



Action plan for the Danish fishing fleet

According to Article 22 of EU Regulation 1380/20132 , Denmark annually submits a fleet report on the balance between the fishing capacity of the fleet and fishing opportunities.

18th of March 2022 Denmark received a letter from DG Mare on the annual fleet report 2020 in which it was stipulated “*STECF found the information presented in the Danish fleet report 2020 insufficient to judge the extent to which the Danish assessment of balance is sound and comprehensive.*”

In the latest report, (2020), Denmark has explained that due to the poor stock conditions for mainly cod and herring in the Baltic Sea, we were considering possible measures to adjust the fleet capacity in the Baltic. This was also reflected in the interpretation of the indicators (table F.7) for smaller vessels that this segment showing signs of weakness/unbalance. For the smaller vessel segments, critical values in the indicators, do not necessarily have to be interpreted as a sign of imbalance because fishing may not be the main economic activity and their impact on the fish resource is insignificant. However, there is a variation within this group and following the quota reductions for cod and herring for 2022, Denmark has carried out a specific analysis for the Baltic Sea which is elaborated in the action plan further below showing that there is a need for carrying out a scrapping scheme for the Baltic Sea in order to reduce the capacity for this particular fleet. Furthermore it has also been decided to carry out a scrapping scheme in order to mitigate the negative effects from Brexit.

Description of the Baltic Sea

On the basis of the latest quota reductions for cod and herring in the Baltic Sea, The Ministry of Food, Agriculture and Fisheries of Denmark asked the Department of Food and Resource Economics (IFRO), Copenhagen University, to conduct an analysis on the Baltic Sea specifically in order to gather specific data on how the last years quota reductions have affected the economy of the fisheries in the Baltic. Especially seeing as no targeted fishery for cod or herring is allowed anymore.

Historically, the cod (*Gadus morhua*) and herring (*Clupea harengus*) quotas have been among the two most important quotas for the Danish fishery in the Baltic Sea. Cod has been caught in subdivisions 22-24 (western Baltic Sea) and in subdivisions 25-32 (eastern Baltic Sea), while herring has primarily been caught in subdivisions 22-24 (western Baltic Sea). However, these three quotas have been reduced gradually since 2015, but in 2020 major reductions took place, and this continued in 2021 for cod in subdivisions 25-32 and herring in subdivisions 22-24. In 2022, also the cod quota in subdivisions 22-24 was significantly reduced, see Table 2.1. Currently, no targeted fishery is allowed for cod and herring, they are only allowed as a bycatch.

Table 2.1. Danish quotas including quota exchanges 2015-2022 (1,000 tonnes)

Quota species	Subdivisions	2015	2016	2017	2018	2019	2020	2021	2022
Cod	22-24	7,639	6,571	3,211	2,592	4,486	2,275	2,071	218
	25-32	12,756	9,940	8,081	7,348	6,300	459	95	107
Herring	22-24	3,924	6,227	7,041	4,550	2,277	637	197	110

Source: The Danish Fisheries Agency, quota statistics, 9 February 2022.

The developments in landings from the Baltic Sea measured in live weight and value are shown in Table 2.2 and Table 2.3. From 2015 to 2021, landings were reduced by 16,000 tonnes, while the landings value was reduced with 130 million DKK. It is also observed that these reductions are primarily driven by reduced landings of cod and herring in subdivision 22-24 and 25-32, respectively.

Table 2.2. Total Danish landings in live weight from the Baltic Sea 2015-2021 (tonnes)

Quota species	Subdivisions	2015	2016	2017	2018	2019	2020	2021
All species	22-32	51,913	45,211	54,899	50,919	51,935	44,159	35,242
- Cod	22-24	7,188	5,517	2,751	2,614	3,615	1,929	682
	25-32	9,355	6,664	5,871	2,579	1,030	20	16
- Herring	22-24	3,357	5,754	5,855	4,095	2,050	587	152

Source: The Danish Fisheries Agency, Vessel Register and Sales Notes Register, 9 February 2022.

Table 2.3. Total Danish landings value from the Baltic Sea 2015-2021 (1,000 DKK)

Quota species	Subdivisions	2015	2016	2017	2018	2019	2020	2021
All species	22-32	255,493	232,502	220,098	198,787	222,618	173,466	126,076
- Cod	22-24	84,722	67,049	38,768	34,955	53,712	36,713	12,750
	25-32	55,228	43,011	43,999	20,409	8,345	234	136
- Herring	22-24	10,063	19,124	19,790	12,388	7,133	2,601	687

Source: The Danish Fisheries Agency, Vessel Register and Sales Notes Register, 9 February 2022.

Development in fleet structure

Following the reduced quota availability, the number of vessels landing cod and/or herring from the Baltic Sea, subdivision 22-24 and 25-32, has also been reduced from 2015 to 2021, cf. Table 3.1. In 2015, 433 vessels landed either cod and/or herring, while the number was 240 in 2021 (corresponding to a reduction of 45 per cent). In Table 3.1, a distinction is made between commercial vessels and non-commercial vessels. A vessel is considered commercial, if it has a total landing value for all its landings above 270,000 DKK, while a non-commercial vessel has a value below. Table 3.1 shows that 99 commercial vessels were landing cod and/or herring in 2021, while there were 141 non-commercial vessels.

It is not straightforward to analyse what has happened to the 193 vessels that have left the cod and/or herring fishery from 2015 to 2021. Several options are possible ranging from making a change in their fishing behaviour away from these quotas, becoming inactive, leaving the fishery etc.

No inactive vessels are included in the following. Given that these vessels have not any registered landings during a year, it is not possible to allocate an inactive vessel to a specific fishing area.

Table 3.1. Number of registered Danish fishing vessels landing cod and/or herring from the Baltic Sea 2015-2021

Status	Length	2015	2016	2017	2018	2019	2020	2021
Commercial	VL0012m	80	79	78	67	68	52	52
	VL1215m	31	24	14	17	15	16	12
	VL1518m	39	35	34	29	30	28	25
	VL1824m	18	12	7	6	6	9	4
	VL2440m	4	5	4	4	3	1	1
	VL40XXm		2			1	1	5
	Total	172	157	137	123	123	107	99
Non-commercial	VL0012m	257	236	220	194	168	163	136
	VL1215m	3	1	3	4	3	1	3
	VL1518m					1	2	1
	VL1824m							1
	Total	260	237	223	198	172	166	141
Total		433	394	360	321	295	273	240

Note: A commercial vessel has a yearly landings value above 270,000 DKK, while a less active-commercial vessel has a yearly landings value below 270,000 DKK.

