Mistra C2B2
Co-Creating
Better Blue

Key economic figures of the blue economy in Sweden

Data brief

Emanuela Vanacore
Frans Sjölander
Nikolaos Xafenias
Siv Huseby

October/2024
www.c2b2.se

Cover photo by Patrik Eld.

Please cite as:
Emanuela Vanacore, Frans Sjölander, Nikolaos Xafenias*, Siv Huseby (2024). Key economic figures of the blue economy in Sweden- Data brief.
*corresponding author

FUNDED BY
MISTRA
The Swedish Foundation for Strategic Environmental Research

Report Title	Key economic figures of the blue economy in Sweden
Status	Draft
Report type	Data brief
Dissemination level	Internal
Related Work Package	1
Deliverable lead	-
Author(s)	Emanuela Vanacore, Frans Sjölander, Nikolaos Xafenias, Siv Huseby
Contact for queries	Nikolaos Xafenias
Internal reviewer(s)	David Rayner, Torsten Linders
Date	8th October 2024
Abstract of deliverable	The purpose of this data brief is to compile existing data on the size, contribution, and distribution of the Swedish Blue Economy within the national economy, addressing internal knowledge gaps and informing future work of the Living Labs in C2B2.

Versions and Contribution History

Version	Date	Modified by	Modification details
v.01	6/9/2024		
v.02	8/10/2024		Internal reviewers' suggestions incorporated
v.03	8/10/2024		Reviewers' comments removed and pdf created
v.04			
v.05			

Executive summary

The purpose of this data brief is to compile existing data on the size, contribution, and distribution of the Swedish Blue Economy within the national economy, addressing internal knowledge gaps and informing future work of the Living Labs in C2B2.

In 2016, the Swedish Statistics Agency (SCB) began developing statistical frameworks for Sweden's marine industries using SNI codes complemented with secondary sources like data from stakeholders and public agencies. That was not without challenges, for example with regards to accurately identifying marine companies from a broad classification of activities within certain branches. SCB's methodology focused on the business sector, excluding public administration and non-profits, and classified the marine industries into five key areas: transport, maritime technology, sea as a natural resource, leisure and tourism, as well as services.

Overall, the role of the blue economy is vital for Sweden, with shipping, marine technology, and natural resources being key contributors. Growth potential is significant, despite regional and sector-specific challenges. From 2014 to 2020, Sweden's marine sectors experienced growth in employment, reaching **44 500** jobs by 2020, with significant hubs in Western Sweden. Annual net turnover averaged **106 BSEK**, contributing notably to Sweden's business sector turnover. Value added by marine businesses averaged **31 BSEK** during this period, making up **0,6%** of Sweden's GDP. Export share for maritime industries was higher than the national average, driven by sectors like Maritime technology and Sea as a natural resource. The shipping sector, responsible for a significant portion of imports and exports, demonstrated growth in value added which was higher compared to the Swedish sector as a whole, despite declining vessel numbers and employment. Sweden's fishing sector saw fluctuating catch values and declining number of vessels and employment from 2014 to 2020, despite increased landed values. Offshore wind power emerged as a growing sector, with substantial expansion expected to drive employment and economic activity across various industries in Sweden.

Regional differences are notable across the Gulf of Bothnia, Baltic Proper, and Kattegat-Skagerrak. The Kattegat-Skagerrak area stands out with its shipping and fishery sectors, contributing **61%** of Sweden’s transport turnover and **46%** of total fish catches. The Baltic Proper seems to be facing a decline in fish catches but remains an important hub for shipping, while the Gulf of Bothnia is less competitive overall, with smaller contributions from fishing and shipping. Wind farms are currently operational only in the Baltic Proper, though similar developments are expected in the Gulf of Bothnia and the Kattegat-Skagerrak area.

This data brief report is structured into three chapters to present the size, contribution, and distribution of the Blue Economy in Sweden. Chapter 1 details the SCB methodology and fundamental economic figures such as employment, turnover, value added, and trade for the Swedish Blue Economy as a whole, with a focus on the sectors of Shipping, Fishing, and Offshore wind. Chapter 2 provides economic figures specific to the Gulf of Bothnia, the Baltic Proper, and the Kattegat-Skagerrak regions, while chapter 3 discusses the findings from the previous chapters.

Table of contents

Executive summary....4
List of figures....6
List of tables....7
Acronym list....7
Introduction....8
1. Economic figures of the Swedish Blue Economy....9
1.1. Introduction....9
1.2. Method....9
1.3. The Swedish blue economy as a whole- current state and historic trends....13
1.3.1. General information and future outlook....13
1.3.2. Employment....13
1.3.3. Net and gross turnover....14
1.3.4. Value added....15
1.3.5. Commodity import and export....16
1.4. Sector-specific figures....16
1.4.1. Shipping....16
1.4.2. Fishing....18
1.4.3. Offshore wind....21
2. Economic figures on resource extraction in the Swedish Marine regions....26
2.1. Introduction....26
2.2. Gulf of Bothnia....26
1.5.1. General information....26
1.5.2. Shipping....27
1.5.3. Fisheries....27
1.5.4. Offshore wind....27
2.3. Baltic Proper....27
1.6.1. General information....27
1.6.2. Shipping....28
1.6.3. Fisheries....29
1.6.4. Offshore wind....29
2.4. Kattegat-Skagerrak....29
2.1.1. General information....29
2.1.2. Shipping....30
2.1.3. Fisheries....30

2.1.4. Offshore wind 31
3. Discussion 32
4. References 34

List of figures

Figure 1: Number of persons employed in Sweden in marine sectors as defined by Eurostat. In this figure Coastal tourism was excluded as it is broadly defined using a specific methodology. Ocean energy and non-living resources are also excluded as they have zero values. Figure adapted from the EU Blue Economy Observatory (2021a). 14
Figure 2: Gross turnover (in M€) of marine sectors in Sweden as defined by Eurostat. In this figure Coastal tourism was excluded as it is broadly defined using a specific methodology. Ocean energy and non-living resources are also excluded as they have zero values. Figure adapted from the EU Blue Economy Observatory (2021a). 15
Figure 3: Gross value added (in M€) in marine sectors as defined by Eurostat. In this figure Coastal tourism was excluded as it is broadly defined using a specific methodology. Ocean energy and non-living resources are also excluded as they have zero values. Figure adapted from the EU Blue Economy Observatory (2021a). 16
Figure 4: Largest sea routes for the export of goods measured in tonnes per annum, average for the years 2018-2020. Both maps are similar but are split for clarity. Figure adapted from Trafikanalys (2022). 17
Figure 5: Largest sea routes for the import of goods measured in tonnes per annum, average for the years 2018-2020. Both maps are similar but are split for clarity. Figure adapted from Trafikanalys (2022). 17
Figure 6: Value (in MSEK) of landed catches in Sweden for the period 2013-2022. Figure adapted from Havs- och Vattenmyndigheten (2023). 18
Figure 7: Number of people employed from 2000 to 2020 in all fishing sectors (excluding inland fisheries) and in the fishing processing sector (marine and inland). Source: (OECD, 2023). 19
Figure 8: Total number of fishing vessels. Figure adopted from Havs- och Vattenmyndigheten (2023). 20
Figure 9: Total number of fishing vessels, all sizes. Source: (OECD, 2023). 20
Figure 10: Values of total imports of fisheries products, total exports of fisheries products and total marine landings according to OECD data. Source: OECD (2023). 21
Figure 11: Annual energy produced by offshore wind energy installations in Sweden from 2004 till 2023. Source: Energimyndigheten (2024). 22
Figure 12: Number of units and installed power of offshore wind energy installations in Sweden from 2003 till 2023. Source: Energimyndigheten (2024). 23
Figure 13: Areas with installed offshore windfarms in Swedish waters (: Bockstigen 1, Kårehamn, Lillgrund), areas with granted permits , with permits application submitted , with ongoing consultation before permits application submission , and with ongoing investigations . Map source: Länsstyrelsen (2024). 23
Figure 14: All ocean and offshore energy (offshore wind + ocean energy) investments in RD&D in Sweden from 2000 till 2022. Source: OECD (2023). 24

List of tables

Table 1: SNI codes used in SCB's methodology for the Transport category. 10
Table 2: SNI codes used in SCB's methodology for the Sea as a natural resource category. 11
Table 3: Established Blue economy sectors- classification according to the EU Blue Economy Observatory. Note the differences in sector- classification compared to the SCB methodology. Table adapted from the EU Blue Economy Observatory (2021b). 12
Table 4: Value (in kSEK) of landings of sea fisheries by coastal district in 2022. Source: Havs- och Vattenmyndigheten (2023). 19
Table 5: Annual average values for the period 2014-2020 of number of companies, number of employees, export (MSEK) and net turnover (MSEK) per marine business segment in the Gulf of Bothnia. Data include only those related to communities with up to 10 000 habitants that lie within 10 Km from the coast. Data source: Koehler et al. (2023). 26
Table 6: Annual average values for the period 2014-2020 of number of companies, number of employees, export (MSEK) and net turnover (MSEK) per marine business segment in the Baltic Proper. Data include only those related to communities with up to 10 000 habitants that lie within 10 Km from the coast. Data source: Koehler et al. (2023). 28
Table 7: Annual average values for the period 2014-2020 of number of companies, number of employees, export (MSEK) and net turnover (MSEK) per marine business segment in small communities with up to 10 000 habitants that lie within 10 Km from the coast in the Kattegat-Skagerrak area. Data source: Koehler et al. (2023). 30

Acronym list

GDP	Gross Domestic Product
NACE	Nomenclature of Economic Activities
OECD	Organisation for Economic Co-operation and Development
SBS	Structural Business Statistics
SCB	Statistiska Centralbyrån (Swedish Statistics Office)
SNI	Swedish Standard Industrial Classification
SwAM	Swedish Agency for Marine and Water Management/Havs- och Vatten Myndigheten

Introduction

The research programme Mistra Co-Creating Better Blue (C2B2) engages marine stakeholders from multiple sectors in collaboration towards a more sustainable, open, and democratic blue economy in Sweden. Utilizing co-creation processes and participatory governance, supported by data and knowledge, the aim is to bring about transformative change in the management of the sea. The cooperation among marine stakeholders occurs in three LivingLabs (North, East, West) associated with Sweden's three marine basins (Gulf of Bothnia, Baltic Proper, Kattegat-Skagerrak). The C2B2 LivingLabs are innovation experiments in real life settings in Sweden, made up of actors across multiple sectors and governance levels in marine environments and interested in marine spatial planning. The LivingLabs create an inclusive and collaborative environment to co-create, together with C2B2 experts in climate science, governance, and data-driven innovation, a common vision for sustainable marine management and spatial planning and to cooperate, experiment and learn how to achieve a more resilient socio-ecological system and a sustainable blue economy.

This data brief is part of C2B2 Task 1.3: Land-sea interactions in the offshore blue economy. Its purpose is to compile existing data published in various reports on the size, contribution and distribution of the Swedish Blue Economy in the overall economy of Sweden. With this report, we intend to fill in identified internal knowledge gaps about the economic data available for Sweden in total and in particular in relation to the different marine regions and the future work of the Living Labs in C2B2. At this point, it is important to note that there is no single interpretation of the blue economy, and national delineations of what constitutes the blue economy vary with no universally accepted framework to comprehensively assess the blue economy or determine the criteria for a fair cross-sector forecast (Barquet et al., 2023). That leads to significant discrepancies in data collection methodologies, along with lack of comparability globally of national-level statistics regarding the blue economy (Statistiska Centralbyrån, 2016). Taking the definition of the European Commission (2018) as a reference, the blue economy is broadly defined as "all economic activities related to oceans, seas and costs", and covers a wide range of interlinked established and emerging sectors, including living resources, coastal tourism, ports, transport, ship building, and oil & gas (established), offshore wind and ocean energy, desalination, environmental protection, and blue biotechnology (emerging). In this report we present data mainly from national sources but compare with selected international sources in parallel, for the three sectors on focus of C2B2: Shipping, Fishing, and Offshore wind.

