



6th International Training Course on WIND TURBINE TECHNOLOGY AND APPLICATIONS

18th October - 03rd November 2010

The renewable energy sources particularly ‘wind energy’ development showed its remarkable growth in the recent years, that can create pollution less and environment friendly atmosphere. India, over the years, has been a trend-setting nation with regard to Wind Power Utilization. Decades of concentrated efforts have started to yield gratifying results and today, wind power gets listed alongside of thermal, hydro and other sources of energy in the power supply mix. There was a time when it used to get classified under “other sources”. This is by no means a minor achievement. The Indian wind energy programme has been very successful in commercializing wind energy and it is interesting to note that India is the first and the only developing country that stands fifth in the world in terms of installed wind power capacity.

The wind energy market is continuing to grow steadily in India along with the rest of the world to become one of the global manufacturing hub for wind turbines. India has about 16 large wind turbine manufacturers with capacity ranging from 225 kW to 2100 kW and several small wind turbine manufacturers producing capacity ranging from 300 W to 50 kW. The global wind industry is facing a shortage of skilled man power to meet the demands of its rapid growth. To address this global demand, C-WET has been continuously organizing International training courses since 2004.

With this background, we are happy to announce the 6th International Training Course on “Wind Turbine Technology and Applications” during 18th October to 03rd November 2010 to address all aspects of Wind Resource Assessment, Wind Farm Development, Wind Turbine Testing, Standards & Certification and Operation & Maintenance of Wind Electric Generators (WEGs) in a focussed manner. This three week course offers a unique opportunity to learn about fundamentals of wind turbine technology and have been well received by the international participants over the years.

Course Objectives

The objective of the training course is to transfer knowledge and special skills to the wind energy personnel active in technical and operational fields. Moreover the course provides an invaluable platform for dialogue and open exchange of views and experiences.

Disseminate knowledge and develop special skills using lectures from scientists and leading professionals in the wind energy sector, interactive sessions with the leading personnel in the Wind Energy field and learning materials.

Build personnel to meet the demand of skilled human resource in the participant’s country and specifically to do extensive research and evolve innovative strategies.

Provide an invaluable platform for exchange of professional and cultural experiences among diverse participants from all parts of the globe.

At the end of this course participants will have strong understanding on fundamentals of wind energy technology along with applications, standards, certification, economics, CDM and policies.

Leverage the research that continues to shape this rapidly evolving discipline.

Methodology & Course Outline

The lectures often include exercises and case studies to stimulate active participation and dialogue. After a general introduction to the wind turbine technology, characteristics of wind resources, grid integration, wind farm design methodology, testing & certification related issues and implementation processes are explained.

Resource Persons

C-WET and national experts, engineers, scientists and academicians, who have contributed significantly for the developments towards the field of energy, renewable energy and wind energy will be the resource persons for this training programme.

Course Syllabus

1. General

- **Introduction to wind energy technology and world-wide developments.**
- **Evolution of wind energy technology.**
- **Developments / breakthroughs.**
- **Government policies and supportive schemes & programme.**
- **Finance opportunities.**
- **Human Resource Development.**
- **Clean Development Mechanism.**
- **Factory and Field visits.**

2. Wind Resource Assessment

- **Wind resource assessment techniques.**
- **Wind flow modeling.**
- **Wind data analysis.**

3. System assembly, standards, testing and certification and operation & maintenance of wind energy system

- **Introduction to wind turbine certification schemes.**
- **Overview of Type Approval Provisional Scheme - 2000 (TAPS 2000).**
- **Basics of aerodynamics.**
- **Introduction to IEC 61400-1 standard.**
- **Assessment of wind turbine loads.**
- **Certification requirements – Electrical System.**
- **Design requirements of mechanical components.**
- **Design requirements of structural components.**
- **Control and protection System.**
- **Overview of wind turbine foundations.**
- **Project certification.**
- **Operation and maintenance requirement.**
- **Manufacturing system evaluation.**
- **Safety and function test.**
- **Introduction to measurement techniques.**
- **Introduction to IEC standards IEC 61400-12-1, IEC 61400-13, Danish standards.**
- **Visits of Test Beds / facilities at WTTS.**
- **Practical training on climbing / safety issues / instrumentation.**
- **Power Performance Measurements.**
- **Yaw Efficiency Measurements.**
- **Introduction to Load Measurements.**
- **Introduction to Power Quality Measurements.**
- **Wind farm design.**
- **Grid integration.**
- **O&M aspects of wind farms.**
- **Risk assessment of wind farms.**

Targeted Participants

The course will be useful for anyone involved in wind energy, or those looking for an introduction. Officials in Government, Public and Private Sectors, Universities, Chambers of Commerce and Industry, etc. can participate in the course.

Eligibility

- Participant should be from any one of the ITEC / SCAAP countries. (Find the list of ITEC / SCAAP countries in <http://itec.mea.gov.in>)
- Degree in Science / Diploma / Engineering disciplines and knowledge in English
- Maximum 60 years
- Relevant experience in Wind Energy preferred

Course Fee

The course is completely sponsored by MEA, Government of India including food, accommodation, travel expenses, book allowance and living allowance. The accommodation provided to participants will be of International Standards.

Reason to Attend

The course will offer a good foundation on the principles of engineering behind wind energy technology and power generation & distribution along with financial viability and entrepreneur opportunities. The course would facilitate an invaluable platform for dialogue and open exchange of views and experiences with Indian scientists / professionals. The course would give a picture of know-how and pave the way to go about setting up a financially viable wind farm project.

Venue

The venue for the course would be the lecture hall in the Centre for Wind Energy Technology (C-WET), Chennai, Tamil Nadu, India.

How to Apply ?

Application should be forwarded through the Indian Embassy / High Commission at the respective country. Details regarding Indian Embassy / High Commission in your country can be found at <http://itec.mea.gov.in>. Upon selection, the Embassy / High Commission of India will inform the nodal / designated Department / Agency of the nominating country and the candidate.

Highlight

In addition to attending the training course, the participants will also have the privilege to participate in the Fourth Delhi International Renewable Energy Conference (DIREC 2010) being held from 27th to 29th October 2010 at New Delhi (<http://direc2010.gov.in/>), as part of the training course.

Course Coordinator

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Organizers

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ABOUT C-WET

The Centre for Wind Energy Technology shortly known as C-WET is an autonomous R&D institution established at Chennai in 1998 by the Ministry of New and Renewable Energy (MNRE), Government of India. It is a young organization with highly experienced professionals with expertise in all related disciplines of wind energy sector. This unique combination makes it a forward looking and practical organization that will take the next logical steps towards advancing wind technology in the right direction. With its open approach to all wind energy related science and technology, C-WET assures assistance from resource assessment to project implementation. As an integral part of C-WET, a world class Wind Turbine Test Station (WTTS) is located at Kayathar in Thoothukudi District, Tamil Nadu. Perhaps, C-WET is the only Testing and Certifying Agency in the country.

C-WET has the responsibility to provide complete scientific and technical backing to all stakeholders in the field of wind energy and has stated its commitment through its quality policy.

C-WET is committed to achieve customer satisfaction, loyalty and confidence by providing credible, prompt and complete solutions of international quality to all the stakeholders in the wind energy sector.

C-WET, strives to be technical focal point of excellence for the present and future. C-WET shall stay at the forefront of Wind Turbine Technology application by continuously improving its expertise.



CENTRE FOR WIND ENERGY TECHNOLOGY

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