Anemoi Newsletter

Issue 02
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Content

Introduction

The Anemoi project started in February 2023. The project aims to study the chemical emissions from offshore wind farms (OWFs) and their impact on the marine ecosystem and aquaculture. Project hypotheses that will be tested within the Anemoi project are:

- OWFs are a sea-based source of chemical emissions, including inorganic and organic contaminants as well as anthropogenic particles such as paint flakes
- Seafood products, cultivated at OWF, are not negatively affected by OWF chemical emissions in comparison to aquaculture products cultivated outside OWFs
- The ecosystem health and hence nature conservation and restoration potential is not negatively affected by OWF chemical emissions.

Within this newsletter, we aim to provide an overview of the project activities for each work package (WP) and a timeline.

The Anemoi project consortium is open to questions and remarks. The consortium can be contacted by mail (see further) or by filling in the Q&A form.

Within the project, we foresee yearly stakeholder meetings: online in spring 2024 and 2026, physical meetings in spring 2025 (Belgium) and at the project end (Denmark).

Contact information

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Mapping regulatory differences on chemical emissions of OWFs (WP1)

The tasks in this WP will be completed between 2023 and 2024:

- Interact with the Anemoi extended peer review community:
  - Contact relevant actors and stakeholders to join the community.
  - Gather details on regulatory aspects and discuss project results via interactive workshops with stakeholders.
- Create a framework to harmonise regulations of chemical emissions in OWFs:
  - Create a comprehensive overview of regulations in the North Sea Region by collecting information from national and international authorities.
  - Aid and promote effective dialogue between stakeholders to identify in which areas harmonisation is needed and possible.

A policy brief will be published with a framework to harmonise regulations of chemical emissions in offshore wind farms.

Chemical and particulate emissions from OWFs (WP2)

The activities in this WP will be spread over the full four years of the project.

- A priority list with target compounds will be determined using:
  - Existing literature and data,
  - Non-target profiling of chemical leachates from reference materials that were extracted in both seawater (realistic scenario) and organic solvents (worst-case scenario),

  and by taking into account the persistence, bioaccumulation and toxicity of these compounds. The priority list will play an important role in other WP2 activities as well as in WP3 .
- Organic and inorganic contaminants released from OWFs will be identified and quantified in samples collected in different OWFs to study their spatial distribution and potential effect on the marine environment. The priority list is used to identify target compounds.
- The presence of microplastics (including paint particles) will also be analysed in the water column as in sediment. The distribution of paint flakes will further be investigated using saltwater-wave-current flume and fluorescent surrogated particles. The distribution, dilution and fate of paint flakes will then be modelled for the North Sea Region.

At the end of the project, a monitoring framework should be established, focussing on priority compounds. A summary of the current conditions in OWFs will be published as well as numerical tools to help predict the dispersion of the contaminants.

Impact of chemicals from OWFs on aquaculture products and marine life (WP3)

The activities in this WP will be spread over the full four years of the project.

- Determine threshold values for acute and chronic toxicity in cod, blue mussels and sediment-dwelling organisms:
  - Identify gaps in toxicology data for compounds in the priority list.
  - Perform toxicity tests for individual compounds of the priority list.
  - Perform toxicity tests on leachates from reference materials.
  - Model the ecotoxicological effects on lower trophic ecosystems using a coupled hydrodynamics-ecosystem model.
- Study the effect and bioaccumulation of OWF emissions on aquaculture products by performing an on-field pilot study with blue mussels.
- Perform a quantitative risk assessment for the target chemicals defined in WP2. Current concentrations will be compared to threshold values derived from existing and newly collected toxicity data.

This WP will deliver important toxicology data on priority substances for OWF emissions. Possibilities of aquaculture in OWFs will be assessed and a strategic plan will be constructed based on risk assessment results to reduce the impact of OWFs.

