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Nutrients and nutrient recycling – regional policy and measures in the Baltic Sea region

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The Baltic Sea

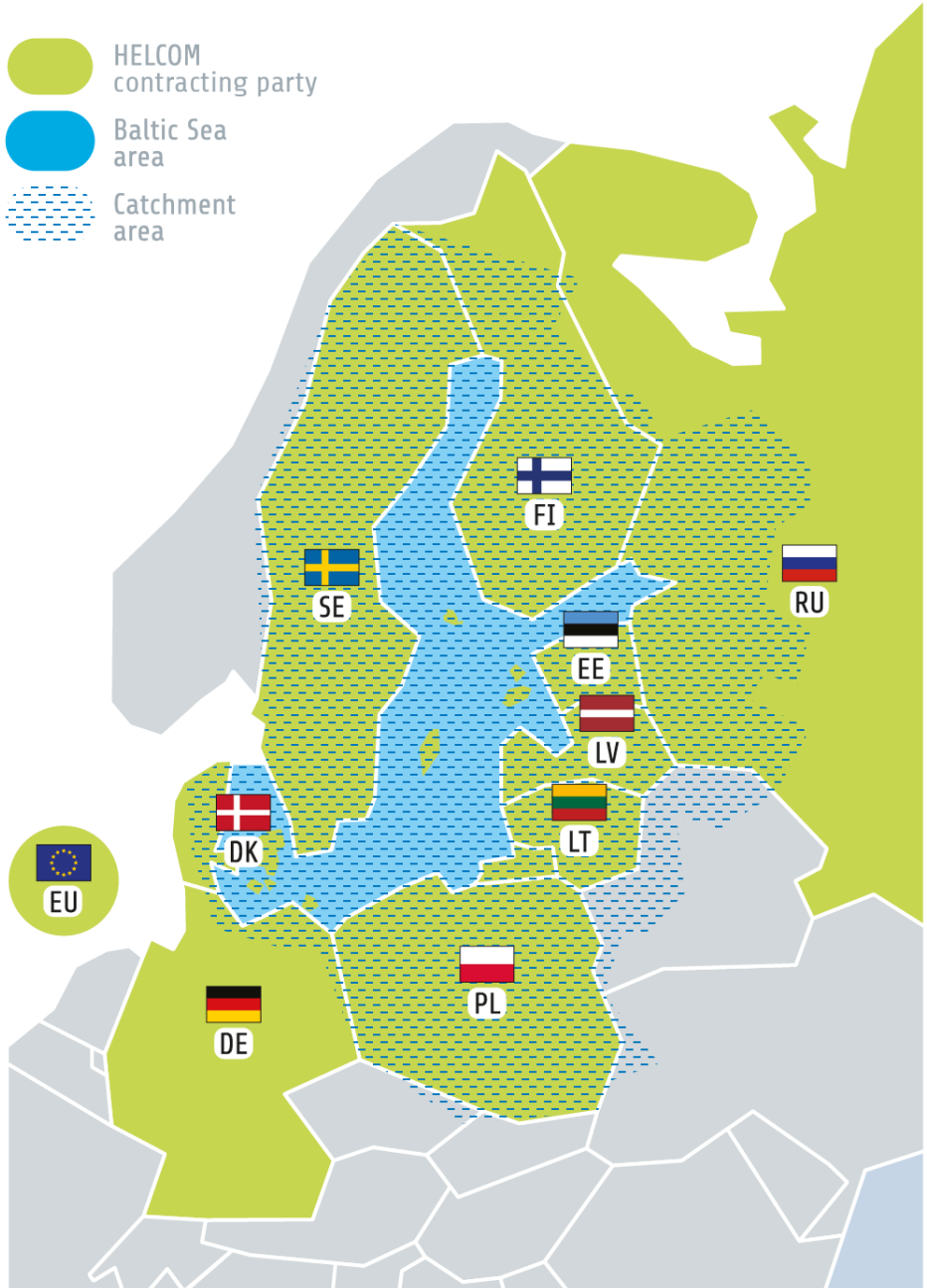
Unique but young and fragile ecosystem

Catchment area:
4x area of the sea

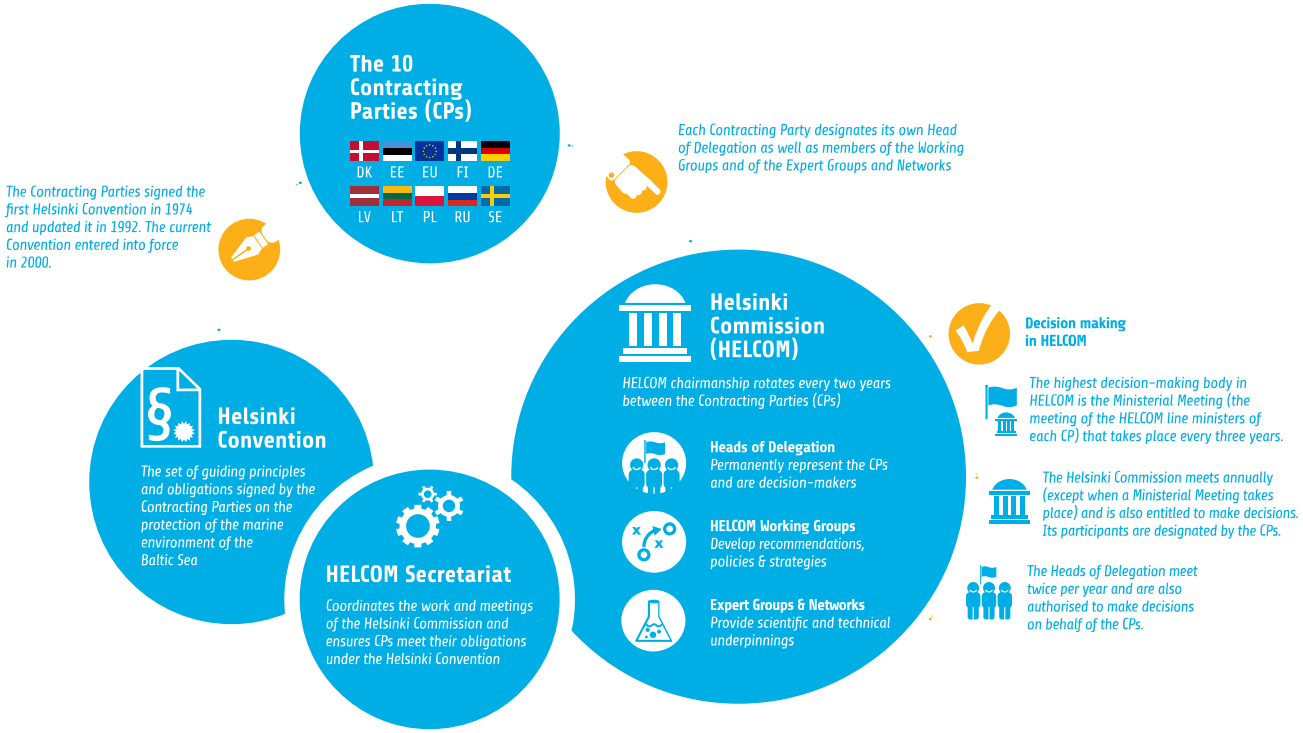
Population (catchment):
85 million

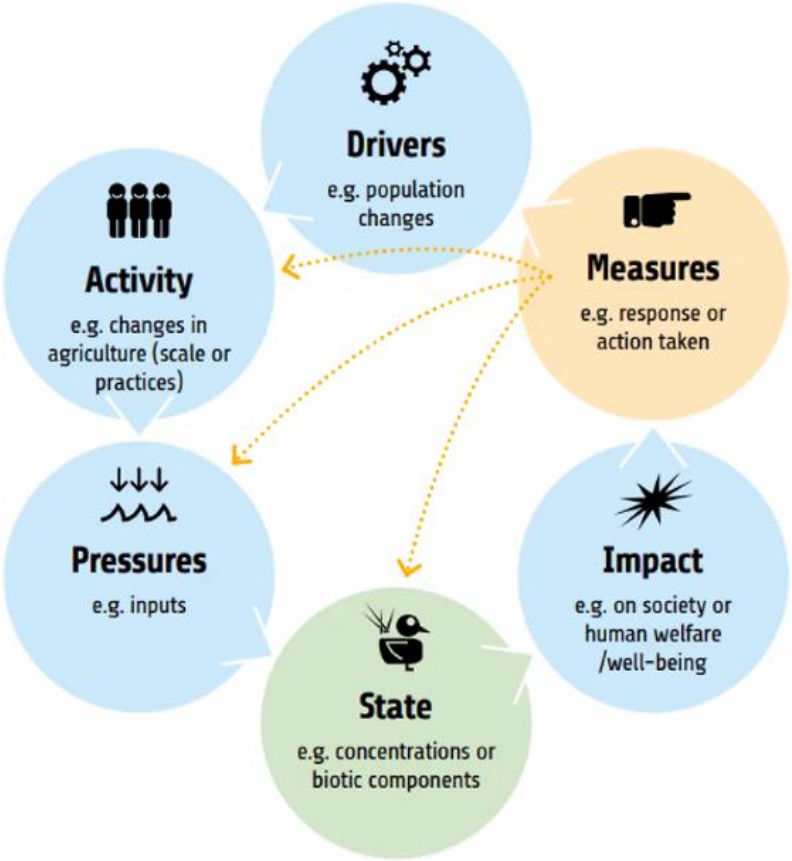
Busy waterway: on average ~1500 ships a day

Multitude of pressures affecting the Baltic



HELCOM, DAPSIM/R Framework and measures





HELCOM tools:
how we get things done

The Helsinki Convention
Instrument of international law with objectives & obligations in **38 Articles** and **Annexes I-VII**: technical guidelines and regulations.