Source: The Danish Fisheries Agency, Vessel Register and Sales Notes Register, 9 February 2022.

Table 3.2 shows the development in number of vessels landing cod, and Table 3.3 shows the development for the vessels landing herring. Reductions proportional to the vessels landing cod and/or herring are observed over the period, i.e., between 45 and 50 per cent reductions.

Table 3.2. Number of registered Danish fishing vessels landing cod from the Baltic Sea 2015-2021

Status	Length	2015	2016	2017	2018	2019	2020	2021
Commercial	VL0012m	79	78	78	67	68	51	52
	VL1215m	31	24	14	17	15	16	11
	VL1518m	36	31	30	25	25	26	24
	VL1824m	16	11	6	5	5	8	2
	VL2440m	4	5	4	4	3	1	1
	VL40XXm					1	1	
	Total	166	149	132	118	117	103	90
Non-commercial	VL0012m	249	233	217	189	167	161	131
	VL1215m	3	1	3	3	3	1	3
	VL1518m					1	2	1
	VL1824m							1
	Total	252	234	220	192	171	164	136
Total		418	383	352	310	288	267	226

Note: A commercial vessel has a yearly landings value above 270,000 DKK, while a less active-commercial vessel has a yearly landings value below 270,000 DKK.

Source: The Danish Fisheries Agency, Vessel Register and Sales Notes Register, 9 February 2022.

Table 3.3. Number of registered Danish fishing vessels landing herring from the Baltic Sea 2015-2021

Status	Length	2015	2016	2017	2018	2019	2020	2021
Commercial	VL0012m	17	13	18	6	9	5	6
	VL1215m	3	2		1		1	1
	VL1518m	7	7	6	5	7	5	3
	VL1824m	2	1	2	1	1	2	1
	VL40XXm		2					
	Total	29	25	26	13	17	13	11
Non-commercial	VL0012m	33	30	27	17	20	18	19
	VL1215m				2			
	Total	33	30	27	19	20	18	19
Total		62	55	53	32	37	31	30

Note: A commercial vessel has a yearly landings value above 270,000 DKK, while a less active-commercial vessel has a yearly landings value below 270,000 DKK.

Source: The Danish Fisheries Agency, Vessel Register and Sales Notes Register, 9 February 2022.

In 2015, 7 commercial vessels and 9 non-commercial vessels landed herring only and did not have landings of cod from the Baltic Sea. This number was reduced to 2 commercial and 5 non-commercial vessels in 2021.

Table 3.4 shows the development in total tonnage, disaggregated on length groups, for vessels fishing cod and/or herring in the Baltic Sea during the period 2015-2021. Table 3.5 shows the corresponding development in engine power (kW). The total tonnage for the commercial vessels decreases from 2016 to 2018, but then increases towards 2021, despite the decreasing number of vessels. This is mainly caused by larger vessels entering both the commercial and non-commercial fishery from 2019 onwards. A similar pattern is observed for the total engine power. The total tonnage and engine power for the non-commercial vessels decreases almost steadily from 2015 to 2021, the only exception being 2020 where both are increasing.

Table 3.4. Development in total tonnage of registered Danish fishing vessels landing cod and/or herring from the Baltic Sea 2015-2021 (GT)

Status	Length	2015	2016	2017	2018	2019	2020	2021	
Commercial	VL0012m	774	765	747	666	675	524	532	
	VL1215m	797	586	322	414	386	403	317	
	VL1518m	1,803	1,721	1,751	1,483	1,728	1,405	1,369	
	VL1824m	1,591	1,073	560	395	422	840	382	
	VL2440m	1,330	1,453	899	899	739	329	329	
	VL40XXm		2,208			1,568	1,568	6,779	
	Total		6,294	7,805	4,280	3,857	5,517	5,069	9,709
Non-commercial	VL0012m	1,064	926	820	747	699	777	623	
	VL1215m	67	17	41	75	56	14	59	
	VL1518m					36	74	38	
	VL1824m							77	
	Total		1,131	943	861	822	792	864	797
Total			7,426	8,748	5,140	4,679	6,309	5,933	10,506

Note: A commercial vessel has a yearly landings value above 270,000 DKK, while a less active-commercial vessel has a yearly landings value below 270,000 DKK.

Source: The Danish Fisheries Agency, Vessel Register and Sales Notes Register, 9 February 2022.

Table 3.5. Development in total engine power of registered Danish fishing vessels landing cod and/or herring from the Baltic Sea 2015-2021 (kW)

Status	Length	2015	2016	2017	2018	2019	2020	2021
Commercial	VL0012m	6,991	7,117	7,007	6,183	6,554	5,205	5,151
	VL1215m	5,438	4,126	2,256	2,667	2,479	2,905	2,386
	VL1518m	8,048	7,321	7,176	6,167	6,438	6,290	5,541
	VL1824m	5,481	3,583	2,105	1,625	1,676	3,182	1,535
	VL2440m	2,123	2,726	2,099	2,099	1,614	485	485
	VL40XXm		5,098			2,999	2,999	12,418
	Total	28,081	29,971	20,643	18,741	21,760	21,066	27,516
Non-commercial	VL0012m	10,291	9,087	8,196	7,552	6,586	7,659	6,076
	VL1215m	467	132	327	680	540	118	454
	VL1518m					124	299	175
	VL1824m							204
	Total	10,758	9,219	8,523	8,232	7,250	8,076	6,909
Total		38,839	39,190	29,166	26,973	29,010	29,142	34,425

Note: A commercial vessel has a yearly landings value above 270,000 DKK, while a less active-commercial vessel has a yearly landings value below 270,000 DKK.

Source: The Danish Fisheries Agency, Vessel Register and Sales Notes Register, 9 February 2022.

Table 3.6 and 3.7 show the development in average (per vessel) tonnage and engine power (kW) from 2015 to 2021 for vessels fishing cod and/or herring in the Baltic Sea. It is observed that both indicators slightly increase over the period for most length groups, except vessels 24-40m where both tonnage and kW per vessel decrease slightly over the period.

