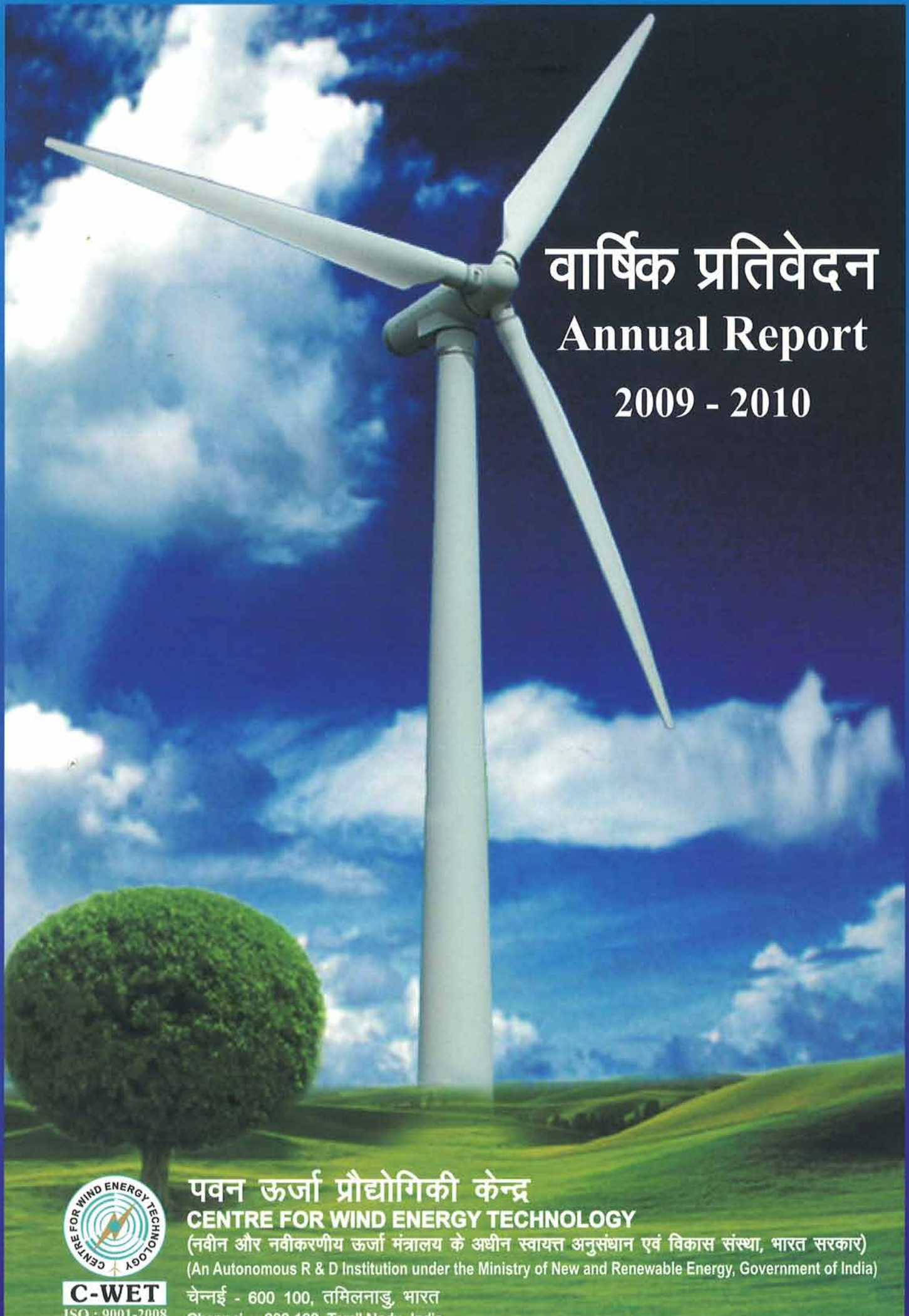

वार्षिक प्रतिवेदन
Annual Report
2009 - 2010

पवन ऊर्जा प्रौद्योगिकी केन्द्र
CENTRE FOR WIND ENERGY TECHNOLOGY
(नवीन और नवीकरणीय ऊर्जा मंत्रालय के अधीन स्वायत्त अनुसंधान एवं विकास संस्था, भारत सरकार)
(An Autonomous R & D Institution under the Ministry of New and Renewable Energy, Government of India)
चेन्नई - 600 100, तमिलनाडु, भारत
Chennai - 600 100, Tamil Nadu, India

C-WET
ISO : 9001-2008

ANNUAL REPORT
2009 - 2010

C-WET

Centre for Wind Energy Technology

(An Autonomous Research and Development Institution under the Ministry of New and Renewable Energy, Government of India)

Chennai - 600 100, Tamil Nadu, India

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.

Executive Director

CENTRE FOR WIND ENERGY TECHNOLOGY
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the Ministry of New and Renewable Energy, Government of India)
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Executive Director's Report

Centre for Wind Energy Technology (C-WET) proactively plans and executes various programmes within the objectives of the Centre in the development of wind power sector in the country. Year after year, C-WET's experience has been very useful in providing value added services to all wind energy stake holders. The services covered wide areas of applications such as development of Indian database of wind resources and identification of various potential locations for commercial exploitation. Wind resource studies in uncovered areas and continuous monitoring of wind data in several stations are still continuing. Preparation of an Indian Wind Atlas has been completed which is a large numerical database of indicative wind resource available anywhere in India. Testing and Certification of Wind Turbine, instrumentation of Wind Turbine Blades, consultancy in wind farm planning, feasibility studies, preparation of detailed project report, preparation of Indian Standards and conducting training courses are some of the other areas of ongoing activities in C-WET.

Empanelment of Small Wind Energy Systems (SWES), international collaborations, improved testing facilities for small battery chargers (Aero-generators), planning to make a foray into the offshore Wind Resource Assessment with Indian and foreign collaborations, number of national and international training courses highlight this year's activities.

C-WET has been effectively contributing to the Indian Standards development through its participation in ET42, Wind Turbine Sectional Committee of Bureau of Indian Standards (BIS) and also in the TC 88 proceedings of International Electrotechnical Commission (IEC), while continuing RLMM list and certification activities.

Research and Development Unit

During the year 2009-2010, Research and Development unit (R&D) has been active in making use of the research infrastructure for a study of nano coating effect on the gear mesh, performance improvements of 20-years old wind turbines, reporting of acoustic measurements, testing of Small Wind Turbines including Niharika Ishan of Auroville, use of wind forecasting in wind power generation, and measurement of power quality of 600 kW machine. Augmentation of research infrastructure with the addition of a new variable speed Wind Turbine of capacity 2 MW is also initiated with the completion of its massive foundation.

R&D unit also coordinated the outsourced projects of Indian grid code formulation to PRDC, Bangalore and Small Wind Turbine market development survey reporting to WISE, Pune apart from the initiation of selected (out of 17 RFPs) received, reviewed and recommended by Research and Development Council (RC) and approved by Governing Council (GC) of C-WET) three sponsored R&D projects on power quality, power evacuation and everybody's battery charger developments with multi-institutional cooperation.

Wind Resource Assessment Unit

Wind Monitoring Stations at more than 640 sites (since 1985) have been established with 37 stations in this year by WRA unit. A total of 88 stations are in operation in this financial year.

The Indian Wind Atlas has been prepared with involvement of Risø National Laboratory for Sustainable Energy, Denmark. The information in the Atlas is valuable to wind energy developers and potential wind energy users

because it allows them to choose a general area of estimated high wind resource for more detailed examination. It gives an updated overview of the wind climatological situations of India, based on reliable measured wind data and using contemporary numerical mesoscale models. Extensive comparisons of micro and meso scale models using Wind Atlas Analysis and Application Programme (WAsP) and Karlsruhe Atmospheric Meso Scale Model (KAMM) were adopted for the preparation of theWind Atlas. The hard copy book of Indian Wind Atlas has been prepared. Special quality color art printing is in progress prior to official release.

In addition to the wind monitoring projects funded by Ministry of New and Renewable Energy (MNRE), the unit has carried out 80 consultancy projects during the year 2009-2010. These short-term projects were to provide micrositing services and preparation of Due Diligence Reports. Under the direction from the Ministry, verification of data collection procedure adopted by private firms was undertaken for a number of stations. Special efforts were taken by meeting the North-East State Nodal Agencies (SNAs) and other SNAs to get effective co-ordination of WRA projects.

A meeting of the WRA programme for the North-East region was held on 22nd October 2009 at Shillong, Meghalaya to review the progress of the WRA activities and to discuss the issues in the North-Eastern States, and another meeting to review the entire WRA programme, with official from MNRE, C-WET and SNAs were held during 10th - 11th November 2009 at C-WET, Chennai and reviewed the progress of WRA projects in 20 States and 2 Union Territories. Apart from this, another review meeting of WRA programme for a few SNAs was held at MNRE, New Delhi on 12th February 2010.

Wind Turbine Testing Unit

At the Wind Turbine Testing unit, 6 new agreements were signed between C-WET and manufacturers for carrying out Power Curve Measurements, Safety and function test & load measurements and analysis. Re-certification as per the requirements of ISO 9001:2000 of the testing unit was completed successfully, with validity upto August 2010.

The desktop audit by National Accreditation Board for Testing and Calibration Laboratories (NABL) as per the requirements of ISO/IEC 17025:2005 was completed successfully, with validity of accreditation upto June 2010.

The unit has applied for MEASNET (International Network for Recognized and Harmonized measurements in wind energy) membership in the area of Power Performance Measurements. The technical audit by MEASNET is under progress.

Improved measurement and data collection techniques including Multi Protocol Label Switching (MPLS) networks for remote monitoring of an instrumented wind turbine testing from C-WET's dedicated system in a Virtual Private Network (VPN) are under implementation apart from preliminary planning of National Blade Test Centre (BTC).

Standards and Certification Unit

Standards and Certification unit carries out Certification of Wind Turbines as per TAPS-2000 (amended). Two provisional type certificates have been renewed during 2009-2010 and four provisional type certification are ongoing. Standards and Certification unit plays an active role in preparation of Indian standards on Wind Turbines. In this regard, the unit is working in close co-ordination with Bureau of Indian Standards (BIS). Also the unit is actively providing its contribution in the formulation of International Electrotechnical Commission (IEC) standards

through BIS. The S&C unit is supporting BIS continuously on various issues for coordination with IEC/TC88 committee. As India is a P-member (P–Participating) in IEC/ TC 88 committee, the unit is providing continuous support and contribution to BIS for voting on the draft IEC standards.

The S&C unit issues the Revised List of Models and Manufacturers (RLMM) of Wind Turbines periodically, as per the directives of MNRE. Owing to the MNRE's revised guidelines for self certification and further liberalization of signing for certification / testing with foreign bodies other than C-WET, an effective scheme of evaluation for RLMM is under progress. The terms of the RLMM Committee have been extended by MNRE with revised terms of reference and revised composition of its members.

Information, Training and Commercial Services Unit

ITCS unit had successfully organized the Seventh National Training Course lasting for 2 days on "Fundamentals of Wind Energy" during 28th - 29th May 2009 & the Eighth National Training Course lasting for 3 days on "Wind Turbine Technology" held during 9th - 11th December 2009 at C-WET, Chennai. A Special International Training Course on "Wind Turbine Testing and Wind Farm Micrositing" was organized for five Engineers from Arab Organization for Industrialization (AOI) during 19th - 28th October 2009. The Fifth International Training Course on "Wind Turbine Technology and Applications" was organized during 3rd - 19th February 2010 and 21 participants from 14 countries attended the training programme. This course is fully sponsored by the Ministry of External Affairs (MEA), Government of India under the Indian Technical and Economic Cooperation (ITEC) / Special Commonwealth Assistance for Africa Programme (SCAAP) programmes and supported by MNRE.

International / Inhouse / Institutional Interactions

First time in India and in C-WET Global wind day 2009 has been celebrated on 15th June 2009. Several students from academic institutions and professionals visited C-WET's facilities. Honorable Minister for New and Renewable Energy, Dr. Farooq Abdullah visited C-WET and interacted with the scientists. Other highlights are the signing of NREL-C-WET MoU under the US-India energy dialogue, and the visit of Chief scientist Dr. Gunjit Bir of NWTC, NREL, USA to C-WET for a face-to-face interaction with scientists of C-WET for possible collaboration, and the visit of Joint Secretary MNRE (WE), Shri Hari kumar. Inauguration of conferences / seminars / workshops, invited lectures by C-WET's scientists and deputation of scientists to conferences / seminars in India / abroad, training of staff in various administrative functions were the features spread out through the entire period during 2009 - 2010.

Peer Review Committee's Appraisal

First ever peer review of C-WET since its inception in 1998 was completed on 30th April 2009 by a high level committee setup by the MNRE, to examine C-WET's activities, user charges in relation to meet its said objectives and to suggest scope for maximizing internal resources. A comprehensive report on C-WET's performance since inception was prepared and sent to committee members in advance. All the unit chiefs of C-WET made detailed presentations along with Executive Director and the committee after thorough deliberations submitted a report to MNRE which was later approved by GC in its 23rd meeting.

Report of Peer Review Committee of C-WET

Preamble:

1. The Ministry of New and Renewable Energy (MNRE), GOI set up a PEER REVIEW COMMITTEE (vide letter No. 61/2/2008 - WE dated 29th January 2009) with the following terms of reference.

(i) To examine whether the objectives, for which the organization was set up, have been or being achieved.

(ii) To suggest whether the activities should be continued at all, based on continued need, or also because of failure in achievement of objectives.

(iii) To examine whether user charges for output or services are levied at appropriate rates.

(iv) To suggest scope for maximizing internal resources.

2. The Chairman of the Peer Review Committee suggested that, the Executive Director, C-WET could prepare a report on C-WET ahead of the scheduled peer review committee meeting, so that the members of the Peer Review Committee can interact effectively with Scientists, Technical staff and Administrative staff of C-WET. The contents of the above report included.

- Approved mandate / charter / mission statement and objectives for which C-WET was established
- Human / Infrastructural, Financial and R&D base
- Performance with respect to various programmes undertaken in the past
- Constraints / hurdles in realizing the full potential
- Vision for the future activities and targets

3. The document prepared and sent to all the members by C-WET prior to the meeting.The meeting of the Peer Review Committee was held on 30th April 2009 at 10.00 AM in C-WET and the minutes of the meeting documented.

4. Observations and Recommendations by the Peer Review Committee.

✦ Examine whether the objective for which the organization was set-up has been or being achieved

Based on the documents furnished by C-WET along with the presentations made in the meeting and detailed discussions during the meeting, the Committee made the following observations and recommendations:

The committee compared the objectives given in the summary report prepared by C-WET with the Memorandum for Creation of C-WET and observed that these were in line with the original objectives envisaged. When the presentations were made by Executive Director, C-WET and other Unit Chiefs on the activities being undertaken by C-WET, they were closely examined and related to the various objectives enshrined in the memorandum of setting up of C-WET. All the activities undertaken by C-WET are in tune with the objectives for which the organization was established. While the summary report gave details of activities carried out, the committee felt that the outputs / outcomes must also be specifically stated against each one of the objectives, for their appreciation. C-WET has prepared a detailed document listing all the outputs and achievements. Considering the limited technical / scientific man power, C-WET has done well in its activities.

