वार्षिक रिपोर्ट
ANNUAL REPORT
2022-23

पवन ऊर्जा - साफ ऊर्जा

WIND ENERGY - CLEAN ENERGY

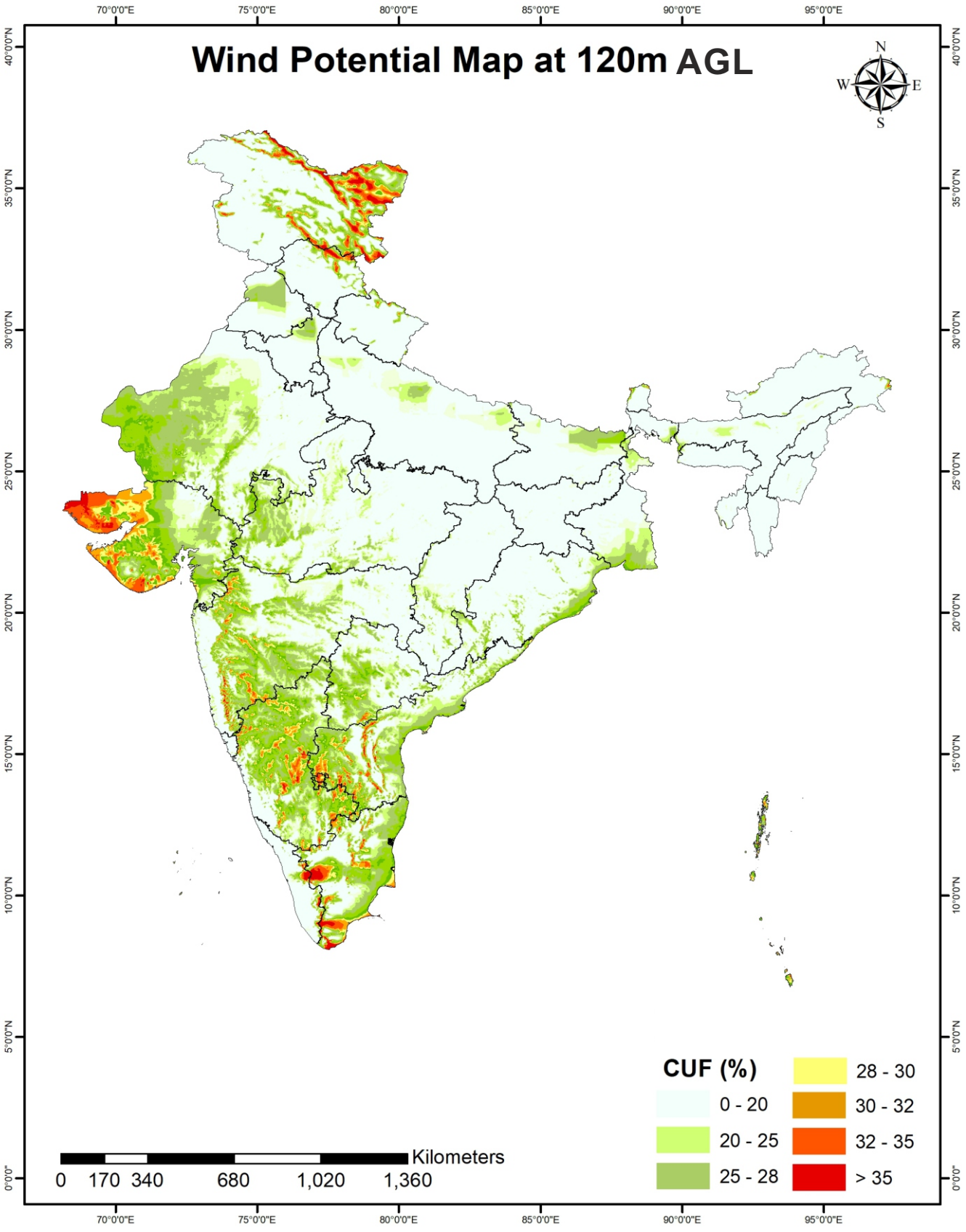
राष्ट्रीय पवन ऊर्जा संस्थान
NATIONAL INSTITUTE OF WIND ENERGY

नवीन और नवीकरणीय ऊर्जा मंत्रालय, अनुसंधान एवं विकास स्वायत्त संस्थान, भारत सरकार

An Autonomous R & D Institution, Ministry of New and Renewable Energy, Government of India

नीवे NIWE

(ISO 9001:2015)


Wind Potential Map at 120m AGL
N
W
E
S
70°0'0"E
75°0'0"E
80°0'0"E
85°0'0"E
90°0'0"E
95°0'0"E
40°0'0"N
35°0'0"N
30°0'0"N
25°0'0"N
20°0'0"N
15°0'0"N
10°0'0"N
5°0'0"N
0°0'0"
CUF (%)
0 - 20
20 - 25
25 - 28
28 - 30
30 - 32
32 - 35
> 35
Kilometers
0 170 340 680 1,020 1,360

Annual Report
2022-23

NATIONAL INSTITUTE OF WIND ENERGY
An Autonomous Research & Development Institution
Ministry of New and Renewable Energy, Government of India
Chennai - 600 100

Inside the Report

Preamble

Technological Highlights

Skill Development and Outreach

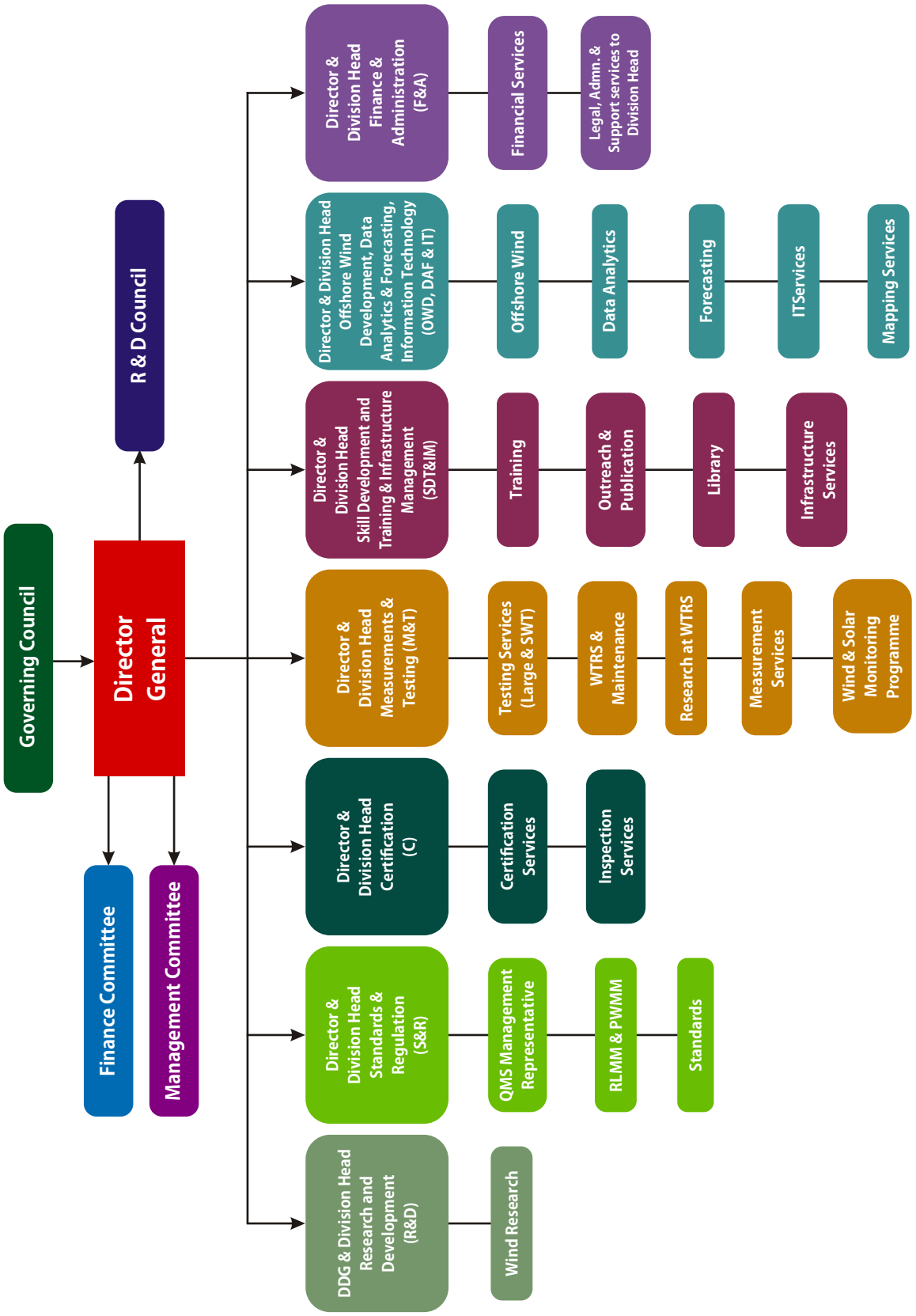
Finance & Administration

Finance Report

PREAMBLE

- Organogram
- From the desk of Director General
- The Charter
- Governing Council
- Committees
- Workforce

ORGANOGRAM


Governing Council
Director General
R & D Council
Finance Committee
Management Committee
Director & Division Head Finance & Administration (F&A)
Financial Services
Legal, Admn. & Support services to Division Head
Director & Division Head Offshore Wind Development, Data Analytics & Forecasting, Information Technology (OWD, DAF & IT)
Offshore Wind
Data Analytics
Forecasting
ITServices
Mapping Services
Director & Division Head Skill Development and Training & Infrastructure Management (SDT&IM)
Training
Outreach & Publication
Library
Infrastructure Services
Director & Division Head Measurements & Testing (M&T)
Testing Services (Large & SWT)
WTRS & Maintenance
Research at WTRS
Measurement Services
Wind & Solar Monitoring Programme
Director & Division Head Certification (C)
Certification Services
Inspection Services
Director & Division Head Standards & Regulation (S&R)
QMS Management Representative
RLMM & PWMM
Standards
DDG & Division Head Research and Development (R&D)
Wind Research

Dr. Rajesh Katyal

from the desk of Director General.....

With a population of 1.4 billion, India has a massive demand for energy to fuel its rapidly growing economy. From a power deficit nation at the time of Independence, the efforts to make India energy-independent have continued for over seven decades. Today, we are a power surplus nation with a total installed electricity capacity of 416 GW. The country has a target of 500 GW of energy capacity from non-fosil fuel resources by 2030 and India will achieve this target before the deadline.

Under the National Wind Monitoring program of the Ministry, 912 dedicated Wind Monitoring Stations (WMS) have been established by NIWE across the country. The Wind Resource Assessment activities of NIWE were extended to Ladakh, A&N Islands and Lakshadweep this year. A project was undertaken for wind and solar resource assessment in Ladakh and Kargil region with the objective of meeting the vision of the Hon'ble Prime Minister for 'Carbon Neutral' Ladakh. Wind resource assessment has also been initiated in Andaman and Nicobar islands, to explore the feasibility of meeting the power demand of the islands from Renewable Energy. LiDAR based offshore wind resource assessment campaign has been initiated at Kadamat Island, Union Territory of Lakshadweep to ascertain the offshore wind power potential of the region and feasibility of powering the desalination plants from offshore wind power projects under the Integrated Wind Solar Measurement and Mapping project. Phase I measurement campaign covering 24 sites have been completed.

The Greening of Rameshwaram island project seeks to promote sustainable and eco-friendly practices by encouraging the use of Renewable Energy sources, specifically wind energy to meet the power demand of the island.

The development and implementation of the SCADA controller device at Bhuj Air Force Station to control the WTG OEMs under war/ emergency situation was successfully demonstrated as per the directives of MNRE.

Technical support was provided to Bureau of Indian Standards (BIS) for the preparation of Indian Standards and review of draft IEC standards / IECRE documents on wind turbines. During the year, five Indian standards on wind turbines have been finalized and accepted by BIS for printing and voting recommendations along with the comments have been sent for 38 nos. of draft IEC/IECRE documents to BIS. Seven testing assignments were initiated during the year. International accreditation for the certification services was obtained as per the ISO / IEC 17065 standard from NABCB, Quality Council of India (QCI).

from the desk of Director General.....

Under the Research programme, a novel wind driven compressed air storage system has been installed and is presently under testing. A novel 3.7 kW Ferrite Vernier PM generator has been designed, simulated and processed for fabrication under the project "Direct-drive rare-earth free doubly salient PM machine" for roof-top wind power generation. During the year, 30 graduate and post graduate students / faculties have completed their internship/project work under mentors from various divisions.

Under skill development activities, two online and three physical international courses under ITEC programme sponsored by MEA and eight customized training courses for various clients were conducted. Apart from the above courses, 144 trainers and 720 participants have been trained through Training of Trainers (TOT) and Training of Participants (TOP) programmes under Vayumitra Skill Development Programme (VSDP) sponsored by MNRE. NIWE organised 10 events to celebrate and commemorate 75 years of India's independence and the glorious history of it's people, culture and achievements. The Global Wind Day celebration along with Silver Jubilee of National Institute of Wind Energy and IREDA-NIWE Annual Awards Ceremony was held on 15th June 2022 at New Delhi in the august presence of the Hon'ble Union Minister for Power and New and Renewable Energy.

As we wrap up another successful year at NIWE, we are delighted to share our accomplishments and milestones with you. The past year has been filled with challenges and opportunities, and we are proud of the progress we've made towards our goals.

Dr. Rajesh Katyal,
Director General (Additional Charge),NIWE

The Charter

The National Institute of Wind Energy (NIWE) was established at Chennai in 1998 as an autonomous R&D institution under the Ministry of New and Renewable Energy (MNRE), Government of India. NIWE is managed by a Governing Council headed by Secretary, MNRE and the Director General is the head of the Institute.

NIWE was established to serve as a technical focal point of excellence to foster the development of Wind Energy in the country and it is a unique research organization in the whole of South Asia. A Wind Turbine Test Station (WTTS) has also been established as an integral part of NIWE at Kayathar, Tamil Nadu with an objective to conduct and / or coordinate testing of complete wind power systems, sub-systems and components according to internationally accepted test procedures.

MISSION

NIWE, 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. NIWE 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 analyse 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 standards including guidelines, procedures, protocols for design, testing and certification of wind power systems, sub-systems and components, taking into consideration the Indian conditions and in line with internationally recommended practices and standards and update the same based on the feedback.
- To establish world class facilities, conduct and coordinate testing of complete wind power systems, sub-systems and components according to internationally accepted test procedures and criteria, whereby the total performance that includes power performance, power quality, noise level, dynamics, operation and safety systems is tested according to agreed protocols safety systems is tested according to agreed protocols.
- To accord type approval / type certification which verifies conformity with safety related requirements as per standards, guidelines and other rules for design, operation and maintenance, as well as adequate documentation of quality issues such as power performance, noise, life expectancy and reliability.
- To monitor the field performance of wind power systems, sub-systems and components, effectively utilize this feedback for fulfillment of the above objective and issue of certification, establish and update the data bank on a continuous basis and serve as information Centre for selective dissemination.
- To undertake human resource development programme 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.

GOVERNING COUNCIL 2022-23

Shri Bhupinder Singh Bhalla, I.A.S.,
Secretary, MNRE, New Delhi

Shri. Vimalendra Anand Patwardhan, I.A.& A.S.,
Joint Secretary and Financial Adviser, MNRE, New Delhi

Shri. Dinesh Dayanand Jagdale
Joint Secretary (Wind Energy), MNRE, New Delhi

Shri. Pradip Kumar Das
Chairman & Managing Director
Indian Renewable Development Agency Limited, , New Delhi

Smt. Suman Sharma, I.R.S.,
Managing Director
Solar Energy Corporation of India Limited (SECI), New Delhi

Shri. Ramesh Chand Meena, I.A.S.,
Principal Secretary to Government, Energy Department, Govt. of Tamilnadu, Chennai

Smt. Mamta Verma, I.A.S.,
Additional Chief Secretary, Government of Gujarat, Gujarat

Dr Abhay A Pashilkar
Director CSIR NAL

Chairman
Indian Wind Turbine Manufactures Association, New Delhi

Shri. Balram Mehta
President, Wind Energy Independent Power Producers Association (WIPPA)

Prof. Nagesh R Iyer
Expert (former Director CSIR-SERC), Chennai

Dr. Rajesh Katyal
Director General (Additional Charge), NIWE, Chennai

COMMITTEES

Finance Committee

Chairman

Joint Secretary and Financial Adviser

Ministry of New and Renewable Energy, (MNRE), New Delhi

Members

Principal Secretary to Govt.

Energy Department, Government of Tamilnadu

Chennai

Joint Secretary (WE)

Ministry of New and Renewable Energy, (MNRE), New Delhi

Director General

National Institute of Wind Energy, Chennai

Director (Wind)

Ministry of New and Renewable Energy, (MNRE), New Delhi

Deputy Secretary [IFD]

Ministry of New and Renewable Energy, (MNRE), New Delhii

Member Secretary

Division Head (Finance & Administration)

National Institute of Wind Energy (NIWE), Chennai

Research & Development Council

Chairman

Director
CSIR-National Aerospace Laboratories, Bangalore

Members

Joint Secretary (WE)
Ministry of New and Renewable Energy (MNRE), New Delhi

Shri. G. Upadhyay
Director, Scientist-G
Ministry of New and Renewable Energy (MNRE), New Delhi

Representative
Department of Science and Technology, New Delhi

Director or Nominee
Wind Engineering Laboratory
CSIR-Structural Engineering Research Centre (SERC), Chennai

Prof. Dr. Rangan Banerjee
Director, Indian Institute of Technology - Delhi (IIT), New Delhi

Director or Nominee
National Institute of Ocean Technology (NIOT), Chennai

Director General
Central Power Research Institute (CPRI), Bangalore

Prof. Dr. H.P. Khincha
Former Vice Chancellor, Visvesvariah Technological University, Bangalore

Dr. K.V. Nagendra Gopal
Associate Professor, Department of Aerospace Engineering
Indian Institute of Technology-Madras, Chennai

Director General
National Institute of Wind Energy (NIWE), Chennai

Member Secretary

Division Head - R&D, NIWE
Nominated by DG, NIWE

Prototype Wind Turbine Models Committee

Chairman

Dr. Rajesh Katyal, Director General (Additional Charge), NIWE, Chennai (from 08.11.2022 onwards)

Dr. K. Balaraman, Director General, NIWE, Chennai (upto 07.11.2022)

Members

Shri. D.V. Giri, Secretary General, IWTMA, New Delhi

Shri. N. Rajkumar, Joint Director, CPRI, Bangalore

Member Secretary

Shri. A. Senthil Kumar, Director & Division Head, S&R, NIWE, Chennai

Internal Complaints Committee for Women

Chairperson

Dr. Vijaya Ravichandran, Scientist 'G', National Institute of Ocean Technology, Chennai

Member

Dr. A. Murugeswari, Assistant Professor, Anna University, Chennai

Dr. A Muthukrishnan, Formerly Senior COA, CSIR – CLRI

Smt. Deepa Kurup, Additional Director, NIWE, Chennai

Smt. K. Tamilselvi, Admin & Accounts Officer, National Institute of Wind Energy, Chennai

Ms. A. Jaseela Banu, Executive Assistant, National Institute of Wind Energy, Chennai

Member Secretary

Smt. K. Saranya, Junior Executive Assistant, National Institute of Wind Energy, Chennai

Official Language Implementation Committee

Chairman

Dr. Rajesh Katyal, Director General (AC), NIWE, Chennai

Members

Shri. S.A. Mathew, Director & Division Head, NIWE, Chennai

Shri. A. Senthil Kumar, Director & Division Head, NIWE, Chennai

Shri. J.C.David Solomon, Director & Division Head, NIWE, Chennai

Dr. K. Boopathi, Director & Division Head, NIWE, Chennai

Dr. P. Kanagavel, Director & Division Head, NIWE, Chennai

Smt. Deepa Kurup, Additional Director, NIWE, Chennai

Member Ex- Officio

Shri. R. Girirajan, Additional Director (F&A), NIWE, Chennai

Member Secretary

Smt. K. Tamilselvi, Admin & Accounts Officer, NIWE, Chennai

WORKFORCE

- **Dr. Rajesh Katyal,** Director General (Additional Charge) (w.e.f. 08.11.2022)
- **S A Mathew,** Director
- **A Senthil Kumar,** Director
- **J C David Solomon**, Director
- **Dr. K Boopathi,** Director
- **Dr. P Kanagavel,** Director
- **Deepa Kurup**, Additional Director (Technical)
- **N Rajkumar,** Additional Director (Technical)
- **R Girirajan,** Additional Director (F&A)
- **A G Rangaraj,** Deputy Director (Technical)
- **M Saravanan,** Deputy Director (Technical)
- **Bhukya Ramdas,** Deputy Director (Technical)
- **J Bastin,** Deputy Director (Technical)
- **M C Lavanya,** Deputy Director (Technical)
- **A Hari Bhaskaran,** Deputy Director (Technical)
- **B Krishnan,** Assistant Director (Technical)
- **Yelchuri Srinath**, Assistant Director (Technical)
- **Anuradha Babu**, Executive Staff Officer
- **K Tamilselvi,** Administration & Accounts Officer
- **Dr. G Arivukkodi,** Assistant Executive Engineer
- **S Arulselvan,** Assistant Executive Engineer
- **A R Hasan Ali**, Assistant Executive Engineer
- **Y Packiyaraj,** Assistant Executive Engineer
- **M Karuppuchamy,** Assistant Executive Engineer

- **B Muthulakshmi,** Executive Secretary-II
- **M R Gunasekaran**, Executive Secretary-II
- **T Sureshkumar,** Assistant Engineer
- **S Paramasivam,** Assistant Engineer
- **R Vinod Kumar,** Junior Engineer
- **R Naveen Muthu,** Junior Engineer
- **T Sankara Rao,** Junior Engineer
- **R Sunderesan,** Executive Assistant
- **A Jaseela Banu,** Executive Assistant
- **K Saranya,** Junior Executive Assistant
- **J Sarita Kumari,** Hindi Translator
- **M Nandakumar,** Technician
- **B Senthilkumar,** Technician
- **M Malaravan,** Transport Coordinator
- **A Mani,** Driver
- **M Selvakumar,** Record Keeper
- **K A Haji Abdul Ibrahim,** Record Keeper

TECHNOLOGICAL HIGHLIGHTS

- Wind and Solar Resource Measurements
- Offshore Wind Development
- Data Analytics
- Forecasting & Information Technology
- RE Projects
- Standards and Regulation
- Testing of Wind Trubine
- Certification of Wind Turbine
- Research and Development

Wind and Solar Resource Measurements

The National Institute of Wind Energy (NIWE) under the National Wind Resource Assessment Programme undertakes various studies to locate wind-rich sites in the country through field measurements for the development of wind farms. The ground-measured data collected from all parts of the country are consolidated for the preparation of the National Wind Power Potential Atlas at various hub heights. Apart from this, all onshore and offshore wind resource-related studies using advanced techniques like models and satellite information are also used for the exploration of wind profiles. NIWE is also involved in activities related to the development of offshore wind power projects in the country by using the latest and most advanced technologies currently available in the world.

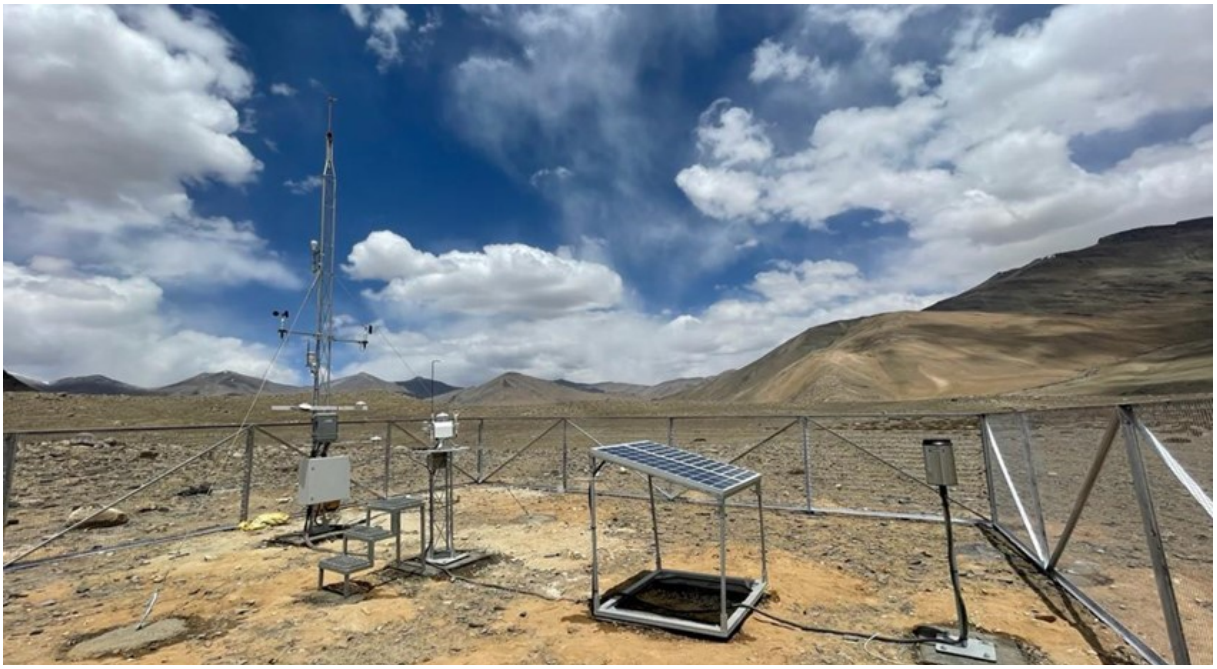
Wind Resource Assessment (WRA) program data is being used widely to establish wind farms in the country. The wind farms established in the country are generally based on the reference data collected under the WRA program. Under this program of the Ministry, 912 dedicated wind monitoring stations & 127 dedicated Solar Radiation Resource Assessment (SRRA) stations have been established with the support of State Nodal Agencies & other institutions. As on date, 43 Nos. of Wind Monitoring stations and 17 nos. of Solar Radiation Resource Assessment stations are operational.

Further during this year, 21 sites have been registered for wind measurement by the private sector from various states in India. The wind data from three (3) private Wind Monitoring stations have been analyzed. Ten (10) consultancy projects focused on various wind farm developmental needs were undertaken for a variety of clients from the public/ government/ private sector during this period.