Table 3.6. Development in average (per vessel) tonnage of registered Danish fishing vessels landing cod and/or herring from the Baltic Sea 2015-2021 (GT)

Status	Length	2015	2016	2017	2018	2019	2020	2021
Commercial	VL0012m	9.7	9.7	9.6	9.9	9.9	10.1	10.2
	VL1215m	24.9	24.4	23.0	24.3	25.7	25.2	26.5
	VL1518m	46.2	49.2	51.5	51.1	57.6	50.2	54.8
	VL1824m	88.4	89.4	80.0	65.9	70.3	93.4	95.6
	VL2440m	332.6	290.6	224.7	224.7	246.3	329.0	329.0
	VL40XXm		1,104.0			1,568.0	1,568.0	1,355.8
Non-commercial	VL0012m	4.1	3.9	3.7	3.9	4,2	4.8	4.6
	VL1215m	22.5	17.0	13.6	18.8	18,8	13.7	19.7
	VL1518m					36,2	36.9	37.5
	VL1824m							77.0

Note: A commercial vessel has a yearly landings value above 270,000 DKK, while a less active-commercial vessel has a yearly landings value below 270,000 DKK.

Source: The Danish Fisheries Agency, Vessel Register and Sales Notes Register, 9 February 2022.

Table 3.7. Development in average (per vessel) engine power of registered Danish fishing vessels landing cod and/or herring from the Baltic Sea 2015-2021 (kW)

Status	Length	2015	2016	2017	2018	2019	2020	2021
Commercial	VL0012m	87	90	90	92	96	100	99
	VL1215m	170	172	161	157	165	182	199
	VL1518m	206	209	211	213	215	225	222
	VL1824m	305	299	301	271	279	354	384
	VL2440m	531	545	525	525	538	485	485
	VL40XXm		2549			2999	2999	2484
Non-commercial	VL0012m	40	39	37	39	39	47	45
	VL1215m	156	132	109	170	180	118	151
	VL1518m					124	150	175
	VL1824m							204

Note: A commercial vessel has a yearly landings value above 270,000 DKK, while a less active-commercial vessel has a yearly landings value below 270,000 DKK.

Source: The Danish Fisheries Agency, Vessel Register and Sales Notes Register, 9 February 2022.

Fishery dependency in the Baltic Sea

In total, Danish fishery had a landings value of 2.8 billion DKK in 2021, whereof 124 million DKK originated from the Baltic Sea. In 2015, the total Danish landings value was 3.4 billion DKK with 255 million from the Baltic Sea. Thus, the importance of the Baltic Sea has declined from 7.5 per cent in 2015 to 4.4 per cent in 2021¹.

Table 4.1 shows the development from 2015 to 2021 in landings value on the different length and commercial groups active in the Baltic Sea. It shows that the commercial vessels landed for 230 million DKK in 2015, equal to a share of 90 per cent of the total Baltic Sea landings. In 2021, the commercial vessels only landed for 106 million DKK, corresponding to a share of 85 per cent. Thus, the non-commercial vessels, despite being of low importance generally in the Baltic Sea, have increased their relative economic importance over the years.

Table 4.1. Distribution of landings value on length groups in the Baltic Sea 2015-2021 (1,000 DKK)

Status	Length	2015	2016	2017	2018	2019	2020	2021
Commercial	VL0012m	49,207	49,775	46,847	47,482	45,901	33,142	32,617
	VL1215m	29,959	19,692	12,185	13,465	21,331	11,782	6,742
	VL1518m	66,195	63,494	64,431	58,503	71,006	47,448	20,053
	VL1824m	28,293	17,945	8,944	4,499	7,875	7,251	5,243
	VL2440m	25,398	15,524	12,764	4,886	4,087	7,889	113
	VL40XXm	31,296	39,000	46,621	47,423	27,470	46,030	40,985
	Total		230,349	205,431	191,791	176,258	177,671	153,541
Non-commercial	VL0012m	24,275	22,980	20,513	19,301	19,371	18,903	17,596
	VL1215m	359	126	119	322	419	197	453
	VL1518m					228	73	52
	VL1824m							159
	Total		24,633	23,107	20,632	19,624	20,019	19,172
Total		254,982	228,538	212,423	195,882	197,690	172,714	124,013

Note: A commercial vessel has a yearly landings value above 270,000 DKK, while a less active-commercial vessel has a yearly landings value below 270,000 DKK.

Source: The Danish Fisheries Agency, Vessel Register and Sales Notes Register, 9 February 2022.

Looking at the dependency of fishing in the Baltic Sea, Table 4.2 shows for the vessels landing either cod and/or herring in the Baltic Sea, how important the Baltic Sea are for them in general. The table shows the overall dependency of fishing in the Baltic Sea, and not only the dependency on cod and herring. The reason

¹ Source: The Danish Fisheries Agency, Vessel Register and Sales Notes Register, 9 February 2022.

is that the fishery, especially for cod, can give rise to bycatches of a range of other species, thus a reduction in these quotas can imply a reduction in the landings of these other species as well. It is observed that for the commercial vessels, 77 vessels had a dependency above 90 per cent in 2015, while this only applied to 36 vessels in 2021. For the non-commercial vessels, the majority of these have a dependency above 90 per cent, which is as expected, because these fishers do not fish for a living but most likely have another employment. Thus, they are not able to make longer trips to other fishing areas.

Table 4.2. Vessel economic dependency on fishery in the Baltic Sea 2015-2021 (number of vessels)

	Interval	2015	2016	2017	2018	2019	2020	2021
Commercial	90-100%	77	71	69	65	58	37	36
	80-89%	4	1	2	2	3	4	1
	70-79%	9	5	8	3	1	4	3
	60-69%	16	11	8	3	4	3	2
	50-59%	11	15	6	7	7	4	2
	40-49%	11	6	9	7	11	5	2
	30-39%	9	8	7	6	13	9	8
	20-29%	13	11	7	10	9	17	10
	10-19%	12	17	14	9	9	15	16
	0-9%	10	14	8	12	9	9	19
	Total	172	159	138	124	124	107	99
Non-Commercial	90-100%	243	224	209	188	164	159	136
	80-89%	2	2	2	2	1	1	0
	70-79%	3	1	3	1	2	0	1
	60-69%	4	1	0	0	2	1	0
	50-59%	0	1	2	2	1	2	0
	40-49%	2	1	2	1	1	0	1
	30-39%	3	2	3	3	1	0	1
	20-29%	0	0	1	0	0	3	1
	10-19%	1	1	0	0	0	0	0
	0-9%	3	4	1	1	0	0	1
	Total	261	237	223	198	172	166	141

Note: A commercial vessel has a yearly landings value above 270,000 DKK, while a less active-commercial vessel has a yearly landings value below 270,000 DKK.

