Research approach for efficient offshore wind farm decommissioning strategies

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Summary
Due to lacking experiences, offshore wind farm decommissioning is associated with profound uncertainties. The research project *SeeOff* presents an approach for the development and assessment of cost-effective, safe, environmental-friendly and publicly accepted decommissioning strategies.

1. Background

In 2017 more than 1.100 offshore wind turbines with an installed capacity of over 5 GW operated in the German North and Baltic Sea [1]. In order to reach the aim of the Renewable Energy Sources Act to increase offshore wind energy production up to 15 GW until 2030, further offshore wind farms will be built. However, at the end of their operational phase all these wind farms need to be decommissioned.

2. Efficient decommissioning of offshore wind farms

2.1 Challenges

First decommissioning experience were made with wind farms that were rather small and located nearshore in shallow waters [2]. Decommissioning of larger offshore wind farms at higher water depth will be involved with more complex challenges. For regulatory approval of offshore wind farms, decommissioning plans are presented. These plans are rather universal and lack of specific technology, methods and procedures. Being a renewable energy technology, offshore wind farm decommissioning should be sustainable and consequently as cost-efficient, environmentally-friend and social-compatible as possible. Therefore a systematic approach to develop and assess decommissioning programs is needed.

2.2 Aims

The research project *SeeOff* aims to support stakeholders at developing and assessing efficient, project specific decommissioning strategies. Efficient decommissioning strategies comply with legal requirements, are cost-minimizing, ensure safety at work and environmental protection and are publicly accepted.

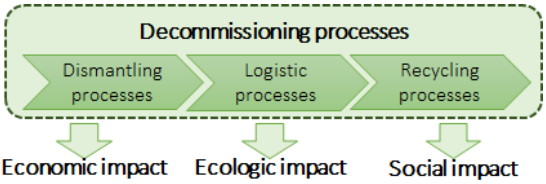

Figure 1: impacts of offshore wind farm decommissioning

2.3 Research approach

Requirements on decommissioning (legal, economic, ecologic, safety-related, social as well as dismantling, logistic and recycling associated demands) will be compiled. Options of dismantling, logistics and recycling will be investigated and transferred into process models, that will be analysed and parametrised. Decommissioning options will be combined to scenarios, which are subsequently assessed regarding their economic, ecologic, safety-related and social impacts. Concluding, a holistic approach that considers conflicting interests of different stakeholders will be developed to identify most efficient decommissioning strategies. Recommendations for improvement of prior offshore wind farm project phases will be identified. Finally, the stakeholder will be provided with a handbook comprising methods and procedures for developing efficient offshore wind farm decommissioning strategies.

3. References

[1] Deutsche Windguard, 2018. Status des Offshore-Windenergieausbaus in Deutschland 2018. https://www.wind-energie.de/themen/statistiken
[2] 4C Offshore Ltd., 2017. Offshore Wind Farms. [accessed on 11.08.2017] http://www.4coffshore.com/windfarms/