Impact on commercial fishing

- Impact on shipping and maritime safety
- impact on underwater cultural heritage and objects of cultural value
- impact on local people (disturbances caused by construction work in the area where the cables disembarked)
- climate change and adaptation

5.3. Necessary studies and expert assessments

Within the framework of the EIA, at least the following studies/expert assessments must be carried out in the following areas (Table 5).

Table 5. Necessary studies and composition of the expert group on the preparation of the EIA report

Area	Study/expert-assessment	Content	Expert to be involved
Unexploded explosive devices and other dangerous objects	UXO (*Unexploded ordnance*) peer review and study	Within the framework of the EIA, as a result of the available data and underwater archaeological research, it will be clarified whether explosive devices or other dangerous objects may be located on the route, on the basis of which it may be necessary to shift the route. Before the start of construction, a magnetometry study is carried out, the purpose of which is to detect unexploded explosive devices located on the seabed in the area of the submarine cable (also under sediments) and their decontamination. The study is carried out in cooperation with the Ministry of Defence.	Company/ expert with relevant competence
Cultural monuments and objects of cultural value	Underwater archaeological survey	Underwater archaeological research consists of two stages: 1) high-resolution sonar examination, as a result of which anthropogenic objects starting from one meter must be identified; (2) video or photographic documentation using photogrammetry or other techniques or methods with an equivalent result for the purpose of identifying, capturing and assessing the condition of potential cultural objects. In the case of wooden wrecks, a dendrochronological examination is added if it is not possible to confirm the age of the wreck by other methods. The results of the study are the basis for long-term monitoring after the installation of submarine cables.	Underwater archaeologist
Seabed geology	Study	Study of the geological situation of the seabed (i.e. mineral composition of sediments, sediment deposits, etc.) and study of sediment properties (structure and texture) to determine the load-bearing capacity of sediments, and geotechnical situation study (*MBES study* , *SSS study* or near-sea shipping, *MAG study*). Perform an analysis of seabed sediments to assess the level of nutrient content and toxicity	Marine geologist

		(heavy metals, TBT, PAH). Sampling points shall be selected in cooperation with a water quality expert, including the designation of potentially contaminated areas. Dredging soil analyses should be carried out in accordance with the relevant HELCOM dredging and dumping instructions.	
Water quality	Water quality study and expert assessment	Fieldwork for modelling the propagation of suspended solids to measure waves, currents and turbidity (suspended solids). Modelling of the distribution of suspended solids on different installation technologies of submarine cables and, if necessary (according to geology studies), on different soils. Modeling and analysis of the spread of oil slick; impact on water quality, including the status of hiiu shallow coastal water body, based on the results of modelling of suspended solids distribution and analysis of sediment samples. Description of the ice conditions in the affected area.	Water quality expert
Seabed biota and habitats	Study and peer review	Fieldwork to refine the fauna and flora and flora of the seabed (species composition, value and location of biota and habitat distribution and status). Impact assessment based on the results of fieldwork and floating propagation modelling.	Seabed Biota and Habitats Expert
Underwater noise	Study and peer review	Explain the level of natural and artificial (laying of an undersea cable) underwater ambient noise in the area affected by the submarine cable.	Noise expert
Fish fauna	Study and peer review	Explain the composition of the fish fauna, possible spawning grounds and migration routes in the EstLink3 area. Based on the results of the study, an assessment of the impact of the proposed activity on the fish fauna, including the spread of underwater noise and suspended solids during the construction phase, the effects of the electromagnetic field during the operation phase. The assessment shall take into account the results of geology, water quality studies (including the modelling of suspended solids) and seabed biota and habitat surveys.	Fish Expert
Fisheries	Study and peer review	Explain the impact of the proposed activity on the state of fish stocks (based on the results of the above fish stock survey) and on commercial fisheries in the area.	Socio-economic impact expert
Seals	Peer review	Possible impact of laying submarine cables on seals, taking into account the results of related studies and expert assessments (e.g. dispersion of suspended solids, fish fauna)	Seal expert
Birdlife	Peer review	The potential impact of laying submarine cables on birds, taking into account the results of related studies and expert assessments (e.g. dispersal of suspended solids, fish fauna, seabed biota and habitats)	Birdlife expert