Onshore Wind Resource Assessment Activities

Carbon Neutral Ladakh

NIWE has initiated a project in Ladakh and Kargil region towards meeting the vision of the Hon'ble Prime Minister for 'Carbon Neutral' Ladakh. In this regard, NIWE carried out extensive field visits to various parts of the Ladakh and Kargil region and identified suitable locations for carrying out the ground measurements and development of Wind-Solar Hybrid projects. To assess the wind power



Solar Radiation Resource Assessment station installed at Debring, Ladakh

potential of the Ladakh & Kargil region towards the development of wind power projects, NIWE had installed 3 Nos. of 100 m WMS and 2 Nos. of SRRA station at Ladakh and data collection from these stations/sites are underway.

Renewable Energy (RE) Park, Kutch, Gujarat

NIWE has identified three (3) locations at the proposed 30 GW Renewable Energy Park (Khavada region), Kutch District, Gujarat to install three (3) nos. of 100 m integrated Wind-Solar Resource Assessment stations. During the year, NIWE installed and commissioned three (3) Nos. of 100 m Integrated Wind–Solar Resource Assessment stations at the proposed 30 GW Renewable Energy Park (Khavada region), Kutch District, Gujarat, and data are being collected. The data from these resource assessment stations will facilitate the project developers/ investors in developing wind/ solar power projects in the region and achieving the target set by the Government of India. Further, NIWE had prepared the conceptual design layout for the development of a wind power project in Renewable Energy park.

Green Islands

The Government of India (GoI) through the Ministry of Power (MoP) and Ministry of New and Renewable Energy (MNRE) had initiated a program, "Greening of Islands" with the objective of converting the power source of the island territories (A&N Islands and Lakshadweep Islands) to 100% renewable sources. To ascertain the actual wind power potential of A&N Islands and the subsequent development of commercial-scale wind power projects in the Island, NIWE carried out extensive field surveys in various parts of A&N Islands and selected eight locations to carry out in-situ ground measurement studies using 100 m masts. The commissioning activities will commence in the month of June 2023 and the data will be collected for 24 months.

Field visits to A&N Islands

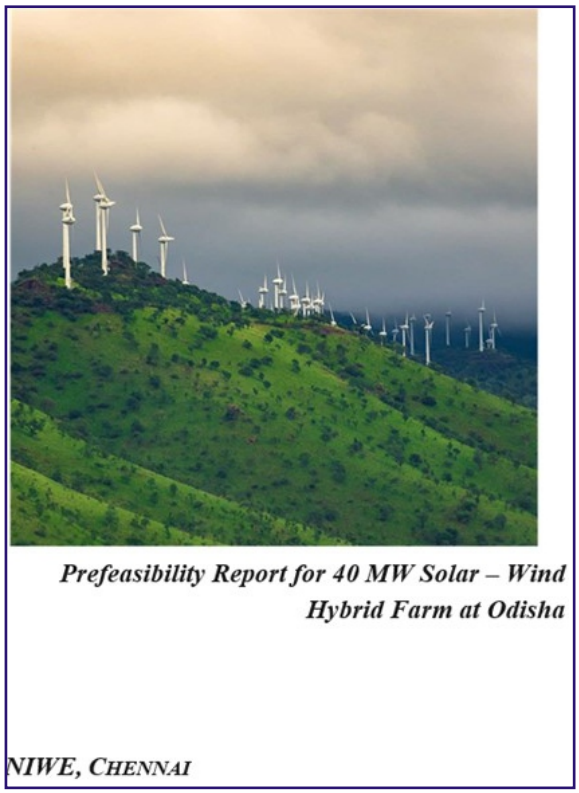
NIWE had planned to carry out the LiDAR-based offshore wind measurement campaign at Kadamat Island, Union Territory of Lakshadweep to ascertain the offshore wind power potential of the region. Subsequent to the study, if the site is found suitable/ feasible for the development of offshore/ nearshore wind power projects, the power generated from the wind farms will be utilized for the desalination plant at Kadamat Island. In this context, during the year NIWE had procured an offshore LiDAR and validation of the same is completed.

Integrated Wind and Solar Resource Assessment (IWSRA)

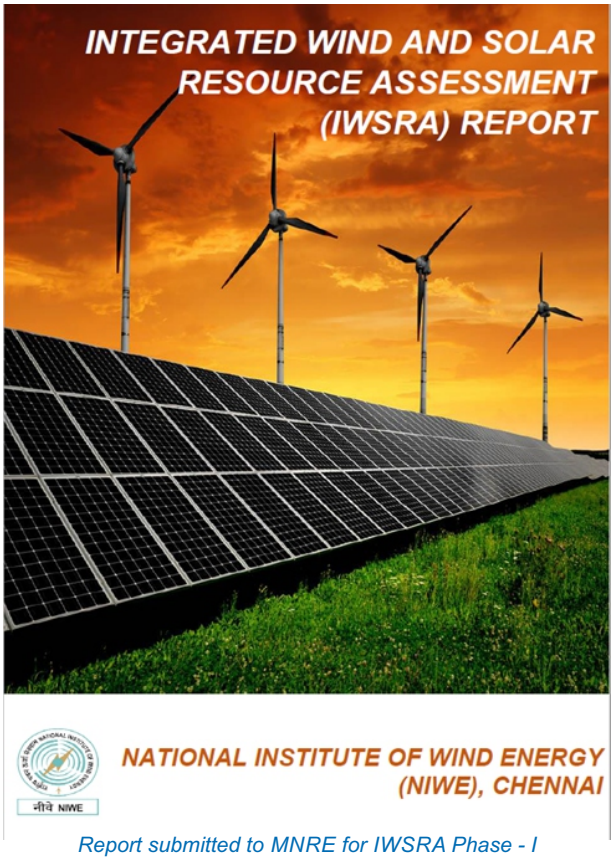
NIWE under MNRE funding has carried out "Integrated Wind and Solar Resource Assessment (IWSRA) through Mapping and Measurements" at 100 m level at carefully chosen sites in different parts of the country. Under this project, 50 numbers of 100 m tall integrated Wind-Solar Monitoring stations (in two phases) with 5 levels of instrumentation are planned to be installed in the country over a period of three years. In Phase-I, NIWE has commissioned 23 IWSRA stations in Tamil Nadu-4, Karnataka-4, Andhra Pradesh-2, Gujarat-7, Maharashtra-3, Rajasthan-1, Telangana-1 and Madhya Pradesh-1 and the data has been collected from these stations.

S.No.	State	Site Name	District
1	TAMIL NADU	Uthumalai	Tirunelveli
2		Dombucheri	Theni
3		Mavathur	Karur
4		Pollachi	Coimbatore
5	GUJARAT	Khavda@1	Bhuj
6		Khavda@2	Bhuj
7		Khavda@3	Bhuj

S.No.	State	Site Name	District
8	GUJARAT	Gogla	Ahmedabad
9		Rampara	Surendranagar
10		Lamba	Jamnagar
11		Gadhwali	Kutch
12	MAHARASHTRA	Sedhewadi	Sangli
13		Sulewadi	Solapur
14		Dhule	Dhule
15	ANDHRA PRADESH	Ramasamudram	Kurnool
16		Hampapuram	Anantapuram
17	TELANGANA	Donakal	Nalgonda
18	KARANATAKA	Nulenur	Chitradurga
19		Yettinahalli	Haveri
20		Narendra	Dharwad
21		Halasangi	Bijapur
22	RAJASTHAN	Damodara	Jaisalmer
23	MADHYA PRADESH	Hedapura	Rajgarh



Report detailing the findings from the Prefeasibility Study



Report submitted to MNRE for IWSRA Phase - I

After collecting data from several sites in various states over a one year period, a report detailing the study and its concluding observation from the data acquired from the sites was submitted to MNRE. It was also proposed to continue this project as Phase – II by covering new locations.

Under Phase – II, of this project site selection / survey in the states of Bihar, Chhattisgarh, Gujarat, Madhya Pradesh, Odisha, Uttar Pradesh, and West Bengal are planned.

Pre-feasibility study for 40 MW Solar–Wind Hybrid Farm at Odisha

A pre-feasibility study and report for a 40 MW Solar – Wind Hybrid Farm at Jagatsinghpur, Odisha was completed and a report detailing the findings was submitted to MNRE.

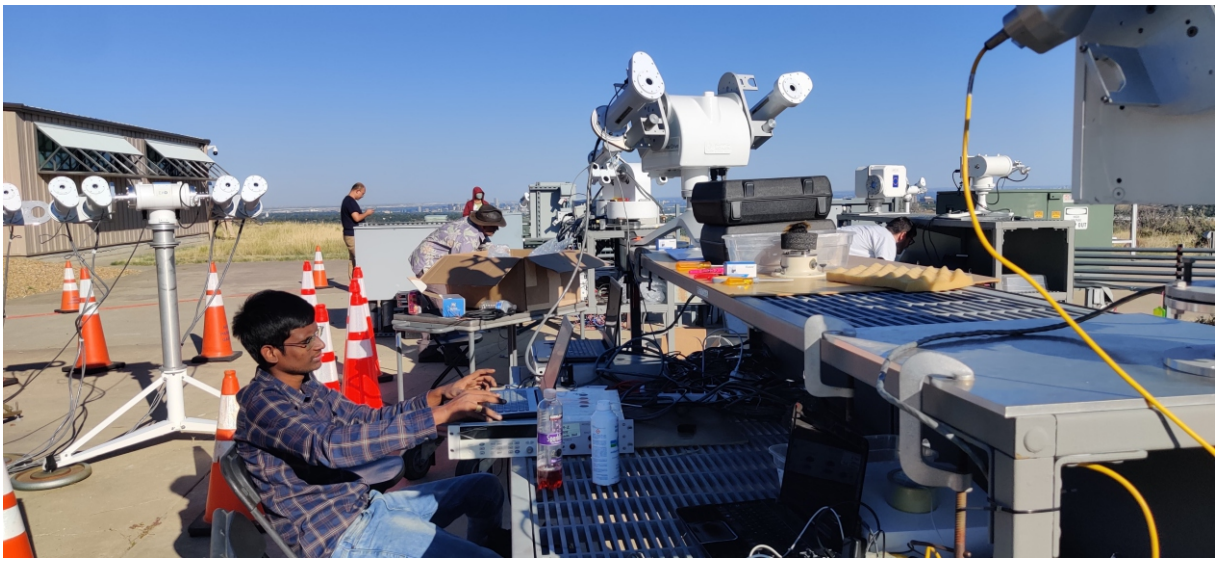
Calibration Activities :

During the year, NIWE carried out the calibration of 7 Pyranometers under commercial mode at NIWE Calibration Laboratory.

Participation in NREL – NPC 2022

NIWE has participated in National Renewable Energy Laboratory (NREL) in NPC-2022; NREL Pyrheliometer Comparisons (NPC-2022) at Solar Resource Research Laboratory in Golden, Colorado, USA. The NPC 2022 has taken place between 26th September and 7th October, 2022. Every five years, the WRR (World Radiometre Reference) is transferred to WMO regional centers and other participants at the International Pyrheliometer Comparisons (IPCs) event.

Participants from various countries and organizations in NPC 2022



NIWE team during calibration of AHF @ NREL, Colorado, USA

Offshore Wind Development

The NIWE is collaborating with the MNRE towards the development of offshore wind power projects along the Indian coastline. This initiative is part of the government's plan to increase Renewable Energy's share in the country's energy mix and reduce Greenhouse Gas Emissions. The aim is to tap into India's vast offshore wind potential to achieve a significant share of Renewable Energy in the country's energy mix. By leveraging advanced technologies, favourable policies, and research collaborations, India is striving to establish a sustainable and efficient offshore wind energy sector that contributes to its energy security and environmental objectives.

To expedite the holistic development of offshore wind projects and streamline the process, three models have been proposed and finalized. Additionally, potential zones / sub-zones have been identified under each model and the MNRE has published a strategy paper for establishment of offshore wind energy project on its website.

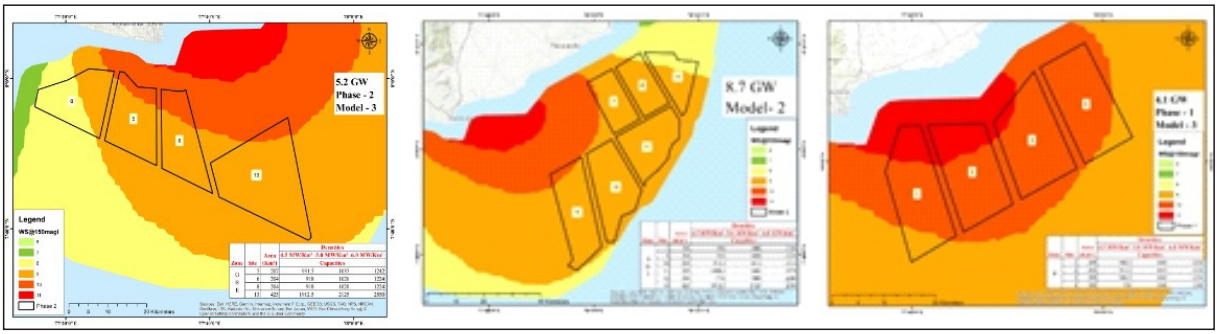


Figure showing maps of models of offshore wind

Greening of Rameshwaram

The initiative to green Rameshwaram Island seeks to promote sustainable and eco-friendly practices. One of its key objectives is to encourage the use of Renewable Energy sources, specifically wind energy, thanks to the island's favourable wind conditions. NIWE propose to take advantage of this potential by establishing wind farms to harness clean energy, reducing the reliance on fossil fuels and helping to

mitigate climate change by reducing Greenhouse Gas Emissions. The greening of Rameshwaram Island is in line with the broader goals of sustainable development and environmental stewardship. By integrating renewable energy, ecosystem restoration, and sustainable waste management, the project aims to create a model for green and resilient communities on the island. The following activities have been carried out:

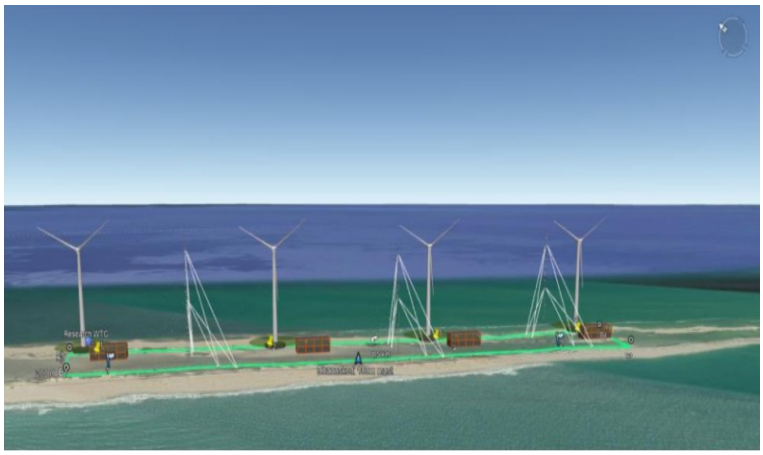


Figure showing Location of Study Area at Dhanushkodi

- Conducted meetings with ISRO to discuss the clearance for offshore wind development in the area of Gulf of Mannar area.
- Developed an Offshore wind energy portal for inviting applications from developers / bidders.
- NIWE has identified a potential Offshore site at Dhanushkodi in order to develop the offshore wind test facility in the country.
- Under the Indo-Danish co-operation, MNRE/NIWE & DEA have jointly carried out Marine Spatial Planning (MSP) studies consisting of various significant factors such as wind speed, water depth, marine traffic, hazardous area, Environmentally sensitive zones etc., The sub-zones are aligned with

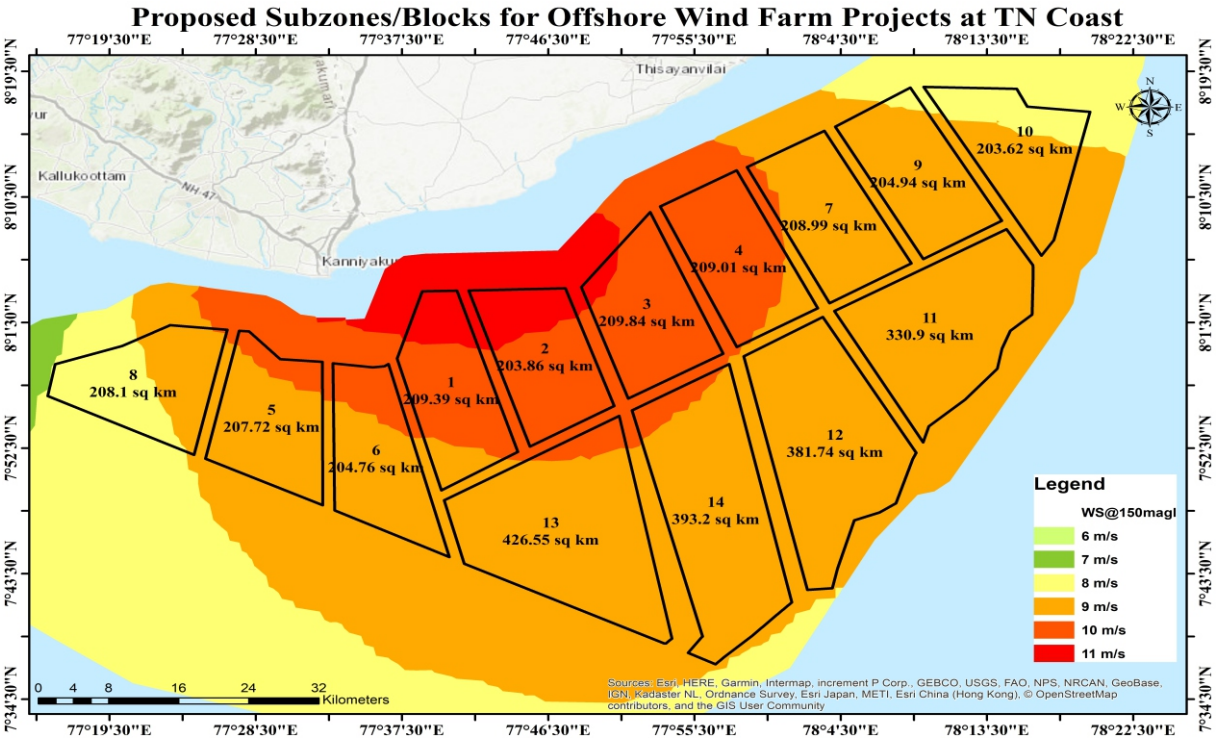


Figure showing Marine Spatial Planning for offshore wind farms in Tamil Nadu

the MNRE strategy document for the developing offshore wind in the Gulf of Mannar, Off the Tamil Nadu coast. Based on the MSP, the identified sub-zones are shown in the figure under different models as stipulated in the strategy document.

INDIA-UK Offshore Wind Summit-2023

NIWE officials participated and presented as a Panelist on "Supply Chain and Infrastructure for Offshore Wind in India" during the 2nd UK-India Offshore Wind Summit 2023 on 10th March, 2023 at the Taj Wellington Mews in Chennai.

India-UK Offshore Wind Summit-2023

Second Taskforce Meeting

NIWE organised Second Taskforce Meeting (Hybrid mode) on the development of Offshore Wind Energy Projects off the coast of Tamil Nadu & Greening of Rameshwaram including TMB clearance, CRZ clearance, preferential tariff and recommended measures under the Co-Chairmanship of Joint Secretary, MNRE and Additional Chief-Secretary to Industries, Government of Tamil Nadu at Secretariat, Chennai on 24th March, 2023.

Taskforce Meeting at Secretariat

Met Ocean Measurement

The Met Ocean Measurement Project (wind, Wave, Tide, Current, Water level, etc.) at Gulf of Mannar and Gulf of Khambhat for fostering the growth of offshore wind in the country aims to gather and analyses comprehensive metrological and oceanographic data. The primary objective of the projects is to collect accurate and reliable data related to weather patterns, wind Speeds, Wave Heights, Sea Currents, and other relevant Oceanographic Parameters. This data is crucial for assessing the Potential for harnessing wind energy, understanding climate patterns and supporting various research and development activities in the field of Renewable Energy.

As per 8th PMC discussion, the matter is in discussion with IIT ocean department, Mumbai & local Industry partner with regard to the Indigenous floating buoy development. Meanwhile, NIWE team visited and identified suitable locations for deploying the Offshore Lidar at VOC port (4 to 5 km inside sea) and Udangudi Thermal Coal jetty (8 to 9 km inside sea) to cover the entire identified zone at Gulf of Mannar.

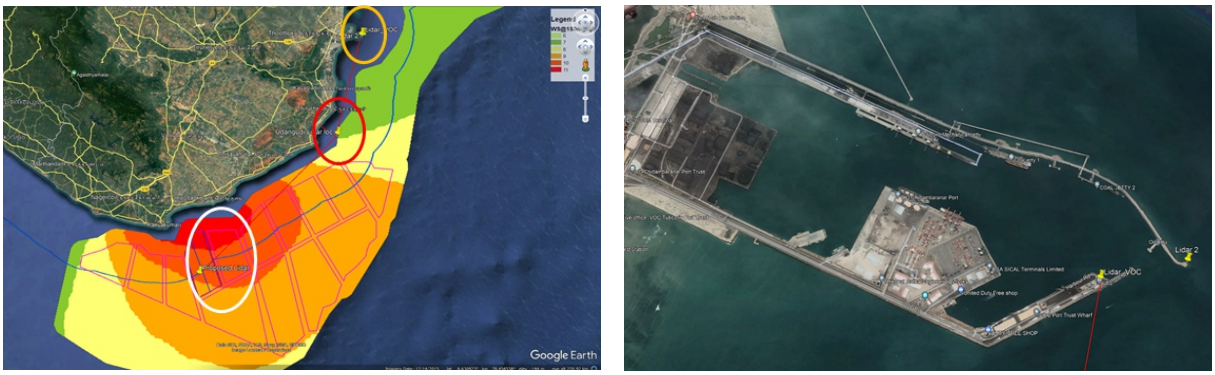
The same was informed during the review meeting of NIWE Chaired by Honorable Minister of New and Renewable Energy, Government of India held on 22/08/2023 at New Delhi. The aforesaid locations referred above at VOC Port and Udangudi thermal power coal jetty locations were showcased. It was

also briefed that by installing the LiDAR's on the available said platforms NIWE will save considerable time and cost. Also as the Offshore measurement is to be taken in a FastTrack mode for floating 1st Offshore tenders (500MW) it will be a good idea to use the existing platform for the offshore wind measurements. In addition to the above, it was also decided by the Honorable Minister to change the Lidar location from sub zone 7 to sub zone 1 under a separate CFA project wherein 500MW offshore tender (Model A) with VGF support and the necessary studies will be completed by end of Dec.2024.

In view of the above circumstances, the aggregate offshore measurement campaign plan has to be initiated (Ref Table-1). During the 9th PMC, it was decided NIWE Suitable locations identified for deploying the Offshore Lidar at VOC port (4 to 5 km inside sea) and Udangudi Thermal Coal jetty (8 to 9 km inside sea) to cover the entire identified zones at Gulf of Mannar, off Tamil Nadu coast for the fostering the growth of offshore wind sector in the country. The proposed Offshore Lidar locations are given in Table -1 & Fig-1

Table -1 Offshore wind Lidar locations

Project budget Head	Name of the Location	Latitude	Longitude	Remarks
(A) MoM	Udangudi Thermal power coal Jetty	8.394088°	78.138128°	Distance from coast 9 km
	VOC Port_1	8.747514°	78.223459°	Distance from coast 6 km
	VOC Port_2	8.748560°	78.228937°	
(B) 500MW CFA	Sub Zone 01	7.902680°	77.664045°	Distance from coast 25 km



Locations identified for measurement at VOC Port Tuticorin, Udangudi Thermal Coal Jetty and Sub Zone 1 of Offshore Wind Blocks

Data Analytics

Development of Long Term Energy prediction model

Wind farm energy output estimates are typically determined during the pre-construction stage, based on short-term measurements (one year). Despite the fact that the measurements have been long-term adjusted, the technique is often dependent on historical measurements or model data, and this approach has gained widespread acceptance in the relevant industry. Therefore, it would be extremely beneficial to the industry if we could predict the wind variation in the future. This would allow the industry to select future energy generation and related economics, which would be highly beneficial. In this regard, an investigation has begun to forecast the long-term fluctuation in energy generation using a model based on an artificial neural network. The model is currently being trained using the Re-analysis data. After the completion of necessary training, the model will be validated using actual measurements and generation.

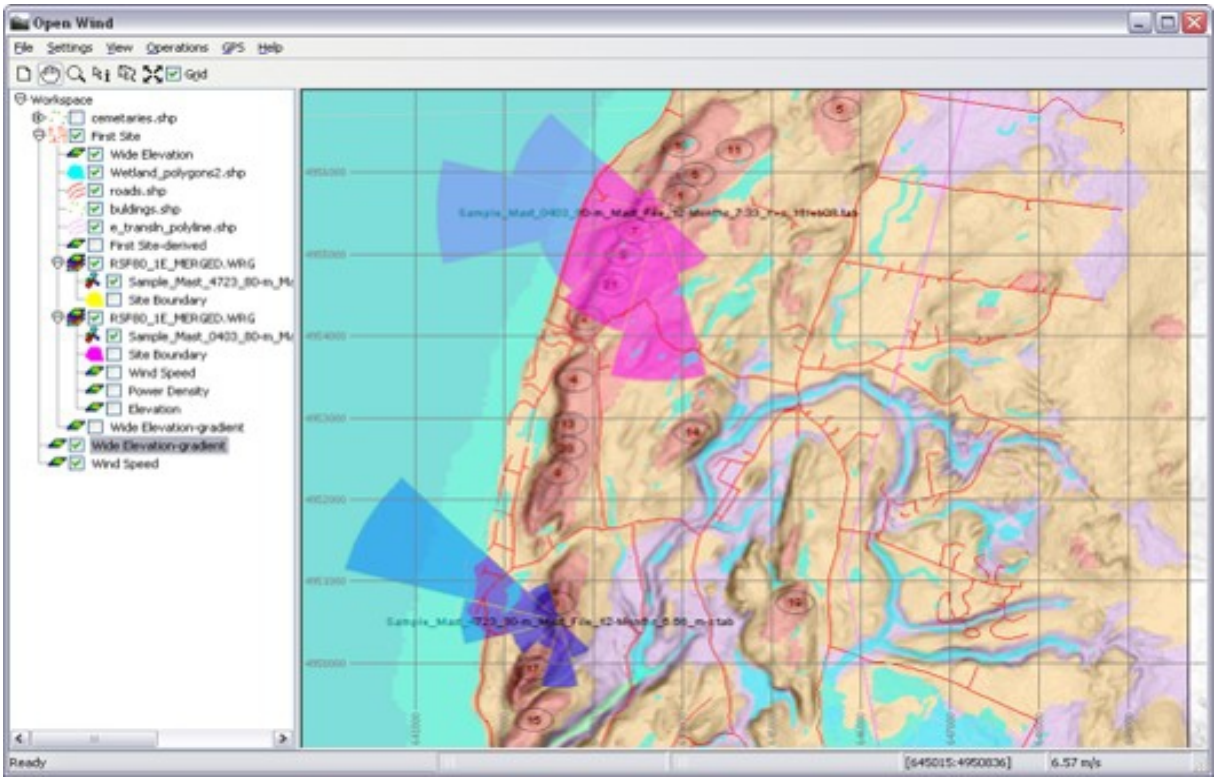
Initiated study of Data Imputation Model development for Wind Data Gap Filling

Wind energy systems require credible wind data sources in order to determine precisely how well the plant will function. Data that is missing or erroneous can arise for a variety of reasons, such as problems with communication and signals, issues with sensors, equipment breakdowns, maintenance and calibration issues and other similar problems when data is missing for a longer duration (one month), the measurement has to be repeated once again for another continuous period of 12 months. Hence a data gap filling mechanism for longer data loss is critical for the industry. In this perspective, the various approaches of data imputation for filling the longer data gaps were investigated.

