Overview of Paldiski Windpark land-use planning and environmental impact assessment process

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Tartu 2011

1. Introduction

Hendrikson&Ko is one of the oldest environmental management and land-use planning companies in Estonia. We focus on consultancy in the fields of environmental management, spatial planning, public management etc. The company applies most sophisticated technologies including digital cartography, geoinformatics, noise and air pollution dispersal modelling and various other tools.

Hendrikson&Ko participated in land-use planning and environmental impact assessment as leading consultant and environmental expert.

In following we give an overview of Paldiski Windpark spatial planning and environmental impact assessment process with focus on readers not specialized in respective processes in Estonia.

2. Overview of Estonian spatial planning and environmental impact assessment system

Estonia is a member state of European Union and Estonian legislation is harmonized with the EU legislation.

The spatial planning legislation is not very strictly regulated in EU regulations and member states are relatively free to develop national systems. After independence in 1991 the Estonian spatial planning system was developed in the line of Scandinavian neighbours, mainly Sweden and Finland.
During the last 20 years the legislation, methodology and practice have developed quite a bit.
The base legislative act is *Planning law / Planeerimisseadus* (https://www.riigiteataja.ee/akt/121032011021)[1].

The spatial planning system in Estonia is based on 4-level spatial plannings:

- State plan (*üleriigiline planeering*) covers all Estonia and marks strategic issues and principles of land-use in very general level.
- County plan (*maakonna planeeing*). Estonian has 15 counties and county comprehensive plan is specifying state plan in a certain county. In county plan the main infrastructure objects (main roads, ports, airfields etc) and land-use priorities (nature protection, agriculture-forestry, industrial, urban etc) are marked in general. The maps are usually in scale of 1:100 000 or similar, so the objects cannot be on a very detail level.
- Local authority comprehensive plan / General plan (*üldplaneering*). Estonia has ca 240 local authorities (cities and parishes) and general plan is specifying county plan in certain local authority in more detail. The maps are usually in scale of 1:5000 – 1:20 000 and therefore the planned objects can be quite detail.

[1] Links to legal acts lead to official and continuously updated legal acts system Riigi Teataja. The legal acts are in Estonian. Not all legislative acts are translated into English but available ones are in homepage of Ministry of Justice http://www.just.ee/6906.

- Detail plan (*detailplaneering*) is the most exact planning and it is used for land plots to be developed (construction) in near future. The area of typical detail plan is 0,1–100 hectares and the scale of maps is usually 1:1000 – 1:5000. Detail plan is base for technical design and after that for construction. Detail plan must comply with general plan.

There are several exceptions in those plannings. For example the possibility to make thematic plans in county plan and general plan level (for example for wind energy) or make planning only for a part of a certain authority territory. Objects of important spatial impact, major linear infrastructure objects and important objects in the state security level, have special conditions in the described 4-level planning system.
Windparks over 5 wind turbines with total power over 7,5 MW are listed in the comprehensive list of **objects of important spatial impact** (*olulise ruumilise mõjuga objektid*) adopted by Government of Estonia with decree nr 198 in 2003 (https://www.riigiteataja.ee/akt/13195695).

All planning processes are open for stakeholders and public, certain meetings and informing events are mandatory to guarantee democratic, widely and openly discussed decision making.

The Paldiski general plan was compiled from 1998 – till 2005 (enacted 14th of June 2005) and in the final documentation the Paldiski Windpark area is defined as area of renewable energy (*taastuva energia ala*), meaning that the location of object of important spatial impact is already agreed and chosen.

Based on Paldiski general plan the detail plan of Paldiski Windpark was initiated on 16th of November 2004

In EU level environmental legislation is much more regulated than spatial planning legislation. The basic act for Environmental Impact Assessment in Estonia is Environmental Impact Assessment and Environmental Management System Act / *Keskkonnamõju hindamise ja keskkonnajuhtimissüsteemi seadus* (https://www.riigiteataja.ee/akt/116112010013) witch complies with EU's so called EIA directives and SEA directives. Also assessment of impacts to Natura 2000 areas is mentioned in so called Habitats directive (article 6) covered in abovementioned act.

