

Projet WIND TURBINE

*Conception and Fabrication of a Domestic
Small Wind Turbine within certification
standard IEC 61400 series*



- **COORDINATION**

Université Al Akhwayn- Ecole d'Ingénierie-
Prof. Anas BENTAMY

- **CONSORTIUM**

Université Al Akhwayn
Université Kiel des Sciences Appliquées
GIMAS

- **DUREE DU PROJET**

3 ans

- **BUDGET DU PROJET EN MAD**

Financement IRESSEN: 2 752 028
Investissement global: 4 245 000

- **CONTACTS:**

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Partenaires Scientifiques



Al Akhawayn University, Renewable Energy Group, School of Science and Engineering: The renewable energy group aims to make notable contributions to teaching through the development of new master degree program in renewable energy and to make sure that AUI research activities in field of renewable energy technologies are in line with national and international developments to adapt technology to local needs and to support national and as well as international industries.

جامعة الأخوين
AL AKHAWAYN
UNIVERSITY



Kiel University of Applied Sciences founded on 1 August 1969 as a result of the merger of several state-run schools of engineering and technical colleges which in themselves can look back on a history of more than 100 years. It has a long tradition in wind energy, esp. in the group founded by Prof. Schaffarczyk in 1997



FACHHOCHSCHULE KIEL
University of Applied Sciences

Partenaires Industriels

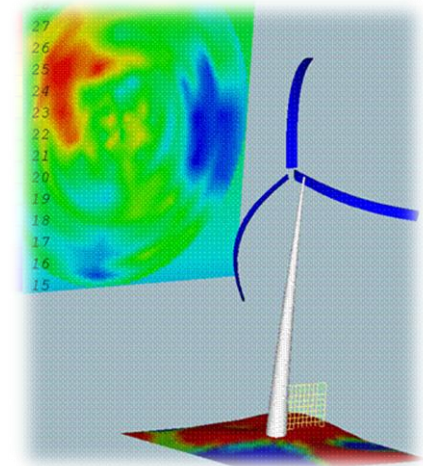


GIMAS: The Group of aeronautical manufacturers GIMAS has a major role in consolidating and strengthening the competitiveness of the Moroccan aviation base and contributing to its international reputation. It works on the development of a strategy for development of aerospace industry and the implementation of the National Pact for Industrial Emergence. GIMAS also partnerships with universities and research centers in engineering to develop national and international R&D programs.

GIMAS
GROUPEMENT DES INDUSTRIES MAROCAINES AERONAUTIQUES ET SPATIALES

Small wind turbine manufacturers' research and development concerns can be expressed mainly in terms of efficiency and design issues. Blades and alternators efficiencies have to be increased from 32% to 45% and from 65-80% to 90-92% respectively, while inverters are already over 90% efficient. Major topics in design are still to continue to increase swept area to capture more energy while minimizing design loads, to improve turbine performance in low-wind conditions and to reduce the number of components in a system. Among others there are issues pertaining to lightning, corrosion, bearing lubrication, alternator winding insulation, and electronics. One of the priorities is also to develop processes and tools that can predict a turbine's energy production more accurately.

The innovation here is to make wind energy more attractive for our country by using locally available materials to produce parts of the wind turbines rather than conventional expensive composite material. Thus the small wind turbines should be inexpensive in production and in service, reliable and durable, and producible locally.



- **Objectifs du projet:**

In addition to the technical and scientific gains acquired by the participants, the findings of the study aim to market a low cost small wind turbine designed to cover the needs of people in remote areas of the countryside. Mass production small wind turbine will drive down the manufacturing costs, enabling more accessibility to small scale renewable equipment. Sharing of this knowledge is vital to the growth of small wind turbine industry in Morocco.

- **Perspectives du projet:**

1. Market a low cost small wind turbine designed to cover the needs of people in remote areas of the countryside;
2. Enrich the Moroccan work market by manufacture, assembly, repair and maintenance tasks of small wind turbine locally;
3. Roadmap for future development of small wind turbine industry in Morocco;
4. Energy independence of remote regions based on affordable, accessible, and local wind energy technology.

*Certification de type
IEC 61400 series*

