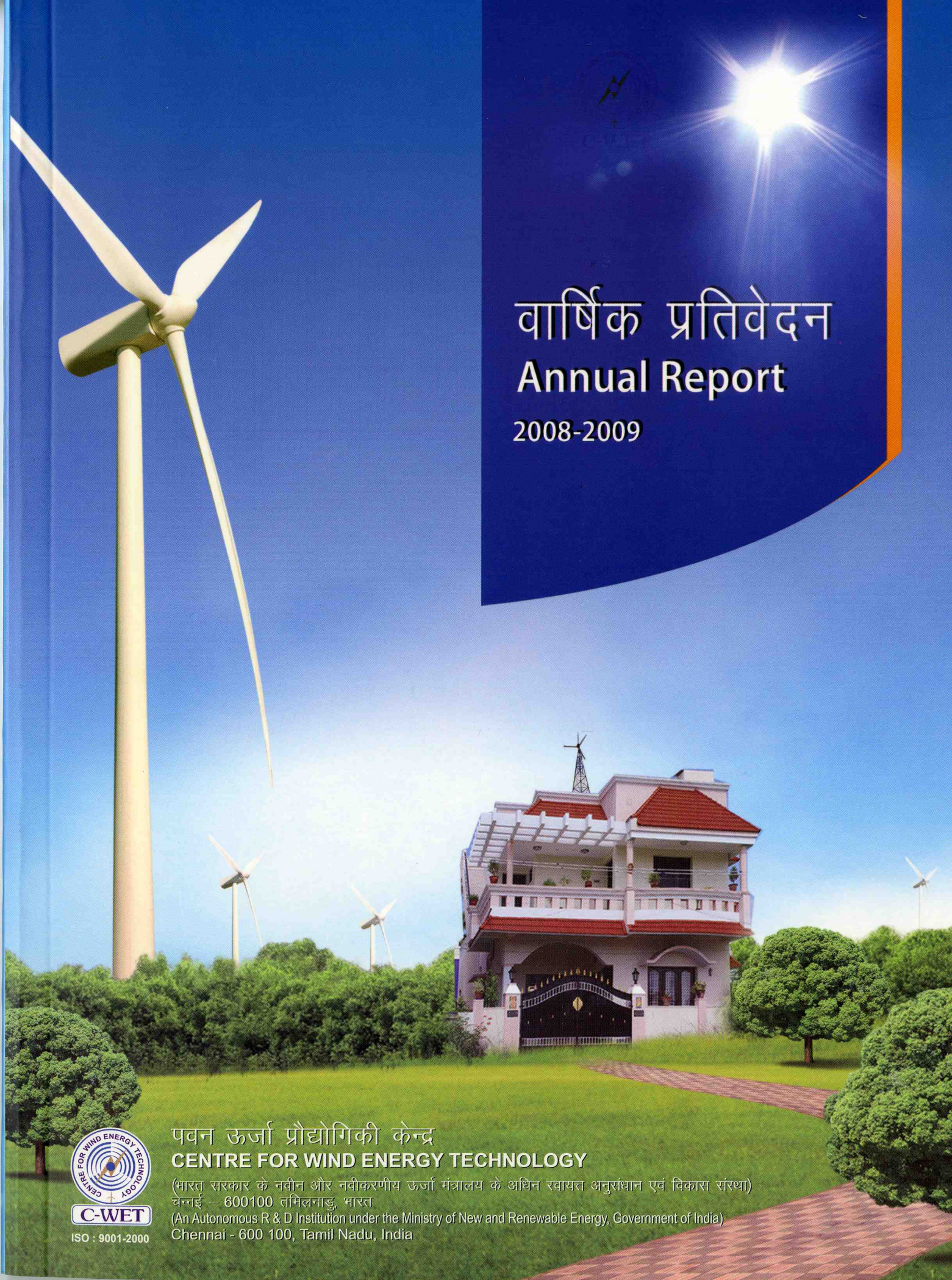




वार्षिक प्रतिवेदन Annual Report 2008-2009



ISO : 9001-2000

पवन ऊर्जा प्रौद्योगिकी केन्द्र

CENTRE FOR WIND ENERGY TECHNOLOGY

(भारत सरकार के नवीन और नवीकरणीय ऊर्जा मंत्रालय के अधिन स्वायत्त अनुसंधान एवं विकास संस्था)

चेन्नई - 600100 तमिलनाडु, भारत

(An Autonomous R & D Institution under the Ministry of New and Renewable Energy, Government of India)

Chennai - 600 100, Tamil Nadu, India

ANNUAL REPORT

2008-2009



ISO 9001 : 2000

CENTRE FOR WIND ENERGY TECHNOLOGY

(An Autonomous R & D 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

(An Autonomous R & D Institution under the Ministry of New and Renewable Energy, Government of India)
Velachery–Tambaram Main Road, Pallikaranai, Chennai - 600 100, Tamil Nadu, India

Phone : +91-44-22463982 / 22463983 / 22463984

Fax : +91-44-22463980

E-mail : info@cwet.res.in

Website : <http://www.cwet.tn.nic.in>

Contents

Description	P.No
Executive Director's Report	5
The Charter	8
From The Units	9
Research & Development	11
Wind Resource Assessment	14
Wind Turbine Testing	21
Standards and Certification	23
Information, Training and Commercial Services	25
General Information	33
Human Resource	37
C-WET Officials on External Committees	38
Auditors' Report	39
Balance Sheet	40
Income & Expenditure Account]]	41
Receipts & Payment Account	42

Executive Director's Report

Centre for Wind Energy Technology (C-WET) continues to play a significant role in the development of wind power sector in the country. Year after year, C-WET has engaged itself in providing value added services to all wind energy stakeholders. The services cover wide areas of applications starting from the development of Indian database of wind resources and identification of various potential locations for commercial exploitation. Wind resource studies in uncovered areas and preparation of Indian Wind Atlas are still continuing with the later nearing completion. 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 are some of the other areas of ongoing activities in C-WET.

With a view to establish offshore wind farm in India, efforts have been taken to study wind resource assessment on two locations; one in Rameshwaram and another in Koodankulam. The test facilities for small battery chargers (Aerogenerators/ Small Wind Turbines (SWTs)) have been established and two small battery chargers are under testing at the Wind Turbine Test Station (WTTS), Kayathar.

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). The 6th National Training Course was organized with special emphasis on "Fundamentals of Wind Energy".

Research and Development (R&D) Unit

During the year 2008-2009, Research and Development unit (R&D) has sought RFPs (Request for Proposals) in major thrust areas identified by R&D Council through a Brain Storming Session, where, about 17 proposals received from various institutions and industry. The 'Blade' and 'Tower' sub-group meetings were held to fine tune the proposals received and reviewed.

Testing of commercial SWTs of Whisper200 and SNT-500 are in progress at WTTS, Kayathar. In order to assist in the efforts of Ministry of New and Renewable Energy (MNRE) for promoting SWTs, a procedure for empanelment of Small Wind Turbines from eligible manufacturers in India have been forwarded for discussion with manufacturers after reviewing 43 models of SWTs from nine manufacturers. The unit has also carried out a noise level measurement at the R&D wind farm at Kayathar. The measurement of Acoustic Emissions of the 600 kW wind turbine was studied using procedures laid out as per IEC-61400-11. Based on the data analysis a detailed report on assessment of Acoustic Emissions of the wind turbine in India was submitted to International Conference in Denmark. With the help of Telecommunication India Limited (TCIL), New Delhi, C-WET has prepared a Detailed Project Report (DPR) for the process of establishing an efficient and reliable generation data collection system for assessing the performance of the wind turbines, in the state of Tamil Nadu as a pilot study.

A working group consisting of expert members from National Institute of Ocean Technology (NIOT), Indian Institute of Technology

Madras (IITM), Nuclear Power Corporation of India Limited (NPCIL), National Thermal Power Corporation (NTPC), Indian Oil Corporation (IOCL) and C-WET geared up the studies for feasibility of offshore wind measurements. In this context, high level officials of Tamil Nadu Maritime Board, Southern Naval Command and District Collector of Ramanathapuram were met by the C-WET team with Executive Director and discussed the necessary clearances for offshore measurements near Dhanushkoti. The joint team of scientists and officials also visited Dhanushkoti and collected the GPS co-ordinates with the help of land surveyors for a detailed project planning to kick start offshore wind measurements.

To enhance the facilities of R & D experimental wind farm, the R & D unit has initiated the procurement of a variable speed wind turbine with a capacity higher than 500 kW. The newly taken over 9 MICON 200 kW old (more than 20 years) wind turbines for R & D wind farm are getting retrofitted and will be made operational in this wind season.

Wind Resource Assessment (WRA) Unit

Under the MNRE sponsored wind monitoring programmes for uncovered areas, C-WET has maintained significant progress last year. A total number of 52 monitoring stations were commissioned during the year 2008-2009. Several other projects for establishing wind measuring stations are in different stages of progress. Comprehensive studies of the wind measuring programme for the country have also been addressed by the unit.

