

ECOCAP

Ecotoxicology analysis of cathodic protections to assess the chemical risk of elements released from galvanic anode and impressed current on the marine environment and its food webs

Duration: 36 months | Launch: 2021 | Total budget: €2,189K

CONTEXT

Cathodic protections – such as galvanic anodes (GACP) and impressed current (ICCP) – and anticorrosion paints are a widely used effective method to prevent the corrosion of metallic materials immersed in seawater. **However, they lead to the release of large quantity of chemical elements into the marine environment, whose potential harmful effect, still poorly understood, is a concern for environmental authorities and civil society. The potential ecotoxicological effects of the released elements on the marine environment and its food webs are not well known yet. There is therefore a need to investigate in depth the environmental impact of such protections.**

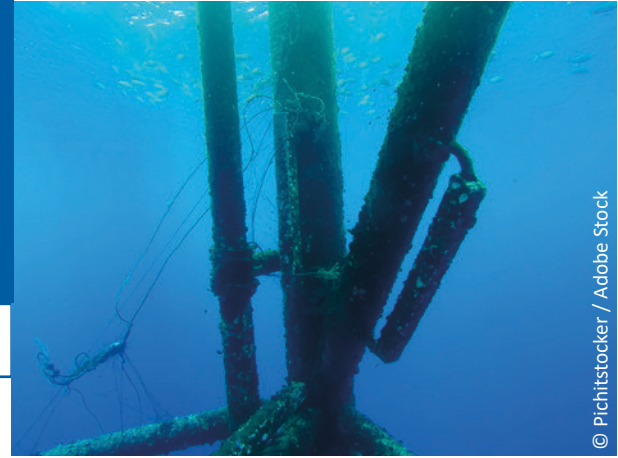
OBJECTIVE

To produce a knowledge base of the potential environmental impacts of anticorrosion protections commonly used in the offshore renewable energy industry, including galvanic anodes cathodic protections (GACP), impressed current cathodic protections (ICCP) and anticorrosion coatings

EXPECTED RESULTS

- A conclusive chemical risk assessment for Aluminum in seawater
- Laboratory experiments to assess the chemical risk of the cocktail of elements released from GACP using Aluminum based anode.
- A first and complete description of elements and (chloro) brominated compounds released from ICCP systems and their fate as a function of time
- A first comparative laboratory study to compare toxicity of seawaters exposed to GACP and ICCP cathodic protections
- A set of tools available for the ORE stakeholders to (1) simulate GACP and ICCP elements dispersion and (2) investigate the potential transfer of released elements in the food webs
- Guidelines for the use of cathodic protections and coatings in future projects.

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TECHNOLOGIES



STAGES OF THE VALUE CHAIN



Preliminary studies Conception

SCIENTIFIC CONTENTS

A bibliographic review and an audit of current practices of cathodic protections and anticorrosion coatings

A series of laboratory experiments to:

- Assess the chemical risk of aluminium in seawater and from GACP
- Study the impacts of GACP and ICCP cocktails of elements on marine organisms.
- Characterise all elements, including (chloro) brominated compounds released by ICCP, and study of their stability in seawater

Upgrade and develop models to:

- Simulate elements' dispersion of GACP and ICCP (hydrodynamic model)
- Investigate the trophic transfer of GACP and/or ICCP elements in food webs (trophic model)

Publication of a conclusion and a recommendation report for ORE stakeholders report

PARTNERS



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