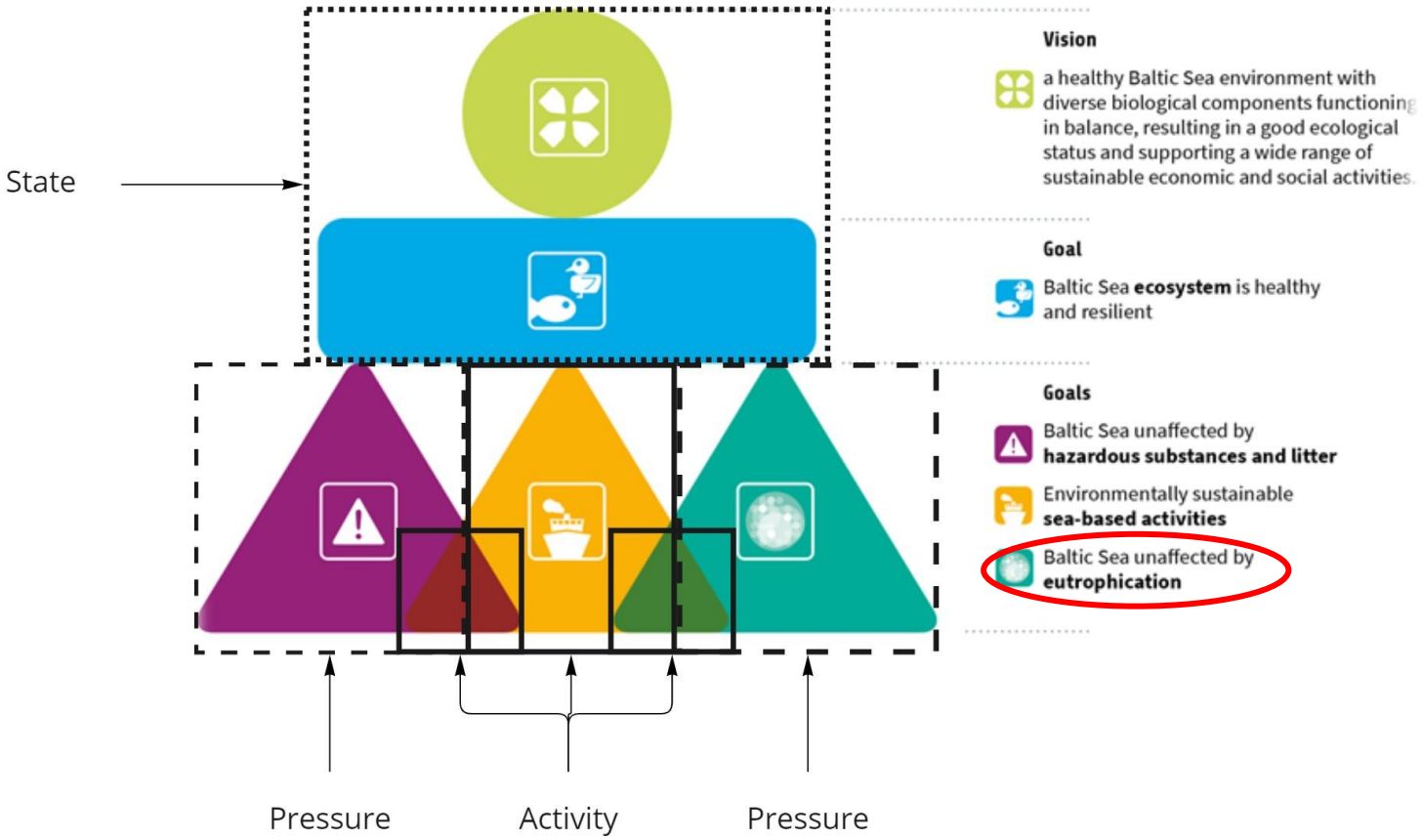
Recommendations
on measures to address areas of concern, implementable through national legislation. In total, about **260** recommendations have been adopted so far.

Action plans & projects
Contain actions and measures with such as Baltic Sea Action Plan, Regional Nutrient Recycling Strategy and most HELCOM projects.

Monitoring & assessments

- Indicators (pressures on and state of the environment)
- Thematic assessments
- Holistic assessments, **HOLAS3 on 2016-2021**

