

# In-situ wireless monitoring of on- and offshore WIND TURbine blades using energy harvesting technology



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Wind turbine blades are manufactured from various non-metallic materials, generally combination of composites. These materials are notoriously difficult to inspect by conventional non-destructive methods as they attenuate ultrasound and cannot be readily inspected by radiography. Taking the limitations of the current methods into account, the WINTUR project is proposed to develop a Structural Health Monitoring (SHEM) system for on and offshore wind turbine blades.

## Project objectives:

The main objectives of the WINTUR project are,

- ✓ To develop an advanced integrated system for real-time monitoring and impending failure detection for on and offshore wind turbine blades
- ✓ To apply **new and novel transducers** with integrated AE and LRU capabilities that will be able to detect and locate flaws in the blades
- ✓ To develop ultrasound focusing techniques and overcome problems of ultrasound attenuation
- ✓ To develop new and novel methods of **powering the sensors** without hardwiring
- ✓ To develop **a central software program** with high-level functions comprising data collection, signal processing, data analysis and representation, information storage and user interface.
- ✓ To develop a communication system for **data transmission**
- ✓ **To demonstrate** the integrated system on wind turbine blades



## Benefits:

- ✓ The WINTUR technology will not require the interruption of power generation
- ✓ The transducers used will be sufficiently light, flexible and of low enough profile as not to interfere with blade aerodynamics
- ✓ The data communication system will be flexible and adapted to the mechanical restrictions of the blades
- ✓ A novel solution is proposed to power the transducers

## Applications:

- ✓ Wind energy sector
- ✓ Composite materials
- ✓ Marine power devices
- ✓ Transport sector

A major dissemination programme will present the findings to industry via a network of events and seminars.

## Project Contact

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## Project Partners

**TWI Ltd - Project Co-ordinator**  
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Smart Material GmbH  
CEDRAT Technologies

Nexus Engineering  
Christou Tsopelas Ltd  
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