The project on preparation of Indian Wind Atlas is in an advanced stage of completion. Combinations of Meso and micro scale simulations/measurements are being validated by C-WET scientists in consultation with RISO, Denmark. Two level Meso /micro

scale simulations have been completed with convergence of errors. Validation of the results is in an advanced stage and the Wind Atlas of the country is expected to be released by the end of the year 2009. The unit has also established three 120m tall mast, one each in Maharashtra, Gujarat and Rajasthan. This would enable long term wind climate study to cater to the wind industry's needs of ever increasing hub heights. The services of this unit are re-certified for quality system of ISO 9001:2000 by Det Norske Veritas (DNV).

Wind Turbine Testing (WTT) Unit

Type testing of Siva Wind Turbine 250 kW has been completed at WTTS, Kayathar and instrumentation of a Rotor of M/s. Leitner Shriram Manufacturing Ltd., Model 1.35 MW wind turbine at Oothumalai has been completed. At Thirumangalakurchi, Chettinadu 600 kW wind turbine has been instrumented and measurements are in progress. Two agreements have been signed for megawatt class machines of M/s. Suzlon and M/s. Kenersys, a new manufacturer. Preparations have been initiated for static blade test of M/s. Winwind. The unit constantly tries to maintain the quality management system and NABL Accreditation. The surveillance audits as per the requirements of ISO 9001:2000 by DNV and ISO/IEC 17025 : 2005 by NABL, New Delhi have been completed successfully. The unit is also in the process of audit by MEASNET (International network for Recognized and Harmonized measurements in wind energy) by constantly upgrading the measurement techniques in the area of power performance measurement on wind turbines.

Standards and Certification (S&C) Unit

The Standards and Certification unit has actively completed the project on closure

of outstanding issues of Provisional Type Certificate of Pawan Shakthi 600kW wind turbine model and renewed certificates of two wind turbine models of M/s.RRB Energy Limited and one wind turbine model of M/s.Southern Wind Farms Limited. Further a Category-I Certification for Elecon 600 kW, a Category-II Certification for Suzlon 1250 kW and three Category-III Certifications for Kenersys 2000 kW, India Wind Power 250 kW and Chettinad Energy 600 kW are in progress. The unit also constantly gives a feedback based on its experience in design evaluation and the discussions under ET 42 of BIS and suggestions are duly considered for implementation by TC88 of IEC. Certification services also follow ISO 9001 : 2000.

Information, Training and Commercial Services (ITCS) Unit

The sixth National Training Course has been completed, which was attended by 62 participants and was inaugurated by Shri. Mohan Verghese Chunkath, I.A.S., Chairman and Managing Director of Tamil Nadu Energy Development Agency (TEDA), Chennai. The course content highlighted various aspects of wind power development and related issues relevant to India.

The quarterly Newsletter "PAVAN" has

been kept up-to-date with 19 issues already published and circulated. The Bilingual website with all the downloadable e-copies is being maintained up-to-date. C-WET's ITCS unit prepared comprehensive display panels with objectives, activities and services of C-WET and were kept on display in the Exhibition arranged in the "Wind India - 2008", an International Conference and Exhibition organized by World Institute of Sustainable Energy (WISE), Pune during 25th and 26th November 2008.

C-WET has been awarded the "Special Institution Recognition Award" by the Wind India 2008, organized by WISE at Chennai.

International/In-house Interactions

Two Indo-Danish project proposals funded by MNRE and preparations for a meeting at MNRE on Indo - US programme on 'Renewable Energy' have been completed. In addition, it is planned to involve C-WET scientists along with industry and inter-unit interaction on selected in-house development projects. C-WET had occasion to meet experts and business groups from USA, Finland, Spain, Denmark, Germany, Bhutan and Arab Organization for Industrialization (AOI) during the period on their visit to our facilities.



A high level Bhutanese delegation in wind farm visit near Kanyakumari, Tamil Nadu along with C-WET officials

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

During the year 2008-2009 the unit has taken initiative to take up projects in a co-ordinated manner with multi-institutional support. For this purpose, the proposals were initiated through "Request for Proposals (RFP)" in the major thrust areas identified under R&D in Wind Energy. Some in-house projects were also undertaken aimed at evaluating and improving the performance of both large and small wind turbines.

Networking with R&D Institutions/Academia

In order to lay impetus on further growth of wind energy in the country, a brainstorming session on 'R&D needs of wind energy' was conducted under the leadership of Dr. Kota Harinarayana, Chairman, R&D Council of C-WET. It was felt that a strategic plan be formulated for R&D with serious efforts from industry, academia and R&D institutions, wherein C-WET would play a co-ordinating role. Subgroups consisting of experts in various fields related to wind energy were constituted to lend their expertise to nine identified thrust areas, namely Blade, Tower / Mast, Generators and Grid integration of wind turbines, Gearbox, Human Resource Development, Hybrid Systems, Research in Wind Resource Assessment and Condition Monitoring of wind turbines.

Proposals were solicited from industry and R&D / Academic Institutions for the above thrust areas. A total of 17 proposals received under the various sub-groups have been reviewed by the sub-group members for recommendation to the R&D Council. Blade and Tower sub-group meetings were held and fine tuning of proposals for final review is completed.

Testing of Small Wind Turbines/ Empanelment of Small Wind Turbines

The unit has undertaken type testing of 2 models of aerogenerators / SWTs namely 5 kW aerogenerator (SNT-50) manufactured by Supernova Technologies Pvt. Ltd., and 1 kW aerogenerator (Whisper 200) manufactured by UD Energy Pvt. Ltd., at the Wind Turbine Test Station, Kayathar. The testing and measurements in progress are power performance measurement, duration test and safety function



Whisper 200, 1 kW model under test

test in accordance with the requirements of IEC 61400-2. The unit will complete testing of two SWTs in this windy season and the lessons learnt will be incorporated in the future protocol.

The unit has formulated a procedure for empanelment of aerogenerators, for MNRE based on an evaluation of their performance. The scope for empanelment will cover safety philosophy, quality assurance and engineering integrity with specific requirement of the safety of SWTs. Based on the procedure finalized during the meeting with SWT manufacturers on 12.08.08, documents of 43 models of small wind turbines from nine manufacturers were reviewed. A need was felt to revise the procedure for empanelment owing to non-availability of test reports, minimum design documentation and the need to complete the empanelment of SWTs turbines within a minimum timeframe.

Measurement of Acoustic Emissions of 600 kW Wind Turbine

The R&D unit has carried out measurement of acoustic emissions of the 600 kW wind turbine



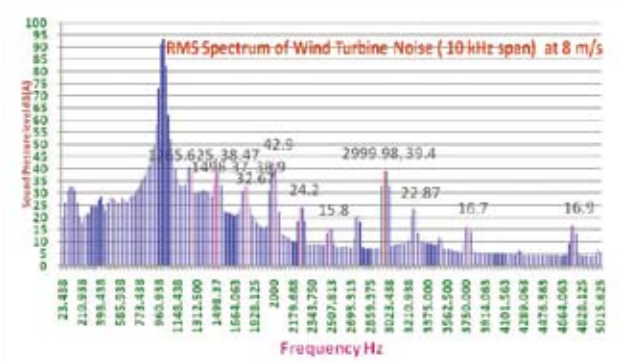
SNT- 50, 5 kW model under test



Test Site, WTTS, Kayathar

installed at Kayathar. The measurements were carried out as per the requirements of IEC 61400-11. The objective of noise impact assessment for a wind turbine is to ensure that the wind turbine is designed in such a way as to minimize any potential noise impact on the community, specifically at nearby residences. This is done by measuring the noise level from the wind turbine and ensuring that the level complies with the acceptable wind farm noise limits.

The scope of measurement was to determine apparent sound power level, third-octave band levels and tonality of sound emitted by the



Acoustic Measurements in progress

wind turbine under measurement for varying wind conditions.

The data analysis of the measurements was carried out. A paper on "Assessment of Acoustic Emissions of a Wind Turbine in India" was submitted and accepted for presentation at the 3rd International Conference on "Wind Turbine Noise 2009" to be held during 17th to 19th June 2009 at Aalborg, Denmark.

Database on Wind Power Generation

The need for establishment of a database on wind turbine performance has been expressed in various forums. Presently, activities related to wind power generation are spread across seven states viz., Andhra Pradesh, Karnataka, Tamil Nadu, Kerala, Rajasthan, West Bengal and Gujarat. The generation related data by State Electricity Boards (SEBs) are mostly in the paper form and reporting format also varies from area to area. In order to address the above issue, R&D unit in consultation with M/s. Telecommunication India Limited (TCIL), New Delhi has prepared a detailed project report for the process of establishing an efficient and reliable data collection system for the performance of the wind turbines in the state of Tamil Nadu, initially.

For the purpose, a web-based software solution on latest web framework will be developed related to the collection of generation data and dissemination of information from these data in the most efficient manner.

Study on Feasibility of Offshore Wind Farm

A working group consisting of expert members from National Institute of Ocean Technology (NIOT), Indian Institute of Technology Madras (IITM), Nuclear Power Corporation of India Limited (NPCIL), National Thermal Power Corporation (NTPC), Indian Oil Corporation Limited (IOCL) and C-WET was constituted to examine the feasibility of offshore wind farms in India. The Executive Director and technical team along with NTPC executives discussed with Tamil Nadu Maritime Board Chief and Southern Naval Command, for necessary clearances for offshore installation.

