A Sustainable Blue Economy – *Post-read*

Bringing Danish stakeholders together to align on a sustainable future

WWF

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During the Sustainable Blue Economy Roundtable on the 7th of June, we gathered stakeholders from across sectors in the Danish blue economy to…

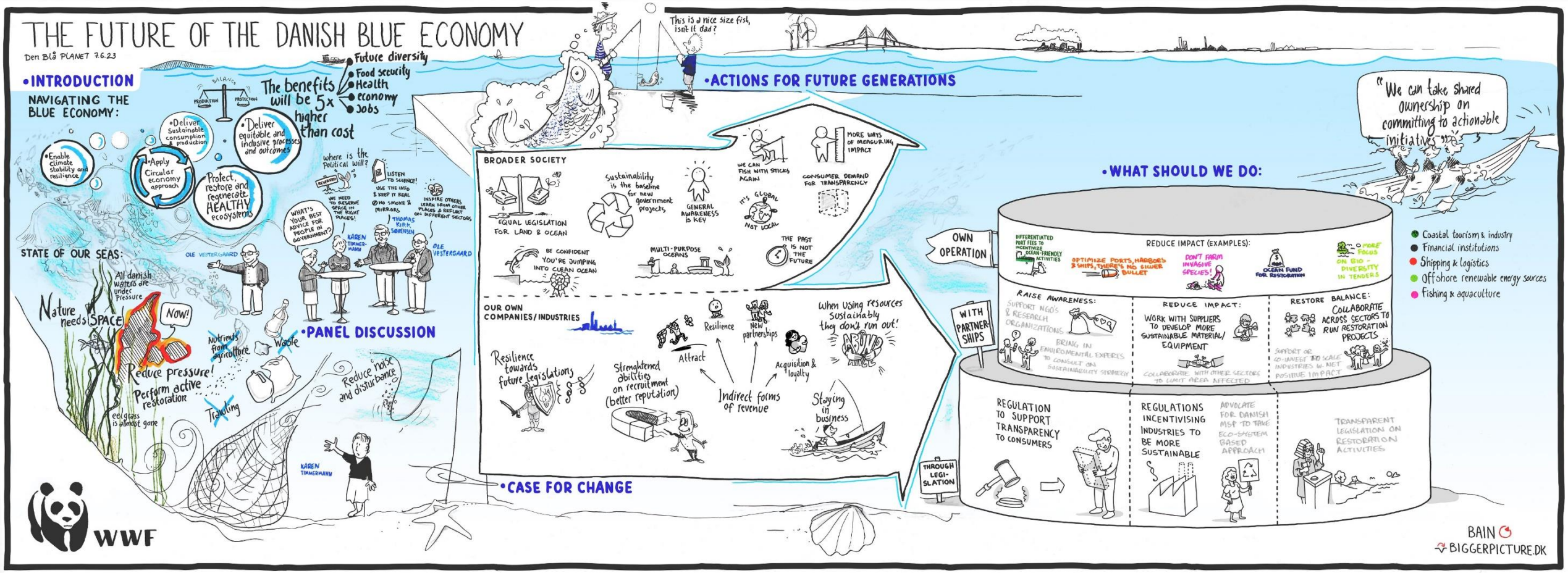
Learn about the issues impacting the ocean's biodiversity from experts in the field

Hear perspectives on the Danish MSP and governmental approach to ocean sustainability during a panel debate

Discuss our ambitions for the future of the Danish economy for our own organizations / industries and the broader society

Ideate on what we can do to raise awareness, reduce our impact and restore balance

What is your vision for the future of the Danish blue economy?


THE FUTURE OF THE DANISH BLUE ECONOMY
Den Blå PLANET 7.6.23
•INTRODUCTION
NAVIGATING THE BLUE ECONOMY:
BALANCE
PRODUCTION
PROTECTION
•Enable climate stability and resilience
•Apply Circular economy approach
•Deliver Sustainable consumption & production
•Deliver equitable and inclusive processes and outcomes
•Protect, restore and regenerate HEALTHY ecosystems
The benefits will be 5x higher than cost
Future diversity
Food security
Health
economy
Jobs
STATE OF OUR SEAS:
All danish waters are under Pressure
Nature needs SPACE
Now!
Reduce pressure!
Perform active restoration
eelgrass is almost gone
Nutrients from agriculture
Trawling
Waste
Reduce noise and disturbance
KAREN TIMMERMANN
OLE VESTERGAARD
where is the political will?
RESERVED
WE NEED TO RESERVE SPACE IN THE RIGHT PLACES!
LISTEN TO SCIENCE!
USE THE INFO & KEEP IT REAL
NO SMOKE & MIRRORS
INSPIRE OTHERS LEARN FROM OTHER PLACES & REFLECT ON DIFFERENT SECTORS
WHAT'S YOUR BEST ADVICE FOR PEOPLE IN GOVERNMENT?
KAREN TIMMERMANN
THOMAS KIRK SØRENSEN
OLE VESTERGAARD
•PANEL DISCUSSION
This is a nice size fish, isn't it dad?
•ACTIONS FOR FUTURE GENERATIONS
BROADER SOCIETY
EQUAL LEGISLATION FOR LAND & OCEAN
Sustainability is the baseline for new government projects
GENERAL AWARENESS IS KEY
WE CAN FISH WITH STICKS AGAIN
IT'S GLOBAL NOT LOCAL
MORE WAYS OF MEASURING IMPACT
CONSUMER DEMAND FOR TRANSPARENCY
BE CONFIDENT YOU'RE JUMPING INTO CLEAN OCEAN
MULTI-PURPOSE OCEANS
THE PAST IS NOT THE FUTURE
OUR OWN COMPANIES/INDUSTRIES
Resilience towards future legislations
Strengthened abilities on recruitment (better reputation)
Attract
Resilience
New partnerships
Acquisition & loyalty
Indirect forms of revenue
When using resources sustainably they don't run out!
Staying in business
•CASE FOR CHANGE
•WHAT SHOULD WE DO:
"We can take shared ownership on committing to actionable initiatives"
OWN OPERATION
DIFFERENTIATED PORT FEES TO INCENTIVIZE OCEAN-FRIENDLY ACTIVITIES
REDUCE IMPACT (EXAMPLES):
OPTIMIZE PORTS, HARBOR'S & SHIPS, THERE'S NO SILVER BULLET
DON'T FARM INVASIVE SPECIES!
OCEAN FUND FOR RESTORATION
MORE FOCUS ON ECO-DIVERSITY IN TENDERS
WITH PARTNER-SHIPS
RAISE AWARENESS:
SUPPORT NGO'S & RESEARCH ORGANIZATIONS
BRING IN ENVIRONMENTAL EXPERTS TO CONSULT ON SUSTAINABILITY STRATEGY
REDUCE IMPACT:
WORK WITH SUPPLIERS TO DEVELOP MORE SUSTAINABLE MATERIAL/ EQUIPMENT
COLLABORATE WITH OTHER SECTORS TO LIMIT AREA AFFECTED
RESTORE BALANCE:
COLLABORATE ACROSS SECTORS TO RUN RESTORATION PROJECTS
SUPPORT OR CO-INVEST TO SCALE INDUSTRIES W. NET POSITIVE IMPACT
THROUGH LEGI-SLATION
REGULATION TO SUPPORT TRANSPARENCY TO CONSUMERS
REGULATIONS INCENTIVISING INDUSTRIES TO BE MORE SUSTAINABLE
ADVOCATE FOR DANISH MSP TO TAKE ECO-SYSTEM BASED APPROACH
TRANSPARENT LEGISLATION ON RESTORATION ACTIVITIES
Coastal tourism & industry
Financial institutions
Shipping & logistics
Offshore renewable energy sources
Fishing & aquaculture
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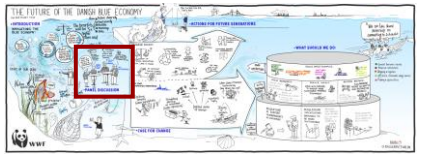
Panel discussion | The Danish MSP needs to improve; an ecosystem-based MSP can enable both environmental and commercial benefits