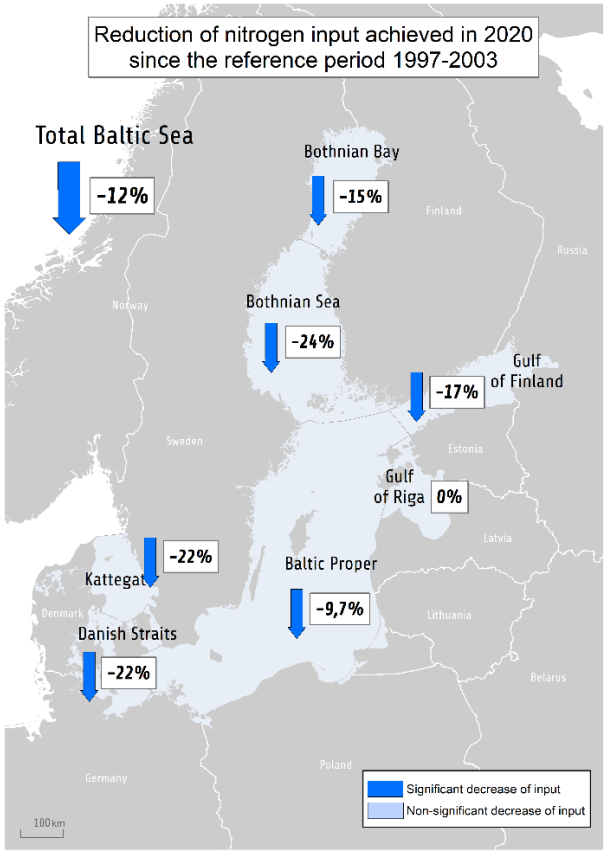
2021 BSAP: structure & goals

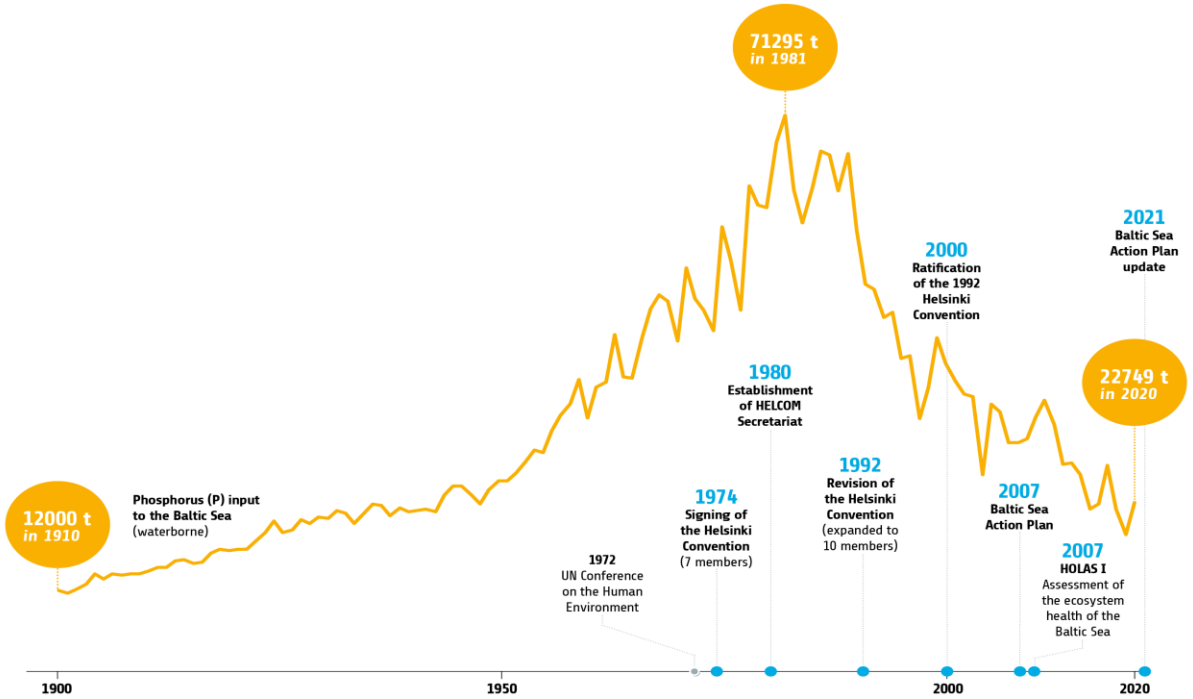


Logic in the structure:
Chain of consequence, whereby human activities result in pressures on the environment, which in turn affect the state of biodiversity, which has been used as a basis when elaborating the updated BSAP