To begin with, a proposal was formulated by the unit in association with WRA unit, C-WET. The principal objective of this proposal is to take up wind resource assessment studies in the southern tip of India particularly at two locations viz. Koodankulam (Kanyakumari) and Rameshwaram (Dhanuskodi) and to examine the feasibility for setting up of offshore wind farm. The aim is to collect data set of wind speeds, wind direction and to gather sea temperature, sea current characteristics and waves data for environmental research, design and development of offshore wind farm and to assess potential impacts of these measured parameters on the wind farms etc. To achieve the said objective, as decided by the Offshore Working Group Committee, the representatives from C-WET, NTPC, IITM and IOCL visited Rameshwaram to identify possible locations for offshore wind resource assessment. With the assistance and direction of District Collector and Thasildar of Ramanathapuram, C-WET team could obtain the GPS co-ordinate and land survey details for the project plan.

Variable Speed Wind Turbine for R&D Experimental Wind Farm at WTTS, Kayathar

The unit has initiated the process of procurement of a variable speed wind turbine with capacity greater than 500 kW to add to its existing R&D Experimental wind farm facility.

Wind Resource Assessment

The unit has been implementing Nationwide Wind Resource Assessment programme sponsored by MNRE, 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, micro siting and evaluation of production estimates of the proposed wind farms. MNRE has 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 & sixty eight locations for periods ranging from one to five years since 1986.

As on 31st March 2009, forty eight stations are in operation in 14 states. During 2008-2009 a total number of 52 wind monitoring stations were commissioned. The over all status of the wind monitoring stations in the country is given in the table below :

Status of Wind Monitoring Stations

Sl. No	State	Number of Stations				
		Established till 31.3.09	Continued from 2007-08	Closed during 2008-09	Installed (new) during 2008-09	In operation as on 31.03.09
1.	Andaman & Nicobar Islands	14	2	-	-	2
2.	Andhra Pradesh	65	4	2	2	4
3.	Arunachal Pradesh	9	-	-	-	-
4.	Assam	9	1	-	1	2
5.	Bihar	3	-	-	3	3
6.	Chattisgarh	6	-	-	3	3
7.	Goa	1	-	-	-	-
8.	Gujarat	65	3	1	6	8
9.	Haryana	8	1	-	1	2
10.	Himachal Pradesh	10	1	-	-	1
11.	Jammu & Kashmir	11	2	-	2	4
12.	Jharkhand	4	-	-	2	2
13.	Karnataka	55	14	4	5	15
14.	Kerala	27	2	-	-	2
15.	Lakshadweep	10	-	-	-	-
16.	Nagaland	1	-	-	1	1
17.	Madhya Pradesh	37	6	3	2	5
18.	Maharashtra	101	4	-	10	14
19.	Manipur	5	1	1	-	-
20.	Mizoram	5	-	-	-	-
21.	Orissa	10	-	-	-	-
22.	Pondicherry	4	-	-	-	-
23.	Punjab	13	-	-	2	2

Sl. No	State	Number of Stations				
		Established till 31.3.09	Continued from 2007-08	Closed during 2008-09	Installed (new) during 2008-09	In operation as on 31.03.09
24.	Rajasthan	38	-	-	1	1
25.	Tamil Nadu	71	3	1	7	9
26.	Tripura	5	-	-	2	2
27.	Uttarakhand	11	-	-	-	-
28.	Uttar Pradesh	9	4	1	2	5
29.	West Bengal	10	-	-	-	-
30.	Sikkim	3	-	-	-	-
	Total	620	48	13	52	87

Of the cumulative total of 620 stations established till 31.03.2009, 216 stations have been found to have Wind Power Density (WPD) in excess of 200 W/m² at 50 m agl. Summary of these 216 stations are given in the following table :

WPD Distribution at the 216 stations

WPD range [W/m ²]	No. of Stations
200 - 250	82
250 - 300	62
300 - 350	31
350 - 400	14
> 400	27

WRA in the uncovered region

State wise details of the wind monitoring stations commissioned during 2008-2009 in the country under various programmes are given in the table below.

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

State wise installations of Wind Monitoring Stations

Sl. No	Stations Established	State	District	Commissioned on
1.	Jaidevwadi	Maharashtra	Jalna	12.05.2008
2.	Kesapur		Hingoli	13.05.2008
3.	Umri		Nagpur	16.05.2008
4.	Bahaduri		Nasik	31.05.2008
5.	Lawada		Amaravathi	08.06.2008
6.	Bingara		Buldana	11.06.2008
7.	Khalkheda		Hingoli	08.06.2008
8.	Bahirwadi		Beed	15.06.2008
9.	Gubadi		Nagpur	06.06.2008
10.	Jagmin		Satara	20.11.2008
11.	Chinnapalasa	Andhra Pradesh	Adilabad	16.05.2008
12.	Simhadri		Vizag	12.11.2008
13.	Bori	Madhya Pradesh	Burhanpur	03.05.2008
14.	Sanai Dongri		Seoni	23.05.2008

Sl. No	Stations Established	State	District	Commissioned on
15.	Rajapur	Uttar Pradesh	Jhansi	07.05.2008
16.	Garaura		Robartsganj	07.02.2009
17.	Rajmergarh	Chattisgarh	Bilaspur	19.05.2008
18.	Bagbahar		Mahasamund	27.02.2009
19.	Ghatgaon		Raigarh	09.03.2009
20.	Salimpur	Haryana	Mahendragarh	09.05.2008
21.	Nava	Gujarat	Surendra Nagar	01.06.2008
22.	Chapriyali		Bhav Nagar	04.06.2008
23.	Vekaria		Junagadh	05.06.2008
24.	Nana Asota		Jamnagar	07.06.2008
25.	Lodhrani		Kutch	08.06.2008
26.	Lamba		Jamnagar	07.12.2008
27.	Batinda	Punjab	Batinda	17.06.2008
28.	Paharpur		Ropar	19.06.2008
29.	Bidda	Jammu & Kashmir	Reasi	22.06.2008
30.	Ijara		Baramulla	25.06.2008
31.	Madam	Tamilnadu	Dharmapuri	26.08.2008
32.	Karikadu		Nilgiris	29.08.2008
33.	Chinnashantipuram		Theni	01.09.2008
34.	M.S.Puram		Madurai	26.09.2008
35.	Kamagiri		Krishnagiri	27.09.2008
36.	Radhapuram		Tirunelveli	04.09.2008
37.	Jamna Marthur		Thiruvannamalai	24.10.2008
38.	Tadakal	Karnataka	Koppal	09.08.2008
39.	Kajibilagi		Bagalkot	11.08.2008
40.	Hulkotti		Gadag	14.10.2008
41.	Singanhalli		Dharwad	15.10.2008
42.	Karajaga		Belgam	16.10.2008
43.	Tuli	Nagaland	Mokokchung	22.08.2008
44.	Panchgram	Assam	Hailakandi	28.08.2008
45.	Kalachera	Tripura	S. Tripura	01.09.2008
46.	Barjola		W. Tripura	30.03.2009
47.	Akal	Rajasthan	Jaisalmer	27.12.2008
48.	Shakhuwapani	Jharkhand	Gumla	20.02.2009
49.	Metrameta		Simdega	22.02.2009
50.	Simultala	Bihar	Jamui	12.02.2009
51.	Lalganj		Vaishali	14.02.2009
52.	Adhaura		Kaimur	16.02.2009

Consultancy Projects

In addition to the wind monitoring projects funded by MNRE, the unit has value added services through 47 consultancy projects during the year 2008-2009. These short-term projects were to provide micro siting services and preparation of due diligence reports. Under

the direction from the Ministry, independent verification of procedure of wind monitoring 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:

Consultancy Projects taken up during 2008 - 2009

Sl. No.	Name of the Project	Name of the Client	Remarks
1.	Consultancy services for Evaluation of power curve demonstration for their 17.6 MW wind farm projects	M/s. Chennai Petroleum Corporation Limited, Chennai	Completed
2.	Verification of Procedure of wind monitoring at Manavale in Kolhapur District, Maharashtra	M/s. Sanchay Properties Pvt. Ltd., Mumbai	Completed
3.	Micro siting and Annual Generation Estimation of Bagalkot Wind Farm, Bagalkot District, Karnataka	M/s. NSL Power Limited, Hyderabad	Completed
4.	Proposed 10 MW wind farming projects	M/s. Indian Railways, Integral Coach Factory (ICF), Chennai	Completed
5.	Energy estimation at Wind Mast location at DS Halli & Kyadigere sites in Karnataka	M/s. Bhoruka Power Corporation Ltd, Bangalore	Completed
6.	Consultancy services (due diligence) for the 35 MW wind farm projects in Maharashtra	M/s. Tata Power Company Ltd, Mumbai	Completed
7.	Site Validation & Generation Estimate for the proposed Winds farms, Satara District, Maharashtra	M/s. RS India Wind Energy Pvt. Ltd, New Delhi	Completed
8.	Verification of Procedure of wind monitoring at Brahmahsagara, Chitradurga District, Karnataka	M/s. Vestas Wind Technology India Pvt. Limited, Chennai	Completed
9.	Verification of Procedure of wind monitoring at Anaburu, Chitradurga District, Karnataka	M/s. Accion Wind Energy Pvt. Ltd, Bangalore	Completed
10.	Wind Monitoring at Radhapuram Village near Veppilangulam	M/s. Surana Industries Limited, Chennai	Ongoing
11.	Verification of procedure of wind monitoring at Vedganga, Kolhapur District, Maharashtra	M/s. Enercon (India) Limited, Mumbai	Completed
12.	Verification of procedure of wind monitoring at Modurgudda, Hasan District, Karnataka	M/s. Sarjan Realities Limited, Pune	Completed
13.	Verification of procedure of wind monitoring at Jagaravalli, Hasan District, Karnataka	M/s. Sarjan Realities Limited, Pune	Completed
14.	Wind Resource Assessment study at Simhadri near Visakhapatnam	M/s. National Thermal Power Corporation Ltd, Visakhapatnam	Ongoing