For land-use plans only Strategic Environmental Impact Assessment (SEA) is applicable In Estonia. EIA is not applicable for planning. Therefore **SEA was made for Paldiski Windpark planning**.

Similarly to land-use planning process, the EIA/SEA process is also open for stakeholders and public, certain meetings and informing events are mandatory to guarantee democratic, widely and openly discussed decision making.
For EIA/SEA the regional department of Ministry of Environment is the supervising and permitting authority. The regional department of Ministry of Environment is officially controlling and permitting the documentation in at least 3 stages (approving of EIA/SEA programme, approving of EIA/SEA report, approving of land-use plan).

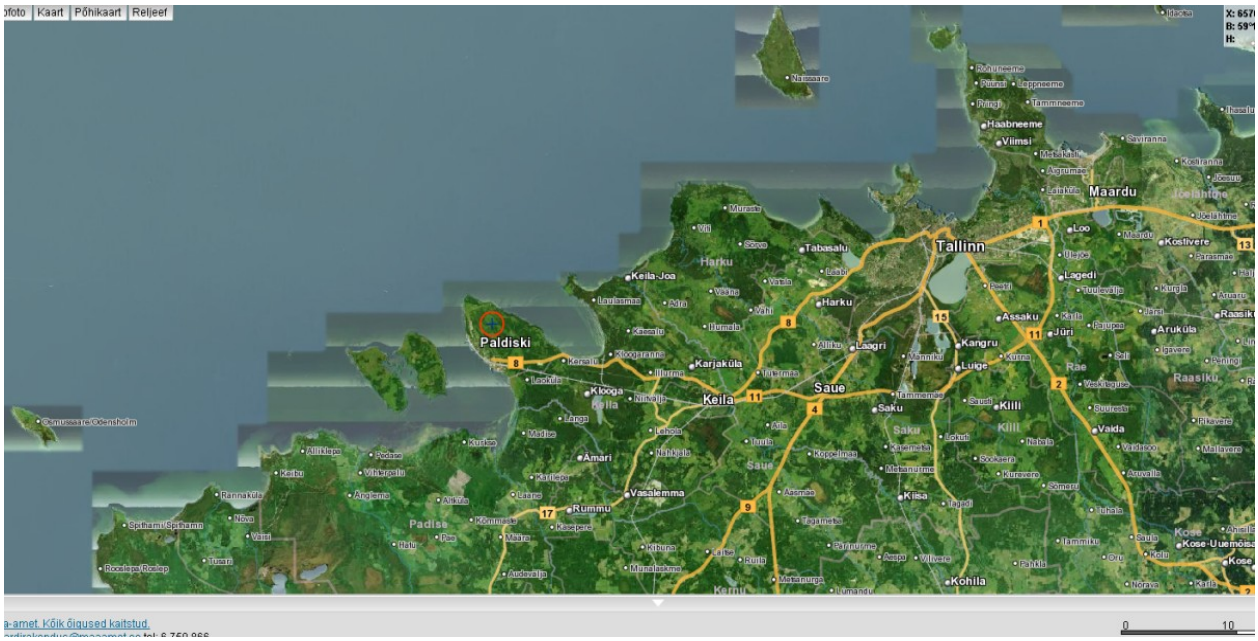
During the last 20 years the environmental impact assessment (both, EIA and SEA) legislation, practice and methodology have developed a lot. Also joining Estonia with EU in 2004 improved the quality of impact assessment.

3. Overview of Paldiski Windpark planning and SEA process. Environmental impact

About project area

Estonia is located in eastern cost of Baltic Sea. The territory of country is 45 000 km² and population is 1,3 million people. Estonia is a member state of European Union and most of other important international organisations (UN, NATO, WTO, OECD etc).

Paldiski is located in North of Estonia approx. 40 km west of capital Tallinn on the Paldiski peninsula in southern cost of Gulf of Finland. The Paldiski local authority (102 km²) consist of urban part (ca 5 km²) in western coast of peninsula and majority of rural area (including 2 islands in west – Suur-Pakri and Väike-Pakri). The territory was used by military forces in soviet period without remarkable civil and private land use, therefore also today's land use is extensive, for example without housing areas.