1. A strong MSP requires a methodological and structured approach, where **all the right stakeholders have a "seat at the table"**

2. Denmark's **current MSP is not sufficiently ecosystem-based**, and there has been inadequate involvement of relevant scientists in the development of the plan

3. Denmark should **draw insights and inspiration from neighbouring countries with ambitious MSP development**, e.g. Sweden's tailored tools to estimate cumulative impacts, Norway's focus on habitat mapping

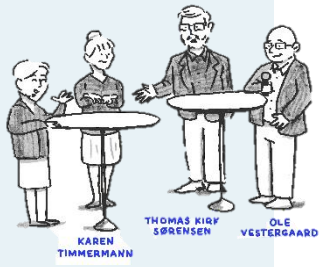
4. The ocean is resilient and able to restore itself with time; however, **action is required now**, and it should be consistent over time

"The most important part of the plan is the process that leads to it, and then the implementation. You really need to get the interests around the table."
Ole Vestergaard, UNEP

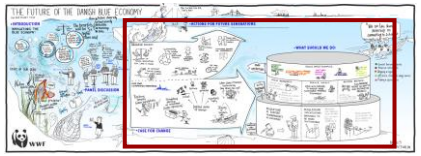
"Regarding the MSP, I haven't heard about scientists being involved in the process at all."
Karen Timmermann, DTU Aqua

"There is a lot of room in the seascape, so if we plan intelligently, we can find and designate high-quality zones for marine nature protection, good wind areas, and productive fishing grounds."
Thomas Kirk Sørensen, WWF

"The ocean is actually quite resilient. If you stop the pressure, it tends to rebound. But it takes time and affects stakeholders, and we currently do not see the political will and patience."
Thomas Kirk Sørensen, WWF

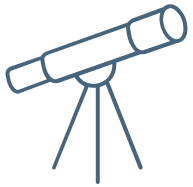


During the workshop we discussed…



What we all hope to achieve by bringing the group together

- **Create connections and alignment** between various stakeholders to limit silos and build alliances
- **Foster creativity and innovation** by bringing diverse perspectives together
- **Understand each other's viewpoints and challenges** to explore the best way to coexist



What course-correcting would look like for our industries and society

- For our organizations we envision:
  - **Improved company reputation** impacting ability to attract customers, talent, partnerships and investment
  - **Competitive advantages** via a head-start on regulations and development of more resilient technologies
- For society we envision:
  - **Restored marine biodiversity** in Denmark with clear and fresh waters
  - **More awareness and ambitious regulations** on ocean sustainability incl. established measurement tools, and a holistic view of land and sea

What we can do, within our industries and across sectors

1. There are **many initiatives companies can take within their own operations** to reduce the key impacts of their industries
2. We **collectively have most energy for reducing impact** both:
   - **Through partnerships** (e.g. working with suppliers on product development, co-location with other industries), and;
   - **Advocating for regulation** that incentivizes impact reduction

See following pages for deep-dives

Together we ideated on ways we can reduce impact within our industries through **companies' own operations**

1 WHAT CAN WE DO / WHAT WE HEARD FROM YOU

Shipping & logistics | **Fishing & aquaculture** | **Offshore RES** | **Coastal activities** | **Financial institutions**

Initiatives you suggested to reduce impact within your own operations…

- Collaboration to **understand the interface** between ports and ships, and **create a holistic, system-wide perspective** on ocean conservation/ restoration
- **Increase the knowledge** within organizations and **share knowledge** across the industry
- **Measure the status of the habitat** before construction projects
- Switch to **more silent propellors**
- Improve **reception facilities** for handling marine litter

Aquaculture focus

- Use **nutrient-efficient feed**
- **Optimise placement** of fish farms
- Intentionally **select farmed species**

Fishing focus

- **Technological dev.** of equipment to limit bycatch and reduce marine litter
- **Waste capture** initiatives to clean-up marine litter and properly dispose

Fishing and aquaculture:

- Use company platform to **increase consumer awareness**

Within own operations

- **Technological dev.** e.g. bubble curtains to reduce noise during construction
- **Clear biodiversity targets** to incentivise behaviour
- Implement **standardized monitoring** of ocean and biodiversity, and **share data** across industry

Via advocating for regulation

- Influence governments to set **clear criteria for biodiversity in tenders** and **harmonize "the rules of the game"** across companies and regions

- Implement **differentiated port fees** to incentivize cruise companies to improve wastewater handling and fuel sources
- Implement **newest standard** of wastewater technology
- Develop and promote **nature tourism experiences** accessible to the 'masses' to increase consumer awareness
- Conduct **research on development of new technologies** to minimize water pollution

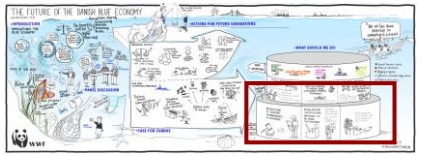
- Implement a **consistent approach to active ownership**, i.e. examine portfolio exposure and risk, measure impact and materiality, share knowledge, set requirements, and implement consequences
- Use **requirements** for sustainable ocean use **in investment decisions**
- **Influence government to create incentives for financial institutions**, e.g. through blue bonds, review and redesign of subsidy schemes, and ocean funds

See s. 15-21 for additional initiatives to consider within your industry

Impact being mitigated

Water pollution | **Direct habitat disruption** | **Species interference**

Collectively, we are energized by collaborating to reduce impact whilst advocating for regulations is hindered by lack of political will



2 WHAT CAN WE DO

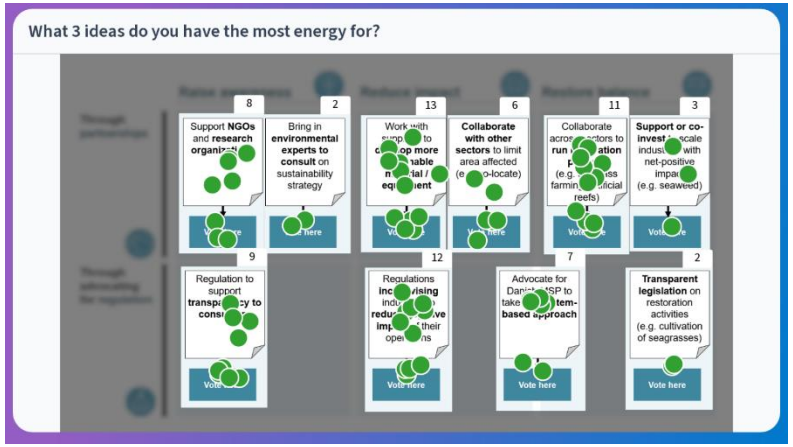
Where do we have the **most energy**?

