Environmental Engineering and Management Journal

October 2020, Vol. 19, No. 10, 1647-1656
http://www.eemj.icpm.tuiasi.ro/; http://www.eemj.eu

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RESEARCH HUB FOR AN INTEGRATED GREEN ENERGY SYSTEM REUSING SEALINES FOR H_2 STORAGE AND TRANSPORT

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Abstract

In this paper, we propose innovative solutions for reusing an inactive offshore gas platform and its associated infrastructures as a scientific research hub, where an integrated energy system and innovative environmental monitoring methods are envisaged. To this end, the Azalea A platform, located in the northern Adriatic Sea, is considered a good pilot site. This study analyzes the engineering solutions on Azalea A for the combined production of solar and wind energy coupled with hydrogen production from seawater electrolysis. It analyzes the potential for storage and transport on land of the produced hydrogen using the sealines connected to the platform. However, this study does not deal with the current structural conditions of the platform (corrosion, stability etc.), which should be evaluated before these solutions are put into practice.

The main outcomes of this work consist in a feasibility study for the reuse of existing infrastructures as a self-sufficient research hub using green energy systems, which include considerations about the measures needed to ensure the protection of the marine environment. Data show a positive feedback about the technical feasibility of the proposal in safety conditions. Furthermore, encouraging outcomes derive also by the economic evaluation that estimates sustainable costs comparing to those implicated with the decommissioning of the infrastructures in the order of tens millions euro. In addition, the proposed reuse seems to be a good opportunity to promote both energy transition toward renewable energy systems and environmental protection, avoiding decommissioning impacts and promoting an innovative monitoring program for the Adriatic Sea.

Key words: blue growth, offshore monitoring, renewable energy, reuse, technology

Received: February, 2020; Revised final: July, 2019; Accepted: July, 2019; Published in final edited form: October, 2020

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