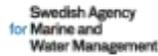




PROPOSALS FOR OPTIMISATION OF THE PROCEDURES ON OFFSHORE WIND FARM ENVIRONMENTAL IMPACT ASSESSMENT





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Disclaimer

The document is produced in the frame of the LIFE+ Nature & Biodiversity project “Innovative approaches for marine biodiversity monitoring and assessment of conservation status of nature values in the Baltic Sea” (Project acronym -MARMONI). The content of this publication is the sole responsibility of the Baltic Environmental Forum and can in no way be taken to reflect the views of the European Union.



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Introduction

Sea area becomes more and more attractive for national economies. At first, it provides a “virtually free” space for development. Secondly, the sea area is very attractive for certain industries. Besides traditional ones, like shipping and fisheries, the sea provides many opportunities for the energy sector, particularly electricity production from wind and wave energy.

While technology for wave use for energy production is still under development, interest in offshore wind energy production quickly develops also in the Baltic Sea Region. The vast windy areas attract developers. The planned Blekinge offshore wind farm (OWF) near the Swedish coastline will be the biggest in the world. Although wind farms are called “green energy producers”, it is obvious that such huge marine infrastructure projects can pose a serious threat to the marine ecosystem, especially to species and habitats, if carried out at wrong locations and with inappropriate technical solutions. Here the importance of a well performed Environmental Impact Assessment comes into place helping in decision making whether the project is acceptable for the society from the environmental viewpoint or not.

The LIFE MARMONI project, although not thoroughly working on environmental impact assessment but on biodiversity assessment and biodiversity monitoring, had the task to evaluate the current implementation of EIA legislation in Estonia and Latvia in relation of new-coming OWF projects, to identify shortcomings and needs for improvement and to elaborate recommendations for potential amendments or improvements of EIA procedures, to support the countries in taking environmentally sound decisions. On request of the Swedish and Finnish project partners, the desk study has been extended to these countries as well.

The document emphasises offshore wind energy production in the Northern Baltic Sea (marine areas of Finland, Sweden, Estonia and Latvia), because here off-shore wind energy production is a relatively new issue with only a few EIA cases yet having been performed and not much of experience for this very complex and different natural conditions (e.g. ice cover during winter) are available.

The document extensively uses the findings presented in the international seminar on “Environmental Impact Assessment of offshore wind farms and other large marine infrastructure”, which was held on 21-22 May 2013 in Riga. At the seminar, more than 40 stakeholders from various organisations (state institutions, developers, scientists, non-governmental organisations) of the Baltic Sea and North Sea Regions shared information on the existing EIA legal procedures in the countries, as well as experience on performing the procedures for recent OWF development projects.

The document has been updated according to new developments in February and March 2016 by the authors.

1 Main offshore development activities in the MARMONI countries

The situation with regard to offshore development is rather different comparing the MARMONI project countries: while Sweden and Finland are definite flagship countries thanks to larger marine areas and also higher economic interest, in Estonia and Latvia such activities have started comparatively recently.

1.1 Sweden

Sweden is most advanced among the MARMONI project countries in relation to offshore wind energy production.

At present, three OWF's are operating in Sweden: Lillgrund (48 turbines with a capacity of 110 MW), Utgrunden 1 (7 turbines, 10 MW) and Yttre Stengrund (5 turbines, 10 MW). Lillgrund in Öresund is operating already since 2007.

A number of projects have received permits for construction (see Table 1).

Table 1: Offshore wind energy production projects with received permits in Sweden

	Number of turbines	Capacity, MW
Storgrundet	53	265
Stora Middelgrund	108	540
Kriegers flak	128	640
Trolleboda	30	150
Utgrunden II	14	72
Kårehamn	16	48
Kattegatt	50	175

More projects are being developed at current date: two offshore wind parks are planned in Hanö Bight. If built, the planned Blekinge OWF with 500-700 turbines and an installed capacity of 2500 MW will be the biggest PWF - not only in the Baltic Sea, but in the world. Another smaller OWF, Taggen wind farm (capacity of 300 MW), is being planned close to Blekinge.

The Taggen project has received a permit, but the developer has applied for smaller changes in the original permit. For Blekinge, the EIA report has been already submitted several years ago, but the final decision is not yet made. The case is currently being reviewed by the Swedish government because of conflicts with military interests in the area. In this particular case, it is the government that will issue the permit if given.