Location of Paldiski Windpark planning area (red circle) in North-West Estonia.

Spatial planning/SEA process and environmental impact

The local authority, Paldiski City Council, initiated appropriate detail planning procedure on November 16th 2004 and strategic environmental impact assessment (SEA) on May 10th 2005. The detail planning is in accordance with Paldiski general plan where the Paldiski Windpark area is defined as area of renewable energy (*taastuva energia ala*). The planning area was decided by Local Authority and Government to be ca 313,5 hectares.

In period from January 2005 till May 2005 the main activities were related to collection of information (geology, natural values, existing infrastructure etc) to prepare preliminary planning proposal and SEA program.

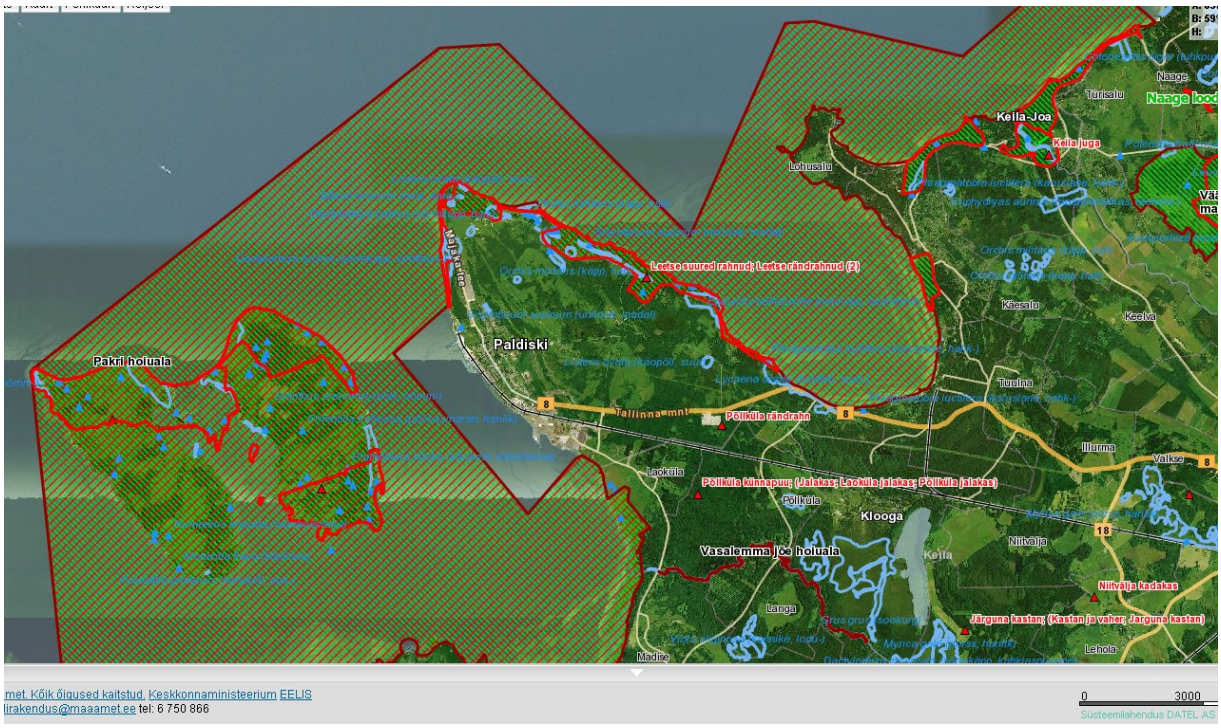
On 14th of June 2007 a public meeting (SEA programme and preliminary planning proposal) was held in Paldiski with 9 participants, mainly representatives of local authority, planner/SEA consultant, developers and local inhabitants.

The SEA program was approved by regional department of Ministry of Environment on 15th of August 2005.