✦ To suggest whether the activities should be continued at all based on continued need, or also because of failure in achievement of objectives.

The committee feels that Renewable Energy sources have come to stay and wind energy sector has good potential. There is no other organization in the country which takes up the works carried out by C-WET. By and large

C-WET is providing advanced technical service to the wind energy sector. While carrying out the review, it was seen that one of the objectives namely,

"Monitor the field performance of wind power systems, sub systems, and components; and effectively use this feedback for fulfillment of the above objectives and issue of certification; establish and update the data bank on a continuous basis; and serve as information centre for selective dissemination"

needs a lot of cooperation from various manufacturers of Wind Energy Generators. With significant sensitivity / IPR related issues cropping up even in certification and testing, monitoring of performance by C-WET on a continuous basis becomes infeasible. Though the objective itself may be laudable, it is infeasible to obtain desired results in view of the commercial interests. Hence the committee feels that the above objective may be dropped.

✦ To examine the user charges for output services are levied at appropriate rates.

The General Manager (F&A) made a brief presentation on the finances of C-WET. Revenue generated through innovative and value added services of Wind Turbine Testing (WTT), Wind Resource Assessment (WRA) and Standards and Certification (S&C) units have been around Rs.309 to Rs.495 lakhs over the last five years. After meeting all the expenditure, the surplus has been taken over to Corpus Fund which stands around Rs.864 lakhs. Expenditure for infrastructural creation is supported by budget grants from MNRE, Government of India. The overall picture presented on finances appears healthy. The committee requested the General Manger to provide a typical work-sheet as to how the charges are worked out for a particular service. Based on the inputs, C-WET was advised to estimate charges based on correct estimates for duration, and taking into account the revised pay scales. In general the charges levied are appropriate. The matter has been discussed at length and has GC's approval. Incidentally Chairman, IWTMA is a member of the GC C-WET.

✦ To suggest scope for maximizing internal resources.

C-WET is already levying charges which lead to surplus corpus funds. Increase in service charges may become inevitable because of the 6th Pay Commission recommendations. This may not be the appropriate time to enhance service charges. If C-WET gets more global visibility and is recognized as a global player, then considerable increase in revenue may be expected, by way of value addition. Some of the following suggestions if implemented can lead to realization of the above objective.

- There is no university which offers higher education in the advanced areas of Wind Energy Technology, covering the multi-disciplinary interactions. This is a handicap as well as an opportunity for C-WET to step in. For this purpose well thought out Research and Development activities are to be undertaken with the specific role identified for C-WET with the approval of RC and GC of C-WET and MNRE, GoI. The title of the project, its duration, the team, status of existing technology, activities proposed to be under taken, and the outcome / deliverables must be included in the project proposals together with a bar chart of activities including time schedule.

- The committee while reviewing the activities of C-WET noted that there is a significant short fall on technical and scientific staff as compared to the sanctioned strength. It may not be possible

to load all the man power and R&D project costs on services undertaken by C-WET. It must be recognized that for providing advanced services, it is necessary to keep in touch with the latest developments in the field. Also the present position of providing advanced technical service alone is a direct result of not taking up R&D activities in India relating to wind energy sector. A start has to be made. Possibly, the funding for the R&D component alone may be provided from budget of Ministry of New and Renewable Energy. The quantum of such budget support may be recommended by GC after approval from RC.

- C-WET may explore the possibility of utilizing the facilities available at advanced institutions like IITs, CSIR laboratories, etc. for its R&D programmes, keeping in view the need to develop Centres of Excellence utilizing core-sector concept.

- Sponsored and Collaborative R&D activities with well defined outputs / outcomes can be taken up which are sponsored by the industry. Confidentiality and IPR issues may be appropriately taken care of, in the project proposals.

- It is seen that scientific and technical staff seek greener pastures after gaining expertise in their relevant fields. It is necessary to retain the trained technical human resource. While one may say that the trained human resource is serving the interests of the country, there is no denying the fact that the efficiency of C-WET comes down by a few notches. Some incentives to scientific and technical personnel may be helpful to retain the trained human resource. These include:

(i) Providing for taking up higher studies under external registration mode for Ph.D., Initially thismay require identification of universities / institutes and appropriate R&D programmes. Once there are number of Ph.D., degree holders in C-WET, then they can serve as external guides to their colleagues.

(ii) Continuing education has become a necessity in advanced technical institutions. Scientists / Technical staff of C-WET may be encouraged to submit papers to international conferences. The expenses for these may be met from interest accrued on Corpus Fund.

(iii) Since considerable work of C-WET relates to business development and certification, these are also to be encouraged and supported.

The Charter

The Centre for Wind Energy Technology (C-WET) is the technical focal point for Wind Energy Technologies and was established at Chennai in 1998 by the Ministry of Non-Conventional Energy Resources (MNES), presently renamed as Ministry of New and Renewable Energy (MNRE). A Wind Turbine Test Station (WTTS) has also been established at Kayathar, Tamil Nadu, with the technical support and partial financial assistance from DANIDA, Denmark.

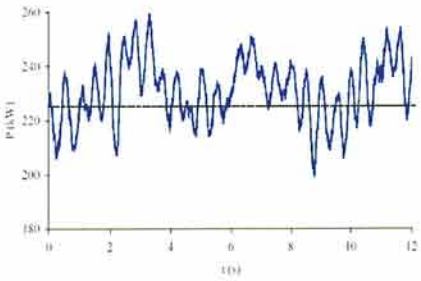
Mission

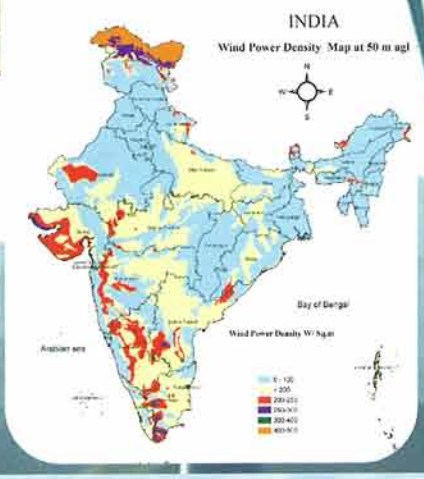
C-WET, a knowledge based institution of high quality and dedication, offers services and seeks to find total solutions for the major stakeholders across the entire spectrum of the wind energy sector. It will support the wind turbine industry in achieving and sustaining quality such that products of the highest quality and reliability are installed, harnessing maximum energy available in the wind. C-WET will strongly support the wind energy industry in developing the know-how and know-why and promoting export of products and services.

Objectives

- To serve as the technical focal point for wind power development in India, for promoting and accelerating the pace of utilization of wind energy and support the growing wind power sector in the country.
- To develop and strengthen the facilities and capabilities, evolve strategies, promote, conduct, co-ordinate and support research and development programmes to achieve and maintain reliable and cost effective technology in wind power systems.
- To analyze and assess wind resources based on the data available from various sources and prepare wind energy density maps / wind atlas / reference wind data.
- To prepare and establish Indian standards on wind turbines and to develop and implement certification system in India.
- To establish world class facilities, conduct and coordinate testing of complete wind power systems and components according to internationally accepted test procedures and criteria, whereby the total performance that includes power performance, power quality, noise level, dynamics and operation and safety systems is tested according to agreed protocols.
- To accord type approval/type certification to wind turbines in accordance with Type Approval Provisional Scheme – TAPS 2000 (amended).
- To undertake Human Resource Development programmes for the personnel working in the wind energy sector.
- To promote commercial exploitation of know-how, know-why results and offer various consultancy services to the customers.
- To promote the development and commercialization of any other Wind Energy Systems including stand-alone systems.

From the Units



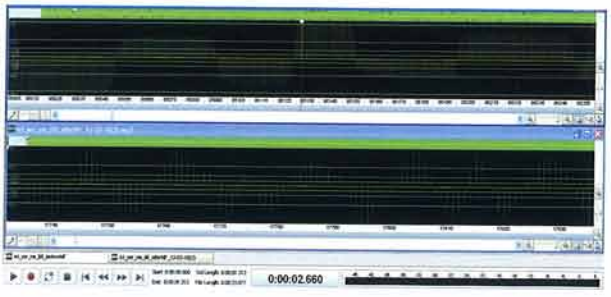


Research and Development

R&D unit addresses the specific purpose of supporting time bound and mission oriented research & development programmes to achieve and maintain world class, reliable and cost effective technology in wind power systems. The unit carries out in-house R&D including development of necessary R&D infrastructure at Chennai and Kayathar and coordinates research and development programs through effective networking with academic institutions, industry, experts and consultants working in a wide spectrum of disciplines for the benefit of wind energy sector. Details of the projects carried out during the year are as below:

Performance Quantification Study on two 20 years design life exhausted 200 kW Wind Turbine Gear Boxes before & after a nano-coating on their Gear Meshing Surface

To study and quantify the state of wear on the meshing surface of gears inside gearboxes of two Wind Turbine which have operated over their 20 years of design life and study the enhancement in their performance when nano-coated. The measurements from the "as-is-where-is" condition of turbine have been taken as a reference and during the next windy season, after injection of the nano-coat additive, an exhaustive set of measurements would be taken for comparison and quantification of the performance enhancement due to the nano-coating effect.



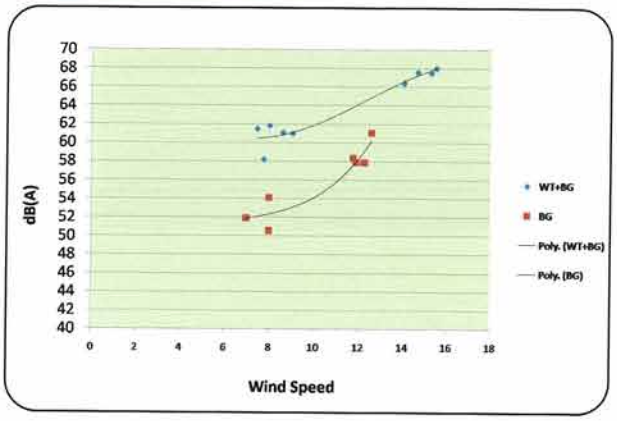
The sound analysis done from the measurements taken using a microphone

Acoustic Measurement of 750 kW Wind Turbine

Acoustic measurements on consultancy mode were undertaken on a GWPL 750 kW constant speed active stall controlled wind turbine at Tenkasi Taluk, Tirunelveli District in Tamil Nadu as per the requirements of IEC 61400-11.

The sound pressure level and one third octave band spectra were measured. The A weighted sound power level and the tones were evaluated from measured data for wind speeds ranging from 8 to 10 m/s at 10 m height.

Acoustic Measurements in Progress



Equivalent continuous sound pressure level measured at reference position

Testing of Small Wind Turbines

Measurements on two test turbines SUPERNOVA's model SNT-50 and UD Energy's model WHISPER 100 were completed. Test reports on Power Performance and safety & function test were prepared and submitted to the clients.

UD Energy SWT - Whisper 100

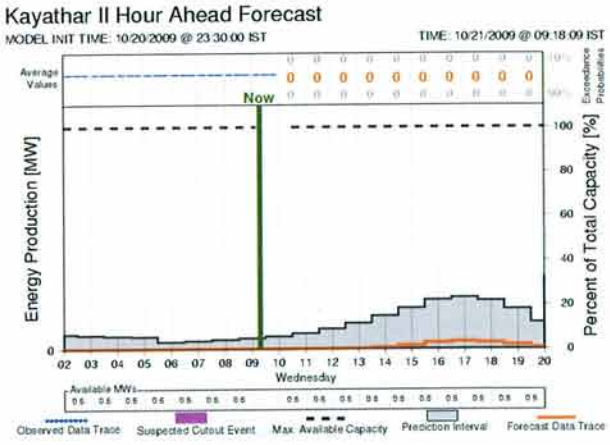
Supernova SWT - SNT-50

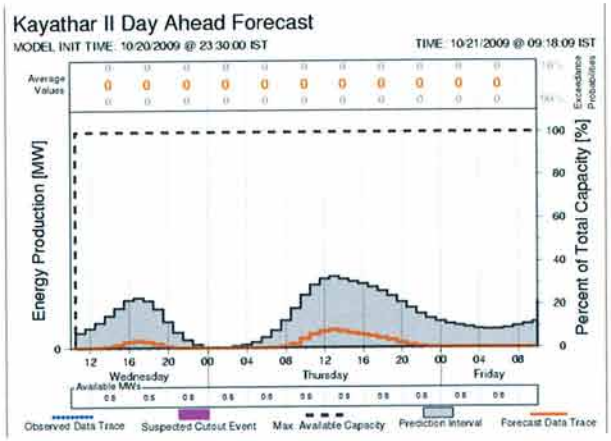
In-House Projects

The following experimental projects were carried out on the R&D / Experimental wind turbines at WTTS, Kayathar.

Wind Energy Forecasting for the 600 kW R&D / experimental wind turbine – A technology demonstration project

The project aims at forecasting suitable and usable wind power that would be available from the 600 kW R&D / Experimental Wind Turbine at Kayathar, Tamil Nadu on an hourly, daily and weekly basis by predicting weather forecast for the site. The results will help in estimating the reliability of the forecasting system (3TIER™) and act as a technology demonstrator to wind power generation companies to enhance effective wind power penetration in the overall energy mix. Wind forecasting will enable the State's utilities to overcome issues of wind infirmity by planned load dispatching of wind power.

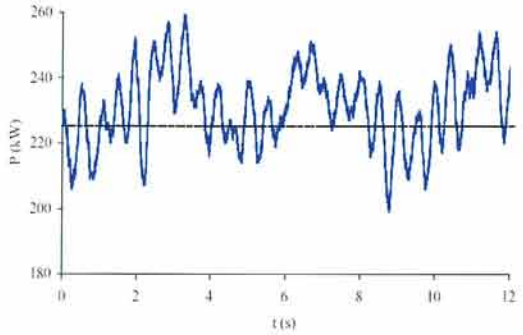




Typical results of Wind Forecasting

Measurement of Power Quality of 600 kW Wind Turbine

The power quality assessment of a wind turbine, characterized by peak power, reactive power absorption, voltage fluctuations and harmonic emissions at the wind turbine terminals / Point of Common Coupling (PCC) helps assessing its effect on the local grid to which it is connected. An experimental study was therefore under taken to determine the power quality parameters for the full operational range of a pitch regulated wind turbine, at Kayathar.



Time series of Active Power

Current Transducer Instrumentation

Data Acquisition System

Transducer for Power Measurement

Field Infrastructure Development for Wind Energy Research

As part of establishing in-house facilities for research, the unit had initiated the procurement of a Variable Speed Wind Turbine of capacity greater than 500 kW. With this C-WET will have wind turbines of three different technologies for experimental / research studies, (viz stall / pitch regulated constant speed and a pitch regulated variable speed).

The foundation works has been completed and the turbine erection works are in progress and the pre-commissioning is expected by the end of March 2010.

Foundation Work is in Progress

Foundation work is being inspected by UC, R&D and UC, WTTS

Niharika Ishan Wind Turbine

The unit has initiated a joint project with Sri Aurobindo Institute of Applied Scientific Research, Pondicherry to carryout preliminary measurements on an omni directional rotor developed by them, and to analyze the feasibility of wind energy applications. The preliminary work involving inspection of the rotor and identification of the relevant parameters for measurement have been completed. Procurement and setting up of the required instrumentation is in progress.