Among other larger offshore infrastructure, the gas pipelines of company *Nord Stream* shall be mentioned. At present, two pipelines have been constructed at the sea bottom (completed in 2011 and 2012, respectively) and gas transport started. *Nord Stream* has started initiating EIA process for two more pipelines to

be placed in parallel to the other two going through Swedish and also Finnish waters.

1.2 Finland

Since 2012, a “blooming” of the wind power market has started also in Finland. Although they are mostly targeting terrestrial areas, offshore is getting more and more attractive.

In Finland, offshore wind turbines have been installed in four places, biggest being the Kemi Ajos semi-OWF with a capacity of 24 MW (2008). The other three sites are very small with a limited number of turbines.

Finland has currently 19 planned wind power projects (total capacity of 2233 MW) for the marine area ranging from only one or two turbines to dozens. Two of the projects are preparing for construction (12 MW), one is applying for permits (240 MW) and the EIA report has been approved for four projects (500 MW). The rest of the projects are in various stages of the planning process. In particular, many plans for offshore wind energy production are located at the Northern corner of the Bothnian Bay.

Other large offshore infrastructure constructions include existing and planned gas pipelines. The two gas pipelines constructed by company *Nord Stream* through the Finnish Exclusive Economic Zone in the Gulf of Finland are the most extensive international operation in the Finnish marine area until present, providing an example of an extensive EIA work and a good case for also international EIA process (Espoo convention). Construction of two new gas pipelines by North Stream 2 AG are currently under investigation and an EIA for the project is under preparation.

1.3 Estonia

At present, no OWF has been yet constructed in the Estonian Exclusive Economic Zone. Currently, three projects are under development in different stages, but no permits have been issued. Accordingly, the country's experience with real implementation is quite limited. Two offshore windfarm EIA cases have been performed (Hiiumaa and Neugrund) but the EIA reports have not been approved due to the incompleteness of the studies.

For the NW-Estonian/Hiiumaa OWF project, an EIA programme was approved in 2007, baseline studies carried out in 2007-2010, the EIA report prepared and a public hearing organised in 2011. In 2013-2014, additional studies were carried out. The preparation of a new EIA report was planned for 2015 but no new public hearing has yet been organised.

For Neugrund OWF, an EIA report was submitted already in 2010, but it received objections from environmental organisations and was not approved. Due to its high nature value, the area was proposed for inclusion in the list of protected areas. The process is expected to be finalised in 2016, and according to the draft protection rules, building (including building of a wind farm) will not be allowed in Neugrund protected area.

For the 3rd Estonian case – the Gulf of Riga OWF project by the company *Eesti Energia AS*, originally planned as MARMONI pilot case for testing a comprehensive EIA implementation – the official EIA procedure has not yet started, but the company has carried out different pre-studies.

Among other recent larger offshore infrastructure projects, *BALTICCONNECTOR* Natural gas pipeline between Finland and Estonia (EIA report in 2015) and *EstLink 2* cable between Estonia and Finland (EIA report in 2010, operating since 2014) shall be mentioned.

1.4 Latvia

Latvia possesses the least experience among the MARMONI countries with offshore development projects and, consequently with their Environmental Impact Assessments.

There have been some attempts from developers' side to initiate offshore wind-farm projects around 2010, but they failed due to legal constraints: not clearly set-up permitting procedure. Meanwhile, the situation has been solved and permitting procedure established. The ongoing maritime spatial planning process will indicate areas most suitable for offshore wind energy production being in line with the recommendation 4.1 of this document and reducing potential conflicts with other sea uses. After approval, the MSP will provide guidance in decision making on tendering areas and issuing licences for OWF construction.

Till present, only one real offshore EIA case was initiated (in 2011) when a company applied for a wind farm development project. The State Environmental Bureau issued an EIA programme valid for 5 years. The developer organised 6 stakeholder meetings within public consultations, but later no further activities were taken. Formally, the process is still open till September 2016. A few EIA cases have been performed for wind farm projects on the mainland close to the coastline.

Also, no other larger marine infrastructure has undergone an EIA process. Accordingly, no offshore infrastructure has been built in Latvian Territorial Sea or Exclusive Economic Zone.

2 Offshore EIA related national legal systems

2.1 Sweden

In general, licencing and EIA for OWF construction is regulated by two main legal acts:

- The Environmental Code (1999) – applied within the Swedish territorial sea (up to 12 nautical miles from the coastline).
- The Act on Sweden's Exclusive Economic Zone (1992) and the Continental Shelf Act (1966) – applied beyond the territorial sea.

According to the Environmental Code of Sweden (1999), for the OWF's falling under the Environmental Code, the permit is issued by one of five Land and Environment Courts. In case of questioning the decision of a Land and Environment Court, the Land and Environment Court of Appeal takes the final decision.