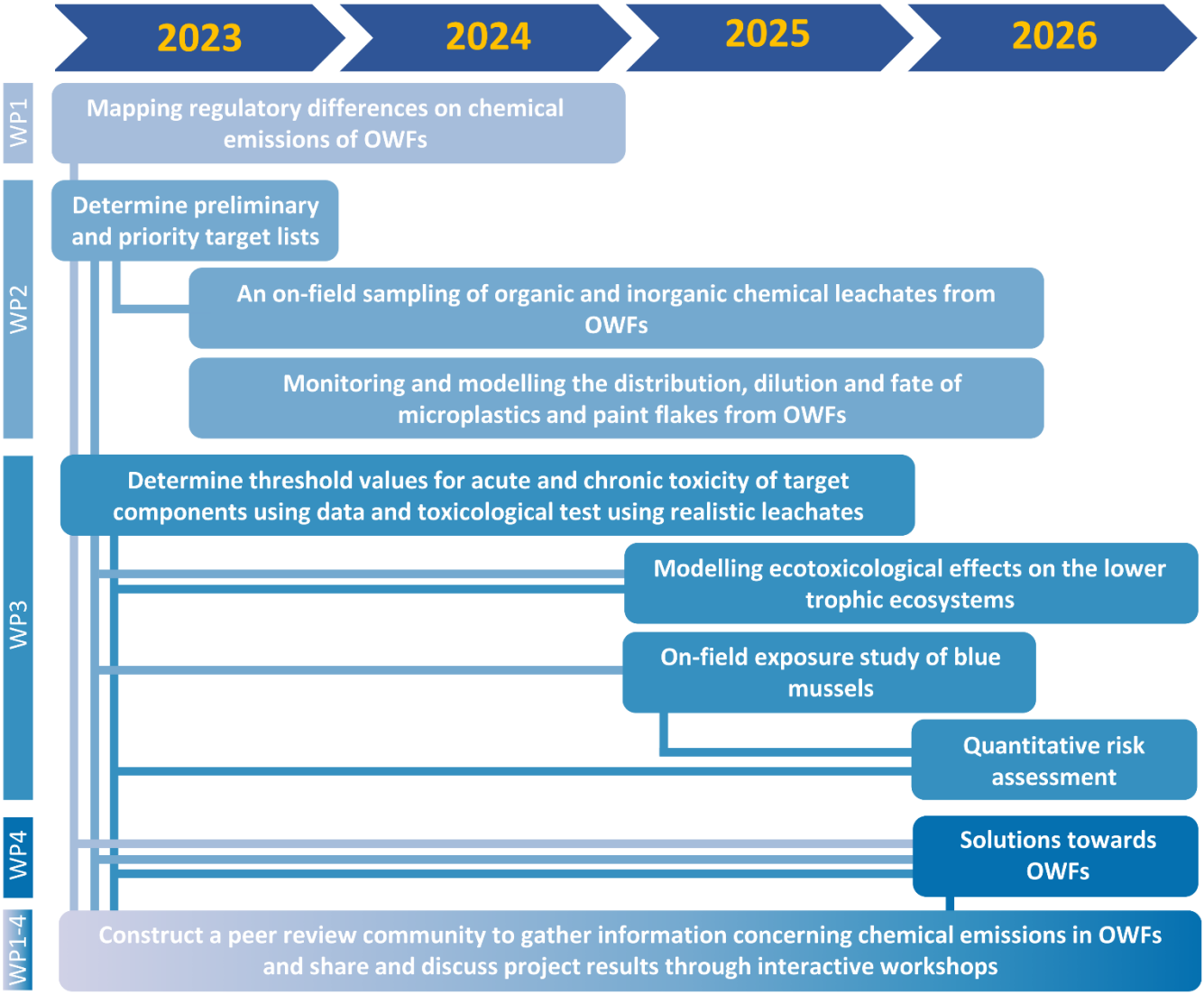
Solutions towards OWFs with non-harmful chemical impacts (WP4)

The activities taking place in this WP will occur in the last year of the project (2026).

- Determine the most sustainable corrosion protection system, taking into account impacts from chemical emissions and efficacity:
  - Acquire data on the design and characterisation of current corrosion protection systems.
  - Develop numerical models to predict the amount of anode and coating material that will dissolute in the marine environment.
  - Assess different corrosion protection systems by modelling corrosion protection efficiency
- Interact with the Anemoi extended peer review community:
  - Based on stakeholder feedback, a report will be made on the collective contextual understanding of chemical emissions from OWFs and potential future scenarios for developments in the North Sea region.
  - Discuss the Project's results with stakeholders during a verification workshop to re-engage peers, quality-check the project's results and update developments in the OWF space. Discussing the project findings is important to increase acceptance, receive feedback and discuss the Anemoi project legacy and future collaborations.

This WP aims to construct a final strategic plan presenting possible solutions to industries to reduce the chemical impact of OWF systems and improve their sustainability as well as creating a discussion forum to facilitate external stakeholder communication.

Anemoi project timeline



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