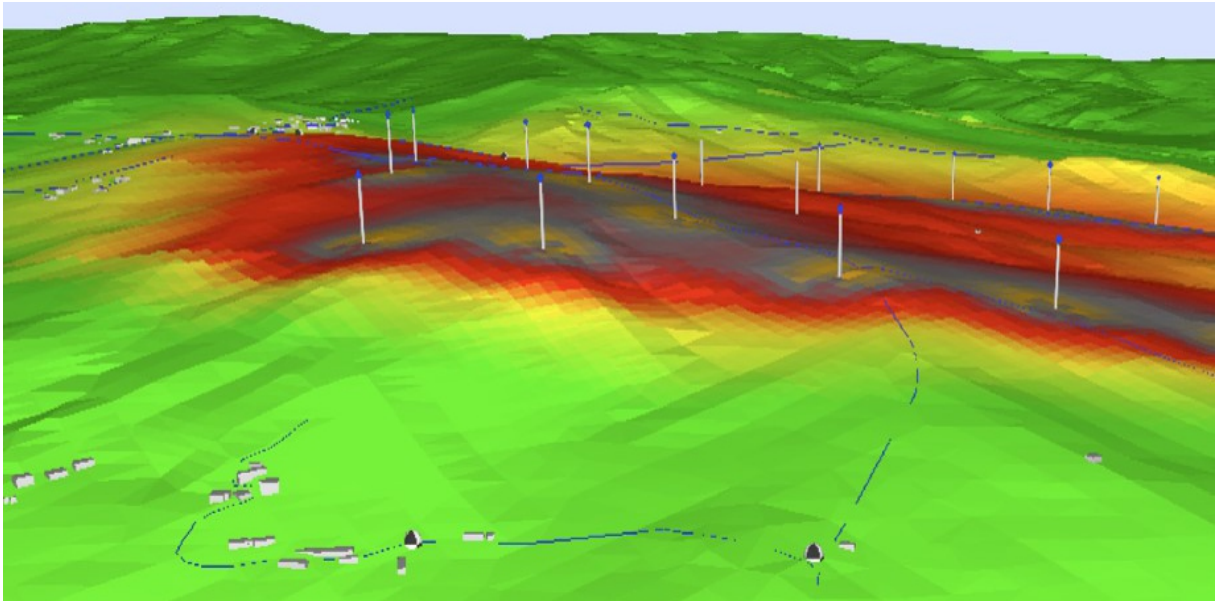
Consultancy Services

NIWE has undertaken various consultancy projects towards supporting the stakeholders of the wind industry, covering verification of wind monitoring procedures, energy yield assessment, detailed

project report preparation, preparation of tender documents, technical bid evaluation and project monitoring consultancy service. The analysis was completed as per the industry standard using the wind data and wind flow modelling analysis. The energy yield calculation was made for P50, P75, P90 & P95 for 01, 10 & 20 years and provided to the client in the reports. As a notable outcome, NIWE has been entrusted by V.O. Chidambaranar Port Trust, Tuticorin, Tamil Nadu and Kerala State Electricity Board for the project monitoring consultancy service work for the development of wind farms at their premises. During the financial year, the division has carried out 24 various consultancy services.



EYA of wind farm using open wind software



Micrositing of the proposed wind farm based on resource grid

Forecasting & Information Technology

The Forecasting & IT unit of NIWE has been established to carry out R&D on VG Power forecasting and to provide forecasting services to stakeholders. The IT unit also continues to upgrade and maintain NIWE's IT infrastructure. The brief activities carried out by the F&IT unit are as follows:

Wind and Solar Power Forecasting

The National Institute of Wind Energy (NIWE) and the National Renewable Energy Laboratory (NREL) collaborated on a project to examine optimal practices for renewable energy forecasting in India and worldwide to support the attainment of the 500 GW green energy target. The initial report has been completed based on the initial findings and recommendations.

Conducted a Benchmarking study on the hybrid wind and solar forecasting system, and prepared a report.

Information Technology

- Based on suggestions from the user divisions, NIWE improved the following web portals:
  - RLMM Online Portal
  - Expenditure Portal
  - Recruitment Portal
  - Vayumitra Skill Development Programme Portal
  - Internship Portal
  - Offshore Portal
- Veeam Backup software has been installed and has commenced backing up various Vms.
- The backup storage server has been installed and configured with storage as an immutable disk to safeguard the data against attacks.

- An operational storage server has been purchased and its configuration has been finalized.
- An endpoint security server has been installed to protect endpoint devices and VMs from cyberattacks.
- Completed the purchase of various IT devices, software, and its renewal.
- Completed a successful security audit, addressing and rectifying all the security vulnerabilities identified in the NIWE infrastructure security assessment.
- NIWE has revised its IT policy (ITP-01 Rev.02).
- The content on the NIWE website has been refreshed and updated.

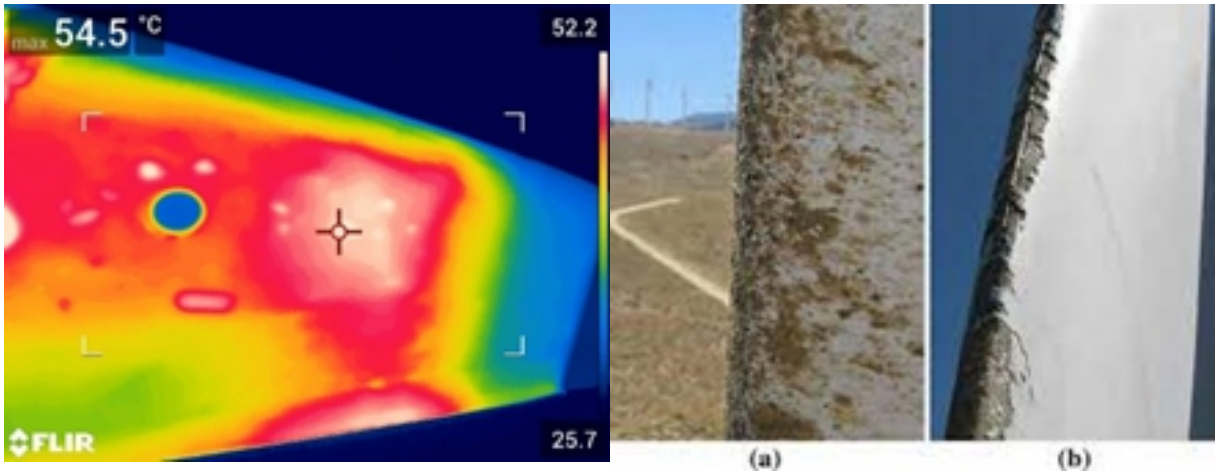
Geo-Tagging of Wind Turbines

As of March 2023, NIWE has applied geotagging to approximately 28,500 wind turbines, representing a combined capacity of 32 gigawatts.

International Project - Indo Danish Project

Maintenance and Repair Strategy for Wind Energy Development

- Framed a survey inquiry form for the training need for technician schemes blade repair, as well as for the purpose of gathering recommendations for damage assessment, blade repair and the prevention of common errors.
- Conducted a survey to determine the extent of the damage to wind turbine blades and the cost of repairing them.
- Prepared literature on blade damage identification techniques.
- Conducted meetings with various NDT suppliers, blade engineers to initiate the experiment and get quotations to understand the quality of inspection using the Infrared technique and other various techniques.



Blade Damage

- Preparation of a journal paper entitled "Damage Assessment and repair strategies for wind turbine blade composite materials" is in progress.

In-house Research Project

Development of Controller/Interface System to control different OEM WTG in the Bhuj area

Wind turbine installations are increasing day by day in the country and the Government of India has an ambitious target of installing 500GW from RE by 2030. Most of these wind turbines are located in remote areas and some of the wind turbines are in the border area of India. In general, WTG is controlled by the respective OEMs with their preparatory SCADA controller systems. Hence, it is not difficult to control the individual or group of multiple OEMs wind turbines with a common SCADA controller device.

Ministry of Defence have requested the Ministry of New and Renewable Energy to develop a centralized controller to control the different make of wind turbines located in the National border area. In this regard, Ministry has formed a committee to monitor the development and implementation of the SCADA controller device at Bhuj Air Force Station. Committee has proposed to develop a centralized Interoperable controller/interface system to control the different OEM's WTG.

Based on the recommendations the following activities have been carried out by NIWE:

- Prepared a tender document for the development of a SCADA controller/interface system project.
- Successfully developed the control system, configured the necessary hardware and software at Bhvad and Naranapar pooling substations for managing 220kV and 33kV feeder levels.
- Delivered the required hardware and software at Bhuj Air Force Station in December 2022 and conducted a pre-demonstration.
- Successfully installed the master controller SCADA system at Bhuj Air Force Station and carried out a trial run on 27th March, 2023.

RE Projects

NIWE services now include support for academic institutions and PSUs in developing renewable energy projects in the wind and solar sectors. NIWE will assist with project development and performance monitoring activities to ensure successful implementation

2 MWp Ground Mounted Grid Connected Solar Power Plant at Indian Institute of Management (IIM), Trichy

- Conducted a Performance Ratio (PR) study for the time period beginning April 1, 2021, and ending March 31, 2022, and compiled the results into a report.
- Monitored SCADA data on a daily basis
- Had meetings with the Contractor regarding the Power plant Generation
- Visited the site and checked the following activities
  - Module cleaning
  - Inverter check
  - Transformer check
  - WMS check
  - Transmission line clearance check
  - Substation visit

SCADA system data view

- O&M Performance Ratio analysis has been carried out

O&M activities

1 MW (AC) Ground Mounted Grid Connected Solar Power Plant at Madurai Kamaraj University (MKU), Madurai

- Monitored SCADA data on a daily basis
- Visited the site and checked the following activities
  - Module cleaning
  - Inverter check
  - Transformer check
  - WMS check
  - Transmission line clearance check
  - Substation visit
- Had meetings with the Contractor regarding the Power plant Generation
- Verifying Performance Ratio and CUF for quarterly basis

O&M activities

SCADA system data view

Site Visit

- Dr. K. Boopathi, Director and Division Head, attended the launch event for "Maritime Spatial Planning & Port Study for India" at Westin, Chennai on 23rd November, 2022. The event was inaugurated by H.E. Mr. Freddy Svane, the Ambassador of Denmark to India, and MNRE Joint Secretary, Shri Dinesh Jagdale.
- On 9th December, 2022, Dr. K. Boopathi attended the launch of the "Tamil Nadu Wind Energy Roadmap" by the Global Wind Energy Council (GWEC). The event was jointly launched by SED fund under the guidance of Tamil Nadu Government in Chennai.

- Dr. K. Boopathi served as a panel member at the "Industry -Academia Conclave-2022" at NMAM Institute of Technology, organised by NITTE, Karnataka on 20th December, 2022.
- Dr. K. Boopathi, Division Head and Engineers conducted a site visit on 21st December, 2022, to identify an appropriate area at NIEPMD, Muttukadu for establishing a Solar Power Plant on the rooftop of the buildings of NIEPMD.

Site assessment (rooftop) for solar power plant

- A team consisting of the Division Head and Project Engineers are conducting a site visit to oversee the foundation work of a 2MW WTG at VOC Port trust, Tuticorin.

Foundation work progress at VOC Port Trust

Intensive Internship Training

Facilitated an intensive internship training program for 16 Electrical and Electronics Engineering students from the Government College of Engineering, Tirunelveli. The training took place at WTRS in Kayathar from 20th July to 23rd August, 2022.

Celebration of Cyber Jaagrookta Diwas (CJD)

Field visit Training session

Organized and celebrated the "Cyber Jaagrookta (Awareness) Diwas (CJD)" on 06-10-2022 in NIWE, Chennai. The program's main objective is to create awareness of "Cyber Crime and Cyber Hygiene". As a part of the celebration, the following activities have been performed.

- Conducted an online 'Cyber Awareness Quiz' programme for self-assessment.
- Circulated Guidelines for Cyber Security Awareness in order to create awareness about the Cyber Security and NIWE IT policy,
- Distributed/pasted the cyber awareness photographs / short sentences Pamphlets Banners in all Walk pathways / common areas of NIWE to create awareness about cyber threats & security.

Awareness programme on Cyber Crime and Cyber Hygiene

A special program was organized to raise awareness about "Cyber Crime and Cyber Hygiene". Shri. M. Kalaiarasan, Inspector of Police from the Cyber Crime Department of Tamil Nadu Police, delivered the keynote address based on his 23 years of experience in the police service. The speech included various case studies to emphasize the importance of cyber hygiene.

NIWE Security Officer Shri. N. Ramalingam briefed the audience about the security practices followed in NIWE and how to be vigilant to avoid cybercrime-related issues. Shri. A. Senthil Kumar, Director & Division Head (S&R), presented the memento and honoured the Chief Guest.

Honouring the chief guest

Chief Guest speech

Standards and Regulation

Introduction

Wind energy sector is consistently growing in India with the increased unit size, higher hub height & larger rotor diameter and with a strong manufacturing base. Standards & Regulation (S&R) division provides various services for the healthy and orderly growth of wind energy sector. The wind energy in India has matured over decades and is presently considered as a mainstream source of Renewable power generation.

Standards

S&R division has been providing the technical support to Bureau of Indian Standards (BIS) for the standards related works on a continuous basis throughout the year. BIS is the National Standards Body which issues Indian Standards. A separate committee viz., Wind Turbines Sectional Committee (ETD 42) was formulated by BIS for preparation of Indian standards on wind turbines, under the Chairmanship of Director General, NIWE. S&R division, which is part of BIS ETD 42 committee, provides the technical support to BIS for the preparation of Indian Standards on wind turbines and also in all the standards related works. Director & Division Head, S&R division along with Deputy Director (T) attended the 12th meeting of Wind Turbines Sectional Committee (ETD 42) of BIS held on 06.09.2022 through video conference under the Chairmanship of DG, NIWE. The working group meeting on standards was organized towards carrying out standardization works. During the year 2022-23, five Indian standards on wind turbines have been finalized and accepted by BIS for printing. A total of Twenty Three Indian standards on wind turbines have been finalized so far.

Contribution to IEC / IECRE

India is the "P" Member in IEC TC 88 committee (through BIS) which issues IEC standards on wind turbine. India is also a member in "The IEC System for Certification to Standards Relating to Equipment

for Use in Renewable Energy Applications (IECRE System) through BIS, which aims to facilitate international trade in equipment and services for use in Renewable Energy Sectors while maintaining the required level of safety".

S&R division has been providing technical support to BIS regularly on the works related to IEC standards / IECRE documents by reviewing various draft IEC standards / IECRE documents and in preparation of voting recommendations for those draft standards / documents. During the year, various draft IEC/IECRE documents have been reviewed. Based on the review, voting recommendations along with the comments have been sent for 38 nos. of draft IEC/IECRE documents to BIS, as a voting recommendation from India to IEC / IECRE and thus the contribution towards formulation of International standard / documents.

IEC TC 88 and IECRE meetings

Director & Division Head, S&R and Deputy Director (T) attended the IEC TC 88 Meeting held during 09.05.2022 – 11.05.2022 conducted by IEC through online.

Director & Division Head, S&R and Deputy Director (T) attended the IECRE 9th REMC meeting held during 11.10.2022 - 12.10.2022 conducted by IECRE through Video Conference.

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

MNRE is issuing Revised List of Models and Manufacturers of wind turbines (RLMM) periodically for the healthy and orderly growth of wind power projects in the country. S&R division, which is part of RLMM committee, has been providing support to MNRE in verification of documentation submitted along with application and in handling RLMM related works. During the year, review of documentation has been completed for 26 wind turbine models and the review comments have been submitted to MNRE / RLMM committee. Director & Division Head, S&R and Deputy Director (T) along with DG, NIWE participated in Nine RLMM committee meetings during the year, through video conference and provided technical support for finalizing the recommendations for issuing the RLMM lists.

Prototype Wind Turbine Models

The amended guidelines of MNRE dated 02.06.2016 for installation of prototype wind turbine models in India is being implemented by S&R division. By implementing the guidelines, the division facilitates the installation of Prototype wind turbine models in the country to carry out the Type Testing for obtaining Type Certificate. In this regard, NIWE has formulated a committee to take the suitable decision on issuing the recommendation letters. S&R division provides the technical support to the committee in verification of the documentation submitted on the prototype wind turbine models for its compliance as per the requirements stipulated in the MNRE guidelines for issuing the recommendation letter(s) in connection with grid synchronization.

During the year, the review / verification of documentation of three prototype wind turbine models in connection with installation of prototype wind turbines in India as per MNRE guidelines has been completed. During the said period, three prototype committee meetings were organized and the division has issued letter in connection with grid synchronization for three prototype wind turbine models with a rated capacity in the range of 3000 kW to 5200 kW for the purpose of Type testing.

Quality Management System (QMS)

The services offered by NIWE viz., "Provision of type certification, testing and wind resource assessment services related to wind energy" are already certified as per ISO 9001:2015 by DNV. Director & Division Head, S&R, as a Management Representative (MR) of ISO 9001:2015, has carried out various works for maintaining ISO 9001 documentation / certification of NIWE. Further, the Internal Audit and Management Review (MR) meeting have been conducted, as per requirements of ISO 9001: 2015 standard.

During the year, Director & Division Head S&R, as a Management Representative (MR), provided the support for the Re-Certification audit of quality management system as per ISO 9001:2015 conducted by DNV. During the audit, inspection services have been included in the scope of audit in addition to the existing scope of the certification.

Successfully completed the re-certification audit and obtained the certificate issued by DNV with the revised scope viz., "Provision of type certification, testing resource assessment and inspection services related to wind energy", with an extended validity until 10.08.2025. The continual improvement and maintaining the quality management system are ongoing.

PWMM Committee Meeting – through Hybrid mode

25th Management Representative Meeting

Re-certification audit conducted by DNV

12th ETD 42 Sectional Committee Meeting

Standards Working Group meeting

Testing of Wind Turbine

Wind Turbine Test Station (WTTS)

Asia's first large wind turbine Test Station was established in NIWE's Wind Turbine Test Station (WTTS) near Kayathar in Tamil Nadu. It also acts as the lead coordinating Laboratory for Testing Wind Turbines, as per the National Laboratory Policy of Govt. of India, for arranging Inter Laboratory Comparison works to ensure the validity of results.

It was established with the technical assistance of Danish Technical University (DTU) (earlier RISO National Laboratory), Denmark, under the Danish International Development Agency (DANIDA) grant and with financial assistance and guidance from the Ministry of New and Renewable Energy (MNRE), Government of India. The Test Station has the following facilities:

- ISO / IEC 17025:2017 accredited Test facility and is the only Laboratory under NABL in India since the year 2006 for Wind Turbine Testing
- Two test beds to test "Large Wind Turbines" up to a total capacity of 1650 kW with readily available grid connection for each test bed.
- Four Test beds to test "Small Wind Turbines" and test beds can be expanded further on request.
- Readily available reference met masts in front of each test bed for heights of 75 meters and 50 meters for acquiring Meteorological Data at the Hub Heights of the test turbines.
- Two control rooms, one test bed with state-of-art data acquisition systems and two office buildings.
- Availability of state-of-the-art data acquisition systems for measurements at the control room of each test bed.
- Availability of an office cum workshop building at WTTS with support team and facilities to carry out any needed measurements support.

- The workshop is equipped with adequate space to accommodate a MW WTG nacelle for instrumentation purposes.
- Availability of sensors and transducers as per the requirements of IEC standards which are stored as per the Quality Management System procedures.
- Availability of 9 Nos. of Micon 200kW, one number each of Suzlon 600 kW, Senvion & Inox 2000 kW make wind turbines' for development of new measurements techniques and National Research.
- In-house laboratory for functionality check-up of instruments.
- In-house laboratory for data warehousing, signal conditioning, equipment design, training & calibration etc.

WTTS is presently equipped to undertake Type Testing (TT) of wind turbines and to conduct the testing of wind turbines as per the requests of customers/manufacturers and the following tests are normally carried out as per International standards IEC 61400-1,2, IEC 61400-11, IEC 61400-12-1/2, IEC 61400-13 and IEC 61400-21.

- Power Performance Measurement
- Yaw Efficiency Test
- Safety and Functional Test
- Load Measurements
- Additionally, capable of undertaking User-defined measurements in Mechanical Loads, Performance Assessment, Acoustics & Power Quality

The above mentioned tests are also being offered to be carried out at customer sites if the site meets the requirements of IEC Standards regarding terrain, obstacles, sector for measurements and wind conditions.

The testing facilities are certified as per the requirements of ISO 9001:2015 and accredited as per the requirements of ISO / IEC 17025:2017.

The Division contributes to the wind energy community by knowledge transfer through National and International training programmes and scientific papers to various National / International journals and conferences on a periodic basis.

Large Turbine Testing

DST approved R&D Project

DST approved R&D project with Test Turbine model – SIVA 250 / 50 kW with 30 / 32 rotor diameter from M/s. Siva Wind Turbine India Pvt Ltd. measurement was completed. Data under analysis for report preparation. Post measurement calibration are underway at Test Bed B, WTTS, Kayathar.

Type Testing of INOX 3 MW

An agreement was signed between NIWE & M/s. INOX for Type Testing of its Wind Turbine INOX DF/3000/145 3.0 MW Power Booster Mode 3.3 MW Rotor Blade Type SR71 (T-Bolt), Hub Height 100 m IEC WT Class IIIB , Rojmal, Rajkot of M/s. INOX WIND LTD. The Instrumentation work has been completed and measurements are under progress.

An Amendment agreement was signed between NIWE & M/s. INOX on 13th January 2023 for the additional measurements of the Power Curve at 3.3 MW of the Test Turbine at Rojmal, Rajkot.

Acoustic Noise Measurements of Senvion 2.3M130 / 2.7 MW

An agreement was signed between NIWE & M/s. SENVION for Acoustic Noise Measurement of its model – Senvion 2.3 M 130 / 2.7 MW turbine, (HH 120m, RD 130m at Tithawa, Gujarat of M/s. Senvion Wind Technology Private Limited. OEM expected to provide the test turbine soon for measurements. The measurements to start in the ensuing windy season.

Limited period Power Curve & Load Measurements of its model GWL 225 a wind turbine of M/s. Southern Wind Farms Limited

An agreement was signed between NIWE and M/s. Southern Wind Farms Ltd on 29th November 2022 for Measurements of its model GWL 225 a wind turbine with 29.8 m rotor diameter Varapatti Village, Sultanpet Post, Sulur Talak, Coimbatore District. Instrumentation for GWL 225 kW Wind Turbine has been carried out by NIWE Team from 20th March 2023 to 31st March 2023. Also calibration of load channel by external load method was carried out.

An Amendment Agreement signed between NIWE and M/s. Southern Wind Farms Ltd on 09th March 2023 for Limited Power Curve & Load Measurements of its model GWL 225 a wind turbine under testing at Varapatti Village, Coimbatore

Agreement on 29th November 2022 was signed between NIWE and M/s. Southern Wind Farms for Limited Measurements of its model GWL 225 with 29.8m rotor diameter for wind turbine located at Varapatti Village, Sultanpet Post, Sulur Taluk, Coimbatore District.

Specific Achievement

As a part of continued capacity building, the Laboratory has now started works on Power Quality Measurements and also through the INDEP program, a strategic alliance between India & Denmark, has embarked on capacity building in the field of Offshore Wind Turbine Testing in the area of Power Performance and Load Measurements for its personnel.

Organize one National Level ILC under GOI-MNRE's National Lab Policy:

"To conduct one Inter-Lab Comparison by NIWE for laboratories and other service providers for achieving harmonization in interpretation of Standards."

- ILC on Power Quality as per IEC 61400-21 with Indian Labs is underway.
- 5 Laboratories are taking part in Power Quality ILC namely, DNVGL, Windguard, UL, 4fores, NIWE.
- NDA has been signed with all Laboratories.
- ILC instruction documents has been shared with participants.
- ILC data has been provided.
- Results received from participants.
- Draft report on results comparison completed

"Participation in Proficiency Test operated by IECRE-MEASNET group"

- Results for IECRE Proficiency Test on Acoustic Noise conducted by MEASNET declared on 01st September 2022 and NIWE passed successfully.
- Participated in IECRE Proficiency Test on Power Performance and also Load Measurements conducted by MEASNET
- Proficiency Test (PT) by MEASNET in Power Quality as per IEC 61400-21 for RETL are under progress. NIWE has registered for the Power Quality PT program.

Capacity Building towards RETL Recognition

As part of India Denmark Energy Partnership Program (INDEP), the division is directly involved in "Work Package 1 - Capacity building of NIWE Human Resources". The objectives of the program are as follows:

- To evaluate NIWE's competencies within tests performed after IEC 61400-12-1 Ed. 1 (2005) - Power curve measurements and IEC 61400-13 (2015) - Measurements of mechanical loads.
- To propose where NIWE competencies should be reinforced in order to prepare the laboratory to become a RETL within IECRE.
- To support capacity building in NIWE personnel using skype meetings with selected experts from DTU Wind Energy.

