



Offshore wind farm in marine spatial planning and the stakeholders engagement: Opportunities and challenges for Taiwan



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ABSTRACT

Taiwan has advantages in the development of offshore wind power, as it has abundant wind energy resources at the seas. The local government has developed a series of measures to promote the development of wind power generation industry. The development of offshore wind farm in Taiwan, however, has to solve the problems that offshore wind farms are overlapping with some traditional fishing grounds and are unable to reach consensus with relevant stakeholders. This paper starts from the great potential of offshore wind power in Taiwan and the active promotion of the government, and analyses the impact and possible opportunities brought by offshore wind farm development to local fisheries, from the perspective of Zhanghua Area, a key area of development of offshore wind farm in Taiwan. This paper proposes that the local government in Taiwan should use marine spatial planning as a tool, through the comprehensive participation of government, developers, fishermen and other bodies, seeking the coexistence and prosperity of offshore wind farm and fisheries. Avoidance, compensation, and feedback, as well as communication and collaboration will be an important strategy to solve the conflicts of multiple use of the sea and to promote the development of marine renewable energy.

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1. Introduction

Taiwan has quite abundant wind energy resources. In particular, owing to strong southwest airflow in summer and northeast monsoon in winter, the windflow speeded up because of the narrow cross-strait mountains, the coast from Taiwan Strait and Taoyuan to Yunlin becomes the best wind farm in the West Bank of Taiwan. Zhanghua Area is a key area of offshore wind farm development in Taiwan (See Fig. 1). Among the 36 potential offshore wind farm sites published by the Bureau of Energy, 21 are located off the coast of Zhanghua (Bureau of Energy, 2015a). According to the report of the Bureau of Energy in Taiwan, the installed capacity of offshore wind power in Taiwan is expected to reach 3 GW in 2025, and will create 10,000 job opportunities (Bureau of Energy, 2017a).

Due to the difficulty to choose the location on the land and popular protests (Buck et al., 2004), the government is actively promoting the offshore wind power. In 2012, the government introduced the “Thousands Wind Turbines Projects” and the “Demonstration Method of Wind Power Generation Offshore Wind Power Generation”. In 2015, the government announced the “Points for Application for Operation of Offshore Wind Power Planning Sites”. It is hoped that the offshore wind power will be promoted through the way of land first, offshore later, pilot first, block later, shallow sea first, and deep sea later, so as to enhance Taiwan's energy autonomy and reduce carbon dioxide emissions.

Although the wind energy resources in the western sea area of Taiwan are rich, and the government is actively promoting the wind power industry, the location of offshore wind farms is overlapped with the traditional fishing grounds, which may cause damage to the fishermen's rights, and may even affect the safety of fishery operations and local economy stability (Buck et al., 2004). How to coordinate the multiple uses of offshore wind power and fishery becomes the priority problem that needs to be solved by decision-makers and developers.