Sl. No.	Name of the Project	Name of the Client	Remarks
15.	Site Assessment for wind Monitoring in Kadappa & Anantapur Districts, Andhra Pradesh	M/s. Advaita Wind Energy Ventures (P) Ltd, Hyderabad	Completed
16.	Verification of Procedure of wind monitoring at Soda Bandhan, Jaisalmer District, Rajasthan	M/s. Suzlon Energy Limited, Pune	Ongoing
17.	Verification of Procedure of wind monitoring at Gangadevi, Beed District, Maharashtra	M/s. Vestas Wind Technology India Private Limited, Chennai	Completed
18.	Verification of procedure of wind monitoring at Pohra site, Rajasthan	M/s. RRB Energy Limited, Chennai	Completed
19.	Verification of procedure of wind monitoring at Sadawaghapur, Satara District, Maharashtra	M/s. Suzlon Energy Ltd. Pune	Completed
20.	Verification of procedure of wind monitoring at Sadawaghapur Forest, Satara District, Maharashtra	M/s. Suzlon Energy Ltd, Pune	Completed
21.	Verification of procedure of wind monitoring at Nallakonda, Anathpur District, Andhra Pradesh	M/s. Enercon India Limited, Mumbai	Completed
22.	Verification of procedure of wind monitoring at Kondamedapalli, Kurnool District, Andhra Pradesh	M/s. Enercon India Limited, Mumbai	Completed
23.	Verification of procedure of wind monitoring at Akal site, Rajasthan	M/s. RRB Energy Ltd, Chennai	Completed
24.	Site Assessment for wind monitoring in Karnataka & Andhra Pradesh	M/s. Advaita Wind Energy Ventures (P) Ltd, Hyderabad	Completed
25.	Verification of procedure of wind monitoring at Mokul, Jaisalmer District, Rajasthan	M/s. Suzlon Energy Ltd, Pune	Completed
26.	Verification of procedure of wind monitoring at Maliya, Rajkot District, Gujarat	M/s. Suzlon Energy Ltd, Pune	Completed
27.	Verification of procedure of wind monitoring at Gude Panchgani-II, Sangli District, Maharashtra	M/s. Suzlon Energy Ltd, Pune	Completed
28.	Verification of procedure of wind monitoring at Vavaniya, Rajkot District, Gujarat	M/s. Suzlon Energy Ltd, Pune	Completed
29.	Verification of procedure of wind monitoring at Chakla, Nandurbar District, Maharashtra	M/s. Suzlon Energy Ltd, Pune	Completed
30.	Study Report on Wind Data Measured at three sites	M/s. Sarjan Realities Limited, Pune	Ongoing
31.	Production Estimate of 50 MW wind farm project at Wandhia, Gujarat	M/s. Vestas Wind Technology India Private Limited, Chennai	Completed

Sl. No.	Name of the Project	Name of the Client	Remarks
32.	Verification of procedure of wind monitoring at Wandhia, Bhuj District, Gujarat	M/s.Vestas Wind Technology India Pvt. Limited, Chennai	Completed
33.	Verification of Procedure of wind monitoring at Tuppadahalli, Shimoga District, Karnataka	M/s. Vestas Wind Technology India Private Limited, Chennai	Completed
34.	Micrositing for wind farming of the proposed wind farm project at Chikkodi site, Belgaum District	M/s. Mysore Mercantile Co. Ltd, Bangalore	Ongoing
35.	Site Assessment for wind monitoring	M/s. Belum Wind Infrastructure Pvt. Ltd, Hyderabad	Ongoing
36.	Providing consultancy services for estimating energy from (50 x 600kW) wind farm at Surajbari and (11 x 600kW) wind farm at Harihar	M/s. MSPL Limited, Hospet	Ongoing
37.	Site Assessment for wind monitoring	M/s. Rayalaseema Wind Energy Company Pvt. Ltd, Hyderabad	Ongoing
38.	Verification of procedure of wind monitoring at Jaibhim, Nandurbar District, Maharashtra	M/s. Suzlon Energy Ltd, Pune	Completed
39.	Verification of procedure of wind monitoring at Jambhore, Nandurbar District, Maharashtra	M/s. Suzlon Energy Ltd, Pune	Completed
40.	Verification of procedure of wind monitoring at Nivali, Barwani District, Madhya Pradesh	M/s. Suzlon Energy Ltd, Pune	Ongoing
41.	Verification of procedure of wind monitoring at Golbawadi, Barwani District, Madhya Pradesh	M/s. Suzlon Energy Ltd, Pune	Ongoing
42.	Production estimate of (5 x 1500 kW) wind farm at Kappatagudda & (3 x 1500 kW) wind farm at Elkurahalli	M/s. Suzlon Energy Ltd, Pune	Completed
43.	Verification of Procedure of wind monitoring at Sripalvan, Satara District, Maharashtra	M/s. Vestas Wind Technology India Private Limited, Chennai	Completed
44.	Site validation and Verification of 98MW Wind Farm Project at Vilaspur, Maharashtra	M/s. Tata Power Company Limited, Mumbai	Ongoing
45.	Verification of procedure of wind monitoring at Kudre Konda, Shimoga District, Karnataka	M/s. Suzlon Energy Ltd, Pune	Ongoing
46.	Consultancy services (due diligence) for the proposed 50.4 MW wind farm project at Chavaneshwar, Satara District, Maharashtra	M/s. Enercon (India) Limited, Mumbai	Ongoing
47.	Consultancy services (due diligence) for the proposed 50.4 MW wind farm project at Gadag, Karnataka	M/s. Enercon (India) Limited, Mumbai	Ongoing

Indian Wind Atlas Project

MNRE has sanctioned a project for Preparation of Indian Wind Atlas to C-WET, Chennai in association with RISO National Laboratory, Denmark in November 2006. The project involves extensive use of micro and meso scale models like WAsP and KAMM in conjunction with simulations using super computers.

Meso-scale modeling by using KAMM has been completed by RISO National Laboratory, Denmark. The meso-scale model generates a generalized wind climate for large domain sizes about 600 km x 600 km with a resolution of 5 km. Micro-scale modeling has been done by C-WET using WAsP and real time wind measurements and topographical features as inputs. The domain size will be of 20 km x 20 km with 1 km resolution. The results of the micro-scale model for various domains have been used for fine-tuning the meso - scale model developed by RISO for India to produce the Wind Atlas of the country.

Wind Atlas Team at Denmark

The major project components are training, modeling, and validation and Indian Wind Atlas preparation. Two levels of meso - micro scale simulations have been completed with converging errors. Validation of the results is in an advanced stage of completion. The Wind Atlas of the country is expected to be released by the end of 2009.



Wind Atlas Team at Denmark



120 m mast installed at Jagmin, Maharashtra

Installation of 120m tall masts

The hub height of horizontal axis wind turbines (HAWT) has been steadily on the increase with the technology advancement for regimes of moderate wind fields prevalent in India.

In order to measure the wind shear at some of the major wind farm locations and to serve as long-term reference stations, a project was sanctioned by the Ministry to commission five numbers of 120m tall masts in five states viz., Tamil Nadu, Karnataka, Maharashtra, Gujarat and Rajasthan, of which three stations were commissioned one each in Maharashtra (Jagmin, Satara District), Gujarat (Lamba, Jamnagar District) and Rajasthan (Akal, Jaisalmer District). Anemometers are located at 5 levels and wind vanes at 3 levels. Apart from these, sensors for measuring temperature, pressure and solar radiation are also mounted. The stations are also equipped with remote data downloading facility.

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 RISO National Laboratory, Denmark under DANIDA grant and with the partial financial assistance and guidance of MNRE. This Test Station has two test beds to test wind turbines up to 1250 kW capacity and 400 kW capacity and the capacity is expandable.

Sensors and transducers as per the requirement of IEC standards are maintained in the workshop and Quality Management System procedures are enforced as per the requirements of ISO 9001:2000 and ISO / IEC 17025 : 2005

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

Testing Programmes

The following testing projects have been completed during the year 2008-2009.

- The measurements and the reporting for RRB 600 kW wind turbine of RRB Energy Ltd., at Valayapalayam, Tamil Nadu.
- The re-instrumentation, measurements and reporting for type testing of Siva 250 kW wind turbine at WTTS Kayathar and IWPL 250 kW wind turbine at Navadra, Gujarat.
- Rotor Instrumentation for M/s. Leitner Shriram Manufacturing Ltd., Model LTW77, 1.35 MW wind turbine at Oothumalai, Tamil Nadu.
- The Instrumentation of Chettinadu 600 kW wind turbine of M/s. Chettinadu Energy Ltd., at Thirumangalakurchi, Tamil Nadu.