The work in this report has been divided into three chapters presenting the size, contribution and distribution of the blue economy in Sweden. In chapter 1, we target readers who are interested in the size and contribution of the blue economy in Sweden as a whole and in the role of each specific sector of particular interest to C2B2: Shipping, Fishing, and Offshore wind. In this chapter we start by presenting the SCB methodology for creating statistics for the Swedish Blue Economy. We then continue with presenting fundamental economic figures for the Swedish Blue Economy as a whole, its current status and historical trends. The main economic indicators presented and discussed in this chapter are employment, turnover, value added, along with commodity imports and exports. These are indicators commonly found in the reports and used for comparison over time, borders, and across sectors. In chapter 1 we also discuss sector-specific figures with economic relevance to three main sectors on focus of C2B2 mentioned above. In chapter 2, we target readers particularly interested in the distribution of the Blue Economy in the different marine regions of interest to C2B2. In this chapter we present general economic figures with specific relevance to the three Swedish Marine regions: Gulf of Bothnia, Baltic Proper, and Kattegat-Skagerrak, along with sector-specific figures for these regions. Finally in chapter 3, we summarise and discuss the findings of the previous chapters.

1. Economic figures of the Swedish Blue Economy

1.1. Introduction

The purpose of this chapter is to orientate the reader on the economic figures and data available, along with data gaps and methodological issues in the **Swedish** data sources and how the methodology for obtaining this data has been formed. Along with the Swedish data sources, economic figures from **OECD** and the **EU Blue Economy Observatory** are also presented and discussed in comparison.

1.2. Method

In June 2016, the Swedish Statistics Agency (SCB) received a government mandate (Näringsdepartamentet, 2016) to develop statistics on the maritime industries in Sweden (Statistiska Centralbyrån, 2016). The starting point for the economic statistics of the maritime industries methodology developed by SCB has been the classification into business activity branches using SNI codes (Swedish Standard Industrial Classification). However, these data had to be complemented with other sources as there were known issues from the usage of SNI codes for the purpose of defining values of the Swedish blue economy. For example, a known issue is that classification into branches is quite general for some areas and includes diverse activities, making it difficult to distinguish which companies are marine and how much of the SNI code corresponds to marine activities. Another issue is that companies are classified according only to their primary activities, meaning the branch where the company has the largest share of value added. This means that in the case a company has multiple activities, only one is taken into account in the statistics (Statistiska Centralbyrån, 2016).

Based on the Swedish marine strategy (Näringsdepartamentet, 2015) and the government mandate, as well as how the concept of economic activity is used in other economic statistics, SCB made an additional delineation to only include marine activities performed by the institutional unit type "companies" which are part of the business sector. For the business sector, the definition used in the National Accounts (Nationalräkenskaperna) is applied, i.e., the part of the economy that consists of market producers and producers for own final use. State and municipal commercial activities are also included in the business sector, while public administration and non-profit organisations serving households were not included.

SCB's methodology employed five areas for categorising the industries, in accordance with the division made for the industries in the national Marine Strategy. These areas are:

a. transport,

b. maritime technology and production,

c. the sea as a natural resource,

d. leisure and tourism, and

e. services

Transport encompasses shipping companies, ports, and logistics firms. Transport can also include public transportation or other forms of passenger transport on water. **Maritime technology and production** refers to shipyards and the recreational boating industry, as well as suppliers of technology, systems, and other subcontractors to the maritime industry. **Sea as a natural resource** is very broad and includes both fishing and aquaculture as well as energy, mineral, and bioresources. **Leisure and tourism** consist of ferry services, cruise operations,

archipelago tourism (including accommodation up to 1 Km inland), recreational fishing, the trade of recreational boats, and marinas. **Services** include ship brokerage, insurance companies, commercial hydrographic surveying, and research activities; such companies depend on the other maritime industries to which they provide services (Statistiska Centralbyrån, 2016).

In SCB's methodology for compiling statistics for the Transport sector, it is the SNI branch classification alone that is used to identify companies. Consultation with various stakeholders like the Maritime Forum (Maritimt Forum), Archipelago shipowners (Skärgårdsredarna), the Swedish Shipowners' Association (Svensk Sjöfart), and the member companies of the Swedish Ports (Sveriges Hamnar), concluded that several of the member companies are captured by SNI codes. Examples of what is *not* included in this category are ports operated within public administration and companies whose main activity is not classified as marine. The codes used for the Transport category are shown in Table 1:

Table 1: SNI codes used in SCB's methodology for the Transport category.

SNI code	Description
50101	Regular sea transport over ocean and coastal waters of passengers
50201	Regular sea transport over ocean and coastal waters of goods
50202	Non-regular sea transport over ocean and coastal waters of goods
50301	Regular sea transport on inland waterways of passengers
50401	Regular sea transport on inland waterways of goods
50402	Non-regular sea transport on inland waterways of goods
52220	Support services for maritime transport
52241	Port handling of goods
77340	Rental and leasing of ships and boats

In SCB's methodology, both fishing and aquaculture as well as energy, minerals, and bioresources are counted under the category "Sea as a natural resource" (Statistiska Centralbyrån, 2016). Information about fishing and fish processing is captured in SNI codes but supplemented with data on commercial fishing from the Swedish Agency for Marine and Water Management (Havs- och vattenmyndigheten) and on aquaculture from the Swedish Board of Agriculture (Jordbruksverket). The SNI codes used for the Sea as a natural resource category are shown in Table 2.

Table 2: SNI codes used in SCB's methodology for the Sea as a natural resource category.

SNI code	Description
03111	Trawling in saltwater
03119	Other saltwater fishing
03120	Freshwater fishing
03210	Fish farming in saltwater
03220	Fish farming in freshwater
10200	Processing and preservation treatment of fish and shellfish
47230	Specialized retail sale of fish, shellfish, and molluscs

As these business activity branch codes do not cover the areas of marine energy, wave and other kinds of water energy, and wind energy, information in SCB's report was obtained from the Swedish Energy Agency's approved facilities for production of ocean and wave-based energy (Statistiska Centralbyrån, 2016). For the purpose of complementarity and clarity in this report, the Swedish Energy Agency's statistics database for wind energy (Vindkraftsstatistik) and the public database (Vindbrukskollen) managed by the County Administrative Board are also presented. Although minerals and bioresources are counted under the category "Sea as a natural resource", no relevant SNI code has been included in SCB's methodology.

Lastly, national statistics are compared with Structural Business Statistics (SBS) compiled by Eurostat and complemented by the EU Data Collection Framework, as described by the EU Blue Economy Observatory (2021b). Eurostat follows a different classification of the blue economy sectors than SCB, though NACE codes (the international equivalent of SNI codes) is also used as basis as described by the EU Blue Economy Observatory (2021b). The different subsectors defined are coastal tourism, living resources, non-living resources, ocean energy, ports activities, shipbuilding & repair, and maritime transport. The definition of coastal tourism in particular is broad as this subsector is not considered to be a single economic activity but rather a broad set of activities undertaken by the tourist (e.g. cultural and recreation good, goods in specialised stores and food and beverage services). The various NACE codes used for calculating the marine proportion for the non-exclusively marine sectors are presented in Table 3. For some of the activities presented below, the Eurostat statistics on the production of manufactured goods (PRODCOM) were used to estimate the maritime proportion, by first identifying the specific maritime products within each NACE class and then calculating the production value share over the total production of that class. For some other activities like *Support activities for other mining and quarrying*, a proportion is calculated as described by the EU Blue Economy Observatory (2021b).

Table 3: Established Blue economy sectors- classification according to the EU Blue Economy Observatory. Note the differences in sector- classification compared to the SCB methodology. Table adapted from the EU Blue Economy Observatory (2021b).

Sector	Subsector	Activity (NACE)		Maritime proportion
		Code	Description	
Marine living resources	Primary sector	A 03.10	Capture fisheries (EU fishing fleet, data from DCF)	100%
		A 03.20	Aquaculture sector (onshore and offshore production, data from DCF)	100%
	Processing of fish products	C 10.20	Processing and preserving of fish, crustaceans and molluscs	100%
		C10.41	Manufacture of oils and fats	PRODCOM
		C 10.85	Prepared meals and dishes	PRODCOM
		C 10.89	Other food product	PRODCOM
	Distribution of fish products	G 46.38	Wholesale of other food, including fish, crustaceans and molluscs	50%
		G 47.23	Retail sale of fish, crustaceans and molluscs in specialised stores	100%
Marine non-living resources	Oil and gas	B 06.10	Extraction of crude petroleum	Oil production
		B 06.20	Extraction of natural gas	Oil production
		B 09.10	Support activities for petroleum and natural gas extraction	Oil production
	Other minerals	B 08.12	Operation of gravel and sand pits; mining of clays and Kaolin	Aggregates extraction
		B 08.93	Extraction of salt	Salt production
		B 09.90	Support activities for other mining and quarrying	SBS proportions
Marine renewable energy	Offshore wind energy	D 35.11	Production of electricity	Wind Europe and Eurostat
		D 35.12	Transmission of electricity	Wind Europe and Eurostat
Port activities	Cargo and warehousing	H 52.24	Cargo handling (port services)	50% (or country-specific information)
		H 52.10	Warehousing and storage	50% (or country-specific information)
	Port and water projects	H 52.22	Service activities incidental to water transportation	100%
		F 42.91	Construction of water projects	100%
Shipbuilding and repair	Shipbuilding	C 30.11	Building of ships and floating structures	100%
		C 30.12	Building of pleasure and sporting boats	100%
		C 33.15	Repair and maintenance of ships and boats	100%
	Equipment and machinery	C 13.92	Manufacture of made-up textile articles, except apparel	PRODCOM
		C 13.94	Manufacture of cordage, rope, twine and netting	PRODCOM
		C 26.51	Manufacture of instruments and appliances for measuring, testing and navigation	PRODCOM
		C 28.11	Manufacture of engines and turbines, except motor vehicle, aircraft and cycle propulsion	PRODCOM
		C 25.99	Manufacture of other fabricated metal products n.e.c.	PRODCOM
		C 32.30	Manufacture of sport goods	PRODCOM
Maritime transport	Passenger transport	H 50.10	Sea and coastal passenger water transport (water transport)	100%
		H 50.30	Inland passenger water transport	100%
	Freight transport	H 50.20	Sea and coastal freight water transport	100%
		H 50.40	Inland freight water transport	100%
	Services for transport	N 77.34	Renting and leasing of water transport equipment	100%
		H 52.29	Other transportation support activities	SBS proportions
Coastal tourism	Accommodation	I 55.10	Hotels and similar accommodation	Specific methodology
		I 55.20	Holidays and other short-stay accommodation	
		I 55.30	Camping grounds, recreational vehicle parks and trailer parks	
		I 55.90	Other accommodation	
	Transport	G 47.30	Retail sale of automotive fuel in specialised stores	
		H 49.10	Passenger rail transport, interurban	
		H 49.31	Urban and suburban passenger land transport	
		H 51.10	Passenger air transport	
	Other expenditures	G 47.60	Retail sale of cultural and recreation goods in specialised stores	
		G 47.70	Retail sale of other goods in specialised stores	
		I 56.00	Food and beverage service activities	

1.3. The Swedish blue economy as a whole- current state and historic trends

1.3.1. General information and future outlook

In the years 2019 and 2020, maritime industries corresponded to ca. **2.1%** of Sweden's gross domestic product (GDP) in terms of net turnover, **0,6%** in terms of value added and **0,3%** in terms of exports (Koehler et al., 2023). For the period 2023-2030, the blue economy is expected to **double** in both value added and employment. However, specific forecasts for Sweden on job creation potential, the development of SMEs, the export potential of marine activities, and the marine sector's impact on the provision of critical services such as food, energy, water and materials are lacking (Barquet et al., 2023).

1.3.2. Employment

In its initial statistical compilation efforts in the year 2014, SCB identified **7 157** marine businesses as defined in SCB's methodology, employing approximately **33 000** persons in Transport with **14 400** persons in total, followed by Leisure and tourism, ca. **7 000** persons in total, Maritime technology and production, ca. **6 000** persons in total, and Sea as natural resource, ca. **4 500** persons in total. This is to be compared with the latest follow-up of the marine strategy that showed that the number of employed individuals in the maritime industries amounted to ca. **44 500** persons in 2020 (excluding urban areas with more than 10 000 inhabitants), of which the number of employed within the areas of marine tourism and transport accounted for approximately **15 500** and **11 500** respectively (Havs- och Vattenmyndigheten, 2024b). Western Sweden boasts approximately **3 000** marine enterprises collectively, employing around **20 000** individuals that constitute **45%** of the country's marine workforce (Business Region Gothenburg, 2022).