Maritime transport and infrastructure	Peer review	The impact of the laying of submarine cables on shipping and maritime safety, as well as security aspects.	Maritime transport expert
Human health and well-being	Peer review	An assessment of the impact during construction (laying of cables on the coast – noise from construction activities and other disturbances) on the nearest residential buildings at the point where the submarine cables landed.	Social impact expert
Protected natural sites and Natura habitat types	Peer review	Impact assessment on protected natural sites and Natura habitat types outside Natura sites in the scope of the proposed activity.	Natural environment expert
Natura sites	Peer review	Assessment of Natura according to the guidance and the results of related studies and expert assessments	Natura assessment expert
Climate change	Peer review	Potential impacts of climate change (sea level rise, flood zone increase, coastal erosion) in the EstLink3 corridor area.	Climate impacts expert

6. OVERVIEW OF THE EIA PROCEDURE

6.1. Parties to proceedings of the EIA

In accordance with Paragraph 13(9) of the KeHJS, the EIA program contains a list of the authorities concerned, together with a statement of reasons for their involvement in the proceedings, see Table 6.

Table 6. Parties to proceedings of the EIA

Interested body/party	Rationale for inclusion
Environmental Board	The authority responsible for controlling compliance with laws and norms established for the use of the environment, nature conservation and the protection of the natural environment.
Ministry of Climate	Competent authority for Baltic Sea protection and international EIA cooperation.
Defense	Competent authority for national defense.
Estonian Defence Forces	An institution involved in national defence issues.
Ministry of Economic Affairs and Communications	Competent authority for maritime spatial planning.
Ministry of Regional Affairs and Agriculture	Competent authority for fisheries.
Ministry of the Interior	The competent authority for internal security and border management.
Lääne-Nigula Municipality Government	The local government of the location of the proposed activity.
Health Board	The authority responsible for the protection of the health of the population and a clean living environment.
National Heritage Board	Day responsible for the protection of cultural heritage institution.
Department of Transport	Authority responsible for safe and secure navigation and ship and port safety and security requirements.
Police and Border Guard Board	Competent authority responsible for security and border surveillance.
Rescue Board	Authority responsible for the organization of rescue operations.
Finnish Environmental Institute	The competent authority designated by the Republic of Finland for the exchange of cross-border EIA information.
Residents and businesses in the area of proposed activities, the general public, environmental organizations, etc.	
Estonian Chamber of Environmental Associations (EKO)	An organization uniting non-governmental environmental organizations. Ensuring that environmental values are taken into account in the realization of the proposed activity.
Estonian Fishermen's Association	Fishing in the area.
MTÜ Läänemaa Rannakalandus Selts	
Easternlightestonia Ltd.	The developer of the proposed communication cable.

Interested body/party	Rationale for inclusion
Telia Eesti AS	EstLink3 submarine cable intersecting infrastructure on the seabed (communication cable holder.
General public, interested/affected persons, e.g. residents and businesses in the area	Is interested in the living and business environment of the region.

6.2. Expected timeline for carrying out the EIA

Table 7 provides an overview of the expected EIA schedule. The schedule has been drawn up on the basis of the procedural deadlines set out in the KeHJS.

Table 7. Expected timeline for carrying out the EIA

Activity	Time/Period	Filler(s)
Initiation of the EIA and the procedure for the application for a superficies license	25.07.2024	Consumer Protection and Technical Regulatory Authority
Notification to the Republic of Finland of the initiation of the EIA	03.09.2024	Ministry of Climate
Forwarding the reply of the Republic of Finland to the developer*	07.11.2024	Consumer Protection and Technical Regulatory Authority
EIA program stage		
Compiling an EIA program in cooperation with the developer	October-December 2024	Skepast&Puhkim OÜ, Elering AS
Submission of the EIA program to the decision-maker (Consumer Protection and Technical Regulatory Authority) for disclosure	January 2025	Elering AS
Notification of disclosure of the EIA program	March 2025	Consumer Protection and Technical Regulatory Authority
Sending the EIA program to the competent Finnish authority and requesting views in Finland	March-May 2025	Ministry of Climate
Public display of the EIA program	min 21 days in Estonia (March 2025)	Consumer Protection and Technical Regulatory Authority
Communication and examination of positions received	April 2025	Consumer Protection and Technical Regulatory Authority, Skepast&Puhkim OÜ, Elering AS
Public consultation on the EIA program (incl. presentation of the views received and an overview of how they have been taken into account)	April 2025	Consumer Protection and Technical Regulatory Authority, Skepast&Puhkim OÜ, Elering AS
Responding to letters received upon disclosure	May 2025	Skepast&Puhkim OÜ, Elering AS