What?

- ↑ **Work with suppliers** to develop more sustainable material and equipment
- ↑ Advocate for **regulations incentivizing sustainability** within industry operations
- ↑ **Collaborate across actors** to run restoration projects

Why?

- Initiatives have the **potential to have a large impact**
- The initiatives are **within companies' scope of control**
- Initiatives **reflect current level of maturity** on the topic (i.e. focus on harm reduction)



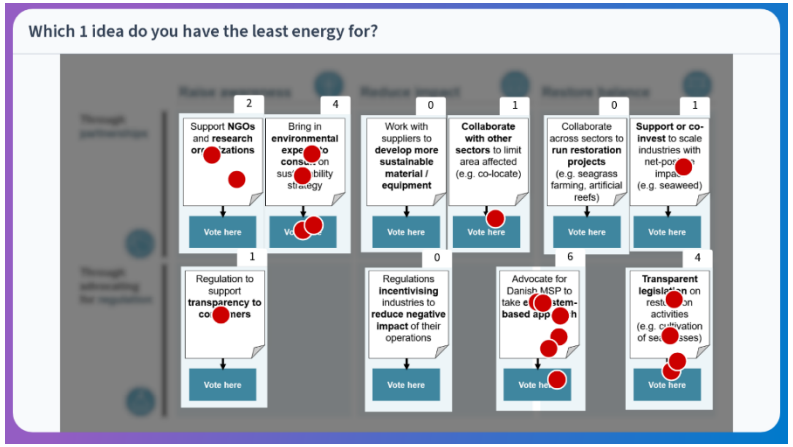
Where do we have the **least energy**?

What?

- ↓ Advocate for **ecosystem-based approach to Danish MSP**
- ↓ Advocate for **transparent regulation on restoration activities** (e.g. seagrass cultivation)
- ↓ Bring in **environmental experts to consult** on sustainability strategy

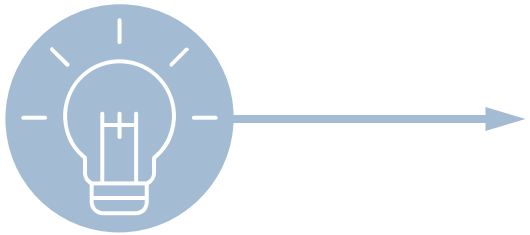
Why?

- Advocating for progressive regulation seems unlikely due to **lack of political engagement / will**
- Topics on **raising awareness or restoring balance less of a focus** than reducing impact



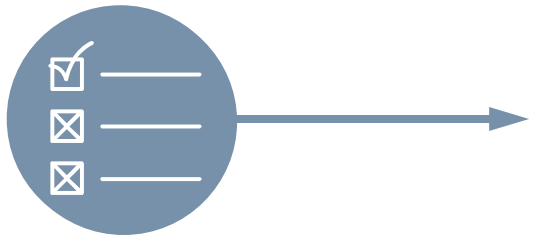
Next steps | For companies to take joint accountability and commitment to this topic, they should consider…

OPPORTUNITIES | NEXT STEPS



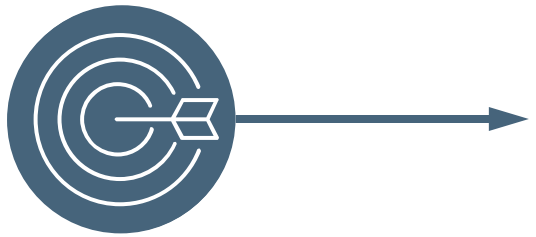
1. Increasing awareness

Opportunity to **improve awareness** of how companies **impact ocean sustainability** and how they are exposed to changing ocean conditions



2. Management structures

Opportunity to **increase maturity of how to manage ocean sustainability** – incl. developing more mature structures and expanding capacity to address it



3. Target setting

Opportunity to **improve target setting for ocean sustainability** – incl. how quantifiable targets are set and how extensively relevant topics are tracked

4. Actions & Initiatives

Opportunity to **raise the bar for actions taken** and become an ocean sustainability front-runner – incl. number of actions taken and impact areas addressed

All of the above is enabled by **strong stakeholder engagement:**

Continued engagement with WWF and other NGOs

Advocacy for the required regulation

Collaboration and partnerships within and across sectors

Frameworks & resources

RECAP | There are a number of critical and interrelated pressures on the ocean's ecosystem that are caused by human activities and must be addressed

KEY ISSUES IMPACTING OCEAN'S ECOSYSTEMS

Water pollution	Direct habitat disruption	Species interference	Climate change

UNDERLYING PRESSURES

Marine litter	Disturbance of seafloor	Extraction of species	GHG emissions
Chemical pollutants / contaminating compounds	Underwater noise	Introduction of non-native species	*See next page for the explanation of the interdependencies between climate change and loss of biodiversity*
Nutrients and organic enrichment	Other physical change to environment	Other negative impact on animal populations	

Focus of this material

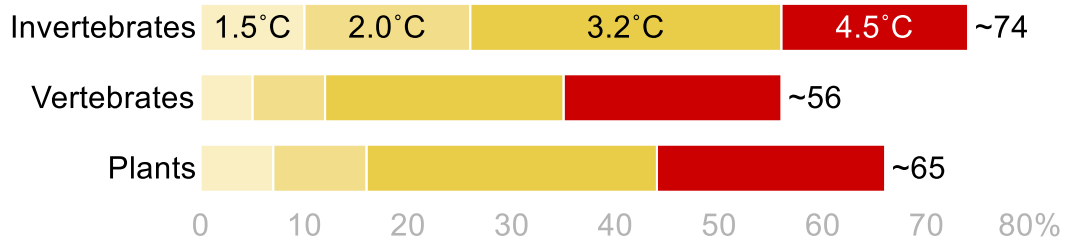
Source: WWF; ICES

Climate change and biodiversity challenges highly related via feedback loops; global warming and ocean acidification accelerating biodiversity loss and vice versa

Rising temperatures and ocean acidification are putting extreme pressure on the ocean's ecosystem

1 Rising temperatures are accelerating biodiversity loss

Species loss: % of species that lose at least half of their habitat (high risk of extinction) in different climate scenarios (mean values; 1.5˚C, 2.0˚C, 3.2˚C, 4.5˚C)