For the period 2014-2018, a report made by the Swedish Agency for Marine and Water Management (SwAM) showed that employment in the maritime industries grew by ca. **6%**; this was **4%** more than that of the benchmark sectors consisting of similar but non-marine businesses (Havs- och Vattenmyndigheten, 2020). For the segments of transport, leisure and tourism, and marine natural resource businesses, employment development was lower than in the benchmark sectors (by **-10%**, **-1%** and **-5%** respectively), contrary to the development for the employment of the Maritime technology and production, and the Service sectors (higher by **+9%** and **+29%** respectively). It is important to note, though, that Marine tourism is narrowly defined in that same report, and does not include industries such as hotels and restaurants but only recreational boats and cruises.

An increase in employment for the period 2014-2018 is also reported by Eurostat (not considering coastal tourism), which though decreased the years 2020-2021, ending up to ca. **35 000** persons (Figure 1). "Maritime transport" is the largest sector also as defined by Eurostat (not considering coastal tourism), employing ca. **15 000** persons in 2021 (**17 000** persons in 2014), followed by "Shipbuilding & repair" and "Living resources" with **7 000** and **8 000** persons respectively in 2014.

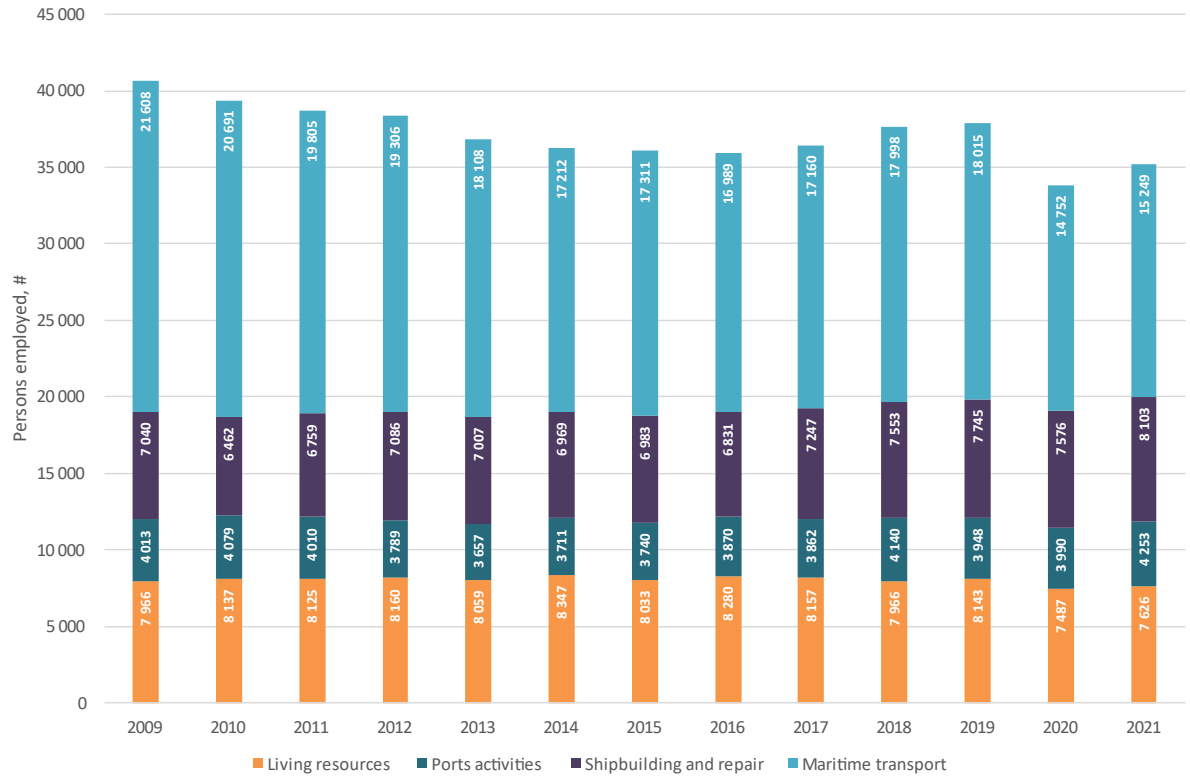

Figure 1: Number of persons employed in Sweden in marine sectors as defined by Eurostat. In this figure Coastal tourism was excluded as it is broadly defined using a specific methodology. Ocean energy and non-living resources are also excluded as they have zero values. Figure adapted from the EU Blue Economy Observatory (2021a).

1.3.3. Net and gross turnover

Net turnover is a key metric used to evaluate a sector's performance and refers to the total revenue generated by the sector from selling goods and services, after deducting any discounts, value-added tax and any other taxes directly related to the turnover. It is the amount that benefits the sector from its primary activities and therefore any income from e.g. other contributions, gifts and membership fees are not counted. According to Koehler et al. (2023), the annual net turnover of the marine industries for the period 2014-2020 averaged on **106 BSEK**, amounting from ca. **95 BSEK** in 2014 and landing to ca. **100 BSEK** in 2020. Over the same period, the largest share of the total net turnover was accounted for by the Transport sector, with an average of ca. **42%** of the share, followed by Sea as natural resource with an average of ca. **24%** of the share (Koehler et al., 2023). In the initial SCB analysis, it is reported that for the year 2014 the maritime industries' net annual turnover accounted for **1,1%** of the total net turnover of the business sector in Sweden. In a later analysis of all the sectors that are dependent on the sea done by SwAM with data from 2014, a **2,2%** of the total net turnover was attributed to these sectors; of that, **1,4%** was attributed to sectors that are partly marine (e.g. tourism and electricity production) and the rest **0,8%** to sectors that are completely marine (e.g. fishing). In the sectors that are partly marine, a number of land-based activities are included in the latter study but not in the first one, that are dependent on the sea as a recipient- e.g. industry, wastewater treatment, and agriculture. A net turnover of **160 BSEK** was reported in the same study for 2014, attributed to all sectors that are depended by the sea.

Looking at the gross turnover of the marine sectors as reported by Eurostat, we see that it amounts to an average of ca. **9 B€** for the periods 2009-2021 excluding the subsector "Coastal tourism" (Figure 2). The "Maritime transport" subsector dominates with **4,4 B€**, followed by "Living resources" with **2,2 B€**.

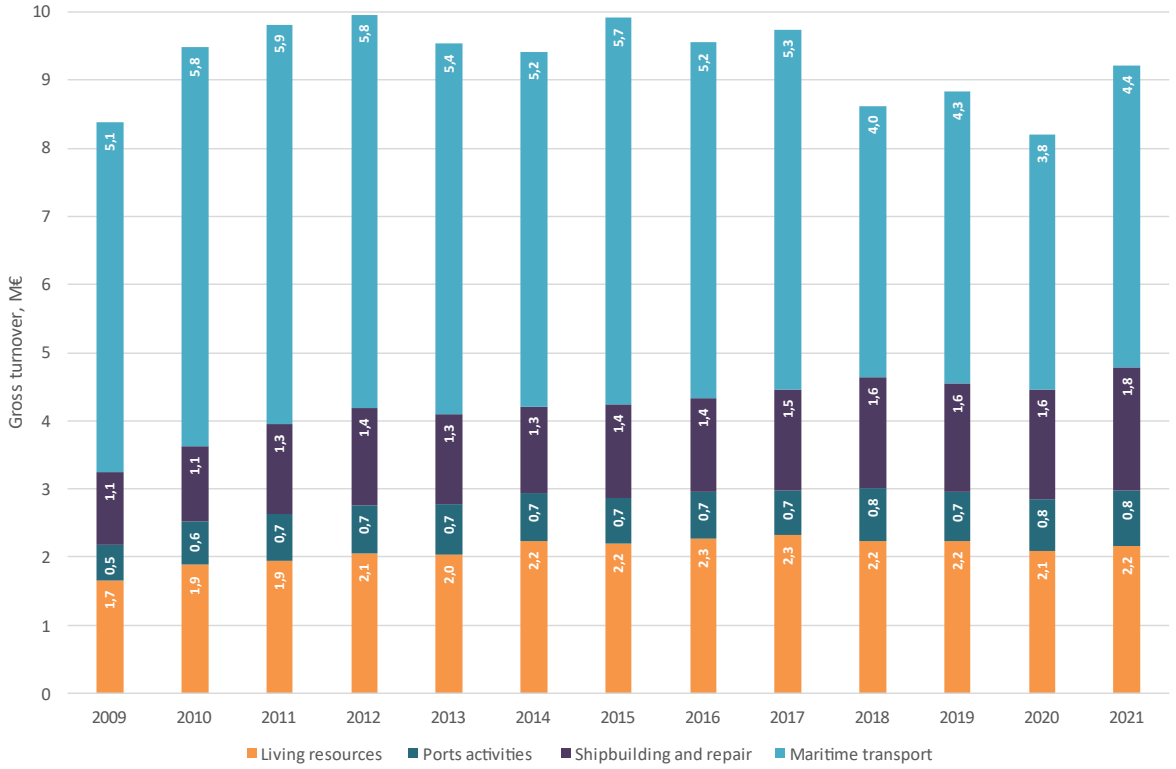

Figure 2: Gross turnover (in M€) of marine sectors in Sweden as defined by Eurostat. In this figure Coastal tourism was excluded as it is broadly defined using a specific methodology. Ocean energy and non-living resources are also excluded as they have zero values. Figure adapted from the EU Blue Economy Observatory (2021a).

1.3.4. Value added

The value added for the marine businesses for the years 2014-2020 was ca. **31 BSEK**, ranging from ca. **25 BSEK** in 2014 to ca. **35 BSEK** in 2018 and ca. **31 BSEK** in 2020. For the years 2019-2020, the value added for the marine businesses corresponded to ca. **0.6%** of Sweden's gross national product (Koehler et al., 2023). Transportation had once more the largest contribution in the total value added, followed by Sea as a natural resource with average shares of ca. **42%** and ca. **26%** respectively for the same time period (Koehler et al., 2023). Compared to relevant benchmarks for the period 2014-2018, the value added in all marine sectors improved more than that of the benchmark sectors (Havs- och Vattenmyndigheten, 2020). For the service industries and industries related to marine resources (energy extraction, fishing and aquaculture), the value added of the maritime parts of the industry grew by **51%** and **55%** more compared to the benchmark sectors. Even within Maritime technology and production industries, the development has been significantly better (**42%** more) than that of the benchmark sectors. Overall, the value added of the marine businesses for the abovementioned period grew by ca. **50%**, meaning **30%** more than that of the comparable businesses (Havs- och Vattenmyndigheten, 2020).

Looking at the gross value added of the marine sectors as reported by Eurostat, we see that it amounts to an average of ca. **2,2 B€** for the periods 2009-2021 excluding the subsector "Coastal tourism" (Figure 3). The "Maritime transport" subsector dominates with **1,2 B€**, followed by "Shipbuilding & repair" with **0,6 B€**.

