



# Maritime safety

## and wind farms at sea





# Roadmap 2030+

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Time frame

This is where we started

This is our destination

# Package of measures

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List of themes

# MOSWOZ themes

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1. Monitoring
2. Nautical safety and collision impact
3. Passage
4. Vessel Traffic Monitoring (VTMon)
5. Emergency Response Towing Vessels (ERTVs)
6. Hydro-Meteo
7. Anchorages
8. Crisis management
9. International dimension

# Planning and completion

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List of themes



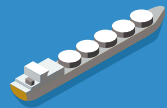
# What is the Roadmap 2030+

The Netherlands is striving to speed up wind energy production in the North Sea. It hopes to generate around 21 gigawatts (GW) of power from the wind farms instead of the previously agreed 11 GW.

Timeframe

Situation 2023

Situation 2031





# Roadmap 2030+

To reach the climate goals, the Netherlands and the EU are building additional wind farms in the North Sea. This has consequences for maritime safety. What is the time frame for wind energy in the Dutch North Sea?

Situation 2023

Situation 2031

**2005** The first Dutch offshore wind farm goes into production

**2013** Energy agreement to generate an extra 4.5 GW at sea every year

**2015** Allocation of wind energy areas in policy plan

Assessment framework for safe distances between shipping lanes and wind farms

Adjustment of shipping lanes around wind farms

**2018  
2019** Research into the cumulative effects of wind farms on maritime safety

Maritime Information Provision Service Point (MISP) in operation

**2016** Building of Borssele wind farms

Ministries of Economic Affairs and Climate Policy and Infrastructure and Water Management resolution on a maritime safety package regarding wind energy at sea. Package of measures starts

**2020**

**2021** Start of Offshore Wind Energy Shipping Safety Monitoring and Research Programme (MOSWOZ)

**2025** First comprehensive evaluation and policy recommendations for the purpose of modifying the measures if necessary

**2031**

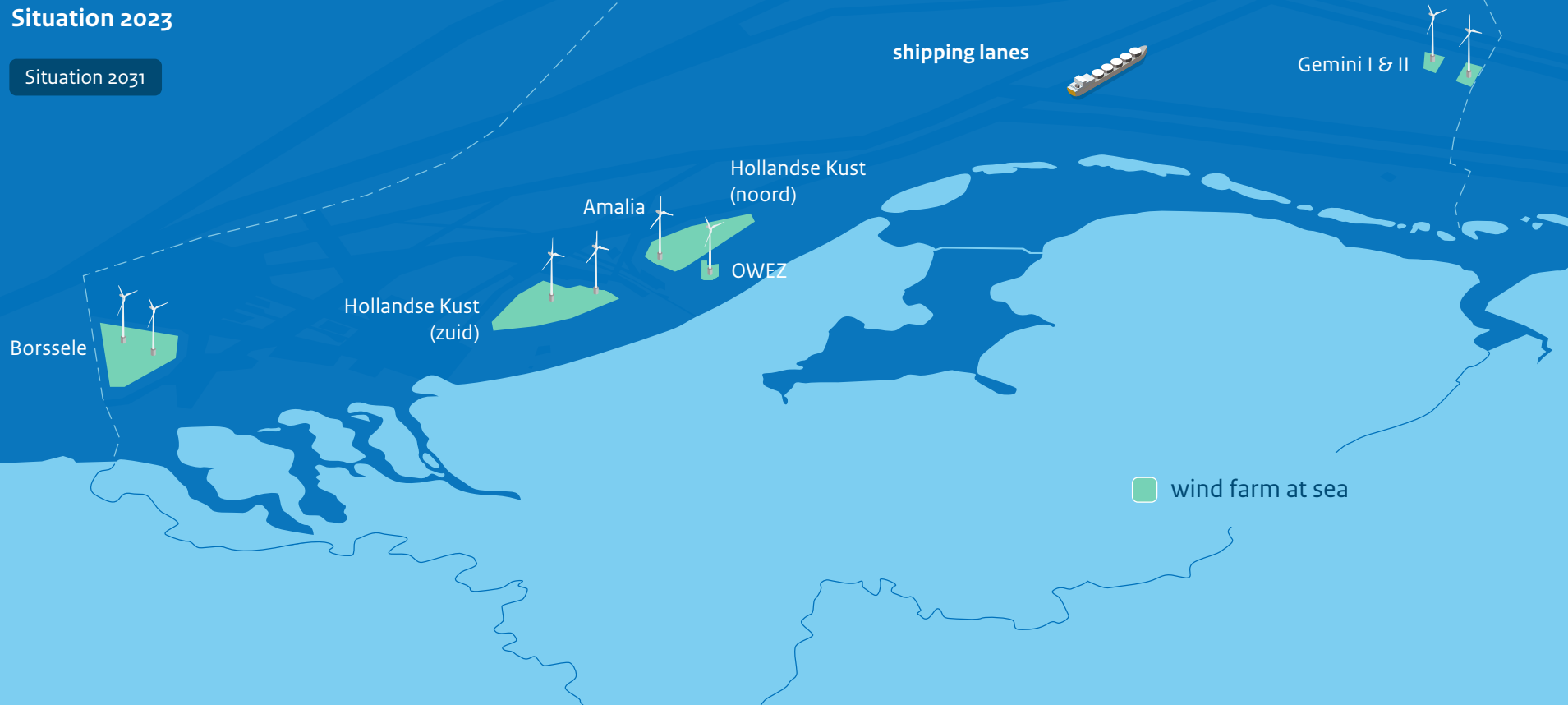
Expanding the scope with Nederwiek and Doordewind (from 11 to 21 GW by 2031)



