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Summary of HELCOM ESA data call first results to complement HOLAS II results

Background

This document summarises the first results of the national HELCOM data call on economic and social analyses (ESA) in the EU MSFD Initial Assessments of the Contracting Parties. The data call aims to provide data for complementing the information presented in the first version of the HELCOM '[State of the Baltic Sea](#)' report (as produced by the [HOLAS II project](#)), as well as to provide information for future development of the regional ESA.

The first data call results aim to serve as basis for a discussion in HELCOM HOLAS II ESA workshop on March 13 of 2018 on what information could be recommended for the HOLAS II update based on the data call results. This document summarises all the data collected as part of the data call, and provides background for the discussion. More concrete recommended results for complementing the HOLAS II reports will be formulated as outcomes of the workshop (including, to provide information for the coming HOLAS II meeting).

The first results include data collected from the Contracting Parties where the national ESA for the MSFD Initial Assessment are completed – Finland, Germany, Poland and Sweden. Data from other countries will be added in the next stage of the data collection (till the end of March).

As part of the data call, selected national data on the ESA of the use of marine waters, the cost of degradation analysis, as well as business-as-usual scenario are collected. They concern the national ESA approaches and specific ESA data and assessments. They are presented in this document following specific aimed results for the HOLAS II reports (the HOLAS II summary report and the supplementary report on the ESA).

Section 1 provides an overview on the aimed results for the HOLAS II reports based on the data call outputs. Further sections summarise the collected data for each aimed result (section 2 concerning the ESA of the use of marine waters, section 3 concerning the cost of degradation analysis and section 4 concerning the business-as-usual scenario).

Action requested

The meeting is invited to take note of the information as background for the discussion in the meeting, and provide comments and views on the inclusion of data call results into the upcoming update of the HOLAS II report.

1 Overview on the aimed results for the HOLAS II reports based on the data call outputs

Table 1 provides an overview on the aimed results for the HOLAS II reports based on outputs of the data call. Detailed information concerning each aimed result is provided in the subsequent sections.

All aimed results are seen for the HOLAS II supplementary report on the ESA, which may include more detailed and technical information. There are few results that could be discussed also for the HOLAS II summary report (see the aimed results 1, 2 and 4 in the table).

Table 1. Overview on the aimed results for the HOLAS II reports based on the data call outputs.

Aimed results	for HOLAS II summary report	for ESA supplementary report
ESA of the use of marine waters		
1) A list of relevant marine uses (activities) for the ESA of the use of marine waters (<i>see section 2.2</i>)	X	X
2) Data on economic and social values from additional activities (not included in the current HOLAS II ESA results) ¹ (<i>see section 2.3</i>)	X	X
3) National approaches for the ESA of the use of marine waters (<i>see section 2.4</i>)		X
Cost of degradation analysis		
4) An overview on environmental problems causing national cost of degradation in the Baltic Sea region (<i>see section 3.2</i>)	X	X
5) An overview on the national approaches for the cost of degradation analysis (<i>see section 3.3</i>)		X
Business-as-usual scenario		
6) An overview on the national practices for the BAU development (<i>see section 4.2</i>)		X
7) National assessments on the future changes in the marine uses (activities) (<i>see section 4.3</i>)		X

2 ESA of the use of marine waters

2.1 Aimed results for the HOLAS II reports

There is an extensive list of human activities (and their connection to pressures) in the HOLAS II summary report (provided in Annex 1 of this document). However, the current HOLAS II ESA results on the ESA of the use of marine waters include limited number of marine uses (activities). The first task of the data call was to obtain an overview on all activities that could be seen as relevant for the ESA of the use of marine waters – based on the lists of activities that are included in the national ESA of the use marine waters, thus, are seen relevant nationally due to some reason. The second data call task was to serve socioeconomic data on the additional activities, which have not been covered by the current HOLAS II assessment.

¹ The current HOLAS II results on the ESA of the use of marine waters cover the following activities – (i) fish and shellfish harvesting, (ii) marine aquaculture, (iii) tourism and leisure (data for accommodation's sector), (iv) recreation (benefits from the recreational use of the sea), (v) marine shipping, (vi) marine transport infrastructure and (vii) off-shore wind energy production (only data characterising the activity are provided for the two latter, but no data on the socioeconomic indicators). The socioeconomic data for these currently included activities will be updated (e.g. adding more recent data) based on the international data sources (like EUROSTAT, STECF).

Hence, the aimed results for the HOLAS II reports include:

1. a list of relevant marine uses (activities) for the ESA of the use of marine waters and reasoning for their inclusion,
2. data on economic and social values from additional activities, which have not been included in the current HOLAS II regional ESA.

Both results are aimed for the HOLAS II summary report and ESA supplementary report (the latter could include more detailed information, e.g. on reasoning for the list of activities, more technical information in relation to the provided data). The information presented in the ESA supplementary report could include also brief information in relation to the practical approaches used in the countries for assessing socioeconomic values from the additional activities (e.g. what indicators and data are used, how the marine related proportion is estimated where relevant).

2.2 A list of relevant marine uses for the ESA of the use of marine waters

As part of the data call, countries were asked to indicate all activities that are included in the national ESA of the use of marine waters and to mark for each activity reason(s) for the inclusion. Table 2 summarise results from these data for the first stage countries (4 countries in total). It also shows number of the countries indicating each activity (see also figure 1).