- The measurements and reporting of CWEL 250 kW wind turbine of M/s. Chiranjeevi Wind Energy Ltd., at Chithambalam, Coimbatore District, Tamil Nadu.
- An agreement has been signed between C-WET and M/s. Suzlon Energy Ltd., to test their new variant of 1250 kW wind turbine in Mettubavi near Coimbatore.
- An agreement has been signed between C-WET and M/s. Kenersys India Pvt. Ltd., to test their 2000 kW wind turbine at WTTS, Kayathar.
- Rotor blade strain gauge installation work carried out for M/s. Leitner Shriram Manufacturing Ltd., 1350 kW wind turbine at Chitradurga site.
- Preparations have been started for static blade tests for M/s. WinWind Power Energy Pvt Ltd.

Quality Management System and NABL Accreditation

Re-certification by DNV as per the requirements of ISO 9001:2000 of the testing unit was completed successfully, with validity up to August 2010.

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



Winwind 1000kW Agreement Signing for Power Curve measurements

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

New Initiatives

The unit has developed an analysis code for load measurements as per the requirements of IEC TS 61400-13.



Strain gaging of Winwind 1000kW blade for static blade testing

The unit has initiated the upgradation of testing and data acquisition equipment from wired technology to a wireless one.

Innovation / New facilities / New infrastructure

The unit has purchased one set of Data Acquisition equipment based on wireless technology. The equipment was deployed for continuous measurements during the November - December 2008 on Suzlon 600 kW wind turbine at WTTS, Kayathar for evaluating its performance.

The unit has proposed to install a highend server at C-WET and establish a network using MPLS (Multi Protocol Label Switching) to pick up data from remote testing sites in India.

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 in line with International Standards (IEC), while taking into account of the Indian

conditions. TAPS - 2000 (amended) has been approved and issued by MNRE. The unit is implementing TAPS-2000 (amended) for 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.

Provisional Type Certification

Provisional Type Certification - Project Completed (2008 - 2009)

S.No.	Manufacturer's Name	Wind Turbine Model/Capacity	Status
1.	RRB Energy Limited	Pawan Shakthi-600 kW (Outstanding issues closure)	Completed

Provisional Type Certificates - Renewed (2008-2009)

S.No.	Manufacturer's Name	Wind Turbine Model/Capacity	Validity
1.	RRB Energy Limited	Pawan Shakthi- 600 kW	04.07.2009
2.	RRB Energy Limited	V39 / 500 kW with 47m Rotor	20.04.2009
3.	Southern Wind Farms Limited	GWL 225 / 225 kW	27.02.2010

Provisional Type Certification – Ongoing Projects (2008-2009)

Category I

S.No.	Manufacturer's Name	Wind Turbine Model/Capacity	Status
1.	Elecon Engineering Company Limited	T600-48 / 600 kW	On going

Category II

S.No.	Manufacturer's Name	Wind Turbine Model/Capacity	Validity
1.	Suzlon Energy Limited	Suzlon S66 – 1250 kW	On going

Category III

S.No.	Manufacturer's Name	Wind Turbine Model/Capacity	Validity
1.	M/s. Kenersys India Private Limited	K82 / 2000 kW	On going
2.	M/s. India Wind Power Limited	I-29 / 250 kW	On going
3.	M/s. Chettinad Energy Private Limited	Chettinad 600 / 600 kW	On going



Certification Agreement signing between M/s. Kenersys India Private Limited & C-WET

Standards

The S&C 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). The S&C unit is also providing its suggestions / recommendations in formulation of IEC standards. CWET's suggestions are duly considered by TC- 88 of IEC and discussed in ET42 of BIS.

Quality Management System – ISO 9001 : 2000

Certification services of C-WET have already been certified for Quality as per ISO 9001:2000 by DNV. The periodic audit was successfully

completed by DNV team and recommended the continuation of certificate, extending the validity up to August 2010.

Revised List of Models and Manufacturers of Wind Electric Generators / Wind Turbine Equipments (RLMM)

In addition to certification, as per the directives of MNRE, S&C unit issues Revised List of Models and Manufacturers of wind turbines (RLMM) periodically. The term of the RLMM committee has been extended by MNRE with revised terms of reference. RLMM lists have been prepared and updated quarterly.

Information, Training and Commercial Services

The Information, Training and Commercial Services (ITCS) unit has executed the following activities during the year 2008–2009.

National Training Course

The Sixth National Training Course on “Wind Farm Development and Related Issues” had been successfully conducted during 25th & 26th September 2008 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 62 participants from academic institutes, industry, State Nodal

Agencies, developers and consultants from various parts of the country.

The training course was inaugurated by Shri. Mohan Verghese Chunkath, I.A.S., Chairman and Managing Director, Tamil Nadu Energy Development Agency (TEDA), Chennai.

The course content for the training was based on a carefully thought out syllabus with specific subject experts giving the lectures. The training course addressed the following aspects:

- Wind resources assessment
- Design and layout of wind farms
- Wind turbine technology
- Grid integration of wind turbines
- Certification of wind turbines
- Testing of wind turbines
- O & M aspects of wind farms



The Chief Guest lighting lamp and declaring the course open



Course participants in C-WET campus

Newsletter

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

In this succession, nineteen issues of PAVAN have already been published and circulated.



The Nineteenth issue of Newsletter PAVAN

C-WET Library

With the objective of establishing and updating the data bank and serve as information Centre for selective dissemination, a well-resourced Library has been established with relevant books, periodicals (Journals & Magazines) and reference materials along with the requisite infrastructure to facilitate the scientific community. Every effort is being made to strengthen the Library by adding literature related to wind energy in particular and renewable energy in general along with its allied subjects.

Currently, the library has a collection of about 2000 books including standards, technical reports and proceedings and about 42 periodicals. The Library has been computerized by using Library Automation Software "AutoLib" for easy and faster retrieval to offer the services effectively.



Snap of Library, Prof. Anna Mani Information Centre

C-WET Bilingual Website

ITCS unit has been maintaining a well browsed bilingual website to create awareness and disseminate information about C-WET activities & services in the wind energy sector. The website is being updated regularly with new information which can be accessed at www.cwet.tn.nic.in



Home page of C-WET website

Exhibition

ITCS unit has prepared panels explaining the objectives, activities and services of C-WET and made a display stall in "Wind India - 2008", an International Conference and Exhibition organized by World Institute of Sustainable Energy, Pune during 25th & 26th November 2008 at Chennai Trade Centre, Chennai. A number of participants visited the



Snap of C-WET stall

stall and obtained information about C-WET and its services. The technical explanation at the stall was well appreciated.

IT and Networking Facilities

The unit is continuously providing services and support through Internet, Intranet, official E-mail and its E-Security facilities enable faster and safe communication enabling the research, project, information dissemination and day-to-day activities in a better manner. The management and troubleshooting of these facilities are being looked after by this unit.

Visit to C-WET Facilities

- 25 students studying Mechanical Engineering at the Vellore Institute of Technology, Vellore visited C-WET on 05.08.2008 and learnt about wind turbine technology as a part of their coursework.
- 55 students studying Physics from SriMeenakshi Women College visited C-WET on 21.08.2008 as a part of their 'Environmental Science project regarding Non-Conventional Energy Sources'.



Students gaining exposure to technology

Display Facilities

The unit is planning to setup a display facility explaining C-WET activities and wind turbine technologies in the Display Hall, which would provide complete information at a single destination to the general public / students and information seekers visiting the campus.

Special Institution Recognition Award

C-WET has been awarded the “Special Institution Recognition Award” by the Wind India – 2008, An International Conference and Exhibition held at Chennai Trade Centre, Chennai organized by

World Institute for Sustainable Energy (WISE), Pune. The Awards Ceremony was held on 25th November 2008 at Chennai Trade Centre, Chennai.



The Executive Director and C-WET officials receiving the award



Award certificate

Publications

- B.L. Mathur and Rajesh Katyal, Digital Simulation of Standalone Wind Energy System using SIMULINK, International conference POWERCOIN 2008, Sona college of technology, Salem, India.
- B.L. Mathur and Rajesh Katyal, Implementation of Standalone Wind Energy System using Microcontroller, Journal of Electrical Engineering, University of "POLITEHNICA", Romania (publication awaited).
- B.L. Mathur and Rajesh Katyal, Standalone Wind Energy System using LC to LC, DC to DC Converter, International conference (ICEESPEEE 09), Department of Electrical & Electronics Engineering, SRM University, Chennai, India.
- Rajesh Katyal and Deepa Kurup, "Testing of Small Wind Turbines" PAVAN issue no.17, April – June 2008.
- Das, S.S., A.K. Patra, and D. Narayana Rao (2008), VHF radar echoes in the vicinity of tropopause during the passage of tropical cyclone: First observations from the Gadanki MST radar, J. Geophys. Res., 113, D09113, doi:10.1029 / 2007JD009014.
- Das, S.S., A.R. Jain, K.K. Kumar, and D. Narayana Rao (2008), Diurnal variability of the tropical tropopause: Significance of VHF Radar Measurements, Radio Sci., 43, RS6003, doi:10.1029 / 2008RS003824.
- S.A. Mathew, "Testing & Certification of Wind Turbine and Experiences in India" in Green Energy Journal issue vol. 4. nos. 5 & 6 September – October & November – December 2008.
- S. A. Mathew, A technological overview of wind energy development, InWind Chronicle, issue January - February 2009.
- E. Sreevalsan, Wind Monitoring Stations, Indian Wind Power Directory 2008, 8th edition, Consolidated Energy Consultant Ltd, Bhopal.
- E. Sreevalsan, Numerical Wind Atlas and Digital Mapping Indian, Green Energy, World Institute of Sustainable Energy, Pune, issue vol. 4 nos. 5 & 6 September – October & November – December 2008).