A Typical View of Niharika Ishan
(Source : Sri Aurobindo Institute of Applied Scientific Research, Pondicherry)

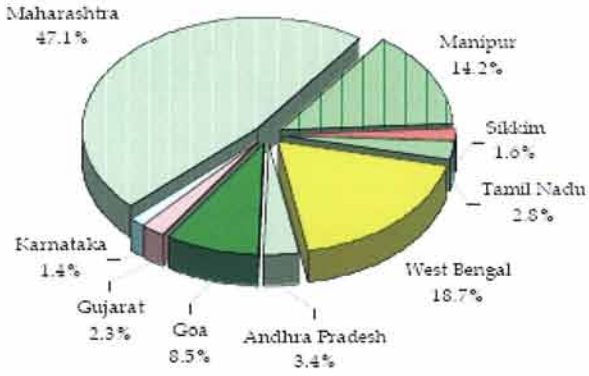
Research Projects Sponsored by C-WET.

Indian Wind Grid Code

A project was sponsored to M/s. Power Research and Development Consultants Pvt. Ltd., Bangalore, to develop the Draft Indian Wind Grid Code. The Draft Report has been prepared and submitted to Central Electricity Regulatory Commission (CERC) who has constituted a Task Force for integration of renewable energy into the Indian grid code.

A Strategic Road Map for Developing the Market for Small Wind Turbines and Wind - Solar Hybrid Systems in India

A status survey project was executed through World Institute of Sustainable Energy, Pune, to conduct an in depth study to assess the potential market and associated issues for small wind turbine systems in India with a view to utilizing them for providing electricity, water pumping services specially in rural areas.



Share (%) of different states in the selected sample of SWT and Hybrid System (Source : WISE report)

Research Projects undertaken with Multi-institutional Support

The following three projects were initiated under 'Request for Proposal' invited by C-WET for carrying out R&D in wind energy:

Study on Power Quality issues in Grid Connected Wind Farms and Identification of Remedial Measures

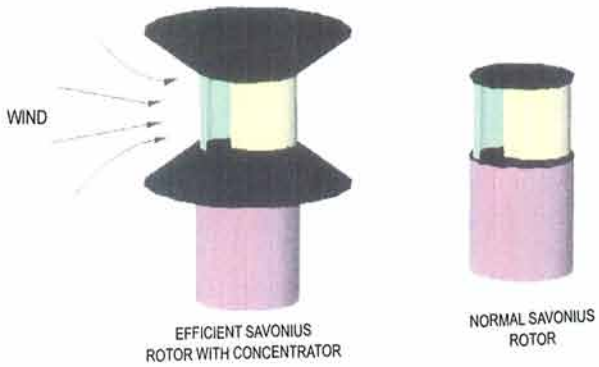
The project has been proposed by Tamil Nadu Energy Development Agency (TEDA) in association with RMK Engineering College and Amrita School of Engineering. The aim is to give recommendations for the appropriate Grid integration of new wind generation systems for the Indian wind power, based on power quality measurements at site and supplemented by simulation studies.

Power Evacuation Studies for Grid Integrated Wind Energy Conversion System

The project, proposed by Anna University, Chennai, aims at optimization of wind turbine operation by ensuring evacuation of the available wind power into the grid. As a part of this project, it is proposed to indentify the locations where wind penetration in to the grid is a problem and enhance the power evacuation with a Thyristor Controller Series Capacitor (TCSC) controller and Voltage Source Convertor (VSC) based High Voltage Direct Current Transmission (HVDC) link. Tamil Nadu Electricity Board (TNEB) will co-operate in sharing their field data of wind power generation and use.

Everybody's Battery Charger

The project has been proposed by RMK Engineering College, Chennai, and aims at designing and fabricating a cost effective savonius rotor with concentrator for battery charging, with a DC power rating of 150 Watt, to be used in villages / hilly areas. New and alternative materials will be used in the design and fabrication of the savonius rotor and an automobile generator will be used for charging the battery by changing windings to have low RPM.



Savonius Rotor Model Under Fabrication

Wind Resource Assessment

The unit is implementing Nationwide Wind Resource Assessment programme sponsored by the Government of India, in association with State Nodal Agencies. In order to extend support to the industry and developers, the unit takes up validation exercises, due diligence studies, micrositing and evaluation of production estimates of the proposed wind farms. The Ministry of New and Renewable Energy (MNRE), Government of India have been sponsoring programmes to measure, analyze and publish wind data in our country for the last two decades. Winds have been measured at five hundred and sixty eight locations for periods ranging from one to five years since 1986. As on 31st March 2010 eighty eight stations are in operation in 20 states and one union territory. During 2009-2010 a total number of 37 wind monitoring stations were commissioned. The overall status of the wind monitoring stations in the country is given in the table below.

Status of Wind Monitoring Stations (2009-2010)

Sl. No.	State / Union Territory	Number of Stations		
		Established till 31.03.2010	Installed (new) during 2009-2010	In Operation as on 31.03.2010
1	ANDAMAN & NICOBAR ISLANDS	14	-	1
2	ANDHRA PRADESH	64	-	2
3	ARUNACHAL PRADESH	9	-	-
4	ASSAM	8	-	-
5	BIHAR	3	-	3
6	CHATTISGARH	7	1	3
7	GOA	3	2	2
8	GUJARAT	64	-	6
9	HARYANA	8	-	1
10	HIMACHAL PRADESH	10	-	-
11	JAMMU & KASHMIR	11	-	2
12	KARNATAKA	48	-	8
13	KERALA	27	-	-
14	LAKSHADWEEP	11	1	1
15	NAGALAND	3	3	3

Sl. No.	State / Union Territory	Number of Stations		
		Established till 31.03.2010	Installed (new) during 2009-2010	In Operation as on 31.03.2010
16	MADHYA PRADESH	38	4	5
17	MAHARASHTRA	118	18	29
18	MANIPUR	8	3	3
19	MEGHALAYA	2	2	2
20	MIZORAM	5	-	-
21	ORISSA	10	-	-
22	PONDICHERRY	4	-	-
23	PUNJAB	13	-	2
24	RAJASTHAN	38	-	1
25	TAMIL NADU	69	-	5
26	TRIPURA	5	-	2
27	UTTARAKHAND	11	-	-
28	UTTAR PRADESH	12	3	5
29	WEST BENGAL	10	-	-
30	SIKKIM	3	-	-
31	JHARKHAND	4	-	2
	Total	**640**	**37**	**88**

Of the cumulative total of 640 stations established till 31st March 2010, 216 stations have been found to have Wind Power Density (WPD) in excess of 200 W/m^2 at 50 m agl. Summary of these 216 stations are given in the following table.

WPD Distribution at the 216 stations

WPD range [W/m2]	Number of stations
200-250	82
250-300	62
300-350	31
350-400	14
>400	27

WRA in the uncovered regions

State wise details of the wind monitoring stations commissioned during 2009-2010 in the country under various programmes are given in the table below.

All the masts are of 50 m height. Sensors are placed at 50 m, 30m and 10 m levels above ground.

State Wise Installations of Wind Monitoring Stations

Sl.No.	Stations Established	State / Union Territory	District	Commissioned on
1	Kesarkarwadi	Maharashtra	Kolhapur	07.11.2009
2	Dolasane		Ahemed Nagar	09.11.2009
3	Girda		Washim	11.11.2009
4	Kolura		Yavatmal	12.11.2009
5	Dhundi		Yavatmal	13.11.2009
6	Portgavan		Yavatmal	15.11.2009
7	Methepatar		Nagpur	16.11.2009
8	Jawla		Yavatmal	29.12.2009
9	Rasulpura		Aurangabad	23.12.2009
10	Chincholi		Aurangabad	22.12.2009
11	Shewga		Aurangabad	21.12.2009
12	Sarati		Aurangabad	22.12.2009
13	Harnhi		Buldana	23.12.2009
14	Garpit		Wardha	28.12.2009
15	Kolasa		Akola	25.12.2009
16	Virgavahan		Amaravathi	27.12.2009
17	Gondhalwadi		Akola	24.12.2009
18	Janori		Washim	31.12.2009
19	Pernem	Goa	North Goa	21.01.2010
20	Betul		South Goa	23.01.2010
21	Agatti	Lakshadweep	Kavarathi	21.11.2009
22	Mamna	Uttar Pradesh	Mahoba	02.07.2009
23	Manikpur		Chiterkoodam	05.07.2009
24	Bhagawanpur		Gorakhpur	07.09.2009

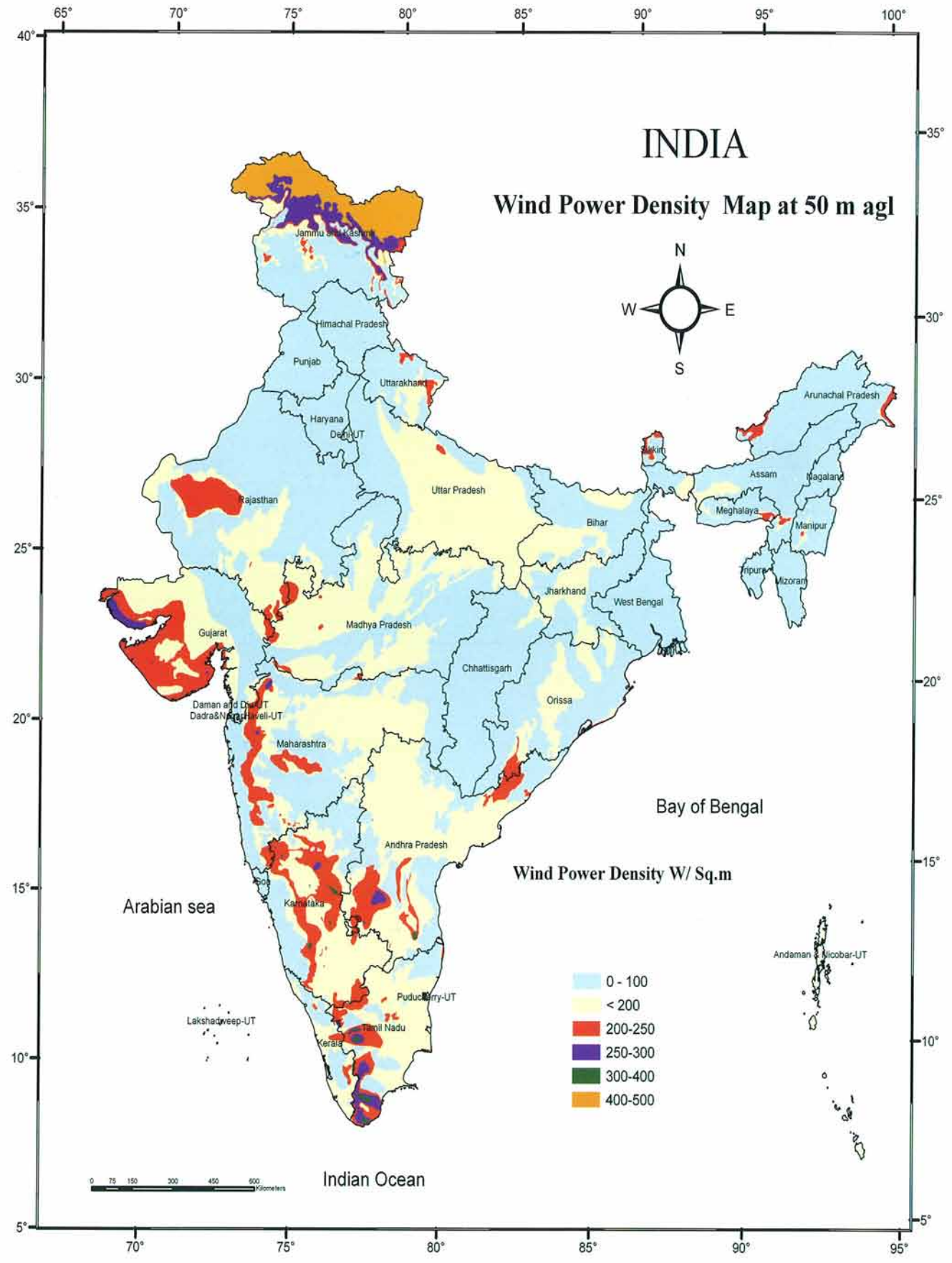
Sl.No.	Stations Established	State	District	Commissioned on
25	Nawapara	Chhattisgarh	Jashpur	04.10.2009
26	Pahari	Madhya Pradesh	Satna	17.09.2009
27	Ubhariya		Betul	19.03.2010
28	Ghat Pipariya		Betul	20.03.2010
29	Searmau		Raisen	22.03.2010
30	Thizama	Nagaland	Kohima	22.04.2009
31	Pfutsero		Pfusero	25.04.2009
32	Kekrima		Phek	09.05.2009
33	Kamnong	Manipur	Ukhrul	19.11.2009
34	Chorjeng Lunghar		Ukhrul	25.11.2009
35	Mao		Senapthi	05.12.2009
36	Laitdiengsai	Meghalaya	East Khasi Hills	09.04.2009
37	Mawiawete		West Khasi Hills	17.12.2009

Indian Wind Atlas

To establish the meteorological basis for estimating the wind climate and wind energy resources of any particular site in India, the Indian Wind Atlas has been prepared. The main objective of the Wind Atlas is to provide suitable wind power data for evaluating the potential site for large electricity-producing wind turbine installations. The Atlas has been prepared with involvement of Risø National Laboratory for Sustainable Energy, Denmark. The information in the Atlas is valuable to wind energy developers and potential wind energy users because it allows them to choose a general area of estimated high wind resource for more detailed examination. It gives an updated overview of the wind climatological situations of India, based on reliable measured wind data and using contemporary numerical mesoscale models. Extensive use of micro and meso scale models like Wind Atlas Analysis and Application Programme (WAsP) and Karlsruhe Atmospheric Meso Scale Model (KAMM) were used for the preparation of the wind atlas. The wind power density map of India is shown in the Fig. next page. The hard copy book of Indian atlas has been prepared during the month of February 2010 and kept it ready for official release.

Consultancy Projects

In addition to the wind monitoring projects, funded by MNRE the unit has carried out 80 consultancy projects during the year 2009-2010. These short-term projects were to provide micrositing services and preparation of due diligence reports. Under the direction from the Ministry, verification of data collection procedure adopted by private firms was undertaken for a number of stations. Details of projects carried out during the financial year are given in table below:



Wind Power Density Map of India at 50 m agl.