32 interactive sessions were undergone by Division with support of DTU Wind during the years 2020 and 2021.For the year 2022, 12 sessions have been completed as on date out of 17 sessions planned.

Application for IECRE RETL could be made in couple of months, due to the following completed / ongoing efforts:

- Having initiated review of test reports by DTU Wind under INDEP program,
- Participated in IECRE Proficiency tests (PT) viz., Acoustics (completed) and Power Performance (under progress) and applied for IECRE PT viz., Load Measurements and Power Quality,

- Established QMS and improving QMS under INDEP Program and compliance with ISO / IEC 17025 by having National Accreditation.

NABL accreditation of NIWE Testing services: Accreditation under NABL

Successfully undergone Audit by NABL on 16th & 17th July, 2022 at WTTS, Kayathar and received Certificate of Accreditation valid until 02nd August 2024 as per ISO / IEC 17025:2017 for both Permanent and Site facility for the following scope.

- Power Performance Measurements (PPM)
- Duration Test
- Load Measurements and Yaw Efficiency Test
- Safety & Function Test

DST-DTU (Denmark Technical University) Project – Hybridize (three Year Research Project starting in 2019-20)

Completed Measurements on Turbine before modification.

Test cum Research Centre for Offshore Wind Turbines at Dhanushkodi

Honorable MoS Shri Bhagwant Khuba had visited the Dhanuskodi Test site on 03rd October, 2022 and was apprised by Director General, NIWE on the development works related to "Offshore Wind Test Cum Research Centre" and the Greening of Rameshwaram Island Project.

DTU, DEA and NIWE team visited Dhanushkodi for an onsite assessment of the proposed locations of the Test Station on 11th October, 2022 and also for defining the full scope and objective of the proposed

MoS accompanied by DG, NIWE at Dhanuskodi Site, TN

"Test cum Research Centre for Offshore Wind Turbines" at Dhanuskodi. NIWE along with DTU, Denmark had organized the External Stakeholders workshop on 13th October, 2022 at NIWE, Chennai. The DANISH Team led by Mr. Peter Hjuler Jensen, Deputy Head of Wind & Energy Systems Department, DTU attended the workshop and shared the Denmark's Offshore Wind Test Center Østerild's experiences.

Stakeholder meeting for Setting Up of Offshore Wind Test Cum Research Centre at Dhanuskodi & Chennai

Certification of Wind Turbine

Type Certification is to confirm that the wind turbine type is designed, documented and manufactured in conformity with design assumptions, specific standards and other technical requirements. The continuation of the accreditation as per the requirements of ISO / IEC 17065 for the certification services has benefited the wind industry to avail accredited type and component certification services for wind turbines within India in line with international practices. It has also created visibility for NIWE amongst International Accredited Certification Bodies. Type Certification of wind turbines facilitates the orderly growth of the wind energy sector. Currently, NIWE provides Certification services in India based on IS/IEC 61400-22:2010. The following major activities have been completed by the division.

Type Certification Projects Completed

NIWE has obtained international accreditation for the certification services as per the ISO / IEC 17065 standard from National Accreditation Board for Certification Bodies (NABCB), Quality Council of India (QCI). The following Type Certification projects and works have been completed by NIWE.

- NIWE has signed an agreement with M/s. RRB Energy Limited (RRBEL) for Pre-Evaluation of documentation in connection with the Type Certification of the Pawan Shakti - 600 kW wind turbine model. Pre-Evaluation has been completed and the documentation requirements have been communicated to RRBEL.
- NIWE has signed an agreement with M/s. Inox Wind Ltd. for Pre-Evaluation of documentation in connection with the Type Certification of the "DF/2000/113" wind turbine model. Pre-Evaluation has been completed and the documentation requirements have been communicated to M/s. Inox Wind Ltd.
- NIWE has issued Type Certificates for 3 wind turbine models so far as per IS/IEC 61400-22:2010 certification scheme. As per the scheme requirement, the maintenance activities have been completed for the 3 type certificates.

Re-Accreditation Assessment by NABCB

NIWE obtained accreditation on 16th April, 2020 for the certification services valid up to 15th April, 2023 as per the requirements of ISO / IEC 17065 standard from the National Accreditation Board for Certification Bodies (NABCB), Quality Council of India. As per accreditation requirements, NABCB has conducted the Re-Accreditation process and the following activities have been completed successfully by National Institute of Wind Energy (NIWE)

- Certification division has prepared the necessary documents for the Re-Accreditation process as per the requirements of ISO / IEC 17065:2012 and submitted requisite documents along with the application to NABCB.
- NABCB has carried out document review and completed the Document Review Report (DRR) process.
- Subsequently, NABCB has conducted the Office Assessment (OA) on 6th & 7th March, 2023 as per the requirements of ISO / IEC 17065:2012 at NIWE, Chennai. The assessment findings were successfully closed and accepted by NABCB. The Re-Accreditation process is ongoing.

Accreditation for Inspection Services

Certification Division has prepared the documents as per the requirements of ISO / IEC 17020:2012 and submitted the application for Accreditation as "Type-A Inspection Body" to National Accreditation Board for Certification (NABCB), Quality Council of India (QCI). The application has been accepted by NABCB and the Document Review Report (DRR) process is ongoing.

Inspection Projects

- NIWE has signed an agreement with M/s. GAIL (India) Limited to carry out the verification of wind turbine components / accessories in 17 numbers of 'Vensys 77' wind turbines installed at the Periyapatti site, Tamil Nadu. Certification division conducted the verification of the availability of the replaced spares / components identified by NIWE in 17 numbers of Vensys 77 wind turbines installed at Periyapatti site, Tamil Nadu of M/s. GAIL (India) Limited (GAIL)" and the project has been completed successfully.
- Certification Division engineers performed an inspection of INOX 2 MW Wind Turbine Blades and Tower at INOX's Manufacturing facility at Barwani, Madhya Pradesh in connection with the consultancy project for VOC Port Trust, Tuticorin, Tamil Nadu.
- Certification Division Engineers performed an inspection of INOX 2 MW Wind Turbine Hub and Nacelle at INOX's Manufacturing facility at Bhuj, Gujarat in connection with the consultancy project for VOC Port Trust, Tuticorin, Tamil Nadu.

Agreement for Cooperation

A co-operation agreement has been signed between NIWE, M/s TUV Rheinland Industrie Service GmbH, Germany and M/s TUV Rheinland (India) Private Limited, Bengaluru and routine interactions are ongoing on a continuous basis.

Quality Management System (QMS)

Wind Turbine Type Certification services of NIWE are certified as per the requirements of ISO 9001: 2015 by DNV Business Assurance B.V (DNV). During the year, the Certification Division has successfully undergone the Renewal Audit with the additional scope of 'Inspection Services' and has been recommended for renewal with the additional scope of inspection issued by DNV. The continual improvement and maintenance of the Quality Management System (QMS) are ongoing.

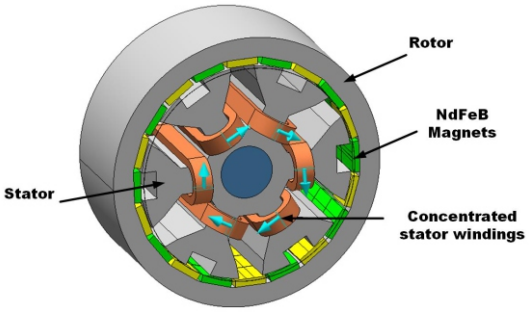
Research and Development

Wind-Driven Air Storage System

A novel wind driven compressed air storage system has been proposed with a 5 kW wind turbine mechanically coupled to a 5 HP compressor. The rotor of the wind turbine drives the compressor and the excess energy from the wind turbine is stored locally, as compressed air in storage pressurized tanks installed in the tower. The system has been installed and is presently under testing.

Direct Drive Doubly salient permanent magnet (PM) machine for Roof-Top wind energy application

The project aims at indigenous design and development of "Direct-drive rare-earth free doubly salient PM machine" for roof-top wind power generation with high efficiency and power density to minimize the overall losses, cost and maintenance. A novel 3.7 kW Ferrite Vernier PM generator has been designed, simulated and processed for fabrication.



Proposed Axial direction PMVG


Wind driven air storage System

NIWE Internship Programme

The programme aims to encourage students and provides an opportunity to choose renewable energy as their career option. To create awareness and interest in the field of renewable energy research among the young talented sciences, Management and Engineering students NIWE invites application from the eligible candidates for the "NIWE-Academic Associate Programme"(NIWE-AAP).

During the year 2022-2023, thirty graduate and post graduate students /faculties have completed their internship/project work and twenty-three graduate & post graduate students are currently pursuing internship and project work at NIWE in the field of wind and solar mentored by various subject matter experts.

SKILL DEVELOPMENT & OUTREACH

- Training
- Prof. Anna Mani Information Centre
- Events
- Papers and Publications
- International Meetings / Training
- Visitors

Training

NIWE is the only premier institute of its kind in the country and it is NIWE's responsibility to scale up wind energy development not only in the country but also in neighbouring and developing countries. As a part of such activities, the Skill Development and Training and Infrastructure Management (SDT & IM) Division, as a focal point for information dissemination and training programs is providing facilities for learning, training, upgrading the infrastructure for good research environment and also reaching out to the public as well as industries to promote wind energy in the country. The following are the activities of the Division during 2022-23:

Training Courses

One of the major activities of Skill Development and Training Division is conducting training courses for National and International participants on various aspects of Wind Energy Technology. The Division has successfully organized 45 International and 55 National Training courses since 2004. Till now more than 2000 national participants from all parts of the country and more than 1000 international professionals from 102 countries were trained.

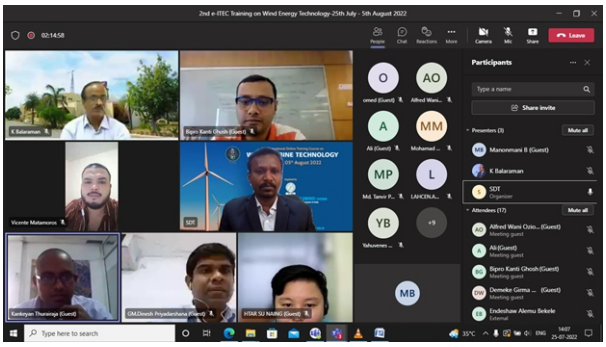
During the year 2022-23, total of 13 training courses were conducted (5 international and 8 national training courses) with the lectures of the courses delivered by engineers and experts from NIWE, wind turbine industries and academic institutions. As part of every training, Course Material (compilation of write-ups of all the presentations / lectures) has been prepared and distributed to all the participants.

International Training Course

NIWE has been conducting training courses under Indian Technical and Economic Cooperation (ITEC) programme sponsored by Ministry of External Affairs (MEA), Government of India. During the period 2022-23, the following 5 training courses both online and physical mode have been conducted;

Second International Online Training Course on "Wind Turbine Technology"

2nd International Online Training Course on "Wind Turbine Technology" was conducted during 25th July to 05th August, 2022 under e-ITEC programme. The course addressed all aspects of Wind Power starting



Participants at Inaugural Function

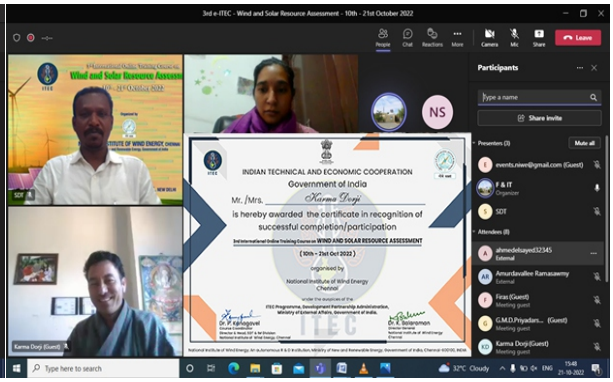
Virtual Certificate Distribution during Valedictory Function

from introduction to Wind and its technology, Wind Resource Assessment, Installation and Commissioning, Grid integration, Operation and Maintenance of windfarms, Financial and Policy Aspects along with Testing and Certification of Wind Turbines. The course was attended by 23 participants from 12 ITEC countries, Bangladesh, Cambodia, Ecuador, Egypt, Ethiopia, Iraq, Mauritius, Morocco, Myanmar, Nepal, South Sudan and Sri Lanka. The training course was inaugurated by Dr. K. Balaraman, Director General in the presence of the Course Coordinator Dr. P. Kanagavel, Director and Division Head, SDT & IM after the welcome address delivered by the Course Coordinator.

Third International Online Training Course on "Wind and Solar Resource Assessment"

Third International Online Training Course on "Wind and Solar Resource Assessment" held during 10th to 21st October, 2022 under e-ITEC programme. The Course addressed all aspects of Wind and Solar Resource Assessment in a focused manner along with a brief introduction to wind and solar technology. 14 participants from 11 different countries (Afghanistan, Bhutan, Bolivia, Egypt, Iran, Iraq, Kenya, Mauritius, Myanmar, Philippines and Sri Lanka) had attended the course. The training course was inaugurated by Dr. K. Balaraman, Director General in the presence of the Course Coordinator Dr. P. Kanagavel, Director and Division Head, SDT & IM after the welcome address delivered by the Course Coordinator.

Participants during Inaugural Function



Online Distribution of the Course Certificate

Course Coordinator Dr. P. Kanagavel, Director and Division Head, SDT & IM delivered the valedictory address and distributed e-certificates to the participants.

Twenty Sixth International Training Course on "Wind Turbine Technology and Applications"

Twenty Sixth International Training Course on "Wind Turbine Technology and Applications" was conducted during 01st to 24th February, 2023 under ITEC programme. The course addressed all aspects of Wind Power starting from Introduction to Wind and its Technology, Wind Resource Assessment, Installation and Commissioning, Operation and Maintenance Aspects of Wind Farms in a focused manner along with Financial and Policy Aspects. 29 participants attended the course from 20 ITEC countries, Bangladesh, Ethiopia, Iraq, Kenya, Lesotho, Morocco, Myanmar, Nicaragua, Niger, Nigeria, Peru, Seychelles, Somalia, Sudan, Syria, Tanzania, Tajikistan, Trinidad & Tobago, Tunisia and Uzbekistan.

Release of Course Material

The training course was inaugurated by Dr. Rajesh Katyal, Director General (Additional Charge) in the presence of Shri. J. C. David Solomon, Director and Division Head, M & T and the Course Coordinator, Dr. P. Kanagavel, Director and Division Head, SDT & IM.

Course Certificate distribution

31 classroom lectures and 6 practical classes were scheduled apart from study visits to windfarm and wind turbine manufacturing factory. The participants were taken for a factory visit to M/s. Siemens Gamesa Renewable Energy Pvt. Ltd., Mamandur and field visit to southern part of Tamil Nadu to visit Wind Turbine Test Station at Kayathar, where they got exposure on small and large wind turbine testing process apart from visiting Gearbox Workshop at Elecon Engineering Company Limited, Thirumangalam, Operation and Maintenance of Wind Turbines at Speed Team Infra Private Limited, Tenkasi and Centralized Monitoring Station at Suzlon Global Services Limited, Thattaparai.

Shri. S.A. Mathew, Director & Division Head, Certification had delivered the valedictory address and distributed the course certificates to all the participants during the Valedictory function.

Fifth Special International Training Course on "Wind Resource Assessment and Wind Farm Planning"

Fifth Special International Training Course on "Wind Resource Assessment and Windfarm Planning" was conducted during 01st to 24th March, 2023 under ITEC programme. A total of 28 participants attended the course from 10 ITEC countries, Cambodia, Ethiopia, Ghana, Kenya, Myanmar, Sudan, Syria, Tanzania, Togo and Uzbekistan.

Glimpse of Inaugural function

Course Coordinator, Dr. P. Kanagavel, Director and Division Head, SDT & IM delivered the Welcome Address and Shri. S. A. Mathew, Director and Division Head, Certification delivered the Inaugural address and inaugurated the course.

23 classroom lectures and 11 practical classes were scheduled apart from study visits to Wind Monitoring Station, Windfarm and Wind Turbine Manufacturing Factory.

The participants were taken to the training facilities of M/s. Vestas Wind Technology India Pvt. Ltd., Ammapettai and visited Advanced Seismic Testing and Research laboratory (ASTaR) at CSIR-Structural Engineering Research Centre, Chennai. The participants enjoyed the practical sessions by visiting the facilities at NIWE. The participants also visited Wind Turbine Test Station at Kayathar, Wind Turbine O & M facilities at RS Windtech Engineers Pvt. Ltd., at Aralvoimozhy, Tamil Nadu and Centralized Monitoring Station at Suzlon Global Services Limited, Radhapuram.

Dr. P. Kanagavel, Director and Division Head, SDT & IM distributed the course certificates to all the participants during the Valedictory function.

Course Certificate distribution

Second Special International Training Course on "Solar Resource Assessment and Development of Solar Power Plant"

Second Special International Training Course on "Solar Resource Assessment and Development of Solar Power Plant" conducted during 15th March to 07th April, 2023 under ITEC programme. A total of 28 participants attended the course from 16 countries namely, Azerbaijan, Cote D'Ivoire, Ethiopia, Ghana, Kenya, Myanmar, Nepal, Niger, Nigeria, Philippines, South Sudan, Sri Lanka, Tajikistan, Tanzania, Tunisia and Uzbekistan.

The inaugural function commenced with the Welcome Address by the Course Coordinator, Dr. P. Kanagavel, Director and Division Head, SDT & IM. The course was inaugurated by Dr. Jai Prakash, Deputy Director General, National Institute of Solar Energy and Dr. Nikhil PG, Assistant Director (Tech.), National Institute of Solar Energy was also present during the inaugural function.

32 lectures were scheduled apart from practical training, study visits to solar power plant and solar

Inauguration of the Course

panels manufacturing factory. The participants visited the facilities of J P Solar, Kondangi, Chennai and they were taken to the southern part of Tamil Nadu to visit Wind Turbine Test Station at Kayathar, where they got an exposure on Wind - Solar Hybrid System, Solar Water Pump System at Virudhunagar, Tamil Nadu and 100 MW Solar Power Plant of NLC India Limited at Kayathar.

Dr. P. Kanagavel, Director and Division Head, SDT & IM distributed the Course Certificates to all the participants during the Valedictory function.

Course Certificate distribution

National Training Course

NIWE has been conducting training courses for national participants and during the period 2022-23, the following 7 training courses both online and physical mode have been conducted. The course has given a picture of complete know-how and pave the way to go about setting up financially viable wind farm projects.

Customized Training Course on "Wind Resource Assessment and Software Application" for the officials of JSW Energy Limited, Mumbai

Customized Training Course on "Wind Resource Assessment and Software Application" was conducted during 28th March to 09th April, 2022 for the officials of JSW Energy Limited, Mumbai. The course was inaugurated by Dr. K. Balaraman, Director General on 28th March, 2022 by lighting the lamp, Kuthuvilakku after his inaugural address in the presence of Course Coordinator Dr. P. Kanagavel, Director and Division Head, SDT & IM, Shri J.C. David Solomon, Director & Division Head of M&T and Dr. K. Boopathi, Director & Division Head of OWD, DAF & IT. Course Material was released by DG, NIWE during the inaugural function and distributed to all the participants. The course was attended by 15 Participants.

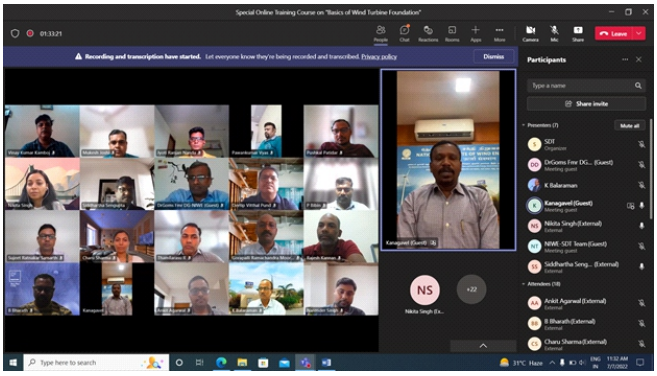
Dr. P. Kanagavel, Director and Division Head, SDT & IM along with Dr. K. Boopathi, Director & Head, OWD, DAF & IT distributed the Course Certificates to all the participants during the valedictory Function. The participants had shared their feedback in the valedictory function and appreciated the quality of lectures and practical sessions.

Release of Course Material

Distribution of Course Certificate

Online Customized Training Course on "Basics of Wind Turbine Foundation" for the officials of M/s. Sembcorp Green Infra Limited

Online Customized Training Course on "Basics of Wind Turbine Foundation" was conducted during 7th & 8th July, 2022. The course was attended by 19 participants. The training had



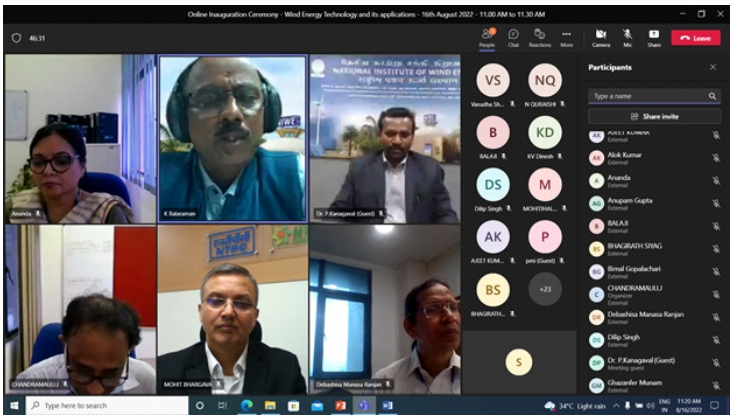
Glimpse of the training

covered different concepts and types of foundations used for wind turbines installed onshore and offshore in detail by the experts.

Special Training Course on "Wind Turbine Technology" for NPTI students

Special Training Course on "Wind Turbine Technology" was conducted for the Students of Renewable Energy, Post Graduate Diploma Course (PGDC) of National Power Training Institute (NPTI), Badarpur, New Delhi during 25th July to 10th August, 2022. The course was attended by 4 participants. The training addressed all the aspects of wind energy along with the practical sessions at Wind Turbine Test Station at Kayathar.

Customized Online Training Course on "Wind Energy Technology and its Applications" specially for the officials of NTPC Limited



Inauguration of NTPC Training

Customized online training course on "Wind Energy Technology and its Applications" was conducted specially for the employees of NTPC Limited during 16th August to 20th October, 2022. The training was a capsule of 36 lectures addressing all aspects of Wind Power starting from what is Wind Energy to Wind Resource Assessment, Project Implementation and Operations & Maintenance Aspects in a focused manner along with Financial and Policy Aspects towards going for economically viable wind farm projects. The course was attended by 29 participants.

Special Training Course on "Basics on Wind Energy Technology" for the officials of Renew Power Pvt. Ltd.

Special training course on "Basics on Wind Energy Technology" was conducted for the officials of M/s. Renew Power Pvt. Ltd. during 28th to 30th November, 2022. The course addressed all aspects of Wind Power starting from what is Wind Energy to Wind Resource Assessment, Project Implementation

DG, NIWE inaugurating the Course & releasing the Course Material

and Operations & Maintenance Aspects in a focused manner along with Financial and Policy Aspects towards going for economically viable wind farm projects. A total of 25 Renew Power officials working in different facets of wind projects had participated enthusiastically in the course.

The Programme Director, Dr. P. Kanagavel, Director and Division Head, SDT & IM delivered the welcome address which was followed by the inauguration of the training course by Dr. Rajesh Katyal, Director General (Additional Charge) who also released the course material. Shri J.C. David Solomon, Director & Division Head, M&T delivered the Vote of Thanks.

Dr. P. Kanagavel presented the course summary of the training during the Valedictory Function. Shri. Swamy Reddy, Senior HR Manager had shared his view about the training on behalf of Renew Power Pvt. Ltd. after which the Course Certificates were distributed to all the participants.

Special Training Course on "Basics of Wind Energy Technology" for the officials of Nordex Engineering and Technology Pvt. Ltd.

Special training course on "Basics of Wind Energy Technology" was conducted for the officials of Nordex Engineering and Technology Pvt. Ltd. during 7th to 9th November, 2022. A total of 25 Nordex officials working in different facets of wind projects had participated in the course.

The Programme Director, Dr. P. Kanagavel, Director and Division Head, SDT & IM delivered the welcome address. Dr. Rajesh Katyal, Director General (Additional Charge) delivered inaugural address and released the course material. Shri S.A. Mathew, Director & Division Head, Certification delivered the Vote of Thanks.

There were 14 presentations scheduled during the course, which was handled by 12 NIWE Engineers.

The participants received their Course Completion Certificates, which was distributed by Dr. Rajesh Katyal, Director General (Additional Charge) on 9th November, 2022.

Release of Course Material

Special Training Course on "Basics of Wind Energy Technology" for the officials of Nordex Engineering and Technology Pvt. Ltd.

Special training course on "Basics of Wind Energy Technology" was conducted for the officials of Nordex Engineering and Technology Pvt. Ltd. during 23rd to 25th January, 2023. 29 Nordex officials working in different areas of wind projects have participated in the course.

Dr. Rajesh Katyal, Director General (Additional Charge) has distributed the Course Certificates to all the participants after his address during the valedictory function.

Glimpse of Inaugural Function & release of Course Material

Dr. Rajesh Katyal is distributing the Course Certificates to Participants

Special Training Course on "Wind Energy Technology" for the officials of Gail (India) Ltd.

Special training course on "Wind Energy Technology" was conducted for the officials of Gail (India) Ltd. during 27th February to 1st March, 2023. The training programme was inaugurated by Shri. S.A. Mathew, Director and Division Head, Certification.

10 lectures were scheduled and visit to Wind Turbine Manufacturing Factory of M/s. Siemens Gamesa Renewable Energy Pvt. Ltd., Mamandur. Dr. P. Kanagavel, Programme Director has distributed the Course Certificates to all the participants.

Release of Course Material

Dr. P. Kanagavel distributing the Course Certificates

Vayumitra Skill Development Programme (VSDP)

MNRE has assigned NIWE to implement "Vayumitra Skill Development Programme (VSDP)" in eight windy states and Kerala as the nodal agency. The objective of the programme is to create skilled workforce for the Indian wind energy sector to achieve the Government of India targets. Based on the discussions and demand of the wind industry, the following three major areas / job levels were identified namely O&M Electrical & Instrumentation Technician – WPP, O&M Mechanical Technician – WPP and Site Surveyor – WPP prepared by Skill Council for Green Jobs (SCGJ) and approved by the National Skill Development Corporation (NSDC) of the Ministry of Skill Development and Entrepreneurship, Government of India.