In period from May 2005 till November 2005 the main activities were preparing of preliminary planning proposal and SEA report. In December 2005 the preliminary planning proposal was formed with 24 possible locations for wind turbines (in final enacted planning 22 wind turbines locations were fixed).

In SEA all possible aspects of environmental impact were studied. Due to the fact that by legislation the EIA is not necessary after this type of SEA, the assessment was carried out with the accuracy of EIA.
The main topics were noise impact for local people, visual impact to surroundings, impacts to nature protection areas (including Natura 2000 sites) and other.

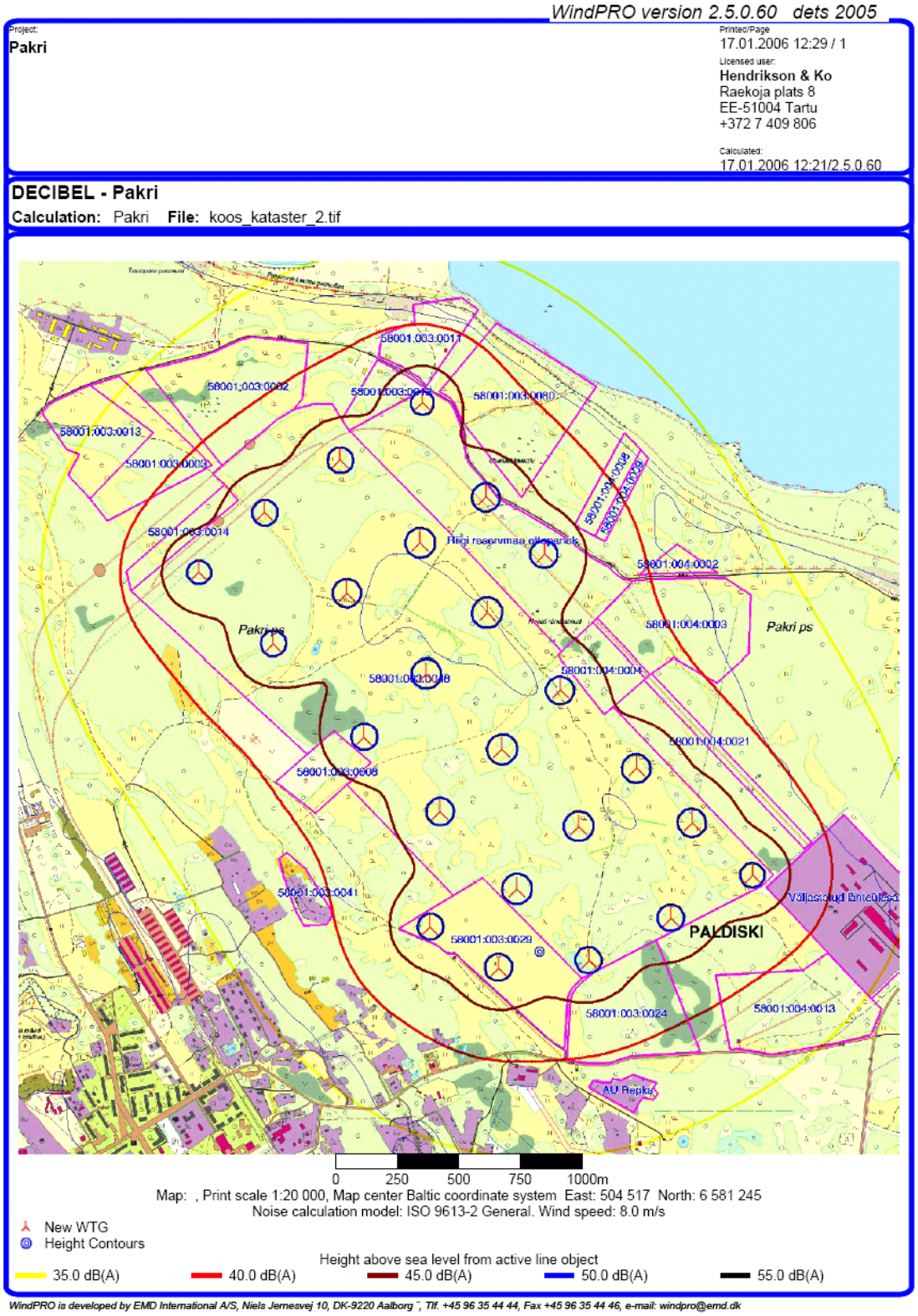
Pakri peninsula is surrounded with protected areas in the sea and because of the remarkable cliff the coastal zone is a protected nature area (landscape reserve). The protected areas in the sea are established to protect nesting areas of birds and also migratory areas (routs and resting). North from the planned windpark is one of the oldest (constructed in 2004) windpark in Estonia with 8 wind turbines (2,3 MW Nordex N-90) where before and during operation several bird and bats surveys were carried out. The main conclusion is that for nesting birds the windpark does not have negative impact because sea birds do not use windpark area (existing and planned) as feeding or "transit" area. The migratory birds follow the northern tops of mainland and islands in that particular area (coasts in North Estonia) and they do not "cut" over the land.



