

EFFIWIND



Thermoplastic materials for blades and nacelle housings

WIND
ENERGY

Context

Wind turbine blades are currently made of composites based on thermoset polymers. Their technological maturity has been proven and they can be easily implemented in production stages (high fluidity of the resin, good adhesion to the composite reinforcing fibers). However these materials cannot be recycled and their mechanical properties, in particular fatigue, can be improved.

Objectives

The EFFIWIND project aims to implement composites based on acrylic for the manufacturing of offshore wind turbines blades and nacelle housings. This major technological innovation in the wind energy sector will lead to weight diminutions, costs cuts in manufacturing since no heating cycle is required, and recycling opportunities. During the project, a three-blade set made of acrylic thermoplastic materials will be manufactured and tested on an operating wind turbine.

Implementation

The main stages of the project are:

- To develop new materials, namely thermoplastic acrylic resins, for the design of lighter, recyclable and repairable blades with better mechanical strength than those based on standard materials. Weight reduction is particularly important since it affects both performance and cost.
- To develop blades manufacturing processes from these materials ;
- To demonstrate the technical validity of this solution on an operating wind turbine ;
- To apply those materials on other plastic components of the turbine, especially for offshore nacelles.

PROJECT SUPPORTED BY ADEME
AS PART OF THE **LOW-CARBON
ENERGY SOURCES PROGRAMME**
(OF THE **INVESTMENTS FOR THE
FUTURE PROGRAMME – PIA**)

Duration: 4,5 years

Launch: March 2014

Total cost of the project: €10.6
M

Including PIA support: €3.7M

Form of PIA support:
subsidies and repayable ad-
vances

Location: Plougras (Brittany)

Coordinator



Partners

ARKEMA CHOMARAT



Plougras test site for the EFFIWIND blade

■ Expected results

Innovation

EFFIWIND will be a major technological innovation for the wind energy sector. Lighter blades will increase the rotor efficiency. This innovation can also enable the use of longer blades of equivalent weight.

Economic and social

Thermoplastic composites are easier to maintain which can lead to operating costs cuts.

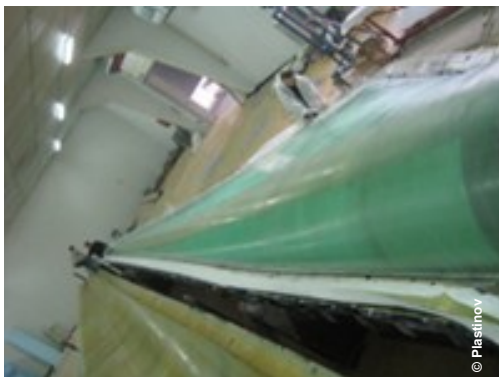
Environment

The environmental benefits will cover the entire life cycle of blades and nacelles: decrease in material consumption, reduced exposure to toxic or noxious products ; operation & maintenance and recyclability.

■ Application and markets

EFFIWIND technology will be applied to all large composite components. The first market will be blades for retrofit and offshore nacelle housings.

In the medium and long term, the EFFIWIND project targets large onshore and offshore wind turbines.



Plastinov blade-manufacturing workshop in Marmande

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