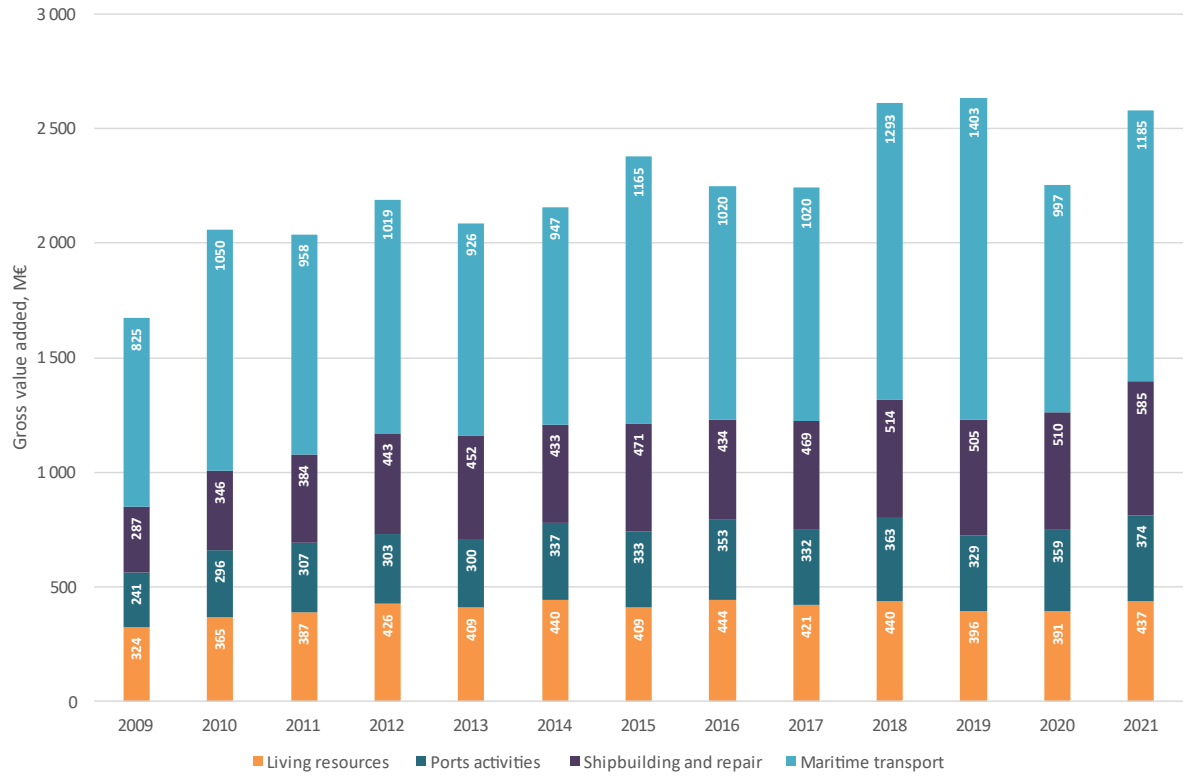

Figure 3: Gross value added (in M€) in marine sectors as defined by Eurostat. In this figure Coastal tourism was excluded as it is broadly defined using a specific methodology. Ocean energy and non-living resources are also excluded as they have zero values. Figure adapted from the EU Blue Economy Observatory (2021a).

1.3.5. Commodity import and export

Looking at the profile of the marine sectors from the report of Havs- och Vattenmyndigheten (2017), we find that the marine sectors had a higher share of exports (**34%**) compared to the Swedish business sector in total (**21%**). Commodity exports amounted from ca. **8 BSEK** in 2014 to **ca. 12 BSEK** in 2020 for the maritime industries, constituting ca. **0.3%** of the Sweden's gross national product in 2019 and 2020 (Koehler et al., 2023). For the period 2014-2018, marine businesses performed better in terms of export of goods compared to benchmark sectors, growing by ca. **130%** which translates into **90%** more than the benchmark sectors (Havs- och Vattenmyndigheten, 2020). However, it is primarily within the Maritime technology industry that Sweden has a significant export; for the period 2014-2020, Marine technology and production constituted on average ca. **61%** of the total marine exports (Koehler et al., 2023). Sea as natural resource came second with ca. **16%**, although it should be noted that some SNI codes included here have their resources from other countries, where, for example, fish, shellfish, and molluscs are processed or sold in Sweden (Koehler et al., 2023). Also, the large portion of Marine technology exports makes figures for sectors other than that difficult to interpret as even small changes in absolute numbers can have large effects on the relative figures (Havs- och Vattenmyndigheten, 2020).

1.4. Sector-specific figures

1.4.1. Shipping

Shipping is responsible for **69%** and **53%** of all imports and exports respectively taking place in Sweden, with the largest exchange of goods happening at the ports of Göteborg, Brofjorden, Helsingborg, Malmö, Trelleborg, Stockholm and Luleå (Figure 4 and Figure 5) (Trafikanalys, 2022).

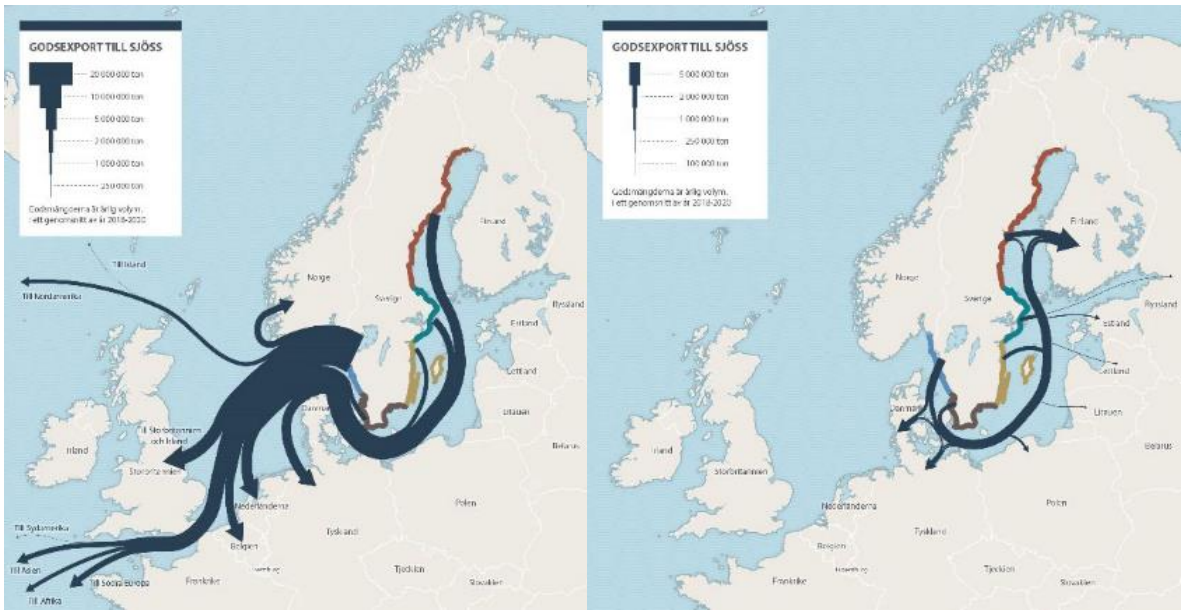

Figure 4: Largest sea routes for the export of goods measured in tonnes per annum, average for the years 2018-2020. Both maps are similar but are split for clarity. Figure adapted from Trafikanalys (2022).

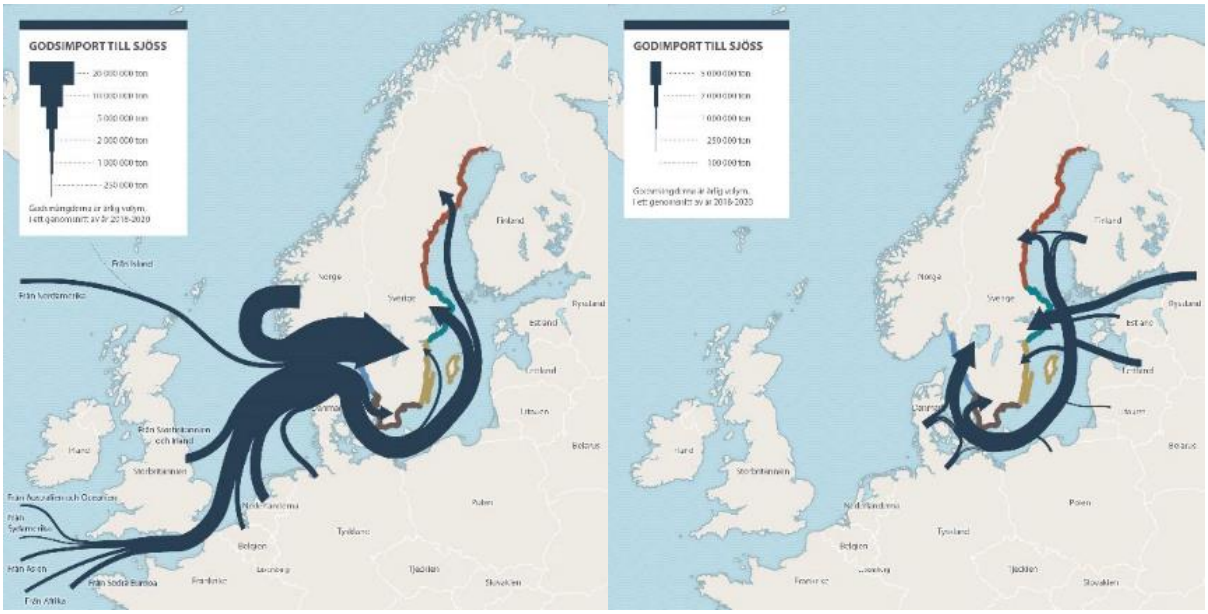

Figure 5: Largest sea routes for the import of goods measured in tonnes per annum, average for the years 2018-2020. Both maps are similar but are split for clarity. Figure adapted from Trafikanalys (2022).

Swedish ships account for ca. **1–2%** of the annual fleet in the entire Baltic Proper (Barquet et al., 2023; Trosvik et al., 2020). In total, the Swedish flagged fleet has been decreasing over time, although the total number of ships controlled by Swedish operators was almost constant for the period 2010-2018. In 2018, the Swedish commercial vessel fleet consisted of about **300** vessels, of which **41%** were cargo ships and **59%** were passenger vessels (Trosvik et al., 2020). Over the period 1990-2018, the number of Swedish cargo ships has been decreasing, while the number of Swedish passenger vessels has been more constant (Trosvik et al., 2020).

In the economic analysis for the period 2010-2015 done by SwAM, it was found that profitability of the Shipping sector had been weak for the period 2010-2015, with an average

annual negative profit level of just under **2 BSEK**. Freight transport and Regular passenger transport had weaker economic competitiveness compared to Non-Regular passenger transport which was the only subsector reaching average economic competitiveness during the period. The sector had also a negative investment level, meaning that companies had collectively sold assets during the period (Havs- och Vattenmyndigheten, 2017).

For the same period, value added within the shipping sector had a higher growth rate compared to that of the Swedish business sector as a whole (**+28%** compared to **+21%**), despite a remarkable decrease in employment (**-25%** compared to **+12%**). The growth in value added can be explained by a strong increase in chartering during 2014-15, while the decrease in employment was due to flagging changes for reasons of competitiveness, as well as rationalisations (Havs- och Vattenmyndigheten, 2017).

From the data of Koehler et al. (2023), extending from 2014 to 2020, we also find that value added linked to the Shipping sector averaged at **13,1±0,5 BSEK**, while net turnover and export averaged at ca. **43,6±1,5 BSEK** and **1,1±0,3 BSEK** respectively for that period.

1.4.2. Fishing

In 2022, the catch value in the first trade stage amounted to approximately **827 MSEK** (**82 MUSD**, Figure 6), representing an increase of ca. **8%** compared to 2021 values (Havs- och Vattenmyndigheten, 2023). The value of foreign landings constituted **43%** of the total catch value, while most value landed in Sweden (ca **73-76%**) took place on the West Coast (Table 4). The value of fodder fish (landed fish not intended for human consumption) in the same year amounted to approximately **236 MSEK** (**23 MUSD**), corresponding to **28%** of the total value.

When studying the catches in terms of total landed weight, we find that these were ca. **121 000 tonnes** in 2022, reduced by **11%** compared to 2021. The weight of catches that landed directly abroad (mainly in Denmark) during 2022 accounted for **68%** of the total Swedish landed weight. Catches that landed abroad consisted of fodder fish by **83%**, with a corresponding share of the catch value at **51%** (Havs- och Vattenmyndigheten, 2023).

Figure 7) (Koehler et al., 2023; OECD, 2023). This is in accordance with a decrease in the total number of vessels in the Swedish fishing fleet which decreased from **1 362** vessels in 2013 to **990** vessels by December 31, 2022 (Figure 8) (Havs- och Vattenmyndigheten, 2023). Data from OECD (2023) agree with this trend, although show slightly different values; from **1 368** vessels in 2013 to **1 136** vessels in 2020 (Figure 9).