# Our starting point

Situation 2023

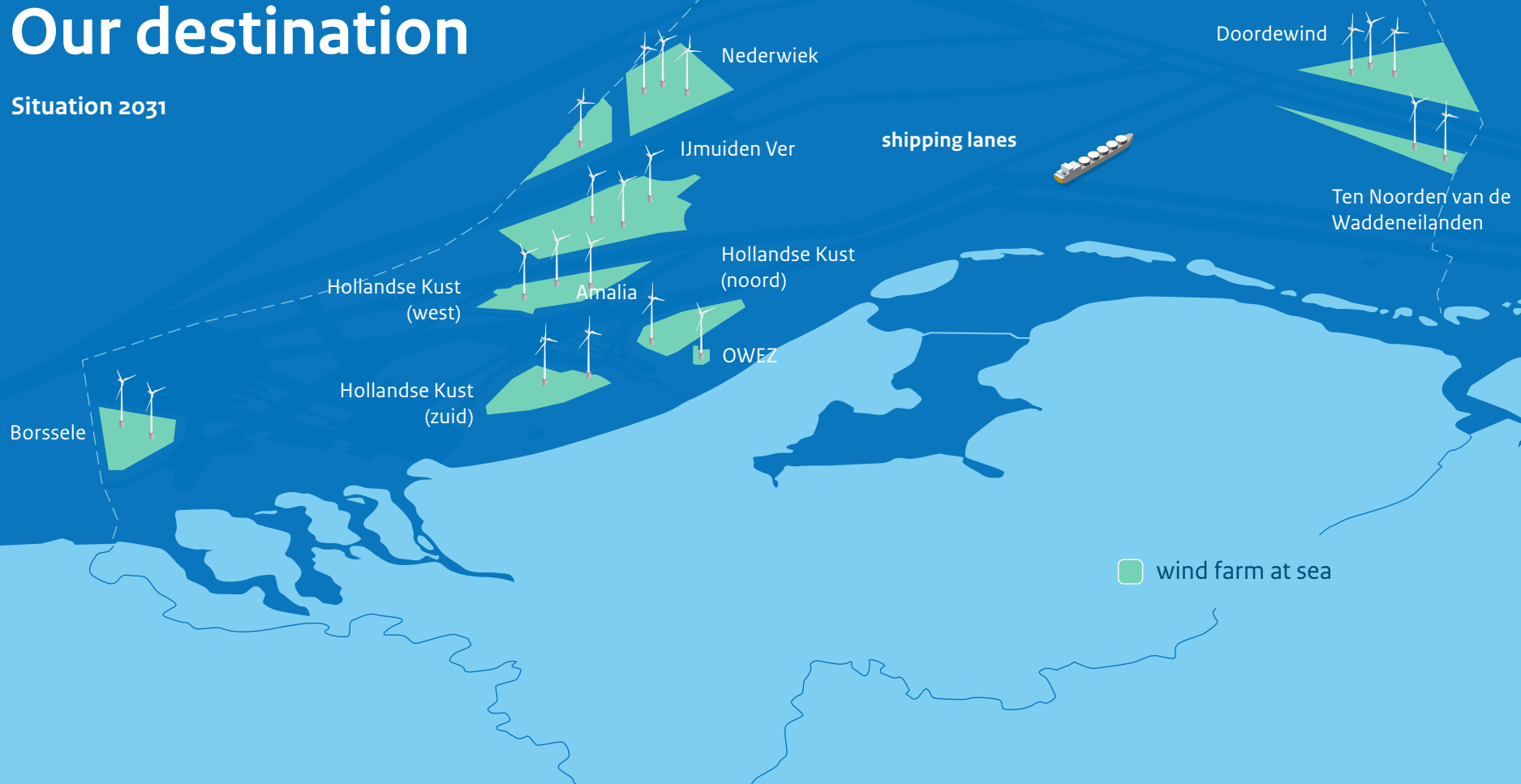
Situation 2031





# Our destination

Situation 2031

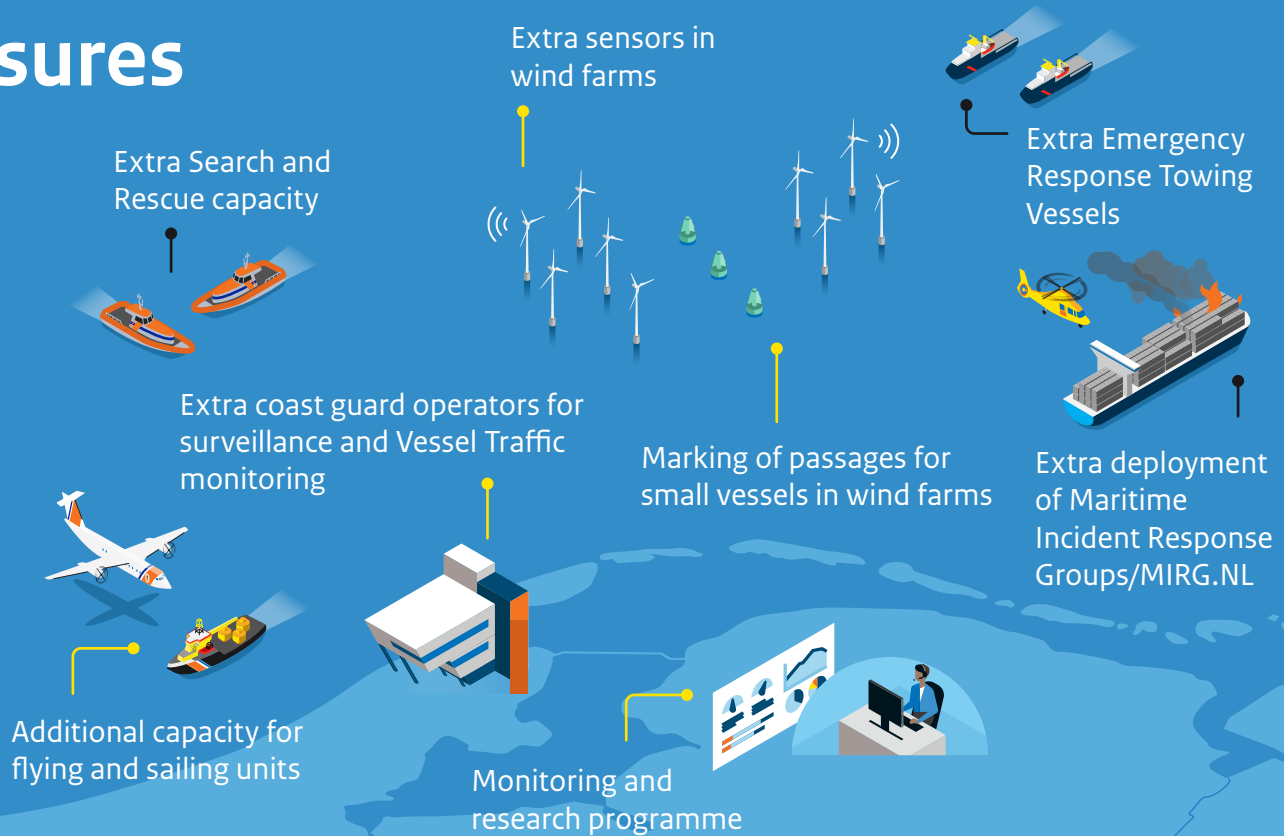




# Package of measures up to 2031

Our preventive and repressive measures keep the North Sea safe for shipping. We monitor their development and effectiveness so that we can advise on adjustments should the situation develop differently than expected. We do this through the MOSWOZ programme.

- Preventive measures
- Repressive measures





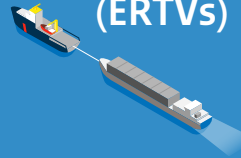
# Themes MOSWOZ

The monitoring and research programme is organised around themes. Each theme can be subdivided into parts.

## → Hydro-Meteo



## → Emergency Response Towing Vessels (ERTVs)



## → Vessel Traffic Monitoring



## → Passage way for small vessels



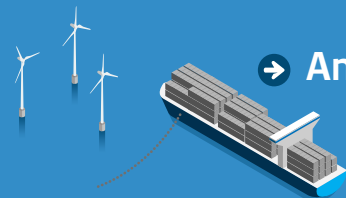
## → Nautical safety and collision impact



## → Monitoring



## → Anchorages



## → Crisis management



## → International dimension







# Monitoring

We closely monitor safety at sea.

- Do anticipated nautical risks really happen and, if so, in the way that was predicted?
- What unexpected occurrences are there?
- How effective and efficient are the measures used for maritime safety?

