

EXECUTIVE SUMMARY

of the activities carried out during the implementation of the project **Dynamics of the REsources and technological Advance in harvesting Marine renewable energy (DREAM), in the period January 2021 – December 2023**

Starting from the high dynamics observed in recent years for the wind industry in the marine environment (offshore wind), a first objective of the project was to evaluate the wind parameters expected until the end of the 21st century considering mainly two different RCP scenarios (RCP4.5 and RCP8.5). Various areas in the European nearshore were considered, being structured on three target areas: AT1 - North Sea and Baltic Sea, AT2 - Iberian Peninsula Area, AT3 - Black Sea. The results provided from the atmospheric models, available from the Swedish Institute of Meteorology and Hydrology (the RCA4 climate model), were processed and analysed and on this basis the performances expected from the latest wind energy extraction technologies were evaluated. Apart from these, the data from the climate model ALADIN63 were also analysed and compared, creating a more complete picture.

From this perspective, the results of the project allowed the development of some important recommendations regarding the improvement of existing technologies and their better adaptation to the wind conditions in the target areas. Another aspect was the analysis of the synergy between wind, wave and solar energy. The advantages of colocation in relation to the implementation of hybrid technologies were also evaluated. Another important objective was a better understanding of the local and global effects of marine energy farms. In this sense, the original computing platform generically called CSIAM (Computational System for Impact Assessment of the Marine energy farms) was implemented. Last but not least, studies were carried out on the medium and long-term effects of marine energy farms. In this context, all 9 activities, provided in the work program, were carried out.

The dissemination of the results was achieved through a large number of publications as follows: 1 monograph (ISBN 978-606-669-386-8, 295p), 61 publications in international journals (of which 40 in journals with a higher impact factor larger than 1). The papers published have a cumulative impact factor of 165.781. Also, more than 30 presentations were made at significant international conferences and other 14 at national conferences. The dissemination was also carried out through the web page: <https://dream.ugal.ro/index.php> and 4 international workshops were organized.

The main results foreseen for the project are:

- R1** Projections regarding the evolution of the efficiency of extracting renewable energy from the marine environment in the target areas considering assumed scenarios and various configurations including resource synergy. **Result achieved!**
- R2** Projections regarding the dynamics of the price of energy (LCOE). The most significant current technologies for wind turbines will be evaluated. **Result achieved!**
- R3** Various floating platform concepts will be considered and analysed. **Result achieved!**
- R4** Identification in the target areas of the coastal areas with the most important concentrations of marine energy resources (hot spots). **Result achieved!**
- R5** Implementation of the CSIAM computing platform for assessing the effects of marine farms. **Result achieved!**
- R6** Annual participation with at least 4 papers at conferences (2 international and 2 national) Result achieved and far exceeded! (30 papers were presented at international conferences or workshops and 14 at national ones).
- R7** Updating the web page through which the results of the project will be disseminated. **Result achieved!**
- R8** Publication of articles in magazines – 9 articles. Result achieved! (61 papers in international journals).
- R9** Publication of a monograph. **Result achieved!**
- R10** Organization of a workshop with international participation - 4 workshops were organized. **Result achieved!**
- R11** Making annual reports and the final report. **Result achieved!**

Finally, it can be appreciated that the objectives proposed for the DREAM project were fully achieved and it was possible to produce valuable results with great international visibility.

Budget 1.038.490,00 lei

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