Supplementing the EIA program according to the results of the disclosure	May-June 2025	Skepast&Puhkim Ltd.
Submission of the EIA program to the decision-maker (Consumer Protection and Technical Regulatory Authority) for making a decision on compliance	June 2025	Elering AS
Compliance with the EIA program	Within 30 days	Consumer Protection and Technical Regulatory Authority
Notification of the decision to declare compliance to the parties	Within 14 days	Consumer Protection and Technical Regulatory Authority
Conducting research	*expected in 2025-2026*	Elering AS and the researchers
EIA report stage		
Preparation of an EIA report based on the results of studies and expert opinions	*expected in 2026-2027*	EIA report consultant, Elering AS
Submission of the EIA report to the decision-maker (Consumer Protection and Technical Regulatory Authority) for publication**	*Within 2 years of the decision to declare the EIA program compliant (KeHJS § 18 (8))*	Elering AS
Notification of disclosure of the EIA report	*Expected in 2026-2027*	Consumer Protection and Technical Regulatory Authority
Sending the EIA report to the competent Finnish authority and requesting views in Finland		Ministry of Climate
Public display of the EIA report		Consumer Protection and Technical Regulatory Authority
Communication and examination of positions received		Consumer Protection and Technical Regulatory Authority, consultant of EIA report, Elering AS
Public consultation on the EIA report (incl. presentation of the views received and an overview of their consideration)		Consumer Protection and Technical Regulatory Authority, consultant of EIA report, Elering AS
Responding to letters received upon disclosure		EIA report consultant, Elering AS
Supplementing the EIA report according to the results of the disclosure		EIA report consultant
Submission of an EIA report to the decision-maker (Consumer Protection and Technical Regulatory Authority) for a decision on compliance		Elering AS
Compliance with the EIA report		Consumer Protection and Technical Regulatory Authority
Notification of the decision to declare compliance to the parties		Consumer Protection and Technical Regulatory Authority

* As this is an electricity connection between Estonia and Finland, it is also a cross-border EIA procedure. On 03.09.2024, the Ministry of Climate Informed the Republic of Finland by letter No. 6-3/24/3651-2 of the decision to initiate an environmental impact assessment and of the possible consequences of transboundary environmental impacts pursuant to § 30 of the KeHJS. On 31.10.2024, the Ministry of Climate Affairs forwarded to the Consumer Protection and Technical Regulatory Authority the views received from the Republic of Finland by letter No SYKE/2024/1695, which must be taken into account in the EIA proceedings. The aspects to be taken into account when carrying out the EIA are: the proposed EstLink3 route passes through the Nõva-Osmussaare bird sanctuary, which is an important bird wintering and migration area, including protected habitats both on land and at sea; when designing submarine cables, avoid reefs and sandy slopes of Natura habitat types outside protected areas, so thorough seabed surveys must be carried out; to also analyse the activities and conditions arising from the Finnish Marine Spatial Plan 2030, which is not a binding document, in the impact assessment; address the spread of dredging suspended solids and their impact on seabed habitats and biota, as well as the ingress of nutrients and hazardous substances into the water column; address maritime safety and potential implications for navigation; to take into account the underwater cultural heritage when determining the locations of submarine cables and, if necessary, the diversion of the route to the locations of monuments; if the EIA procedure is also carried out in the Republic of Finland, a joint EIA procedure must be carried out.

** When conducting EIA studies and preparing the EIA report, it is necessary to take into account the fact that according to § 18 (8) of the KeHJS, the developer must submit the EIA report to the decision-maker for disclosure within 2 years from the date of the decision to declare the EIA program compliant. As planning and conducting various marine studies and preparing expert assessments and an EIA report based on them is a time-consuming process, including an important sequence of conducting studies, it may be necessary to extend the deadline for submitting the EIA report for publication.

6.3. Overview of the publication of the EIA program

To be added after publication

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