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THE MULTIPURPOSE OFFSHORE TROPOS PLATFORM: ENVIRONMENTAL AND SOCIETAL ISSUES

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ABSTRACT

The key objective of the on-going TROPOS project is the development of a floating modular multi-use platform system for use in deep waters with an initial geographic focus on locations of Crete (Greece), Gran Canaria and Taiwan. The TROPOS multi-use platform system will be able to integrate a range of functions from the Transport, Energy, Aquaculture and Leisure sectors. A core part of the project addresses Environmental and Socio-Economic Impact Assessment (EIA, SIA) from the construction and operation of the platform, that are assessed through common schemes for all locations (European/ international regulations), and then adapted to the pending national and local regulations. The conference presentation describes the procedures and some results from these assessments.

INTRODUCTION

The key objective of the on-going TROPOS project funded under the EU FP7 programme "Ocean of Tomorrow", call OCEAN 2011.1 – Multi-use offshore platforms, is the development of a floating modular multi-use platform system for use in deep waters, with an initial geographic focus on locations of Crete (Greece), Gran Canaria and Taiwan [1]. The TROPOS approach is centered on the modular development. In this way, the flexible TROPOS multi-use platform system is able to integrate a range of functions from the Transport, Energy, Aquaculture and Leisure sectors (named as TEAL components in the project, Fig. 1). The Energy component consists of renewable ocean energy technologies only. Floating structures were chosen for our design study as they may be more costly, but are a much easier to build at the shore, can be towed to the location for erection and released for decommissioning.

Figure 1. The EIA and SIA work is an essential element in the planning and design of the TROPOS platform, in the various TEAL combinations.

Therefore much less impact on the sea floor is expected compared to fixed platforms. A core part of the project addresses Environmental Impact Assessment (EIA) and Socio-Economic Impact Assessment (SIA) from the construction and operation of the platform, that are assessed through common schemes for all locations (European/international regulations), and then adapted to the pending national and local regulations.

METHODOLOGY

International and national environmental regulations apply and Best Environmental Practices exist in order to mitigate the environmental impact of all activities at sea, addressing chemical, physical and biological impacts of different quality and affecting different spatial scales, ranging from the discharge of liquid and solid contaminants to the production of acoustic

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noise and visual impacts. EIA considerations are thus a critical and complex part of the development of the TROPOS platform as they carry technical, logistical and socio-economical constraints to the viability equation. Multi-use platforms will generate a series of environmental impacts that accumulate at one location and will thus need proper assessment, for all disciplines but also as a whole, and the EIA methodology and mitigation may build on but also differ from those applicable to single-use platforms. Multi-use (*vs* single use) may also offer opportunities to mitigate impacts through the shared use of logistics, with an overall reduction of impacts per activity.

The approach in TROPOS for the development of a legislative and normative framework for multi-use offshore platforms, is to extrapolate and extract from legislation, standards and experience for single-use structures. This means to evaluate and compare environmental impacts from single-use, dual-use and multi-use designs and describe gaps in the present methodology, legislation and norms, and suggest improvement/amendments to present applicable legal regimes. Fig. 2 describes the general EIA procedure. The SIA follows a similar procedure as EIA.

OBSERVATIONS

A review and analysis of existing legislation for single-use platforms was performed. Based on both numerical and physical modelling to assess environmental issues, including field validations, the three tentative sites for a TROPOS platform were located. These are sites on the southern shore of Gran Canaria, south-east of Crete and south-west of Taiwan (Liuqiu Island), respectively. The concepts of the three scenarios for location-specific EIA aspects are called Leisure Island (Gran Canaria) and Green & Blue platform (Crete and Taiwan) [2]. Next, health and safety, visibility and public acceptance and national framework conditions and requirements will be treated by means of selected case studies. We will then describe in Work Package 6 the potential constraints and barriers for multi-use concepts, and set the requirements to comply with environmental regulations. Environmental monitoring strategies will then build upon the variables identified. The overall environmental impact and socio-economic work will finally feed into the other work packages for final platform specifications and viability studies.

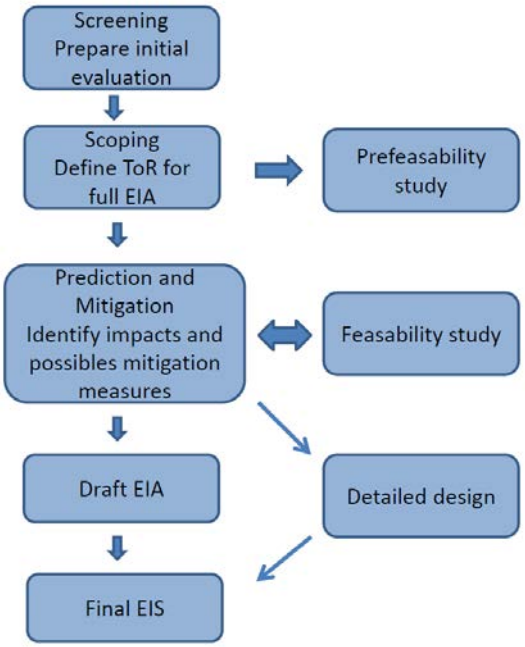

Figure 2. Flowchart describing the EIA procedure and links to the technical design process.

CONCLUSIONS

The presentation gives an overview of the EIA/SIA assessments in the TROPOS project and the work completed so far. The study examines and recognizes the potential environmental effects during both construction and operational phases for generating oceanic energy from three various regions, and combine with multiple purpose functions to increase benefits and reduce impacts. The study will provide the required data to modify the design, and to develop a forecasting and mitigation assessment mechanism for further implementation.

To summarize the environmental aspects of the TROPOS platform design assessed so far, some synergies could be identified, but not yet quantified. I.e. joint waste and waste water treatment between the uses enable potentially negative impacts to balance one another and thus will result in reduction of overall impacts. The joint logistics for erection, supply and maintenance are envisaged to save costs as well as reducing the environmental footprint overall. Use of renewable energy directly on the platform and consumption of seafood, both produced there will also reduce needs for transport logistics and energy.

The potential environmental and socio-economic impacts during the construction and the operational phases are still being examined in detail as identified for the core platform and for modules on marine energy generation, aquaculture production, tourism and other related transport activities.

ACKNOWLEDGEMENTS
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