https://helcom.fi/baltic-sea-action-plan/

Earlier developments: Reductions of waterborne input of nitrogen (N) and phosphorus (P) by 2020





https://helcom.fi/baltic-sea-trends/holistic-assessments/

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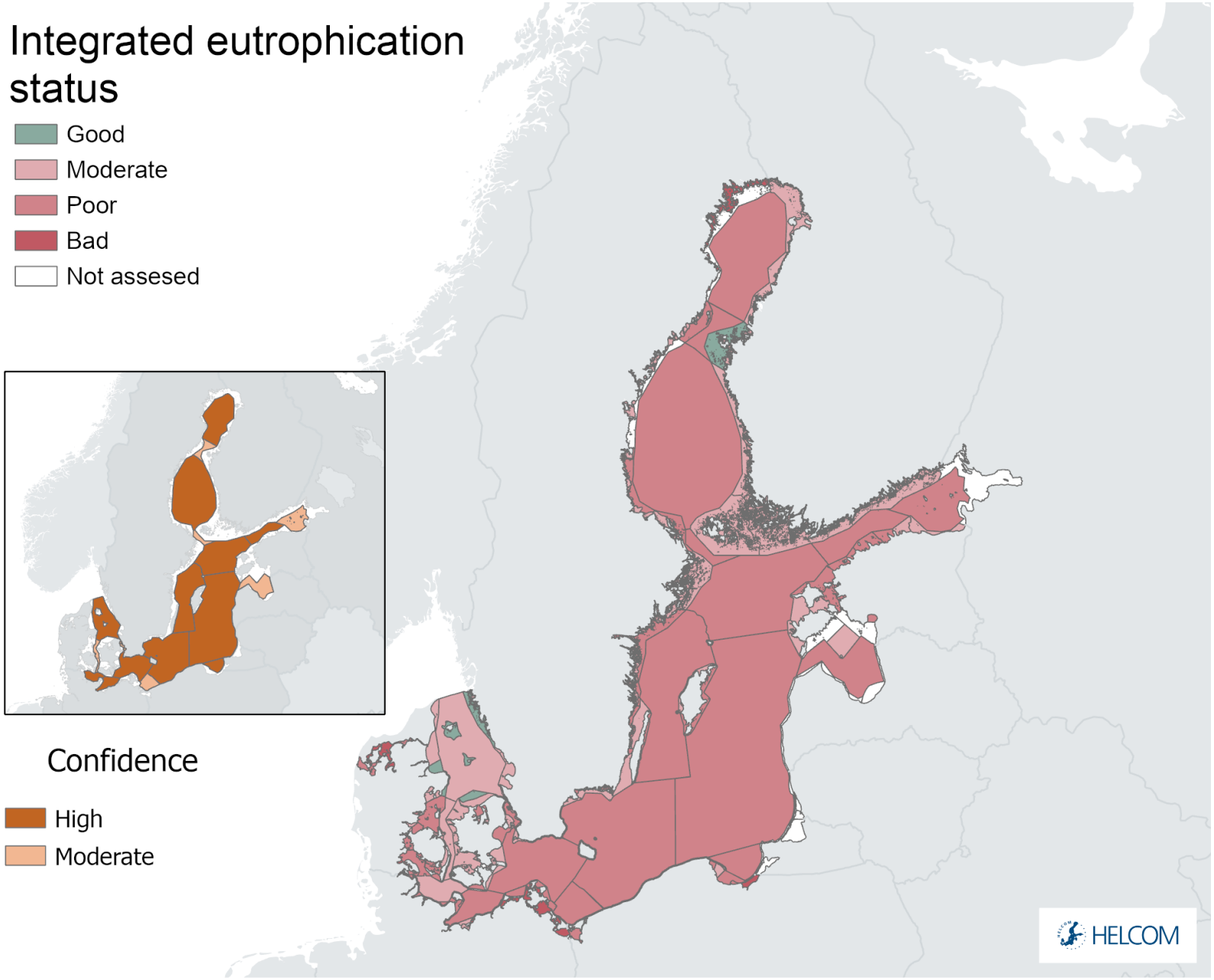
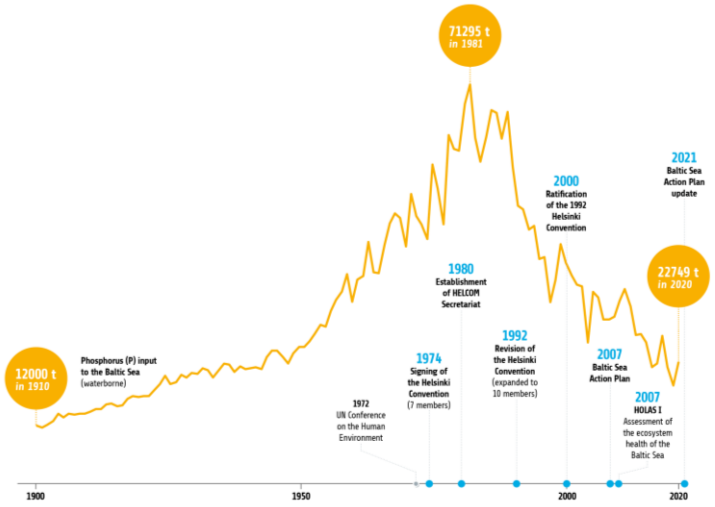