If an activity is seen relevant for inclusion in the national assessment, it is because of some reason. Thus, the relevance depends on the reasons (or criteria) why the activities are included. To obtain a joint regional list of relevant activities these reasons (or criteria) need to be agreed.

The national results show that countries include in the analysis the activities due to their created pressures on the marine environment, as well as due to dependence on the environmental state. However, some countries include also the activities deriving benefits from the sea use, even if not creating significant pressures, such as fish and shellfish processing and ship building and maintenance (indicated as relevant in Germany, Poland and Sweden).

Table 2. A list of relevant marine uses (activities) for the ESA of the use of marine waters (based on lists of activities included in the national assessments).

Marine uses (activities)	N° of countries ^[1]	Creates pressure on the marine environment	Depends on the environmental state ^[2]	Derives benefits from the sea use ^[3]
Fish and shellfish harvesting	4	DE, FI, PL, SE	DE, PL, SE	PL
Marine aquaculture ^[4]	3	FI, SE	DE	
Off-shore wind energy production	3	DE, FI, SE		
Marine transport - shipping	4	DE, FI, PL, SE	PL	PL
Marine transport infrastructure ^[5]	4	DE, FI, PL, SE		PL
Dredging and depositing of the dredged materials	2	DE ^[6] , PL ^[6]	PL ^[6]	PL ^[6]
Extraction of minerals	3	DE ^[6] , FI, PL	DE ^[6]	PL
Transmission of electricity and communications (cables)	2	DE ^[6] , FI		
Fish and shellfish processing	2		PL	PL, SE
Marine uses (activities)	N° of countries ^[1]	Creates pressure on the marine environment	Depends on the environmental state ^[2]	Derives benefits from the sea use ^[3]
Ship building and maintenance	3	DE ^[6] , PL		PL, SE
Marine related tourism and leisure activities	4	DE, FI, PL	DE, PL	PL, SE
Other activities:				
marine protected areas ^[6] , nutrient regulation from agriculture and urban wastewater	1	FI		
agriculture, municipal sector	1	PL ^[6]		PL ^[6]

Note! The current results cover data from Germany, Finland, Poland and Sweden.

Notes to the table:

^[1] Total number of the countries including the activity in the national assessment.

^[2] This reason is not analysed in Finland.

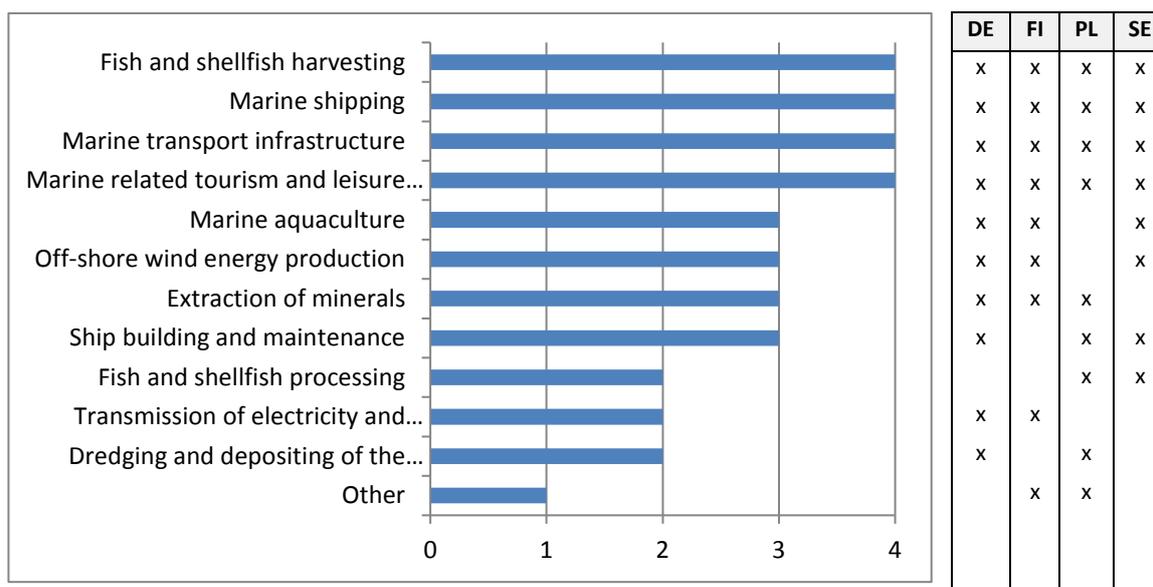
^[3] This reason is not analysed in Germany and Finland.

^[4] The pressure from this activity is not assessed in Germany.

^[5] Various sectors of the economy are included under this activity by the countries (in Sweden also dredging activity is considered here).

^[6] Marked as relevant, however quantitative data are not provided.

Figure 1. Number of the countries where each activity is included in the national ESA of the use of marine waters.



