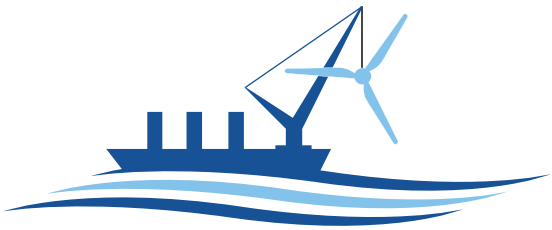

leanwind

Logistic Efficiencies And Naval architecture for Wind Installations with Novel Developments

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Definitions

Abbreviation	Full Term
CfD	Contract for Difference
Dx.x	Deliverable
FEED	Front End Engineering Design
FID	Financial Investment Decision
IRR	Internal Rate of Return
LCOE	Levelised Cost Of Energy
NPV	Net Present Value
O&M	Operation and Maintenance
OWF	Offshore Wind Farm
R&D	Research and Development
WP	Work Package

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Executive Summary

The following document provides an outline of the structure and intended use of the logistic and financial models such that a potential user can understand clearly the capabilities of the models and how to use them effectively, independently and in conjunction.

The logistic models consist of a set of mathematical algorithms capable of optimising the holistic Offshore Wind Farm (OWF) supply chain for the three project phases: installation; operations and maintenance; and decommissioning. The models address the logistic challenges related to transportation from port to the OWF site; transportation to coastal base ports; as well as the selection of suitable ports by identifying capabilities and requirements of the ports for each stage of the OWF project.

The financial model is an excel cash flow sheet with a number of user data entry sheets and output sheets. This over-arching financial model then interacts with a number of dedicated time series simulation modules, which calculate the cost and duration of activities in the project phases: installation, operations and maintenance (O&M) and decommissioning. These three modules can also be used as stand-alone models. The financial results are then used to populate an investment risk analysis module using @Risk software. The outputs from the models can then be used as input to environmental Life Cycle Assessment models being developed in Task 8.4.

The LEANWIND logistics and financial models are non-proprietary and therefore unbiased, independent assessment tools for use by numerous potential users. Expected users are outlined in more detail in section 4. The intention is to be useful to users ranging from students and academics to industry funding bodies and project or technology developers.

The capabilities of the supply chain logistic and financial models are timely with the recent industry and international commitments to reduce costs in the Offshore Wind sector.
In particular, this is evidenced by the DONG Energy recent HornSea bid (September 2017) of £57.5/MWh which is more than 50% less than the bid for the first phase of the same farm only 2 years ago (£140/MWh).[1] These latest Contract for Difference (CfD) contracts in the UK showed that Offshore Wind is now cheaper than new gas projects.[2]

These models will be validated together to provide a starting point for the work in Task 7.4; to assess the innovations developed in the LEANWIND project.

[1] https://uk.reuters.com/article/uk-britain-renewables-dong-energy/denmarks-dong-wins-uk-contract-to-build-worlds-largest-offshore-wind-farm-idUKKCN1BM0R1
[2] https://www.carbonbrief.org/analysis-uk-auction-offshore-wind-cheaper-than-new-gas