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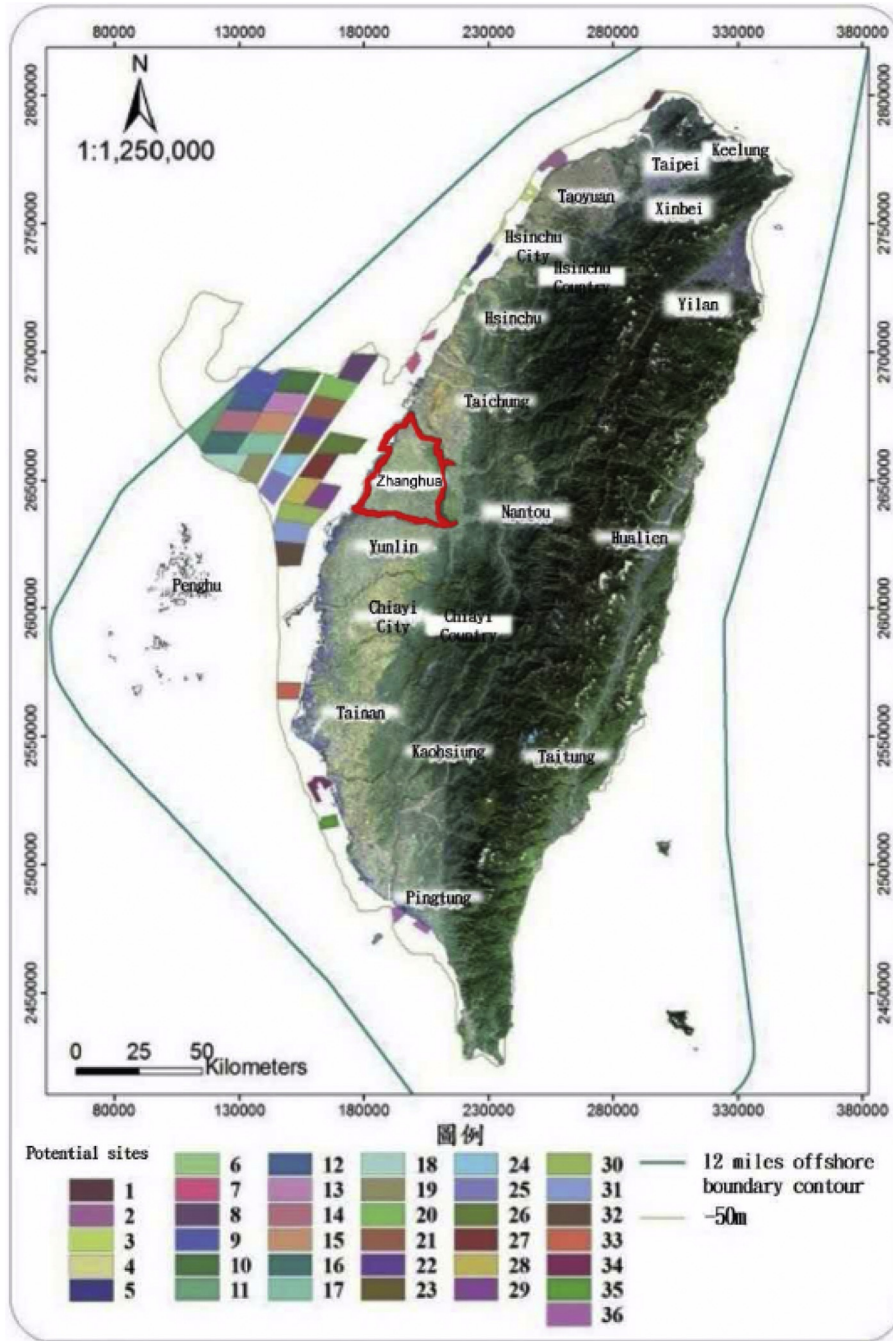


Fig. 1. Scope of the potential sites of offshore wind farms in Taiwan. Source: created by this research.

Marine spatial planning (hereinafter MSP) provides frameworks and tools for coordinating existing and future ocean users, through science-based, multi-stakeholder decision-making (Nutters and Silva, 2012). On 4th February 2015, the Taiwan Legislative Yuan passed the “Coastal Zone Management Act”, which stipulates the MSP as a tool to implement integrated coastal zone management and promote the sustainable development of coastal zones. The management methods of MSP provide a feasible way to solve the conflicts between offshore wind power and fishery in Taiwan.

This paper introduces the positive and negative impacts on fishery in the long run in the planning of offshore wind farm in Zhanghua. In order to solve the conflicts between the offshore wind

energy and local fishery rights, it is proposed to use MSP as a management tool to seek the coexistence and prosperity. This paper suggests that avoidance, compensation, feedback, communication and cooperation will be an important strategy to coordinate the use of offshore wind power and fishery.

2. Overview of the development of offshore wind energy

2.1. Overview of the development of offshore wind energy in Europe

Since 1995, the total number of the world’s wind turbines has increased rapidly, with an annual growth of about 30%. In recent

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