Permits for OWF's within the Swedish territorial waters are in general issued by the Land and Environment Courts. Permits for OWF's in the Swedish EEZ are issued by the Government.

For the OWF's falling under the Act on Sweden's Exclusive Economic Zone, the permit is issued by the Ministry of the Environment.

The consultation procedure for any EIA is detailed in the Environmental Code of Sweden. The developer shall consult with applicable county administrative boards, the supervising authority, and 3rd parties that may be affected. In the case of significant impact, other governmental authorities, municipalities, the public and additional 3rd parties shall be involved.

The consultation is to take place long before submitting the EIA report and applying for a permit. The consultation must cover the geographic scope and design of the activity, as well as the content of the EIA. The length of the consultation process is not specified but it needs to be performed well in advance before the permitting process. It can vary between some months to up to one year before the project owner hands in their application.

The full EIA process is overseen by competent authorities so in the end an adequate EIA is ensured (exact details on case-by-case basis). The permits are issued by the Land and Environment Courts or by the Government in certain cases (i.e. when it concerns military interests). Several institutions are involved in the EIA process including County administrative boards, municipalities, national authorities and stakeholders.

2.2 Finland

Finland has a legislative system, which is based on national laws and fulfils the legal requirements of EU directives and other international treaties and conventions. This means that all larger development projects have to go through a legally binding permitting process which on average lasts for 8 months (longer if the project is large, e.g. projects carried out by company *Nord Stream*).

Different laws abide in the national waters and EEZ. The Land-use and Building Act (to be amended in near future by regulations concerning MSP) governs the planning process in the Finnish national marine waters (excluding the EEZ). Also,

the Water Act sets forth restrictions concerning construction activities in the Finnish marine area (excluding the EEZ).\

The Nature Conservation Act restricts development projects with potentially harmful effects on species or habitats whenever planned projects are occurring on or nearby *Natura 2000* sites. Activities in the Exclusive Economic Zone are governed by the EEZ Act, which will be amended in near future with regulations concerning MSP.

During an EIA process, relevant authorities are consulted in multi- or bilateral meetings. Other stakeholder groups are involved through interactive workshops, interviews, etc.

The regional ELY-centres (Centres for Economy, Transportation and Environment) are the competent authorities for projects planned and executed in the Finnish marine area. The State Regional Administrative Agency (AVI) makes decisions on licences and permits pursuant to the Environmental Protection Act and the Water Act.

The Finnish Government gives permits for construction activities occurring in the Exclusive Economic Zone. Ministries, mainly the Ministry of the Environment, are in charge of the Espoo Convention (Convention on Environmental Impact Assessment in a Transboundary Context) process concerning transnational environmental impacts.

2.3 Estonia

The EIA process in Estonia is being regulated by the Environmental Impact Assessment and Environmental Management System Act (22.02.2005). In 2015, the Act (and the whole the impact assessment system) was revised. One of the main changes was bigger involvement/lead role of the decision maker in the impact assessment procedure. The procedure is specified by Regulations of the Government No 224 "Specified list of activity fields requiring screening/preliminary estimate to determine the need for EIA" [08.05.2012), as well as the Regulation of the Minister of the Environment on „The forms for the EIA licence and its application" (31.05.2005).

As regards the consultation process, the concerned parties and public have to be informed in all major steps of an EIA procedure. Public consultations are required for the environmental impact assessment programme and for the environmental impact assessment report.

The decision-maker is the issuer of development consent (a building permit or a permit of use of a building; an integrated environmental permit or an environmental permit within the meaning of the General Part of the Environmental Code Act or a superficies licence; a geological exploration permit or a permit for general geological survey; other documents permitting the proposed activity with potentially significant environmental impact).

Building permits and authorisations for buildings that are built on public water body (including offshore cables and pipelines as well as superficies licences for OWF's) are issued by the Technical Regulatory Authority. Before issuing the permit, Technical Regulatory Authority must consult with concerned authorities (including Ministry of the Environment among others).

EIA is usually made in the frame of application of the permit for special use of water that in case of offshore infrastructure is issued by the Ministry of the Environment.

Post-decision monitoring is done by the Environmental Board.

2.4 Latvia

In Latvia, the procedure of Environmental Impact Assessment is being regulated by the Law on Environmental Impact Assessment (adopted on 14.10.1998). The procedure is specified in Cabinet of Ministers Regulations No 18 "The procedure for assessing environmental impact of the planned activity and accepting the planned activity" (adopted on 13.01.2015).