Source: The Danish Fisheries Agency, Vessel Register and Sales Notes Register, 9 February 2022.

Table 4.3 gives an impression of how the vessels with the highest dependency, i.e., above 90 per cent, are allocated on length groups in 2015 and 2021, showing that primarily the vessels below 12m have a high dependency of the Baltic Sea in both years. For the commercial vessels, there were 53 vessels below 12m with a high dependency in 2015, but this number was reduced to 30 vessels in 2021.

Table 4.3. Length group distribution of vessels with a dependency of the Baltic Sea above 90 per cent (number of vessels)

	Year	<12m	12-15m	15-18m	18-24m	24-40m
Commercial	2015	53	13	8	2	1
	2021	30	4	2		
Non-commercial	2015	239	3			
	2021	133	2		1	

Most of the vessels above 18 meters have generally a low dependency of fishing in the Baltic Sea. These vessels conduct a seasonalised fishery for primarily herring and sprat in the Baltic Sea, but otherwise fish in other waters such as Skagerrak and the North Sea.

Economic performance 2015-2021

Describing the economic performance of the vessels fishing cod and/or herring in the Baltic Sea entails adjustment of the available economic statistics data. As many of these vessels do not solely operate in the Baltic Sea, the available statistics does not allow for an isolation of the economic performance of these vessels. Furthermore, the current economic statistics is only available until 2019, i.e., just before the quota reductions were implemented.

Thus, to describe the economic performance of vessels catching cod and/or herring in the Baltic Sea, it is necessary to supplement with estimates of the economic statistics for these specific vessels. Also, assumptions about the development in costs statistics in 2020 and 2021 are needed.

An estimate of the cost structure of the vessels operating in the Baltic Sea is obtained by adjusting each cost component with the proportion between the average landing value for the entire fleet observed in the fisheries account statistics from Statistics Denmark², and the average landing value for vessels operating in the Baltic Sea observed in the sales notes register from the Danish Fisheries Agency. In the latter, it is, as described previously, possible to identify and obtain the precise and latest landing values for the vessels operating in the Baltic Sea.

Furthermore, to obtain costs for 2020 and 2021, costs for the previous three years (i.e., 2017-2019 for 2020, and 2018-2020 for 2021) adjusted with the development in fuel prices and inflation. The three years average are used to level out random fluctuations.

Based on the known values of landings and the estimated cost figures, the economic performance for the involved commercial vessels can be calculated for the commercial vessels, for which Statistics Denmark collects account statistics. The financial effect for the less active commercial vessels could in principle also

² <https://www.dst.dk/en/Statistik/emner/erhvervsliv/fiskeri-og-akvakultur/fiskeri>

be calculated, but due to their low activity, such calculations will have to be based on strong assumptions about their cost structure. Therefore, the financial analysis here and the estimation of financial consequences below are limited to cover only the commercial vessels.

The economic indicators used to describe the economic performance are:

- 1) Value of landings,
- 2) Gross profit defined as landings value minus operating costs (excluding crew) and fixed costs,
- 3) Net profit defined as gross profit minus crew payments.

The gross profit gives a measure for the amount left to pay for labour and capital. To derive the net profit, crew payments are deducted, and net profit thus shows the amount left for payment of the capital and payments to the owner.

With respect to the operating costs, fuel costs and costs for provisions and ice/chilled sea water, these are assumed to be dependent on the fishing activity, and are scaled with changes in the landing values, when estimating the economic results in 2022, using the 2022 quotas. Sales costs and crew payments are also assumed to change with the value of landings and are predicted by multiplying the landing value with the average sales and crew payments percentages found in the account statistics, respectively.

The remaining costs are assumed to be fixed and are thus not related to the fishing activity level. These costs include insurance costs, maintenance costs and various other costs.

It must be noted that crew payments for especially the smaller vessels below 12 meters are low, because these are often only operated by the owner. Thus, the gross profit and net profit for these fleets will not be very different compared to the figures for the vessels in the other length groups.

For discretionary reasons only fleets with at least 4 vessels are presented in the economic tables, and only aggregate values on length groups are presented. The following calculations are based on data from the Vessels Register and Sales Notes Register hosted by the Danish Fisheries Agency and the Cost and Earnings Database hosted by Statistics Denmark.

Table 5.1 shows the development in average landings value per vessel on the different length groups for the commercial vessels fishing cod and/or herring in the Baltic Sea from 2015 to 2021. Table 5.2 and 5.3 show the corresponding average gross profit and net profit per vessel over the period.

From Table 5.1 it is observed that the landings value per vessel decreases for most length groups over the period, except for the 15-18m group where the landings value increases from 2015 to 2021. However, there are fluctuations over the periods, especially with all length groups experiencing an increase in landings value per vessel in 2019 that had a higher cod quota in area 22-24, compared with 2017-2018 and 2020-2021. From 2019 and onwards, the landings value per vessel decreases for all length groups, except the 18-24m vessels that see a slight increase in 2021. However, this length group is also reduced from 6 to 4 vessels between 2019 and 2021, and the slight increase may thus reflect higher capacity utilisation. Approximately similar patterns are observed for the distribution of gross and net profit per vessel (Table 5.2 and 5.3) over the period.

Table 5.1. Distribution of average landings value per vessel on length groups in the Baltic Sea 2015-2021 (1,000 DKK)

Length	2015	2016	2017	2018	2019	2020	2021
VL0012m	739	776	753	813	847	828	770
VL1215m	1,569	1,431	1,007	1,493	1,991	1,477	1,273
VL1518m	2,639	3,607	3,987	4,138	5,269	3,317	3,213
VL1824m	5,347	6,883	6,786	5,053	5,183	3,714	5,631
Total	1,827	2,030	1,924	1,934	2,325	1,838	1,701

Source: Own calculations based on data from the Danish Fisheries Agency, Vessel Register and Sales Notes Register, 9 February 2022.

