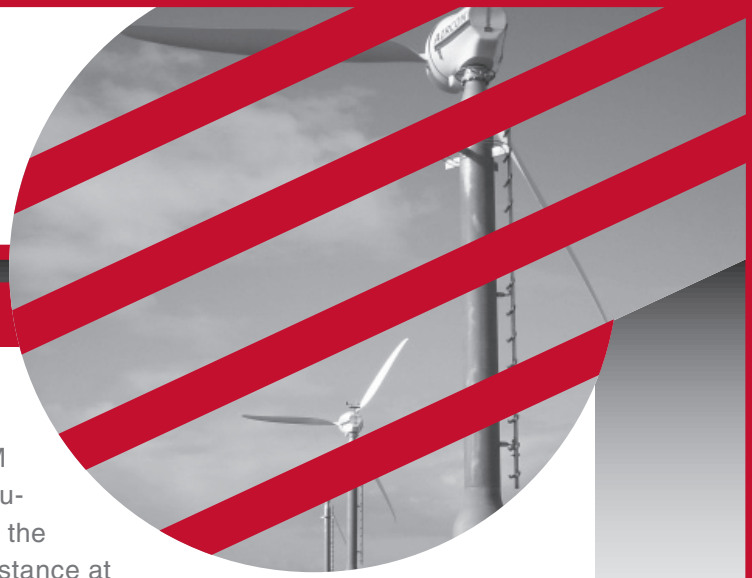
OMCE-Calculator



EWIS

Being one of the leading institutes on wind energy research, ECN established the EWIS (ECN Wind Industrial Support) group in 2009 to better bring the R&D results to the market. During the last three decades, ECN has developed expertise on aerodynamics, structural analyses, turbine control, offshore operation and maintenance, and grid connection. With the growing wind industry, ECN received more requests for assistance and EWIS has become the vehicle to support the wind energy industry in their product developments.

EWIS's focus is on the high end of the market which means that we will make use of tools and knowledge that have been developed in-house and include the latest R&D results!

The EWIS team is a mixture of young professionals and experienced researchers which ensures a fast response and high quality.

More information

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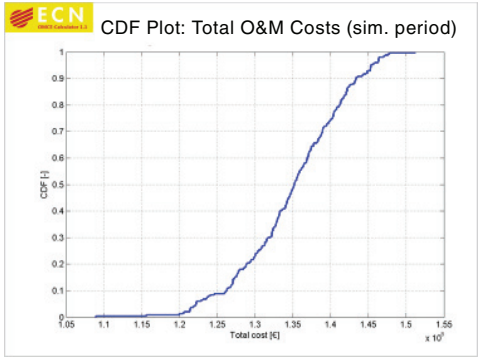
Product description

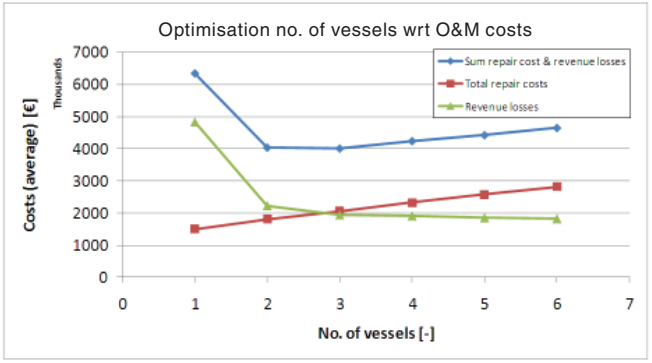
The Software

The OMCE-Calculator (Operation and Maintenance Cost Estimator) has been developed to estimate the future O&M costs of an operating offshore wind farm. The OMCE-Calculator can be used for estimating required O&M budgets for the next say 1, 2, or 5 years. Such a situation is relevant for instance at the end of the warranty period, or when new contracts with OEM's and/or contractors need to be extended.

The OMCE-Calculator requires details on preventive, corrective and condition based maintenance as input for the wind turbines as well as for the Balance of Plant (BOP). The tool is best used with operational data from the wind farm under consideration, but can also be used with long term average data as input (failure rates, wind and wave statistics, costs of vessels and spare parts, lead time of vessels and spare parts, etc.).

The tool responds with cost and availability figures and generates tables with figures and graphs that can be used for optimisation purposes. By means of "what-if analyses" (How much does the downtime reduce if I use more vessels or keep less spares in stock?) the wind farm operators are able to compare the adequacy of different maintenance strategies and to select the most cost effective one. Since the OMCE-Calculator is a time simulation tool, it automatically incorporates the variability due to weather conditions and random occurrence of failures.





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Specifications

Description of Software:	• OMCE-Calculator software (with 3 hardware keys for 3 users) • User manual
Designated sites:	all offices of Licensee world wide
Licence fee:	€ 20 000 for 3 users € 5 000 for the following licenses
Licence term:	Unlimited use
Services:	one day technical and software support (by telephone and/or e-mail, not on-site)
Additional maintenance fee:	€ 2 500
Additional options:	Three-day course given by ECN experts for € 6.000,--; dates and detailed contents on reques

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The Model

The OMCE-Calculator is a time domain simulation tool built with MATLAB and designed with user-friendliness in mind. The tool consists of four modules:

- Input: The graphic user interface (GUI) is designed to facilitate the user in defining the baseline O&M scenario and the successive improvements.
- Pre-processor: The O&M models and weather data are pre-processed to assess the accessibility of the defined equipment and their weather limits.
- Simulator: The maintenance schemes are integrated in time for the defined O&M scenario by performing a number of simulations for a user-defined period in the near-future.
- Post-processor: Costs are assigned to the simulated maintenance schemes and downtime results. The results are presented in tables and graphs.

The four modules are usually executed in order, and are all accessible from the OMCE-Calculator main menu. The tool generates averages, standard deviations and minima/maxima as output for the user-defined period (costs, downtime, and required resources). Based on the results of the baseline scenario, cost drivers can be identified and by means of scenario studies the optimal strategy can be determined.

The Experience

The OMCE-Calculator is based on the experiences of ECN gained with developing, selling and using the ECN O&M Tool (www.ewis.nl/software). This tool programmed in MS-Excel is meant to be used in the planning phase of a wind farm and generates long term average values. The feedback that we received on the ECN O&M Tool from more than 20 users worldwide has been included in the OMCE-Calculator. The OMCE-Calculator realistically takes into account a.o. the sequence of failures and repairs, the usage of vessels, the limited number of spares, and the actual weather conditions. The demo version of the OMCE-Calculator was tested by 12 users of the ECN O&M Tool and their findings have been incorporated in the first commercial version.

Optional: three-day course

A two-day training is offered to help you get the most out of the OMCE-Calculator. On request we can also provide an additional one-day training as a more general introduction into modelling the O&M aspects of a wind farm.