In relation to an EIA process in protected areas, the procedure is being regulated by Cabinet of Ministers Regulations No 157 "The procedure for assessing the impact on specially protected areas of European importance (Natura 2000)" (adopted on 19.04.2011). Strategic Environment Assessment is regulated by Cabinet of Ministers Regulations No 157 "The procedure for assessing strategic environment assessment" (adopted on 23.03.2004).

Two state institutions are responsible for offshore EIA processes in Latvia. The developer submits application to the State Environmental Service for screening if there is no certainty about the necessity of a full EIA process. The Service does screening of the application and decides on further procedure either issuing specific technical regulations or forwarding it to the State Environmental Bureau for further steps. If the project falls under obligation to perform a full EIA according to the umbrella law, the developer shall apply directly to the Bureau, which is the responsible organisation for organising and supervising the whole EIA procedure. The Bureau also issues the final statement whether the project is accepted for further implementation or not.

Consultations with various interested parties are very well covered by the legal system. Stakeholders must be involved in various steps of the EIA procedure: they must be informed and their opinions taken into account in practically all steps of any EIA.

As regards EIA procedure, onshore wind farm projects, which are close to the coastline and are most similar to offshore EIA, suggest that no changes in the procedure are needed according to the present experience.

3 Assessment of the performance of EIA procedures

In principle, all MARMONI project countries have an appropriate EIA legislation according to the requirements set by EU common requirements (Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment), which theoretically should work well if applied correctly. The procedure is also applicable for the development of OWF's in the Baltic Sea.

However, practical cases of the implementation of EIA procedure reflect some weaknesses in the system, which are not so much related to the quality of the EIA legislation and its procedures itself (highlighted below).

It shall be stressed that only Sweden and Finland have experience in performing full EIA procedures for OWF's, Estonian and Latvian regulations have not yet faced "real-life-test" except initial studies in Estonia, therefore the given assessment is rather judging theoretically on "availability of procedures" and not on their quality in implementation and enforcement for the both countries. Based on the existing legislation and related experience in performing offshore EIA project, a country matrix was developed, where all main EIA steps were assessed according to performance quality (Table 2).

Table 2: The performance of the main EIA steps in Sweden, Finland, Estonia and Latvia

Main EIA steps	Sweden	Finland	Estonia	Latvia
1. Project preparation and application to the Competent Authority – submission of the application for development consent to the Competent Authority.	Good	Good	Good	Good
2. Screening - The process by which the Competent Authority takes a decision on whether or not EIA is required. Public must be informed about the decision.	Good	Good	Good	Good
3. Scoping – The process of identifying the content and extent of the Environmental Information to be submitted to the Competent Authority under the EIA procedure. As result of scoping the EIA programme is prepared, which is subject for public consultation.	Good	Good	Good	Good
4. Environmental Studies – The surveys and investigations carried out by the Developer and the EIA Team in order to prepare the Environmental Impact Statement (EIS) for submission to the Competent Authority.	Good	Good	Good	Good
5. Preparation of Environmental Impact Statement (EIS) - The draft EIS is a subject for consultation with Statutory Environmental Authorities, other interested parties and the public. Results of the consultation have to be considered when preparing the final EIS.	Good	Good	Good	Good
6. Decision by the Competent Authority and announcement of the decision (including the reasons for it and a description of the measures required to mitigate adverse environmental effects).	Good	Good	Good	Good

Main EIA steps	Sweden	Finland	Estonia	Latvia
7. Post-decision monitoring if the project is granted consent.				
Consultation process (goes across several steps of the EIA procedure)				

Note: meaning of colours in the matrix

	- fully performing
	- partly performing

The first steps of an EIA - **Project preparation and application to the Competent Authority** and **Screening** – are adequately covered by legislation and well performing in all four countries.

Scoping is recognised as partly performing in Sweden and Finland. Although the scoping procedure is covered by legal documents, it is not specified how it shall be exactly done. No strict consensus exists about the minimum requirements for surveys and investigations within an EIA, and these are generally set case by case.

Environmental Studies are recognised as partly performing in Finland, Sweden and Estonia. The quality of performed Environmental Studies can vary among cases because of different reasons. Certainly, it directly depends on the quality of the work of the company performing the Studies. However, there are also some procedural drawbacks – the lack of clear guidance how to perform studies in certain cases, or which kind of studies shall always be conducted. There is not a strict consensus about the minimum requirements for surveys and investigations and these are generally set case by case. Today, this is being solved during the scoping processes for every project.