Invited Lectures delivered in Conferences and Seminars

Rajesh Katyal

- 'Towers and Foundation Concepts' in the Sixth National Training Course on 'Wind Farm Development and Related Issue' during 25th & 26th September 2008 at C-WET, Chennai.
- 'Wind Turbine Technology' at S.A. Raja Engineering College, Chennai
- 'Wind Energy Technology' in the National Seminar on Renewable Energy Scenario, on 6th February 2009 at Cape Renewable Energy Research Centre, Nagarcoil, Tamil Nadu.

K. Boopathi

- 'Wind Turbine Technology' in the Sixth National Training Course on "Wind Farm Development and Related Issues" during 25th & 26th September 2008 at C-WET, Chennai.
- 'Wind Turbine Technology and Latest Development' in the TNEB Workshop-cum-training Programme on "Means to Overcome Operational Difficulties in Evacuation of Wind Energy" during 2nd & 3rd December, 2008 at Tirunelveli.
- 'Wind Energy Technology' in the National Conference on "Power and Energy Systems

– NPES-09” during 6th & 7th March, 2009 at Kalasalingam University, Srivilliputtur, Tamil Nadu.

- ‘Wind Energy Technology and Recent Developments’ in the National Conference on “Non-conventional Energy Sources – NESCON-2009” at Gurunanak College on 12th March 2009.

Deepa Kurup

- ‘Grid Integration of Wind Turbines’ in the Sixth National Training Course on “Wind Farm Development and Related Issues” during 25th & 26th September 2008 at C-WET, Chennai.

Dr. E. Sreevalsan

- ‘Wind Resource Assessment Techniques’ in the Sixth National Training Course on “Wind Farm Development and Related Issues” during 25th & 26th September 2008 at C-WET, Chennai.
- “Wind power Development in the State of Kerala” on 15th January 2009 at Trivandrapuram for World Institute of Sustainable Energy, Pune.
- “How to fix up your correct wind mill site” on 19th December 2008 at Coimbatore for Indian Wind Power Association, Chennai.
- “Wind Resource Assessment in India” in the MNRE-IBSA working group meeting on Energy on 19th September 2008 at MNRE, New Delhi.
- “Wind Power in India” on 09.03.2009 at Shri. Andal Alagar College of Engineering, Mamandur, Tamilnadu.

Anvar Ali

- ‘Power Performance Measurements’ in the Sixth National Training Course on “Wind Farm Development and Related Issues” during 25th & 26th September 2008 at C-WET, Chennai.
- ‘Grid Integrated Wind Farm’ in the TNEB Workshop-cum-training Programme on “Means to Overcome Operational Difficulties in Evacuation of Wind Energy” during 02nd & 03rd December 2008 at Tirunelveli.

J.C. David Solomon

- ‘Overview of Testing & Mechanical Load Measurements’ in the Sixth National Training Course on “Wind Farm Development and Related Issues” during 25th & 26th September 2008 at C-WET, Chennai.

R. Kumaravel

- ‘Harnessing Wind Energy – HAVEN’ at the Hindustan University, Padur, Chennai on 17th March 2009.
- ‘Wind Turbine Testing’ in the training on “Wind Energy Technology” offered through Continuing Education Programme of IIT Bombay, Mumbai during 15th to 18th April 2008.

A. Senthil Kumar

- ‘Certification of Wind Turbines’ in the Sixth National Training Course on “Wind Farm Development and Related Issues” during 25th & 26th September 2008 at C-WET, Chennai.
- ‘Type Certification of Wind Turbines in India’ in the “WIND INDIA – 2008” an International Conference and Exhibition during 25th & 26th November 2008 held at Chennai Trade Centre, Chennai.
- ‘Type Testing & Certification of Wind Turbines’ in the ‘MNRE – IBSA working group meeting on Energy’ at MNRE, New Delhi.

V. R. Gireesh Kumar

- ‘Aerodynamics and Design of Wind Turbine’ in the Sixth National Training Course on “Wind Farm Development and Related Issues” during 25th & 26th September 2008 at C-WET, Chennai.

Visits Abroad

- Dr. E. Sreevalsan and Dr. Siddarth Shankar Das visited Denmark from 6th to 13th December 2008 in connection with the “Preparation of Indian Wind Atlas Project”.



C-WET Official at Asia-Pacific Wind Energy Forum

- Shri. Rajesh Katyal, Unit Chief, R & D, was deputed to attend the Foundation Workshop on "Asia Pacific Wind Energy Forum" on 20th – 21st November 2008 at Seoul, South Korea, organized by Korean Wind Energy Development Organization. The objective of the meeting was to strengthen the links of collaboration and exchange of know-how information among the regional Asia-Pacific countries. He gave a presentation sharing the valuable experience on "Indian policy on Wind Energy disseminations and industrial status".

Seminars / Conferences / Training Programmes attended

- Rajesh Katyal and K. Boopathi, "Sixth Structural Engineering Convention – SEC 2008" during 18th to 20th December 2008 at Structural Engineering Research Centre (SERC), Chennai.
- Rajesh Katyal and K. Boopathi, "Advanced course on Computational Structural Mechanics" during 21st to 23rd January 2009 at SERC, Chennai
- Deepa Kurup, IEEE conference on "Large scale integration of wind turbines to the grid" during February 2009
- S.A. Mathew, M. Anvar Ali, R. Kumaravel, J.C. David Solomon and Project Assistants, 'Usage of Load measurement software' by RISO, Denmark. The Training was imparted by Mr. Uwe Schmidt Paulsen, Senior Scientist and Mr. Allan Vesth of RISO, Denmark.
- R. Kumaravel & Project Assistant, "Power Quality and Harmonics" on 13th August 2008 conducted by Copper promotion council at Hotel GRT Grant, Chennai.
- J. C. David Solomon, "Sixth Structural Engineering Convention – SEC 2008" during 18th to 20th December 2008 at Structural Engineering Research Centre (SERC), Chennai.

- R. Kumaravel, 'Fatigue studies' during 21st to 23rd January 2009 conducted by SERC, Chennai.
- J.C. David Solomon, 'Advanced course on Fatigue and fracture behavior of materials, components and structures (ACFF' 09)' during 11th to 13th February 2009 organized by SERC, Chennai.
- S.A. Mathew, M. Anvar Ali, R. Kumaravel, J.C. David Solomon and Project Assistants, 'SCADA' on 5th February 2009 conducted by Genisys Smart Automation Pvt. Ltd., Chennai at C-WET, Chennai.
- S.A. Mathew, two day workshop on 'Large Scale Integration of Wind Energy into the Grid' during 20th & 21st February 2009 organized by IEEE Power and Energy Society, Bangalore.
- Testing unit Project Assistants, 'NI Wi-Fi Data Acquisition' on 12th August 2008 at Hotel GRT Grant, Chennai, and 'Training in Labview basics' on 10th September 2008 at Hotel Savera, Chennai and also participated in 'Automation Test Summit 2008' on 23rd September 2008 at Hotel Residency Tower conducted by National Instruments.
- A. Senthil Kumar, 'WIND INDIA – 2008' an International Conference and Exhibition during 25th & 26th November 2008 held at Chennai Trade Centre, Chennai.
- A. Senthil Kumar, 'Second Wind Turbine Sectional Committee (ET42) Meeting' held in BIS, New Delhi.
- A. Senthil Kumar, '9th Meeting of Non-Conventional Energy Sources Sectional Committee MED 04' held at BIS, New Delhi.
- P. Kanagavel, "Implementation of the Right to Information Act 2005 and its procedures' during 28th to 31st August 2008 at Mysore.
- P. Kanagavel, 'Second Advanced training programme on Cyber Laws Information and Security for Scientists' during 13th to 19th October 2008 organized by Indian Institute of Public Administration at New Delhi.
- P. Kanagavel, 'Energy Day 2009' on 21st March 2009 organized by the Department of Energy Science & Environment at IIT Bombay, Mumbai.
- G. Rajan, '5 days training programme on Web Design' conducted by Ministry of Labour & Employment during 02nd to 8th June 2008 at Hyderabad.
- R. Girirajan, 'One Day Workshop on Service Tax' on 20.09.2008 organized by Management Study Centre, Chennai
- G. Rajan, 'Second Annual conference on Renewable Energy in India' during 5th & 6th February, 2009 at New Delhi organized by Power Line, New Delhi.