Holistic assessment 2016-21:

Overall eutrophication status

- Combines 9 direct and indirect indicators.
- 93.8% of the area is sub-GES.
- ‘Bad’ status (worst category) covers 1.3% of the area.



THIRD HELCOM HOLISTIC ASSESSMENT OF THE BALTIC SEA 2016–2021

HOLAS 3

Baltic Marine Environment Protection Commission

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Eutrophication

Eutrophication goal

"Baltic Sea unaffected by eutrophication"

Ecological objectives

- *Concentrations of nutrients close to natural levels*
- *Clear waters*
- *Natural level of algal blooms*
- *Natural distribution and occurrence of plants and animals*
- *Natural oxygen levels*

Management objective

- *Minimize inputs of nutrients from human activities*

- Reinforced the regional **nutrient input reduction scheme**
  - first introduced and agreed on in 2007 as part of the first HELCOM Baltic Sea Action Plan, revised in 2013 and 2021
  - **Maximum allowable inputs (MAI)** of nutrients, indicating the maximum level of inputs of water and airborne nitrogen and phosphorus to the Baltic Sea sub-basins to reach good environmental status of the Baltic Sea.
  - **Nutrient Input Ceilings (NIC)** define maximum inputs via water and air to achieve good status with respect to eutrophication for Baltic Sea sub-basins for each country.

To reduce inputs, (response →) <u>measures</u> were agreed upon:

- In 2021 BSAP there are 36 eutrophication related actions under themes of:
  - Follow-up of the implementation of nutrient input targets
  - Agriculture
  - Atmospheric nitrogen emissions
  - Wastewater sector
  - Nutrient recycling

HELCOM Working Group on Source to Sea Management of Nutrients and Hazardous Substances and Sustainable Agricultural Practices: https://helcom.fi/helcom-at-work/groups/source-to-sea-2/

Earlier developments: Sub-basins classification of achieving **Maximum Allowable Inputs** (MAI) for N and P by 2020

Baltic Sea ub-basin	MAI*	N input 2020	Statistical uncertain ty 2020	N input including statistical uncertainty 2020	Exceedance of MAI in 2020	Input 2020 including statistical uncertainty in % of MAI	Classification of achieved reduction
Bothnian Bay (BOB)	57 622	53 632	1 783	55 415		96	
Bothnian Sea (BOS)	79 372	67 391	2 643	70 034		88	
Baltic Proper (BAP)	325 000	398 659	8 640	407 299	82 299	125	
Gulf of Finland (GUF)	101 800	107 775	9 814	117 588	15 788	116	
Gulf of Riga (GUR)	88 417	88 333	3 208	91 541	3 124	104	
Danish Straits (DS)	65 998	57 566	1 749	59 314		90	
Kattegat (KAT)	74 000	68 456	1 617	70 074		95	
Baltic Sea (BAS)	**792 209**	**858 905**	**12 381**	**871 286**	**79 077**	**110**	