The preparation of **Environmental Impact Statement** (EIS) is recognised as partly performing in both Finland and Sweden. While an EIS need to be performed is covered by legal documents, more details on what such EIS must include is not covered.

The process of **Decision by the Competent Authority** is fully covered in all countries.

Post-decision monitoring is fully performing. While the monitoring programme is regulated in the permission, details (i.e. methods for measuring different impacts, time intervals) are not covered and are usually decided after the permitting process in consultation with the Supervisory Authority.

Additionally, there are some drawbacks in the **consultation process**, which goes through many steps of the whole EIA procedure. In Sweden, it is typically being performed very early, which makes it difficult for any party to foresee the end result and thus the actual environmental impacts. An early consultation is important to obtain opinions on the content of the EIA, however, often this leads to the presented development plans being in a very early phase and not very detailed. For those cases a second consultation procedure (or similar) would be useful. In Finland, the possibilities of various stakeholders to influence the EIA process is not sufficient, the developer usually is a step ahead when comments arrive and is not obliged to take the statements into consideration.

4 Recommendations for optimisation of the implementation of EIA procedures

Summarising the outcomes from assessing the national offshore related EIA legislation and practical EAI cases, the overall conclusion is that most of improvements have to be made on rising information reliability and credibility for ensuring grounded decisions. It means to pose clearer requirements for comprehensive environmental impact studies to be undertaken by the developers and to build on national baseline information to be able to take decisions in an EIA process, while the formal legal frame is actually in place in the target countries and cannot be much criticised. Some minor recommendations for optimisation of EIA procedures have been defined here to improve performance of EIA. They reflect the viewpoint of the MARMONI scientists and experts, as well as their guest developers and policy makers from the Baltic Sea region.

Most of the proposals are relevant for all four MARMONI countries (and partly the whole Baltic Sea region).

The recommendations are summarised in Table 3 and further explained in the text of Chapter 3.

Table 3: The proposed actions to improve performance of the main EIA steps in Sweden, Finland, Estonia and Latvia

EIA step	Identified shortcomings	Proposed actions	Sweden	Finland	Estonia	Latvia
Overall (designation of areas suitable for OWF)	Areas for offshore wind farms are not designated	Performance of MSP/SEA to identify conflicts between interests / impacts in an early stage	X	X	X	X
Scoping	Lack of requirements for the scope of surveys and investigations	Development of guidelines for environmental impact studies	X	X	X	X
Environmental Studies	Lack of criteria to assess obtained information	Development of guidelines for environmental impact studies	X	X	X	X
	Lack of holistic assessment of summing up impacts of different offshore infrastructure	Development of criteria for assessment of cumulative effects and inclusion in EIA legislation	X	X	X	X
	Not/partly available offshore environment/sea use data from other countries	Better policies and solutions for data sharing among institutions/countries	X	X	X	X
Consultation process (goes across all EIA procedure)	Important comments of stakeholders can be missed in the process	Harmonisation with stakeholders must be enforced		X		

4.1 Designation of areas suitable for OWF

4.1.1 Performance of MSP/SEA to identify conflicts between interests / impacts in an early stage

At present, it is a common situation that developers apply for activities, e.g. an OWF, in a particular marine area and only later strategic planning of the marine territory takes place, if ever, while the ideal situation is to carry out a strategic plan analysis at first.

The present experience reflects the necessity to plan the locations of OWF's harmonising them with the interests of other economic sectors (fisheries, maritime transport, defence), as well as taking into account environmental concerns. Maritime Spatial Planning is a powerful tool that allows finding most appropriate places for wind farms with the least conflicts with other sectors.

Maritime Spatial Planning sets conditions when and where human activities take place at sea.

From the environmental perspective, the MSP process shall help in regulating relevant drivers and pressures of an area and identifying most appropriate places for construction of wind farms with the least impact on species and habitats. The MSP can make a significant contribution to achieving and maintaining good environmental conditions of an area by regulating relevant drivers and pressures.

There is already a significant step towards it: On 23 July 2014, the Directive 2014/89/EU of establishing a framework for maritime spatial planning was adopted, thus establishing an overall legal EU framework for compulsory spatial planning of marine areas.

The Directive obliges Member States to set up maritime spatial plans which identify the spatial and temporal distribution of relevant existing and future activities and uses in their marine waters. The plans for all marine waters of the Member States shall be established by 2021.