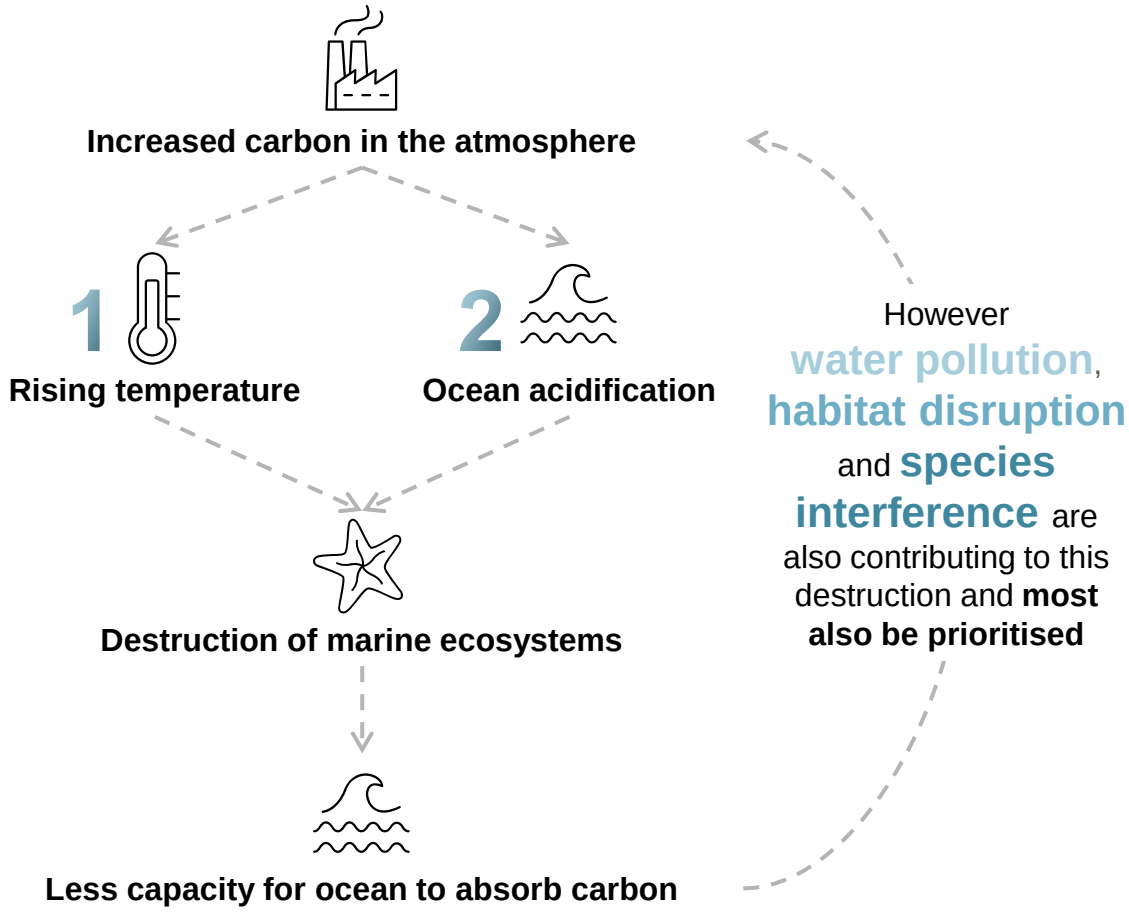
2 Ocean acidification perpetuates biodiversity loss and limits further carbon absorption

20-30%
excess CO2
Absorbed by ocean since pre-industrial era

↑30%
acidification
observed during the 20th century

↑2-3x
acidification
In ocean expected by 2100

The impact of this is self-compounding as the ocean becomes less and less able to serve as a 'carbon sink'



Source: IPCC (2022), Zurich (2022); Copernicus (2022)

Water Pollution | Marine litter, chemical pollutants, and nutrient enrichment contribute to water pollution, most of which is from land-based sources

	Marine litter	Chemical pollutants / contaminating compounds	Nutrients and organic enrichment
WHAT IS IT?	• Marine litter consists of all **man-made solid items/fragments** that have been disposed directly into marine environments or transported from land to sea • **Plastic accounts for ~80%** of marine litter	• Chemical pollutants include a **range of toxic and non-toxic pollutants** • E.g. metals, petroleum products, pharmaceutical products, detergents, biocides, and other chemicals	• Nutrients and organic enrichment are based on **excess nutrients from ocean-based and land-based activities** • E.g. nitrogen and phosphorus from fertilizers, sewage and other sources
WHAT IS THE IMPACT?	• Larger items can cause **physical harm to marine animals**, e.g. from ingestion and entanglement • Microplastics may pose further physical **and toxicological risk** • The impact is worsened by **slow rate of degradation** for most items (particularly plastics)	• Chemical pollution may impact the ocean ecology in several ways, including affecting animals' **ability to reproduce**, **survival rates of offspring and health of coral reefs** • Chemical pollution can also **cause toxins to enter the food chain**, impacting animal and human health	• Excessive nutrients may lead to **eutrophication** (excess growth of algae and plants in coastal water), which can cause **ocean acidification** and **reduced oxygen levels** • Additional impact includes **uninhabitable conditions** for coral reefs and marine animals
KEY METRICS	**14+** **million tonnes** of plastic ends up in oceans each year **20-500** **years** for plastics to degrade	**300-400** **million tonnes** of heavy metals, solvents, toxic sludge and other waste **dumped into oceans per year**[1]	**23%** **of European seas** have eutrophication problems[2], particularly in the Baltic sea

Note: (1) "The First Global Integrated Marine Assessment: World Ocean Assessment I" (2016) – UN report; (2) Based on the assessed areas in the EEA report "nutrient enrichment and eutrophication on Europe's seas" (2019).
Source: WWF; National Geographic; UNEP; AZO Cleantech; European Environment Agency; International Union for Conservation of Nature (IUCN); US National Ocean Service; OneOcean Flotilla

Direct habitat disruption | Habitats can be disrupted by disturbance of seafloor, underwater noise and other physical changes, including hydrographical changes

	Disturbance of seafloor	Underwater noise	Other physical change to environment
WHAT IS IT?	• Seafloor disturbance is caused by e.g. **construction work** (e.g. offshore energy installations), **aggregate extraction,** and **bottom trawling** • The **seafloor is habitat** for benthic plants and animals, and stores carbon	• Noise pollution originates from **machinery and equipment** (e.g. ship engines and propellors), and other **marine activities** (e.g. pile driving, seismic surveying and drilling)	• Other physical changes include water **turbidity** and **sediment plumes**, **light pollution**, hydrographical changes, etc. • These effects occur from e.g. mining and extraction, and construction work
WHAT IS THE IMPACT?	• Significant damage to the seafloor with benthic species killed, injured or dislocated • **Resuspension of sediment can cause additional harm** by e.g. clogging gills, release nutrients, leading to curtailed number of animals and biodiversity; additionally, it **may disrupt sediment carbon storage**	• Potential **direct harm** to marine animals, (e.g. physiological stress, hearing loss), **and behavioural change** due to interference with natural sounds (used to communicate, navigate) • **Noise pollution is exacerbated by water**, thus potentially affecting large ocean areas	• Light pollution may **disorient, attract or repel** marine animals • Sediment plumes may spread, and **harm suspension-feeding fauna** • Hydrographical changes may alter e.g. **currents and waves**
KEY METRICS	**79%** of EU coastal seafloor is disturbed by bottom trawling	**4x** faster transport of sound in water than air **60x** further travel of sound in water than air	**2 million km²** Nearly 2 million square kilometres of ocean gets night light pollution (including land-based pollution from cities)

Source: WWF; International Association of Oil & Gas Producers; U.S. Geological Survey; US National Ocean Service; Danish Fisheries Association (via The Fishing Daily); ScienceNewsExplores; Pictures: Dredging Today (Xanthe Rivett/CAFNEC/WWF-Aus)

Species interferences | Overfishing, bycatch, invasive species and collisions are disrupting ecosystems and may cause harm to species

Extraction of species

WHAT IS IT?