Baltic Sea Sub-basin	MAI*	P input 2020	Statistical uncertainty 2020	P input including statistical uncertainty 2020	Exceedance of MAI in 2020	Input 2020 including statistical uncertainty in % of MAI	Classificatio n of achieved reduction
Bothnian Bay (BOB)	2 675	2 396	143	2 540		95	
Bothnian Sea (BOS)	2 773	2 559	70	2 629		95	
Baltic Proper (BAP)	7 360	13 013	802	13 814	6 454	188	
Gulf of Finland (GUF)	3 600	4 156	828	4 984	1 384	138	
Gulf of Riga (GUR)	2 020	2 074	248	2 322	302	115	
Danish Straits (DS)	1 601	1 202	63	1 265		79	
Kattegat (KAT)	1 687	1 506	44	1 550		92	
Baltic Sea (BAS)	**21 716**	**26 389**	**1 306**	**27 695**	**5 979**	**128**	

Classification of achieving MAI in 2015 (1995-2015 data), 2016 (1995-2016 data), 2017 (1995-2017 data), 2018 (1995-2018 data), 2019 (1995-2019) and 2020 (1995-2020) for nitrogen and phosphorus:

green=MAI fulfilled, yellow= fulfilment is not determined due to statistical uncertainty, and red=MAI not fulfilled

https://indicators.helcom.fi/indicator/inputs-of-nutrients/

Earlier developments: Classification of achieving **Nutrient Input Ceilings** for total nitrogen (TN) and total phosphorus (TP) by 2020

Status and trends toward new TN NIC - 2020 - taking into account extra reduction

Country/basin	BOB	BOS	BAP	GUF	GUR	DS	KAT
Denmark	↓	↓	↓	↓	↓	↓	↓
Estonia	↓	↓	↓	↓	↑	↓	↓
Finland	↓	↓	↓	↓	↓	↓	↓
Germany	↓	↓	↓	↓	↓	↓	↓
Latvia	↓	↓	↑	↓		↓	↓
Lithuania			↑		↑		
Poland	↓	↓		↓	↓	↓	↓
Russia	↓	↓	↓		↓	↓	↓
Sweden	↓	↓		↓	↓		↓
Belarus							
Czech Republic			↓				
Ukraine			↑				
Baltic Sea shipping	↓	↓	↓	↓	↓	↓	↓
North Sea Shipping	↓	↓	↓	↓	↓	↓	↓
Other countries	↓	↓	↓	↓	↓	↓	↓

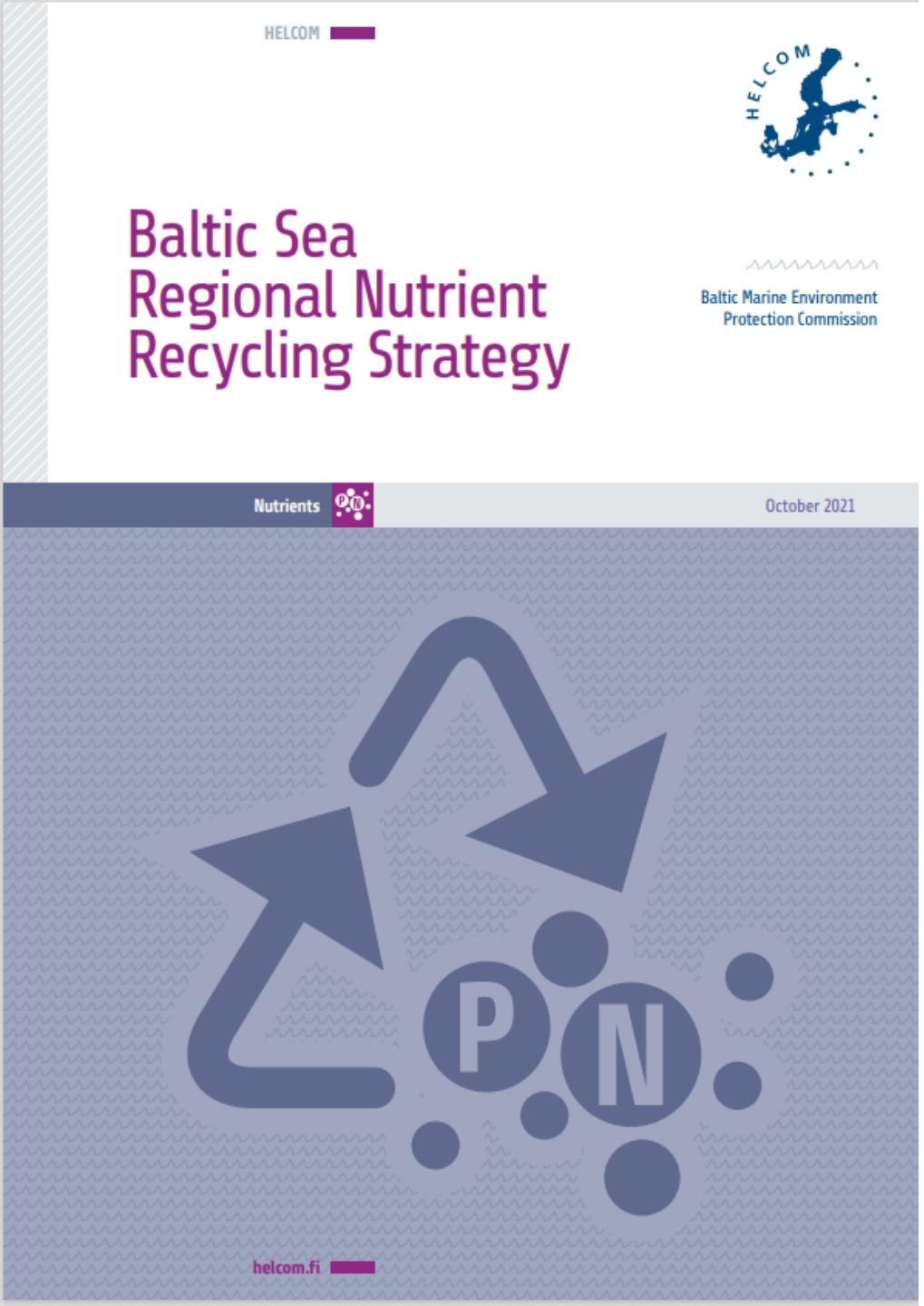
Status and trend toward new TP NIC - 2020 taking into account extra reduc

