CONTRACTOR
"Dunărea de Jos" University from Galaţi

Program:	**IDEI**
Project Type:	**Exploratory Research Projects**
Project Code:	**PN-III-P4-ID-PCE-2016-0017**

PROJECT PLANNING PLAN (2017-2019)

Project Name: Renewable Energy extraction in MARine environment and its Coastal impact - REMARC

- Framework structure -

Year	Stage	Objectives	Activities	Results delivered per stage
2017	Single	E1. Analysis of the main wind and wave databases available for continental European coastal areas, including the Black Sea Basin.	**Act 1.1** - Mapping wind and wave energy in European coastal areas, considering different databases in parallel. **Act 1.2** - Develop a web page through which the results of the project will be disseminated and will be updated systematically	Mapping wind and wave energy, identifying areas with increased potential and highlighting the synergy between the two resources, based on various types of data (both from models and measured). Making the site to disseminate the results of the project.

Year	Stage	Objectives	Activities	Results delivered per stage
2018	Single	E2. Implementation and validation, using satellite data and 'in situ' measurements of multi-level wave modeling systems based on spectral model SWAN (acronym from	**Act 2.1** - Implementation and validation of multi-level wave modeling systems based on the SWAN phase average spectral model that will focus on European coastal areas with the highest wave potential.	A wave prediction system based on spectral models, validated for different levels of computing, and which is focused on various European coastal areas (such as the west of the Iberian peninsula, the Mediterranean Sea, the

		Simulating Waves Nearshore), systems that will be focused on European coastal areas with the greatest potential of waves energy and synergy with wind energy. One of the target areas will be the western area of the Black Sea and especially the Romanian seaside area.	**Act 2.2** - Making long-term analysis of wave conditions in the coastal areas considered, developing high-resolution energy maps and identifying areas with increased potential (hot spots).	Baltic Sea and the North Sea) as well as the western Black Sea region, including the Romanian seaside. Carrying out long-term analysis of wave conditions in the considered coastal areas, developing high resolution energy maps and identifying areas with increased potential (hot spots). Identifying in each target location other alternative sources of reusable energy.

Year	Stage	Objectives	Activities	Results delivered per stage
2019	Single	E3. Common analyzes of wave and wind data and the production of bivariate distribution charts of sea states corresponding to time intervals of more than 10 years. For each location an estimate of the electrical power expected from various extraction devices will be made along with the evaluation of some synthetic indicators such as capacity factor and capture width. Studies on the influence of marine energy farms on the wave climate and on coastal dynamics.	**Act 3.1** - Making bivariate distribution diagrams of sea states, corresponding to time intervals exceeding 10 years. Estimation of the expected electrical power from various extraction devices together with the calculation of some synthetic indicators such as capacity factor and width catch. **Act 3.2** - Studies on the influence of marine energy farms on the wave climate and on coastal dynamics. A special emphasis will be placed on coastal protection that can be achieved through future energy farms.	Assessing the efficiency of the various existing technologies for extracting wave and wind energy in locations identified as 'hot spots'. In the first phase, the following technologies will be considered: Pelamis, Wave Dragon and Aqua Buoy, and for the wind, the Vestas, Siemens and Senvion turbines. However, as this research area is very dynamic, other new technologies will also be considered. Special attention will be given to the analysis of the performances of the various technologies in the Romanian coastal areas. Case studies on short, medium and long-term coastal impacts of marine energy farms.

Project Manager**,**
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