Table 5.2. Distribution of average gross profit per vessel on length groups in the Baltic Sea 2015-2021 (1,000 DKK)

Length	2015	2016	2017	2018	2019	2020	2021
VL0012m	348	336	340	369	344	333	306
VL1215m	736	722	475	655	869	543	360
VL1518m	1,464	2,161	2,314	2,306	2,936	1,736	1,339
VL1824m	2,873	4,067	3,570	2,827	2,790	1,637	2,403
Total	949	1,122	1,029	1,006	1,187	851	681

Source: Own calculations based on data from the Danish Fisheries Agency, Vessel Register and Sales Notes Register, 9 February 2022, and cost information from Statistics Denmark.

Table 5.3. Distribution of average net profit per vessel on length groups in the Baltic Sea 2015-2021 (1,000 DKK)

Length	2015	2016	2017	2018	2019	2020	2021
VL0012m	264	241	249	270	299	253	238
VL1215m	456	505	305	346	530	276	129
VL1518m	859	1,257	1,253	1,247	1,467	831	475
VL1824m	1,498	2,227	1,628	1,290	1,269	545	811
Average	570	679	584	570	671	435	312

Source: Own calculations based on data from the Danish Fisheries Agency, Vessel Register and Sales Notes Register, 9 February 2022, and cost information from Statistics Denmark.

Financial consequences with the cod and herring quotas in 2022

Assessing the financial consequences for the fishers following the reductions in the cod and herring quotas in the Baltic Sea for 2022 will be done as a static-comparative analysis. This will be combined with an analysis of the projected loss over a 16-year period starting from 2022, corresponding to the notice period for withdrawing the individual transferable rights to quotas regulated under the Danish system of individual Vessel Quota Shares, in which both cod and herring in the Baltic Sea are included. The calculations will answer the questions, (i) what would the economic results have been in 2021 if the cod and herring quotas had been at the 2022 levels displayed in Table 2.1, and (ii) what would the long-term earnings be over a 16-year period starting in 2022 if the 2022 quota situation and earnings/costs persist for the next 16 years?

The financial consequences will be addressed with two scenarios indicating expected minimum and maximum repercussions on the profitability of the vessels. These two scenarios indicate the expected upper and lower bounds of possible financial consequences of the quota reductions in 2022. However, it must be emphasized that in some situations, it might be possible for the fishers to change their behaviour, including fishing pattern, thus reducing some of the expected negative effects. Moreover, it is possible that some types of changed behaviour potentially can result in reduced fishing options for other fishers, who are not fishing in the Baltic Sea and not included in the present calculations. However, because the majority of the Danish fishing quotas are managed with individual transferable rights, this possibility is considered limited. Thus, only financial consequences for vessels fishing cod and/or herring in the Baltic Sea are considered.

In both scenarios, it is assumed that the quotas for cod and herring are assumed to be utilised 100 per cent in 2022.

In the minimum repercussion scenario, it is assumed that the changed cod and herring quota in subdivisions 22-24 and subdivisions 25-32 will only result in changed landings of cod and herring respectively, and not in any change of landings for other species caught in these areas. Because it is assumed that the landings of other species are not reduced, it is in this scenario indirectly assumed that fishers can without any costs change their fishing pattern/behaviour and still catch and land these other species as previously, thus avoiding catching cod/herring. Such a change might be due to gear changes, fishing in other seasons instead of for instance in the season where cod is peaking, i.e., winter and spring. However, it must be noticed that even outside the cod season by-catches of cod cannot be completely avoided, thus making this scenario the lower bound of possible economic losses given the quota reductions.

In the maximum repercussion scenario, it is assumed that not only the landings of cod and herring are reduced, but also that the landings of other consumption species are reduced in area 22-24 proportionally to the reduced activity in the cod fishery, except for species caught with no or little expected bycatch of cod, i.e., sprat, sand eel, salmon, and eel. Thus, the applied reduction of all other species is calculated as the proportion between the estimated cod landing value in subdivision 22-24, following from the proposed quotas in 2022, and the landing value of cod in subdivision 22-24 in 2021.

To calculate the financial repercussions for the vessels involved, this is, as discussed above, only done for the commercial vessels for which Statistics Denmark collects account statistics. Thus, the analysis of the financial consequences is limited to cover only the commercial vessels.

Description of the financial repercussions at the vessel level will be based on the three indicators and the method outlined above.

Table 6.1 shows the effect on landings value, gross profit, and net profit per vessel, divided on length groups, given the expected outcome in 2022. All indicators show that the financial performance for all fleet groups will decrease or directly deteriorate, even if only the minimum repercussion scenario is considered.

Especially vessels <12m, that have a high dependency on landings from the Baltic Sea (cf. Table 4.3) are expected to be affected by the reductions in quotas, with an average reduction in the maximum repercussion scenario of 47 per cent in landings value, 89 per cent in gross profit, and 101 per cent in net profit from 2021 to 2022.

Table 6.1. Average landings value, gross profit, and net profit per vessel in the baseline and the minimum and maximum repercussion scenarios for 2022 (1,000 DKK)

	Length	Baseline 2021	Only lower landings of reduced quotas 2022	Lower landings of reduced quotas and other species 2022
Landings- value	VL0012m	770	674	405
	VL1215m	1,273	1,214	999
	VL1518m	3,213	3,057	2,772
	VL1824m	5,631	5,460	5,347
	Total	1,701	1,590	1,331
Gross profit	VL0012m	306	235	35
	VL1215m	360	320	169
	VL1518m	1,339	1,223	1,006
	VL1824m	2,403	2,280	2,199
	Total	681	599	406
Net profit	VL0012m	238	174	-3
	VL1215m	129	99	-14
	VL1518m	475	404	269
	VL1824m	811	738	690
	Total	312	251	98

Source: Own calculations based on data from the Danish Fisheries Agency, Vessel Register and Sales Notes Register, 9 February 2022, and cost information from Statistics Denmark.