Country/basin	BOB	BOS	BAP	GUF	GUR	DS	KAT
Denmark			↓			↓	↓
Estonia			↓	↓	↓		
Finland	↓			↓			
Germany						↓	
Latvia			↓				
Lithuania			↓		↓		
Poland			↓				
Russia			↓	↓	↓		
Sweden		↓	↓			↓	
Belarus			↓				
Czech Republic			↓				
Ukraine			↑				
Baltic Sea shipping							
North Sea shipping							
Other countries							

More information: https://helcom.fi/baltic-sea-action-plan/nutrient-reduction-scheme/national-nutrient-input-ceilings/

Associated action documents to 2021 BSAP

- HELCOM Recommendation 42-43/1 on Regional Action Plan on Underwater Noise
- **HELCOM Recommendation 42-43/2 on Amendments to Part II Annex III "Criteria and Measures Concerning the Prevention of Pollution from Land-Based Sources" of the 1992 Helsinki Convention**
- HELCOM Recommendation 42-43/3 on Regional Action Plan on Marine Litter
- **Baltic Sea Regional Nutrient Recycling Strategy**
- Regional Maritime Spatial Planning Roadmap 2021-2030
- **Guidelines for Sea Based Measures to Manage Internal Nutrient Reserves in the Baltic Sea Region**



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Vision

Nutrients are managed sustainably in all HELCOM countries, securing the productivity of agriculture and minimizing nutrient loss to the Baltic Sea environment through efficient use of nutrients and cost-effective nutrient recycling.

Objectives:

- *Baltic Sea region as a model area for nutrient recycling*
- *Reducing environmental impacts*
- *Safe nutrient recycling*
- *Knowledge exchange and awareness raising*
- *Creating business opportunities*
- *Improving policy coherence*

Interreg Baltic Sea Region
Co-funded by the European Union
CIRCULAR ECONOMY CiNURGi

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Horizontal topics

HT24: Consider designating **HELCOM hot spots** by 2025 on the basis of identified additional **sources of major negative impact** on the Baltic marine ecosystem. Starting with the development of specifying criteria for the designation and deletion of the hot spots by 2023, and based on those criteria, initiate and undertake targeted measures with the aim of eliminating such possible new hot spots.

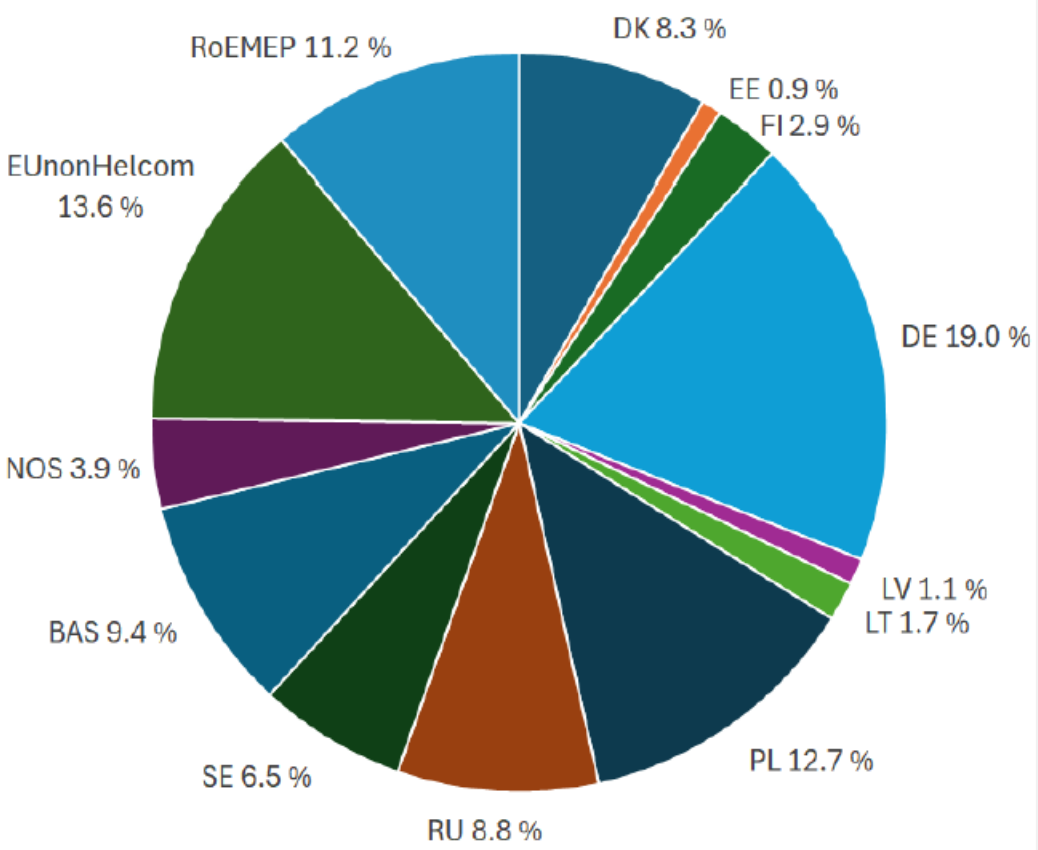
- **Climate change**
- **Monitoring**
- **Maritime spatial planning (MSP)**
- **Economic and social analysis**
- **Hot spots**
- **Knowledge exchange and awareness raising**
- **Financing**

