UpWind

MCE Brussels, Rue de l'Aqueduc 118, 1050 Brussels
9 October 2008 (14:00 – 17:30)

Coordinator of UpWind
Peter Hjuler Jensen
Risø DTU

SIXTH FRAMEWORK PROGRAMME

UpWind

Program for Mid Term UpWind Work shop

Introduction	
14:00 – 14:10	Opening and introductory remarks *Peter Hjuler Jensen, Risø/DTU (UpWind co-coordinator)*
14:10 – 14:30	Main conclusions from the last Periodic Activity Report *Jos Beurskens, ECN (UpWind co-manager)*
Mid term results of selected UpWind Work Packages	
14:30 – 14:50	Up scaling, Integrated design, Standards *Sten Frandsen, Risø/DTU (WP 1A1 Leader)* *Bernard Bulder, ECN (WP 1B4 Leader)*
14:50 – 15:10	Smart rotor blades *Gijs van Kuik, Delft University of Technology (WP 1B.3 Leader)*
15:10 – 15:30	Aerodynamics and aero-elastics *Flemming Rasmussen,Risø/DTU (WP2 Leader)*
15:30 – 15:50 Coffee/Tea Break	
15:50 – 16:10	Rotor structure and materials *Bert Janssen, ECN (WP3 Leader)*
16:10 – 16:30	Transmission and conversion *Jan Hemmelmann, GE Global Research (WP 1B.2 Leader)*
16:30 – 16:50	Design of Large Sectional Blades *Angel González Palacios, Gamesa Innovation & Technology (WP 1B1Leader)*
16:50 – 17:10	Flow in wind farms *Rebecca Barthelmie, University of Edinburgh (WP 8 Leader)*
17:10 – 17:30	Training and education *Evagelos Politis ,CRES (WP 1A.3 Leader)*
17:30 – 17:35	Closing remarks

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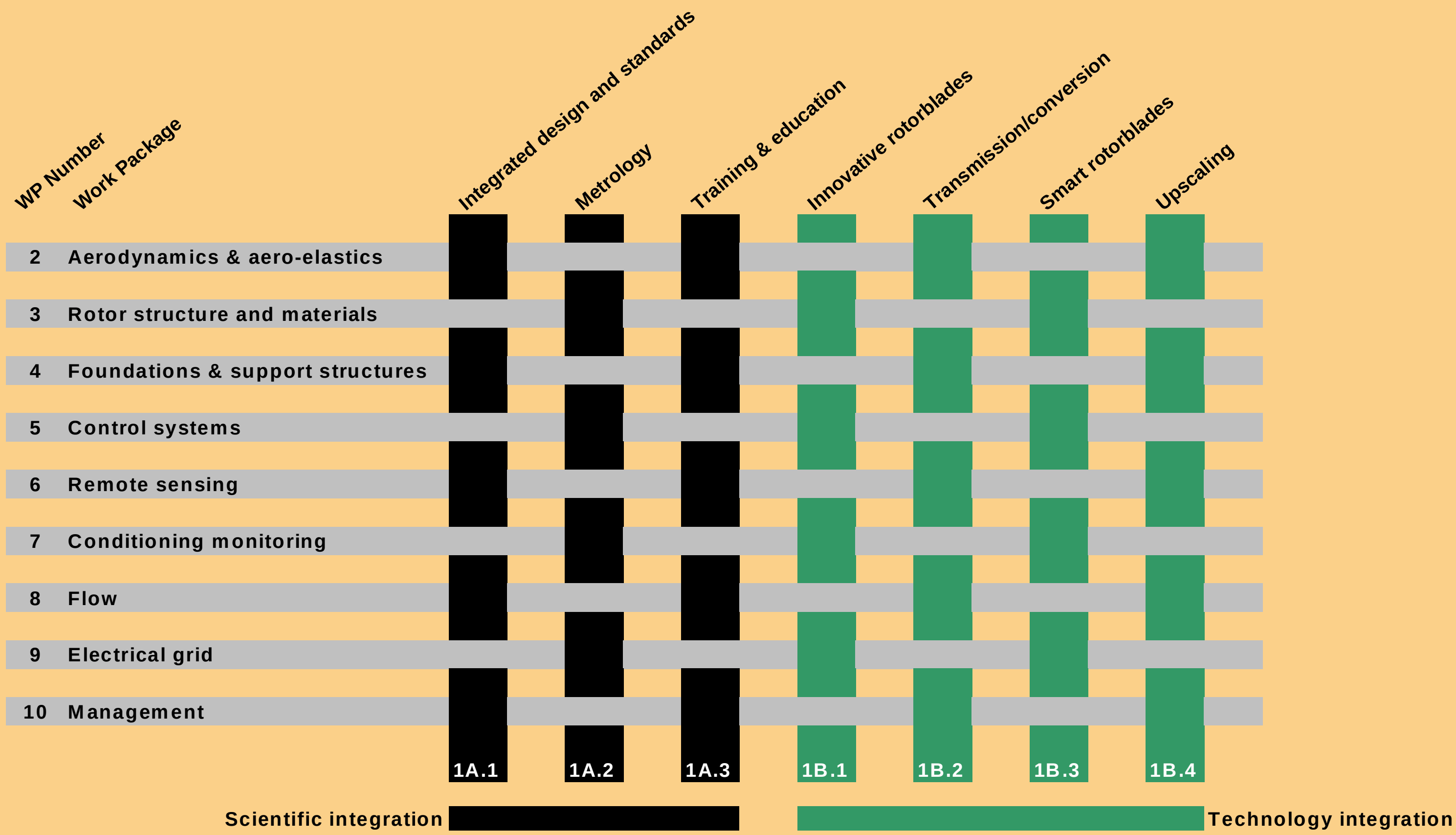
Project title: Integrated Wind Turbine Design