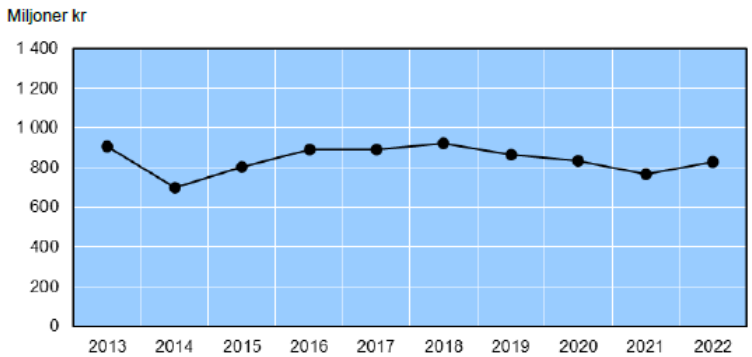

Figure 6: Value (in MSEK) of landed catches in Sweden for the period 2013-2022. Figure adapted from Havs- och Vattenmyndigheten (2023).

Table 4: Value (in kSEK) of landings of sea fisheries by coastal district in 2022. Source: [Havs- och Vattenmyndigheten (2023)](#).

Year	On the West Coast	On the South Coast	On the East Coast	Abroad	Total
2021	307 975	43 553	54 606	360 968	767 102
2022	348 277	41 333	84 462	352 628	826 700

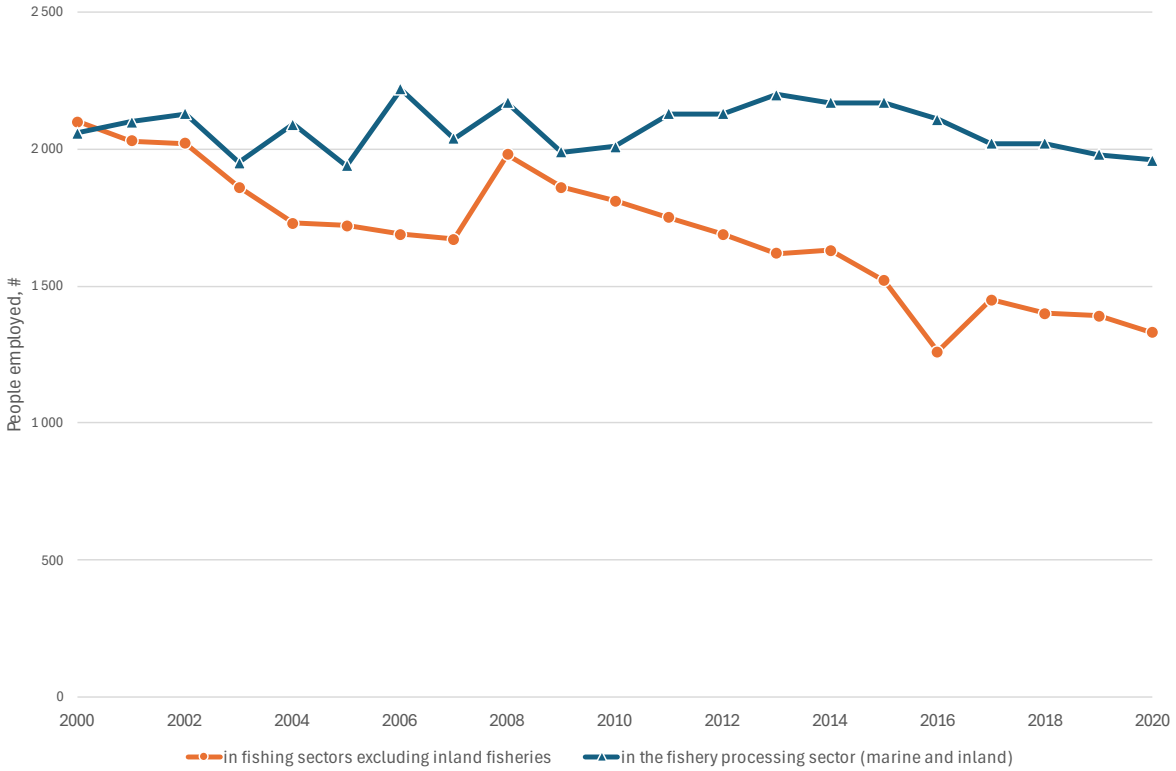

Figure 7: Number of people employed from 2000 to 2020 in all fishing sectors (excluding inland fisheries) and in the fishing processing sector (marine and inland). Source: ([OECD, 2023](#)).

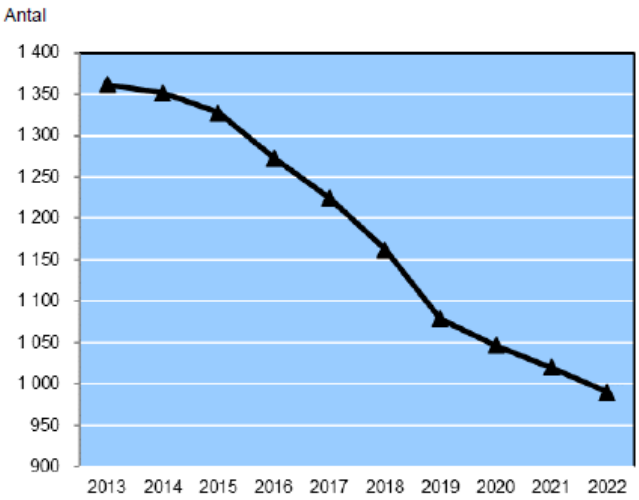

Figure 8: Total number of fishing vessels. Figure adopted from [Havs- och Vattenmyndigheten (2023)](#).

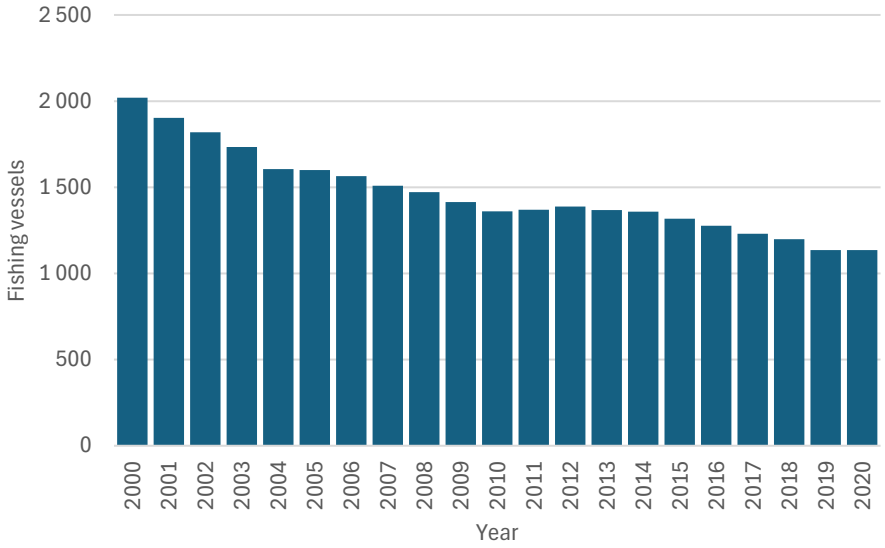

Figure 9: Total number of fishing vessels, all sizes. Source: ([OECD, 2023](#)).

Despite some discrepancies with the national data from SwAM ([Havs- och Vattenmyndigheten, 2023](#)) while considering the USD/SEK exchange rate for the period 2013-2022, data from [OECD (2023)](#) reveal a similar trend for the value of total marine landings. According to the OECD source, the value of total marine landings for the same period amounted to **105-133 MUSD** (Figure 10). Looking at the value of imports and exports of fisheries' products in Sweden, we notice that the value of total imports has consistently been higher than the value of exports for the whole period presented by [OECD (2023)](#).

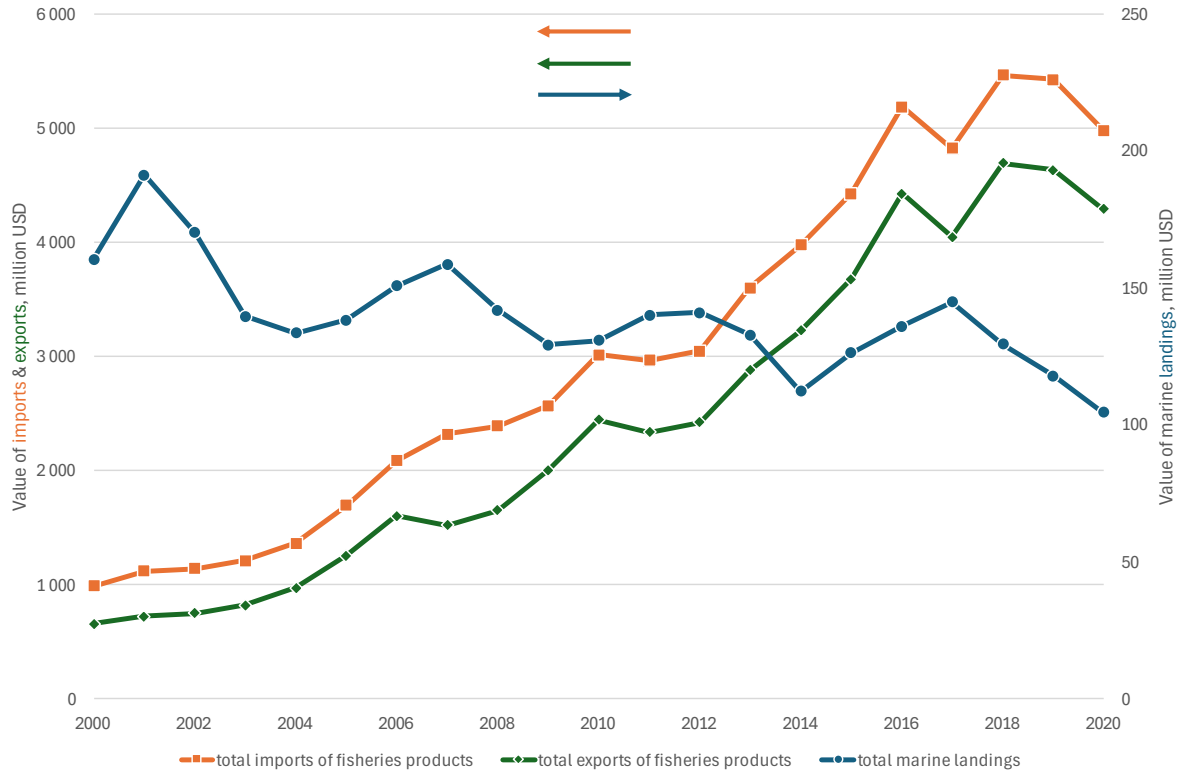

Figure 10: Values of total imports of fisheries products, total exports of fisheries products and total marine landings according to OECD data. Source: OECD (2023).

In the economic analysis done by SwAM for the sectors that are dependent on the sea for the period 2010-2015 (Havs- och Vattenmyndigheten, 2017), the sector of "Marine commercial fishing & aquaculture" was divided into four subsectors: i) marine commercial fishing, ii) fish & shellfish processing, iii) fish wholesale, and iv) fish retail. Dominating among these subsectors were shown to be "fish wholesale" along with "fish & shellfish processing", while all subsectors except "marine commercial fishing" showed good profitability. Within marine commercial fishing, the analysis showed that larger-scale operations seem to create significantly more value per employee than small-scale fishing. For the studied period, the sector showed slightly higher growth in value added than in Sweden as a whole, but also a lower proportion of exports (in the first stage), lower growth in employment, no growth in the number of companies, and a higher proportion of bankruptcies. Activities related to limited liability companies and foreign ownership were shown to have more value added and employment in the sector than their average for Sweden as a whole. The Baltic Proper and the Kattegat-Skagerrak areas dominate in terms of value-added generation in the sector, with **57%** and **38%** respectively on average for the period 2010-2015. The Gulf of Bothnia was thus responsible for only a small portion (**5%** on average) of the value added in the sector.