Among the objectives of maritime spatial plans are some directly relevant to planning the locations of OWF's: application of an ecosystem-based approach, contribution to the preservation, protection and improvement of the environment, as well as contribution to the sustainable development of energy sectors at sea. There is a danger that maritime spatial plans can overstress sectorial interests and plans; they shall not lose integration of environmental conditions, processes and impacts.

The main problem in relation to EIA for OWF is that the overall MSP process in the Baltic Sea has just started, while already many applications for OWF have been received before the MSP has been in place:

At the moment, only two Baltic Sea countries possess maritime spatial plans. Germany has an approved maritime spatial plan since longer time (adopted in 2009). In Lithuania, the plan was adopted in 2015.

Sweden has initiated its MSP process and the Swedish Agency for Marine and Water Management will prepare three draft plans (Bothnian Bay, Baltic Sea, and Western Waters – Skagerrak and Kattegatt). Also in Finland, the ongoing MSP

processes will also result in three regional marine spatial plans, which will be developed by regional councils.

In Estonia, two first pilot maritime spatial plans have been developed in Pärnu and Hiiu Counties, but they are not yet in force. The development of MSP for the whole area of Estonia is expected to be launched in the beginning of 2017.

In Latvia, the MSP for the whole sea area started in 2015 with most probable adoption in 2017.

Strategic Environmental Assessment is another important tool supporting cautious decision making. The SEA procedure shall be applied to any strategic document related to OWF development, e.g. energy sector plans and maritime spatial plans. A good example is the strategic environmental impact assessment of 15 Norwegian offshore areas, which helped to rank various marine areas according to the weight of impacts on biodiversity features, as well as analysed social, economic and technical issues.

Strategic environmental assessment (SEA) is a systematic decision support process, aiming to ensure that environmental and possibly other sustainability aspects are considered effectively in policy, plan and programme making.

On the EU level, the overall legal framework is Directive 2001/42/EC on the assessment of the effects of certain plans and programmes on the environment (Strategic Environmental Assessment Directive, adopted on 27 June, 2001).

The following actions are recommended to be performed:

- The national EIA legislation shall include the provision that development of new OWF's in a certain area may be accepted only in the case, if it is foreseen in the Maritime Spatial Plan.
- Each maritime spatial plan shall carefully evaluate the possible locations of OWF's not only looking from interaction with other sectors viewpoint, but also significant analyses must be done about impacts on environmental conditions, and species and habitats particularly.
- The MSP process shall influence permitting procedures – no permits shall be issued if the marine area of interest has not been designated as wind energy production area by an approved maritime spatial plan. As an example, the Estonian government will not initiate development procedure until MSP is ongoing.
- All development strategies and plans related to offshore wind energy production, as well as maritime spatial plans must undergo a Strategic Environmental Assessment procedure.

4.2 Scoping and Environmental Studies

4.2.1 Development of a “Baltic Sea guidelines for OWF EIA”

There are well developed procedural steps how to perform Environmental Impact Assessment covered both by European Directives and national legislations. Nevertheless, the contents of the baseline studies are not strictly determined, developers and consultants are quite free to choose what issues should be cov-

ered in in the program and what part of the programme needs additional data collection. Usually national legislation do not have strict requirements of performing baseline studies with field data collection in cases some kind of background information is available from previous studies or national databases. For OWF projects in case of Northern Baltic such kind of background information usually does not exist and developers have to guess and optimise the data collection programmes. It leads to the situation that EIA reports differ in their content list, which makes difficult a proper decision making. There is not a strict consensus about the minimum requirements for surveys and investigations and these are generally set case by case.

A few guiding documents exist on performance of the offshore wind farm EIA relevant for North and Baltic Sea:

- Germany: Standard. Investigation of the Impacts of Offshore Wind Turbines on the Marine Environment (StUK4) (2013; the first version developed in 2001 and updated several times)
- Denmark: Danish Offshore Wind. Key Environmental Issues – a Follow-up (2013)
- Poland: Guide to the location determination and environmental impact forecasting procedures for OWF's in Polish maritime areas (2011)
- Belgium: OWF's in the Belgian part of the North Sea. Early environmental impact assessment and spatio-temporal variability (2010)
- Baltic States: Guidelines for the investigation of the impacts of OWF's on the marine environment in the Baltic States (2009).

Most of the experiences these documents are based on experiences from OWF constructions and impact assessments in the North Sea and/or Southern Baltic Sea and do not take into consideration the complexity of the Baltic Sea's ecosystem and its regional differences.

The first comprehensive guiding document has been developed in Germany in 2001; it served as example for many countries, however, it has been heavily disputed for being too detailed and too local (North Sea conditions) and revised several times.