- Extraction of species includes **intended or unintended over-extraction from human activities**, particularly fishing
- Two severe challenges are **overfishing**, i.e. faster extraction than replenishment and **unwanted bycatch**

WHAT IS THE IMPACT?

- Overfishing, i.e. population reduction, can **harm ecosystems' balances** long-term
- Bycatch are unintentionally **harming and killing** vast amount of marine animals, including **endangered species**
- Overfishing may limit access to seafood

KEY METRICS

40%+

of NE-Atlantic fish populations are overfished

4

million tonnes
of bycatch are caught from bottom trawling per year

Introduction of non-native species

WHAT IS IT?

- Introduction of non-native species refers to **transport or release of species** in waters they are not normally part of the ecosystem
- Non-native species are introduced by **shipping** (e.g. biofouling) and release from **fishing and aquaculture**

WHAT IS THE IMPACT?

- Non-native species may be **invasive**, thus altering ecosystems through e.g. **disruption of native habitats**, **extinction** of flora and fauna (e.g. predation or out-competing on space and resources) and **spreading of diseases**

KEY METRICS

640 non-native species

have invaded European waters since 1970 (excluding microalgae, pathogens and parasites)

Other negative impact on animal populations

WHAT IS IT?

- Negative impact on animal populations is incidents causing unhealthy populations or **undesired population sizes**
- This includes for instance **collisions** (e.g. cetaceans colliding with ships, and birds with wind turbines), and **pest outbreaks**

WHAT IS THE IMPACT?

- Collisions may result in **physical trauma or death** of the animal, and **potential longer-term** decrease in populations from mortality
- Deliberate inhumane treatment (e.g. on fishing vessels, or slaughtering) **is inherently negative**

KEY METRICS

75+

Species are affected by ship collisions

Source: WWF; European Environment Agency; UNFCCC; OCEANA; National Geographic; National Oceanic and Atmospheric Administration (NOAA); A Global Review of Vessel Collisions With Marine Animals (2020); AnimalEquality; Pictures: International fund for Animal Welfare (Souffleurs d'Ecume); NOAA

KEY ISSUES

Organizations should prioritize actions based on the key issues in their industry

/ NOT EXHAUSTIVE

Shipping & logistics

There are a number of initiatives companies can do within their own operations to…

- **Limit water pollution** from vessel and port operations (both marine litter and chemical pollutants)
- **Reduce underwater noise** from vessel operations
- **Limit seafloor disturbance** from port construction and maintenance
- **Avoid introducing non-native species & other negative impact on animal populations** from vessel and port operations

Fishing & aquaculture

- **Limit marine litter** from equipment and operations
- **Limit seafloor disturbance** specifically relevant for bottom trawling
- **Avoid extraction of species** that is un-intentional or unsustainable
- **Limit other negative impact on animal populations** for example through parasite outbreaks

Offshore extraction

- **Avoid water pollution from chemical pollutants** in water from e.g. oil spills
- **Limit seafloor disturbance** within aggregate extraction and oil & gas rigs/infrastructure
- **Reduce underwater noise** particularly during construction and operations
- **Limit other negative impact on animal populations** through collisions, change to migration path etc.

Offshore RES

- **Limit marine litter** from operations (e.g. wear and tear of blades)
- **Limit seafloor disturbance** of offshore windfarms and related infrastructure
- **Reduce underwater Nosie** particularly during construction and operations
- **Limit other negative impact on animal populations** through collisions, change to migration path etc.

Coastal activities

- **Limit water pollution** from land-based activities (including marine litter, nutrient enrichment and chemical pollutants)
- **Avoid habitat disruption** from tourism activities generating underwater noise or other habitat disruption

Financial institutions – actions to reduce impact across industries

Water pollution | **Direct habitat disruption** | **Species interference**

Shipping & logistics | Idea catalogue for reduction of impact from operations based on key issues for industry

OPPORTUNITIES | SHIPPING & LOGISTICS

Legend
- Water pollution
- Direct habitat disruption
- Species interference

/ NOT EXHAUSTIVE

Action	Initiative examples
Limit water pollution (from marine litter and chemical pollutants)	– Manage **waste and scrubber discharge** (both on ships and via port reception facilities), adhering to MARPOL Annex V[1] – Invest in research on **ship paint** that limit microplastic and biocides – Implement port facilities and procedures for **material recycling and re-use** (e.g. from ship deconstruction) – Use **lightweight composite materials** (e.g. fiber-reinforced plastic), limiting fuel consumption and increased durability
Reduce underwater noise	– Reduce **sailing speed** – Optimize **port calls**, limiting waiting and queues – Design ship hull and propellors to e.g. **limit noisy cavitation** – Use **noise-reducing machinery** (e.g. electrification), and insulation techniques
Limit seafloor disturbance	– Investigate and mitigate **anchoring impacts** on sensitive habitats – Avoid **dredging and dumping** of marine aggregates in or near areas with important ecological habitats
Avoid introduction of non-native species	– Further develop and use **efficient antifouling coating**, whilst ensuring potential negative impact from e.g. copper or biocides is limited – Adhere to strict standards on **ballast water management**
Limit other negative impact on animal populations	– Implement **Collision Risk management Plans** (adhering to COLREGS[2]) – **Re-route ships** to avoid areas with important ecological habitats (incl. co-location of routes)
Across actions	– Support the implementation of **necessary regulation** to reduce e.g. biofouling, hull cleaning in ports, underwater noise, and incentivise ecology-friendly sailing routes, ship recycling, reporting systems for litter and pollution

Note: (1) Regulation of the International Convention for the Prevention of Pollution from Ships (MARPOL); (2) International Regulations for Preventing Collisions at Sea
Source: WWF; International Maritime Organization (IMO); European Maritime Safety Agency (EMSA); European Maritime Transport Environmental Report 2021 – European Environment Agency and EMSA; EU Horizon; Bain IP; lit. search

Fishing & aquaculture | Idea catalogue for reduction of impact from operations based on key issues for industry