The results indicated that the activities can be grouped into groups:

- activities relevant and assessed with quantitative data in all the countries: fish and shellfish harvesting, marine shipping, marine transport infrastructure, marine related tourism and leisure activities;
- activities relevant for some countries, but not present in other countries: marine aquaculture, off-shore wind energy production (both relevant in Finland, Germany and Sweden), extraction of minerals (relevant in Finland, Germany and Poland);²
- activities relevant in most countries, but with various situations for providing quantitative socioeconomic data: ship building and maintenance (relevant in Germany, Poland and Sweden, socioeconomic data provided only in the two latter), fish and shellfish processing (indicated as relevant and socioeconomic data provided in Poland and Sweden).
- activities indicated as relevant in some countries but commonly missing quantitative socioeconomic data for the analysis – dredging (indicated as relevant in Germany and Poland however no socioeconomic assessments could be developed, assessed together with other sectors related to the marine transport infrastructure in Sweden), and transmission of electricity and communications via cables (indicated as relevant in Finland and Germany however quantitative data (other than socioeconomic) provided only in Finland).

Relevant issues when thinking about the recommended result for the HOLAS II update:

- What could be the joint regional list of relevant activities for the regional ESA of the use of marine waters? What are relevant criteria for inclusion? Providing reasoning for the included activities.

² Information from the second stage countries indicates, for instance, that the marine aquaculture and off-shore wind energy production are not present in Latvia and Estonia, extraction of minerals is not taking place in Latvia.

Keeping in mind two perspectives – the 2018 update for the HOLAS II and the future regional ESA.

- Availability of quantitative data (and socioeconomic data in particular) to be able to provide the estimates on the social and economic values.

Keeping in mind two perspectives – the 2018 update for the HOLAS II and the future regional ESA (taking into account that the information base may develop in the future).

The result is aimed **for both the HOLAS II summary report and ESA supplementary report.**

2.3 Data on economic and social values for additional marine uses

The data call aimed to explore possibility of providing socioeconomic data for additional activities, which have not been included in the current HOLAS II regional ESA³, by collecting such data from the countries' national assessments. Data for the most recent year included in the national assessments were asked. Two types of data were asked (for each additional activity):

- 1) data on the socioeconomic indicators, like value added and employment,
- 2) other quantitative data for characterising activity.

Table 3 summarises the data collected from the first stage countries (4 in total) on the additional activities and their data included in the countries' national assessments (using the "thematic approach" for this analysis). The table provides overview on all the collected data. It needs to be discussed – what can be derived based on such data for the regional ESA.

³ The current data in HOLAS II ESA of the use of marine waters will be updated based on international data sources. These data were not asked from the countries. They cover – (i) fish and shellfish harvesting, (ii) marine aquaculture, (iii) tourism and leisure (data for accommodation's sector), (iv) recreation (benefits from the recreational use of the sea), (v) marine shipping, (vi) marine transport infrastructure and (vii) off-shore wind energy production (only data characterising the activity are provided for the two latter, but no data on the socioeconomic indicators).

Table 3. Additional activities and their data included in the national ESA of the use of marine waters.

Note! The current results cover data from Finland, Germany, Poland and Sweden. Numbers in parentheses for the quantitative data show the data year.

Activities	NACE codes of included sectors	Value added (million EUR)	Employment	Other quantitative data
Marine transport infrastructure (sectors related to ports, dredging)				
Finland				
Germany				
Poland	H52.10, H52.22, H52.24, L68.20, L68.32 ⁴	Revenues from activity – 1869.1 (2016)	Employed persons – 10142 (2016)	
Sweden ⁵	H52.22, H52.24, H52.29 (partly) ⁶	Gross value added – 818.65 (2014)	Employment in FTE – 7497 (2014)	
Extraction of minerals				
Finland	(sand & gravel)			6 million m ³ annually (2011-2015)
Germany				
Poland	(crude petroleum)		Employed persons – 378 (2016)	
Sweden				
Transmission of electricity and communications (cables)				
Finland				number of electricity cables – 5, their capacity 2450 MW (2016)
Germany				
Poland				
Sweden				
Fish processing (NACE code C10.20)				
Finland				
Germany				
Poland	C10.20	Revenues from activity – 2929.3 (2016)	Employed persons – 21055 (2016)	Average annual gross wages and salaries (EUR) - 9583.2 (2016)
Sweden ⁷	C10.20	Gross value added – 94.22 (2014)	Employment in FTE – 1603 (2014)	

⁴ The included sectors: cargo handling (H52.24); cargo storage and ware-housing (H52.10); activities supporting water transport (H52.22); rental and operating of own or leased real estate (L68.20); Real estate management at request (L68.32). Data regarding seaports' authorities and cargo handling and storage in seaports were used (from the statistical yearbook of maritime economy).

⁵ The provided data include national data for all sea regions (not only Baltic).

⁶ The included sectors: service activities incidental to water transport (H52.22), cargo handling (H52.24) and other transportation support activities (H52.29). Micro-economic data were used to estimate the marine-related shares of activities of these sectors.

⁷ The provided data include national data for all sea regions (not only Baltic).