Table 6.2 presents the expected total landings value, gross profit and net profit (all measured in present value) per vessel over a period of 16 years starting with 2022 in the case where (i) it is assumed that the baseline economic situation from 2021 persists over the entire period, (ii) it is assumed that the economic situation corresponding to the minimum repercussion scenario for 2022 persist over the entire period, and (iii) it is assumed that the economic situation corresponding to the maximum repercussion scenario for 2022 persists over the entire period. In evaluation of these results, a discount rate of 3.5 per cent is used, following the current recommendation from the Danish Ministry of Finance (Finansministeriet, 2021). Furthermore, the cod and herring quotas are assumed to be fully utilised in all the years.

Table 6.2. Projected landings value, gross profit, and net profit per vessel in the baseline and the minimum and maximum repercussion scenarios for the period 2022-2037 (1,000 DKK)

	Length	Baseline	Only lower landings of reduced quotas	Lower landings of reduced quotas and other species
Landings- value	VL0012m	9,638	8,438	5,072
	VL1215m	15,940	15,195	12,507
	VL1518m	40,214	38,272	34,698
	VL1824m	70,484	68,345	66,930
	Total	21,288	19,906	16,656
Gross profit	VL0012m	3,828	2,938	432
	VL1215m	4,512	4,010	2,117
	VL1518m	16,755	15,310	12,587
	VL1824m	30,078	28,538	27,528
	Total	8,520	7,504	5,082
Net profit	VL0012m	2,975	2,184	-42
	VL1215m	1,612	1,236	-169
	VL1518m	5,945	5,055	3,368
	VL1824m	10,153	9,243	8,642
	Total	3,906	3,137	1,232

Source: Own calculations based on data from the Danish Fisheries Agency, Vessel Register and Sales Notes Register, 9 February 2022, and cost information from Statistics Denmark.

Overcapacity in the Baltic Sea commercial fishing fleet

Given the financial predictions for 2022 presented in Table 6.1, the expected overcapacity in 2022 with respect to number of vessels, tonnage (GT) and engine power (kW) is estimated. The overcapacity is determined relative to (i) the actual capacity in 2021, and (ii) the average capacity during the period 2017-2019, where the cod and herring quotas were at a higher level compared to 2020-2022. The latter is included in the comparison, as it must be expected that overcapacity already existed in 2021, given the considerable decrease in quotas from 2019.

Three capacity indicators are considered, i.e., (i) landings value per capacity unit, (ii) gross profit per capacity unit, and (iii) net profit per capacity unit. Besides per vessel, two capacity units are used, i.e., tonnage (GT) and engine power (kW).

Table 7.1 shows the capacity indicators for 2021 and averaged over the period 2017-2019 for vessels fishing cod and/or herring in the Baltic Sea. It is observed that all capacity indicators in 2021 are reduced compared to the average indicators for 2017-2019, illustrating the decreasing quotas and thus increasing overcapacity. Especially the vessels above 12m have decreasing capacity indicators, with up to a 73 per cent decrease in the net profit capacity indicators between 2017-2019 and 2021 for the 12-15m fleet. The overall decrease in the net profit capacity indicators for all considered length groups is between 49 and 54 per cent.

Table 7.1. Capacity indicators for 2021 and averaged over the period 2017-2019 (1,000 DKK / capacity unit)

	Length	Landings value per capacity unit			Gross profit per capacity unit			Net profit per capacity unit		
		Per vessel	Per GT	Per kW	Per vessel	Per GT	Per kW	Per vessel	Per GT	Per kW
Average 2017-2019	VL0012m	804	81.9	8.7	351	35.8	3.8	272	27.7	2.9
	VL1215m	1,497	60.9	9.3	666	27.1	4.1	393	16.0	2.4
	VL1518m	4,465	83.3	21.0	2,519	47.0	11.8	1,322	24.7	6.2
	VL1824m	5,674	78.4	19.9	3,062	42.4	10.8	1,396	19.3	4.9
	Total	2,061	79.9	14.6	1,074	41.7	7.6	608	23.6	4.3
2021	VL0012m	770	75.2	7.8	306	29.9	3.1	238	23.2	2.4
	VL1215m	1,273	48.1	6.4	360	13.6	1.8	129	4.9	0.6
	VL1518m	3,213	58.7	14.5	1,339	24.4	6.0	475	8.7	2.1
	VL1824m	5,631	58.9	14.7	2,403	25.1	6.3	811	8.5	2.1
	Total	1,701	60.8	10.8	681	24.3	4.3	312	11.2	2.0

Note: The calculations of gross profit and net profit per length group include all the underlying gear groups even if they have negative net profits in the years included (it might not be the same vessels from year to year having negative figures). This is considered the best approach to account for the stochasticity in the fishery. Leaving these numbers out of the aggregated length group figures would give an overoptimistic picture of the economic performance for the length group.

Source: Own calculations based on data from the Danish Fisheries Agency, Vessel Register and Sales Notes Register, 9 February 2022, and cost information from Statistics Denmark.

Table 7.2 shows the capacity indicators for the minimum and maximum repercussion scenarios for 2022 based on the figures presented in Table 6.1 and the fleet capacity (measured in GT and kW) for 2021, cf. Table 3.6 and 3.7.

Comparing with the 2021 capacity indicators from Table 7.1, the indicators for the minimum repercussion scenario are comparable to the corresponding 2021 indicators, although to some degree reduced, especially for the net profit capacity indicators. The maximum repercussion scenario indicators, on the other hand,

are noticeably lower, especially the net profit capacity indicators that are predicted to be 68 per cent lower compared to 2021.

However, comparing the predicted 2022 capacity indicators with the 2017-2019 average show that all capacity indicators are reduced significantly. Especially, it is noticed that the net profit capacity indicators decrease with around 62 per cent for the minimum repercussion scenario and with approximately 85 per cent for the maximum repercussion scenario, when comparing with the 2017-2019 baseline indicators.