- FP6 Integrated project
- Start date: 1 March 2006
- Duration: 60 months
- 40 partners (39 to 43)
- Costs: 22,340,000 EUR (+)
- EC funding: 14,288,000 EUR (+)

Annual General Meeting:

Report for the year and plan for next 18 month

UpWind Work package structure



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WP descriptions available

Challenge

Research activities

Results and expectations

Contact data

Participants of WG

THE RESEARCH ACTIVITIES

The main research activities for the integral design approach and standards' work package include:

- Defining and updating a reference wind turbine and a reference technical-economic cost model for benchmarking to be used for communication of the design parameters and design developments and the main economic and dynamic performance parameters for all UpWind project activities;
- Development, application and evaluation of an integral design approach methodology in offshore wind turbine design;
- Development of standards in general and for the application of the integral design approach, including definitions of interfaces between models, including data needs, specifications and protocols;
- Definitions and specifications of experimental data to be condensed into input design parameters for the design models or to verify critical design and performance issues.

In practical terms, the above research activities are sub-divided into 4 tasks.

SUBTASK A: REFERENCE WIND TURBINE AND COST MODEL

The subtask is dedicated at facilitating the integration of the different activities in all the horizontal (and vertical) work packages throughout the project. For this, a reference wind turbine will be defined to provide a basis for communication and comparisons. The design parameters and the main characteristics, including results of parameter sensitivity studies, will be defined and kept up to date. Input data will be provided from the other work packages. The data will be made easily accessible to all partners in the project.

Work Package 1

SUBTASK B: INTEGRAL DESIGN APPROACH METHODOLOGY

Other technology sectors, such as air-transport, have experienced a development similar to wind energy with respect to increasing complexity and focus on specialists. For some of these technologies "Knowledge Based Engineering" (KBE) is investigated as a means to increase productivity of the design teams and to reduce the boundaries between disciplines. KBE tries to model not only properties of a product, but also the knowledge about the product that captures the engineering intent behind the design. KBE can be used in Design and Engineering Engines (DEE), to automate the multi-disciplinary processes. This automation is not intended to replace the design team, but rather to replace routine activities and to improve efficiency and consistency of information exchange. As a result, design teams will have more time for their creative contributions and thus can increase their productivity. Core element of the DEE is a (multi-) model generator in which the parametrical description of the product resides. It gets input from a concept generator and (re)generates the input for the analysis tools: the discipline silos. Typically, the discipline silos are commercial off-the-shelf analysis tools. The Knowledge Based Engineering tools reside in the concept generator.

Thus, the objective of this activity is to assess the feasibility of this approach for wind turbine design and to develop the knowledge needed to generate a DEE for this purpose. It is noted that the analysis tools in the discipline silos are external tools and are not part of the development undertaken in this activity. However, this activity will contribute to and make use of the common formats developed in this task, as these represent the interfaces between the model generator and the analysis tools. The reference turbine will be used as a case study.