Sub-questions





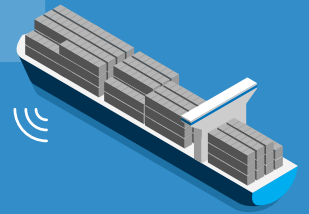
# Monitoring

## Sub-questions

What data and information are relevant and how do we gather them?

What are the most important trends and developments over the next 5 to 10 years, and what implications do they have for maritime safety?

How well do the sensors work and are there any relevant innovations?





# Nautical Safety and collision impact

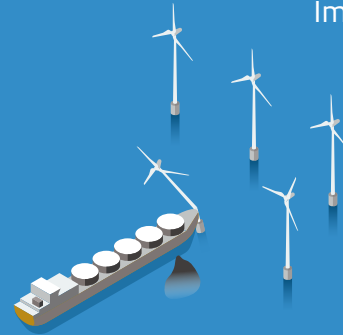
We analyse the events leading to and the impact of collisions in and close to wind farms at sea.

- What are the risks and consequences of collisions; how can we prevent collisions; and how can we limit damage?

## Sub-questions



Limiting collision damage



Implications of collision analysis



Preventing collisions



# Nautical Safety and collision impact

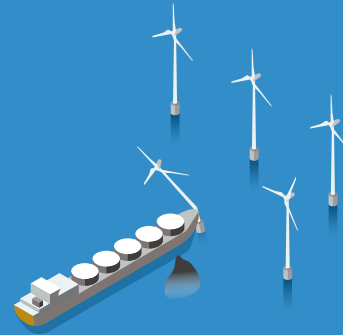
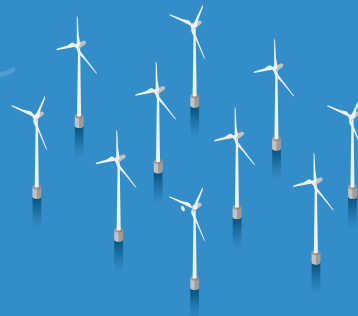
## Sub-questions

How do crews deal with the increasing complexity?

What are the potential consequences for humans, the environment and the economy?

What additional requirements do other countries set for wind turbines?

How will future developments (for example new fuels and hydrogen production) affect maritime safety in collisions?

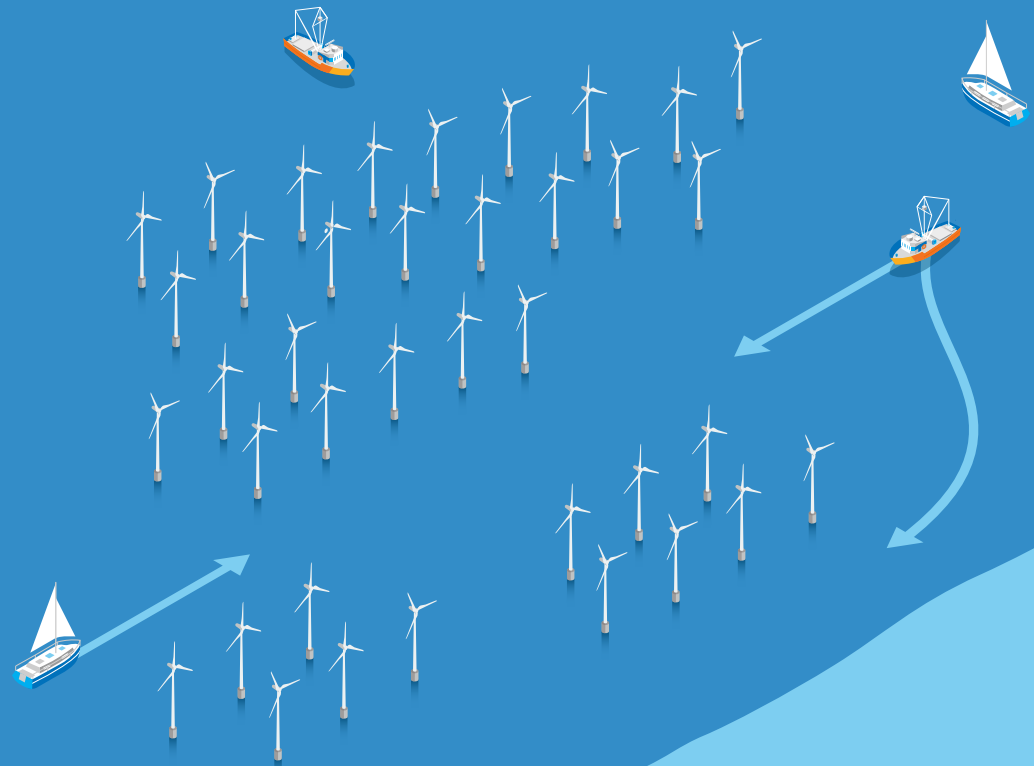




# Passageway for small vessels

We map the risks of passage through rather than around wind farms.