Consultancy Projects taken up during 2009 - 2010

Sl. No.	Name of the Project	Name of the Client	Remarks
1	Verification of Procedure of Wind Monitoring at Theni site in Tamil Nadu	M/s. Vestas Wind Technology India Private Limited, Chennai	Completed
2	Verification of Procedure of Wind Monitoring at Shiravalli, Satara District in Maharashtra	M/s. Kenersys India Private Limited, Pune	Completed
3	Verification of procedure of Wind Monitoring at Akal, Jaisalmer District in Rajasthan (Extn.)	M/s. RRB Energy Limited, Chennai	Completed
4	Analysis of Wind Monitoring data from Maharashtra	Maharashtra Energy Development Agency, Pune	Ongoing
5	Production Estimation for 20 MW Wind Farm at Suzlon Site, Sinnar, Nashik in Maharashtra	M/s. ITC Limited-Hotel Division, Chennai	Completed
6	Verification of procedure of Wind Monitoring at Pohra, Jaisalmer District in Rajasthan (Extn.)	M/s. RRB Energy Limited, Chennai	Completed
7	Micrositing and Annual Generation Estimation for 10 MW wind farm at Kurtkoti Village in Gadag District, Karnataka	M/s. Farmers Wind Power Resources Pvt. Ltd., Bangalore	Completed
8	Energy Generation Estimation for 29.7 MW Wind Energy projects at Arasinagundi and Anabaru in Davanagere District, Karnataka	M/s. Acciona Wind Energy Pvt. Ltd., Bangalore	Completed
9	Wind Resource Assessment Studies at Ambalapuzha IT Park, Kerala	M/s. Infopark, Kochi	Ongoing
10	Wind Resource Assessment study at Tehri Dam in Garhwal district, Uttarakhand	M/s. Tehri Hydro Development Corporation Ltd., Rishikesh	Ongoing
11	Wind Resource Assessment Studies at three locations in Siddavvannadurga site, Chitradurga District, Karnataka	M/s. NSL Power Private Limited, Hyderabad	Ongoing
12	Wind Resource Assessment study at three locations in the Kukuru region, Betul District, Madhya Pradesh	M/s. Narmada Hydroelectric Development Corporation Ltd., Bhopal	Ongoing
13	Micrositing for Wind Farming at Guledagudda site in Karnataka	M/s. Karnataka Power Corporation Ltd., Bangalore	Completed
14	Micrositing for Wind Farming at Kappatagudda site in Karnataka	M/s. Karnataka Power Corporation Ltd., Bangalore	Completed

Sl. No.	Name of the Project	Name of the Client	Remarks
15	Production Estimate of the proposed Wind Farm projects at Hassan & Harpanahalli in Karnataka	M/s. ITC Limited, Bangalore	Completed
16	Verification of procedure of Wind Monitoring at Phalodi in Rajasthan (Extn.)	M/s. Suzlon Energy Limited, Pune	Completed
17	Verification of procedure of Wind Monitoring at Harpanahalli-1, Davangere district in Karnataka	M/s. Vestas Wind Technology India Private Limited, Chennai	Completed
18	Wind Resource Assessment Studies at Devarkulam, Tirunelveli District, Tamil Nadu	M/s. Tamil Nadu Newsprint and Papers Limited (TNPL), Chennai	Ongoing
19	Consultancy charges for the 50.4 MW Wind Farm at Khandke in Maharashtra	M/s. Enercon India Ltd., Mumbai	Completed
20	Production Estimate of the proposed Wind Farm projects at Chakla & Bothe in Maharashtra	M/s. ITC Limited, Bangalore	Completed
21	Wind Data Collection, Processing and Analysis at Toranahalli Village, Belgaum district in Karnataka	M/s. Mysore Mercantile Co. Limited, Bangalore	Ongoing
22	Verification of procedure of Wind Monitoring at Gorsar Mocha, Porbander District in Gujarat	M/s. Suzlon Infrastructure Services Ltd., Pune	Completed
23	Verification of procedure of Wind Monitoring at Varvada, Jamnagar District in Gujarat	M/s. Suzlon Infrastructure Services Ltd., Pune	Completed
24	Verification of procedure of Wind Monitoring at Balambha, Jamnagar District in Gujarat	M/s. Suzlon Infrastructure Services Ltd., Pune	Completed
25	Verification of procedure of Wind Monitoring at Adodar, Porbander District in Gujarat	M/s. Suzlon Infrastructure Services Ltd., Pune	Completed
26	Consultancy services for Evaluation of power curve demonstration	M/s. Suzlon Energy Limited, Pune	Completed
27	Verification of procedure of Wind Monitoring at Mundra, Kachch District in Gujarat	M/s. Tata Power Company Limited, Mumbai	Completed
28	Wind Resource Assessment at Puthuvypeen shore Tank farm area in Kochi, Kerala	M/s. Bharat Petroleum Corporation Limited, Kochi	Ongoing
29	Production estimation for 23 x 2.1 MW = 48.3 MW projects at Hearda site in Karnataka	M/s. Suzlon Energy Limited, Pune	Completed

Sl. No.	Name of the Project	Name of the Client	Remarks
30	Verification of procedure of Wind Monitoring at Sindgiri, Bellary District in Karnataka	M/s. Suzlon Infrastructure Services Limited, Pune	Completed
31	Verification of procedure of Wind Monitoring at Soda Bandhan, Jaisalmer district in Rajasthan (Extn.)	M/s. Suzlon Energy Limited, Pune	Completed
32	Verification of procedure of Wind Monitoring at Basavapatna, Harihar in Karnataka	M/s. RRB Energy Limited, Chennai	Completed
33	Production Estimate for (4 x 2.1 MW) M/s. Suzlon WTGs at Sindhgiri site in Karnataka	M/s. Suzlon Energy Limited, Pune	Completed
34	Production estimation for (1 x 1.65 MW) M/s.Vestas WTGs at Gudepanchgani site in Maharashtra	M/s. Kalani Industries Pvt. Ltd., Indore	Completed
35	Verification of procedure of Wind Monitoring at Agaswadi in Maharashtra	M/s. Regen Powertech Private Limited, Chennai	Completed
36	Production Estimate for (13 x 2.1 MW) M/s. Suzlon WTGs at Sindhgiri site in Karnataka	M/s. Suzlon Energy Limited, Pune	Completed
37	Consultancy services for proposed 25 MW Wind Farming projects at Elavanthi in Tamil Nadu	M/s. Gamesa Wind Turbines Private Limited, Chennai	Completed
38	Verification of procedure of Wind Monitoring at Rani Amberi, Satara District in Maharashtra	M/s. Kenersys India Private Limited, Pune	Completed
39	Verification of procedure of Wind Monitoring at Avandi, Kolhapur District in Maharashtra	M/s. Sarvodaya Properties Pvt. Ltd., Mumbai	Completed
40	Production Estimation for 36 MW Wind Farm project Kolewadi & Khabalwadi - Landewadi sites in Satara District, Maharashtra	M/s. Kenersys India Private Limited, Pune	Ongoing
41	Consultancy services for proposed 50 MW Wind Farm projects in Tamil Nadu	M/s. Neyveli Lignite Corporation Limited, Neyveli	Ongoing
42	Micrositing and Annual Generation Estimation for proposed 50 MW Wind Farm project at Mundra site, Kutch district, Gujarat	M/s. The Tata Power Company Limited, Mumbai	Ongoing
43	Consultancy services for proposed 25 MW Wind Farming projects at Theni in Tamil Nadu	M/s. Gamesa Wind Trubines Private Limited, Chennai	Completed
44	Micrositing and Annual Generation Estimation of proposed Wind Farm project at Kappatagudda site in Gadag District, Karnataka	M/s. Karnataka Power Corporation Limited, Bangalore	Ongoing

Sl. No.	Name of the Project	Name of the Client	Remarks
45	Site Assessment for Wind Monitoring in Bijapur & Belgaum	M/s. Karnataka Power Corporation Limited, Bangalore	Completed
46	Wind Resource Assessment Studies at three locations in Orissa	M/s. Orissa Renewable Energy Development Agency, Bhuvaneswar	Ongoing
47	Verification of procedure of Wind Monitoring at Lalpur-1, Jamnagar District in Gujarat	M/s. Enercon India Limited, Mumbai	Completed
48	Verification of procedure of Wind Monitoring at Andhralake-Central, Pune District in Gujarat	M/s. Enercon India Limited, Mumbai	Ongoing
49	Verification of procedure of Wind Monitoring at Lalpur-2, Jamnagar District in Gujarat	M/s. Enercon India Limited, Mumbai	Completed
50	Verification of procedure of Wind Monitoring at Maloshi, Satara District in Maharashtra	M/s. Suzlon Infrastructure Services Ltd., Pune	Ongoing
51	Verification of procedure of Wind Monitoring at Akal, Jaisalmer District in Rajasthan	M/s. Suzlon Infrastructure Services Ltd., Pune	Ongoing
52	Verification of procedure of Wind Monitoring at Hearda, Davangere District in Karnataka	M/s. Suzlon Infrastructure Services Ltd., Pune	Ongoing
53	Verification of procedure of Wind Monitoring at Sidenur, Davangere District in Karnataka	M/s. Suzlon Infrastructure Services Ltd., Pune	Ongoing
54	Verification of procedure of Wind Monitoring at Kalmangi, Bellary District in Karnataka	M/s. Suzlon Infrastructure Services Ltd., Pune	Ongoing
55	Verification of procedure of Wind Monitoring at Golay, Kachchh District in Gujarat	M/s. Suzlon Infrastructure Services Ltd., Pune	Ongoing
56	Verification of procedure of Wind Monitoring at Karamtha in Kachchh District of Gujarat	M/s. Suzlon Infrastructure Services Ltd., Pune	Ongoing
57	Verification of procedure of Wind Monitoring at Karvat in Satara District of Maharashtra	M/s. Suzlon Infrastructure Services Ltd., Pune	Ongoing
58	Verification of procedure of Wind Monitoring at Agaswadi in Satara District of Maharashtra	M/s. Suzlon Infrastructure Services Ltd., Pune	Ongoing
59	Verification of procedure of Wind Monitoring at Wand Notiyar in Kachchh District of Gujarat	M/s. Suzlon Infrastructure Services Ltd., Pune	Ongoing

Sl. No.	Name of the Project	Name of the Client	Remarks
60	Verification of procedure of Wind Monitoring at Lathdi in Kachchh District of Gujarat	M/s. Suzlon Infrastructure Services Ltd., Pune	Ongoing
61	Verification of procedure of Wind Monitoring at Baradiya in Jamnager District of Gujarat	M/s. Suzlon Infrastructure Services Ltd., Pune	Ongoing
62	Verification of procedure of Wind Monitoring at Gotne in Satara District of Maharashtra	M/s. Suzlon Infrastructure Services Ltd., Pune	Ongoing
63	Verification of procedure of Wind Monitoring at Torangallu in Bellary District of Karnataka	M/s. Suzlon Infrastructure Services Ltd., Pune	Ongoing
64	Verification of procedure of Wind Monitoring at Kundur in Devangere District of Karnataka	M/s. Suzlon Infrastructure Services Ltd., Pune	Ongoing
65	Technical Due Diligence for proposed 220.8 MW Wind Farm projects at 4 states (Tamil Nadu, Gujarat, Andhra Pradesh & Rajasthan)	M/s. Enercon India Ltd, Mumbai	Ongoing
66	Production Estimate of the proposed Wind Farm projects at Suzlon site (Amudhapuram) and Enercon site (Vagaikulam) in Tirunelveli Distrit, Tamil Nadu	M/s. ITC Limited, Chennai	Ongoing
67	Wind Resourse Assessment studies at two locations in Karantaka	M/s. Karnataka Power Corporation Limited, Bangalore	Ongoing
68	Verification of procedure of Wind Monitoring at Sanosara in Rajkot District of Gujarat	M/s. Kenersys India Pvt. Ltd., Pune	Ongoing
69	Verification of procedure of Wind Monitoring at Pratapgad in Rajkot District of Gujarat	M/s. Kenersys India Pvt. Ltd., Pune	Ongoing
70	Production Estimate for (25 x 1.25 mW=31.25 MW) M/s. Suzlon WTGs at Torangallu site in Karnataka	M/s. Suzlon Energy Limited, Pune	Ongoing
71	Production Estimate for (18 x 1.50 mW=27 MW) Suzlon WTGs at Minicheri site in Karnataka	M/s. Suzlon Energy Limited, Pune	Ongoing
72	Verification of procedure of Wind Monitoring at Tejuva in Jaisalmer District of Rajasthan	M/s. Suzlon Infrastructure Services Ltd., Pune	Ongoing
73	Verification of procedure of Wind Monitoring at Minichery in Bellary of Karnataka	M/s. Suzlon Infrastructure Services Ltd., Pune	Ongoing
74	Verification of procedure of Wind Monitoring at Suro Ki Dhani in Jaisalmer District of Rajasthan	M/s. Suzlon Infrastructure Services Ltd., Pune	Ongoing

Sl. No.	Name of the Project	Name of the Client	Remarks
75	Consultancy services for proposed 25 MW Wind Farming projects at Theni in Tamil Nadu	M/s. Gamesa Wind Trubines Private Limited, Chennai	Ongoing
76	Consultancy services for Production Estimation of (26 x 1250 kW = 32.5 MW) M/s. Suzlon WTGs at Adodar in Gujarat	M/s. Suzlon Energy Limited, Pune	Ongoing
77	Consultancy services for Production Estimation of (16 x 1500 kW = 24 MW) M/s. Suzlon WTGs at Gorsar in Gujarat	M/s. Suzlon Energy Limited, Pune	Ongoing
78	Verification of procedure of Wind Monitoring at Theni-1 in Theni district of Tamil Nadu	M/s. Regen Powertech Private Limited, Chennai	Ongoing
79	Verification of procedure of Wind Monitoring at Theni-2 in Theni district of Tamil Nadu	M/s. Regen Powertech Private Limited, Chennai	Ongoing
80	Verification of procedure of Wind Monitoring at Bhud in Sangli district of Maharashtra	M/s. Regen Powertech Private Limited, Chennai	Ongoing

Meeting & Training

A meeting of the WRA programme for the North-East region was held on 22nd October 2009 at Shillong, Meghalaya to review the progress of the WRA activities and to discuss the issues in the North-Eastern States, and another meeting to review the entire WRA programme, with officials from MNRE, C-WET and SNAs were held during 10th - 11th November 2009 at C-WET, Chennai and reviewed the progress of WRA projects in 20 States and 2 Union Territories. Apart from this another review meeting of WRA programme for a few SNAs was held at MNRE, New Delhi on 12th February 2010.

WRA - North - East SNA meeting : Participants

WRA : MNRE - C-WET - SNA meeting in progress

Wind Turbine Testing

Development of Wind Turbine Test Station

C-WET's Wind Turbine Test Station (WTTS) near Kayathar in Tamil Nadu was established with the technical assistance of Risø National Laboratory, Denmark under Danish International Development Agency (DANIDA) grant and with the partial financial assistance and guidance of Ministry of New and Renewable Energy (MNRE), Government of India. This Test Station has two test beds to test wind turbines upto 1250 kW capacity and 400 kW capacity and the capacity is expandable.

Sensors and transducers as per the requirement of IEC standards are maintained at the test station and Quality Management System procedures are as per the requirements of ISO 9001:2000 and ISO / IEC 17025:2005.

Nine numbers of 200 kW Micon make wind turbines were acquired from Tamil Nadu Electricity Board (TNEB) and retrofitted with new controllers. They are now available for development of new measurement techniques.

Testing Programmes

Blade Instrumentation work for static blade test was carried out for M/s. WinWinD Power Energy Pvt. Ltd. for 1 MW wind turbine blade at Vengal, Chennai.