Activities	NACE codes of included sectors	Value added (million EUR)	Employment	Other quantitative data
Ship building and maintenance				
Finland				
Germany				
Poland	C30.11, C30.12, C33.15	Revenues from activity – 2562.7 (2016)	Employed persons – 32610 (2016)	Average annual gross wages and salaries (EUR) – 15477.6 (2016)
Sweden ⁸	C30.11, C30.12, C33.15, C.33.12 (partly), C33.20 (partly) ⁹	Gross value added – 582.46 (2014)	Employment in FTE – 6571 (2014)	
Marine related tourism and leisure activities				
Finland	I55.2, I55.3, I56.1, G47.11, N79.1, R93.29	Gross value added – 284 (2014)	Working days – 7250 (2014)	
Germany	(sectors need to be clarified)	Gross value added – 2000 (2013)		
Poland	Not specified ¹⁰	Revenues from activity – 53.9 (2016)	Employed persons – 1177 (2016)	Average annual gross wages and salaries (EUR) – 8552.4 (2016)
Sweden ¹¹	I55.10, I55.20, I55.30, I56.10 (partly – 1 km from coastline)	Gross value added – 2171.4 (2014)	Employment in FTE – 41924 (2014)	
Other marine uses				
Finland	Recreational benefits			Benefits 1040 M€ and 4 recreational visits per year (2010)
	“Regulating nutrients” (from agriculture and communal sewage)			Benefits as avoided costs for agriculture 1469 M€ (2015) and communal sewage sector 126 M€ (2015)

⁸ The provided data include national data for all sea regions (not only Baltic).

⁹ The marine related proportion of these activities (where “partly”) is estimated by assessing the marine proportion of the “Industrial commodity production index” (comes from yearly statistics).

¹⁰ Various tourism-related economic activities according to the Statistical yearbook of maritime economy (NACE codes are not specified). Data of the entities in coastal regions (e.g. Pomorskie, Warmińsko-Mazurskie and Zachodniopomorskie) are accounted in the estimates.

¹¹ The provided data include national data for all sea regions (not only Baltic).

The results show diversity across the countries in terms of covered activities, sectors of economy included under specific activities (e.g. marine transport infrastructure (sectors related to ports), ship building and maintenance, sectors related to tourism), the used quantitative indicators (e.g. various indicators on economic impacts, various employment indicators), also lack of socioeconomic data on such activities as extraction of minerals and transmission of electricity and communications via cables.

Relevant issues when thinking about the recommended result for the HOLAS II update:

- What data could be included in the updated HOLAS II reports to extend the list of activities and sectors covered by the ESA of the use of marine waters?

! Keeping in mind the list of relevant activities (aimed result 1, information provided in section 2.2).

- What can be concluded for the future regional ESA.

The result is aimed **for both the HOLAS II summary report and ESA supplementary report.**

2.4 National approaches for the ESA of the use of marine waters

This section summarises the collected data in relation to the national approaches for the ESA of the use of marine waters. These data were collected to provide additional methodological information for the HOLAS II ESA supplementary report, as well as to support information exchange and future coordination of the approaches in the sea region.

Relevant issues when thinking about the recommended result for the HOLAS II update:

- What information could be relevant for the updated HOLAS II report?
- What can be concluded for the future regional ESA.

The result is aimed **for the ESA supplementary report.**

From the two **general approaches** recommended for the ESA of the use of marine waters¹², most of the countries have used combination of these approaches. The marine uses (activities) are analysed according to the marine water accounts approach, and the results are complemented with quantitative assessments of ecosystem services and benefit estimates for selected ecosystem services (in Finland, Poland and Sweden). In Germany only the thematic approach is used.

The **included activities** differ across the countries. Overall, those activities are included that create pressures on the marine environment (included in all the countries), are dependent on the environmental state (considered as reason in Germany, Poland and Sweden), as well as, in some countries, also those deriving benefits from the sea use, even if not creating significant pressures, such as fish and shellfish processing and ship building and maintenance.

Other elements of the national approaches are reviewed concerning the additional sectors for which the data were collected.

There are differences across the countries in the **sectors of economy (and NACE codes)** included under the marine transport infrastructure (sectors related to ports), ship building and maintenance and marine related tourism and leisure activities. The included NACE codes are specified in table 3.

¹² Marine water accounts approach and Ecosystem services approach as recommended by WG ESA (2010) „Economic and social analysis for the Initial Assessment of MSFD: A Guidance document” MSFD CIS.

Concerning the **used indicators**, revenues and gross valued added are used as economic indicators, total employed persons and employed persons in full time equivalent (FTE) are used as social indicators (with one exception in Finland where annual number of working days is used as social indicator for marine related tourism and leisure activities). Poland used also annual gross wages and salaries as the socioeconomic indicator. The activity on extraction of minerals lacks data on socioeconomic values (employed persons are provided only in Poland, extracted mineral amounts provided in Finland). The same applies also to transmission of electricity and communications via cables (only Finland has included quantitative data on this activity characterising the number of electricity cables and their capacity).

The most recent **data year** varies across the countries – mainly data for 2014 (in few cases for 2013 or 2015) are used in Germany, Finland and Sweden, while data for 2016 are used in Poland.¹³

In terms of **data sources**, the national statistical data sources are primarily used for the socioeconomic data in Sweden (data from the national statistical office) and Poland (data from the maritime economy statistical yearbooks), since these are countries providing socioeconomic estimates for the largest number of additional sectors. In these countries, micro-economic or companies' data are used in addition concerning some sectors to estimate marine-related proportion of the economic activities (e.g. for ports-related sectors, mineral extraction, sectors related to ship building and maintenance). In Finland the socioeconomic data for tourism and leisure activities are derived from earlier national study, and sectoral data or specific studies are used for other quantitative data (for the activity data on extraction of minerals and electricity cables and for the estimates on benefits to sectors from the regulating ecosystem services' use).

