CIVIL AND ENVIRONMENTAL ENGINEERING

MUR DM 118 - Environmental monitoring and impact assessment of offshore renewable energy systems

Funded By	MINISTERO DELL'UNIVERSITA' E DELLA RICERCA [P.iva/CF:97429780584] Politecnico di TORINO [P.iva/CF:00518460019]
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Context of the research activity	Offshore renewable energy is in rapid development thanks of its high potential to contribute to reaching European decarbonization targets and a net zero energy system. Within this context, the priority is often on maximizing efficiency, reducing costs and speeding up deployments; however, although often overlooked, environmental impact assessment and mitigation must be included in design and development, to achieve real sustainability. Progetto finanziato nell'ambito del PNRR – DM 118/2023 - CUP E14D23001710006
Objectives	The topic of this research is to perform a throughout quantitative analysis of environmental impact assessment of offshore renewable energy technologies, including wave energy converters and floating offshore wind turbines, defining a priority scale of areas of concern depending on different working principles and installation conditions; for each area of concern, the research will define measuring protocols and monitoring activities to transparently keep track of environmental impacts, either negative, neutral, or positive. The monitoring architecture shall be structured such that design variables can be related to environmental impact key performance indicators, in order to provide feedback on the design and suggest mitigation and correction actions. Main impact areas of concern are anticipated to be related to noise emission, visual hindrance, sea bottom erosion, disturbance to local flora and fauna, electromagnetic fields. The research activity will encompass both experimental campaigns and numerical modelling. Two sites of interest are preliminary identified in the Mediterranean Sea: one for wave energy conversion and one for floating offshore wind. Experimental activities will include noise measurement, visual inspection of flora and fauna, and free

	surface elevation. Similarly, numerical modelling will be used to investigate noise propagation and inform on potential mitigation actions.

Skills and competencies for the development of the activity	The candidate should be familiar with the following aspects: - marine biology - underwater acoustics - statistical analysis - experimental campaign execution Moreover, the candidate should be able to interact in a collaborative working environment. International experience is preferred.