Contributions of emissions from different countries and sectors to atmospheric nitrogen input to the Baltic Sea and its sub-basins 2021

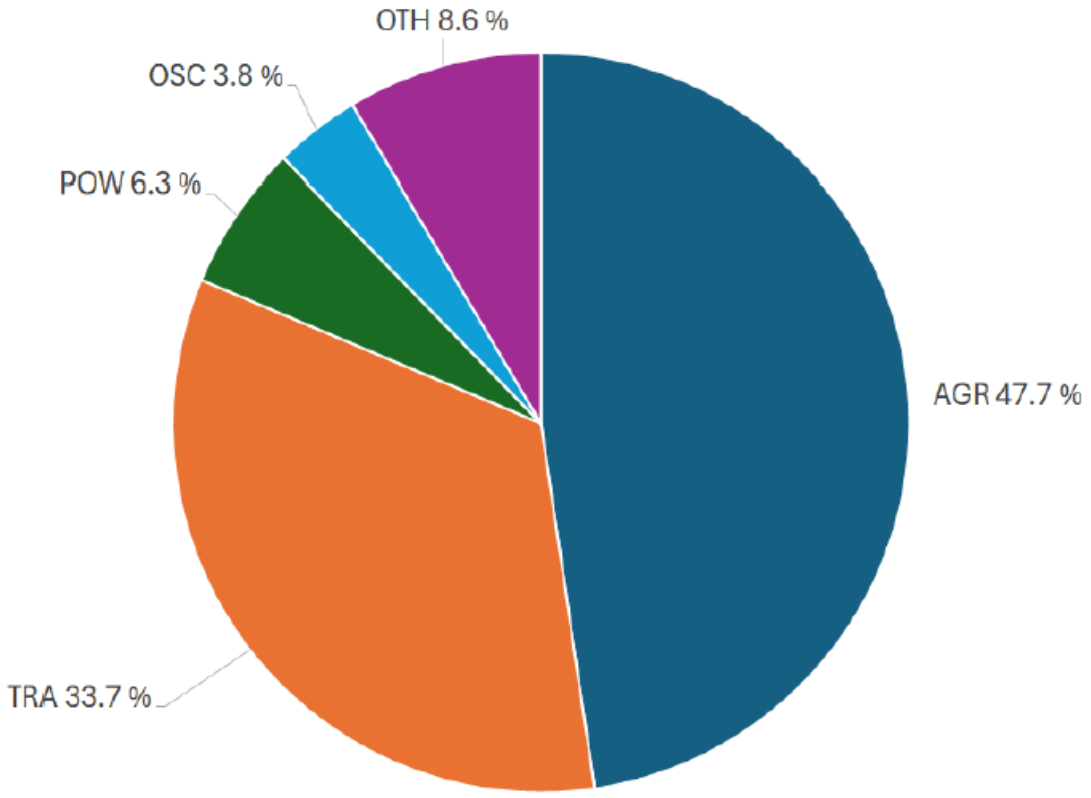
- Regular part of Pollution Load Compilation (PLC-8) projects
- Part of HELCOM and EMEP collaboration under the Convention of Long-Range Transport of Air Pollution, modelling done by the MSC-W (Meteorological Synthetisizing Centre West, Norwegian Meteorological Institute)
- Scientific/Policy question: **What were the contributions to atmospheric deposition of oxidized/reduced/total nitrogen from different sectors and countries/regions in 2021?** (‘Actual’ depositions! Not normalized)
- 5 sectors: **Agriculture**, Transport, Power generation, Other stationary combustion, All other anthropogenic emissions
- 13 countries/regions: The nine HELCOM countries, North Sea and Baltic Sea shipping, Rest of EU, Rest of World.
- Receptors: The Baltic Sea and its 9 sub-basins

Shares of tot-N deposition to the Baltic Sea

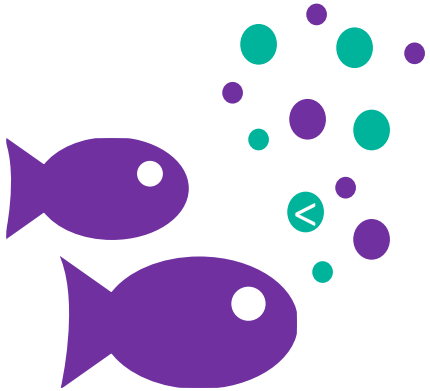
by Country/Region



by Sector



Regional HELCOM nutrient work – takeaway points

- Key to success in regional nutrient reduction and management: intergovernmental political will and commitment
  - Jointly agreed **monitoring** methods and practices, joint **reporting** and **data** management
  - Sound and robust **scientific** basis and modelling for nutrient reductions
  - Clear and transparent joint **tracking** of progress of the joint reduction targets

Thank you!