When using available statistical data (according to NACE codes), some sectors require **estimating the proportion of activity that can be attributed to the marine waters' use**. It concerns sectors related to the marine transport infrastructure (ports), ship building and maintenance and sectors serving the marine related tourism and leisure activities. Socioeconomic estimates for the first two activities are provided in Poland and Sweden. For the sectors related to the marine transport infrastructure (ports), micro-economic data were used in Sweden to estimate the marine-related shares of activities of specified sectors, and data on activities of specified sectors in seaports (from the statistical yearbook of maritime economy) were used in Poland. For the shipbuilding and maintenance, Sweden has considered few sectors which are partly maritime and the marine related proportion is estimated by assessing the marine proportion of the "Industrial commodity production index" (comes from yearly statistics). For the sectors serving the marine related tourism and leisure activities, all countries have developed the socioeconomic estimates covering range of sectors (with differences across the countries) and considering the activities in coastal areas (e.g. 1 km from coastline in Sweden, specified coastal regions in Poland).

3 Cost of degradation of the marine environment

3.1 Aimed results for the HOLAS II reports

The current HOLAS II ESA results lack an overview on where the cost of degradation is (for which environmental problems/ecosystem services). The data call aims to provide such an overview based on national assessments, as well as to collect information on national approaches and types of assessments to support information exchange and coordination of the approaches in the sea region. Hence, the aimed results for the HOLAS II reports include:

¹³ Information from the second stage countries shows that more recent data (like in Poland) could be used also in other countries (e.g. Latvia, Estonia).

1. an overview on the environmental problems causing national cost of degradation in the Baltic Sea region,
2. an overview on the national approaches for the cost of degradation analysis.

The first result is aimed for both HOLAS II reports, the second result only for the ESA supplementary report.

3.2 Environmental problems causing national cost of degradation in the Baltic Sea region

The countries were asked to indicate all environmental themes where there is degradation of the marine environment compared to good environmental status, as well as what was used as baseline for assessing the cost of degradation (the current state and/or business-as-usual scenario). Table 4 summarises the results from the first stage countries.

The results show that the degradation assessments are not developed concerning some environmental themes – energy introduction (including noise) is not assessed in all the countries except Finland, marine biodiversity is not assessed in some countries, only commercial fish stocks are assessed in Poland. It can be concluded that for all the themes which have been assessed there is degradation of the marine environment (at least when the current state is used as the baseline for the assessment).

In addition to the cost of degradation assessments according to the marine environmental themes, some countries have developed also assessments in relation to the marine ecosystem services. Sweden has conducted the degradation assessment covering all ecosystem services based on quantitative (non-monetary) assessment approach. Germany and Poland has provided monetary assessment of cost of degradation in relation to recreational ecosystem services.

Relevant issues when thinking about the recommended result for the HOLAS II update:

- What result could be recommended for the HOLAS II update as “an overview on environmental problems causing cost of degradation in the Baltic Sea region”? What issues are relevant and should be taken into account for such an overview?

! Consistency with the regional assessments of the state of the marine environment.

- What can be concluded for the future regional ESA.

The result is aimed **for both the HOLAS II summary report and ESA supplementary report.**

Table 4. An overview on environmental problems causing national cost of degradation in the Baltic Sea region.

Results show responses on a question “Is there degradation of the marine environment compared to good environmental status?”

The information in parentheses specifies what is used as baseline for assessing the degradation of the marine environment for the cost of degradation analysis – the current state (“current”), the business-as-usual scenario (“BAU”) or both (“both”).

	Loss of marine biodiversity	Introduction of non-indigenous species	State of commercial fish stocks	Eutrophication	Contaminants in the marine environment	Marine litter	Energy introduction (including noise)	Other problems
Finland	Yes (current)	Yes (current)	Yes (current)	Yes (current)	Yes (current)	Yes (current)	Yes (current)	Yes (current) for other Descriptors (D4, D6, D7)
Germany ^[1]	Not assessed	Yes	Not assessed	Yes	Yes	Yes	Not assessed	
Poland	Not assessed	Not assessed	Yes (both)	Not assessed	Not assessed	Not assessed	Not assessed	
Sweden	Yes (current)	Yes (current)	Yes (current)	Yes (current)	Yes (current)	Yes (current)	Not assessed	

Notes to the table:

^[1] The baseline for the assessment is not specified (since only qualitative analysis of the cost of degradation is conducted for now and a research project is planned for the assessment in the future).

3.3 National approaches for the cost of degradation analysis

This section summarises the collected information in relation to the national approaches for the cost of degradation analysis. It was collected to support information exchange and future coordination of the approaches in the sea region. At the same time, the collected information provides also an overview on types of the cost of degradation assessments available from the national scale. It shows large diversity across the countries in the types of estimates provided as part of the national assessments. One conclusion is that this diversity limits possibilities to use the national data as potential source for the regional cost of degradation estimates.

The collected information is described further in this section.

Relevant issues when thinking about the recommended result for the HOLAS II update:

- What information could be relevant for the updated HOLAS II report?
- What can be concluded for the future regional ESA (e.g. need for international valuation studies, developing other quantitative (non-monetary) assessment approaches)?

The result is aimed **for the ESA supplementary report**.