- Is optimising passage beneficial or not for maritime safety?
- What is the interaction between vessels entering, exiting or crossing each other that sail around wind farms and between vessels that traverse wind farms?
- What is the impact of the different shared uses of wind farms on maritime safety?





# Passageway for small vessels

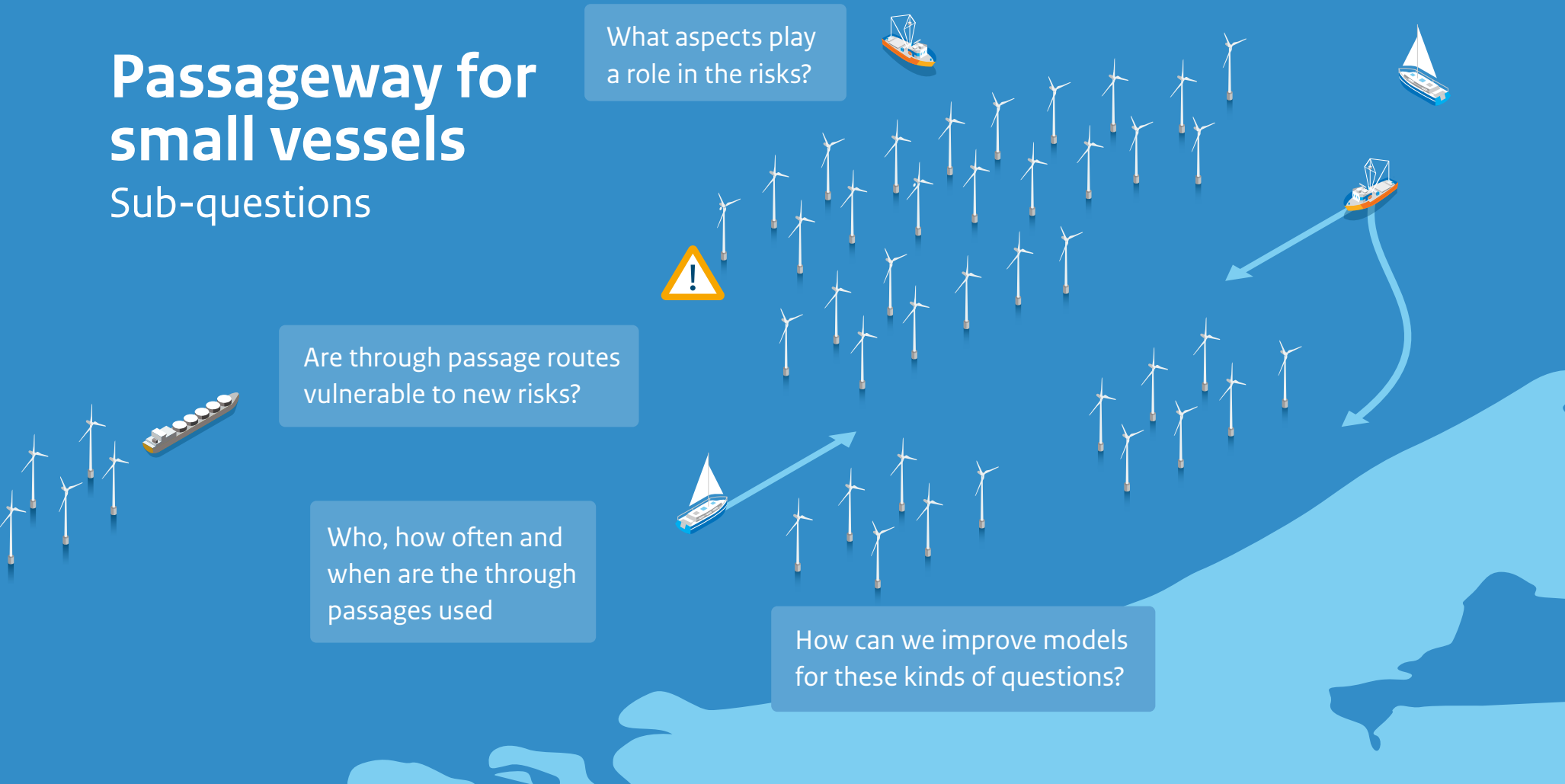
## Sub-questions

What aspects play a role in the risks?

Are through passage routes vulnerable to new risks?

Who, how often and when are the through passages used

How can we improve models for these kinds of questions?





# Vessel traffic monitoring VTMon

The Coast Guard issues information on the situation in and around wind farms and warns for potential dangers. The emergency response is coordinated in case of incidents.

- How can traffic monitoring best help improve the safety of shipping in and close to wind farms?