In 2011, the European Commission has issued the guidance document "Wind energy developments and *Natura 2000*", however, this document is far too general for specific OWF EIA cases and do not cover issues outside the *Natura 2000* management.

One issue, which the MARMONI team wants to recommend after studying all those documents, is that any guidelines should not so much focus on particular sampling methodology but on the issues and problems to be covered within the EIA process, which might be different for each specific project site as determined by the complexity of environmental conditions of particular sea area and available background information.

The industry and the licensing authorities need comprehensive "**Baltic Sea EIA guidelines**" with step by step clear instructions, with regional geographic investigation scenarios and with minimal possibilities for different interpretations. The document must get a wider regional acceptance, potentially through HELCOM or under e.g. ESPOO Convention. It must hinder the developers to do only the minimum efforts and consultants do the investigations as cheaply and

quickly as possible. Such guidelines would pose a clear framework, which determines requirements to be compulsory taken into account.

The technologies for offshore wind energy production are rapidly developing and so is the knowledge on possible impacts on marine environment coming from offshore installations. Therefore, such guidelines shall not be static and must be a subject of constant development.

Such guidelines will require a thorough data collection and assessment by advanced marine scientists and must be based on a set of real EIA cases adding up to the experience collection also cases from the Northern Baltic Sea region.

The recently elaborated MARMONI "Guidelines for environmental impact studies on marine biodiversity for offshore wind farm projects in the Baltic Sea Region" cover the minimum compulsory set of biodiversity related issues, which should be covered by an Environmental Impact study, and can function as a part of these recommended comprehensive guidelines; however, large number of issues covering other aspects of marine environment (hydrology, ice conditions, sedimentology, geology and geomorphology, water chemistry etc.) have not been object of the MARMONI guidelines and should be included.

These guidelines shall also contain assessment criteria for all environmental issues to be taken into account. These would be helping competent authorities in taking correct decisions on impacts and avoid potentially negative decisions based on precautionary principle or worst-case scenario. While it is a sound approach for the environment, it must also support developer who invests resources in investigations and would like to rely on justified decisions. Defined assessment criteria would also help the developer to timely detect problematic issues and optimise research. In most optimum way, the criteria shall be international agreed and become legally binding.

4.2.2 Development of criteria for assessment of cumulative effects of OWF and inclusion in EIA legislation

In the Baltic Sea, still only a limited number of OWF's operate, and individual impacts of them on species and habitats may be negligible and limited to the specific site. Nevertheless, the wind energy production projects are quickly developing, and there is a danger of summing up the impacts of each individual wind farm leading to so called **cumulative effect**. Combinations of impacts from many operating windfarms may lead to exceeding some critical thresholds for species populations: e.g., the planned Blekinge OWF in Sweden would be the largest in the world. Very close to the site, a smaller twin project Taggen OWF is being carried out, which could add to the cumulative effect.

Outside the Baltic Sea Region, Belgian coastal zone can be mentioned as the example, where up to 530 wind turbines are planned in an area of 210 km², but the focus is on each individual project, not looking at cumulative impacts of them as a whole.

But the cumulative effect is not limited only to a local scale. It may appear also on a regional or even pan-Baltic scale. Particularly, highly mobile migrating species (migratory birds and bats, grey seals, harbour porpoises) may suffer from it.

At present, the knowledge for assessing cumulative effects is not sufficient. It is partly because of limited experience with OWF operation and also gaps in knowledge in species ecology that hinders setting impact thresholds.

Cumulative effects from other sea uses also shall be taken into account when performing EIA's for OWF impacts at particular locations.

The following actions are recommended to be performed on a national/international scale:

- Thorough analyses of long term species data on a pan-regional scale are needed to have better understanding in relationship between population status/impacts/the cumulative effect, and set acceptable impact levels for populations.
- Internationally agreed scientific criteria/methodology for the assessment of cumulative effect shall be developed.
- The requirement to assess the cumulative effect shall be included in national EIA legislations.
- The cumulative effect shall be taken into account when performing Maritime Spatial Planning and Strategic Environmental Assessment. It would later enable to simplify EIA procedure for single projects.

It is advised that the assessment of cumulative effects itself is done by a competent authority or by a national or international expert institution/organization to avoid subjective statements if the assessment is performed by the development company. If the analysis is done by an authority in possession of all possible data and is based on internationally agreed impact analysis criteria, the results would be more reliable and difficult to refuse.

As the task requires high level scientific knowledge, the best way how to implement it would be via international projects bringing together leading marine scientists and at HELCOM level. The agreed criteria later shall be transposed to national legal systems, and responsible authorities shall be designated.