From the three **general approaches** recommended for the cost of degradation analysis¹⁴, most of the countries have used combination of two approaches. The cost of degradation is analysed for relevant themes of the marine environment according to the thematic approach, and the results are complemented with quantitative or monetary assessments in relation to the marine ecosystem services (monetary estimates for recreational ecosystem services are provided in Germany and Poland, degradation of all ecosystem services is assessed in Sweden based on quantitative assessment approach). In Finland only the thematic approach is used.

There are differences across the countries in the **assessment approaches** used for assessing specific cost of degradation. The approaches range from qualitative analysis of the cost of degradation for the identified degradation themes (in Germany and Poland) to monetary estimates of the cost of degradation for wide range of degradation themes (in Finland and Sweden) or selected ecosystem services (in Germany and Poland). Table 5 provides an overview of the general approaches for the analysis and specific assessment approaches used in the first stage countries.

Table 5. National approaches for the cost of degradation analysis of the marine environment.

	Thematic approach	Ecosystem services (ES) approach	Cost-based approach
Finland	Joint monetary assessment for all degradation themes ^[1]		
Germany	Qualitative analysis ^[2] for the identified degradation themes	Monetary assessment for recreational ES	
Poland	Qualitative analysis for the identified degradation themes ^[3]	Monetary assessment for recreational ES	
Sweden	Monetary assessment for selected degradation themes ^[4]	Quantitative (non-monetary) assessment for all ES	

Notes to the table:

¹⁴ Thematic approach, Ecosystem services approach and Cost-based approach as recommended by WG ESA (2010) „Economic and social analysis for the Initial Assessment of MSFD: A Guidance document” MSFD CIS.

^[1] *One monetary estimate is provided for all identified degradation themes (were covered in one contingent valuation study and the used method does not allow for estimating separate values for each theme).*

^[2] *Qualitative analysis of the cost of degradation is conducted for now and a research project is planned for the assessment in the future. All themes, where the degradation assessment has been done, are covered in the cost of degradation analysis. These themes include introduction of non-indigenous species, eutrophication, contaminants in the marine environment and marine litter.*

^[3] *The themes, where the degradation assessment has been done and, hence, the cost of degradation is analysed, include commercial fish stocks.*

^[4] *The assessed degradation themes include marine biodiversity (partly), commercial fish stocks and eutrophication.*

There is diversity also in the **environmental themes and ecosystem services covered by the cost of degradation assessments**. In Finland, Germany and Poland all the identified degradation themes are covered, although only in a qualitative manner in Germany and Poland, and only one theme has been assessed in Poland. Germany and Poland have complemented the assessment with monetary estimates for the recreational ecosystem service. In Sweden monetary estimates are developed for some of the identified degradation themes, while quantitative assessment is conducted covering all marine ecosystem services.

The countries conducting monetary assessments for the degradation themes (Finland and Sweden) have used the current state as **baseline** for the cost of degradation assessment. Poland analysed the cost of degradation (for commercial fish stocks) against both the current state and the business-as-usual scenario. In Germany baseline for the cost of degradation analysis is not specified (since only qualitative analysis is done for now).

4 “Business-as-usual” scenario (BAU)

4.1 Aimed results for the HOLAS II reports

The main aim of the data call was to provide an overview on the national practices for the business-as-usual scenario (BAU) development to support planning of the regional BAU development in the future. In addition it was investigated – what information can be obtained from the national scale concerning assessments on the future changes in the marine uses (activities), which is one element of BAU and is done as part of the ESA. Hence, the aimed results for the HOLAS II reports include:

- 1) an overview on the national practices (approaches and assessments) for BAU development,
- 2) national assessments on the future changes in the marine uses (activities).

Both results are aimed for the ESA supplementary report. However, it could be discussed whether the second result could be seen appropriate for including also in the HOLAS II summary report.

4.2 National practices for the BAU development

Countries were asked information on national approaches for assessing the future changes in activities and use of BAU as baseline in national assessments for the cost of degradation analysis and planning of the future policy measures (for assessing gap to good environmental status). An overview on the approaches for assessing the future changes in activities is provided in table 6, and all collected information from the first stage countries is described below.

Most countries have developed national assessments for the future changes in **activities** (except Germany where such assessment is provided only for off-shore wind energy production). The most commonly assessed activities are fish and shellfish harvesting, off-shore wind energy production,

marine shipping, marine transport infrastructure and marine related tourism and leisure activities. Marine aquaculture, tourism and leisure infrastructure and agriculture are covered by some of the countries. Other activities are covered by very few countries.

All the countries have used qualitative **assessment approach**, except Poland where quantitative assessment on the future changes is developed for part of activities (fish and shellfish harvesting, marine shipping and marine transport infrastructure). Sweden and Germany has used the year 2030 as the **time frame** for the assessment, Poland used 2020 and 2030 for part of activities. No specific time frame is used in Finland.

National sectoral information and expert judgement are common **types of information sources** for the assessment in all the countries. Finland has used national data on past development of activities and expert judgement, Poland has used national sectoral information and expert judgement for all assessed activities, Sweden has used national sectoral data and expert judgement for fisheries and marine aquaculture and relevant national agency reports for all other assessed activities. The expert judgement is used as the main source also in Germany.