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):

Shri. Deepak Gupta, Secretary, MNRE, New Delhi	Chairman
Dr. V. Siddhartha, Ministry of External Affairs (Formerly Outstanding Scientist, DRDO, Ministry of Defense), New Delhi	Member
Shri. R. C. Mishra, Financial Adviser, MNRE, New Delhi	Member
Shri. V. S. Verma, Member Planning, CEA, New Delhi	Member
Secretary to the government, Energy Department, Govt. of Tamil Nadu, Secretariat, Chennai	Member
Dr. A. R. Upadhyay, Director, National Aerospace Laboratories, Bangalore	Member
Shri. K. P. Sukumaran, Advisor, Wind Energy Group, MNRE, New Delhi	Member
Shri. Debasish Majumdar, Chairman and Managing Director, IREDA, New Delhi	Member
Dr. Kota Hari Narayana, Raja Ramanna Fellow, National Aerospace Laboratories, Bangalore	Member
Shri. D. V. Giri, Chairman, IWTMA, Chennai	Member
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):

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

Finance Committee

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

Shri. R.C. Mishra, Financial Adviser, MNRE, New Delhi	Chairman
Shri. P.W.C. Davidar, I.A.S., Special Commissioner & Secretary to Govt., Energy Department, Tamil Nadu Government	Member
Shri. K. P. Sukumaran, Adviser, Wind Energy Group, MNRE, New Delhi.	Member
Mr. G. Upadhyay, Director (WE), MNRE, New Delhi	Member
Mr. A. K. Kaushik, Director (Finance), MNRE, New Delhi	Member
Dr. S. Gomathinayagam, Executive Director, C-WET, Chennai	Member
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):

Dr. Kota Hari Narayana, Raja Ramanna Fellow, NAL, Bangalore	Chairman
Dr. G.B. Pant, Ex-Director, IITM, Pune	Member
Prof. Sujay Basu, Professor (Retd.), Jadavpur University, Calcutta	Member
Smt. K.A. Fathima, Senior Director & Head, Power Electronics Group, C-DAC (Formerly ER&DCI), Trivandrum	Member
Dr. A. Rama Mohan Rao, Scientist, SERC, Chennai	Member
Dr. Vidyadhar Mudkavi, Scientist, NAL, Bangalore	Member
Shri. J.P.L.N. Sastry, Ex. G.M. & Head, R&D, BHEL, and Ex. OSD of C-WET, Hyderabad	Member
Shri K.P. Sukumaran, Adviser, Wind Energy Group, MNRE, New Delhi	Member
Dr. S. Gomathinayagam, Executive Director, C-WET, Chennai	Member
Shri. Rajesh Katyal, Unit Chief, R&D Unit, C-WET, Chennai	Member Secretary

Revised List of Models and Manufactures (RLMM) Committee

The following are the members of the Revised List of Models and Manufacturers of Wind Electric Generators/ Wind Turbine Equipment Committee (RLMM)

Executive Director, C-WET, Chennai	Chairman
Adviser, Wind Energy Group, MNRE, New Delhi	Member
Chairman, IWTMA, Chennai	Member
Hon'y. Vice Chairman, IWPA, Chennai	Member
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):

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

Staff Promotion

Name	Previous Cadre	Promoted Cadre	Date of Promotion
Rajesh Katyal	Scientist – D	Scientist – E	01.01.2009
K. Boopathi	Scientist – B	Scientist – C	01.01.2009
P. Kanagavel	Scientist – B	Scientist – C	01.01.2009
B. Muthulakshmi	Stenographer	Sr. Stenographer	13.10.2007
M.R. Gunasekaran	Stenographer	Sr. Stenographer	13.04.2008

New Recruitment

Name	Designation	Date of Joining
Dr. S. Gomathinayagam	Executive Director	22.01.2009
Mohamed Hussain	Scientist – D	11.08.2008
R. Sasikumar	Scientist – B	27.03.2009
N. Rajkumar	Scientist – B	30.03.2009
R. Vinod Kumar	Technician	24.03.2009
R. Naveen Muthu	Technician	24.03.2009

Hindi Teaching Scheme

- M. R. Gunasekaran, Senior Stenographer, ITCS attended and passed the “Pragya” Hindi Examination.
- A. Senthil Kumar, Unit Chief Incharge, S&C attended and passed “Praveen and Pragya” Hindi Examinations.
- B. Muthulakshmi, Senior Stenographer, ED’s Office attended and passed “Praveen and Pragya” Hindi Examinations.
- M. R. Gunasekaran, Senior Stenographer, ITCS attended and passed the “Hindi Typewriting” Examination

Farewell

- Shri. V. R. Gireesh Kumar, Scientist ‘C’ resigned his duty from C-WET and he was given a warm farewell on 11.12.2008. His work tenure spanned from 15.04.2002 to 11.12.2008.

National Day Celebrations

- The Independence Day and the Republic Day were celebrated with much 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.



Republic Day - 26th January 2009



Independence Day – 15th August 2008

Vigilance Awareness Week

- Vigilance Awareness Week for the year 2008 was observed in C-WET from 03.11.2008 to 07.11.2008. All 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 and the Committee conducted its meetings on 31.03.2009. No complaints were received during the year 2008-2009.

Important Visitors

- A team of Korean delegates visited C-WET on 09.06.2008.
- Shri. Deepak Gupta, I.A.S., Secretary, MNRE visited C-WET on 16.10.2008.
- Shri. Maley Mishra, I.F.S., Joint Secretary, Ministry of External Affairs visited C-WET on 09.01.2009.
- Ambassador of Chile visited C-WET on 13.01.2009 to view the Centre's capabilities. The Ambassador was considering the feasibility of enlisting C-WET amongst the President of Chile's 'National Energy Programme'.
- Spanish energy supply chain with 15 members visited C-WET on 06.03.2009.
- MITA Technik, Chief visited C-WET and had discussions about future prospects and collaborative works.
- A multi-disciplinary team from Spain with scientists of CENER visited C-WET and presented their activities and also had discussions for future collaborative works.

Human Resource (as on March 2009)

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
R. Sasikumar	Scientist
K. Boopathi	Scientist
G. Arivukkodi	Junior Engineer
R. Vinod Kumar	Technician
K.A.Haji Abdul Ibrahim	Attendant

Wind Turbine Testing

S.A. Mathew	Scientist & Unit Chief i/c
A. Mohamed Hussain	Scientist
M. Anvar Ali	Scientist
R. Kumaravel	Scientist
M. Karuppuchamy	Junior Engineer
A.R. Hasan Ali	Junior Engineer
Y. Packiyaraj	Junior Engineer

Standards and Certification

A. Senthil Kumar	Scientist & Unit Chief i/c
N. Rajkumar	Scientist
S. Arulselvan	Junior Engineer

Information, Training and Commercial Services

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

Administration

D. Lakshmanan	General Manager (F&A)
G. Rajan	Administration-cum Accounts Officer
R. Girirajan	Assistant
K. Tamilselvi	Assistant
B. Muthulakshmi	Sr. Stenographer
M. Malaravan	Driver
M. Selvakumar	Attendant

C-WET officials on external Committees / Membership of Associations / Bodies

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
- Anna University, Chennai
External Examiner of UGC-JRF-PhD program for MIT
- Tamil Nadu Scientists Award (TANSA-2008) for Engineering and Technology.
Member, Expert Advisory Committee
- Institute of Energy Studies - Anna University, Chennai.
Executive Committee Member

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
- Evaluation RFQ & RFP Bid Committee (Wind Farms in Kerala)
Committee Member
- Tender Evaluation Committee (Technical) of NTPC, BPCL and SAIL
Member

A. Senthil Kumar

- Wind Turbines Sectional Committee, ET 42 of BIS
Member

V. R. Gireesh Kumar

- Institution of Engineers (India)
Associated Member
- Indian Institute of Metals
Associated Member

P. Kanagavel

- Society for the Advancement of Library and Information Science (SALIS)
Member.

R. Kumaravel

- Institution of Engineers (India)
Associate Member.

Auditor's Report

The Executive Director

C-WET

Chennai-600100

Auditor's Report to the members of the governing body of Centre for Wind Energy Technology, Chennai-600 100.

We have audited the attached Balance sheet of Centre For Wind Energy Technology (C-WET), Velachery - Tambaram Main Road, Pallikaranai, Chennai – 600 100 as at March 31, 2009 and also the Income and Expenditure Account for the year ended on that date annexed thereto. These financial statements are the responsibility of the management of Centre for Wind Energy Technology (C-WET). Our responsibility is to express an opinion on these financial statements based on our audit.

We conducted our audit in accordance with auditing standards generally accepted in India. Those Standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatements. An audit includes examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements. An audit also includes assessing the accounting principles used and significant estimates made by management as well as evaluating the overall financial statements presentation. We believe that our audit provides reasonable basis for our opinion.

We report that:

- a) We have obtained all the information and explanations, which to the best of our knowledge and belief were necessary for the purpose of our audit.
- b) In our opinion proper books of accounts as required by law have been kept by Centre for Wind Energy Technology (C-WET) so far as it appears from our examination of those books.
- c) The Balance Sheet and Income and Expenditure Account dealt with by this report are in agreement with the books of account.
- d) The Balance Sheet and Income and Expenditure Account dealt with by this report are prepared in accordance with the applicable Accounting Standards issued by the Institute of Chartered Accounts of India.
- e) In our opinion and to the best of our information and according to the explanations given to us, the said accounts together with schedules, accounting policies and notes there-on give a true and fair view in conformity with the accounting principles generally accepted in India.
 - i) In the case of the Balance Sheet, of the state of affairs of the Centre for Wind Energy Technology (C-WET) as at March 31, 2009; and
 - ii) In the case of the Income and Expenditure Account, of the excess of income over expenditure for the year ended on that date.