Integration and Scientific work packages

Horizontally the scientific work packages are displayed and vertically the integration work packages.

SUBTASK C: DEVELOPMENT OF (PRE) STANDARDS FOR THE APPLICATION OF THE INTEGRAL DESIGN APPROACH

This subtask is dedicated to the development and formulation of standards in a broad sense, and for the application of the integral design approach of subtask B. Hence the subtask C aims at integrating the design models, experimental methods and concepts arising from the horizontal work packages.

SUBTASK D: INTEGRATION, REVIEW AND PLANNING WORKSHOPS

This subtask focuses on coordination and cross-cutting activities.

RESULTS AND EXPECTATIONS

So far cost functions for the components of the wind turbine, for which the input from parallel project activities is needed have been developed.

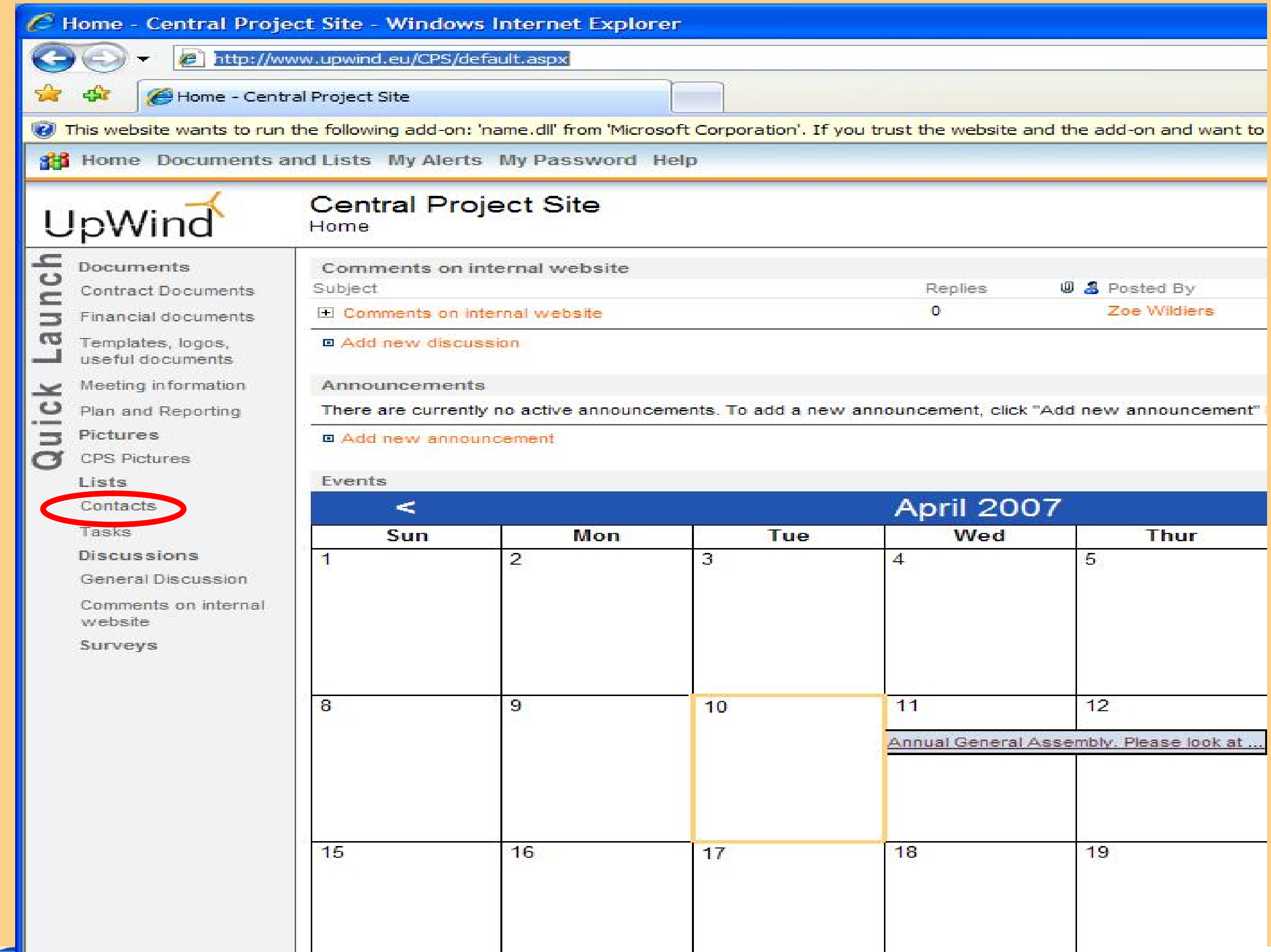
This WP works in close cooperation with the WP Upscaling (1B4).