The programme envisages training of 5010 Participants through Training of Participants (TOP) programme (1830 participants in O&M Mechanical Technician, 1830 trainees in O&M Electrical Technician and 1350 trainees in Site Surveyor). The TOP programme will be conducted at the identified Training Partners located close to Wind Farms of nine windy states, namely Andhra Pradesh, Gujarat, Karnataka, Kerala, Maharashtra, Madhya Pradesh, Rajasthan, Tamil Nadu and Telangana. To train the participants through the identified institutions, NIWE will train 690 Trainers (345 participants from the institutes and 345 participants from the wind industry) through 12 days Training of Trainers (TOT) programmes.

Activities

An exclusive web portal (https://vsdp.niwe.res.in/) for VSDP with all requisite content and features was launched for the benefit of all the stakeholder. Identified 12 Training Centers through Expression of Interest (EOI) during the financial year 2022-23 and the remaining 10 are to be identified in the financial year 2023-24. Five batches of Training of Trainers (TOT) programme have been successfully

completedme and trained 144 trainers. All the 144 participants have been assessed by Skill Council for Green Jobs (SCGJ) and certified by National Skill Development Corporation (NSDC) of Ministry of Skill Development and Entrepreneurship (MSDE), Government of India.

Glimpses of TOT Programme

24 batches of Training of Participants (TOP) programme have been completed and trained 720 participants and 11 batches of TOP programme is ongoing with 330 participants which will be completed by May, 2023.

Glimpses of TOP Programme

NIWE as an Awarding Body and Assessment Agency of NCVET

Indian wind energy sector is in compelling need to create mass trained / skilled manpower to achieve the targets fixed by the Government of India and become the global leader in the sector. As Wind Energy is a multi-disciplinary subject and requires expertise to handle the Awarding and Assessment functions to ensure quality process, NIWE has all the needed expertise and hence had approached National Council for Vocational Education and Training (NCVET) for dual category of both Awarding Body and Assessing Agency. After undergoing a lot of documentation and formalities, NIWE was granted provisional status of Awarding Body on 29th August 2022. To get the necessary dual recognition, NCVET had insisted NIWE to own at least one Qualification Pack (QP) pertaining to the sector. Accordingly, a QP on "Wind Energy Technology Engineer" for 536 Hrs. duration was developed and submitted to NCVET for approval. The approval for grant of QP is awaited for NIWE to become an Awarding Body (AB) and Assessment Agency.

Prof. Anna Mani Information Centre

The Library has more than 2000 books on Renewable Energy in general and Wind Energy in particular with allied subjects. NIWE's Library has also subscribed to all major National and International Journals & Magazines as well as print and online related to wind energy and other allied engineering disciplines. It is also having Technical Reports, Conference Proceedings and Annual Reports and other information resources like Wind Atlas and Data books, Maps, Manuals, Souvenirs, Digital Resources, etc. NIWE Library has been computerized with Library Automation Software and Online Public Access Catalogue (OPAC) facility is made available. It has also membership with leading libraries like IIT, Anna University and American Library for reference purposes. The following are the present resources of the NIWE Library;

Description	2022-23
Books	2220
Donated Books	457
Standards (Hard Copy, CD ROM & PDF)	798
Annual reports	166
Conference /Proceedings	446
Manuals	33
Technical Report	355
Non-Book Materials	166
Subscribed Periodicals	30
International Journal	12
International Magazine	02
National Journal	06
National Magazine	09
E-Journals (Online)	18
News Paper	13

The Library was visited by 1728 visitors and 126 books were issued to NIWE staff during the period.

Events

Celebration of Global Wind Day and NIWE Silver Jubilee

The Global Wind Day celebration along with Silver Jubilee of National Institute of Wind Energy and IREDA-NIWE Annual Awards Ceremony was held on 15th June, 2022 at New Delhi. The event was organized under the aegis of Azadi Ka Amrit Mahotsav (AKAM), Ministry of New and Renewable Energy (MNRE) in collaboration with National Institute of Wind Energy (NIWE) and Indian Renewable Energy Development Agency (IREDA). The celebration was inaugurated by the Hon'ble Shri. R. K. Singh, Union Minister for Power and New and Renewable Energy. Shri. Singh delivered the keynote address and

Inauguration of the Global Wind Day Celebration by Hon'ble Minister Shri. R.K. Singh

Shri. Dinesh Jagdale, Joint Secretary, MNRE delivering the welcome address

Shri. Indu Shekhar Chaturvedi, Secretary, MNRE delivering address the august gathering

Hon'ble Shri. R. K. Singh Union Minister delivering the keynote address

Dr. K. Balaraman, DG, NIWE delivering the vote of thanks

congratulated the wind fraternity for their achievement. He appreciated the role of NIWE in the development of wind energy sector. Shri. Indu Shekhar Chaturvedi, Secretary, MNRE, Shri Dinesh Jagdale, Joint Secretary, MNRE and Dr. K. Balaraman, Director General, NIWE were present in the ceremony. Dr. P. Kanagavel, Director and Head, SDT & IM, NIWE, Convener of IREDA-NIWE Annual Awards for Wind Energy has coordinated the programme.

The officers from Central and State Governments, DISCOMs, CPSUSs, Wind Industry and Academia, Think Tanks, Consultants & others participated in the celebration.

IREDA-NIWE Annual Awards for the year 2020, 2021 and 2022

The IREDA-NIWE Annual Awards for Wind Energy to promote innovation, Research & Development, Manufacturing, Developing & Harnessing Wind Energy at the State and National levels and to motivate individuals, stakeholder to strive for the best in the field was announced for the following three broad categories. For the year 2022, the category of "Best Performing State Nodal Agencies of the year" award was revised as per Review committee's suggestion. The new category of the award was the "Best Performing Wind Farm Developer".

- IREDA-NIWE Award for the Best Performing State Nodal Agencies for the Year (2020 and 2021) and IREDA-NIWE Award for the Best Performing Wind Farm Developer (2022)

- IREDA-NIWE Award for the Best Institution of Higher Learning in Wind Energy and
- IREDA-NIWE Award for the Best Research Work

The selection of the awardees for all the three categories was done through an eminent "Jury Committee" comprising of Senior Members from Government Organizations, Academic Institutions, Media and Financial Sectors. The Jury Committee adopted the notified criteria and recommended the nominations for each of the category to be awarded for the year from the nominations received, segregated under the various categories.

Due to Covid Pandemic restrictions, NIWE postponed the award ceremony since 2020. It was subsequently scheduled during the "Global Wind Day 2022" and "Silver Jubilee Celebration of NIWE" on 15th June, 2022.

The Award Ceremony was held on 15th June, 2022 at New Delhi and inaugurated by the Hon'ble Shri R. K. Singh, Union Minister for Power and New and Renewable Energy. Shri Singh awarded the prizes carrying a citation and a cash award of INR 1.00 lakh to the following three categories of winners of IREDA-NIWE Annual Award for Wind Energy for the year 2020, 2021 and 2022.

The best performing State for the year 2020

The award was conferred to State of Tamil Nadu which had installed the highest wind capacity during 2018-19 with 771.8 MW. The award was received by Ms. Asia Mariam, IAS, Managing Director, TEDA.

Ms. Asia Mariam, IAS, Managing Director, TEDA receiving the Award

The best performing Research Institutions for the year 2020

The award was conferred to the "Gandhigram Rural Institute", Dindigul, Tamil Nadu for promoting Research, Innovation, Knowledge Transfer in the field of Wind Energy.

Vice Chancellor in-charge of Gandhigram Rural Institute, Dindigul receiving the Award

Best Research Work in Wind Energy for the year 2020

The award was conferred to Dr. A. Sathyabama, Associate Professor, National Institute of Technology Surathkal, Karnataka for her work in Wind Energy. She has published over 90 research papers and completed three R&D project from CSIR, SERB and DST.

Dr. Sathyabama receiving the Award

The best performing State for the year 2021

The award was conferred to State of Gujarat which had installed the highest wind capacity during 2019-20 with 1468.45 MW. The award was received by Ms. Shivani Goyal, IAS, Director, GEDA.

Ms. Shivani Goyal, IAS, Director, GEDA receiving the Award

The best performing Research Institutions for the year 2021

The award was conferred to the Basaveshwar Engineering College, Bagalkote, Karnataka for promoting research, innovation in the field of Wind Energy. They have carried out Pioneering Research Wind Data, Small Wind Turbine and Micro-grid.

Principal of the Basaveshwar Engineering College receiving the Award

Best Research Work in Wind Energy for the year 2021

The award was conferred to Dr. Agnimitra Biswas, Associate Professor, National Institute of Technology, Silchar, Assam for his work on Vertical Axis Wind Turbine using experimental and computations methods. He has published over 75 research papers.


Dr. Agnimitra Biswas receiving the Award

The best performing Wind Farm Developer of the year 2022

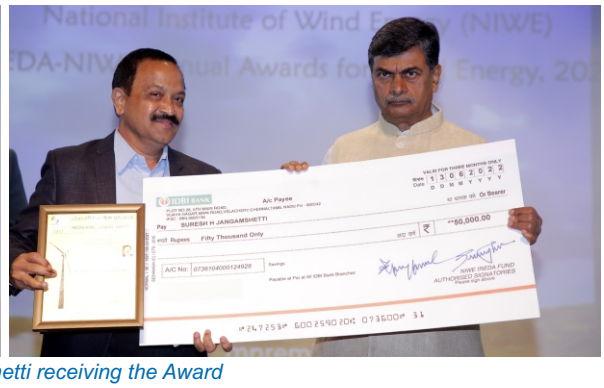
The award for the best performing Wind Farm Developer for the year 2022 was conferred to M/s. Renew Power Private Limited, Gurugram, Haryana.


Officials of M/s. Renew Power Private Limited receiving the Award

Best Research Work in Wind Energy for the year 2022

(The award for the year 2022 is shared by two researchers)

The first researcher is Dr. Suresh H Jangamshetti, Professor & Head, Basaveshwar Engineering College, Bagalkote, Karnataka for his work on Short-term Wind Forecasting Model for Planning of Wind Plants and Scheduling Power.

Dr. Suresh H. Jangamshetti receiving the Award

The second researcher is Mr. Neeraj Verma, Ph.D student, Sardar Vallabhai National Institute of Technology, Surat, Gujarat for his work on Aerodynamic Design Optimization of Horizontal Axis Wind turbine having multiple aerofoil with chord based Reynolds number consideration.

Mr. Neeraj Verma receiving the Award

Azadi ka Amrit Mahotsav 2021-22

NIWE with the support of MNRE has scheduled eight events to commemorate 75 years of India's Independence (Azadi ka Amrit Mahotsav). The announcement about the event along with the instructions and venue were hosted on NIWE website and circulated through Social Media pages along with the Flyer.

Seventh Event - RE Camp on the Operations of Wind Turbine at Kayathar

The seventh event on "RE Camp on the operations of Wind Turbine" at Kayathar (for 15 and 19 age group) was conducted during 30th May to 04th June, 2022. 74 registrations were received and 32 participants have attended the camp at Kayathar

It created awareness and provided a good foundation on the principles of engineering behind wind energy technology and its operations in the field during all the seasons. The camp was very helpful to the participants to facilitate a valuable forum for dialogue and open exchange of views and experiences with professionals. Participation certificates were distributed to the participants at the end of the RE camp.

Explaining gear box and main shaft of wind turbine

Explaining 75 kW Solar photovoltaic power plant

Participants at WTTS Campus, Kayathar

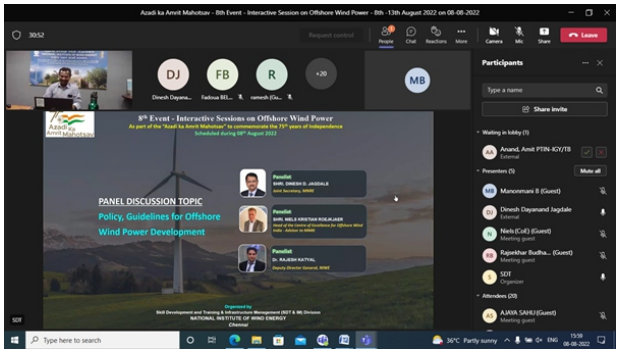
Eighth Event - Interactive Session on Offshore Wind Power

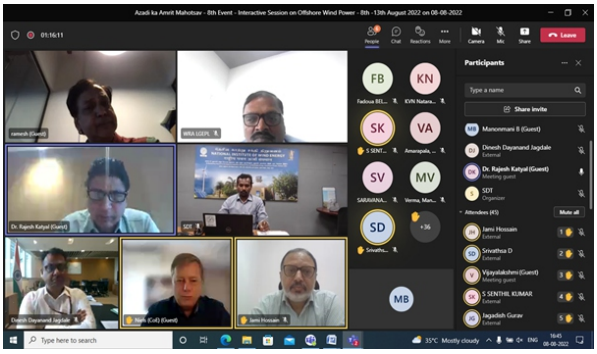
"Interactive Sessions on Offshore Wind Power" was conducted successfully on 08th August, 2022, 10th August, 2022 and 12th August, 2022.

Totally 409 number of National and International participants registered from wind and its allied industries, students, scholars from academic institutions and professionals for the following three topics.

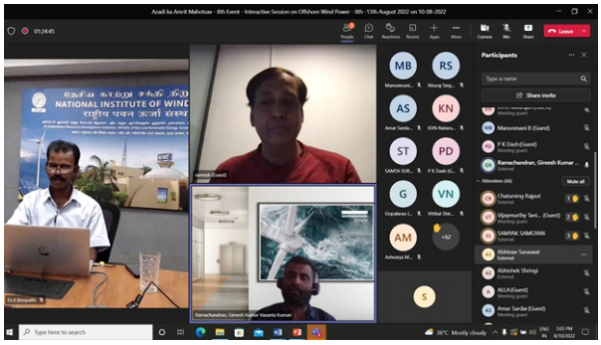
Panel members and registration details :

Date and Time of the Event	Topic	Panel Members	Registrations received against the announcement	Participants attended the event
08.08.2022 1600 to 1700 hours (IST)	Policy, guidelines, for off-shore wind power development	Shri Dinesh D. Jagdale Joint Secretary, MNRE Mr. Neils Project Director, CECP-NIRAS Dr. Rajesh Katyal Deputy Director General, NIWE	143	52
10.08.2022 1600 to 1700 hours (IST)	Challenges, issues towards develop-ment of offshore wind power	Dr. K. Boopathi Director & Head OWD, DAF & IT, NIWE Dr. Prabir Kumar Dash Scientist, MNRE Dr. Gireesh Ramachandran Principal Specialist, DNV	136	85
12.08.2022 1600 to 1700 hours (IST)	Supply chain / logistics / skill gap analysis of offshore wind power	Dr. K. Balaraman, DG, NIWE Mr. Vibhash Garg, Director, PwC Mr. Ramesh Singhal, CEO, i-Maritime	130	42

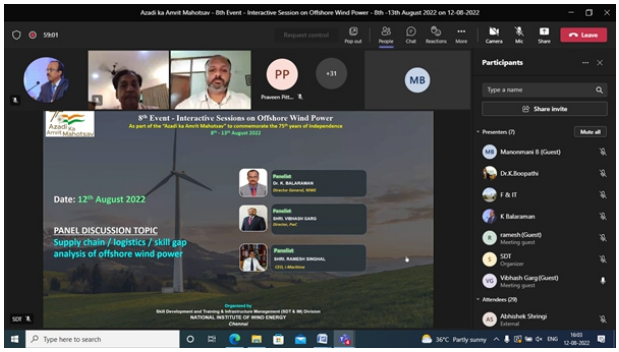




08th August, 2022 - Policy, guidelines, for off-shore wind power development



10th August, 2022 - Challenges, issues towards development of offshore wind power



12th August, 2022 - Supply chain / logistics / skill gap analysis of offshore wind power

The sessions were very lively and interactive. The panel members shared their inputs on the topics, "Policy, guidelines for off-shore wind power development", "Challenges, issues towards development of offshore wind power" and "Supply chain, logistics, skill gap analysis of offshore wind power" followed by Q&A session and interaction with the participants.

The event has provided a wonderful learning experience for the participants on offshore Wind power project developments.

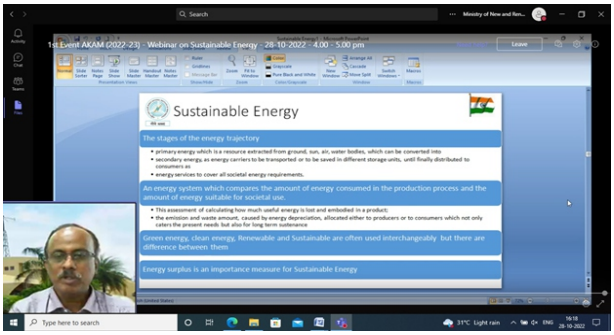
Azadi ka Amrit Mahotsav-2022-23

The following six events were conducted. The speakers gave a detailed presentation on different aspects of respective theme. It was followed by Q&A session, which was open for the participants to chat and interact with the speakers. All the doubts and queries raised by the participants were clearly explained and clarified by the speaker. The answers were very useful to the participants to have a feel

about the sector. The participants were very much satisfied with the presentation and had reciprocated the same by appreciating and thanking the speaker.

Event details

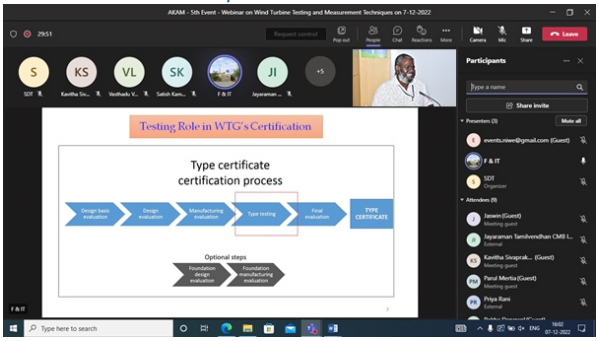
Event No. & Date	Webinar Theme	Speaker	Registrations received	Participants attended
1st Event 28.10.2022	Sustainable Energy	Dr. K. Balaraman DG, NIWE	245	44
2nd Event 11.11.2022	International Standards on Wind Turbines	Shri. A. Senthil Kumar, Director & Head S&R Division, NIWE	84	23
4th Event 02.12.2022	Type Certification of Wind Turbines	Shri. S.A. Mathew Director & Head Certification Division, NIWE	80	15
5th Event 07.12.2022	Wind Turbine Testing and Measurement Techniques	Shri. J.C. David Solomon Director & Head Measurements & Testing Division, NIWE	57	26
7th Event 27.01.2023	Wind Resource Assessment	Dr. K. Boopathi Director & Head, OWD, DAF & IT Division, NIWE	78	38
8th Event 15.02.2023	Design and Layout of Wind Farms	Shri. J. Bastin Deputy Director (Technical) Unit Chief Data Analytics, NIWE	74	25



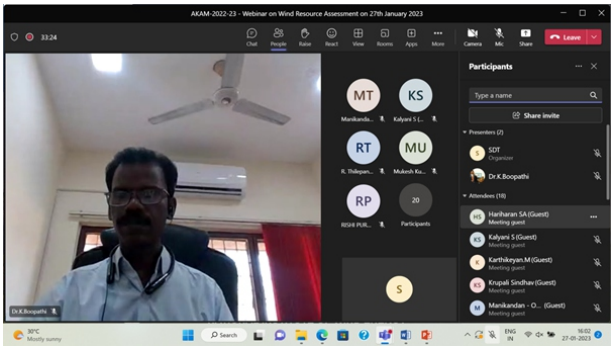
Glimpse of the 1st Event

Glimpse of the 2nd Event

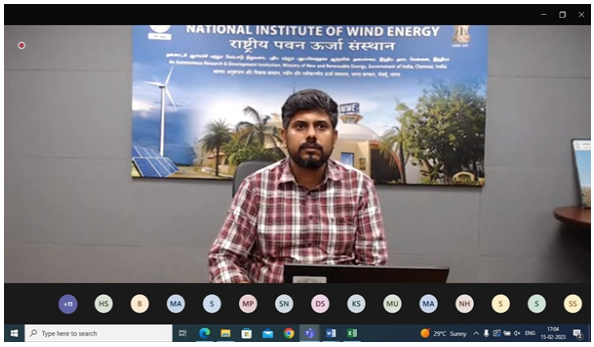
Glimpse of the 4th Event



Glimpse of the 5th Event



Glimpse of the 7th Event



Glimpse of the 8th Event

AKAM – Renewable Energy (RE) Camp

RE camp created awareness and provided a good foundation on the principles of engineering besides wind energy technology and its operations in the field during all the seasons. The camp was very helpful to the participants to facilitate a valuable forum for dialogue and open exchange of views.

The participants had opportunity to acquire knowledge on wind energy technology, wind resource assessment, aerodynamic technology, wind components, wind electrical generator and operations of wind turbine through classroom lectures. Participation certificates were distributed to the participants at the end of the RE camp during the valedictory function.

Third Event - "RE Camp at Kayathar for ITI / Diploma Students

The third event, "RE Camp at Kayathar for ITI / Diploma Students" was conducted during 19th to 23rd December, 2022. 32 registrations were received and 28 participants have attended.

Classroom Lecture

Participants learning to wear Harness belt for safety

Group Photo of the Students at Wind Farm, WTTS, NIWE, Kayathar

Sixth Event - RE Camp at Kayathar for Engineering Graduate Students

The sixth event, "RE Camp at Kayathar for Engineering Graduate Students" was conducted during 6th to 10th February, 2023. 58 registrations were received and 29 participants have attended.

On the last day, the participants have been asked to present a PPT about what they have learned about the aspects of Wind Turbines in the RE Camp. They presented and explained the key takeaways of the RE Camp which was grasped from the classroom lectures, practical classes and Field Visits.

Learning to wear safety belt for climbing

Certificate distribution

Group Photo - at the WTTS, NIWE, Kayathar Campus

Exhibition

NIWE had participated in the Fourth International Trade Fair and Conference, "Windergy India 2022" held at Pragati Maidan New Delhi from 27th to 29th April, 2022 organised by Indian Wind Turbine Manufacturers Association (IWTMA). NIWE had established a Stall and showcased its activities in an elaborate manner by way of digital display boards highlighting the core activities, distributing brochures, and short videos. The 3-day trade fair and conference had provided a platform to meet,

interact and engage with policymakers, regulatory authorities, international and domestic technology, solutions and service providers from the wind power industry. About 300 visitors has visited the NIWE stall for enrichment of their knowledge in the wind energy sector.

Students & Training Participants Visit

To create awareness and to motivate towards research on wind energy, achieving the indigenization and also to create awareness about the activities and services of NIWE, schools and college students are encouraged to visit the campus. During the period from April 2022 to March, 2023, the following visits were coordinated.

- 22 students and 2 staff of Anna University, Chennai on 25th April, 2022.
- 70 students and 1 staff of S.A. Engineering College, Chennai on 31st May, 2022.
- 21 students and 2 staff of College of Fisheries Engineering, Nagapattinam on 3rd June, 2022.
- 25 participants and 1 coordinator of ITEC Course participants of National Productivity Council, Chennai - delegation from Tanzania through USAI Energy Utility Partnership Program (EUPP) under Executive Exchange on RE Integration to WTTS, Kayathar on 5th August, 2022
- 78 students and 4 staff of Ramachandra Public School, Chennai on 23rd August, 2022.
- 60 students and 1 staff of Vel Tech Rangarajan Dr. Sagunthala R&D Institute of Science and Technology, Chennai on 1st September, 2022.
- 36 students and 23 staff of Winners of Econ Events by Government Corporation and Government Aided Schools, Department of Environment, Government of Tamil Nadu on 3rd September, 2022.
- 64 students and 4 staff of Ramachandra Public School, Chennai on 6th September, 2022.
- 21 participantsand 1 coordinator of ITEC Course participants from National Productivity Council, Chennai - delegation from 14 countries on 21st November, 2022.
- 50 students and 2 staff of Vellore Institute of Technology (VIT), Chennai on 09th November, 2022.
- 43 students and 2 staff of Vellore Institute of Technology (VIT), Chennai on 14th November, 2022.
- 5th year student (Architecture) of 5th McGan's Ooty School on 20th January, 2023.
- 8 participants and 1 coordinator of NITTTR, Chennai on 2nd March, 2023.
- 15 participants and 1 coordinator of ITEC Course participants for National Productivity Council, Chennai - delegation from various countries on 13th March, 2023.

Under MoU signed from 01.04.2022 to 31.03.2023

- MoU signed between National Lignite Corporation (NLC) India Limited & National Institute of Wind Energy (NIWE) for "Strategic Collaboration in developing onshore and offshore Wind Power Projects in India" at NIWE, Chennai on 19th October, 2022 for five years.
- MoU signed between NIWE and National Thermal Power Corporation (NTPC) for Strategic

Collaboration in developing onshore and offshore wind power projects in India on 03rd November, 2022.

- MoU signed between MNRE & NIWE for one year
- MoU signed between Hindustan Group of Institutions and NIWE on 07th November, 2022 for three years

National Institute of Wind Energy (NIWE) and UK's Offshore Renewable Energy (ORE) Catapult) have signed a Joint Declaration of Intent (JDI) on 22nd June, 2022 to establish a five-year collaboration programme. They will work together on innovation and research and development, market and supply chain growth, new technology test and demonstration and skills programmes for offshore wind.

MoU inked between NIWE and ORE-Catapult

Papers and Publications

1. "Deep-Learning-Based Adaptive Model for Solar Forecasting Using Clustering," an article published in MDPI Energies 2022, 15(10), 3568; https://doi.org/10.3390/en15103568 – 13th May, 2022 - Authors: Sourav Malakar, Saptarsi Goswami, Bhaswati Ganguli, Amlan Chakrabarti, Sugata Sen Roy, K. Boopathi and A. G. Rangaraj.

2. "A Critical Review of Detecting Faults and Damages in Wind Turbine Blades" a review article published in Journal of Biosensors & Renewable Sources - https://lupinepublishers.com/biosensors-renewable-sources/pdf/JBRS.MS. ID.000128.pdf - 15th Sep.2022 – Authors: AG Rangaraj, P Vanaja Ranjan and Shobanadevi Ayyavu.

