Module label: Wind Farm Technology, Economics & Environmental Issues

Module code: pre327

Credit points: 7.5 KP

Workload: 225 h

Used in course of study:

- Master's Programme European Master in Renewable Energy (EUREC) > Mastermodule

Contact person: [Contact person name]

Entry requirements: [Entry requirements]

Skills to be acquired in this module:

At the completion of this module, the student will:

- possess advanced knowledge on wind farm design
- possess advanced knowledge on economics and environmental issues
- be skilled in wind farm design and environmental impacts using simulation programs (GH WindFarmer), practical experience
- have an understanding of economical parameters to successful project realisation

Module contents:

1. Wind Farm Technology Issues
   - Wind exploitation in wind farms
   - Energy predictions and optimization
   - Balance of plant
   - Wind farms electrical design
   - Wind Farm design, wake effect (simple and advanced wake models, numerical methods - CFD approach)

2. Economics of WT and Externalities
   - Calculation methods
   - Current plant costs
   - Wind energy prices
   - The value of wind energy
   - External costs
   - Future price trends

3. Environmental Issues
   - Environmental benefits
   - Environmental effects
   - Amenity (land use, visual impact)
   - Technical analysis of noise and electromagnetic interference
   - Ecology (birds)
   - Consumption of energy and materials

4. Market development and status of industry
   - Characteristics of the EU industry
   - Present status of wind power
   - Market description
   - Market predictions
   - Wind energy targets
   - Wind energy market incentives in Europe

5. Offshore
   - Turbine modelling
   - Support structures – foundation
   - Wind farms aspects
   - Grid connections

6. Wind energy in urban areas

7. Wind forecast
   - Introduction to Coupled Ocean / Atmosphere Mesoscale Prediction System (COAMPS)

Reader's advisory:


Links:

Language of instruction: English

Duration (semesters): 1 Semester
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