Sub-questions





# Vessel traffic monitoring VTMon

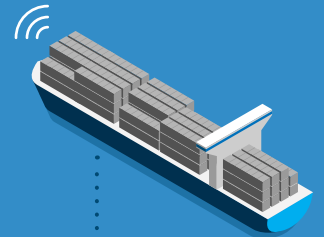
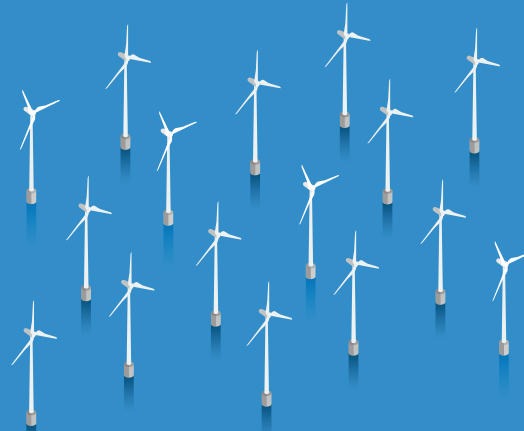
## Sub-questions

Do any particular areas have higher risks (hotspots)?

How can we foster greater national and international coordination with harbours, North Sea countries, and international fora?

What vessel traffic services do we want to and can we offer?

What is desirable and necessary?





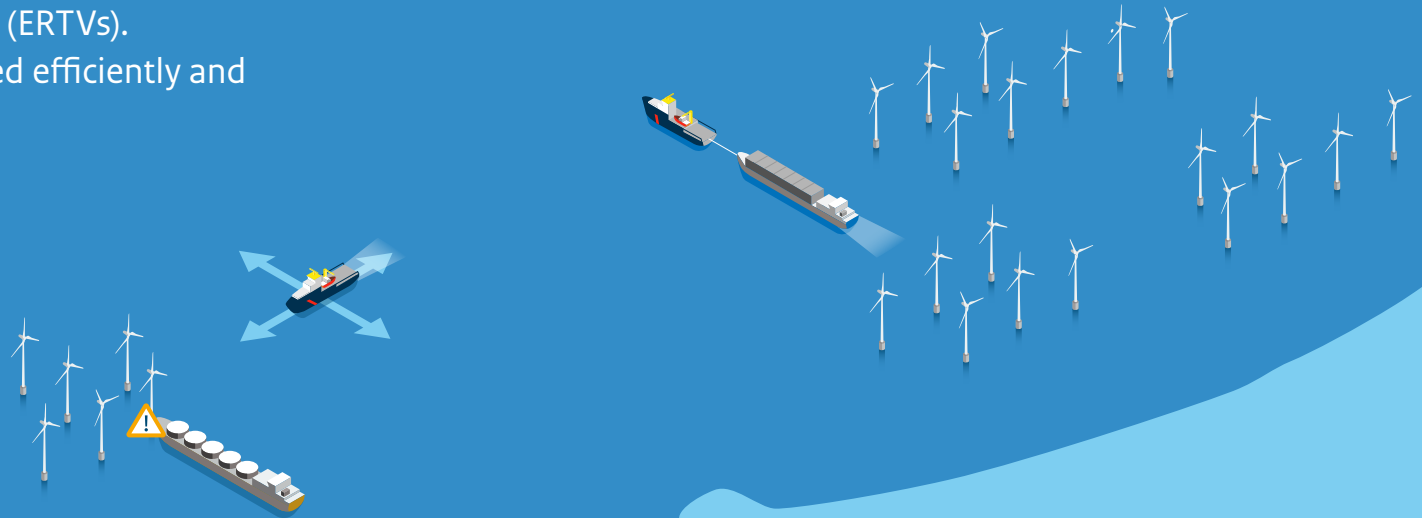


# Emergency Response Towing Vessels

The Coast Guard tries to prevent accidents and helps vessels in emergencies with Emergency Response Towing Vessels (ERTVs).

- How can ERTVs be used efficiently and effectively?

Sub-questions





# Emergency Response Towing Vessels

## Sub-questions

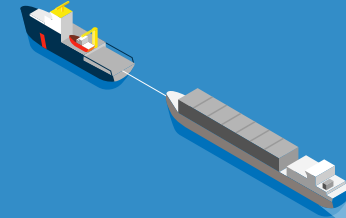
What factors are relevant for the successful use of ERTVs?

What are the possibilities and limitations, legal and otherwise, for using ERTVs?

