

10<sup>th</sup> International Training Course on  
**WIND TURBINE TECHNOLOGY AND APPLICATIONS**

*Specially for African Countries*

**20<sup>th</sup> March - 12<sup>th</sup> April 2013**



Organized by



**CENTRE FOR WIND ENERGY TECHNOLOGY, Chennai, India**



Sponsored by

**MINISTRY OF EXTERNAL AFFAIRS, Govt. of India, New Delhi**

Supported by

**MINISTRY OF NEW AND RENEWABLE ENERGY, Govt. of India, New Delhi**

## Introduction

Wind power is being adapted the world over as the most efficient power generation source that does not cause greenhouse emissions. With the raising concerns on climate change, countries are under pressure to turn towards using Renewable Energy (RE) sources and reduce CO<sub>2</sub> emissions. Amongst RE sources, Wind energy proved to be more successful energy option next to hydro and more than 250 GW has been installed worldwide. Earth's commercially viable wind power potential is estimated at 72 TW which is five times more than world's total energy demand. With such a huge potential, only very few countries are really using wind power. USA, some of the European countries and Asian countries like China and India are using wind energy at a large scale. Wind energy has been least used in African continent, where only very few countries like Egypt, Morocco, Tunisia, South Africa etc. uses Wind energy for power generation. Deficit of skilled human resource has been one of the main barriers to hinder wind energy and other renewable energy diffusion.

India, over the years, has been a trend-setting nation with regard to Wind Power Utilization. The Indian Wind Energy programme has been very successful in commercializing wind energy and holds fifth position globally in terms of installed wind power capacity.

As C-WET is the only institute of its kind in the developing countries, it is C-WET's responsibility to speed up wind energy development not only in the country but also in neighbouring countries. As a part of such activities, C-WET had already successfully organized Ten International Training Programmes on "Wind Turbine Technology and Applications" since 2004, which includes a customised special International Training Course for Arab Organisation for Industrialization (AOI) Engineers on "Wind Turbine Testing and Wind Farm Micrositing". C-WET has also successfully organised 14 National Training courses including one special course for State Nodal Agencies (SNAs) and MNRE scientists and a special course for students to create an effective infrastructure, competent & skilled human resources in the wind energy sector. With this vast experience, it is worthy effort that India can incorporate lessons learned from its own experience and foster wind energy developments elsewhere in the Indian subcontinent and other geographical sub-regions.

It is in this context, a four week 10<sup>th</sup> International Training Course is scheduled during 20<sup>th</sup> March to 12<sup>th</sup> April 2013 specially for African counties to address all aspects of wind energy starting from introduction to wind and its technology, wind resource assessment, installation & commissioning and operation maintenance of wind farms, along with financial aspects and testing & certification of wind turbines in a focused manner with practical, field & factory visits.

## Objective

- ❖ The prime objective is to transfer knowledge and special skills to the African participants
- ❖ Build skilled human resource so that there will be advancement of wind energy in the participants' country
- ❖ To do extensive research and evolve innovative strategies
- ❖ Provide an invaluable platform for exchange of professional and cultural experiences among diverse participants from different parts of the globe
- ❖ Leverage the research that continues to shape this rapidly evolving discipline

## Training Methodology

The lectures include exercises and case studies to stimulate active participation and dialogue. Hands-on working wind energy equipments and excursions to operating wind farms and wind turbine manufacturing facilities are also scheduled to enhance transfer of knowledge.

## Resource Persons

The resource persons will be C-WET scientists, industry professionals, academicians and other national experts who have significantly contributed for wind energy development in India.

## Course Syllabus

The course content for the training was carefully thought out syllabus with specific subject experts giving lectures and going through the specific case studies such that at the end of the day, considerable useful knowledge transfer was perceived.

The training addresses the following aspects:

- ❖ Wind energy conversion technology and power generation
- ❖ Wind resource assessment and techniques
- ❖ Planning including design of wind farms

- ❖ Design of wind turbine
- ❖ Wind turbine components and performance characteristics
- ❖ Wind turbine technology developments
- ❖ Cost benefit analysis of wind energy projects
- ❖ Installation and commissioning of wind farms
- ❖ Post installation activities - Grid integration
- ❖ O & M aspects of wind farms
- ❖ Testing & Certification of wind turbines
- ❖ Small wind turbine and hybrid systems
- ❖ Indian government policies, schemes and legal frameworks
- ❖ Wind energy developments in India
- ❖ CDM related to wind energy development

In addition to the classroom lectures visits to Wind farms and manufacturing facility would be organized during the course to give a complete picture of the know-how and how to go about in setting up a coordinated wind energy programme at a national level.

### Targeted Participants

The course will be useful for anyone involved in wind energy industry, or those looking for an introduction. Person from the following fields will find this course very relevant.

- ❖ Power Industry
- ❖ Manufacturers
- ❖ Utilities
- ❖ Project Developers / Managers
- ❖ Consultants
- ❖ NGOs
- ❖ Academic and R&D institutions
- ❖ Suppliers and Distributors
- ❖ Government Organizations
- ❖ Media

### Eligibility

- ❖ Applicant should be from any one of the **African countries**
- ❖ **Degree / Diploma in Engineering/Science** with good knowledge in English
- ❖ Age should be between **25 to 45 years**
- ❖ Relevant experience in wind energy preferred

### Course Fee

The course is **completely free** including to and fro air fare, sponsored by Ministry of External Affairs

(MEA), Government of India including local travel expenses, accommodation, food, living and book allowances. Accommodation provided 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 forum for dialogue and open exchange of views and experiences with Indian Scientists and professionals. The course would give a picture of complete know-how and pave the way to go about in setting up a financially viable wind farm project.

### The Programme

The total course duration is 24 days from 20<sup>th</sup> March to 12<sup>th</sup> April 2013 encompassing presentations, lectures with case studies, success stories and exercises.

### Venue

The venue for the course will be the Conference Hall of C-WET, Chennai, India.

### How to Apply?

The interested candidate may contact Indian embassy / High Commission of the respective countries for filing application. 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.

### Course Coordinator

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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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