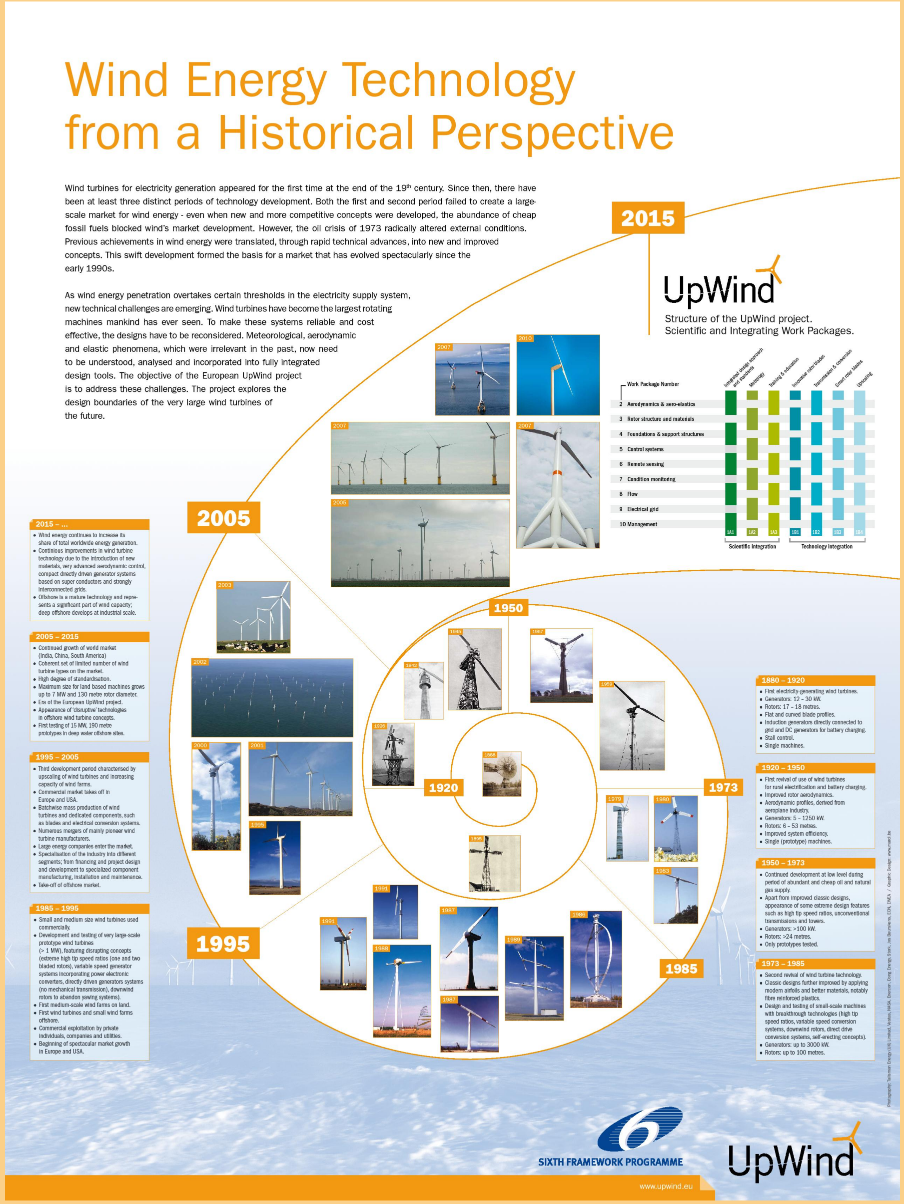
The final results of the work package include:

- Guidelines for the integral design approach, including guidelines for design models, experimental methods and concepts arising from the scientific WP's;
- Recommendations and pre-standards to be submitted for IEC/ISO and CEN/CENELEC for the revision or development of international standards for design and tests of wind energy systems.

www.upwind.eu

Central Project Site (CPS)





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