Date :

Place : Chennai

For V. SOUNDARARAJAN & Co.,
Chartered Accountants

Sd/-
V.S. RAVIKUMAR
Partner
(Membership No.18030)

CENTRE FOR WIND ENERGY TECHNOLOGY

(An Autonomous R & D Institution under MNRE, Government of India)

Chennai - 600 100

BALANCE SHEET AS AT 31st MARCH, 2009

		(Amount in Rs.)	
	Schedule	31 st March 2009	31 st March 2008
CAPITAL FUND AND LIABILITIES			
CAPITAL FUND	1	7,89,56,828	11,33,76,558
EARMARKED - PROJECTS	1A	4,58,81,486	2,49,81,378
RESERVES AND SURPLUS	2	13,57,13,513	9,56,99,981
CURRENT LIABILITIES AND PROVISIONS	3	8,10,38,455	7,09,70,531
TOTAL		34,15,90,282	30,50,28,448

ASSETS

FIXED ASSETS

(a) Created out of Central Governments Grants	4	7,13,45,402	11,78,15,595
(b) Created out of Own Resources - Projects Funds		4,22,404	5,33,943
CURRENT ASSETS, LOANS AND ADVANCES	5	26,98,22,476	18,66,78,910
TOTAL		34,15,90,282	30,50,28,448

SIGNIFICANT ACCOUNTING POLICIES	13
NOTES ON ACCOUNTS	14

for Centre for Wind Energy Technology

As per our Report attached
for **V. Soundararajan & Co.,**
Chartered Accountants

Sd/-
D. Lakshmanan
General Manager (F&A)

Sd/-
Dr. S. Gomathinayagam
Executive Director

Sd/-
President/Chairman

Sd/-
V.S. Ravikumar
Partner

CENTRE FOR WIND ENERGY TECHNOLOGY

(An Autonomous R & D Institution under MNRE, Government of India)

Chennai - 600 100

INCOME AND EXPENDITURE ACCOUNT FOR THE YEAR ENDED 31st MARCH, 2009

		(Amount in Rs.)	
	Schedule	31 st March 2009	31 st March 2008
INCOME			
Income from Scientific & Technical Consultancy Services	6	3,97,19,942	2,41,57,723
Income from publication	7	20,09,337	15,38,925
Interest Earned	8	1,68,02,034	1,18,31,541
Other Income	9	24,90,447	9,20,818
Grants from Government of India allocated for Revenue expenditure during the year		1,84,25,542	(14,09,054)
Grants from Government of India allocated for In house project expenditure during the year		7,16,164	85,80,471
Deferred Income transferred from Capital Fund (vide Note No.4)	4	6,54,12,458	2,58,54,443
TOTAL (A)		14,55,75,924	7,14,74,867
EXPENDITURE			
Establishment Expenses	10	1,89,30,862	94,04,951
Other Administrative Expenses	11	20,42,22,655	1,70,61,553
In house project expenditure		7,16,164	85,80,471
Depreciation	4	6,55,23,997	2,59,65,607
TOTAL (B)		10,55,93,678	6,10,12,582
Balance being excess of Income over Expenditure (A-B)		3,99,82,246	1,04,62,285
Prior period adjustment	12	(9,840)	(1,64,02,500)
BALANCE BEING SURPLUS TRANSFERRED TO GENERAL RESERVE ACCOUNT		3,99,92,086	2,68,64,785
SIGNIFICANT ACCOUNTING POLICIES	13		
NOTES ON ACCOUNTS	14		

for Centre for Wind Energy Technology

As per our Report attached
for **V. Soundararajan & Co.,**
Chartered Accountants

Sd/-
D. Lakshmanan
General Manager (F&A)

Sd/-
Dr. S. Gomathinayagam
Executive Director

Sd/-
President/Chairman

Sd/-
V.S. Ravikumar
Partner

CENTRE FOR WIND

(An Autonomous R&D Institution under Ministry of New
Chennai -

RECEIPTS AND PAYMENTS ACCOUNT

RECEIPTS	(Amount in Rs.)	
	31 st March 2008	31 st March 2007
I. Opening Balances		
(a) Cheques in hand	2,775,739	13,256
(b) Bank balances		
i) In Current Account	23,991,956	22,466,413
ii) In Deposit Accounts	144,000,000	99,922,247
(c) Stamps on hand	4,319	7,119
II. Grants Received		
(a) From Government of India	50,000,000	90,000,000
(b) Sale of Fixed Assets	137,055	
(c) From Government of India for execution various projects	39,864,501	10,000,000
(d) From Government of India for organising international training		1,078,656
III. Income on Investments		
IV. Interest Received		
(a) On Bank deposits	16,802,034	11,831,541
V. Other Income		
(a) Fees for services	34,559,999	10,628,998
(b) Income from publications	158,600	1,579,669
(c) Energy receipts	4,509,943	13,528,725
(d) Misc. income	4,450,844	920,818
VI. Amount borrowed		
VII. Any other receipts		
(a) Fees received in advance on Consultancy projects	30,212,729	34,629,518
(b) Security deposit received	330,800	2,458,000
(c) Earnest money deposit received		2,485,000
(d) Service Tax Realised	3,865,352	6,038,465
(e) TDS to be remitted	125,903	54,162
(f) Transfer of Advance on Capital (Including imports)	5,728,789	423,626
TOTAL	36,15,18,563	308,066,213

for Centre for Wind Energy Technology

Sd/-
D. Lakshmanan
General Manager (F&A)

Sd/-
Dr. S. Gomathinayagam
Executive Director

ENERGY TECHNOLOGY

& Renewable Energy, Government of India)

600 100

FOR THE YEAR ENDED 31st MARCH, 2009

	(Amount in Rs.)	
PAYMENTS	31 st March 2008	31 st March 2007
I. Expenses		
(a) Employee related Expenses	14,348,302	9,139,863
(b) Administrative Expenses - (Operational & TA/DA)	20,706,333	15,386,564
II. Payments made against funds for various projects out of CFA		
(a) In house R&D project expenses	677,606	8,340,539
(b) Seminar & Information dissemination	90,680	256,700
(c) Accreditation fee	27,714	123,673
(d) Enhancement of test facilities		(16,402,500)
Out of Grants for projects		
(a) International training programme		541,065
(b) Cuban Training Programme	927	1,159,050
(c) Indo-Danish Meet	22,000	
(d) Wind Shear Assessment expenses	12,779,037	740,805
(e) North-Eastern Project	9,397	13,474
(f) North-Eastern Project 2006-07	24,300	2,544,674
(g) Study on Uncovered / New areas (2003-04 to 2008-09)	18,420,370	12,947,827
III. Investment and Deposits made		
IV. Expenditure on Fixed assets & Capital Work-in-Progress		
(a) Purchase of Fixed assets	19,212,213	74,705,700
(b) Expenditure on Capital Work-in-progress	220,634	(3,500)
(c) Advance on capital account (including imports)	862,513	3,112,785
V. Refund of Surplus Money		
(a) Balance of Grants-in-aid to Govt. of India		
VI. Other Payments		
(a) Refund of Security deposits		200,000
(b) Refund of Earnest Money Deposits	630,000	2,580,000
(c) Expenditure on Consultancy Projects	3,083,362	2,167,393
(d) Advance & Deposits	4,769,144	2,937,887
(e) Payment of TDS	54,162	14,207
(f) Service tax remittances	38,65,352	6,038,465
(g) Receivable from Debtors	2,747,438	(5,009)
(h) Festival advance paid	3,300	1,200
(i) Transfer of Fees received in advance	34,587,249	10,753,337
VII. Closing Balances		
(a) Cheques in hand	40,605	2,775,739
(b) Bank Balances		
i) In Current Account	31,233,454	23,991,956
ii) In Deposit Accounts	193,100,000	144,000,000
(c) Stamps on hand	2,471	4,319
TOTAL	36,15,18,563	308,066,213

for Centre for Wind Energy Technology

As per our Report attached
for **V. Soundararajan & Co.,**
Chartered Accountants

Sd/-
D. Lakshmanan
General Manager (F&A)

Sd/-
Dr. S. Gomathinayagam
Executive Director

Sd/-
President/Chairman

Sd/-
V.S. Ravikumar
Partner



पवन ऊर्जा प्रौद्योगिकी केन्द्र

(भारत सरकार के नवीन और नवीकरणीय ऊर्जा मंत्रालय के अधिन स्वायत्त अनुसंधान एवं विकास संस्था)

CENTRE FOR WIND ENERGY TECHNOLOGY

(An Autonomous R & D Institution under the Ministry of New and Renewable Energy, Government of India)

वेलचेरी-ताम्बरम मेन रोड, पल्लिकरणै, चेन्नई - 600 100, तमिलनाडु, भारत

Velachery-Tambaram Main Road, Pallikaranai, Chennai - 600 100, Tamil Nadu, India

Phone / दूरभाष : +91-44-22463982 / 22463983 / 22463984

Fax / फ़ैक्स : +91-44-22463980

E-mail / ईमेल : info@cwet.res.in

Website/ वेबसाइट : <http://www.cwet.tn.nic.in>