4.2.3 Better policies and solutions for data sharing among institutions/countries

Although data exchange on the international level has always been stressed as necessity in various international documents, it is not so easy in the practical life. The transboundary site "Kriegers flak", which is shared between Germany, Denmark and Sweden, can be mentioned as an example when bordering countries were not able to get information what is happening on the other side.

As the need to look at a wider Baltic Sea region context is obvious when performing an EIA, better policies and solutions for data sharing among institutions/countries are needed, and a legal mechanism has to be found ensuring easy data exchange among countries. The current HELCOM practice is not sufficient.

The overall principles of data exchange shall be internationally agreed. In principle, there are three categories of data each of which need a specific approach:

- Data on biological, chemical and physical features of the environment – they shall be stored in the responsible national organisations and be freely available online or by the request.
- Classified data of restricted availability – a special agreement shall be made and they shall be available on request justifying the need.
- Business related data – this is most complicated type of data, because competing interests of business is among biggest obstacles.

The issue could be solved in the frame of the Directive on Establishing a framework for maritime spatial planning, which stresses that the Member States sharing a sea should cooperate to ensure that their MSP are coherent and coordinated, as well as use best available data and organise the sharing of information on environmental, social and economic data, as well as physical data about marine waters.

The most optimum way for data sharing could be development of an open-access marine/maritime data system (information platform), which stores EIA relevant environmental/sea use data.

4.3 Stakeholder consultation

4.3.1 Harmonisation with stakeholders must be enforced

Involvement of various stakeholders in EIA processes is important, because it ensures a higher quality of EIA reports and more grounded decisions. The present experience in Finland suggests that the efficiency of stakeholder involvement shall be improved. Active discussions during EIA processes are vital to ensure good quality of environmental impact studies and decision making. The offshore EIA cases are usually running very quickly in Finland (8 months on average), therefore stakeholder involvement must be optimised to include most grounded statements into the process.

The competent authority should work to increase the cooperation among project developers and stakeholders, particularly experts, so that knowledge exchange would occur already during first steps of the EIA development process. This would increase the quality of the EIA and assure the project development of an efficient use of resources for the EIA and the permitting process.

As there are cases when stakeholders blame their proposals/opinions are not taken into account, it is proposed that the competent authority organises expert panels after all stakeholder statements are received. The authority combines the major points from the statements and subjects these to the panel. Discussions among the competent authority, expert panel and the developer shall find the best possible solutions for the identified problems.

In 2013, the European Commission prepared the proposal for a Directive of the European Parliament and of the Council amending Directive 2011/92/EU of the assessment of the effects of certain public and private projects on the environment. The European Parliament has supported changing and amending the Directive.

Some amendments are in line with the recommendations developed within this document:

(12a) With a view to strengthening public access and transparency, a central portal providing timely environmental information with regard to the implementation of this Directive electronically should be made available in each Member State.

(12b) In order to reduce the administrative burden, facilitate the decision-making process and reduce project costs, the necessary steps should be taken towards standardisation of the criteria in line with Regulation (EU) 1025/2012 of the European Parliament and of the Council of 25 October 2012 on European standardisation, with the aim of being able to support the use of best available technologies (BAT), improve competitiveness and prevent standards from being interpreted differently.

(12c) Again with a view to further simplifying and facilitating the work of the competent administrations, guidance criteria should be drawn up that take into account the characteristics of the various sectors of economic or industrial activity. This should be based on the instructions under Article 6 of Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora.

Conclusions

In conclusion, despite the fact that the overall procedures for Environmental Impact Assessment are well in line with national and European legal frames, much needs to be done to give better technical guidance to developers and implementing competent authorities to take decisions that are environmentally sound. This guidance must address the specific ecological features of the Baltic Sea, especially its Northern parts which are less investigated, but more vulnerable; they must address more than the marine biology which has been the only theme of the MARMONI project. And they must have a wider outreach than the specific local project they refer to. The marine environment, in difference to the terrestrial environment, is more affected by cumulative effects of larger amounts of OWF installations. On the other hand, we know less about the marine ecology as well as on impacts by OWF – a situation that makes proper decisions even more complicated and delicate.

LIFE+ Nature & Biodiversity project “**Innovative approaches for marine biodiversity monitoring and assessment of conservation status of nature values in the Baltic Sea**” (Project acronym MARMONI, Project No. LIFE09 NAT/LV/000238).

Please visit the project website: <http://marmoni.balticseaportal.net/>

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