It can be concluded overall that, while there is some diversity in the covered activities and the used time frame for the assessment, the national assessments rely commonly on the qualitative assessment approach for assessing future changes in the activities. Thus, the outcomes are similar by their nature.

Concerning the **use of BAU for other national assessments**, BAU is used as baseline for assessing gap to GES in Sweden and Poland, and considered in a qualitative way in the gap assessment also in Germany. In Finland gap to GES is not assessed. Concerning baseline for the cost of degradation analysis, the current state is used as baseline (not the BAU) in Sweden and Finland, and both the current state and the BAU in Poland. In Germany the baseline for the cost of degradation analysis is not specified.

Relevant issues when thinking about the recommended result for the HOLAS II update:

- What information could be relevant for the updated HOLAS II report?
- What can be concluded for the regional BAU development in the future (e.g. on possible use of the national assessments as information source for the regional BAU, on relevance of and practically feasible approaches for assessing the future changes in the activities, on relevant issues that should be taken into account)?

The result is aimed **for the ESA supplementary report.**

Table 6. An overview on the national approaches for assessing the future changes in activities as part of BAU development. The provided information specifies: (1) assessment approach, (ii) time frame of the assessment, (iii) the main used information sources. Options for the assessment approach: qualitative assessment (QUAL), quantitative assessment (QUAN), modelling, other.

Covered activities	Finland ^[1]	Germany	Poland	Sweden
Fish and shellfish harvesting (professional)	QUAL data on past development		QUANT, 2020 sectoral information and expert judgement	QUAL, 2030 sectoral data
Marine aquaculture	QUAL data on past development			QUAL, 2030 sectoral data and expert judgement
Off-shore wind energy production	QUAL data on past development	QUAL, 2030 expert judgement		QUAL, 2030 (relevant) National agency report
Marine shipping	QUAL data on past development		QUANT, 2020 and 2030 sectoral information and expert judgement	QUAL, 2030 (relevant) National agency report
Marine transport infrastructure	QUAL data on past development		QUANT, 2020 and 2030 sectoral information and expert judgement	QUAL, 2030 (relevant) National agency report
Extraction of minerals	QUAL expert judgement ^[2]			
Transmission of electricity and communications (cables)	QUAL data on past development			
Marine related tourism and leisure activities	QUAL expert judgement		QUAL, 2020 sectoral information and expert judgement	QUAL, 2030 (relevant) National agency report
Marine related tourism and leisure infrastructure	QUAL data on past development			QUAL, 2030 (relevant) National agency report
Agriculture			QUAL, 2020 sectoral information and expert judgement	QUAL, 2030 (relevant) National agency report
Forestry				QUAL, 2030 (relevant) National agency report
Waste treatment and disposal				QUAL, 2030 (relevant) National agency report
Other:				
regulating service to mitigate nutrient input from agriculture	QUAL expert judgement			
regulating service to mitigate nutrient input from sewage treatment	QUAL expert judgement			

Notes to the table: ^[1] No specific time frame is used for the expected future trends of activities. ^[2] Sand and gravel extraction.

4.3 National assessments on the future changes in the activities

For the activities where the future changes have been assessed, countries were asked to specify the assessed future trend (using 3 categories – decreasing, no significant changes, increasing). Table 7 summarises the result from the first stage countries. This could be result for the ESA supplementary report. However, it could be discussed whether such result could be seen appropriate for including also in the HOLAS II summary report. In addition to the possible outcome like table 7, also brief textual description for each activity (at least for the activities commonly assessed in the countries) on the expected future changes in various countries could be developed.

The results show that there are activities with increase expected in the future commonly in the countries, in particular, marine shipping, marine transport infrastructure, marine related tourism and leisure activities, but also off-shore wind energy production and marine related tourism and leisure infrastructure in some countries. Different future trends are expected for fish and shellfish harvesting and marine aquaculture across the countries, with decreasing trend (for aquaculture in Finland and fishing in Sweden), increasing trend (for aquaculture in Sweden and fishing in Finland) or no significant changes (for fishing in Poland). Future changes in other activities are assessed by rather few countries, and they, in most cases, show decreasing trends or no significant changes (for instance, no significant changes for extraction of sand and gravel in Finland, decreasing trend or no changes for agriculture in Poland and Sweden, no changes for forestry and waste treatment and disposal in Sweden, decreasing trend for regulating service to mitigate nutrient input from agriculture and sewage in Finland).

Table 7. National assessments on the future changes (trend) in the activities. The information in parentheses specifies the time frame of the assessment. Categories for the future changes (trend): Decreasing ↘, No significant change →, Increasing ↗.

Activities	Finland	Germany	Poland	Sweden
Fish and shellfish harvesting (professional)	↗		→ (2020)	↘ (2030)
Marine aquaculture	↘			↗ (2030)
Off-shore wind energy production	↗	↗ (2030)		→ (2030)
Marine shipping	↗		↗ (2020 and 2030)	↗ (2030)
Marine transport infrastructure	↗		↗ (2020 and 2030)	↗ (2030)
Extraction of minerals	→ ^[2]			
Transmission of electricity and communications (cables)	↗			
Marine related tourism and leisure activities	↗		↗ (2020)	↗ (2030)
Marine related tourism and leisure infrastructure	↗			↗ (2030)
Agriculture			↘ (2020)	→ (2030)
Forestry				→ (2030)
Waste treatment and disposal				→ (2030)
Other:				
regulating service to mitigate nutrient input from agriculture	↘			
regulating service to mitigate nutrient input from sewage treatment	↘			

Notes to the table: ^[1] No specific time frame is used for the expected future trends of activities. ^[2] Sand and gravel extraction.

