Abstract
Currently Offshore wind energy is very expensive. The purpose of this study is to create a cost model which shows how the cost of offshore wind energy can be and the changes in the cost of energy as the design of the wind turbine changes. The wind turbine costs are broken down by main components of a wind turbine and calculated based on the wind turbine physical attributes and dimensions as well as materials where possible. According to this model, the cost of offshore wind energy generated by 100 wind turbines in 60m or more of water depth with a rating of 10MW and tension leg platform foundation is estimated to be 9 cents (2012 US dollars) per kWh. The cost reduces with use of improved technology such as a floating foundation instead of a rigid structured foundation. The cost goes further down with government subsidies and more experience in the field.

Assumptions
- Wind farm is situated in deep water
- The wind turbines are fully assembled on shore and the floated out to the site of installation vs. assembling them at site using cranes on boat like structures.
- The greater the distance from the coast, the greater the wind speed so more energy is produced.
- Incentives in the market are not included in this model
- The cost model used is a development of the engineering and cost model of the Technical Report NREL/TP-500-40566 December 2006. Therefore most of the assumptions used in that model are inherent in this model.

Method

Results

Conclusion
Offshore Wind Energy is a promising renewable energy. While onshore wind energy is fairly mature, offshore wind energy is very new and estimated to high costs. Some of the ways to reduce the costs would be by using lighter, stronger, and more durable materials, floating foundations in deep and transitional waters and deploying more wind farms which would provide more experience and more data in the field thus reducing the amount of time and money spent on logistics and instalments.

References


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