1.4.3. Offshore wind

Around **28 TWh** of wind power was produced in 2020 in Sweden, compared to the **3.5 TWh** produced in 2010. Of that, ca. **0.6 TWh** was produced the same year by the **81** offshore wind energy installations (**75** in 2023) with an **202 MW** installed power (**193 MW** in 2023) at the sea and large lakes at Lillgrund, Kårehamn, Vindpark Vänern and Bockstigen (Figure 11, Figure 12) (Barquet et al., 2023; Energimyndigheten, 2024). In comparison, installed power for harvesting sea energy in the years 2014-2019 was orders of magnitude lower, ranging from **0.18 MW** in 2014 up to **3.26 MW** in 2017 and 2018 (Havs- och Vattenmyndigheten, 2020). Offshore wind power is in a growth phase and thus it is difficult to provide exact figures on the revenue generated by the electricity produced from a wind farm, as the parks have long-term Power

Purchase Agreements (PPA) that are not public. Based on estimates, the selling price of electricity from the current offshore wind power in Sweden would be between **153-229 MSEK**. A more modern wind farm with a planned production of **5 TWh** annually can be estimated to generate ca. **3-3,7 BSEK** per year (Energimyndigheten & Havs- och Vattenmyndigheten, 2023). In the socioeconomic analysis of offshore wind done in 2017 by the Swedish Energy Agency, a production cost of ca. **100 € per MWh** produced is mentioned in 2016 prices, along with an estimation of **59-86 € per MWh** by 2020 and **49-76 € per MWh** by 2035. In the same analysis, a support cost for expansion of offshore wind power from the mid-2020s was estimated to be ca. **5-6 BSEK per TWh**, ca. **4 times** more than the cost expected from the electricity certificate system per TWh (Energimyndigheten, 2017).

In 2023, there were **8** licensed wind farms at sea and in large lakes that were not into use yet, with several other projects at different stages of the planning process, both for anchored and floating wind structures (Barquet et al., 2023) (Figure 13). Second-generation plans are being prepared, focusing on offshore wind power which is due in 2024 and expected to provide an additional **90 TWh** to the already planned **30 TWh** (Energimyndigheten & Havs- och Vattenmyndigheten, 2023). From the total of **120 TWh**, **30 TWh** are planned in the Gulf of Bothnia, **70 TWh** in the Baltic Proper, and **20 TWh** in the Kattegat-Skagerrak area. However, the Swedish Energy Agency's conclusions is that "*without prioritising the energy interest over other interests or developing solutions for co-existence, it is highly likely that the goal of enabling an additional **90 TWh** of annual electricity production, primarily in the Baltic Proper and the Kattegat-Skagerrak area, will not be achieved*". It is important also to note that at the time of this report, proposals for amended marine spatial plans are being prepared by SwAM to meet the future need for electricity. The plan proposals are to be submitted to the Swedish Government by the end of 2024.

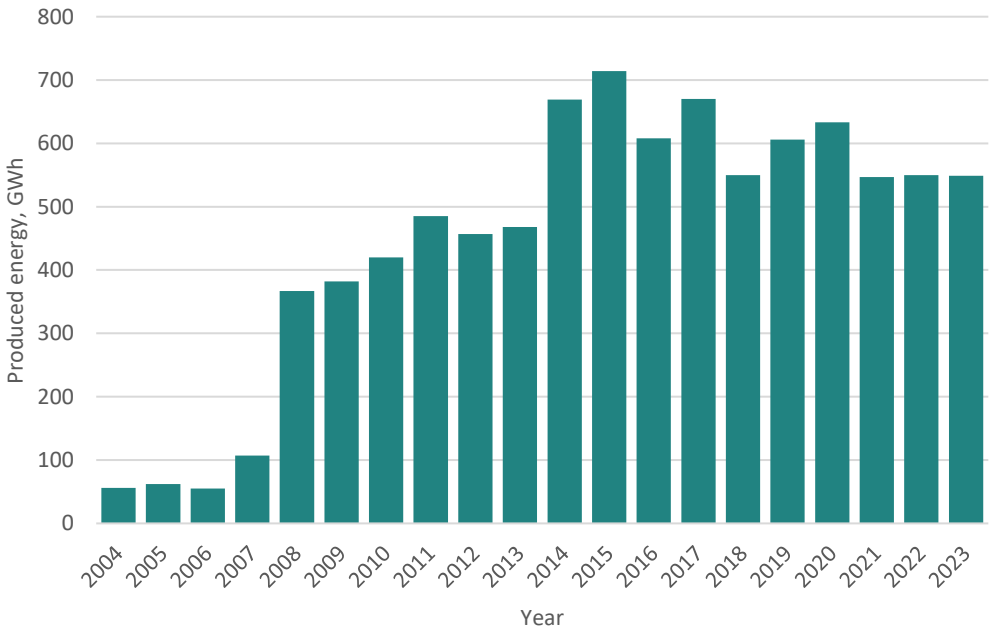

Figure 11: Annual energy produced by offshore wind energy installations in Sweden from 2004 till 2023. Source: Energimyndigheten (2024).

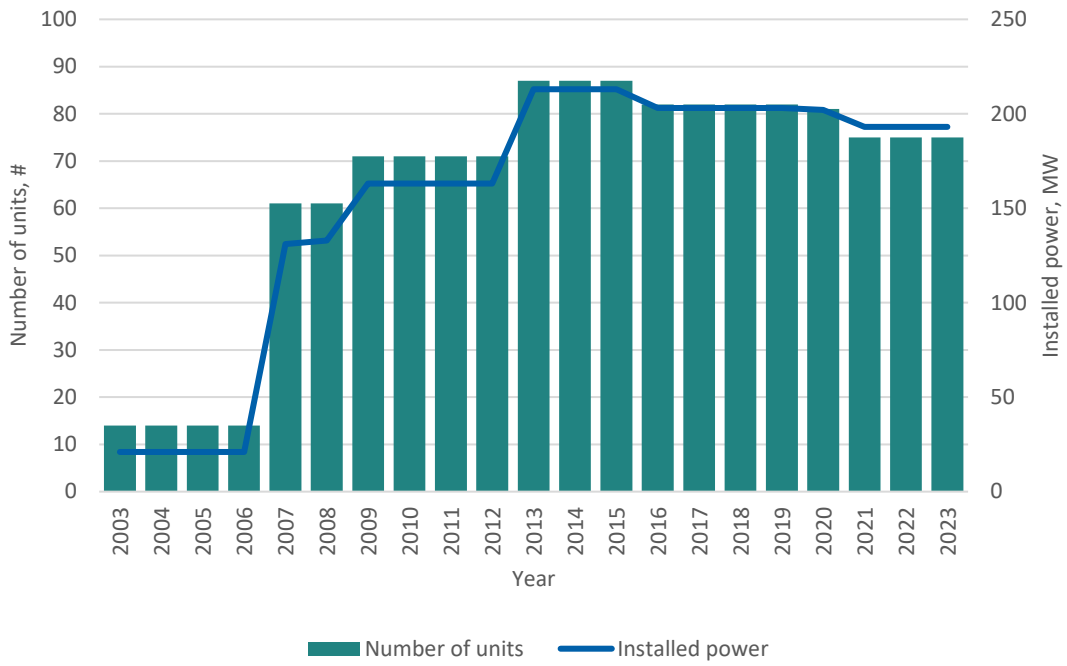

Figure 12: Number of units and installed power of offshore wind energy installations in Sweden from 2003 till 2023. Source: [Energimyndigheten (2024)](#).

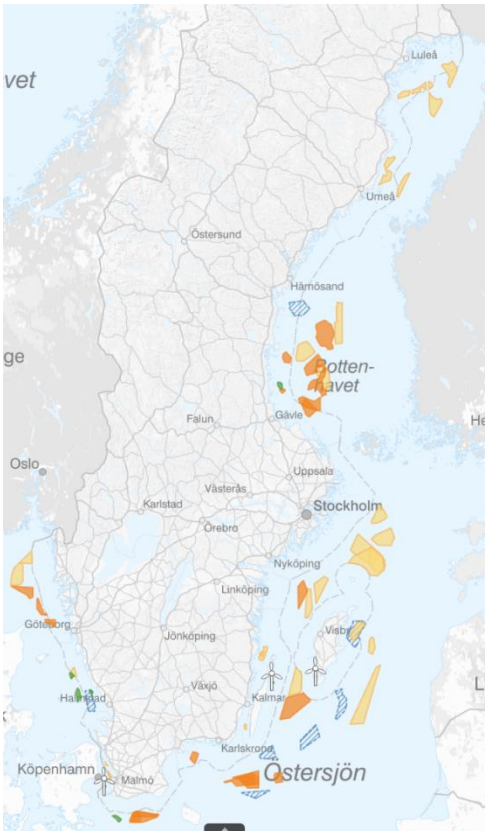

Figure 13: Areas with installed offshore windfarms in Swedish waters (: Bockstigen 1, Kårehamn, Lillgrund), areas with granted permits , with permits application submitted , with ongoing consultation before permits application submission , and with ongoing investigations . Map source: [Länsstyrelsen (2024)](#).

From the data reported by OECD (2023), we see that ocean and offshore RD&D investments varied considerably throughout the years but had an overall increasing trend from the year 2005 and onwards (Figure 14).

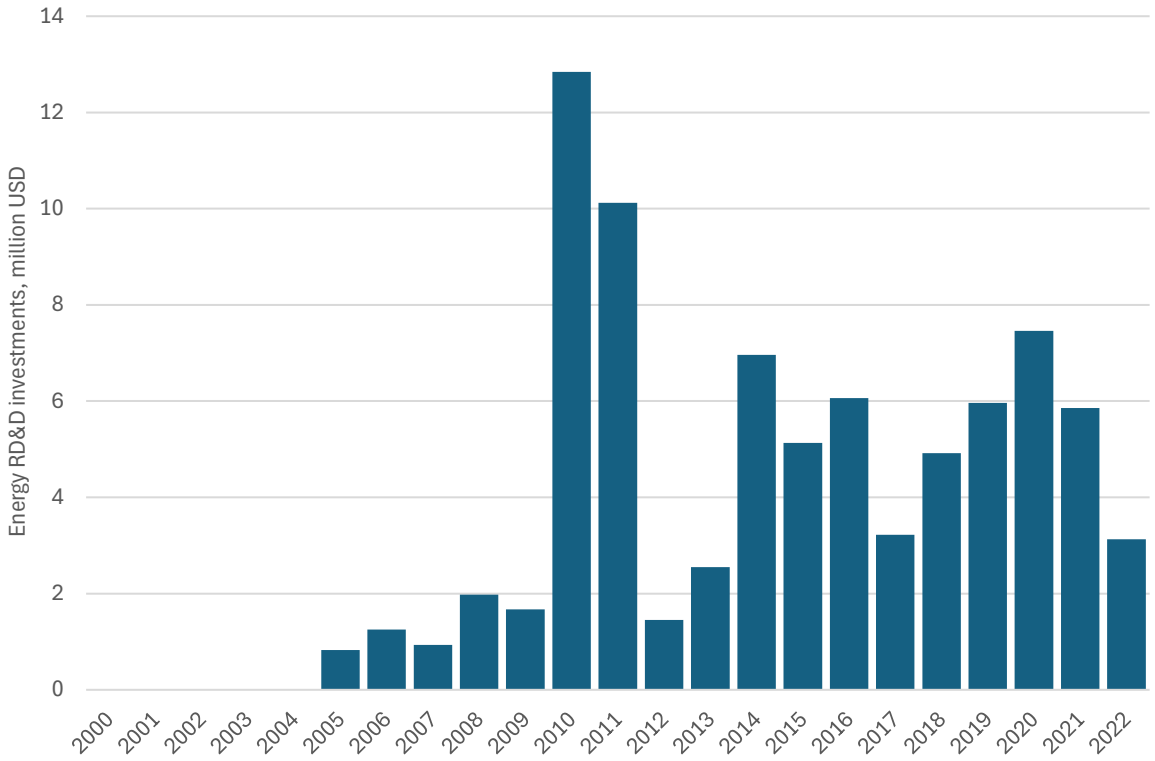

Figure 14: All ocean and offshore energy (offshore wind + ocean energy) investments in RD&D in Sweden from 2000 till 2022. Source: OECD (2023).