Nature protection areas (including Natura 2000) in the region (http://xgis.maaamet.ee/xGIS/XGis).

In avoiding negative impact on birds and bats the main mitigation measure was the site selection in relatively conflict free area. Taking into consideration the site specific conditions and general practice in Estonia, the 2-year post-construction monitoring of birds and bats was defined.

Also other possible issues of importance were analysed and assessed during SEA process in proper way using advanced methods and technology. For example for noise assessment the special software WindPRO was used, examples of the results are presented in following.



The results of noise modelling (carried out using special software WindPRO) for preliminary planning solution with 24 wind turbines.

WindPRO version 2.7.483 Nov 2010

Project:
Pakri II 201009 Proposals

Description:
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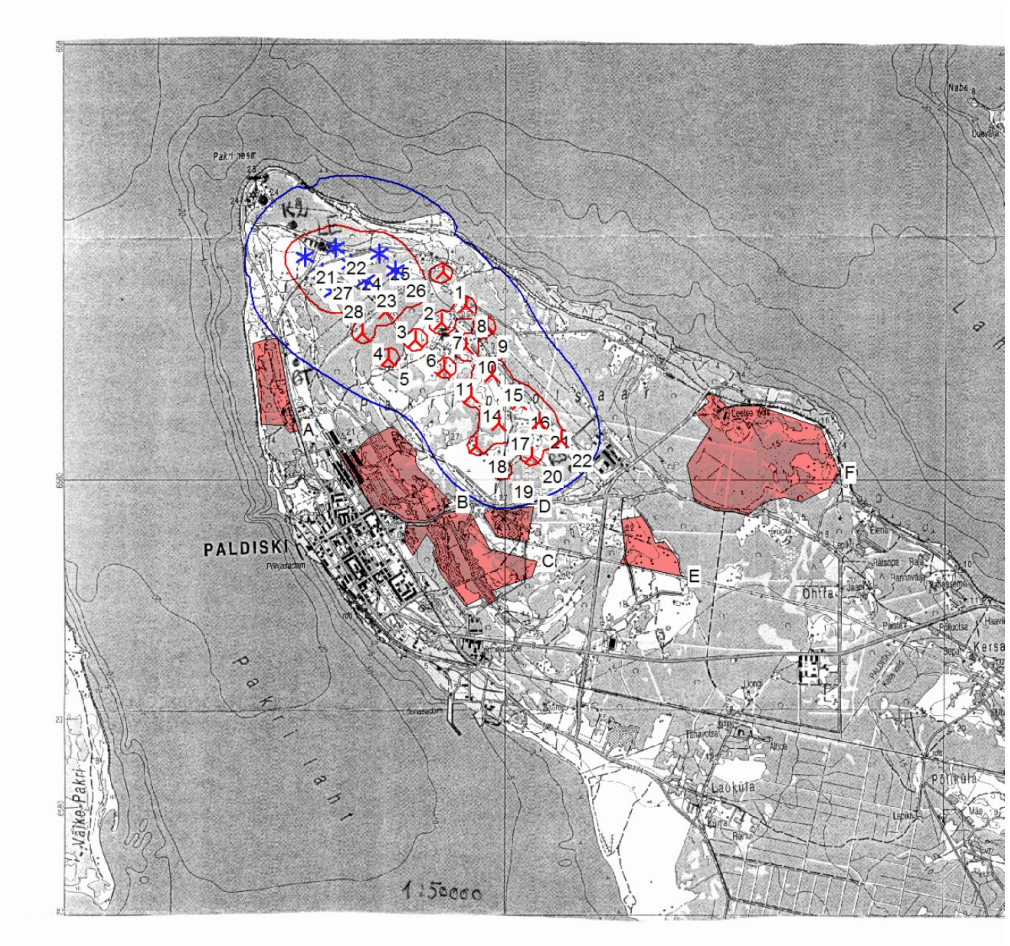
DECIBEL - Map 8,0 m/s