OPPORTUNITIES | FISHING & AQUACULTURE

Legend
- Water pollution
- Direct habitat disruption
- Species interference

/ NOT EXHAUSTIVE

Action	Initiative examples
Limit marine litter	– Use more **sustainable equipment**, e.g., tear-resistant, copper-free nets – Conduct more **frequent inspections** of gear and equipment – Develop **effective protocols** surrounding loss, reporting and retrieval of **lost gear**
Limit seafloor disturbance	– **Use different gear** to reduce damage to habitats (e.g. lighter-weight nets, mechanisms to lift net above seafloor) – **Limit mobile, bottom-contacting gear** and/or advocate for establishing protected zones
Avoid unintentional or over-extraction of species	– Use gears and technology with higher **selectivity** to reduce bycatch (e.g. Turtle Exclusion Devices) – Support adoption of **fully documented fisheries** (i.e. camera control) – **Maximise usage of fish/materials extracted**, e.g. by using low-priced fish parts in processed products – Support establishment of permanent or temporal **closed areas** – Use only **sustainably caught fish for feed** production
Limit other negative impact on animal populations	– **Prevent overcrowding** and manage water quality to mitigate risk of disease and manage fish stress level (reducing escapes)
Across actions	– Encourage implementation of **marine protected areas** in essential fish habitats – Advocate for industry specific regulations e.g. **fishing quotas**; **quality regulations** for fishing equipment etc.

Source: Ocean's Future to 2050 (2021) – DNV; Bain IP; Lit. search

Offshore extraction | Idea catalogue for reduction of impact from operations based on key issues for industry

OPPORTUNITIES | OFFSHORE EXTRACTION

Legend
- Water pollution
- Direct habitat disruption
- Species interference

/ NOT EXHAUSTIVE

Actions	Initiative examples
Avoid water pollution from chemical pollutants	– Limit water-based **drilling fluids** – Limit discharge **chemical pollutants**, e.g. produced water, esp. in vulnerable areas – Effective **monitoring** of water pollution
Limit seafloor disturbance	– Use baseline ecological survey data and **wildlife sensitivity mapping** to limit installation impact on seafloor, habitats and species – Avoid **dredging and dumping** of marine aggregates in areas with important ecological habitats – Ensure **sediment control** measures, e.g. aggregate dredge disposal in sediment-disposal areas (e.g. using fall pipes) – Implement **adaptive maintenance dredging**[2]. i.e. use real-time hydrographical data to determine need
Reduce underwater noise	– Use **soft-start**[1] to give animals time to escape the acute noise and physical impact – **Schedule activities** to limit impact in ecologically sensitive periods (e.g. for migratory species, fish spawning, etc.) – Use **noise-limiting foundation technologies** e.g. vibratory hammers
Avoid other habitat disruptions	– **Monitor effects** of biodiversity measures, e.g. artificial reefs – **Limit use of light** used in construction and from flaring – Thoroughly **assess impacts on deep sea species**, habitats and conditions from deep sea mining
Limit other negative impact on animal populations	– Implement **Collision Risk management Plans** (adhering to COLREGS[3])
Across actions	– Support development of regulations to **ban non-emergency flaring and venting** – Support development of **MSP** and regulations on utilization of **deep-sea areas**

Note: (1) Start with low levels of acoustic activity, then gradually increase; (2) Ensuring minimum depth of seafloor in relation to e.g. ship navigation and berthing; (3) International Regulations for Preventing Collisions at Sea; Source: WWF; International Maritime Organization (IMO); Environmental management in the upstream oil and gas industry (2020) – report by IOGP & IPIECA; Harmful Marine Extractives – UN Environment Programme reports; International Seabed Authority

Offshore RES (1/2) | Idea catalogue for reduction of impact from operations based on key issues for industry

OPPORTUNITIES | OFFSHORE RES

Legend
- Water pollution
- Direct habitat disruption
- Species interference

/ NOT EXHAUSTIVE

Actions	Initiative examples
Limit marine litter	– **Wear-resistant materials** and components (e.g. turbine blades to limit microplastic pollution) – Improve circularity in material flows (e.g. recycling of turbine blades)
Limit habitat disruption (primarily from seafloor disturbance and noise pollution)	– Use **wildlife sensitivity mapping and marine spatial planning (MSP)** to locate parks with limited impact on seafloor, habitats and species – **Co-locate** with existing and future submerged infrastructure – Ensure **sediment control** measures, e.g. aggregate dredge disposal in sediment-disposal areas (e.g. using fall pipes) – Use lowest impact methods when **burying cables** – **Enhance biodiversity on-site** (e.g. artificial reefs) where appropriate, and **compensate impact** from restoration elsewhere in seascapes – **Monitor effects** of biodiversity measures, e.g. artificial reefs – **Schedule construction and on-site activities** to limit impact in ecologically sensitive periods – Use existing **noise-limiting foundation technologies** (e.g. suction bucket), or develop new ones – Limit **electromagnetic** impact (e.g. burying cables, improved insulation, collection in traces, etc.) – Promote regulation that prevents physical impact on seafloor to allow **coincidental rehabilitation of benthic fauna**

Note: (1) International Regulations for Preventing Collisions at Sea
Source: WWF; International Maritime Organization (IMO); Bain IP; European Commission notice C(2020) 7730; Sintef; Market participant interviews

Offshore RES (2/2) | Idea catalogue for reduction of impact from operations based on key issues for industry

OPPORTUNITIES | OFFSHORE RES

Legend
- Water pollution
- Direct habitat disruption
- Species interference

/ NOT EXHAUSTIVE

Actions	Initiative examples
Limit other negative impact on animal populations	– Use **visual and acoustic deterrents** and surveillance to limit harm to animals during construction and operations (i.e. to avoid collision) – Schedule **temporary shut-downs** to limit collision risk (e.g. during mass-migration) – **Monitor bird/bat presence** in real-time – Design wind farms to limit collisions, e.g. by **paint colour**, use of **lighting and bird corridors** between turbines – Implement **Collision Risk management Plans** (adhering to COLREGS[1])
Across actions	– Develop and **support tender criteria** promoting ocean sustainability – Invest in **knowledge development**, and share knowledge within and across industries (e.g. on sustainable OFW projects)

Note: (1) International Regulations for Preventing Collisions at Sea
Source: WWF; International Maritime Organization (IMO); Bain IP; European Commission notice C(2020) 7730; Sintef; Market participant interviews

Coastal activities | Idea catalogue for reduction of impact from operations based on key issues for industry