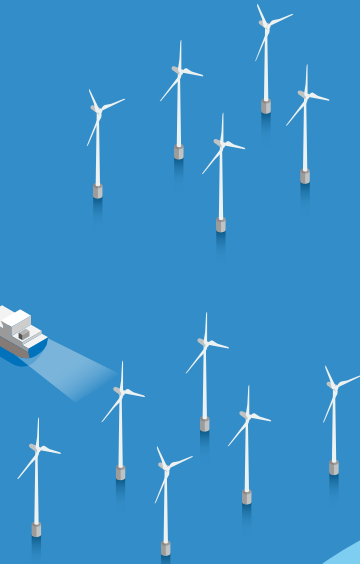
Borssele



How can we bring about the optimal use of Emergency Response Towing Vessels? What is a good way of working and what is needed for this?



Hollandse Kust





# Hydro-meteo

What impacts do wind farms have on the local weather and water conditions of the North Sea that are relevant for maritime safety?

Sub-questions



Disruptive turbulence



Water currents and wave patterns



Mist and cloud formation





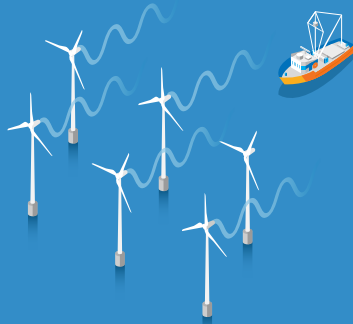
# Hydro-meteo

## Sub-questions

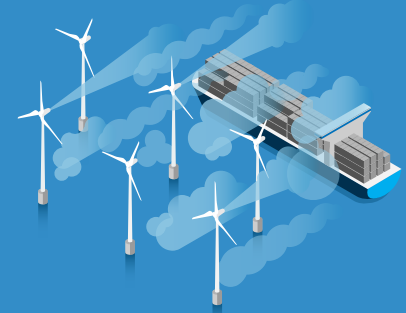
What conditions are dangerous for shipping? These could include wave action, currents, wind speeds and direction, turbulence and visibility.



What effects affect maritime safety and what mitigation measures are feasible?



Can additional current Hydro-Meteo information help ensure safety?