3. Low Specific Power Wind Turbines for Reduced Levelized Cost of Energy', Wind Turbines - Advances and Challenges in Design, Manufacture and Operation. IntechOpen, Oct. 26, 2022. Doi: 10.5772/intechopen.103139 - Authors: Dr. K. Balaraman and J. Bastin.

4. "Tonality Analysis of Wind Turbine Noise based on IEC Standard." Dr..G Arivukkodi, AEE. Shri David Solomon. J.C, Director and Division Head, NIWE Dr. K. Balaraman, Director General, Ms.Lina Stefi G.L, Project Engineer. IJRASET (International Journal for Research in applied Science and Engineering Technology) – September 2022 (published)

5. Dr. G. Arivukkodi, Assit. Executive Engineer, NIWE has presented the paper " Psycho – Acoustic Survey on Wind Turbine Noise and Environmental impact" published in International Journal for Research in Applied Science and Engineering Technology (IJRASET), Volume 10 Issue X October, 2022.

6. Bhukya Ramdas, Deputy Director (Tech.), NIWE has presented the paper on " Validation of Global Wind Atlas for India" at IPRECON Conference held on 17th December, 2022 at College of Engineering, Karunagapally, Trinvandrum, Kerala. The paper has been published in IEEE International Power & Renewable Energy Conference dated 16th March, 2023.

7. Bhukya Ramdas, Deputy Director (Tech.), NIWE has presented the Research Paper Titled "Fault Detection in Wind Turbines using K-Nearest Neighbor Regression and K-Means Clustering: An Analysis of Rotor Bearing Temperature Data" in International Conference on Artificial Intelligence for Energy & Renewable Energy Systems (ICAIERESYS-2023) held on 19th March, 2023 at New Delhi.

8. Hari Bhaskaran, Deputy Director, NIWE submitted the article "Wind Characteristics of Tamil Nadu coast towards development of Microgrid" – A case Study for simulation of small scale hybrid wind and solar energy system – submitted the article in Ocean Engineering, Elsevier.

International Meetings / Trainings

- Shri, B. Krishnan, Assistant Director (Technical) attended Training on "RE Integration in Power System" at DTU Denmark organized by DTU, Denmark from 9th October to 6th November, 2022.
- Dr. K. Boopathi, Director, participated in the "Offshore Energy Exhibition and Conference (OEEC22)" at Amsterdam, the Netherlands, jointly organized by Dutch Government, Offshore Wind, and Hydrogen trade Organizations and the OEEC organization from 29th November to 1st December, 2022.
- Dr. G. Arivukkodi & Shri.Naveen Muthu attended Acoustic training arranged by Hottinger Bruel and Kjaer, Denmark from 02nd to 8th May, 2022.

Acoustic training at Denmark

- 5 days Bladed Training (Aeroclastic Simulation Software) conducted by DNV through Online by Shri. S.A. Mathew, Director, Shri. S. Arulselvan, Assistant Executive Engineer and Shri. S. Paramasivan, Assistant Engineer.

Meeting with CEO, NABCB at New Delhi

Inspection at Blade and Tower facility

Visitors

Delegates visited to NIWE

DELHI

Shri. Bhagwanth Khuba, Hon'ble Minister of State for Chemicals & Fertilizers and New & Renewable Energy visited NIWE on 22nd August, 2022

DENMARK Visit of Indo-Danish Delegates regarding Centre of Excellence for Offshore Wind and RE 22nd November, 2022

UNITED NATIONS Mr. Erik Solheim (6th Executive Director, United Nations Environment Programme, Former Under Secretary General), Member of The Governing Council headed by the Chief Minister of Tamil Nadu visited WTTS, Kayathar Test Center on 14th December, 2022 to understand the Working of WTTS and its service to the nation. A. R. Hasan Ali, Assistant Executive Engineer made the official presentation to the dignitary guest.

WTTS, Ayyanaruthu Village, Tuticorin, Tamil Nadu

NORWAY HE Mr Hans Jacob Frydenlund, Ambassador Norway along with his team visited NIWE and discussion held Recapitulating Re-Fuelling Indo-Norway Cooperation in Ocean Space on 3rd August, 2022 at NIWE.

FINANCE & ADMINISTRATION

Finance & Administration

Anti Terrorism Day

Anti-Terrorism Day was observed on 20th May, 2022. As per the instructions received from Ministry of Home Affairs, a pledge taking ceremony was undertaken in a befitting manner.

Swachhta Hi Seva Week

The Swachhata Pakwada was observed from 01st to 15th June, 2022. As a part of the observance, the Swachhata activities like cleaning of NIWE Campus at Chennai & Kayathar were carried out.

International Yoga Day

In pursuance of Ministry of Ayush, GoI, International Yoga Day was observed on 21st June, 2022 with the activities viz., Orientation Programme on Yoga, demonstration and practice of Yoga based on the common yoga protocol. As per the Ministry's directions, short duration protocol Yoga break

(Y-break) for people at work places was observed and Y-break App and videos was installed on Smart Phone and followed the demonstration of yoga through Mobile App.

Independence Day

As per the precedence followed by NIWE, Independence Day was celebrated at NIWE on 15th August, 2022.

Vigilance Awareness Week

Vigilance awareness week for the year 2022 was observed in NIWE from 31st October to 6th November, 2022 as per the instructions of Central Vigilance Commission and the pledge was taken by the employees of NIWE.

On the observance of Vigilance awareness week, an essay competition was conducted on 03rd November, 2022 on the theme "Corruption free India for a Developed Nation" and cash awards were presented to the winners.

Rashtriya Ekta Diwas

As per the instructions of Cabinet Secretary, GoI, Rashtriya Ekta Diwas (National Unity Day) was observed on 31stOctober, 2022 and pledge was taken by the employees of NIWE.

Constitution Day

The "Constitution Day" was celebrated on 26th November, 2022. As part of the observance, the employees of NIWE have read the Preamble of Constitution of India under Hybrid mode. On this occasion, a lecture session on "Constitution of India" by an expert was also organized.

Republic Day

As per the precedence followed by NIWE, Republic Day was celebrated at NIWE on 26th January, 2023.

Martyrs' Day

As part of observance followed by NIWE, two minutes silence was observed at NIWE on 30th January, 2023 at their work places in memory of those who gave up their lives in the struggle of India's freedom.

International Women's Day

To celebrate the spirit of women empowerment every year, the International Women's Day was celebrated on 8th March, 2023 at NIWE. The women's day was celebrated by organizing a lecture session on "Gender Sensitive Issues" by a legal expert.

Internal Compliant Committee (ICC) at work place

In accordance with GoI instructions, an Internal Complaints Committee for women for redressal of complaints concerning sexual harassment in work place has been constituted in NIWE. The committee met at regular intervals and visited all the women employees in the campus. No complaint have been reported by the individual before the Committee.

Welfare and Safety Measures

As a preventive measure to protect the interest of the welfare of the staff members, the following activities have been carried out regularly at NIWE.

- Sanitizing of the campuses on daily basis.
- PPE kits have been procured for the personnel those who are sanitizing entire campus.
- Thermal scanners have been procured and thermal scanning has been done for all the staff on daily basis as well as for visitors and are being monitored regularly.
- Awareness Generation meeting on Communicable Diseases and Prevention and control of Covid-19 and Dengue was organized with the support of Department of Public Health and Preventive Medicine, Chennai on 29th August, 2022 and the staff of NIWE have participated in a large gathering and was benefited by the lectures delivered by the Health Department Officials.
- Covid-19 Vaccination (Booster Dose) was administered for NIWE staff and their family members on 17th September, 2022 with the great support of the Greater Chennai Corporation Authorities at Corporation Primary Health Centre, Pallikaranai.

Official Languages Act

NIWE has been an active member in the Town Official Language Implementation Committee, Chennai. The Hindi version of "PAVAN", the Quarterly News Bulletin of NIWE is considered a standard communication in Hindi.

Hindi fortnight was celebrated in NIWE from 14th to 30th September, 2022. Various competitions like Hindi essay writing, handwriting, stenography, etc. were conducted and prizes were distributed to the winners and participants.

Spoken classes are being taken in Hindi for non-Hindi speaking staff and also separate attention is being given to the staff for appearing in Official Language exams.

Right To Information Act

During the year 2022-23, 26 applications were received seeking information under RTI Act, 2005 and requisite details have been given. 1 No. of appeal has been preferred against the decision of CPIO.

Implementation of persons with disabilities act 1995

The following facilities are being made available to Persons with Disabilities

- Though NIWE is functioning in a two storey building (where lift is not mandatory) a lift has been provided for the convenience of physically challenged.
- A separate ramp has been provided to enable use of crutches / wheel chairs.
- Low level steps laid by the side of the lift for easy access.
- Post reservation for physically handicapped as per GOI rules.

FINANCE REPORT

- Balance Sheet
- Income & Expenditure
- Receipts & Payments
- Schedules
- Auditor's Report

NATIONAL INSTITUTE OF WIND ENERGY

An Autonomous R&D Institution, MNRE, Government of India

BALANCE SHEET AS AT 31ST MARCH, 2023

(Amount in Rs.)

FUND AND LIABILITIES	Schedule	31st March, 2023	31st March, 2022
CAPITAL ASSET FUND	1	26,23,87,933	23,12,52,543
RESERVES AND SURPLUS	2	43,04,36,105	42,90,20,129
CURRENT LIABILITIES AND PROVISIONS	3	20,38,79,951	39,91,61,436
TOTAL		**89,67,03,989**	**1,05,94,34,108**
ASSETS			
FIXED ASSETS			
(a) Created out of Central Governments Grants	4	22,61,66,778	19,02,73,383
(b) Out of Internal Generation Grants		3,62,21,157	4,09,79,159
CURRENT ASSETS, LOANS AND ADVANCES	5	63,43,16,054	82,81,81,566
TOTAL		**89,67,03,989**	**1,05,94,34,108**
SIGNIFICANT ACCOUNTING POLICIES	13		
NOTES ON ACCOUNTS	14		

For National Institute of Wind Energy

Sd/-
R Girirajan
Addl. Director
(F&A)

Sd/-
Dr.Rajesh Katyal
Director General

As per our Report attached
PPN & Co
Chartered Accountants
Firm Regn No.013623S
Sd/-
D. Hitesh
Partner
Membership No.231991

NATIONAL INSTITUTE OF WIND ENERGY

An Autonomous R&D Institution, MNRE, Government of India

INCOME AND EXPENDITURE ACCOUNT FOR THE YEAR ENDED 31ST MARCH, 2023

(Amount in Rs.)

INCOME	Schedule	CFA - Revenue	MOM - Revenue	IWSRA - Revenue	NE Region	SRRA	NIWE IREDA FUND	Hybridize	TARE Scheme (DST)	VAYU-MITRA	ITEC	TOTAL GRANTS 31/03/2023	IE 31/03/2023	TOTAL GRANTS 31/03/2022	IE 31/03/2022
		1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*(1+2+3+4+5 +6+7+8+9+10)*			
Income from Services	6	-	-	-	-	-	-	-		-	-	-	11,14,82,362	-	13,57,80,652
Income from publication	7	-	-	-	-	-	-	-		-	-	-	-	-	5,338
Interest Earned	8	-	-	-	-	-	-	-		-	-	-	1,70,42,192	-	1,52,46,076
Other Income	9	38,141	-	-	-	-	-	-		-	-	38,141	49,92,428	-	65,34,717
Interest Earned & Other Income (Grant)	3.1	2,46,475	-	-	-	-	5,69,845	32,022		7,60,520	-	16,08,862	-	14,08,301	-
Grants from Government of India allocated for Revenue expenditure during the year		12,00,00,000	-	-	-	-	-	-	3,35,000	-	1,20,91,500	13,24,26,500	-	25,47,16,408	-
TOTAL (A)		**12,02,84,616**	**-**	**-**	**-**	**-**	**5,69,845**	**32,022**	**3,35,000**	**7,60,520**	**1,20,91,500**	**13,40,73,503**	**13,35,16,982**	**25,61,24,709**	**15,75,66,783**
EXPENDITURE												-	-	-	-
Opening stock		-	-	-	-	-	-	-		-	-	-	-	-	-
Establishment Expenses	10	-	-	-	-	-	-	-		-	-	-	7,70,19,658	-	8,06,68,293
Consultancy Project Expenses	11 (b)	-	-	-	-	-	-	-		-	-	-	5,51,72,583	-	8,73,70,997
Other Administrative Expenses	11 (a)	2,96,66,098	-	-	-	-	-	-		-	-	2,96,66,098	-	3,23,03,852	-
Expenditure from Grants		-	7,32,248	6,06,944	-	-	8,39,391	6,54,797		1,03,69,443	30,89,150	1,62,91,973	-	47,27,216	-
On Advances/Deposits/ Prepaid /EMD,SD,PG's etc.,"	3.1	1,23,87,626	-	4,00,000	-	-	-	-		38,663	-	1,28,26,289	-	69,38,776	-
Refunded to Ministry												-	-	34,62,774	-
In house project expenditure		5,31,94,529	-	-	-	-	-	-		-	-	5,31,94,529	-	4,62,22,627	-
Expenditure for Earmarked Project		-	-		-					-	-	-	-	-	-
Expenditure out of Previous Year Advance		-	-	-	-	-	-	-		-	-	-	-	-	-
TOTAL (B)		**9,52,48,253**	**7,32,248**	**10,06,944**	**-**	**-**	**8,39,391**	**6,54,797**	**-**	**1,04,08,106**	**30,89,150**	**11,19,78,889**	**13,21,92,241**	**9,36,55,246**	**16,80,39,290**
Balance being excess of Income over Expenditure (A-B)		2,50,36,363	(7,32,248)	(10,06,944)	-	-	(2,69,546)	(6,22,775)	3,35,000	(96,47,586)	90,02,350	2,20,94,614	13,24,741	-	(1,04,72,506)
EMD,Performenc Guarnatee,Security Deposit Returned		-	-	-	-	-	-	-		-	-	-	-	-	-
Add: Opening Balance B/f (C)	3.1	40,838	12,42,62,522	10,21,434	-	(50,70,685)	1,28,88,490	12,25,396	-	2,79,81,970	-	16,23,49,965	-	(1,19,498)	-
Prior period adjustment (D)	12	-	-	-	-	-	-	-		-	-	-	-	-	-
Transfer to Capital Asset Fund (E)	4	-	-	-	-	-	-	-		-	-	-	-	-	71,07,282
Transfer to Welfare Fund (F)		-	-	-	-	-	-	-		-	-	-	-	-	-
Refunded to MNRE (G)		2,50,27,923						32,022	-	7,60,520		2,58,20,465			
Transferred to Central Nodal Agency account (H)			12,42,62,522	10,21,434						1,75,73,864		14,28,57,820			
BALANCE BEING SURPLUS TRANSFERRED TO GENERAL RESERVE FUND {A- (B+D) }		**-**	**-**	**-**	**-**	**-**	**-**	**-**		**-**	**-**	**-**	**13,24,741**	**-**	**(1,75,79,788)**
"UN-UTILIZED GRANTS OUT OF GOVT. GRANTS FOR REVENUE EXPENDITURE { (C+A)-B-G-H }"		**49,278**	**(7,32,248)**	**(10,06,944)**	**-**	**(50,70,685)**	**1,26,18,944**	**5,70,599**	**3,35,000**	**-**	**90,02,350**	**1,57,66,294**	**-**	**16,23,49,966**	**-**
SIGNIFICANT ACCOUNTING POLICIES	**13**	**-**	**-**	**-**	**-**	**-**	**-**	**-**		**-**		**-**	**-**	**-**	**-**
NOTES ON ACCOUNTS	**14**	**-**	**-**	**-**	**-**	**-**	**-**	**-**				**-**	**-**	**-**	**-**

For National Institute of Wind Energy

Sd/-
R Girirajan
Additional Director, (F&A)

Sd/-
Dr. Rajesh Katyal
Director General

As per our Report attached
PPN & Co, Chartered Accountants
Firm Regn No.013623S
Sd/-
D. Hitesh, Partner
Membership No.231991

NATIONAL INSTITUTE OF WIND ENERGY

An Autonomous R&D Institution, MNRE, Government of India

RECEIPTS AND PAYMENTS ACCOUNT FOR THE YEAR ENDED 31ST MARCH, 2023

(Amount in Rs.)

RECEIPTS		FY 2022-23	FY 2021-22
I.	**Opening Balances**		
(a)	Cheques in hand	-	-
(b)	Bank balances	-	-
i)	In Current Account	2,08,000	99,970
ii)	In Savings Bank Account	38,26,78,603	8,08,25,496
iii)	In Deposit Accounts	32,76,34,585	43,30,95,951
iv)	Cash in hand	1,620	1,620
(c)	Stamps in hand	3,705	5,549
		71,05,26,513	51,40,28,586
II.	Grants Received / UnUtilised Grants		-
(a)	From Government of India for Grant	22,00,00,000	41,07,15,355
(b)	From Government of India for SRRA Project	-	-
(c)	Grants in Aid from DST	3,35,000	-
III.	Investments Withdrawn	-	-
IV.	Interest Received -	-	
(a)	On Bank deposits	1,56,37,118	1,68,45,927
(b)	On Savings A/C	89,21,767	46,25,577
(c)	On IT Refund	-	2,18,371
V.	Other Income -	-	
(a)	Fees for services Including Advances	7,20,53,052	7,09,91,299
(b)	Income from publications	-	-
(c)	Energy receipts	-	6,250
(d)	Misc. Income	-	78,46,391
VI.	Amount borrowed -	-	
VII.	Any other receipts	-	-
(a)	Fees received in advance on Consultancy projects	5,92,679	14,06,000
(b)	Security deposit / Earnest money deposits received	50,72,900	1,09,86,686
(c)	TDS to be remitted	3,32,510	51,85,775
(d)	Expenses/Salary Payable/S.Creditor/Advance	-	5,588
(e)	Receivable from Debtors/other payments/Branch division	9,35,56,187	21,02,62,988
(f)	Advances and Deposits-IE	1,28,23,220	10,68,81,181
(g)	Advances and Deposits-Grants	-	5,52,16,890
(h)	Other Liabilties	10,93,218	1,42,28,749
		43,04,17,651	91,54,23,027
	TOTAL	**1,14,09,44,164**	**1,42,94,51,613**

For National Institute of Wind Energy

Sd/-
R Girirajan
Addl. Director
(F&A)

Sd/-
Dr.Rajesh Katyal
Director General

As per our Report attached
PPN & Co
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Sd/-
D. Hitesh
Partner
Membership No.231991

NATIONAL INSTITUTE OF WIND ENERGY

An Autonomous R&D Institution, MNRE, Government of India

RECEIPTS AND PAYMENTS ACCOUNT FOR THE YEAR ENDED 31ST MARCH, 2022

(Amount in Rs.)

PAYMENTS			FY 2022-23	FY 2021-22
I.	**Expenses**			
	(a)	Employee related Expenses	5,48,38,516	1,29,25,083
	(b)	Administrative Expenses	8,09,18,911	4,92,62,321
II.	**Payments made against funds for various projects**		-	-
	Out of CFA		-	-
	(a)	In house R&D project expenses	7,76,36,838	3,32,24,157
	Out of Grants for projects		-	-
	(a)	From Government of India for Grant	66,30,854	78,01,150
	(b)	From Government of India (Met-Ocean Measurement)	6,52,522	1,79,840
	(c)	From Government of India (Integrated Wind & Solar Research Assessment)	6,05,255	32,58,495
	(d)	From Government of India for SRRA Project	-	4,52,418
III.	**Investment and Deposits made**		-	-
IV.	**Expenditure on Fixed assets & Capital Work-in-Progress**		-	-
	(a)	Purchase of Fixed assets including Advances (Grants)	6,47,53,439	4,07,76,216
	(b)	Purchase of Fixed assets (Internal Generation)	-	1,30,90,817
V.	**Refund made during the year**		-	-
	(a)	Balance of Grants-in-aid to Government of India	29,47,95,043	1,69,68,330
	(b)	Interest Earned	1,09,09,807	13,18,197
VI.	**Other Payments**		-	-
	(a)	Refund of SD /PG/EMD - From Internal Genertation	25,33,095	81,07,295
	(b)	Expenditure on Consultancy Projects	-	7,58,60,410
	(c)	Advance & Deposits from Grants	4,46,76,224	1,41,33,979
	(d)	Advance & Deposits from SRRA	-	-
	(e)	Advance & Deposits from Internal Generation	1,48,928	10,76,98,820
	(f)	Payment of TDS (Grants)	40,77,213	25,86,118
	(g)	Payment of TDS (Internal Generation)	1,01,55,027	1,41,15,818
	(h)	GST remittance	1,34,56,701	98,45,902
	(i)	Receivable from Debtors/other payments /Branch Division	9,38,20,864	30,34,46,359
	(j)	Deposit to Employee benefit fund	-	38,37,081
VII.	**Changes in Working Capital**		-	-
		Total	-	-
VIII.	**Closing Balances**		-	-
	(a)	Cheques in hand	-	-
	(b)	Bank Balances:	-	-
		i) In Current Account	1,00,000	2,08,000
		ii) In Savings Bank Account	9,06,36,352	38,26,68,603
		iii) In Deposit Accounts	28,95,85,880	31,66,84,585
		iv) In Deposit Accounts (SRRA)	-	1,10,00,000
	(c)	Cash in hand (NIWE Canteen)	3,228	1,620
	(d)	Stamps in hands	9,467	
		TOTAL	**1,14,09,44,164**	**1,42,94,51,613**

For National Institute of Wind Energy

Sd/-
R Girirajan
Addl. Director
(F&A)

Sd/-
Dr.Rajesh Katyal
Director General

As per our Report attached
PPN & Co
Chartered Accountants
Firm Regn No.013623S
Sd/-
D. Hitesh
Partner
Membership No.231991

NATIONAL INSTITUTE OF WIND ENERGY

An Autonomous R&D Institution, MNRE, Government of India

SCHEDULES FORMING PART OF BALANCE SHEET AS AT 31ST MARCH 2023

(Amount in Rs.)

SCHEDULE 1 - CAPITAL ASSET FUND	CFA-Capital	NE Region	MOM	IWSRA	SRRA	IE	31.03.2023	31.03.2022
Opening Balance								
Balance as at the beginning of the year	18,48,97,773	40,30,628	-	-	13,44,981	4,09,79,159	23,12,52,541	25,15,59,937
Add : Prior period adjustment	-	-	-	-	-	-	-	6
Add : Addition from Capital Grant	7,37,16,658	-	-	-	-	-	7,37,16,658	2,71,75,406
Add : Addtion from Internal Revenue Generation prior years	-	-	-	-	-	-	-	2,326
Add : Addtion from Capital Grants SRRA	-	-	-	-	-	-	-	-
Add : Addtion from Capital Grants MNRE	-	-	-	-	-	-	-	-
Add : Addtion from Capital Grants MoM	-	-	-	-	-	-	-	-
Add : Addtion from Internal Revenue Generation	-	-	-	-	-	-	-	1,33,44,406
Less : Deletion from Internal Revenue Generation	-	-	-	-	-	-	-	-
Less: Deletion from Capital Grants	-	-	-	-	-	-	-	-
Less: Deletion from Internal Revenue Generation	-	-	-	-	-	-	-	62,37,124
Less: Deletion from Capital Grants SRRA	-	-	-	-	-	-	-	-
Less: Depreciation on assets purchased out of Grants MNRE	3,59,16,668	11,00,045	-	-	-	-	3,70,16,713	4,87,31,968
Less: Depreciation on assets purchased out of Internal generation	-	-	-	-	-	47,58,003	47,58,003	52,48,527
Less: Depreciation on assets purchased out of Grants SRRA	-	-	-	-	8,06,551	-	8,06,551	6,11,920
TOTAL	**22,26,97,763**	**29,30,583**	**-**	**-**	**5,38,430**	**3,62,21,157**	**26,23,87,933**	**23,12,52,543**

For National Institute of Wind Energy

Sd/-
R Girirajan
Additional Director, (F&A)

Sd/-
Dr. Rajesh Katyal
Director General

As per our Report attached
PPN & Co, Chartered Accountants
Firm Regn No.013623S
Sd/-
D. Hitesh, Partner
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NATIONAL INSTITUTE OF WIND ENERGY
An Autonomous R&D Institution, MNRE, Government of India

SCHEDULES FORMING PART OF BALANCE SHEET AS AT 31ST MARCH 2023

(Amount in Rs.)

SCHEDULE 2 - RESERVES AND SURPLUS	31st March, 2023	31st March, 2022
General Reserve Fund		
Balance at the beginning of the year (A)	42,78,98,861	44,54,78,650
Addition during the year being surplus (B)	13,24,742	-1,75,79,788
Total (A+B)	**42,92,23,602**	**42,78,98,862**
Welfare Fund (General Reserve) (C)	12,12,503	11,21,268
TOTAL (A+B+C)	**43,04,36,105**	**42,90,20,130**

For National Institute of Wind Energy

Sd/-
R Girirajan
Addl. Director
(F&A)

Sd/-
Dr.Rajesh Katyal
Director General

As per our Report attached
PPN & Co
Chartered Accountants
Firm Regn No.013623S
Sd/-
D. Hitesh
Partner
Membership No.231991

NATIONAL INSTITUTE OF WIND ENERGY

An Autonomous R&D Institution, MNRE, Government of India

SCHEDULES FORMING PART OF BALANCE SHEET AS AT 31st MARCH 2023

(Amount in Rs.)