Static Blade Test carried out for WinWinD Power Energy for 1 MW Wind Turbine at Vengal, Chennai

Blade Instrumentation work carried out for WinWind Power Energy for 1 MW Wind Turbine at Vengal, Chennai

Testing/Measurement agreements were signed by C-WET with

- M/s. WinWinD Power Energy Pvt. Ltd. for Power Curve Measurements of 1000 kW wind turbine at Ayyanaruthu, Kayathar, Tamil Nadu.

Rotor Instrumentation work carried out for WinWind Power Energy for 1 MW Wind Turbine at Vengal, Chennai

- M/s. Ghodawat Industries (India) Pvt. Ltd. to test their G1650 model wind turbine at Kaledhon near Satara, Maharastra.
- M/s. Pioneer Wincon Pvt. Ltd. for Power Curve Measurements of 750 kW wind turbine at Poigai near Tenkasi, Tamil Nadu.
- M/s. WinWinD Power Energy Pvt. Ltd. for Safety and Function test of 1000 kW wind turbine at Ayyanaruthu, Kayathar, Tamil Nadu.

- M/s. Inox Wind Ltd. to test their 2000 kW wind turbine at Chettikurichi near Kayathar, Tamil Nadu.

An agreement has been signed between C-WET and M/s. Inox Wind Ltd for type testing of 2000 kW wind turbine at Chettikurichi Nr. Kayathar, TN

Blade Instrumentation work for Inox 2000 kW Wind Turbine

Nacelle Instrumentation work for Inox 2000 kW Wind Turbine

- To carry out Load measurements, analysis & reporting of Winwind 1000 kW wind turbine at Ayyanaruthu, Tamil Nadu.

Quality Management System and NABL Accreditation

The external audit as per the requirements of ISO 9001 - 2000 was carried out as per schedule and the unit was recommended for continuation of the certification till August, 2010.

The surveillance audit as per the requirements of ISO/IEC 17025:2005 by NABL was completed successfully, with validity of accreditation upto June 2010.

The unit has applied for MEASNET (International network for Recognized and Harmonized measurements in wind energy) membership in the area of Power Performance Measurements. The technical audit by MEASNET is under progress.

Other Facilities

The unit has a well-equipped laboratory at C-WET, Chennai where functional testing of data acquisition systems along with sensors and transducers is done before deployment.

The Laboratory has also a working wind turbine model for training engineers in deployment of instruments.

The reports issued by the unit are accepted by International Certification bodies like DNV, DEWI - OCC and TUV SUD.

Innovation / New Facilities / New Infrastructure

The unit contributed to the draft business plan for setting up Blade Test Centre (BTC) in India, coordinated with Mr. Carsten, BLAEST, Denmark, IWTMA and Indian WEG manufacturers.

The establishment of a network for access and transfer of data from remote sites to C-WET using Multi Protocol Label Switching (MPLS) is under progress.

The unit has completed a static blade test with partners from India & abroad.

Standards and Certification

S&C unit carries out the certification of wind turbines, as per Type Approval - Provisional Scheme - TAPS - 2000 (amended), the Indian type certification scheme for wind turbines, formulated inline with International Electrotechnical Commission (IEC) Standards, while taking into account of the Indian conditions. TAPS - 2000 (amended) has been approved and issued by Ministry of New and Renewable Energy (MNRE). Standards and Certification unit is implementing TAPS - 2000 (amended) for the type certification of wind turbines in India. Type certification of wind turbines plays an active and important role for the orderly growth of the Indian Wind Industry.

Activities

I. Provisional Type Certification

A. Provisional Type Certificates - Renewal (2009-2010) - (Completed / Ongoing)

Sl. No.	Manufacturer's Name	Wind Turbine Model / Capacity	Validity
1	M/s. RRB Energy Limited	Pawan Shakthi - 600 kW	04.07.2010
2	M/s. RRB Energy Limited	V39 / 500 kW with 47m Rotor	20.04.2010
3	M/s. Southern Wind Farms Limited	GWL 225 / 225 kW	Ongoing

B. Provisional Type Certification - Ongoing Projects (2009-2010)

Category I

Sl. No.	Manufacturer's Name	Wind Turbine Model / Capacity	Status
1	M/s. Suzlon Energy Limited	Suzlon S.52/600 kW	Ongoing

Category II

Sl. No.	Manufacturer's Name	Wind Turbine Model / Capacity	Status
1	M/s. Suzlon Energy Limited	Suzlon S66 – 1250 kW	Ongoing
2	M/s. RRB Energy Limited	Pawan Shakthi – 600 kW with 65m tubular tower	Ongoing

Category III

Sl. No.	Manufacturer's Name	Wind Turbine Model / Capacity	Status
1	M/s. India Wind Power Limited	I-29 / 250 kW	Ongoing

II. Standards

Standards and Certification unit plays an active role in preparation of Indian standards on wind turbines. In this regard, the unit is working in close co-ordination with Bureau of Indian Standards (BIS). Also the unit is actively providing its contribution in the formulation of International Electrotechnical Commission (IEC) standards through BIS. S&C unit is supporting BIS continuously on various issues for coordination with IEC / TC 88 committee. As India is a Participating Member (P-member) in IEC / TC 88 committee, the unit is providing continuous support and contribution to BIS for voting on the draft IEC standards.

III. Revised List of Models and Manufacturers (RLMM) of Wind Turbines

S&C Unit issues the Revised List of Models and Manufacturers (RLMM) of Wind Turbines periodically, as per the directives of Ministry of New and Renewable Energy (MNRE). The list is finalized by the Committee appointed by MNRE. S&C unit reviews the documentation / information provided by the Wind Turbine Manufacturers and organizes the RLMM meetings, for updating the Revised List of Models and Manufacturers of Wind turbines (RLMM) periodically. The terms of the RLMM Committee have been extended by MNRE with revised terms of reference and revised composition.

IV. Quality Management System (QMS) - ISO 9001:2000

Certification services of C-WET have already been certified for ISO 9001:2000 by Det Norske Veritas (DNV). The second periodic audit was successfully completed by DNV team and recommended for continuation of ISO 9001:2000 certificate.

Executive Director, Scientists & Engineers of C-WET along with trainers from Garrad Hassan during the "GH Bladed" Software Training Programme at C-WET.

Information, Training and Commercial Services

The Information, Training and Commercial Services (ITCS) unit has been very busy executing training programmes, upgrading the infrastructure for good research environment in C-WET by providing IT & training facilities and also reaching out to the public as well as industries to promote wind energy in the country. The following are the activities during the year 2009-2010.

Training Programmes

C-WET has been acting as a pioneer in producing human resource through various wind energy orientation programmes. This year the unit had organized two national and two international training programmes and trained 146 national and 26 international participants. Increasing number of student participation has been a significant achievement of these training programmes. All the programmes have received good feedbacks from the participants and also got suggestion to organize more training programmes in the future for specific areas of wind energy development. As part of the training course, we regularly bring out a book as Course Material, the compilation of the lecture notes by the speakers and are being distributed among the participants.

Seventh National Training

ITCS unit had successfully organized a 2 days Seventh National Training Course on "Fundamentals of Wind Energy" during 28th - 29th May 2009 to address all aspects of Wind Power starting from Wind Resource Assessment to project implementation and operations & maintenance in a focused manner. The course was attended by 69 participants from academic institutes, industry, State Nodal Agencies, developers and consultants from various part of the country. The training course was inaugurated by Dr. Michael Hogedal, Managing Director & Vice President, Vestas Wind Technology India Private Limited, Chennai.

Participants in front of C-WET building

Shri. Raju Manoharan, Superintending Engineer, Non-Conventional Energy Sources (NCES), Tamil Nadu Electricity Board (TNEB) read out the valedictory address on behalf of Shri. T. Jayaselan, Chief Engineer, NCES, TNEB and distributed the course certificate to the participants.

Eighth National Training

The Eighth National Training Course lasting for 3 days on "Wind Turbine Technology" was held during 9th - 11th December 2009 at C-WET, Chennai. 77 participants attended the training course from academic institutes, industry, State Nodal Agencies, developers and consultants from various parts of the country. The duration of the course was extended to three days due to the demand of the participants in the previous training programmes. The training course was inaugurated by Dr. M. A. Atmananad, Director, National Institute of Ocean Technology, Chennai after the introductory remarks by Dr. S. Gomathinayagam, Executive Director, C-WET. This National Training Course had addressed all aspects of wind power harnessing, starting from wind resource assessment to project implementation and operations & maintenance in a focused manner.

The course topics were structured in such a way that would be both beneficial for the freshmen in the industry as well as a refresher to the experienced. The course content was well organized and appreciated by the participants. The people who had offered the presentation/lecture were C-WET's scientists and professionals with years of experience in the wind turbine industry.

Shri. R. Sellamuthu, I.A.S, Additional Chief Secretary / Development Commissioner, Planning & Development Department, Government of Tamil Nadu was the Chief Guest for the valedictory function and he had been kind enough to distribute the course certificates to the participants.

Special International Training

A special International customized Training Course on "Wind Turbine Testing and Wind Farm Micrositing" was organized for five Engineers from Arab Organization for

Participants receiving certificate from the Chief Guest Shri. R. Sellamuthu, I.A.S.

AOI Engineers during Practical Training

Industrialization (AOI) during 19th - 28th October 2009. This was the first course of its kind in C-WET, tailor-made for special topics. The training programme covered lectures on Testing and Micrositing and also includes practical training on meteorological mast erection for Wind Resource Assessment, climbing, Measurement, Testing and Instrumentation, visit to Wind Farms, manufacturing companies and to C-WET's Wind Turbine Test Station at Kayathar.

The objective of the training programme was to transfer knowledge and to develop special skills needed by the wind energy personnel working in the technical and operational fields and to share the experiences from the lessons learnt over the past two decades. This course had provided invaluable platform for dialogue and open exchange of views and experiences. The total course duration was ten days covering tutorial lectures, exercises and manufacturing facilities and wind farms visits to give a complete picture of the know-how and how to go about setting up a coordinated wind energy programme at an international level. The self-supporting course was highly appreciated by the participants.

Fifth International Training

The Fifth International Training Course on "Wind Turbine Technology and Applications" was organized during 3rd - 19th February 2010. 21 participants from 14 countries attended the training programme. This course is fully sponsored by the Ministry of External Affairs (MEA), Government of India under the Indian Technical and Economic Cooperation (ITEC) / Special Commonwealth Assistance for Africa Programme (SCAAP) programmes and supported by MNRE. This is the first programme for ITEC & SCAAP countries organized by C-WET. The participants were from Afghanistan, Algeria, Egypt, Eritrea, Fiji Islands, Guyana, Liberia, Mauritius, Morocco, Nigeria, Peru, Sudan, Tanzania, and Yemen.

International participants during wind farm and factory visit

The course content for the training was a very comprehensive syllabus with experts in various fields giving lectures and specific case studies. Practical training with wind resource assessment instrumentation, Testing equipment, R&D equipment was made available and visits to manufacturing facilities were also arranged for the understanding of the complete know-how. The participants also travelled down to the southern tip of India to visit wind farms and C-WET's own Wind Turbine Test Station (WTTS), Kayathar. The participants were very much satisfied by the quality of lectures and hospitality in India.

C-WET - IWTMA Workshop

To keep pace with the latest technologies among the working professional of the wind energy sector, C-WET and Indian Wind Turbine Manufacturers Association (IWTMA) has

initiated a programme of organizing technological demonstration workshops / seminars / guest lectures every month at C-WET, which would be both beneficial to the Scientists in C-WET and also wind industry professionals. In this initiative, the first workshop was organized on Wind Resource Assessment using Computational Fluid Dynamics (CFD) on 2nd March 2010 at C-WET.

Newsletter "PAVAN"

ITCS unit has been continuously bringing out its well received quarterly newsletter "PAVAN" to spread awareness on the latest developments on wind energy and the activities and roles of the centre. The "PAVAN" highlights the events / development and accomplishments / endeavors of C-WET and carries focused articles, success stories, expert's interviews, new rules and policies of Government and the latest news and views.

24th Issue of PAVAN

In this succession, twenty four issues of PAVAN have already been published and circulated. The issues are also freely downloadable from C-WET's website.

Prof. Annamani Information Centre : C-WET's Library

ITCS unit is maintaining a state-of-art library named after "Prof. Anna Mani" as Information Centre. With more than 1500 books on renewable energy in general and wind energy in particular. It includes books on Energy and environment, sustainable development, all engineering disciplines, science and management. C-WET's Library has also subscribed to all major National and International Journals & Magazines (approximately 60 in count) on wind energy and other allied engineering disciplines. It is also having around 50 technical reports and 90 conference proceedings and other information resources like Wind Atlas and data books, Maps, manuals, souvenirs, digital resources etc. The library has been computerized using library software for easy access and management. Online Public Access Catalogue (OPAC) is also available. It also has tie-up with leading libraries like IIT, Anna University and American Library for reference purposes. The facility has already been utilized by many professionals from academia and industry.

Display Facilities

ITCS unit had established a Display Hall showcasing / illustrating C-WET activities and wind turbine technologies. This facility has been established with the aim of disseminating the complete information at a single destination to the general public /students and information seekers visiting the campus. Shri. V. Subramanian, I.A.S. former Secretary, MNRE inaugurated the Display Facility of C-WET on the first ever Global Wind Day celebrated on 15th June 2009 in India at C-WET.


Display Hall : Banners Detailing C-WET Activities and Services

Inauguration of Display Hall of C-WET on Global Wind Day 2009

A working model of water pumping wind mill and other wind turbine models showing the various types of tower, number of blades etc. The components of wind turbine and procedural steps for successful wind farm project are displayed. Posters carrying unit wise detailed activities and services along with the achievements are also available for the visitors. The facility had been already visited by school and college students, faculty, industrialists and national and international dignitaries and appreciated the facility as informative.

C-WET Bilingual Website

The unit maintains a bilingual website 'www.cwet.tn.nic.in' which carrics all information about wind energy development in India and abroad. The website is continuously constructed for up-to-date information on wind energy and it also has wind energy related information resources like free quarterly

C-WET Website Home Page

newsletters carrying latest developments and technical updates in the wind industry. Internal academic and research information, services to the industry and individual, a technical glossary, updated policy information and statistics are available in the website.

The website has link to more than 300 potential information resources on wind energy systems. The website already has more than 2 lakh visitors and about 1 lakh hits was during the period of 2009-2010. The website can be accessed at www.cwet.tn.nic.in

Participation in Exhibitions

As part of Information dissemination and public outreach activities, ITCS unit is putting up information stall in the renewable energy related events to create awareness among the public about activities and services of C-WET.

C-WET Staff during Exhibition

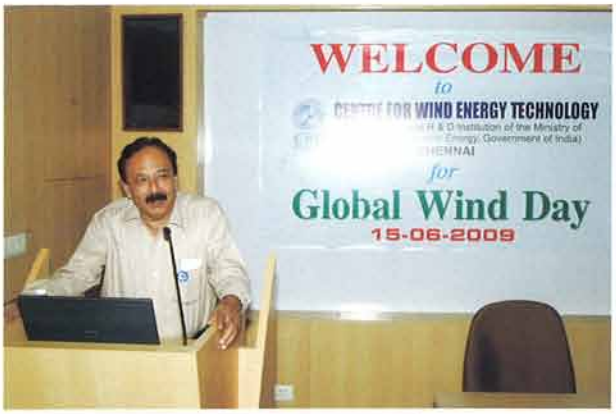
The following are the events in which C-WET has participated during the year 2009 - 2010.