Calculation: Enercon 20 night p2



0 1 2 3 4 km

Map: Paldiski oro , Print scale 1:75.000, Map center LEST92 East: 504.193 North: 6.581.404

Noise calculation model: ISO 9613-2 General. Wind speed: 8,0 m/s

New WTG Existing WTG Noise sensitive area

Height above sea level from active line object

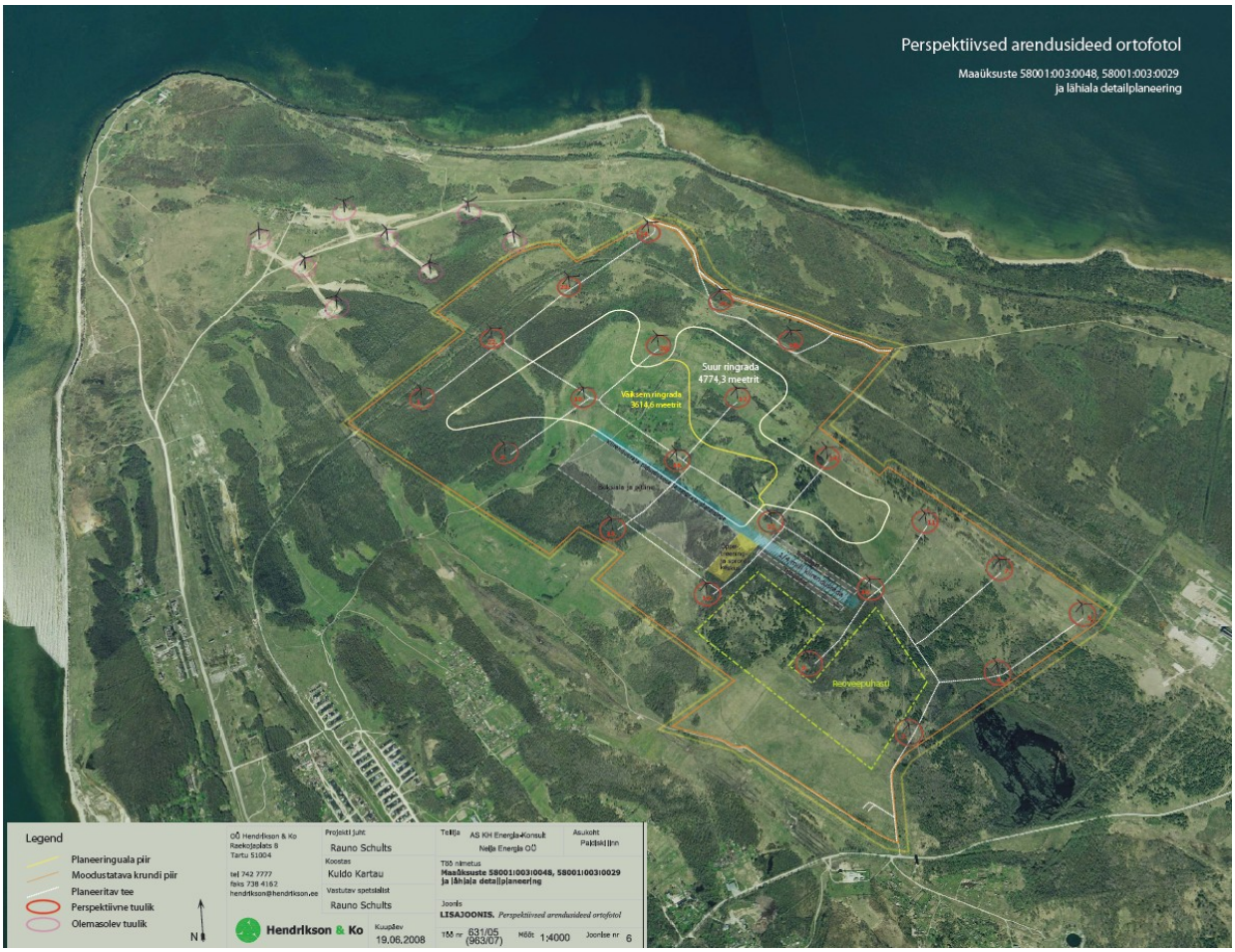
40,0 dB(A) 50,0 dB(A)