According to the Swedish Wind Association, offshore wind power has the potential to supply **45%** of the electricity needs by 2050, and a **10-fold** increase in offshore wind power in Sweden is forecasted by 2030, putting Sweden on a path to address expected increased demand of electricity originated by hydrogen production and transport electrification. According to the same source, an extension to **167 TWh** of offshore wind energy by 2050 is estimated to be the most cost-effective way to meet the increased electricity demand (Svensk vindenergi, 2021), though that would require a ca. **280 times** increase from the 2020 levels. In the same scenario, the Swedish Wind Association also calculates that offshore wind power can create **1 500** to **4 000** annual jobs in Sweden by 2030, and up to **10 000** annual jobs by 2050. For the period 2025–2050, there is an expectation that offshore wind power will be able to generate **165 000** jobs. According to Barquet et al. (2023), OECD statistics reveal that the necessary **1 808 MW** to be installed between 2022 and 2030 would mean ca. **27 120 new jobs** in Sweden, of which **13 560** in direct manufacturing, **9 040** in indirect manufacturing, **2 170** in installations, and **2 350** through other indirect employment effects. Also, a prolonged expansion of offshore wind capacity after 2030 could guarantee long-term employment. In the analysis done by the Swedish Energy Agency, it was concluded that "*the number of jobs created locally, nationally, and internationally by the expansion of offshore wind power is uncertain*", with about **10-30%** of the jobs expected to be created in Sweden (Energimyndigheten, 2017). According to the same source, an expansion of **15 TWh** would correspond to ca. **1 600- 12 000 full-time jobs**, depending on cost development and turbine size. These, as the study concludes, will not be entirely new full-time jobs, but rather a transition of labour from other sectors.

An expansion of offshore wind power also means increased demand for products along the value chain, including foundations, cables, vessels, monitoring services, food and accommodation for staff. The value of these goods and services in Sweden can amount to between **2** and **7 BSEK** annually by 2030, and between **7** and **17 BSEK** annually by 2050, depending on the share of national production against imports (Svensk vindenergi, 2021).

2. Economic figures on resource extraction in the Swedish Marine regions

2.1. Introduction

The purpose of this chapter is to provide economic figures specific to the Gulf of Bothnia, the Baltic Proper, and the Kattegat-Skagerrak regions. Data exclusively from Swedish data sources are presented in this chapter.

2.2. Gulf of Bothnia

1.5.1. General information

A smaller portion of the Maritime industry takes place in the Gulf of Bothnia, although all sectors are competitive except for land-based industries and fishing. Fishing in particular is not as competitive as in the other sea basins due to lower productivity in the area, which also explains the absence of several major players. Compared to the overall business sector, the marine sector of the Gulf of Bothnia exhibits higher proportions of limited liability companies, group-affiliated, and foreign-owned operations in value added and employment, but lower proportions in the overall number of companies present in the region. There has been a decrease in value, employment, and the number of companies observed during the period 2010-2015. There is also a more limited spread of profits compared to the Baltic Proper and the Kattegat-Skagerrak areas (Havs- och Vattenmyndigheten, 2017).

Looking at the data of Koehler et al. (2023) on small communities with less than **10 000 habitants** that lie within **10 Km** from the coast (personal communication), transport was the most important business segment in the Gulf of Bothnia in terms of annual turnover, amounting to **924 MSEK** on average during the period 2014-2023; that was followed by Sea as natural resource and Marine technology and production (Table 5).

Table 5: Annual average values for the period 2014-2020 of number of companies, number of employees, export (MSEK) and net turnover (MSEK) per marine business segment in the Gulf of Bothnia. Data include only those related to communities with up to 10 000 habitants that lie within 10 Km from the coast. Data source: Koehler et al. (2023).

Business segment	# of companies	# of employees	Export	Net turnover
Sea as natural resource	209	177	6	369
Service	8	40	12	159
Marine technology and production	46	137	53	308
Transport	30	428	1	924
Leisure and tourism	35	41	0	141
Total	328	82	72	1 900

1.5.2. Shipping

Statistics from Havs- och Vattenmyndigheten (2017) for the period 2010-2015 report an average annual turnover of **1 311 MSEK** in the transport sector, corresponding to **3%** of the total annual turnover in the whole of Sweden. An annual average of **62 companies** within shipping is referred to in the same study for the Gulf of Bothnia, which corresponds to **7%** of the total number of companies within shipping in Sweden. The Swedish Agency for Marine and Water Management also reports a total of **334 employees** within shipping, corresponding to **3%** of the average total number of employees within shipping in Sweden for the period 2010-2015 (Havs- och Vattenmyndigheten, 2017). When looking at value creation, we find that only ca. **3%** of value creation by the Shipping sector could be attributed to the Gulf of Bothnia for the same period (Havs- och Vattenmyndigheten, 2017).

The average annual turnover for transport in the Gulf of Bothnia related to communities with up to **10 000 habitants** and within **10 Km** from the coast during the period 2014-2020 was **924 MSEK** (Koehler et al., 2023); this amounts to **2%** of the total turnover from transport in Sweden. In the same study **30** companies are listed to the maritime transport employing **428 persons**. This corresponds to about **3%** of total number of transport companies in Sweden during the same period and 5% of the total number of employees within the transport section. The number of employees reported for the small communities in this study is higher than that of the whole region reported by Havs- och Vattenmyndigheten (2017). On one hand that could be attributed to the different time periods and data sources used in these reports, but it could also indicate a significant number of companies located in small communities in this region.

1.5.3. Fisheries

As mentioned previously, the Swedish Agency for Marine and Water Management (2017) does not separate data for the Gulf of Bothnia from those of the Baltic Proper and Öresund region. How much of these catches are caught in the Gulf of Bothnia corresponding to LL North is therefore not defined. Looking at the study of Koehler et al. (2023), the mean annual total turnover from Sea as natural resource (which includes fisheries) in the Gulf of Bothnia is reported to be **369 MSEK** during the period 2014-2020 for communities within **10 Km** from the coast and with up to **10 000 habitants**. This corresponds to about **2%** of the total average annual turnover in Sweden for the period. **209 fishery companies** (**9%** of total number of companies) and **177 employees** were reported in the region in the same study.

1.5.4. Offshore wind

There are currently no existing offshore wind parks nor offshore wind parks with permits in the Gulf of Bothnia. However, **6 applications** of offshore wind in the economic zone have been submitted to the Swedish Government, namely Polargrund Offshore, Eystrasalt Offshore, Sylen, Fyrskeppet Offshore, Olof Skötkonung, and Najaderna (Regeringskansliet, 2024).

2.3. Baltic Proper

1.6.1. General information

In the study of Havs- och Vattenmyndigheten (2017) analysing the period 2010-2015 and comparing with the overall business sector, the marine sector of the Baltic Proper was shown to have higher proportions of limited liability companies, group-affiliated, and foreign-owned operations in value creation and employment, although not in the number of companies. The sectors were not growing in value added in the region and were growing only limitedly in employment and number of companies. The marine sector showed an overall good profitability, but the Ports and Support Services sector were no longer economically competitive, with a wider profit spread than for the Kattegat-Skagerrak area. The export share was higher than for Sweden as a whole but not as strong as in the Kattegat-Skagerrak area. Businesses in the area

also faced high solvency. The area has large gross investment levels, but net investments were at the same level as for the Kattegat-Skagerrak area.

According to the statistics from Koehler et al. (2023) on small communities with up to **10 000 habitants** that lie within **10 Km** from the coast, Transport (**1 036 MSEK**) along with Marine technology and production (**998 MSEK**) were the most important business segments in the Baltic in terms of average turnover during the period 2014-2020, closely followed by Sea as natural resource (**830 MSEK**) (Table 6).

Table 6: Annual average values for the period 2014-2020 of number of companies, number of employees, export (MSEK) and net turnover (MSEK) per marine business segment in the Baltic Proper. Data include only those related to communities with up to 10 000 habitants that lie within 10 Km from the coast. Data source: Koehler et al. (2023).

Business segment	# of companies	# of employees	Export	Net turnover
Sea as natural resource	387	410	46	830
Service	16	60	1	234
Marine technology and production	262	509	3	998
Transport	100	368	1	1 036
Leisure and tourism	165	186	1	524
Total	**931**	**1 533**	**53**	**3 622**

1.6.2. Shipping

According to the statistics from Havs- och Vattenmyndigheten (2017) on annual averages from shipping between years 2010-2015, the annual turnover originating from companies related to transport in the Baltic Proper region amounted to **12 337 MSEK**, corresponding to around **34%** of the total turnover from transport in Sweden annually. In the study, **456** companies related to shipping in the Baltic Proper region employed **5 594** persons as annual average during years 2010-2015, amounting to **51%** of the companies and **48%** employed within the transport sector in Sweden as a whole. When looking at value creation, we find that ca. **45%** of value creation by the Shipping sector could be attributed to the Baltic Proper for the same period (Havs- och Vattenmyndigheten, 2017).

According to the study by Koehler et al. (2023), the average annual turnover between year 2014-2020 originating from transport in the communities of the Baltic Proper region with up to **10 000 habitants** lying within **10 Km** from the coast amounted to **1 036 MSEK**; this corresponds to around **2%** of the total turnover (**43 600 MSEK**) originating from transport in Sweden during the period. In the study **100** companies, employing **368** persons within the transport sector were classified as related to the Baltic Proper region, amounting to **11%** of the companies and **4%** of the employees within the transport sector in Sweden as a whole.

1.6.3. Fisheries

In the Baltic Proper and Öresund area catches amounted to **75 230 tons** in 2023 constituting **52%** of the total catches by Swedish Fishermen (**142 518 tons**) (Havs- och Vattenmyndigheten, 2023). These numbers demonstrated a decrease by **14%** compared to the **87 597 tons** caught in the area in 2022. It is not clear though from the statistics available how much of these catches relate to the Baltic proper and the Gulf of Bothnia. The species with the highest catches are sprat and herring which amounts to a more than **97%** of total catches.

According to the study by Koehler et al., (2023), the average annual turnover between years 2014-2020 originating from Sea as natural resource in the communities with up to **10 000 habitants** lying within **10 Km** from the coast in the Baltic Proper region amounted to **830 MSEK**; that corresponds to around **3%** of the total turnover (**24 500 MSEK**) originating from the sector in Sweden during the period. In the study, **387 companies** employing **410 persons** within the sector were classified as related to the Baltic Proper region, amounting to **16%** of the companies and **8%** of the persons employed within the "Sea as a natural resource" category in Sweden as a whole.

1.6.4. Offshore wind

This marine area has three existing offshore wind farms but no economic figures related to these wind farms have yet been identified:

- Lillgrund wind farm in Öresund is found between Sweden and Denmark, which is the largest offshore wind park in Sweden consisting of **48 turbines**;
- Kårehamn wind farm outside Öland consisting of **16 turbines**;
- Bockstigen wind farm south of Gotland consisting of **5 turbines**

There currently is one permit granted for an offshore wind park in Kriegers flak located south of Skåne. By mid-September 2024 there were **12** existing **applications** submitted to the Swedish Government, for offshore wind farms to be located in the region.

2.4. Kattegat-Skagerrak

2.1.1. General information

A significant portion of Shipbuilding occurs in the North Sea, but Ports and Support Services as well as Fishing are also prominent here. Compared to the overall business sector, the marine sector of the Kattegat-Skagerrak area exhibits higher proportions of limited liability companies, group-affiliated, and foreign-owned operations in terms of value added and employment, but not in the number of companies. The Kattegat-Skagerrak area accounts for **38%** of the total value added, with essentially average profitability from 2010 to 2015. There is growth in value, employment, and the number of companies within the analysed sectors as a whole, along with a significant portion of exports. (Havs- och Vattenmyndigheten, 2017).

According to Koehler et al. (2023), "Sea as natural resource" was the most important business segment in small communities of up to **10 000 habitants** lying within **10 Km** from the coast in the Kattegat-Skagerrak area in terms of turnover, amounting to **3 384 MSEK** on average during the period 2014-2023 (Table 7).

