



## Continuous monitoring of the structural condition of the tower and supporting structure of floating and static offshore wind turbines

The TowerPower project has been kicked-off

On the 5<sup>th</sup> and 6<sup>th</sup> of May, the 11 partners of the collaborative European project TowerPower met in Aix-en-Provence (France) to kick it off. The project aims to develop a remote real time monitoring system for the ageing diagnosis of offshore wind turbine structures.

This development meets a real demand from the offshore wind park operators looking for maintenance cost reductions by increasing time between onsite inspections. The project will last 3 years within a budget close to 2 M€.

Coordinated by the cluster Capenergies (FR), the TowerPower project will involve:

- Associations having activities in the wind energy sector, who will carry out the dissemination and exploitation scheme of the innovation: Capenergies (FR), Cylsolar (ES) et Associazione Italiana Prouver non Distruttive – AIPnD (IT),
- Pilot SMEs interested by the technology, who will contribute to orientate the research work: Kingston Computer Consulting - KCC (UK), Moniteye (UK), Teknisk Data AS (NO), WLB (CY) et TecopySA (ES),
- Research centres in charge of the system design, development and validation: CETIM (FR), Innora (GR) et TWI (UK)

A typical substructure for an offshore wind turbine generator consists of a foundation structure (piles/buckets), a Monopile/Jacket, a Transition Piece and a Tower. The main ageing phenomena observed are:

- Instances of fatigue cracking in the support towers;
- Flange bolts at the ends of the tower sections becoming loose;
- Higher than expected levels of vibration, which could cause either of the above mechanisms;
- Degradation of the grouted joint between the pile and transition piece in offshore installations.

Relying on a network of sensors of various natures, on amplifying electronics and on advanced signal processing algorithms, the TowerPower solution will enable self-learning of the normal behavior “signature” of the structure and to detect any deviation from the initial record. Meanwhile, the system will contribute to a better understanding of physic-chemical phenomena leading to flaws triggering.

The intellectual property generated through the project, including eventual patent applications, will be jointly owned by the participating associations, which may conclude licenses agreements with the participating SMEs, their member companies and even other companies in the world according to the business opportunities. Thus, Teknisk Data (TDA), being a designer of offshore foundations, will be able to benefit from the development of systems that can give real feedback on actual structural response of the support structure. Measurements from such intelligent systems will be important instruments for O&M planning and life extension of wind turbine generator support structures, and TDA consider this is an upcoming market for structural designers, and involvement in the TowerPower project thereby enhance TDA’s role in the field of offshore wind energy, in line with TDA’s strategic priorities and those of the PACA region in the frame of its “smart specialization”.





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### Partners' Logos



### Pictures :



Offshore wind park



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Crack in the weld of the tower



Crack in the weld of the flange to the tower

