

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

*Specially for African Countries*

24<sup>th</sup> October to 21<sup>st</sup> November 2019



नीवे NIWE

Organized by \_\_\_\_\_  
**NATIONAL INSTITUTE OF WIND ENERGY, CHENNAI**  
Ministry of New and Renewable Energy, Government of India

\_\_\_\_\_ Sponsored by  
**MINISTRY OF EXTERNAL AFFAIRS, NEW DELHI**  
Government of India



## Introduction

Renewable Energy in particular Wind and Solar has become mainstay in meeting energy needs having achieved grid parity in term of costs as well as technical requirement. The wind energy has proved a highly successful energy option with installation of over 560 GW worldwide by the end of December 2018. It is estimated that viable wind power potential across globe is 72 TW, which is four times more than the current World's total energy demand. The major wind generator installation is in USA, some of the European countries and Asian countries like China and India and other countries catching up with the rest. Wind Energy has been least used in African continent, where only very few countries like Egypt, Ethiopia, Kenya, Morocco, South Africa etc. uses wind energy for power generation. Lack of skilled human resource has been one of the main barriers that hinders wind and other renewable energy integration.

The National Institute of Wind Energy (NIWE), under the Ministry of New and Renewable Energy, Government of India has pioneered in promoting wind Energy and has contributed for promotion of wind energy as one of the primary energy sources in India. Decades of concerted efforts have started to yield gratifying results and today, Wind power contributes 10.6% (35625.97 MW) of the total Indian energy mix of 356100.19 MW and stands fourth in terms of installed wind power capacity worldwide as on March 2019. With this vast experience, we have an obligation to disseminate the knowledge learnt to foster growth of wind energy across globe. In this context, a four week International Training Course is scheduled by NIWE specially for African countries under India Africa Forum Summit - III (IAFS-III) sponsored by Ministry of External Affairs (MEA), Government of India. NIWE to its credit has successfully conducted 34 international training courses, wherein 693 professionals from 88 countries have been trained and has also conducted 31 national training courses and trained about 1386 professionals.

## Objectives

- ❖ The prime objective is to transfer knowledge and special skills to the international participants.
- ❖ To build skilled human resource so that there will be advancement of wind energy in the participating country.
- ❖ To provide an invaluable platform for exchange of professional and cultural experiences among diverse participants.
- ❖ To leverage the research that continues to shape this rapidly evolving discipline.

## Course Syllabus

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

The course will address the following aspects:

- ❖ Wind energy conversion technology and power generation
- ❖ Wind turbine technology and developments
- ❖ Design of wind turbines
- ❖ Wind turbine components and performance characteristics
- ❖ Wind resource assessment and techniques
- ❖ Planning including design of wind farms
- ❖ Wind farm developments and feasibility study
- ❖ Pre-Investment study and Cost benefit analysis
- ❖ 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
- ❖ Wind energy developments in India
- ❖ Indian government policies and schemes and legal frameworks.

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

## Training Methodology

- (a) Class room lectures including exercises and case studies to stimulate active participation and dialogue.
- (b) Practical classes at different laboratories.
- (b) Hands-on working on wind energy equipments.
- (c) Study visits to operating wind farms and wind turbine manufacturing facilities to enhance effective transfer of knowledge.

## The Programme

The total programme duration will be **29 days** from **24<sup>th</sup> October to 21<sup>st</sup> November 2019**.

## Venue

The venue for the programme will be the **Conference Hall of National Institute of Wind Energy, Chennai, India**.

## Resource Persons

The resource persons for this training course will be NIWE engineers, industry professionals, academicians and other national experts who have significantly contributed for wind energy development in the country.

## Target Participants

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

- ❖ Academic and R & D Institutions
- ❖ Power Industry
- ❖ Manufacturers
- ❖ Suppliers and Distributors
- ❖ Utilities
- ❖ Consultants
- ❖ Project Developers
- ❖ Government Organization
- ❖ NGOs and Green Engineers

## Reason to Attend

The course will offer a good foundation on the principles of engineering behind wind energy

technology, 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 setting up a financially viable wind farm project.

## Eligibility

- ❖ Applicants should be from any one of the **African country**.
- ❖ **Diploma or Degree** in any **Science** or **Engineering** streams with good knowledge in English.
- ❖ Age should be between **25 to 45 years**.

## Course Fee

The course is **completely free** which is sponsored by Ministry of External Affairs (MEA), Government of India under India Africa Forum Summit - III (IAFS-III) which includes **to and fro air fare, local travels, accommodation, living allowance and book allowance**. Accommodation provided will be of international standards.

## How to Apply?

Interested candidates may download the application and contact Indian Embassy / High Commission of India in respective participant countries to submit application to forward NIWE for processing. The application form may be download from NIWE website @ [http://niwe.res.in/department\\_itcs\\_itc.php](http://niwe.res.in/) and may also request through email.

## Course Coordinator

### **Dr. P. KANAGAVEL**

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## ABOUT NIWE

National Institute of Wind Energy formerly Centre for Wind Energy Technology shortly known as NIWE 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 premier institution with highly experienced professionals having expertise in all related disciplines of wind energy sector. NIWE is a forward looking and practical institution always well placed to take the next logical steps towards advancing wind technology in the right direction. With its progressive approach to all wind energy related science and technology from onshore to offshore, NIWE assures assistance from resource assessment (both wind and solar, RE forecasting for Energy production) to project implementation. As an integral part of NIWE, a world class accredited services providing Wind Turbine Test Station (WTTS) is established at Kayathar, Tamil Nadu. Perhaps, NIWE is the only Testing and Certifying agency in the country. NIWE has been vested with 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.

### QUALITY POLICY

NIWE 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.

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



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## NATIONAL INSTITUTE OF WIND ENERGY

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