- URJA 2009, a national Exhibition on Energy Efficient and Renewable Energy Products & Technologies during 21st - 25th May 2009 at Town Hall, Ernakulam, Cochin.
- CLIKTRONICA 09, a 2 day trade show and Conference on Renewable Energy during 16th - 19th July 2009 at Bangalore organized by Consortium of Electronic Industries of Karnataka.
- National level TECHFEST, AARUUSH 09 organized by SRM University, Chennai during 8th - 11th September 2009.
- Wind Energy Expo 2010 at Chennai Trade Centre, Nandambakkam, Chennai during 26th - 28th February 2010.

The exhibits were well received by visitors from industries and the public. The visitors were very appreciative of the services rendered by the MNRE, especially the role of C-WET. The various private industries participated and expressed their appreciation for the support offered by C-WET in conducting their business in India. Many students were inspired and expressed keen interest of their career in wind energy industry.

Global Wind Day

C-WET celebrated "Global Wind Day 2009" for the first time in India on 15th June 2009 between 11 am to 1 pm. Shri. V. Subramanian, I.A.S, former Secretary, MNRE delivered a Wind-Day lecture on "Wind Energy: Global Scenario" at C-WET. Various stakeholders from State Nodal Agencies, Industries and Association of wind energy sector, including



Shri. V. Subramanian, I.A.S., former Secretary, MNRE delivering the Wind-Day lecture

investors in wind energy attended the Wind Day lecture. IWTMA also celebrated the Wind Day with competitions for the school students and the prize distribution function for the winners was held in C-WET as Post Wind Day Programme on 18th November 2009.

IT and Networking Facilities

A state of the art server has replaced the old server. The C-WET's new server serves four important purposes. The first is to act as a mail server which provides 256 bit encrypted password hashing as opposed to the earlier 64 bit. This means faster email service and better data protection. The second purpose is to act as an intranet server to disseminate information within the various units of C-WET and to keep the employees updated about the activities of the center. The server will also host the main C-WET website and also act as a database to contain research data. The new system can handle data at the speed of 10 GHz which is 100 times faster than the previous system.

Educational visits to C-WET

As part of promotion of wind energy in the country, C-WET is encouraging the young minds, students to visit the various renewable energy facilities available. The following visits have been arranged, wherein the C-WET activities & services were explained and the facilities available in the campus were shown.

Presentation to the Students during C-WET visit

- 30 students along with two faculties from Crescent School, Vandalur visited on 13th July 2009.
- 15 participants along with the faculty from National Institute of Technical Teachers Training and Research (NITTTR), Taramani, Chennai visited on 23rd July 2009.
- Mr. Stephen Miner, Senior Vice President for conference, American Wind Energy Association visited on 12th August 2009.
- Mr. Tetsuya Enomoto, from Mitsubishi Research Institute visited C-WET on 17th August 2009. C-WET activities and services were explained and the facilities available in the campus were shown.
- Mr. Steve Sawyer, Secretary General, Global Wind Energy Council (G-WEC) visited on 8th September 2009.
- 6 M.Tech (Bio Energy) students along with two faculty members of Tamil Nadu Agricultural University (TNAU), Coimbatore visited on 8th September 2009.

Students gaining exposure to Technology

- Energy Auditors, as part of the training course organized by National Productivity Council visited on 29th October 2009.
- Sri Lankan Engineers visited on 6th November 2009 as part of the India-Sri Lanka Wind Energy knowledge exchange program coordinated by Indian Wind Energy Association (InWEA) under the auspices of USAID, India.
- 20 Students along with two faculty members from Alpha Matriculation School, Chennai visited on 27th November 2009.
- Professor Kishor Mehta, who has been instrumental Lubbock in establishing wind science and engineering division at Texas Tech University, USA visited on 16th December 2009 and addressed the C-WET scientists, technicians including project staff about the curriculum development activity in the University.
- Coordinated & organized the Lady Doak College, Madurai Student's visit on 8th January 2010.
- Students from the Aeronautical department from PB College of Engineering, Sri Perumbudur visited the campus on 19th January 2010. They were shown the campus facilities, educational videos and the display facilities.

Important Visitors to C-WET

Honourable Minister of New & Renewable Energy

Our Honourable Minister of New and Renewable Energy, Government of India, Dr. Farooq Abdullah visited C-WET on 20th June 2009. Dr. S. Gomathinayagam, Executive Director, C-WET made a brief presentation about C-WET explaining its activities and services.

Honorable Minister Dr. Farooq Abdullah Visit to C-WET

Honorable Minister visited the newly inaugurated display facilities, library, laboratories and facilities of all the units of C-WET. He had an interesting insightful discussion with all the unit chiefs and scientists inspiring them to contribute more in the area of wind energy.

He also planted a sapling in the centre in commemoration of his visit. Ms. Gauri Singh, Joint Secretary, MNRE, Mr. Rohit Kansal, PS to Minister and Mr. K. P. Sukumaran, Advisor, MNRE made their presence to grace the occasion.

Indo-US Dialogue on Energy Co-operation NREL Visit

Dr. Gunjit Bir, Chief Scientist, National Wind Turbine Centre (NWTC) of National Renewable Energy Laboratory (NREL) visited

Dr. Gunjit Bir discussing with C-WET Scientists

the C-WET during the 18th - 23rd March 2010 as part of the MoU signed in 23rd November 2009 between C-WET and NREL under Indo - US collaborative project initiated by Ministry of New and Renewable Energy. To identify the possible collaborative area, he discussed with all the Unit Chiefs, Scientists, Junior Engineers and Technicians. He has also visited various infrastructure and facilities available in the campus and WTTS, Kayathar. Dr. Gunjit Bir appreciated the C-WET contribution towards the wind power development in the country and also the efforts taken by C-WET for human resource development.

Joint Secretary (Wind Energy), MNRE Visit

The Joint Secretary for Wind Energy (MNRE), Shri. Hari Kumar visited C-WET on 23rd March 2010 for the first time. He had a meeting with the Executive Director and all Unit Chiefs and later the Joint Secretary visited various infrastructure and facilities available in the campus. He has also visited Wind Turbine Test Station (WTTS), Kayathar and expressed his appreciation for C-WET's effort this far and offered his valuable suggestions towards the future development. Dr. Gunjit Bir, Chief Scientist, Wind Turbine Test Centre of National Renewable Energy Laboratory (NREL) was also present in the meeting and had a discussion with the Joint Secretary.

Shri. Hari Kumar and Dr. Gunjit Bir with C-WET Scientists

Egypt Minister

Campus visit was organized for the Egyptian Minister for Electricity and Energy, Dr. Hassan Younis on 17th November 2009, with discussion with C-WET's scientific team.

Visits Abroad

C-WET Scientist during Asia-Paciffic Wind Energy Forum

Publications

Executive Director

N. Lakshmanan, S. Gomathinayagam, P. Harikrishna, A. Abraham & S. Chitra Ganapathi, "Basic Wind Speed Map of India with long-term hourly wind data", Current Science, Vol.96, No.7, 10th April 2009.

Research and Development Unit

Rajesh Katyal, Scientist & Unit Chief and J.C. David Solomon, Scientist "Inspection & Certification of Wind Turbine: Indian Perspective", In Wind Chronicle, New Delhi, Vol.5, No.4, August - September 2009.

Rajesh Katyal, Scientist & Unit Chief and Dr. S. Gomathinayagam, Executive Director "Better Understanding of our Fuel: Wind", Energy and Fuel User's Journal, Chennai. (paper submitted and accepted, to be published in January - March 2010 issue).

K. Boopathi, Scientist, Deepa Kurup, Scientist, Rajesh Katyal, Scientist & Unit Chief and Dr. S. Gomathinayagam, Executive Director "Assessment of Acoustic Emission of a Wind Turbine in India" Third International Meeting on Wind turbine Noise, Alborg, Denmark, 2009.

Wind Resource Assessment Unit

Dr. E. Sreevalsan, Scientist & Unit Chief "Statistical Methods for Wind Energy Estimation" in Indian Wind Power Directory 2009, 9th Edition published by Consolidated Energy Consultant Ltd., Bhopal.

Information, Training and Commercial Services Unit

P. Kanagavel, Scientist & Unit Chief i/c, "Web Enabled Information System for Wind Energy Technology" has been presented at the International Conference on E-Resources in Higher Education at Bharathidasan University, ruchirappalli during 20th February 2010.

P. Kanagavel, "Human Resource Development for Wind Energy by C-WET", PAVAN C-WET newsletter No.24, pp 5-8, January - March 2010.

Invited Lectures delivered in Courses / Conferences and Seminars

Dr. S. Gomathinayagam
Executive Director

- ***"Wind Power - National Scenario"*** -Green Power, 2009 at Taj Chennai on 18th - 19th June, 2009.
- ***"Chief Guest in Wind Power - National Scenario"*** Power Trading Opportunities at Coimbatore on 5th September, 2009.
- ***"Structural Design in Wind Electric Generators"***- endowment lecture - 2009 - Annamalai University, Annamalai nagar.
- ***"Wind Electric Power in India"*** Inaugural Lecture - Vellammal Electrical and Electronics Engg. College, on 29th July, 2009.
- ***"Overview of Sustaining Wind Energy as Green Power"*** Aarush 09 - SRM Valedictory Address on 12th September, 2009.
- ***"Research & Development on Wind Power Technology in India"*** - AU-MIT on 30th September, 2009.
- ***"Power Conference - 2009"*** - Hotel Park Sheraton - 7th October, 2009.
- InWEA - Srilankan Program 3rd - 6th November, 2009.
- Presentation - to meet PRO, DyCM - Offshore Wind on 9th November, 2009.
- Chief Guest for sports Day - Sarada Vidyalaya, T.Nagar on 14th November, 2009.
- Development Commissioners Office - Presentation on Offshore wind on 18th Dec 2010.
- ***"Indo-Scottish Workshop*** - 8th December, 2009 - IIT Mumbai - Research Activities - Proposal in WE.
- ***"Civil Engineers in Wind Power Development in India"*** - Inauguration of "Civil Engg. Assn. in 2009" - Sree Sastha Institute of Engg. & Tech. on 6th Jan 2010.
- ***"Emerging Trends in Energy & Environment"*** Inaugural Address - Sai Ram Engg. College on 7th Jan 2010.
- 8th & 9th Jan, 2010 Member of National Advisory Committee for National Seminar on Grand Engineering Opportunities - CDM in Chemical Process Industries.
- ***"Wind Energy Conversion Technologies"*** - Chief Guest & Inaugural Address - Velammal Engg. College - National Level Workshop on Wind Energy on 21st Jan, 2010 - NWET.
- ***"Wind Potential"*** - Keynote Address & Inauguration 2nd week of Energy Fortnight - Cape Renewable Energy Research Centre, Kanyakumari on 25th Jan, 2010.

Rajesh Katyal
Scientist & Unit Chief, R&D

- ***"Design of Foundation concepts used for wind turbine application"***, during the Seventh National Training program on 29th May 2009.
- ***"Wind Solar Hybrid System"*** during thhe discussion meet at Agency for Non-Conventional Energy and Rural Technology (ANERT), Thiruvananthapuram on 16th June 2009.
- ***"Indian Wind Grid Code"*** delivered on 03rd November 2009 at Chennai, to Sri Lankan Delegates, organized by INWEA.

- ***"R&D in Wind Energy"*** - at MNRE-IEA Workshop on Cooperation on Renewable Energy & Renewable Energy Technologies at New Delhi.
- ***"Introduction to IEC 61400-1 & 13, WTTS, QMS"*** for Arab Organisation for Industrialization (AOI) Engineers during the Special International Training organized by C-WET on 22nd October 2009.
- ***"Towers and Foundations Concepts"*** at Eighth National Training course held from 09th - 11th December 2009.
- ***"Small Wind Turbine and Hybrid System"*** at Eighth National Training course held from 09th - 11th December 2009.
- ***"Wind Electric Generation: Modern Trends"*** delivered at National Institute of Technology, Trichy.
- ***"Wind Solar Hybrid Systems"*** delivered at National Workshop on Wind Energy Conversion Technology organized by Velammal Engineering College, Chennai.
- ***"Small Wind Turbine and Hybrid System"*** at Renewable Energy Fortnight from 18th - 30th January 2010 at Cape Institute of Technology.
- ***"Wind Turbine Foundation"*** at Fifth International Training Course during February 2010 at C-WET, Chennai.
- ***"Small Wind Turbine and Hybrid system"*** at Fifth International Training Course during February 2010 at C-WET, Chennai.
- ***"Recent Trends on Wind Turbine Technology"*** VIRINCHIKKA-10 at Sri Chandrashekarendra Saraswathi Viswa Mahavidyalaya (SCSVMV) University, Kanchipuram.

Dr. E. Sreevalsan
Scientist & Unit Chief, WRA

- ***"Introduction to Wind Resource Assessment"*** & ***"Wind Structure, Statistics and Energy Analysis"*** at C-WET, Chennai on Special International training course on 'Wind Turbine Testing and Wind Farm Micrositing' for Arab Organization for Industrialization (AOI) Engineers 19th - 28th October 2009.
- ***"Meso & Micro scale models for Wind Resource Assessment, Wind Resource Assessment Techniques - An Introduction & Design and Layout of Wind Farms"*** at C-WET, Chennai Fifth International Training Course on "Wind Turbine Technology and Applications", 03rd - 19th February 2010.
- ***"Wind Power Meteorology"*** on Seventh National Training course on "Fundamentals of Wind Energy", 28th - 29th May 2009 at C-WET, Chennai.
- ***"Wind Resource Assessment and Techniques"*** on Eight National Training course on Wind Energy Technology, 09th - 11th December 2009 at C-WET, Chennai.

S.A. Mathew
Scientist & Unit Chief, Wind Turbine Testing

- ***"Testing of Wind Turbines"*** during India - Sri Lanka Wind Energy Knowledge Exchange program organized by Indian Wind Energy Association held during 03rd - 06th November, 2009 at Trident Hotel, Chennai.
- ***"Wind Turbine Technology in India and its impact"*** in the International Conference Green Power VI held on 18th November 2009 at Silver Oak Hall, India Habitat Center, New Delhi.

- ***"Testing of Wind Turbines"*** at seventh & eighth national training course on "Wind Energy Technology" organized by C-WET.
- ***"Introduction to testing of wind turbines, Measurement techniques and Power curve measurements"*** at Special International training course on 'Wind Turbine Testing and Wind Farm Micrositing for Arab Organization for Industrialization (AOI) engineers organized by C-WET.
- ***"Wind Turbine Testing & Measurement Techniques, Power Curve Measurements, Wind Turbine Technology and its Impact"*** *at* Fifth International Training Course on "Wind Turbine Technology and Applications" organized by C-WET.