SCHEDULE 3 : CURRENT LIBILITIES AND PROVSISIONS:	Schedule	CFA - Capital	CFA - Revenue	NE Region	MOM	IWSRA	SRRA	NIWE IREDA Fund	Hybridize	TARE SCHEME DST	VAYU-MITRA	ITEC	TOTAL IE	As on 31/03/2023	As on 31/03/2022
A. CURRENT LIABILITIES															
Sundry Creditors for expenses:							-	-	-	-	-	-	-	-	1,24,75,284
Expenses payable		-	-	-	-	-	28,243	-	-	-	-	-	31,45,271	31,73,514	-
Salary Payable		-	-	-	-	-	-	-	-	-	-	-	36,53,712	36,53,712	37,50,386
Security Deposit, EMD & PG		-	-	-	-	-	-	-	-	-	-	-	2,19,37,844	2,19,37,844	1,83,92,679
Advances Received on Projects		-	-	-	-	-	-	-	-	-	-	-	2,67,93,983	2,67,93,983	2,67,93,983
Statutory Liabilities		-	-	-	-	-	-	-	-	-	-	-	45,61,677	45,61,677	10,10,732
Other Current Liabilities		3,45,27,429	2,01,03,580	20,15,420	-	21,08,650	-1,09,645	-	24,56,703		38,663	-	-	6,11,40,799	2,72,12,214
Branch Division Payables		45,056	96,876		10,00,000	30,00,000	1,08,26,012	-	-	-	-	-	7,92,913	1,57,60,857	1,39,20,393
TOTAL (A)		**3,45,72,485**	**2,02,00,456**	**20,15,420**	**10,00,000**	**51,08,650**	**1,07,44,610**	**-**	**24,56,703**	**-**	**38,663**	**-**	**6,08,85,400**	**12,12,61,529**	**8,96,35,278**
UN UTILISED GRANTS				-	-	-	-	-	-	-	-	-	-	-	
a) Central Finance Assistance MNRE (Grants-in-Aid)	3.1	4,21,422	49,278	-	-7,32,248	-10,20,538	-50,70,685	-	5,70,599	3,35,000	-	90,02,350	-	35,55,178	28,00,31,459
Earmarked Projects SRRA USP		-	-	-	-	-	-	-	-	-	-	-	-	-	-
IREDA NIWE FUND		-	-	-	-	-	-	1,26,18,944	-	-	-	-	-	1,26,18,944	1,28,88,490
TOTAL (B)		**4,21,422**	**49,278**	**-**	**-7,32,248**	**-10,20,538**	**-50,70,685**	**1,26,18,944**	**5,70,599**	**3,35,000**	**-**	**90,02,350**	**-**	**1,61,74,122**	**29,29,19,950**
TOTAL { (A)+(B) }		**3,49,93,907**	**2,02,49,733**	**20,15,420**	**2,67,752**	**40,88,112**	**56,73,925**	**1,26,18,944**	**30,27,302**	**3,35,000**	**38,663**	**90,02,350**	**6,08,85,400**	**13,74,35,651**	**38,25,55,228**
B. PROVISIONS															
Gratuity		-	-	-	-	-	-	-	-	-	-	-	3,68,20,113	3,68,20,113	1,18,38,784
Leave Encashment		-	-	-	-	-	-	-	-	-	-	-	2,96,24,187	2,96,24,187	47,67,425
TOTAL (C)		**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**6,64,44,300**	**6,64,44,300**	**1,66,06,209**
GRAND TOTAL { (A)+(B)+(C) }		**3,49,93,907**	**2,02,49,733**	**20,15,420**	**2,67,752**	**40,88,112**	**56,73,925**	**1,26,18,944**	**30,27,302**	**3,35,000**	**38,663**	**90,02,350**	**12,73,29,700**	**20,38,79,951**	**39,91,61,436**

For National Institute of Wind Energy

Sd/-
R Girirajan
Additional Director, (F&A)

Sd/-
Dr. Rajesh Katyal
Director General

As per our Report attached
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Firm Regn No.013623S
Sd/-
D. Hitesh, Partner
Membership No.231991

NATIONAL INSTITUTE OF WIND ENERGY

An Autonomous R&D Institution, MNRE, Government of India

SCHEDULES FORMING PART OF BALANCE SHEET AS AT 31st MARCH 2023

(Amount in Rs.)

SCHEDULE 3.1 : UNUTILISED GRANT - CFA	CFA - Capital	CFA - Revenue	NE Region	MOM Capital	MOM Revenue	IWSRA Capital	IWSRA Revenue	SRRA	Hybridize (DST)	TARE SCHEME (DST)	NIWE IREDA Fund	VAYU-MITRA	ITEC	As on 31/03/2023	As on 31/03/2022
Funds															
Balance as at the beginning of the year	8,67,78,382	40,838	-	3,21,73,630	12,42,62,522	1,16,17,973	10,21,434	(50,70,685)	12,25,396	-	1,28,88,490	2,79,81,970	-	29,29,19,950	1,94,10,285
Add : Grants received during the year	10,00,00,000	12,00,00,000	-	-	-	-	-	-	-	3,35,000	-	-	1,20,91,500	23,24,26,500	41,07,15,355
Add :Misc. Income on Grants	-	38,141	-	-	-	-	-	-	-	-	-	-	-	38,141	51,13,593
Add :Interest Earned on Grants	13,68,132	2,46,475	-	-	-	-	-	-	32,022	-	5,69,845	-	-	22,16,474	23,76,575
Add: Interest Accrued on Grants	-	-	-	-	-	-	-	-	-	-	-	7,60,520	-	7,60,520	68,057
Add: Profit on Sale of Assets	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Add: Transferred from Earmarked Projects	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Add: SNA Refund	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Add:EMD, SD, PG Received	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total (A)	**18,81,46,514**	**12,03,25,454**	**-**	**3,21,73,630**	**12,42,62,522**	**1,16,17,973**	**10,21,434**	**(50,70,685)**	**12,57,418**	**3,35,000**	**1,34,58,335**	**2,87,42,490**	**1,20,91,500**	**52,83,61,585**	**43,76,83,865**
Less : Refunds															
Interest earned on Grants refunded to Ministry	13,68,132	2,81,936	-	-	-	-	-	-	32,022	-	-	7,60,520	-	24,42,610	17,33,894
Other Income Earned refunded to Ministry	51,19,257	40,838	-	-	-	-	-	-	-	-	-	-	-	51,60,095	93,627
Refund of Unutilized Grants	8,24,36,535	2,47,05,149	-	-	-	-	-	-	-	-	-	-	-	10,71,41,684	26,65,920
Transferred to CNA Account	-	-	-	3,21,73,630	12,42,62,522	1,16,17,973	10,21,434	-	-	-	-	1,75,73,864	-	18,66,49,423	-
Total (B)	**8,89,23,924**	**2,50,27,923**	**-**	**3,21,73,630**	**12,42,62,522**	**1,16,17,973**	**10,21,434**	**-**	**32,022**	**-**	**-**	**1,83,34,384**	**-**	**30,13,93,812**	**44,93,441**
Total Fund Available (C= A-B)	**9,92,22,590**	**9,52,97,531**	**-**	**-**	**-**	**-**	**-**	**(50,70,685)**	**12,25,396**	**3,35,000**	**1,34,58,335**	**1,04,08,106**	**1,20,91,500**	**22,69,67,773**	**43,31,90,424**
Less: Expenditure															
Grants from Government of India allocated for Capital	6,69,64,348	-	-	-	-	13,594	-	-	-	-	-	-	-	6,69,77,942	5,00,78,003
Grants from Government of India allocated for Revenue expenditure	-	2,96,66,098	-	-	7,32,248	-	6,06,944	-	6,54,797	-	8,39,391	-	30,89,150	3,55,88,628	3,63,74,761
Grants from Government of India allocated for NER	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Grants from Government of India allocated for SRRA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Expenditure relating to Grants from Government of India for the inhouse projects during the year	-	5,31,94,529	-	-	-	-	-	-	-	-	-	-	-	5,31,94,529	4,62,22,627
Grants from Government of India allocated for VSDP	-	-	-	-	-	-	-	-	-	-	-	1,03,69,443	-	1,03,69,443	-

For National Institute of Wind Energy

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As per our Report attached
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D. Hitesh, Partner
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NATIONAL INSTITUTE OF WIND ENERGY

An Autonomous R&D Institution, MNRE, Government of India

SCHEDULES FORMING PART OF BALANCE SHEET AS AT 31st MARCH 2023

(Amount in Rs.)

SCHEDULE 3.1 : UNUTILISED GRANT - CFA (continues..)	CFA - Capital	CFA - Revenue	NE Region	MOM Capital	MOM Revenue	IWSRA Capital	IWSRA Revenue	SRRA	Hybridize (DST)	TARE SCHEME (DST)	NIWE IREDA Fund	VAYU-MITRA	ITEC	As on 31/03/2023	As on 31/03/2022
Transfer to capital asset fund	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Transfer to Income & Expenditure	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Excess of Expenditure out of Previous Year Advance	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EMD,Performenc Guarnatee,Security Deposit Returned	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sub Total (i)	**6,69,64,348**	**8,28,60,627**	**-**	**-**	**7,32,248**	**13,594**	**6,06,944**	**-**	**6,54,797**	**-**	**8,39,391**	**1,03,69,443**	**30,89,150**	**16,61,30,542**	**13,26,75,390**
Less: Payables															
Expenses Payable	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Security Deposits & Performance Guarantee	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sundry Creditors	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other Current Liabilities	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Advances received	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Salary Payable / EPF Payable	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sub Total (ii)	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Less: Advances & Deposits	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Less: Advances paid	3,18,36,820	1,23,87,626	-	-	-	-	4,00,000	-	-	-	-	38,663	-	4,46,63,109	75,95,084
Less: Deposits	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Less: Prepaid Expenses	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sub Total (iii)	**3,18,36,820**	**1,23,87,626**	**-**	**-**	**-**	**-**	**4,00,000**	**-**	**-**	**-**	**-**	**38,663**	**-**	**4,46,63,109**	**75,95,084**
Total (D) [i+ii+iii]	**9,88,01,168**	**9,52,48,253**	**-**	**-**	**7,32,248**	**13,594**	**10,06,944**	**-**	**6,54,797**	**-**	**8,39,391**	**1,04,08,106**	**30,89,150**	**21,07,93,651**	**14,02,70,474**
UNUTILIZED GRANT (Refundable to Ministry)	4,21,422	49,278	-	-	-	-	-	-	-	-	-	-	90,02,350	94,73,050	25,58,94,779
UNUTILIZED GRANTS (Receivable from Ministry)	-	-	-	-	(7,32,248)	(13,594)	(10,06,944)	(50,70,685)	-	-	-	-	-	(68,23,471)	(50,70,685)
UNUTILIZED GRANTS / Funds (Others)									5,70,599	3,35,000	1,26,18,944	-	-	1,35,24,543	4,20,95,856

For National Institute of Wind Energy

Sd/-
R Girirajan
Additional Director, (F&A)

Sd/-
Dr. Rajesh Katyal
Director General

As per our Report attached
PPN & Co, Chartered Accountants
Firm Regn No.013623S
Sd/-
D. Hitesh, Partner
Membership No.231991

NATIONAL INSTITUTE OF WIND ENERGY

An Autonomous R&D Institution, MNRE, Government of India

FIXED ASSETS

SCHEDULE 4 : FIXED ASSETS

(Amount in Rs.)

Depreciation of Assets	Gross Block				Depreciation					Net Block	
	As on 01.04.2022	Addition	Deletion/ Adjustment	As on 31.03..2023	As on 01.04.2022	Addition	Deletion/ Adjustment	Prior Period Adjustment	Total as on 31.03.2023	As on 31/03/2023	As on 31/03/2022
CFA Capital											
Land	1,76,10,064			1,76,10,064	-				-	1,76,10,064	1,76,10,064
Building	7,31,28,434			7,31,28,434	6,40,93,990	15,94,159			6,56,88,149	74,40,285	90,34,444
Furniture & Fitting	1,30,32,853	80,83,189		2,11,16,042	1,17,73,223	5,46,352			1,23,19,575	87,96,467	12,59,630
Instruments & Equipments	23,21,78,011	3,70,70,462	64,835	26,91,83,638	15,46,35,319	2,62,15,664	64,835		18,07,86,148	8,83,97,490	7,75,42,693
DANIDA Instruments & Computers (Free of Cost)	1,26,69,970			1,26,69,970	1,26,69,949				1,26,69,949	21	21
MNRE Asset (Free of Cost)	21,445			21,445	21,444				21,444	1	1
Computers	14,29,42,139	2,48,81,204		16,78,23,342	14,19,72,949	31,60,930			14,51,33,879	2,26,89,463	9,69,189
Vehicles	37,30,868			37,30,868	34,85,029	2,43,237			37,28,266	2,602	2,45,839
R&D Wind Turbine	10,98,26,430			10,98,26,430	10,98,26,415				10,98,26,415	15	15
Infrastructure Facilities	5,06,77,982			5,06,77,982	2,79,03,197	40,52,922			3,19,56,119	1,87,21,863	2,27,74,785
Books	22,34,032	5,05,885		27,39,917	22,34,031	1,03,404			23,37,435	4,02,482	1
Capital Work In Progress	5,54,61,094	31,75,918		5,86,37,012	-	-			-	5,86,37,012	5,54,61,094
TOTAL (A)	**71,35,13,322**	**7,37,16,658**	**64,835**	**78,71,65,145**	**52,86,15,546**	**3,59,16,668**	**64,835**	**-**	**56,44,67,379**	**22,26,97,766**	**18,48,97,776**
NER											
Instruments & Equipments (NER)	77,99,810			77,99,810	37,69,183	11,00,045			48,69,228	29,30,582	40,30,627
TOTAL (B)	**77,99,810**			**77,99,810**	**37,69,183**	**11,00,045**			**48,69,228**	**29,30,582**	**40,30,627**
SRRA USP											
Computers (USP)	62,78,287			62,78,287	59,41,172	3,37,114			62,78,286	1	3,37,115
Furniture & Fitting (USP)	12,79,997			12,79,997	10,94,771	73,037			11,67,808	1,12,189	1,85,226
Instruments & Equipments (USP)	41,52,86,273			41,52,86,273	41,52,86,272				41,52,86,272	1	1
Infrastructure Facilities (USP)	40,55,703			40,55,703	32,33,064	3,96,400			36,29,464	4,26,239	8,22,639
TOTAL (C)	**42,69,00,260**	**-**	**-**	**42,69,00,260**	**42,55,55,279**	**8,06,551**	**-**	**-**	**42,63,61,830**	**5,38,430**	**13,44,981**

For National Institute of Wind Energy

Sd/-
R Girirajan
Additional Director, (F&A)

Sd/-
Dr. Rajesh Katyal
Director General

As per our Report attached
PPN & Co, Chartered Accountants
Firm Regn No.013623S
Sd/-
D. Hitesh, Partner
Membership No.231991

NATIONAL INSTITUTE OF WIND ENERGY

An Autonomous R&D Institution, MNRE, Government of India

FIXED ASSETS

SCHEDULE 4 : FIXED ASSETS (Continues...) (Amount in Rs.)

Depreciation of Assets	Gross Block				Depreciation				Net Block	
	As on 01.04.2022	Addition	Deletion/ Adjustment	As on 31.03..2023	As on 01.04.2022	Addition	Deletion/ Adjustment	Prior Period Adjustment	Total as on 31.03.2023	As on 31/03/2023	As on 31/03/2022
Internal Revenue Generation											
Computers	1,22,56,127			1,22,56,127	1,22,47,127	9,000			1,22,56,127	1	9,001
R&D Wind Turbine	22,22,55,060			22,22,55,060	22,22,55,058				22,22,55,058	2	2
WTTS Land	57,01,000			57,01,000	-				-	57,01,000	57,01,000
INFRASTRUCTURE FACILITIES	4,98,757			4,98,757	2,26,690	49,876			2,76,566	2,22,191	2,72,067
Vehicle (All)	48,74,209			48,74,209	36,10,693	3,73,053			39,83,746	8,90,463	12,63,516
Project Vehicle & Battery Operated Vehicle	-			-	-	-			-	-	-
Instruments & Equipments (All)	5,30,79,361	-	-	5,30,79,361	1,98,14,100	42,38,694	-	-	2,40,52,793	2,90,26,568	3,32,65,261
Instruments & Equipments	4,89,77,086			4,89,77,086	1,75,10,708	42,12,108			2,17,22,816	2,72,54,270	3,14,66,378
Instruments & Equipment (Jyoti)	3,500			3,500	3,500				3,500	-	-
Instruments & Equipment (50M Mast)	6,97,468			6,97,468	6,97,468				6,97,468	-	-
Instruments & Equipment (10M R&D Mast)	9,197			9,197	9,197				9,197	-	-
Instruments & Equipment - TESTING	44,240			44,240	44,240				44,240	-	-
Instruments & Equipment - SRRA-IE	33,19,670			33,19,670	15,48,987	26,586			15,75,573	17,44,098	17,70,683
Instruments & Equipment - SECI	28,200			28,200	-	-			-	28,200	28,200
Instruments & Equipments (CANTEEN)	37,641			37,641	34,385	2,097			36,482	1,159	3,256
Furniture & Fittings (IE)	6,12,152			6,12,152	3,13,457	65,711			3,79,168	2,32,984	2,98,695
Furniture & Fittings (CANTEEN)	1,95,720			1,95,720	29,358	19,572			48,930	1,46,790	1,66,362
Total (D)	**29,95,10,027**	**-**	**-**	**29,95,10,027**	**25,85,30,867**	**47,58,003**	**-**	**-**	**26,32,88,870**	**3,62,21,157**	**4,09,79,160**
Current year figures (A+B+C+D)	**1,44,77,23,419**	**7,37,16,658**	**64,835**	**1,52,13,75,242**	**1,21,64,70,875**	**4,25,81,267**	**64,835**	**-**	**1,25,89,87,307**	**26,23,87,935**	**23,12,52,544**
Previous Year Figures	**1,41,34,40,731**	**4,05,19,812**	**62,37,124**	**1,44,77,23,419**	**1,16,18,80,257**	**5,45,92,418**	**-**	**1,800**	**1,21,64,70,875**	**23,12,52,544**	**25,15,59,937**

For National Institute of Wind Energy

Sd/-
R Girirajan
Additional Director, (F&A)

Sd/-
Dr. Rajesh Katyal
Director General

As per our Report attached
PPN & Co, Chartered Accountants
Firm Regn No.013623S
Sd/-
D. Hitesh, Partner
Membership No.231991

NATIONAL INSTITUTE OF WIND ENERGY

An Autonomous R&D Institution, MNRE, Government of India

SCHEDULES FORMING PART OF BALANCE SHEET AS AT 31st MARCH 2023

(Amount in Rs.)

SCHEDULE 5 : CURRENT ASSETS, LOANS & ADVANCES:	CFA - Capital	CFA - Revenue	NE Region	MOM	IWSRA	SRRA	NIWE IREDA Fund	Hybridize	TARE SCHEME DST	VAYU-MITRA	ITEC	TOTAL IE	As on 31/03/2023	As on 31/03/2022
A. CURRENT ASSETS:														
Sundry Debtors				-	-	3,27,269						8,10,06,692	8,13,33,961	5,81,26,853
Inventories				-	-							-	-	
Stock of Stationery		54,046		-	-							-	54,046	1,13,494
Stock of Wind Atlas Book				-	-							4,57,346	4,57,346	4,57,346
Stamps in hand		9,467		-	-							-	9,467	3,705
Bank Balances:				-	-							-	-	
With Scheduled Banks:				-	-							-	-	
In Current Account				-	-							1,00,000	1,00,000	2,08,000
In Savings Bank Account	6,49,755	28,81,983	2,51,510	2,67,752	19,89,492	51,65,206	1,20,66,324	5,70,598	3,35,000	-	90,02,350	6,64,43,803	9,96,23,772	38,26,78,603
In Cash				-	-							3,228	3,228	1,620
In Deposit Account				-	-							28,95,85,621	28,95,85,621	32,77,24,590
Branch Division Receivables				-	-		4,74,110					1,52,86,746	1,57,60,856	1,39,20,393
TOTAL (A)	**6,49,755**	**29,45,496**	**2,51,510**	**2,67,752**	**19,89,492**	**54,92,475**	**1,25,40,434**	**5,70,598**	**3,35,000**	**-**	**90,02,350**	**45,28,83,436**	**47,11,67,441**	**76,93,14,211**
B. LOANS, ADVANCES AND OTHER ASSETS														
Advances and other amounts recoverable in cash or in kind or for value to be received:														
a) Prepayments		5,642			-							-	5,642	
b) Interest accrued on term deposits					-							-	-	2,95,542
c) Advances	3,43,44,149	1,72,98,596	17,63,910		20,98,620			24,56,704		38,663		1,17,364	5,81,18,006	4,14,93,444
d) Consultancy WIP					-							3,23,10,944	3,23,10,944	-
e) Balance with Govt. Authority - TDS					-	1,80,950	78,510					1,64,14,739	1,66,74,199	1,70,78,369
f) TDS deducted by Clients												52,59,061	52,59,061	
h) Other Deposits						500						5,07,80,261	5,07,80,761	
TOTAL (B)	**3,43,44,149**	**1,73,04,238**	**17,63,910**	**-**	**20,98,620**	**1,81,450**	**78,510**	**24,56,704**	**-**	**38,663**	**-**	**10,48,82,369**	**16,31,48,613**	**5,88,67,355**
GRAND TOTAL { (A)+(B) }	**3,49,93,904**	**2,02,49,734**	**20,15,420**	**2,67,752**	**40,88,112**	**56,73,925**	**1,26,18,944**	**30,27,302**	**3,35,000**	**38,663**	**90,02,350**	**55,77,65,805**	**63,43,16,054**	**82,81,81,566**

For National Institute of Wind Energy

Sd/-
R Girirajan
Additional Director, (F&A)

Sd/-
Dr. Rajesh Katyal
Director General

As per our Report attached
PPN & Co, Chartered Accountants
Firm Regn No.013623S
Sd/-
D. Hitesh, Partner
Membership No.231991

NATIONAL INSTITUTE OF WIND ENERGY

An Autonomous R&D Institution, MNRE, Government of India

SCHEDULES FORMING PART OF INCOME & EXPENDITURE ACCOUNT FOR THE YEAR ENDED 31ST MARCH, 2023

(Amount in Rs.)

	31st March, 2023	31st March, 2022
SCHEDULE 6 - INCOME FROM SALES / SERVICES		
Income from Services		
Income from Scientific & Technical Consultancy Services	7,91,15,018	10,37,79,711
Energy receipts	3,14,67,344	3,20,00,941
Wind Power Forecasting Receipts	9,00,000	-
TOTAL	**11,14,82,362**	**13,57,80,652**
SCHEDULE 7 - INCOME FROM PUBLICATION		
Sale of Books & Reports	-	5,338
TOTAL	**-**	**5,338**
SCHEDULE 8 - INTEREST EARNED		
On Term Deposits with Scheduled Banks	1,48,89,176	1,28,16,965
On Savings Bank account with Scheduled Banks	21,53,016	24,29,111
TOTAL	**1,70,42,192**	**1,52,46,076**
SCHEDULE 9 - OTHER INCOME		
Interest Received	22,617	22,519
Participation Fees	48,62,440	26,91,672
Registration Fees	-	80,000
Miscellaneous Income	1,07,371	37,40,526
TOTAL	**49,92,428**	**65,34,717**
SCHEDULE 10 - ESTABLISHMENT EXPENSES ADMINISTRATION AND R&D STAFF		
Salaries and Allowances	6,31,19,856	6,17,22,277
Salaries and Allowances - Contract Staff	5,89,378	13,09,130
Contribution to Provident Fund (EPF)	63,71,200	64,92,178
Contribution to Pension & Gratuity (With LIC)	19,10,260	42,62,459
Incentives to Employees	-	55,000
Leave travel concession	4,62,744	9,59,547
Children Education Allowance	9,45,000	8,64,000
Medical reimbursement	14,31,123	19,08,590
Newspaper reimbursement	1,70,230	1,77,480
Leave Salary (Contirbution to LIC)	11,24,388	25,15,050
LIC Admin. Charges (Gratuity & Leave Encashment)	4,65,479	2,87,602
Encashment of Earned Leave on LTC	4,03,502	65,566
Staff welfare expenses	26,498	49,414
TOTAL	**7,70,19,658**	**8,06,68,293**

For National Institute of Wind Energy

Sd/-
R Girirajan
Addl. Director
(F&A)

Sd/-
Dr.Rajesh Katyal
Director General

As per our Report attached
PPN & Co
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NATIONAL INSTITUTE OF WIND ENERGY
An Autonomous R&D Institution, MNRE, Government of India

SCHEDULES FORMING PART OF INCOME & EXPENDITURE ACCOUNT FOR THE YEAR ENDED 31ST MARCH, 2023

(Amount in Rs.)

SCHEDULE 11 - OTHER ADMINISTRATIVE EXPENSES	31st March, 2023	31st March, 2022
Advertisement and Publicity	17,19,685	4,44,228
Auditor's Remuneration	85,500	75,000
Bio Gas Expenses	24,000	24,000
Electricity and Power	37,35,511	29,13,734
Expenses on Books, Data & Periodicals	8,77,278	15,22,384
Expenses on Fees (Sitting Fees & Honorarium)	75,000	62,500
Expenses on Seminar & Meetings	7,79,108	3,45,513
Hospitality Expenses	1,23,588	3,36,733
Office expenses & Maintenance	72,69,216	69,55,926
Other Expenses (Hindi Prom.,OLA Act, Bk Chrg.)	3,89,222	2,47,635
Postage & Courier	58,995	73,189
Printing and Stationery	3,28,794	5,53,114
Rates & taxes/ Licence Fee	14,997	10,45,391
Repairs (AMC etc.,)	21,48,130	35,12,388
Security Charges	94,84,243	85,78,311
Telephone and Communication Charges	2,39,641	18,28,961
Training and Development	2,60,359	16,333
Travel & Conveyance and Taxi hire	5,60,239	19,66,222
Vehicles Running and Up Keeping	9,21,434	8,09,608
Water Charges	5,71,158	4,09,614
TOTAL (A)	**2,96,66,098**	**3,23,03,852**
CONSULTANCY PROJECT EXPENSES		
Expenses on In Consultancy Projects (B)	5,51,72,583	8,73,70,997
GRAND TOTAL { (A)+(B) }	**8,48,38,681**	**11,96,74,849**

For National Institute of Wind Energy

Sd/-
R Giririjan
Addl. Director
(F&A)

Sd/-
Dr.Rajesh Katyal
Director General

As per our Report attached
PPN & Co
Chartered Accountants
Firm Regn No.013623S
Sd/-
D. Hitesh
Partner
Membership No.231991

NATIONAL INSTITUTE OF WIND ENERGY

An Autonomous R&D Institution, MNRE, Government of India

SCHEDULES FORMING PART OF INCOME & EXPENDITURE ACCOUNT FOR THE YEAR ENDED 31ST MARCH, 2023

(Amount in Rs.)