OPPORTUNITIES | COASTAL ACTIVITIES

Legend
- Water pollution
- Direct habitat disruption
- Species interference

/ NOT EXHAUSTIVE

Action	Initiative examples
Limit water pollution from marine litter	– Use recyclable packaging and improve **material circularity** – Ensure **closed loop waste management**
Limit water pollution from chemical pollutants	– Improve sustainability of products through **green chemistry** – Ensure **lower emission of nutrients** to coastal waters – Improve offshore and onshore **waste management** – Install **wastewater treatment systems** within production facilities for pharmaceuticals, chemicals, metals, etc. – Shift to **less harmful solvents** for agricultural, pharmaceutical and manufacturing operations – Set stricter sustainability **requirements for suppliers** (e.g., sustainable fertilizers)
Limit water pollution from nutrient enrichment	– Create **wetlands** to capture excess nutrients from farms – Phase out release of untreated **sewage** – Introduce **organic farming** practices – Source more **sustainable animal feed**
Limit habitat disruption	– **Change sailing/cruising routes** to avoid sensitive marine habitats – Avoid **anchoring** of pleasure crafts in seagrass and other sensitive areas
Across actions	– Promote **sustainable, restorative tourism** and related activities – Promote **waste reduction and circular economy models**; implement regulations on waste disposal (esp. of hazardous waste and manure); – Develop measures to **reduce the use of pesticides, fertilizers and antibiotics**

Source: Good Practices for Sustainable Cruise Tourism – European Commission (2022); Reduce environmental impacts of pharmaceuticals along the value chain – Swedish Environmental Research Institute (2020); Lit. search

Financial services | Idea catalogue for reduction of impact from operations based on key issues for industry

OPPORTUNITIES | FINANCIAL SERVICES

Legend
- Water pollution
- Direct habitat disruption
- Species interference

/ NOT EXHAUSTIVE

Action	Initiative examples

Across actions	– **Ensure a structured and consistent investment approach**
	  – Implement the **Make Oceans Count** 3-step approach for financial institutions
	  – Assess investments and influence portfolio companies in accordance to **UN's Turning the Tide framework**
	– **Incentivize ocean conservation and restoration**
	  – Implement **conservation bonds** or other bonds classified as **blue or green**
	  – Investigate **other financial products** for ocean conservation/restoration (e.g. insurance, conservation bonds, etc.)
	  – **Advocate** for action from public institutions, **e.g. incentives** for ocean-positive financial products
	  – Support innovation by setting targets and standards for investing in ocean-positive **startups and innovation** projects
	  – **Review and re-design existing subsidy schemes** that cause perverse incentives for activities that cause direct and indirect harm to marine environments
	– **Collaborate with private or public institutions to de-risk or optimize product portfolio**
	  – Explore **blended-finance mechanisms** where finance provided by state-owned financing funds can provide a leverage effect
	  – Initiate partnerships with other private and public **financial institutions**
	  – Acquire inhouse or outsourced **technical expertise on ocean sustainability**
	  – Consider joining existing **coalitions** or expert networks (e.g. join UNEP's Sustainable Blue Economy Finance Initiative)

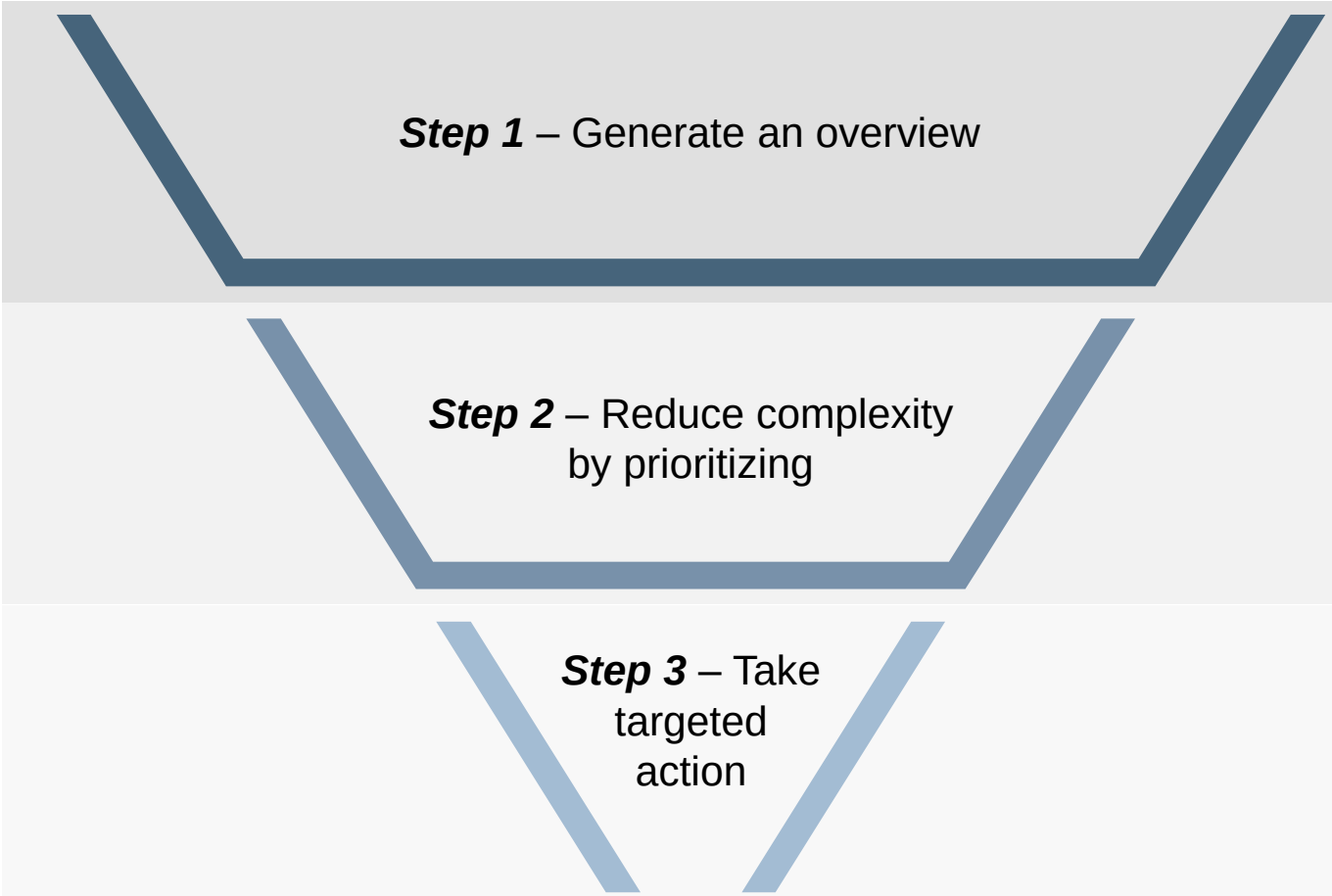
Explanations in next pages

Source: WWF; Turning the Tide: How to finance a sustainable ocean recovery (2021) – UN environment programme; 1000 Ocean Startup; Lit. search

Framework example | The Make Oceans Count project includes a suggested approach for environmental impact assessments for financial institutions

OPPORTUNITIES | FINANCIAL SERVICES

The 3-step Make Oceans Count[1] approach



- **High-level** portfolio risk and opportunities mapping
- Including **mapping** of key environmental pressures, geographical scope, and economic scope (direct/indirect; physical/transition; etc.)