A. Senthil Kumar
Scientist & Unit Chief, S&C

- ***"Wind Turbine Type Certification"*** to Sri Lankan delegates as a part of "India-Sri Lanka Wind Energy Knowledge Exchange Program" organized by Indian Wind Energy Association (InWEA).
- ***"Type Certification of wind turbines as per TAPS-2000: An overview"*** in the Seventh National Training Programme conducted by C-WET.
- ***"Wind Turbine Certification and Standards"*** in the Eighth National Training Programme conducted by C-WET.
- ***"Type Certification of Wind Turbines as per IEC WT 01"*** and ***"Introduction to IEC 61400-1 and IS 875 Standards"*** in the Fifth International training Programme organized by C-WET.

P. Kanagavel
Scientist & Unit Chief i/c, ITCS

- ***"Role of C-WET in Wind Energy Development"*** at Eighth National Training course held from 09th - 11th December 2009.
- **"Wind Energy Development for Industry"** in All India Seminar on "Clean Development Mechanism in Chemical and Process industries" organized by Institute of Engineers (India) Bangalore during 08th - 09th January 2010.
- ***"Role of C-WET in Wind Energy Development"*** at Fifth International Training Course during February 2010 at C-WET, Chennai.
- ***"C-WET's Role in Wind Power Development in India"*** on 08th March 2010 at Raj Park Hotel, Chennai in the "Wind Power Development and Use" programme organized by Life Academy, Sweden and sponsored by SIDA.

J.C. David Solomon
Scientist, R&D

- ***"Issues related to Design and Manufacture of Wind Energy Harvesters"*** at MIT, Anna University on 21th October 2009.

- ***"Design Aspects of Drive Train"*** at Eighth National Training course held from 09th - 11th December 2009.
- ***"Wind Turbine Dynamics & Testing"*** delivered at National Workshop on Wind Energy Conversion Technology organized by Velammal Engineering College, Chennai.
- ***"Design Aspects of Drive Train"*** at Fifth International Training Course during February 2010 at C-WET, Chennai.

K. Boopathi
Scientist, WRA

- ***"Wind Turbine Technology & Application"*** to Southern state polytechnic lectures at TTI, Taramani on 22nd July 2009.
- ***"Wind Turbine Components"*** Eight National Training course on Wind Energy Technology, 09th - 11th December 2009 at C-WET, Chennai
- ***"Wind Resource Assessment by using Remote Sensing Instruments"*** Special International training course on 'Wind Turbine Testing and Wind Farm Micrositing' for Arab Organization for Industrialization (AOI) Engineers 19th - 28th October 2009.
- ***"Wind Turbine Components"*** on Fifth International Training Course on "Wind Turbine Technology and Applications" on 03rd - 19th February 2010.
- ***"Assessment of Wind Energy Potential in India"*** and Wind Turbine Technology Status & Challenges in India to National Institute of Technology, Hamirpur, Himachal Pradesh on 24th December 2009.
- ***"Renewable Energy Development in India"*** on 08th March 2010 at Raj Park Hotel, Chennai in the "Wind Power Development and Use" programme organized by Life Academy, Sweden and sponsored by SIDA.

Deepa Kurup
Scientist, R&D

- ***"Generators and Grid Integration of Wind Turbines"*** at Eighth National Training course held from 09th - 11th December 2009.
- ***"Wind Electric Generation and Grid Integration"*** delivered at National Workshop on Wind Energy Conversion Technology organized by Velammal Engineering College, Chennai.
- ***"Grid Integration of Wind Turbines"*** at Fifth International Training Course during February 2010 at C-WET, Chennai.
- ***"Wind Energy"*** at Training program conducted by South Asia Regional Initiative for Energy under USAID at Thiruvananthapuram.

R. Sasikumar
Scientist, WRA

- ***"Measurements & Instrumentation", "Demonstration of Wind Monitoring Station Installation", "Siting guidelines for Wind Measurements"*** and ***"Data Collection, Station Operation, & Maintenance"*** for Special International

training course on 'Wind Turbine Testing and Wind Farm Micrositing' for Arab Organization for Industrialization (AOI) engineers 19th - 28th October 2009.

- ***"Siting Guidelines for Wind Measurements, Monitoring Station Instrumentation and Installation & Station Operation and Data Collection & Analysis"*** for Fifth International Training Course on *"Wind Turbine Technology and Applications"* on 03rd - 19th February 2010.

R. Kumaravel
Scientist, Wind Turbine Testing

- ***"Recent Trends in Renewable Energy"*** at AICTE sponsored National Seminar organized by Mookambigai College of Engineering at Tiruchirapalli during 17th - 18th April 2009.
- ***"Wind Electric Generators"*** in the workshop on *"Electrical Machines"* organized by St.Josephs College of Engineering, Chennai on 25th August 2009.
- ***"Recent Developments in Wind Energy"*** at Krishna College of Engineering, Coimbatore held on 20th February 2010.

N. Rajkumar
Scientist, S&C

- ***"Design Evaluation of Wind Turbine Gearbox"*** in the Fifth International training Programme organized by C-WET.

S. Arulselvan
Junior Engineer, S&C

- ***"Control and Safety system of the Wind Turbine System"*** in the Eighth National Training Programme conducted by C-WET.
- ***"Wind Electric Generators"*** and ***"Design requirements of Control and Protection System"*** in the Fifth International training Programme organized by C-WET.

G. Arivukkodi
Junior Engineer, WRA

- ***"Measurement Parameters & Data Analysis"*** Special International training course on 'Wind Turbine Testing and Wind Farm Micrositing for Arab Organization for Industrialization (AOI) engineers 19th - 28th October 2009.
- ***"Measurement Parameters & Station Operation and Data Collection & Analysis"*** on Fifth International Training Course on "Wind Turbine Technology and Applications" on 03rd - 19th February 2010.

Seminars / Conferences / Training Programmes Attended

Executive Director

- Executive Committee Meeting, Anna University, April 2009
- Peer Review Committee Meeting, April 2009
- Empanelment of Small Wind Turbines, May 2009
- Job Opportunities in Wind - All India Radio, Chennai, June 2009
- Pudiyador Ulagam - All India Radio, Chennai, June 2009
- Full Bright - Climate Change Risks & Adaptations - Panel Discussion - Taramani, July 2009
- Energy Management Conference by BSI India, August 2009
- Seminar on "Power Trading Opportunities" in Coimbatore by IWPA, September 2009
- IIM Ahmedabad Meeting - Innovation Incubation & Entrepreneurship Research Seed Fund Management Committee, October 2009
- Inauguration address - Workshop in IIT, October 2009
- Power Conference, October 2009
- State Nodal Agencies Meeting of NE states Program in Guwahati, October 2009
- Historic Opening of PMA Chapter in Raj Bhavan, December 2009
- Dr. Subramanian, Saint Gobain USA - Department of Mechanical Engineering, IIT, February 2010
- Toray Industries One Day Seminar, March 2010

Research and Development Unit

- Deepa Kurup, Scientist has participated in ***URJA 2009*** - Renewable Energy exhibition at Cochin, May 2009.
- Rajesh Katyal, Scientist & Unit Chief has attended Brainstorming session and delivered a presentation on ***"Small Wind Turbine Testing and Certification"*** at WISE, Pune, May 2009.
- Rajesh Katyal, Scientist & Unit Chief has attended a meeting on ***"Development of Course for Renewable Energy Technology"*** at IIT-Madras.
- Deepa Kurup, Scientist has attended 5th National Workshop on ***"Power Electronics (NWPE 2009) under the aegis of NaMPET"*** at Thiruvananthapuram.
- Rajesh Katyal, Scientist & Unit Chief has attended meeting on ***"Task Force for Integration of Renewable Energy into the Grid"*** organized by Central Electricity Regulatory Commission (CERC), New Delhi.
- Rajesh Katyal, Scientist & Unit Chief and J.C David Solomon, Scientist have participated ***"BLADED Software"*** Training course conducted by M/s. Garrad Hassan, UK , at Chennai during 30th November - 04th December 2009.
- Rajesh Katyal, Scientist & Unit Chief has attended the training program on ***"CFD Technology Vs Linear Models by Meteodyn"***.

Wind Resource Assessment Unit

- Dr. E. Sreevalsan, Scientist & Unit Chief has participated ***"Wind Power Development in Andhra Pradesh"*** meeting at NEDCAP Head office, Hyderabad on 17th June 2009.
- K. Boopathi, Scientist has participated ***"Introduction to Wind Turbine Noise"*** course on 17th June 2009 at Alborg, Denmark.
- K. Boopathi, Scientist has participated ***"ArcInfo GIS"*** training programme conducted by NIIT ESRI India at C-WET on 20th - 22nd October 2009.
- K. Boopathi, Scientist has participated one week ***"GH Bladed software"*** training programme at C-WET during 30th November - 04th December 2009.
- G. Arivukkodi, Junior Engineer has participated in the training programme on ***"Communication & Presentation Skills"*** for Women Scientist, Sponsored by Department of Science & Technology during 16th - 21st November 2009 at Xavier Institute of Management, Bhubaneswar.
- G. Arivukkodi, Junior Engineer has attended ***"ArcInfo GIS"*** training programme conducted from NIIT ESRI India Ltd., at C-WET, Chennai during 20th - 22nd October 2009.
- B. Krishnan, Junior Engineer has participated 2 - day ***"Internal Auditor training on QMS as per ISO 9001:2008 standard"*** conducted by DNV during 26th - 27th August 2009.
- B. Krishnan, Junior Engineer has attended ***"ArcInfo GIS"*** training programme conducted from NIIT ESRI India Ltd at C-WET, Chennai during 20th - 22nd October 2009.
- T. Suresh Kumar, Junior Engineer has participated 2- day ***"Internal Auditor training on QMS as per ISO 9001:2008 standard"*** conducted by DNV during 26th - 27th August 2009.
- T. Suresh Kumar, Junior Engineer has attended ***"ArcInfo GIS"*** training programme conducted by NIIT ESRI India Ltd at C-WET, Chennai during 20th - 22nd October 2009.
- T. Suresh Kumar, Junior Engineer has participated Weekend training programme over Five weekends (10 days) on ***"Geospatial Technology"*** 06th March - 04th April 2010 at Sathyabama University,Chennai.
- R. Vinod Kumar, Technician has attended ***"ArcInfo GIS"*** training programme conducted by NIIT ESRI India Ltd at C-WET, Chennai during 20th - 22nd October 2009.
- Dr. E. Sreevalsan, R. Sasikumar, K. Boopathi, G. Arivukkodi, B. Krishnan and T. Suresh Kumar attended the workshop on ***"CFD Technology Vs Linear Models by Meteodyn"*** conducted by IWTMA and C-WET held on 02nd March 2010 at C-WET conference hall.

Wind Turbine Testing Unit

- S. A. Mathew was invited to participate in ***"Panel discussion in India Labview conference"*** organized by National Instruments held on 24th November 2009 at Hotel Royal Park, Chennai.
- S. A. Mathew attended the ***"7 Habits of Highly Effective People Signature Program"*** organized by Franklin Covey South Asia held on 25th - 26th February 2010 at Hotel Raj Park, Chennai.
- S. A. Mathew, Shri. M. Anvar Ali and Shri. R. Kumaravel attended the workshop on ***"CFD Technology Vs Linear Models by Meteodyn"*** conducted by IWTMA and C-WET held on 02nd March 2010 at C-WET conference hall.
- M. Anvar Ali attended the NSIC (ISO 9001-2008) one day seminar on ***"Alternative Sources of Power &***

Energy Conservation" at NSIC - Software Technology Park, Chennai on 10th September 2009 organized by NSIC Technical Services Centre.

- R. Kumaravel, Scientist attended the seminar on ***"Fiber Optic"*** organized by Integrated Process Systems (IPS) held on 02nd November 2009 at Esthell Continental Hotels & Resorts, Chennai.
- R. Kumaravel participated in the training program by Garrad Hassan, UK on the modeling software ***"GH Bladed"*** during 30th November - 04th December 2009 at C-WET.
- R. Kumaravel attended the ***"7 Habits of Highly Effective People Signature Program"*** organized by Franklin Covey South Asia held on 25th - 26th February 2010 at Hotel Raj Park, Chennai.

Scientists & Engineers of Wind Turbine Testing

- Testing Unit Scientists attended a lecture delivered by Shri. V. Chandran, Superintending Engineer, TNEB on ***"Integration of wind energy in Tamilnadu"*** at C-WET on 21st July 2009.
- Testing unit Scientists attended the training/demonstration of ***"Mathlab Software"*** during 11th - 12th November 2009 at C-WET.

Standards and Certification Unit

- Shri. A. Senthil Kumar, Unit Chief, S&C, Shri. N. Rajkumar, Scientist, Shri. S. Arulselvan, Junior Engineer and Shri. C. Stephen Jeremias, Junior Engineer have participated in the training programme on ***"GH Bladed"*** software, conducted by M/s. Garrad Hassan Partners Limited" at C-WET.
- A. Senthil Kumar, Scientist & Unit Chief attended two day workshop on ***"7 Habits of Highly effective People"*** organized by M/s. Franklin Covey, Chennai.
- A. Senthil Kumar, Scientist & Unit Chief has participated in the International Conference on ***"Wind Energy: 20 by 2020"*** held at New Delhi.
- N. Raj Kumar, Scientist 'B' & Shri. C. Stephen Jeremias, Junior Engineer attended the training on ***"Internal Auditor Course (ISO 9001)"*** conducted by DNV at Chennai.
- S. Arulselvan, Junior Engineer attended a short term course on ***"Power Quality & Energy Management Perspectives in Indian Industries"*** organized by Coimbatore Institute of Technology in association with C-DAC, Thiruvanathapuram.
- A. Senthil Kumar, Scientist & Unit Chief, N. Raj Kumar, Scientist 'B' & C. Stephen Jeremias, Junior Engineer attended one day workshop on ***"CFD Technology Vs Linear Models by Meteodyn"*** by Meteodyn, France at C-WET.
- C. Stephen Jeremias, Junior Engineer participated in ***"ECOFEST-09"*** technical event organized by Tamil Nadu Agricultural University.

Information, Training and Commercial Services Unit

- P. Kanagavel, Scientist and Unit Chief i/c has participated the program on ***"The 7 habits of highly effective people"***.
- P. Kanagavel, Scientist and Unit Chief i/c has participated the program on ***"All India Seminar on Green Power Revolution"*** held during 21st - 22nd January 2010 at Hyderabad.
- M. R. Gunasekaran, Senior Stenographer attended a one day workshop on ***"Role of Excellence: Personal Assistants and***

Executive Secretaries" on 19th December 2009, organized by Management Study Centre, Chennai.