Relevant issues when thinking about the recommended result for the HOLAS II update:

- What result could be recommended for the HOLAS II update?
- What can be concluded for the regional BAU development in the future? Including, what issues are relevant and should be taken into account for the given assessment? For instance,
 - how to integrate such national assessments (trends) into a common sea region assessment (including, on what scale, e.g. sea sub-basins),
 - keeping in mind that such assessments should be usable for the next steps of BAU – for assessing expected changes in pressures and state.

The result is aimed **for the ESA supplementary report. Could it be appropriate also for the summary report?**

Annex 1: HOLAS II list of human activities and their connection to pressures

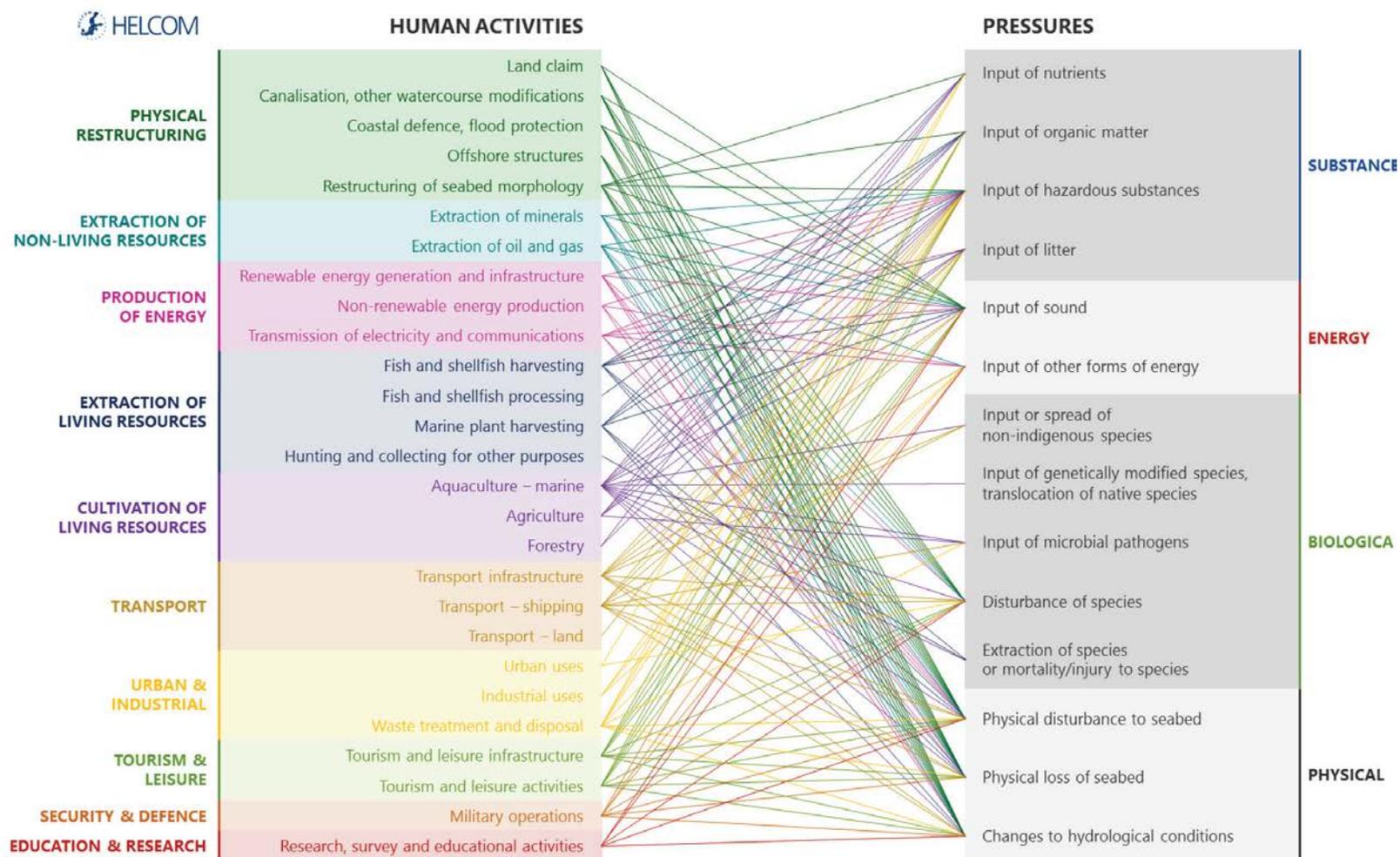


Figure. Human activities in the Baltic Sea and their connection to pressure types. The lines show which pressures are potentially induced by a certain human activity, without inferring the magnitude of the pressure in each case, nor its potential impacts on the environment. The figure illustrates the level of complexity potentially involved in the management of environmental pressures.

Source: HELCOM (2017): First version of the 'State of the Baltic Sea' report – June 2017 – to be updated in 2018. Available at: <http://stateofthebalticsea.helcom.fi>.