Table 7: Annual average values for the period 2014-2020 of number of companies, number of employees, export (MSEK) and net turnover (MSEK) per marine business segment in small communities with up to 10 000 habitants that lie within 10 Km from the coast in the Kattegat-Skagerrak area. Data source: Koehler et al. (2023).

Business segment	# of companies	# of employees	Export	Net turnover
Sea as natural resource	541	1 048	494	3 384
Service	16	144	258	514
Marine technology and production	270	1 004	68	1 911
Transport	70	427	71	1 376
Leisure and tourism	131	223	29	899
Total	**1 027**	**2 845**	**1 535**	**8 083**

2.1.2. Shipping

According to Havs- och Vattenmyndigheten (2017), the annual turnover originating from companies related to transport in the Kattegat-Skagerrak area amounted to **22 304 MSEK** for the period 2010-2015, corresponding to around **61%** of the total turnover from shipping in Sweden annually. In the study, **378** companies were related to shipping in the Kattegat-Skagerrak area, employing **5 819** persons as annual average during years 2010-2015. This amounted to **42%** of the companies and **50%** of the transport sector employees in Sweden as a whole. When looking at value creation, we find that ca. **52%** of value created by the Shipping sector could be attributed to the Kattegat-Skagerrak area for the same period (Havs- och Vattenmyndigheten, 2017).

In small communities on the West Coast with up to **10 000 habitants** that lie within **10 Km** from the coast, the shipping sector's turnover amounted to **1 376 MSEK** (**3%** of turnover from total transport in Sweden 2014-2020), with **70** companies (**8%** of companies within transport in Sweden during the period) and **427** employees (**5%** of employees within transport in Sweden during the period) linked (Koehler et al., 2023).

2.1.3. Fisheries

Statistics on catches in the different sea areas indicate that the annual catches in Nordsjön, Skagerrak and Kattegat amounted to **61 569 tons** and **4 671 tons** respectively in 2023, which is over **46%** of the total catches by Swedish fishermen (**142 518 tons**) (Havs- och Vattenmyndigheten, 2024a). Also, the catches in the areas in 2023 increased with over **37%** compared to the **43 552** and **4 592 tons** caught in the area in 2022. By May 2024, catches on the West Coast accounted for **2 030 tons** (compared to **1 868 tons** in 2023) for a corresponding value of **125 481 kSEK** (compared to **125 206 kSEK** in 2023). Therefore, landings in the area for the period from May 2023 to May 2024 increased respectively by **8,67%** in quantity and **0,22%** in value (Havs- och Vattenmyndigheten, 2024a).

Koehler et al. (2023) estimated that for communities on the West Coast with up to **10 000 habitants** lying within **10 Km** from the coast, the "Sea as natural resource" category has

generated a turnover **3 384 MSEK** (**14%** of turnover from total Sea as natural resource in Sweden 2014-2020), with **541** companies linked (**23%** of companies classified within "Sea as natural resource" in Sweden during the period). The number of employees in the sector linked to those communities has been calculated at **1 048** (**21%** of employees within "Sea as natural resource" in Sweden during the period). The number of employees per company present in these communities is higher on the West Coast (ca. **2 employees per company**) than in the Baltic Proper and the Gulf of Bothnia (**ca. 1 employee per company**), indicating the presence of large companies in the region.

2.1.4. Offshore wind

There are no existing offshore wind parks in the Kattegat-Skagerrak area, although two permits for offshore wind park on the West coast (Galatea-Galene and Kattegatt syd) have been granted by the Swedish Government. It is worth mentioning that the application in Stora Middelgrund has been rejected.

3. Discussion

The data presented on Sweden's blue economy highlight both the sector's current significance and potential for growth and transformation. The maritime industries, though a small portion of Sweden's overall economy, play a vital role through specific sectors such as shipping, marine technology, and natural resources. The relatively stable net turnover and value added from these industries reflect their consistent contribution to the economy, supported by the growth in value added in all marine sectors which for the time of the existent studies has been better than the benchmark sectors. More in particular, the Maritime technology sector exhibited a strong performance and not only dominated exports but also showed robust value added growth compared to non-marine benchmarks, suggesting a competitive edge for Sweden in this field.

The sector-specific figures for Sweden's blue economy reveal diverse trends across sectors, highlighting the unique challenges and opportunities within each sector. Shipping plays a crucial role in Sweden, with a significant portion of national imports and exports passing through its ports. The sector faced good growth rate, despite declining number of Swedish-flagged vessels and weak profitability of the sector for the time period studied. Despite these issues, the shipping sector's growth in value added suggests that it remains a vital part of Sweden's economy, particularly in the Baltic Proper and Kattegat-Skagerrak regions. The Kattegat-Skagerrak area dominates in both total turnover and number of employees, reflecting the strategic importance of the area's proximity to global trade routes. The disparity between the regions is notable, also given that the Baltic Proper has a higher concentration of companies (51% of total Swedish shipping companies) but (at least for the period 2010-2015) seemed to struggle with profitability and economic competitiveness compared to the Kattegat-Skagerrak area. The Gulf of Bothnia represents a small share of the sector, e.g. in annual turnover and number of companies.

The fishing industry seems to be facing challenges due to the decreasing number of vessels and employment and the higher number of bankruptcies compared to Sweden as a whole. The sector's high reliance on foreign landings on one hand and the country's dependence on imports on the other hand could indicate an imbalance in the industry dynamics. The profitability within the sector varies, with larger-scale operations and specific subsectors like fish wholesale and processing performing better and creating more value per employee than small-scale fishing. Both the fish landings' volume and value are mainly divided between the Baltic Proper and the Kattegat-Skagerrak areas, contributing to the local economy. It should be mentioned here that the classification done by SCB and used in various reports where for example both fisheries and offshore wind are grouped under the "Sea as a natural resource" category, complicates the analysis of any distinct economic impacts and trends of each sector, making it more difficult to assess their individual contributions and challenges.

Offshore wind represents a potentially growing and transformative sector within Sweden's blue economy, where ambitious plans for further expansion position it as a cornerstone of Sweden's future energy strategy. The potential to meet a substantial portion of Sweden's electricity needs by 2050 through offshore wind is a significant economic opportunity, offering potentially substantial job creation and demand for products and services along the value chain. However, the sector has been stagnant during the last decade and its future success will depend on the timely development of planned projects, continued investment in research and development, and the ability to cover a growing demand for products along the value chain. While the Baltic Proper region seems to have more mature infrastructure in place, the Gulf of Bothnia and the Kattegat-Skagerrak area are preparing for similar development.

This report has been part of C2B2's Task 1.3 looking at land-sea interactions in the Swedish blue economy. These interactions refer to the complex relationships and dependencies between terrestrial and marine environments, economies and communities. The data presented in this report are expected to contribute to our future work on land-sea interactions, in particular understanding economic interactions and dependencies, along with impact on communities and the environment.

As an example, the employment trends observed in the marine sectors, such as the decline in fishing jobs, could eventually be correlated with the socio-economic health and economic focus of coastal communities. Analysing these trends could provide insights into the social and economic impacts of shifts such as changes in community structure and demographics. On the other hand, the projected growth in offshore wind power with the associated job creation and effect on electricity prices will likely require substantial onshore support such as port facilities and accommodation, but it could also create conflicts with other land uses such as tourism and fishing. Understanding these interactions can help in planning for infrastructure development and workforce training, and in making informed decisions and effective planning.

4. References

Barquet, K., Sjöberg, M., Vieira Passos, M., Gunnäs, A., Piseddu, T., and Leander, E. (2023). Towards a sustainable blue economy in Sweden. https://doi.org/10.51414/sei2023.014

Business Region Gothenburg. (2022). Branschfakta maritima näringar— Business Region Göteborg. https://www.businessregiongoteborg.se/analys-omvarld/branschfakta/maritima-naringar

Energimyndigheten. (2017). Havsbaserad vindkraft- En analys av samhällsekonomi och marknadspotential. ISSN: 1403-1892, available from https://www.regeringen.se/

Energimyndigheten. (2024). Vindkraftsstatistik. https://pxexternal.energimyndigheten.se/pxweb/sv/Energimyndighetens_statistikdatabas/search/?searchquery=vindkraft

Energimyndigheten and Havs- och Vattenmyndigheten. (2023). Samexistens mellan havsbaserad vindkraft, yrkesfiske, vattenbruk och naturvård. ISBN: 978-91-89329-55-3, available from https://www.havochvatten.se/

EU Blue Economy Observatory. (2021a). Blue Economy Indicators. https://blue-economy-observatory.ec.europa.eu/dashboard-0_en

EU Blue Economy Observatory. (2021b). Methodology for the estimation of the established sector's data. https://blue-economy-observatory.ec.europa.eu/methodology-estimation-established-sectors-data_en

European Commission. (2018). What is the blue economy? https://oceans-and-fisheries.ec.europa.eu/publications/what-blue-economy_en

Havs- och Vattenmyndigheten. (2017). En ekonomisk analys av sektorer som är beroende av havet. ISBN 978-91-87967-73-3, available from https://www.havochvatten.se/

Havs- och Vattenmyndigheten. (2020). Redovisning av uppdrag att vidareutveckla den maritima strategins indikatorer och redovisa en uppföljning av den maritima strategin. Available from https://www.havochvatten.se/

Havs- och Vattenmyndigheten. (2023). Det yrkesmässiga fisket i havet 2022. ISSN 1654-417X, available from https://www.havochvatten.se/

Havs- och Vattenmyndigheten. (2024a). Det yrkesmässiga fisket i havet 2024. ISSN 1654-4056, available from https://www.havochvatten.se/

Havs- och Vattenmyndigheten. (2024b). Förslag till ändrade havsplaner för Bottniska viken, Östersjön och Västerhavet Granskningsversion- Bilaga planeringsförutsättningar. Dnr 2024-001194, available from https://www.havochvatten.se/

Koehler, B., Mustamäki, N., and Bryhn, A. (2023). Ekonomisk analys av nyttjandet av Sveriges hav åren 2014-2020. ISBN 978-91-8046-683-7. https://doi.org/10.54612/a.1bkq1osiop

Länsstyrelsen. (2024). Vindbrukskollen. https://vbk.lansstyrelsen.se/

Näringsdepartamentet. (2015). Förslag till Inriktning För Nationell Maritim Strategi- Vision Och Åtgärdsområden. Artikelnummer N2015.22, available from https://www.regeringen.se/

Näringsdepartamentet. (2016). Uppdrag att utveckla statistiken kring maritima näringar. Dnr N2016/04097/MRT, available from https://www.regeringen.se/

OECD. (2023). Sustainable Ocean Economy. https://stats.oecd.org/index.aspx?datasetcode=OCEAN#

Regeringskansliet. (2024). Havsbaserad vindkraft. https://www.regeringen.se/regeringens-politik/miljo-och-klimat/havsbaserad-vindkraft/

SCB and Havs- och Vatten Myndigheten. (2023). Recreational fishing in 2023. ISSN: 1654-417X (Online), available from https://www.scb.se/

Statistiska Centralbyrån. (2016). Redovisning av regeringsuppdraget att utveckla statistiken kring de maritima näringarna. https://www.scb.se/contentassets/c8fcd2ab2611413eb749434d74563374/redovisning-av-regeringsuppdraget-att-utveckla-statistiken-kring-de-maritima-naringarna-januari-2017.pdf

Svensk vindenergi. (2021). Havsbaserad vindkraft – en nyckel till industrins omställning. https://svenskvindenergi.org/wp-content/uploads/2021/12/Policyrapport-Havsbaserad-vindkraft-en-nyckel-till-industrins-omstallning.pdf

Trafikanalys. (2022). Kartläggning av gränsöverskridande godsflöden. https://www.trafa.se/globalassets/rapporter/2022/rapport-2022_18-kartlaggning-av-gransoverskridande-godstransporter.pdf

Trosvik, L., Vierth, I., and Andersson-Sköld, Y. (2020). Maritime transport and air emissions in Sweden and business-as-usual scenarios for 2030 and 2045. Based on AIS data for 2015. DiVA id: diva2:1420777, available from https://vti.diva-portal.org/