- Focused **sector** investment analytics and risk management
- Including assessment of **company-specific activities** (incl. geographies), **business processes**, and **ocean-related impact**

- **Integration** into investment and data processes
- Assessment of the **company's experience and knowledge**; the **feasibility and costs** related to impact mitigation, their **access to capital**, and the investor's **possibility to influence** the company's decisions

Note: (1) Make Oceans Count, a project on how to help financial institutions measure, manage and reduce ocean-related dependencies and impact; co-developed by WWF and six pension funds
Source: WWF Make Oceans Count project

Framework example | The UN Turning the Tide framework is set up to guide investment decisions based on industry specific indicators

OPPORTUNITIES | FINANCIAL SERVICES

UN Turning the Tide framework[1] (summary version)

Industry	Topic	Indicator	SDG
Fishing and aquaculture	Illegal, unreported and unregulated (IUU) fishing	• Evidence of IUU • Lack of transparency on fishing technique	14.2 14.4 16.2
Shipping and ports	Water pollution	• Introduction of invasive species through ballast water and biofouling • Ship noise exceeds recognized thresholds	12.4 14.2
Offshore RES	Pollution	• No measures to limit noise from seismic exploration • Sharing of best practices to mitigate impact	14.1
Coastal tourism and industry	Physical impact on habitat	• No limit on visitor traffic in marine protected areas • Cruise ships keeping minimum distance from critical habitat	14.2

Examples of industries, and corresponding topics and indicators

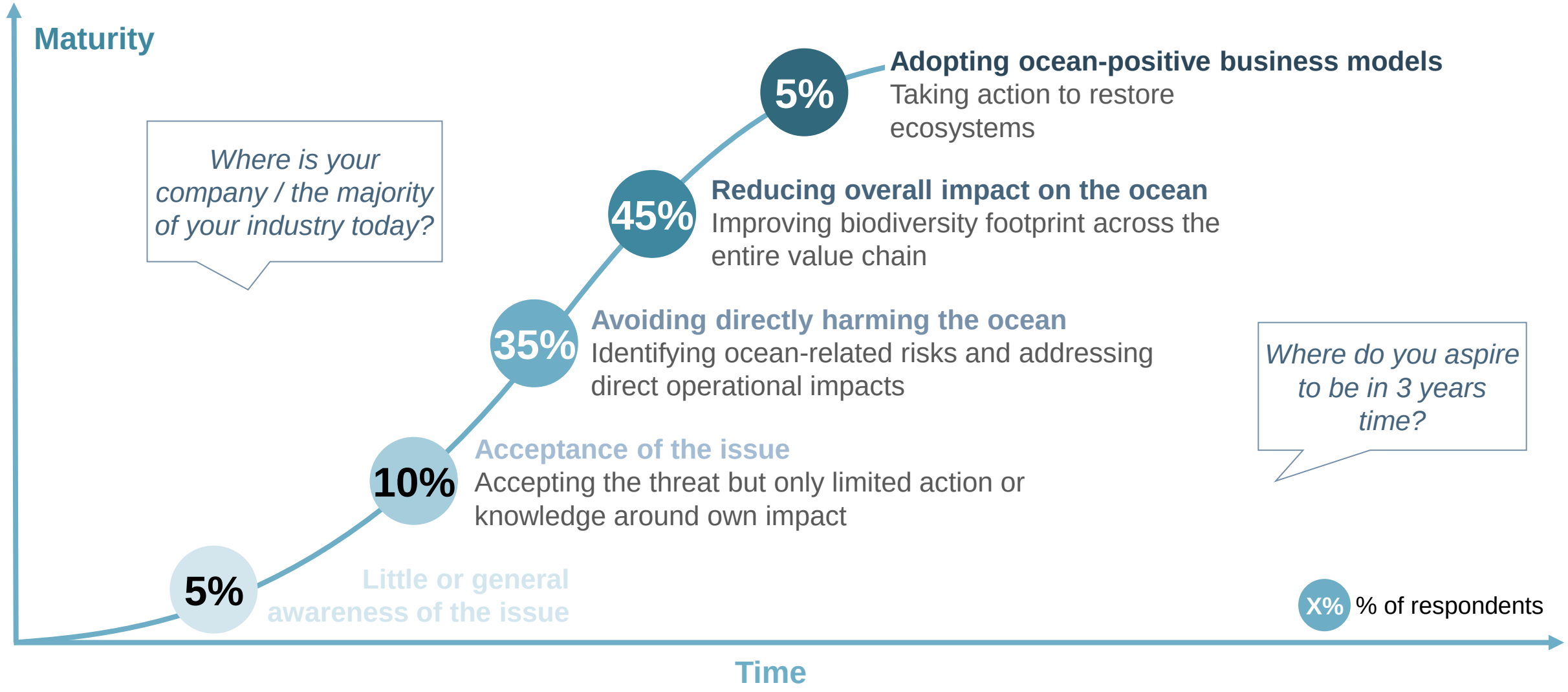
Classify each indicator to assess the company

- Seek out investment
- Challenge company
- Avoid investment

Note: (1) Short version of the UN Turning the Tide framework for assessment of investments, with industries slightly adjusted to fit our categorization
Source: Turning the Tide: How to finance a sustainable ocean recovery (2021) – UN environment programme

Considering ocean sustainability, 50% of companies assess themselves as relatively mature by taking actions to reduce or eliminate their negative impact on the ocean

WHERE ARE WE NOW?



Source: Blue Economy survey 2023 (WWF and Bain & Company)

The principle of scope 1, 2 and 3 emissions can also be applied when considering impact on ocean sustainability

WHAT IS IN SCOPE?

Scope 1

Negative impact from **direct operations**, e.g.:

- Seabed disturbance and underwater noise and physical change from ship traffic and installation of offshore sites
- Capture of bycatch and introduction of non-native species during fishing operations
- Direct emissions from ship engines, production plants, agricultural machines etc.

Scope 2

Negative impact caused by **indirect activities**, e.g.:

- Chemical pollutants from pharmaceutical wastewater and improper disposal of medications
- Nutrient enrichment from agricultural wastewater and aquaculture operations
- Fossil energy used at ports, cruise ships, hotels or for the operation of manufacturing plants, agricultural machinery etc.

Scope 3

Negative impact **across the supply chain**, i.e. from the **production, management and application of raw materials** such as :

- Parts used in building of ships, wind farms, oil platforms etc.
- Fertiliser used in agriculture
- Management of chemicals transported via sea

While reducing scope 1 impact is imperative and under an individual company's control, we ***cannot achieve ocean sustainability without appreciation for scope 2 and 3 impact***

This can be done by raising ***awareness*** *around ocean sustainability* ***across the entire value chain*** *and working with suppliers to* ***improve the full life-cycle of operations***

Initiative ideation | Ideation can be facilitating by categorizing initiatives based on their purpose and how to mobilise those best suited to act

/FRAMEWORK

WHAT SHOULD WE DO?

	Raise awareness	Reduce impact	Restore balance
Through own operations			
Through partnerships			
Through advocating for regulation			

Prioritization of initiatives | Evaluating the impact and feasibility of initiatives can help guide prioritization

/FRAMEWORK

WHAT TO DO FIRST?