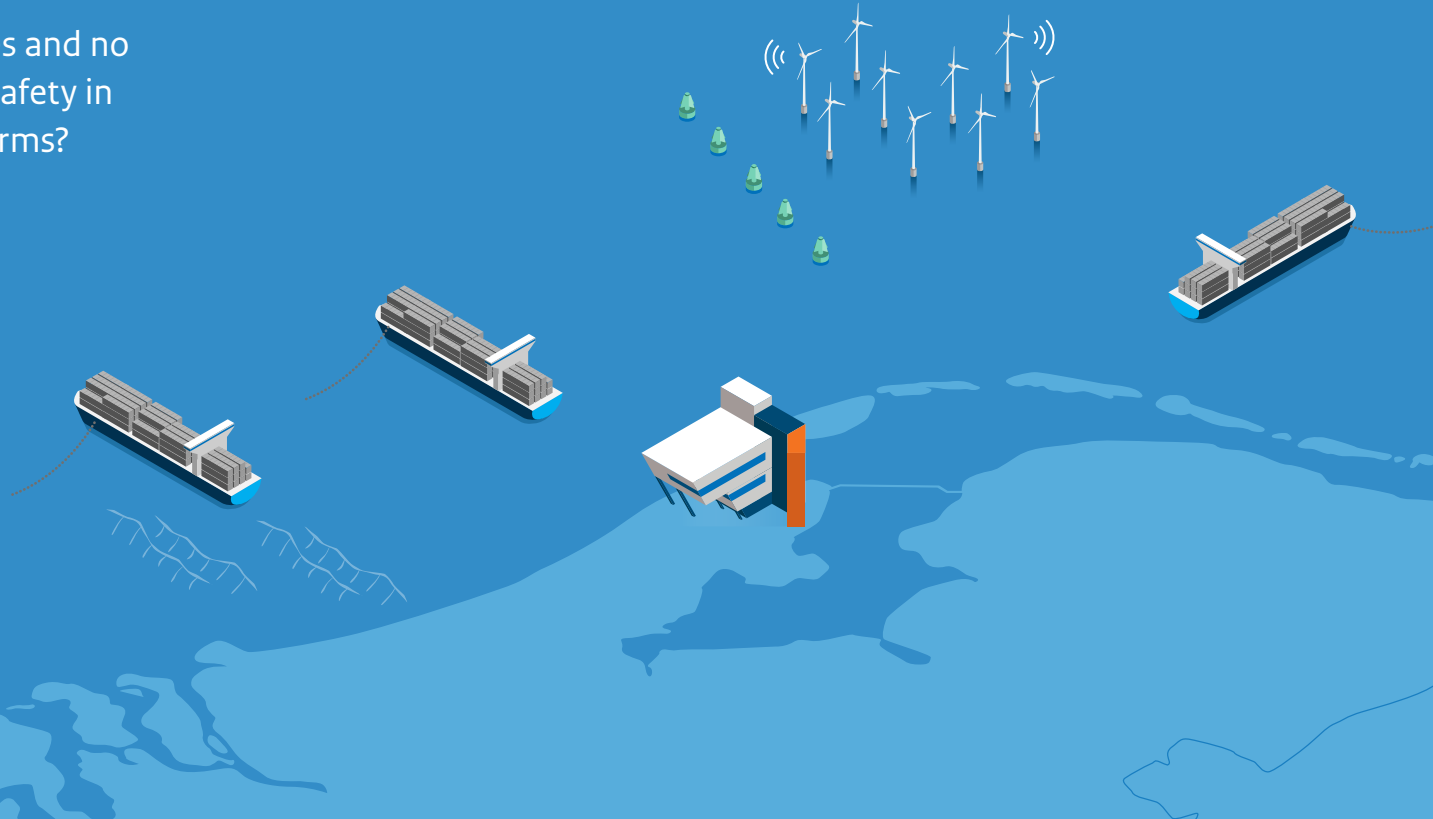




# Anchorage

How can anchorages and no anchor zones help safety in and around wind farms?

Sub-questions





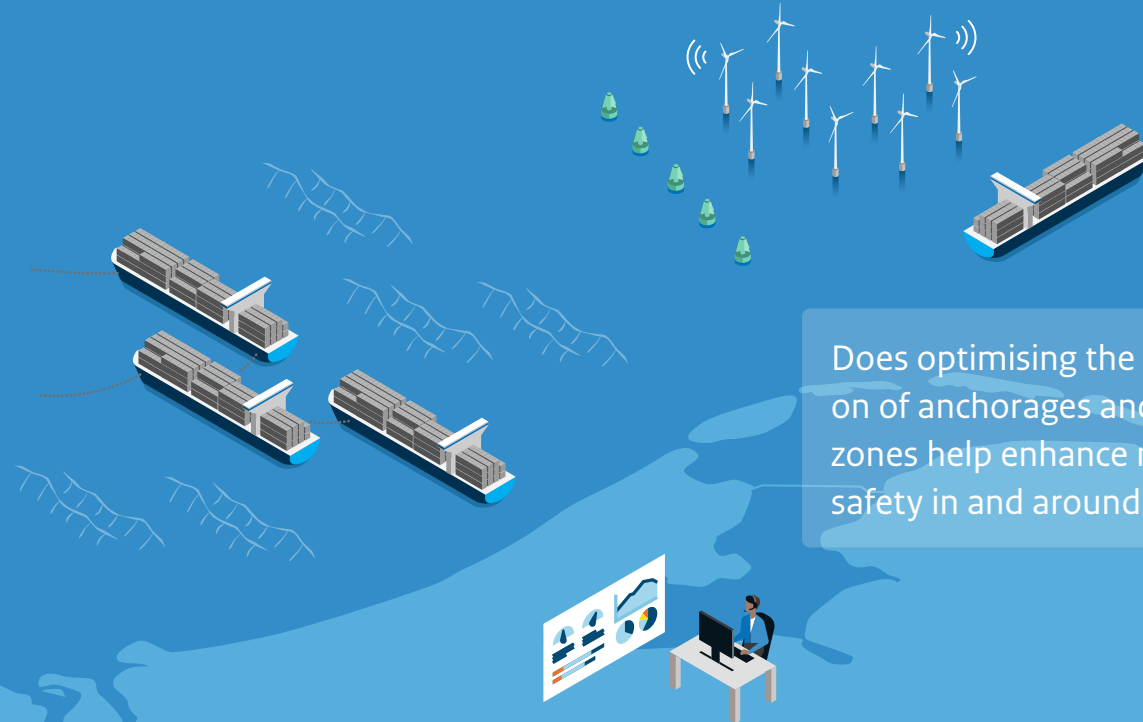
# Anchorage

## Sub-questions

What measures would make anchorages safer?

What are the risks in each anchorage and no anchor zone in and around wind farms?

Does optimising the use and location of anchorages and no anchor zones help enhance maritime safety in and around wind farms?





# Crisis management

Is the crisis management sufficiently prepared to handle maritime and other incidents/emergencies in and around wind farms?

Sub-questions





# Crisis management

## Sub-questions

How can innovations help in maritime safety and crisis management?

How are wind farms at sea included in the planning?



What can the crisis management team learn from potential and actual incidents and exercises?



What are the implications of a wind farm at sea for SAR (Search and Rescue), oil spill cleaning, firefighting and deploying ERTVs in and around wind farms?

How are wind farms at sea included in the OTO (Education, Training, Practice)?







# International dimension

How can we encourage international knowledge development and exchange for the benefit of maritime safety in and around wind farms?

Sub-questions







# Planning and completion

- The Netherlands Coastguard
- Rijkswaterstaat