WindPRO is developed by EMD International A/S, Niels Jernesvej 10, DK-9220 Aalborg Ø, Tlf. +45 96 35 44 44, Fax +45 96 35 44 46, e-mail: windpro@emd.dk

The results of noise modelling (carried out using special software WindPRO) for final (enacted planning) planning solution with 22 wind turbines.

The Estonian noise legislation is in accordance with EU legislation. Wind turbines are defined as sources of industrial noise with the following acceptable noise levels regarding new developments and projects: 50 dBA in daytime and 40 dBA in night-time. The closest living houses (summer cottages) are in the south-west direction in appropriate distances to guarantee the maximum noise level below 40 dBA even in worst case scenarios.

The allowed maximum shadow flickering duration is not regulated by any legislation in Estonia. In base of good practice the Scandinavian and other countries guidelines and recommendations are often used. Mainly 30 hours per year is the maximum acceptable duration of flickering in a single household. Also 10 hours is often used in assuring good conditions in nearest impacted areas. The closest living house is situated south and south-west direction where the flickering effect can occur in early morning and will not cause remarkable disturbance (in reality the closest living areas are summer cottages without permanent inhabitants).



Overview of planned Paldiski Windpark on orthophoto.

On 19th of December 2005 a public meeting (regarding the SEA report) was held in Paldiski with 7 participants, mainly representatives of different authorities. No public interest and remarkable topics were raised during the meeting and also in publication period before the meeting.

During the period from October 2005 to 2008 different authorities (fixed by Planning Act) approved planning proposal and according to Planning Act in 3rd of April 2008 Paldiski City Government adopted the planning and send it to public consultation (period 19th of April 2008 – 5th of may 2008). The public meeting was held in 21st of May 2008. During public consultation one proposal was received to include into planning solution additional elements (car racing track and natural water treatment on wetland base). The proposed elements were included between wind turbines into planning as information (not enacted) for possible future developments (needs additional planning).

For EIA/SEA the regional department of Ministry of Environment (Harju-Järva-Rapla region) is the supervising and permitting authority. On the 15th of June 2011 the Ministry of Environment approved EIA/SEA report and determined 2-years post-construction monitoring for birds and bats.

On 12th of August 2009 the Paldiski City Government enacted the planning.

Summary of spatial planning and SEA process

Paldiski Windpark planning was **detail planning** based on Paldiski general plan. The Paldiski general plan was compiled from 1998 – till 2005 (enacted 14th of June 2005) and in the enacted documentation the Paldiski Windpark area is defined as area of renewable energy (*taastuva energia ala*), meaning that location for object of important spatial impact is agreed and chosen.
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Both processes, spatial planning and SEA, were involved consultant Hendrikson&Ko and the process was carried out in very good cooperation between them. Maximum connecting of spatial planning and SEA processes is regarded as good practice in Estonia.

Both, the spatial planning and SEA process, were open for stakeholders and public, as certain meetings and informing events are mandatory to guarantee democratic and widely discussed decision making.

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