Table 7.2. Average capacity indicators for the minimum and maximum repercussion scenarios for 2022 (1,000 DKK/capacity unit) with unchanged capacity from 2021

	Length	Landings value per capacity unit			Gross profit per capacity unit			Net profit per capacity unit		
		Per vessel	Per GT	Per kW	Per vessel	Per GT	Per kW	Per vessel	Per GT	Per kW
Only lower landings of reduced quotas	VL0012 m	674	65.9	6.8	235	22.9	2.4	174	17.0	1.8
	VL1215m	1,214	45.9	6.1	320	12.1	1.6	99	3.7	0.5
	VL1518m	3,057	55.8	13.8	1,223	22.3	5.5	404	7.4	1.8
	VL1824 m	5,460	57.1	14.2	2,280	23.9	5.9	738	7.7	1.9
	Total	1,590	56.9	10.1	599	21.4	3.8	251	9.0	1.6
Lower landings of reduced quotas and other species	VL0012 m	405	39.6	4.1	35	3.4	0.3	-3	-0.3	0.0
	VL1215m	999	37.8	5.0	169	6.4	0.9	-14	-0.5	-0.07
	VL1518m	2,772	50.6	12.5	1,006	18.4	4.5	269	4.9	1.2
	VL1824 m	5,347	55.9	13.9	2,199	23.0	5.7	690	7.2	1.8
	Total	1,331	47.6	8.5	406	14.5	2.6	98	3.5	0.6

Note: See note to Table 7.1.

Source: Own calculations based on data from the Danish Fisheries Agency, Vessel Register and Sales Notes Register, 9 February 2022, and cost information from Statistics Denmark.

To estimate the excess capacity in the Baltic Sea fishing fleet, it is important to identify a baseline for this. As mentioned in the beginning, two different baselines are used, (i) the capacity observed in 2021 and, (ii) the average capacity for 2017-2019. Capacity adjustments are taking place over time to accommodate for changed fishing opportunities, economic conditions, and preferences among fishers. Therefore, to compare solely with the capacity in 2021 will show a lower excess capacity of two reasons, (i) some fishers have already taken the consequences of the changed conditions since 2019, and (ii) the economic conditions in the two last years (2020 and 2021) have been worse than the previous years, as illustrated by Table 7.1, thus

producing a strong incentive to leave the fishery. Using both 2021 and 2017-2019 as baselines will therefore provide a more informed indication of the perceived excess capacity in 2022.

Table 7.3 shows for each capacity measure (number of vessels, GT, and kW), the amount needed for the average vessel in each length group to have the same landing value, gross profit, and net profit per capacity unit in 2022 as in 2021 and 2017-2019, respectively. Thus, comparing the observed capacity in 2021 with the estimated capacity measures for 2022 indicates how many vessels, GTs and kW that should in principle be removed to have unchanged economic performance compared with either 2021 or 2017-2019.

Table 7.3. Capacity required in 2022 to obtain the same economic performance as in 2021 and 2017-2019

	Length	Landings value per capacity unit			Gross profit per capacity unit			Net profit per capacity unit			
		Vessels	GT	kW	Vessels	GT	kW	Vessels	GT	kW	
Observed capacity 2021	VL0012m	52	532	5,151	52	532	5,151	52	532	5,151	
	VL1215m	12	317	2,386	12	317	2,386	12	317	2,386	
	VL1518m	25	1,369	5,541	25	1,369	5,541	25	1,369	5,541	
	VL1824m	4	382	1,535	4	382	1,535	4	382	1,535	
	Total	93	2,601	14,613	93	2,601	14,613	93	2,601	14,613	
Capacity required in 2022 to obtain the same economic performance as in 2021	Only lower landings of reduced quotas	VL0012m	46	466	4,519	46	466	4,519	46	466	4,519
		VL1215m	11	301	2,260	11	301	2,260	11	301	2,260
		VL1518m	24	1,309	5,314	24	1,309	5,314	24	1,309	5,314
		VL1824m	4	371	1,490	4	371	1,490	4	371	1,490
		Total	85	2,447	13,582	85	2,447	13,582	85	2,447	13,582
	Lower landings of reduced quotas and other species	VL0012m	28	285	2,788	28	285	2,788	28	285	2,788
		VL1215m	9	244	1,815	9	244	1,815	9	244	1,815
		VL1518m	22	1,204	4,909	22	1,204	4,909	22	1,204	4,909
		VL1824m	4	364	1,459	4	364	1,459	4	364	1,459
		Total	62	2,097	10,971	62	2,097	10,971	62	2,097	10,971
Capacity required in 2022 to obtain the	Only lower landings of reduced quotas	VL0012m	44	413	3,923	43	408	3,917	43	409	3,938
		VL1215m	10	234	1,573	8	210	1,485	8	201	1,450
		VL1518m	16	895	3,439	15	827	3,203	14	795	3,095

same economic performance		VL1824m	4	273	1,185	3	256	1,084	3	246	1,032
		Total	74	1,815	10,120	69	1,701	9,689	68	1,651	9,516
	Lower landings of reduced quotas and other species	VL0012m	27	255	2,415	26	251	2,408	26	251	2,420
		VL1215m	8	194	1,292	7	171	1,200	6	163	1,163
		VL1518m	15	822	3,161	14	758	2,940	13	727	2,840
		VL1824m	4	268	1,161	3	251	1,062	3	241	1,011
		Total	53	1,539	8,030	49	1,431	7,610	48	1,383	7,434

Note: See note to Table 7.1.

Source: Own calculations based on data from the Danish Fisheries Agency, Vessel Register and Sales Notes Register, 9 February 2022, and cost information from Statistics Denmark.

Table 7.4 gives the changes in percentages, and it becomes apparent that because the economic performance in the period 2017-2019 was better than in 2021, the capacity reductions are thus higher, when using this period as baseline. Besides, the reductions are larger in the maximum repercussion scenario compared to the minimum repercussion scenario, given that the economic results in the maximum repercussion scenario are lower than in the minimum repercussion scenario.