SCHEDULE 12 - PRIOR PERIOD ADJUSTMENT	31st March, 2023	31st March, 2023
Prior Period Expenses/ Income	-	-
TOTAL	**-**	**-**

For National Institute of Wind Energy

Sd/-
R Girirajan
Addl. Director
(F&A)

Sd/-
Dr.Rajesh Katyal
Director General

As per our Report attached
PPN & Co
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Sd/-
D. Hitesh
Partner
Membership No.231991

NATIONAL INSTITUTE OF WIND ENERGY

An Autonomous R&D Institution, MNRE, Government of India

SCHEDULE 13: SIGNIFICANT ACCOUNTING POLICIES

1. General information

1.1 The NATIONAL INSTITUTE OF WIND ENERGY (NIWE) formerly known as Centre for Wind Energy Technology (C-WET) is an Autonomous R&D Institution under Ministry of New & Renewable Energy, Government of India. The C-WET is formed as a Society on 18th February, 1998 and registered as a society under Section 10 of the Tamil Nadu Societies Registration Act, 1975 on 21st March, 1998 (further name change as NIWE has been incorporated and fresh certificate obtained from Registrar of Societies vide No.475 of 2014) with the object to serve as the technical focal point for Wind Power Development in India, support Research and Development Programme, assess Wind Resources, establish Standards, Testing and Certification of wind power systems, sub-systems and components and undertake Human Resource Development Programs.

1.2 The Department of Scientific and Industrial Research, Ministry of Science and Technology, Govt. of India, vide their letter no. 11/378/2000-TU-V dated 21.05.2015 recognized NATIONAL INSTITUTE OF WIND ENERGY as a Scientific and Industrial Research Organization for a period up to 31.03.2021 and vide their letter no. 11/378/2000-TU-V Dated 18.10.2021 recognized NATIONAL INSTITUTE OF WIND ENERGY as a Scientific and Industrial Research Organization for a period up to 31.03.2024.

The Director of Income Tax (Exemptions), Chennai, vide order no.DIT (E) No. 2 (268) / 98-99 dated 21.10.1999, granted registration under section 12AA of the Income Tax Act, 1961, as Public Charitable Trust.

1.3 The Department of Revenue, Central Board of Direct Taxes, New Delhi vide their letter notification no.22/2009 (F.No.203/32/2008/ITA-II) dated 25.02.2009 has notified NATIONAL INSTITUTE OF WIND ENERGY in the category of 'OTHER INSTITUTION' partly engaged in research activities under clause (ii) of the sub- section (1) of section 35 of the Income Tax Act, 1961 with effect from 01.04.2005.

2. Accounting Convention

2.1 The financial statements are prepared on the basis of historical cost convention and on the accrual method of accounting.

2.2 The income on consultancy / professional projects is accounted on Accrual basis based on percentage of completion & the balance amount fees received is transferred to Fees / Income Received in Advance ledgers. Similarly, expenses relating to such income are transferred to Prepaid expenses ledger & accrued during the year in which is Income is declared.

3. Inventory Valuation

3.1 Inventories are valued at lower of cost computed on first in first out method and realizable value.

3.2 Stocks of Wind Atlas are valued at cost.

4. Fund Accounts

4.1 Capital Asset Fund:

Grants utilized for purchase of fixed assets are transferred to capital asset fund and depreciation is set off against these funds.

4.2 General Reserve Fund

Surplus or deficits as generated from the Scientific and Technical Consultancy activities are taken to this fund.

5. Fixed Assets

5.1 Fixed Assets are stated at cost of acquisition inclusive of freight, duties and taxes and incidental and direct expenses related to acquisition less depreciation.

5.2 NIWE creates the relative fund account by transfer of sums from Income & Expenditure account in respect of fixed assets acquired out of Internally generated funds and not covered by capital donations and/or government grants so as to exhibit the same balance under the fixed assets accounts and the capital asset fund account.

5.3 Grants utilized for purchase of fixed assets are transferred to capital asset fund so as to exhibit the same balance under the fixed asset's accounts and the capital asset fund account.

5.4 Fixed Assets received by way of non-monetary grants are capitalized at values stated, and credited to corresponding fund.

6. Depreciation

6.1 Depreciation is provided on straight-line method as per rates specified in the Income-Tax Act, 1961.

Tangible Assets	Percentage of Depreciation
Building (Other than residential purpose)	10
Furniture and Fitting	10
Plant & Machinery (Instrument and Equipment) & Vehicle for official purpose	15
Computers (Including Computer Software)	40
Renewable Energy Device – Wind/Solar	40
Library Books	40

6.2 In respect of additions to / deductions from fixed assets during the year, depreciation is considered on pro-rata basis. Library books were previously booked at 60% but as Income Tax Act, the same should be depreciated at 40%. The same is followed from current year.

6.3 Assets costing Rs.5,000/- or less are fully provided for in the year of Purchase as per the uniform format of Accounts for Central Autonomous Bodies from the year 2001-2002.

6.4 Depreciation on assets are charged to the assets and deducted from capital asset funds.

6.5 The life time of the equipments such as Cup Anemometer, Wind Vane and Mast Materials ranges between 12-18 months. Hence, the same are fully written off during the year of purchase.

7. Grants-in-Aid from Government

7.1 Grants-in-aid from Government are accounted on realization basis and shown under the head "Un-utilized Grant".

7.2 Grants related to Revenue are credited in the Income and Expenditure Statement separately.

7.3 Grants related to specific projects are credited to the respective projects accounts and utilized for the specific project purposes.

7.4 Grants utilized for purchase of fixed assets are transferred to Capital Asset Fund.

8. Foreign Currency Transactions

Transactions denominated in foreign currency are accounted at the exchange rate prevailing at the date of the transaction. Foreign currency monetary assets and liabilities are translated at year end exchange rates and resultant difference if any is recognized as exchange loss or gain as the case may be.

9. Retirement Benefits

9.1 Gratuity liability for the employees of NIWE is covered under the Group Gratuity policy with Life Insurance Corporation of India. The contribution payable for the year towards the policy is charged off to revenue and Gratuity liability is created. Contribution paid is debited to Gratuity fund account, Gratuity fund is reduced from the Gratuity liability for the purpose of presentation in the financial statement.

9.2 Leave salary liability for the employees of NIWE are covered under the Group Leave Encashment Scheme policy with Life Insurance Corporation of India. The contribution payable towards the policy is charged off to revenue and leave salary liability is created. Contribution paid is debited to leave salary fund with LIC account, liability is reduced from the fund for the purpose of presentation in the financial statement.

9.3 Employees Provident Fund Account of the employees of NIWE is maintained at the Office of the Regional Provident Funds Commissioner, Chennai. The contribution paid is based on the actual remuneration paid and as per Act. The same is charged off to revenue.

10. Uniform Format of Accounts for Central Autonomous Bodies

The accounts are prepared based on the Uniform Format of Accounts for Central Autonomous Bodies from the year 2001-2002.

11. The salary expenditure and project consultancy expenditure are met from the internal sources generated by NIWE. The balance of revenue after meeting the expenditure is transferred to General Reserve Fund.

NATIONAL INSTITUTE OF WIND ENERGY
An Autonomous R&D Institution, MNRE, Government of India

Schedule 14: Notes forming part of accounts

1. Contingent liabilities:

Contingent liabilities not provided for: NIL (previous year NIL)

2. Capital commitments:

I. Government of Tamil Nadu granted permission vide G.O. No.MS.No.89 dated 26.02.2001 to enter-upon land measuring about 4.41 acres at Survey No 657/1A2 at Pallikaranai Village, Tambaram Taluk, Kancheepuram District for construction of Campus and the same was taken possession during March, 2001. The value of land is yet to be fixed by the Government of Tamil Nadu. Pending fixation, a sum of Rs.18,56,169/- worked out on the basis of market value as per TN G.O Ms.No.206 of Revenue Department dated 19.02.1997 was taken as land value in the accounts for the year 2008-2009. The Construction of building on the aforesaid land was entrusted with CPWD and the building was taken possession during March, 2004.

II. Tamil Nadu Energy Development Agency granted permission to enter-upon land measuring about 8.64 acres at Ayyanaruthu and Panikerkulam Village, Kovilpatti Taluk, Thoothukudi District for establishment of Wind Turbine Test Station and the same was taken possession during March, 2000. The value of land is yet to be ascertained by the Government of Tamilnadu and hence not recorded in the accounts.

III. Solar Radiation Resource Assessment Unit

(a) Ministry of New and Renewable Energy, Delhi vide letter No.29/1/2009-10/JNNSM[ST] dt.27.07.2010 has entrusted to NIWE Chennai, the implementation of a Mission Mode Project for setting up of 50 SOLAR MONITORING STATIONS at high potential sites of solar power in the country at a cost of Rs.2484.17 lakhs to be spent over a period of 5 years.

(b) Ministry of New and Renewable Energy, Delhi vide letter No.29/1(3)/2011-12/JNNSM[ST] dt.30.03.2013 has entrusted to NIWE Chennai, the implementation of a Mission Mode Project for setting up of further 60 SOLAR MONITORING STATIONS at high potential sites of solar power in the country at a cost of Rs.3060.00 lakhs to be spent over a period of 5 years.

(c) Ministry of New and Renewable Energy, Delhi vide letter No.29/02/2015-16/JNNSM dt.30.06.2016 has Sanctioned Merger of Phase-I and II of Solar Radiation Resource Assessment (SRRA) Project and Extension as Unified SRRA Project (USP) up to March 2020.

(d) Ministry of New and Renewable Energy, Delhi vide letter No.29/02/2015-16/JNNSM

dt.11.08.2020 has sanctioned Rs.2.23 Crores for Unified SRRA Project (USP) and extended up to 31.10.2020.

3. Current Assets, Loans and Advances:

In the opinion of the management, the current assets, loans and advances have a value on realization in the ordinary course of business equal at least to the aggregate amount shown in the Balance Sheet.

4. Taxation:

In view of there being no taxable income under the Income Tax Act, 1961, no provision for income tax has been considered necessary.

5. Remuneration to Auditors:

Audit fees, Tax Audit and Fees for Utilization Certificates - Rs. 72,000/- per annum plus taxes as applicable.

6. Income:

The Ministry of Non-Conventional Energy Sources vide letter no. 51/18/2000-WE (PG) dt.05.07.2002 has permitted to retain the sale proceeds of Wind Energy Resource Survey data, Handbook and Micro-survey reports and accordingly the same has been accounted as income from publication.

7. Internal Control:

NIWE has adequate internal control procedures in the areas of Cash, bank purchases, expenses [salaries, traveling allowance, projects, administration and other recurring/non recurring] billing for consultancy services, receipt and utilization of government grants and utilization of grants received for the specific projects, stores accounting, fixed asset verification, etc. The Additional Director [F&A] is responsible for continuously monitoring and reviewing the effectiveness of internal control procedures.

NIWE is following the Rules and Regulations contained in GFR [General Financial Rules] and DFR [Delegation of Financial Rules] as made applicable by the Governing Council of NIWE. During the financial year 2022-23, the review of internal control procedures by the Division Head [F&A] has not brought out any material lapse in the system. Besides Internal Audit is also conducted by the Auditors i.e. 3rd party Chartered Accountant registered with C&AG. Further, NIWE is an organization having the accreditation of ISO: 9001:2015 for Testing, Standards , Certification, Wind Solar Resource Measurement and Wind Turbine Test Station at Kayathar & Purchase and for Testing, Standards & Certification from National Accreditation Board for Laboratories, which has stringent monitoring systems and is subject to periodical audits by those organizations.

8. (a) Stock in Hand (CFA):-

The Centre has the following Instruments & Equipment and its spares which are neither

classifiable as assets (because, they are not long term benefits) nor as stocks in hand (because they have recurring nature of usage for short period of time beyond 12 months after re-calibration) were purchased during previous years and valued it at cost as detailed below:

Instrument	No.	Closing Stock
ANEMOMETER	186	1,17,05,116
WIND VANE	90	43,62,524
TEMPERATURE	32	3,62,831
PRESSURE	23	4,66,956
MICROCOMM	12	30,08,091
PYRANOMETER	25	33,31,611
RAIN GAUGE	14	1,43,500
	382	2,33,80,630

The above instruments & Equipment and its spares are accounted in the financial statements of the respective year of purchase and expended in that year itself as they were purchased out of Grants received in various years and contain partly used/yet to be installed in the masts.

9. The balance of revenue after meeting the salary and consultancy project expenditure is transferred to General Reserve Account, as shown below: (Ref: I&E)

(Amount in Rs.)

Income generated			**13,35,16,982**
Less:	Salary component of service functions	7,70,19,658	**13,21,92,241**
	Consultancy Project Expenses	5,51,72,583	
	Transfer to Capital fund		
Balance transferred to General Reserve Fund			**13,24,741**

10. As per the approval of 8th meeting of GC, NIWE held on 14/12/2001 & pursuant to the agreement entered into with the client /manufacturers, NIWE is entitled to retain the entire energy receipts realized and for the financial year 2022-23, a sum of Rs. 3,14,67,344 /- (Ref: Energy Receipt - Sch.6) has been earned.

11. The total interest income earned is Rs.1,70,42,192 /-. Out of which Rs.1,48,89,176 /-, earned from Term Deposit with Scheduled Banks and Rs.21,53,016 /- from Savings Bank account with Scheduled Banks (Ref: Sch.8) is shown under income and expenditure.

12. The figures shown in the accounts are rounded off to the nearest rupee.

13. The previous year figures are regrouped / reclassified wherever considered necessary to make them comparable with current year's figures.

14. Schedule 1 to 14 annexed form an integral part of Balance Sheet as at 31st March, 2023 and Income and Expenditure Account for the year ended on that date.

Signatures to Schedule 1 to 14

For National Institute of Wind Energy

Sd/-	Sd/-	
R Girirajan	Dr.Rajesh Katyal	
Addl. Director	Director General	
(F&A)		

As per our Report attached
PPN & Co
Chartered Accountants
Firm Regn No.013623S
Sd/-
D. Hitesh
Partner
Membership No.231991

Place : Chennai

Date : 04.10.2023

P P N AND COMPANY
CHARTERED ACCOUNTANTS
No.2, IV Cross Street, Sterling Road, Nungambakkam, Chennai - 600034.
(Near to Loyola College) Ph : 044 - 2828 0033, Cell : 98844 48912
E-mail : info@ppnaco.com | Web : www.ppnaco.com | www.ppnaco.co.in

INDEPENDENT AUDITOR'S REPORT

To the Members of **M/S. NATIONAL INSTITUTE OF WIND ENERGY,** Survey No.657/1 A2, Velachery – Tambaram main road, Pallikaranai, Chennai – 600 100.

Report on the audit of Financial Statements

Opinion

We have audited the accompanying financial statements of **M/S. NATIONAL INSTITUTE OF WIND ENERGY**, Survey No.657/1 A2, Velachery – Tambaram main road, pallikaranai, Chennai – 600 100. , which comprise the Balance Sheet as at 31st March, 2023, the Statement of Income and Expenditure for the year ended, Receipts and Payments Account and a summary of the significant accounting policies and other explanatory information.

In our opinion and to the best of our information and according to the explanations given to us, the aforesaid financial statements give the information required by the Act in the manner so required and give a true and fair view in conformity with the accounting principles generally accepted in India, of the state of affairs of the Society (NIWE) as at 31st March, 2023, and its Excess of Expenditure over Income, subject to the points mentioned in "Notes Forming part of Financial Statements".

Basis of Opinion

We conducted our audit in accordance with the Standards on Auditing (SAs). Our responsibilities under those Standards are further described in the Auditor's Responsibilities for the Audit of the Financial Statements section of our report.

We are independent of the Society (NIWE) in accordance with the Code of Ethics issued by the Institute of Chartered Accountants of India together with the ethical requirements that are relevant to our audit of the financial statements, and we have fulfilled our other ethical responsibilities in accordance with these requirements and the ICAI's Code of Ethics.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our opinion on the Financial Statements.

Management's Responsibility for the Financial Statements

The Society (NIWE)'s management is responsible for the preparation of these financial statements that give a true and fair view of the financial position, financial performance, total comprehensive income, change in equity and cash flows of the Society (NIWE) in accordance with the accounting principles generally accepted in India, including the Accounting Standards specified.

This responsibility also includes maintenance of adequate accounting records for safeguarding the assets of the Society (NIWE) and for preventing and detecting frauds and other irregularities; selection and application of appropriate accounting policies; making judgments and estimates that are reasonable and prudent; and design, implementation and maintenance of adequate internal financial controls, that were operating effectively for ensuring the accuracy and completeness of the accounting records, relevant to the preparation and presentation of the financial statements that give a true and fair view and are free from material misstatement, whether due to fraud or error.

Auditor's Responsibility

Our objectives are to obtain reasonable assurance about whether the financial statements are free from material misstatement, whether due to fraud or error, and to issue an auditor's report that includes our opinion.

Reasonable assurance is a high level of assurance but is not a guarantee that an audit conducted in accordance with SAs will always detect a material misstatement when it exists.

Misstatements can arise from fraud or error and are considered material if, individually or in aggregate, they could reasonably be expected to influence the economic decisions of users taken based on these financial statements.

As a part of an audit in accordance with SAs, we exercise professional judgement and maintain professional skepticism throughout the audit. We are also:

Identify and assess the risks of material misstatement of the financial statements, whether due to fraud or error, design and perform audit procedures responsive to those assessed risks and obtain audit evidence that is sufficient and appropriate to provide a basis for our opinion. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal control.

Evaluate the appropriateness of accounting policies used and the reasonableness of accounting estimates and related disclosures made by management.

Evaluate the overall presentation, structure, and content of the financial statements, including the disclosures and whether the financial statements represent the underlying transactions and events in a manner that achieves fair presentation.

Materiality is the magnitude of misstatements in the financial statements that, individually or in aggregate, makes it probable that the economic decisions of a reasonably knowledgeable user of the financial statements may be influenced. We consider quantitative materiality and qualitative factors in (i) planning the scope of our audit work and in evaluating the result of our work; and (ii) to evaluate the effect of any identified misstatements in the financial statements.

Key Audit Matters (KAM)

Key audit matters are those matters that, in our professional judgement, were of most significance in our audit of the financial statements of the current period. These matters were addressed in the context of our audit of the financial statements as a wholly, and in forming our opinion thereon.

1. **Advances Receivables – Rs.97,67,573/-:**

During the process of audit we found that there is an huge amount of advance receivables from debtors is pending as on 31-3-23. The list are given below:

S.No	Scheme	Particulars	Amount in Rs.
1	Hybridize	Indian Institute of Technology	24,56,704
2	SRRA	National Institute of Solar Energy	3,27,269
3	IE	Maharashtra Energy Development Agency (MEDA)	18,000
4	IE	India Wind Power Ltd Ahmedabad	18,61,427
5	IE	Ministry of External Affairs	14,55,541
6	IE	Energoimport	35,30,632
7	IE	Wind Force Management Services Private Limited	1,18,000
Total			**97,67,573**

2. **Staff Advance Payable - Rs.5,93,117/-:**

It was noticed that an amount of **Rs. 5,93,117/-** is outstanding to be paid for more than a year to staff against expenses incurred by them during the course of work. The details are given below:

S.No	Scheme	Party Name	Amount in Rs.
1	CFA -NE	Hari Baskaran	1,83,117
2	CFA -NE	B Senthil Kumar	2,19,000
3	CFA -NE	Duleswar Boruah	38,000
4	CFA -NE	R Naveen Muthu	90,000
5	CFA -NE	Aochuba Jamir	35,000
6	CFA -NE	B Senthil Kumar	28,000
	Total		**5,93,117**

3. **Advance Received from Customers - Rs.3,09,73,532/-:**

The advance amounts to **Rs.3,09,73,532/-** has been received from customers under Internal Earnings Scheme. The detailed list are given below:

S.No	Particulars	Amount in Rs.
1	Fees In Advance: WRA&O (18-19)	10,88,983
2	National Institute Of Ocean Technology (IE)	2,20,00,000
3	WSOM Fee In Advance (2019-20)	32,05,000
4	Fees-in-Advance -OWD,DAF & IT	5,00,000
5	Indian Renewable Energy Development Agency Ltd(Dr)	10,62,000
6	Iacharya Silicon Limited - Dr (SRRA-IE)	36,050
7	Hero Future Technologies (WIPPA)	11,60,000
8	NHPC Limited (Haryana)	50,000
9	Mundra Windtech Limited	5,50,000
10	Renew Power Ventures Private Limited	29,500
11	Wapcos Limited	90,000
12	United India Insurance Company Limited	40,770
13	Jayachandran Nair	13,179
14	Indian Renewable Energy Development Agency Ltd(Dr)	10,62,000
15	Iacharya Silicon Limited - Dr (SRRA-IE)	36,050
16	NHPC Limited (Haryana)	50,000
Total		**3,09,73,532**

4. **Advance paid to Suppliers – Rs.5,08,89,582/-:**

The advance to supplier as on 31-3-2023 amounts to **Rs.5,08,89,582/-.** The details are given below:

S.No	Scheme	Particulars	Amount in Rs.
1	North region	TREDA, Tripura – WRA	2,85,500
2	North region	AEDA, Assam – WRA	3,08,300
3	North region	MNREDA, Meghalaya – WMS	8,74,500
4	North region	NREDA, Nagaland – WRA	1,71,500
5	North region	Unadjusted Advances	2,68,500
6	North region	Kintech	38,727
7	CFA Revenue	Balmer Lawrie & Co. Ltd., (CFA-REV)	56,447
8	CFA Revenue	KCG College of Technology	2,95,000
9	CFA Revenue	Indian Institute of Technology (Goa)	9,61,800
10	CFA Revenue	CPWD (Chennai)	82,82,280
11	CFA Revenue	EMD International	6,88,689
12	CFA Revenue	The Eppley Laboratory Inc	6,49,425
13	CFA Revenue	Gayatri Vidya Parishad (Gvp-Sirc) (CFA)	5,62,483
14	CFA Revenue	Sathyabama Universit (CFA)	1,51,250
15	CFA Revenue	National Institute of Technology (Durgapur)	5,86,889
16	CFA Revenue	West Bengal Renewable Energy Development Agency	30,160
17	CFA Revenue	Gujarat Development Agency (GEDA)	12,47,000
18	CFA Revenue	Anert, Kerala (80M Level) (CFA)	1,51,374
19	CFA Revenue	GEDA (Gujarat) (CFA)	5,58,798
20	CFA Revenue	Tamilnadu Energy Development Agency (100M) (CFA)	49,753
21	CFA Revenue	Bihar Renewable Energy Development Agency (CFA)	5,50,000
22	CFA Revenue	Ladakh Renewable Energy Development Agency (CFA)	3,42,000

S.No	Scheme	Particulars	Amount in Rs.
23	CFA Revenue	Anert Kerala (CFA)	2,628
24	CFA Revenue	TEDA,Tamil Nadu (CFA)	8,33,909
25	CFA Revenue	Anert, Kerala (WRA Uc/Na 2016-17) (CFA)	75,400
26	CFA Revenue	CREDA, Chhattisgarh (CFA)	1,50,800
27	CFA Revenue	TSREDCO, Telangana (CFA)	75,400
28	CFA Revenue	Assam Energy Development Agency	4,00,000
29	CFA Capital	Atalon (CFA-C)	4,04,250
30	CFA Capital	CPWD (Coimbatore)	1,40,00,000
31	CFA Capital	CPWD (Chennai)	1,78,36,820
Total			**5,08,89,582**

5. Creditors outstanding – Rs.26,31,456/-:

During the audit we found that the creditors outstanding as on 31-3-23 amounts to **Rs.26,31,456/-.** The details are given below:

S.No	Scheme	Creditors	Amount in Rs.
1	Internal earnings	Inox Green Energy Services Limited	1,36,600
2	Internal earnings	Janani Travels (IE)	24,364
3	Internal earnings	Eagle Security & Personnel Services	7,16,558
4	Internal earnings	SGS Weather & Environmental System Pvt Ltd	43,330
5	Internal earnings	Meatech Solutions LLP	16,75,600
6	Internal earnings	Ex Servicemen Security Services	35,004
Total			**26,31,456**

6. **TDS Recoverable details not available – Rs.1,63,90,096/-:**

During the audit it was noticed that huge balances are held in current assets as TDS recoverable from various previous years. However, there was no proper records for such balances. The details are given below:

S.No	Particulars	Amount in Rs.
1	TDS Recoverable 2014-2015 (IE)	47,47,111
2	TDS Recoverable 2015-2016 (IE)	43,99,847
3	TDS Recoverable 2017-18 (IE)	26,72,584
4	TDS Recoverable 2019-20 (IE)	1,31,000
5	TDS Recoverable 2020-21 (IE)	12,48,407
6	TDS Recoverable 2021-22 (IE)	27,76,591
7	TDS Recoverable (IE)	57,824
8	TDS Recoverable 2014-2015 (Pre GST – SRRA-IE)	22,952
9	TDS Recoverable 2015-2016 (Pre GST – SRRA-IE)	3,33,780
Total		**1,63,90,096**

For P P N AND COMPANY
Chartered Accountants
Firm Reg No: 013623S

D.Hitesh
Partner
Membership No.231991
Date:
Place: Chennai
UDIN:

Technical focal point for development of wind energy

NATIONAL INSTITUTE OF WIND ENERGY

An Autonomous Research & Development Institution
Ministry of New and Renewable Energy, Government of India

नीवे NIWE

ACCREDITED SERVICES

Accredited Wind Turbine testing (small and Large) and certification services in accordance to the requirements of IS/ISO/IEC

STANDARDS AND REGULATION

Making of Indian standards on wind turbines and technical support to MNRE in implementation of regulatory frame work for wind turbines.

RESOURCE ASSESSMENT

Nationwide wind (on-shore and off-shore) and solar resource assessment for identification of potential locations to establish wind & solar power projects

RESEARCH AND DEVELOPMENT

State-of-the-art infrastructure including research station with wind farm, laboratory and software for academic and industrial research

SKILL DEVELOPMENT

Skill development and training for national and international professionals on all aspects of wind / solar energy technology and project developments

Vayumitra Skill Development Programme for creating Skilled Manpower for Wind Energy Sector

OFFSHORE WIND ENERGY

Nodal Agency for Offshore Wind Energy development in India

EXPERT SERVICES

- Wind Data Analytics, feasibility studies, technical due diligence, micro siting, DPR preparation for wind & solar power development
- Wind-Solar Hybrid measurements & Development
- Preparation of Wind and Solar Atlas
- Wind and Solar Power Forecasting
- Development of Wind and Solar projects
- Calibration of solar sensors

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राष्ट्रीय पवन ऊर्जा संस्थान

NATIONAL INSTITUTE OF WIND ENERGY

नवीन और नवीकरणीय ऊर्जा मंत्रालय, अनुसंधान एवं विकास स्वायत संस्थान, भारत सरकार

An Autonomous R & D Institution, Ministry of New and Renewable Energy, Government of India

वेलचेरी - ताम्बरम मुख्य मार्ग, पल्लिकरनै, चेन्नई - 600 100, तमिलनाडु, भारत

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