Finance and Administration

- D. Lakshmanan General Manager, F&A attended National Residential Training Program on ***"Right to Information Act, 2005"*** during 16th - 17th November 2009 at Chandigarh organized by Institute of Public Administration, Bangalore.
- D. Lakshmanan General Manager, F&A attended seminar on ***"Right to Information Act 2005"*** on 22nd February 2010 organized by the Institute of Secretariat Training and Management, New Delhi.
- G. Rajan, AAO attended management training on ***"Business Taxation for Corporates"*** from 31st January 2010 for 10 weeks organized by MSME Development Institute, Govt. of India, Chennai.
- G. Rajan, AAO attended one day seminar on ***"Right to Information Act, 2005"*** on 16th December 2009, organized by the Institute of Secretariat Training and Management, New Delhi.
- G. Rajan, AAO attended programme on ***"Management of Taxation"*** during 09th - 12th February 2010 organized by the Institute of Cost and Accountants of India.
- G. Rajan, AAO attended a training course on ***"Public Finance Management for Group A officers"*** organized by the institute of Secretariat Training and Management, New Delhi.
- G. Rajan, AAO attended a two day ***"Special Modular Programme on Contract Labour"*** during 24th - 25th February 2010 organized by Institute of Public Administration, Bangalore.
- R. Girirajan, Assistant has attended ***"Management Training on Business Taxation for Corporates"*** from 31st January 2010 for 10 weeks organized by M/s. MSME Development Institute, Govt. of India, Chennai.
- R. Girirajan, Assistant attended programme on ***"Management of Taxation"*** during 09th - 12th February 2010 organized by the Institute of Cost and Accountants of India, Orissa.
- R. Girirajan, Assistant attended special Workshop on ***"Income Tax on Salaries"*** on 15th May 2009 organized by Parsam Institute of Statutory Rules, Bangalore.
- R. Girirajan, Assistant attended a training programme on ***"Capacity Enhancement for use of Consultancy Services"*** on 22nd September 2009 organized by ITCOT Consultancy Services Ltd., Chennai.
- K. Tamilselvi, Assistant has attended management training on ***"Business Taxation for Corporates"*** from 31st January 2010 for 10 weeks organized by MSME Development Institute, Govt. of India, Chennai.
- K. Tamilselvi, Assistant attended a training programme on ***"Capacity Enhancement for use of Consultancy Services"*** on 22nd September 2009 organized by ITCOT Consultancy Services Ltd, Chennai.
- R. Chandrasekaran, Assistant attended a two day workshop on ***"Cost Reduction through better Material Management"*** during 07th - 08th August 2009 organized by Management Study Centre, Chennai.
- R. Chandrasekaran, Assistant attended a two day Interactive Session on ***"Extempore Leadership for Officers"*** organized by Management Study Centre, Chennai.
- Anuradha Babu, Private Secretary attended a one day workshop on ***"Role of Excellence: Personal Assistants and Executive Secretaries"*** on 11th June 2009, organized by Management Study Centre, Chennai.

General Information

GOVERNING COUNCIL

The following are the members of the Governing Council & Annual General Body (To administer and guide the affairs of the Centre):

1	Shri. Deepak Gupta, Secretary, I.A.S., MNRE, New Delhi	Chairman
2	Shri. Sharad Gupta, I.A.S., Director General, Bureau of Indian Standards, New Delhi	Member
3	Shri. Rajarshi Bhattacharya, I.A.S., Additional Secretary & Financial Adviser, MNRE, New Delhi	Member
4	Shri. S. M. Dhiman, Member Planning, CEA, New Delhi	Member
5	Shri. P. W. C. Davidar, I.A.S., Secretary to the Government, Energy Department, Govt. of Tamil Nadu, Secretariat, Chennai	Member
6	Dr. A. R. Upadhyay, Director, National Aerospace Laboratories, Bangalore	Member
7	Shri. Harikumar, Joint Secretary (Wind Energy), MNRE, New Delhi	Member
8	Shri. Debasish Majumdar, Chairman and Managing Director, IREDA, New Delhi	Member
9	Dr. Kota Hari Narayana, Raja Ramanna Fellow, National Aerospace Laboratories, Bangalore	Member
10	Shri. D. V. Giri, Chairman, IWTMA, Chennai	Member
11	Dr. S. Gomathinayagam, Executive Director, C-WET, Chennai	Member Secretary

MANAGEMENT COMMITTEE

The following are the members of the Management Committee (To take decisions as and when required and to inform GC from time to time):

1	Chairman, Governing Council, C-WET	Chairman
2	Financial Adviser, MNRE	Member
3	Executive Director, C-WET	Member

FINANCE COMMITTEE

The following are the members of the Finance Committee
(To review the financial performance of the Centre):

1	Shri. Rajarshi Battacharya, I.A.S., Additional Secretary & Financial Adviser, MNRE, New Delhi	Chairman
2	Shri. P. W. C. Davidar, I.A.S., Secretary to Govt., Energy Department, Tamil Nadu Government	Member
3	Shri. Harikumar, Joint Secretary (Wind Energy) MNRE, New Delhi	Member
4	Dr. S. Gomathinayagam, Executive Director, C-WET, Chennai	Member
5	Mr. G. Upadhyay, Director (WE), MNRE, New Delhi	Member
6	Mr. A. K. Kaushik, Director (Finance), MNRE, New Delhi	Member
7	Shri. D. Lakshmanan, General Manager (F&A), C-WET, Chennai	Member Secretary

RESEARCH AND DEVELOPMENT COUNCIL

The following are the members of the Research and Development Council
(To guide C-WET on laying down Research direction to serve the Indian Wind Energy Sector):

1	Dr. Kota Hari Narayana, Raja Ramanna Fellow, NAL, Bangalore	Chairman
2	Shri. Harikumar, Joint Secretary (WE),MNRE, New Delhi	Member
3	Dr. G. B. Pant, Former Director & Honorary Fellow, IITM, Pune	Member
4	Shri. Ajit K. Gupta, National Project Management, UNDP/GEF Global Water Heating Project & Former Adviser, MNRE	Member
5	Smt. K. A. Fathima, Sr. Director & Head, Power Electronics Group, C-DAC, (Formerly ER & DCI), Trivandrum	Member
6	Shri. M. P. Ramesh, Former ED, C-WET, Bangalore	Member
7	Shri. K. P. Sukumaran, Former Adviser, MNRE, New Delhi	Member
8	Shri. D. V. Giri, Chairman, IWTMA, Chennai	Member
9	Dr. S. Gomathinayagam, ED, C-WET, Chennai	Member
10	Shri. Rajesh Katyal, Unit Chief, R&D Unit, C-WET, Chennai	Member Secretary

REVISED LIST OF MODELS AND MANUFACTURERS OF WIND TURBINES (RLMM) COMMITTEE

The following are the members of the Revised List of Models and Manufacturers of Wind Turbines (RLMM) Committee

1	Dr. S. Gomathinayagam, Executive Director, C-WET, Chennai	Chairman
2	Shri. K. P. Sukumaran, Adviser (Wind Energy), MNRE (upto 31.12.2009)	Member
3	Shri. G. Upadhyay, Director (Wind Energy), MNRE (from 01.01.2010)	Member
4	Shri. D. V. Giri, Chairman, IWTMA, Chennai	Member
5	Shri. K. Kasthurirangaian, Chairman, IWPA, Chennai	Member
6	Shri. A. Senthil Kumar, Unit Chief, S&C, C-WET, Chennai	Secretary

HINDI PROMOTION COMMITTEE

The following are the members of the Hindi Promotion Committee (Constituted for the purpose of promotion of Hindi Official Language in C-WET):

1	Executive Director, C-WET	Chairman
2	Shri. Rajesh Katyal, Scientist & Unit Chief, R&D, C-WET	Member Secretary
3	Shri. D. Lakshmanan, General Manager, F&A, C-WET	Member
4	Admin & Accounts Officer, C-WET	Member
5	Shri. P. Kanagavel, Scientist & Unit Chief i/c, ITCS, C-WET	Member
6	Mr. R. Kumaravel, Scientist, Testing, C-WET	Member

HINDI TEACHING SCHEME

The year was marked by an additional thrust given for the implementation of official language. **Shri. A. Senthil Kumar**, Unit Chief, S&C and **Smt. B. Muthulakshmi**, Senior Stenographer passed "**PRAGYA**" Hindi Examination with more than 80% marks. **Shri. M. R. Gunasekaran**, Senior Stenographer completed "**Hindi Typewriting on Computers**" with flying colors securing 93% marks. **Shri. T. Sureshkumar**, Junior Engineer, WRA unit has attended the Probodh class in Hindi teaching scheme 05th January - 18th May 2010 (Weekly 3 days) at IIT Madras.

C-WET has been an active member in the Town Official Language Implementation Committee, Chennai and had the special privilege of sponsoring a cultural program. The centre took part in the "**DOL Sponsored Trainer's Hindi Training Programme**" at National Informatics Centre, Rajaji Bhavan, Chennai for 5 days from 07th - 11th December 2009. The Officer (i/c) of Official Language also attended C-DAC sponsored programme on increased use of Hindi on computers at the Headquarters of Southern Railway, Chennai on 21st January 2010.

The Hindi version of "**PAVAN**", the Quarterly News Bulletin of C-WET, is considered a standard technical literature amongst the scientific community. C-WET has since adopted Unicode for all communications in Hindi

Staff Promotion During 2009-2010

Sl. No.	Name	Previous Cadre and scale of pay	Promoted Cadre and scale of pay	Date of Promotion
1	Dr. E. Sreevalsan	Scientist 'D' Pay Band 15600 - 39100 Grade Pay Rs. 7600/-p.m	Scientist 'E' Pay Band 37400 - 70000 Grade Pay Rs. 8700/-p.m	01.01.2010
2	Shri. S. A. Mathew	Scientist 'C' Pay Band 15600 - 39100 Grade Pay Rs. 6600/-p.m	Scientist 'D' Pay Band 15600 - 39100 Grade Pay Rs. 7600/-p.m	01.01.2010
3	Shri. A. Senthilkumar	Scientist 'C' Pay Band 15600 - 39100 Grade Pay Rs. 6600/-p.m	Scientist 'D' Pay Band 15600 - 39100 Grade Pay Rs. 7600/-p.m	01.01.2010
4	Shri. K. A. Haji Abdul Ibrahim	Attendant Pay Band 4440 - 7440 Grade Pay Rs.1650/-p.m	Daftary Pay Band 5200 - 20200 Grade Pay Rs. 1900/-p.m	18.08.2009

New Recuitment

Sl. No.	Name	Designation	Date of Joining
1	Shri. C. Stephen Jeremias	Junior Engineer	01.04.2009
2	Shri. B. Krishnan	Junior Engineer	01.04.2009
3	Shri. T. Suresh Kumar	Junior Engineer	02.04.2009
4	Shri. S. Maruthanayagam	Driver	01.04.2009

National Day Celebrations

The Independence Day and the Republic Day were celebrated with reverence at the C-WET Campus. The events began with a parade of the security personnel at C-WET followed by Flag Hoisting and concluded with distribution of sweets.

Independence Day 15th August 2009

Republic Day - 26th January 2010

Vigilance Awareness Week

Vigilance Awareness Week for the year 2009 was observed in C-WET from 03rd - 07th November 2009. All the employees took the pledge prescribed by the Central Vigilance Commission.

Committee for Prevention of Sexual Harassment of Women at Work Place

In pursuance of Government instructions, a Complaints Committee for women for redressal of complaints concerning sexual harassment in work place has been constituted in C-WET. The Committee conducted its meeting on 07th December 2009 and 29th March 2010. No complaints were received during the year 2009-2010.

Important Visitors

- Hon'ble Minister Dr. Farooq Abdullah, Ministry of New and Renewable Energy visited C-WET on 20th June 2009.
- Dr. Hassan Younis, Egyptian Minister of Electricity and Energy visited C-WET on 18th November 2009.
- Shri. V. Subramanian, I.A.S., Former Secretary to Government of India, Ministry of New and Renewable Energy delivered lecture on "Wind Energy : Global Scenario" at C-WET on 15th June 2009 in connection with the "Global Wind Day".
- Mr. Erkki V. Jaatinen, Product Head, M/s. METSO, Finland visited C-WET on 07th September 2009 and had discussion on the SENSODEC 6 S - Wind Turbine Health Monitoring System and delivered a lecture on "Health Monitoring Systems for wind turbines".
- Engineers from AOI (Arab Organization for Industrialization) visited C-WET for attending the International Training course on "Wind Turbine Testing and Wind Farm Micrositing" during the period 19th - 28th October 2009.

Human Resource (as on 31st March 2010)

Dr. S. Gomathinayagam
Executive Director

Research & Development

Rajesh Katyal	*Scientist & Unit Chief*
J. C. David Solomon	*Scientist*
Deepa Kurup	*Scientist*
R. Naveen Muthu	*Technician*

Wind Resource Assessment

Dr. E. Sreevalsan	*Scientist & Unit Chief*
K. Boopathi	*Scientist*
R. Sasikumar	*Scientist*
G. Arivukkodi	*Junior Engineer*
B. Krishnan	*Junior Engineer*
T. Suresh Kumar	*Junior Engineer*
R. Vinod Kumar	*Technician*
K. A. Haji Abdul Ibrahim	*Daftary*

Wind Turbine Testing

S. A. Mathew	*Scientist & Unit Chief*
M. Anvar Ali	*Scientist*
R. Kumaravel	*Scientist*

Standards and Certification

A. Senthil Kumar	*Scientist & Unit Chief*
N. Rajkumar	*Scientist*
S. Arulselvan	*Junior Engineer*
C. Stephen Jeremias	*Junior Engineer*
B. Muthulakshmi	*Senior Stenographer*

Information, Training and Commercial Services

P. Kanagavel	*Scientist & Unit Chief i/c*
M. R. Gunasekaran	*Senior Stenographer*

Administration

D. Lakshmanan	*General Manager (F&A)*
G. Rajan	*Administration-cum-Accounts Officer*
Anuradha Babu	*Private Secretary*
R. Girirajan	*Assistant*
K. Tamilselvi	*Assistant*
M. Malaravan	*Driver*
S. Maruthanayagam	*Driver*
M. Selvakumar	*Daftary*

Wind Turbine Test Station

A. Mohamed Hussain	*Scientist & Unit Chief*
M. Karuppuchamy	*Junior Engineer*
A. R. Hasan Ali	*Junior Engineer*
Y. Packiyaraj	*Junior Engineer*

C-WET official on external Committees, Bodies and membership of Associations

S. Gomathinayagam

- "Institution of Engineers (India)", Life Member / Chartered Engineer
- "Computer Society of India", Life Member / Chartered Engineer
- "Instrument Society of India", Life Member / Chartered Engineer
- "Indian Society of Wind Engineers", Life Member / Chartered Engineer
- "Indian Meteorological Society", Life Member
- "External Examiner of UGC-JRF Ph.D program for MIT", Anna University, Member
- "Expert Advisory Committee", Tamil Nadu, Scientists Award- (TANSA) - 2008 for Engineering and Technology.
- "Executive Committee Member of Institute of Energy Studies", Anna University, Chennai.
- Member of Monitoring Committee, NIMITLI, Wind Turbine Development Project of CSIR

D. Lakshmanan

- "National Institute of Personnel Management", Kolkata, Corporate Member.

Rajesh Katyal

- "Institution of Engineers (India)", Member.

E. Sreevalsan

- "Indian Meteorological Society", Member.
- "Doctoral Committee (Academic Research)", Sathyabama Deemed University, Chennai, Member.
- "Committee Member of Evaluation RFQ & RFP Bid Committee" (Wind Farms in Kerala)
- "Tender Evaluation Committee (Technical) of NTPC and NLC, Neyveli", Member.

A. Senthil Kumar

- "Wind Turbines Sectional Committee, ET 42 of BIS", Member.

R. Kumaravel

- "Institution of Engineers (India)", Associate Member.

P. Kanagavel

- "Society for the Advancement of Library and Information Science (SALIS)", Member.
- Indian Academic Library Association (IALA), Member.