Table 7.4. Capacity reduction in 2022 to obtain the same economic performance as in 2021 and 2017-2019 (per cent)

		Length	Landings value per capacity unit			Gross profit per capacity unit			Net profit per capacity unit		
			Vessels	GT	kW	Vessels	GT	kW	Vessels	GT	kW
Capacity required in 2022 to obtain the same economic performance as in 2021	Only lower landings of reduced quotas	VL0012m	-12	-12	-12	-12	-12	-12	-12	-12	-12
		VL1215m	-5	-5	-5	-5	-5	-5	-5	-5	-5
		VL1518m	-5	-4	-4	-5	-4	-4	-5	-4	-4
		VL1824m	-3	-3	-3	-3	-3	-3	-3	-3	-3
		Total	-9	-6	-7	-9	-6	-7	-9	-6	-7
	Lower landings of reduced quotas and other species	VL0012m	-47	-46	-46	-47	-46	-46	-47	-46	-46
		VL1215m	-24	-23	-24	-24	-23	-24	-24	-23	-24
		VL1518m	-13	-12	-11	-13	-12	-11	-13	-12	-11
		VL1824m	-6	-5	-5	-6	-5	-5	-6	-5	-5
		Total	-33	-19	-25	-33	-19	-25	-33	-19	-25
Capacity required in 2022 to obtain the same economic performance as in 2017-2019	Only lower landings of reduced quotas	VL0012m	-15	-22	-24	-18	-23	-24	-18	-23	-24
		VL1215m	-20	-26	-34	-31	-34	-38	-34	-37	-39
		VL1518m	-35	-35	-38	-40	-40	-42	-42	-42	-44
		VL1824m	9	-29	-23	-21	-33	-29	-26	-36	-33
		Total	-20	-30	-31	-26	-35	-34	-27	-37	-35
	Lower landings of reduced quotas and other species	VL0012m	-48	-52	-53	-50	-53	-53	-50	-53	-53
		VL1215m	-34	-39	-46	-44	-46	-50	-47	-48	-51
		VL1518m	41	-40	-43	-46	-45	-47	-48	-47	-49
		VL1824m	-11	-30	-24	-22	-34	-31	-28	-37	-34
		Total	-43	-41	-45	-47	-45	-48	-48	-47	-49

Source: Own calculations based on data from the Danish Fisheries Agency, Vessel Register and Sales Notes Register, 9 February 2022, and cost information from Statistics Denmark.

Source: *Fleet report for the Danish Baltic Sea fishing fleet.* / Hoff, Ayoe; Andersen, Jesper Levring. 2022. 24 s., (IFRO Commissioned Work; Nr. 2022/13).

Permanent cessation scheme for cod fishers in the Baltic Sea

In order to reduce the fleet in the Baltic Sea, Denmark is planning a permanent cessation scheme for cod fishers. The analysis shows that the vessels fishing only for herring (and sprat) are larger vessels over 18 meters, which generally have a low dependency on the Baltic Sea. The identified overcapacity in the Baltic Sea thus includes vessels fishing for either cod or cod and herring. The suggested reduction capacity depends on which baseline is set as target for assessing the overcapacity. For 2021, it must be assumed that there was already overcapacity in the Baltic Sea. Quotas for herring and cod have been reduced annually since 2015, but the large reductions were adopted from 2020 onwards. Moreover, the economy has been affected by corona meaning that an average of the years 2017-2019 is the better baseline to compare to, when assessing overcapacity.

As the analysis states the *perceived* excess capacity for 2022 entails different scenarios to show the maximum and minimum repercussion scenario when taking three capacity measures into account – number of vessels, GT and kW. The estimates contain uncertainties as to how some fishermen can switch to other fisheries or otherwise counter the negative effects of the reduced quotas. It must be assumed that the Vessel Quota Shares released when some vessels are scrapped may be purchased by other fishermen who thus have the opportunity to improve their fishing activities and economy. The proposed overcapacity also varies depending on the different criterias.

Taking this into account, Denmark aims at a reduction capacity goal to 786 GT and 4493 kW, representing 30 percent of the tonnage and 31 percent of the kW of the fleet in the Baltic Sea – corresponding to 2,0 percent of the tonnage and 1.4 percent of the kW of the total Danish fleet. This reduction goal represents 19 vessels according to the analysis; however, it is uncertain how this will play out in reality. According to the analysis, the excess vessels are divided into different groups of vessels and it cannot be predicted in advance that this distribution will be the same in reality.

The permanent cessation measure will take place during 2022 and the capacity will be reduced at the latest at the end of 2023.

The allocated funding to the scrapping scheme will most likely not be sufficient to grant scrapping premiums to enough vessels to reach the reduction goal by scrapping alone. The permanent cessation scheme is planned to be carried out as part of the EMFF-programme and the regulation (EU) No 508/2014 sets out that support can be granted to active vessels that have carried out fishing activities at sea for at least 90 days per year during the last two calendar years preceding the date of submission of the application for support. For the Eastern Baltic cod, the calendar years shall be 2017 and 2018. The last years' combination of the corona-pandemic together with lower quotas entails that some fishermen will not meet the criteria to be able to apply for support under the scrapping scheme even if they should be motivated to apply.

The effect of the scrapping scheme will have an immediate effect – reducing capacity; and then there will be more long-term structural effects that can be observed over time which depends on future quota volumes, which vessels purchase the freed-up Vessel Quota Shares and the general market adjustment. As described in the analysis 73 commercial vessels have already left the cod and/or herring fisheries over the last seven years and further market adjustment must be expected depending on how the quotas develop for the Baltic in the future. It is expected that the reduction goal is a longterm goal where not only the scrapping scheme will influence the outcome.

Furthermore the scrapping scheme is part of a national action plan for the Baltic Sea that via a number of initiatives focuses on healthier marine environment with healthy fish stocks, development and differentiation of the fishing industry, and the strengthening of recreational fishing.

Additional measures to reduce fleet capacity in general

Apart from the permanent cessation scheme for the Baltic, Denmark is also planning adjustments to the fleet structure with regard to mitigate the negative effects of Brexit. This scheme will also be carried out in 2022 and terminated by the end of 2023 – thus the final results of this scheme will also be visible in the course of 2024.

The impact of both scrapping schemes will be monitored to evaluate the results and to determine the effect on the overall capacity.

Additional remarks

The suggested action plan will most likely not imply that all indicators for the Danish fleet will shift into uncritical levels at once. It should be noted – as already explained in the fleet report – that the indicators for the small scale segments should not necessarily be interpreted as an overcapacity. A large share of the small vessels is owned by part-time fishermen. They are important for the regional communities to uphold activity in small ports and landing sites and the smaller coastal communities, however their activity is quite low, and has no significant impact on the overall stock. Many owners of small non-commercial vessels keep their vessel for social and recreational purposes. This is confirmed by a large number of inactive vessels under 10 metres and the inferior quantities landed by the non-commercial part of the small scale fleet.