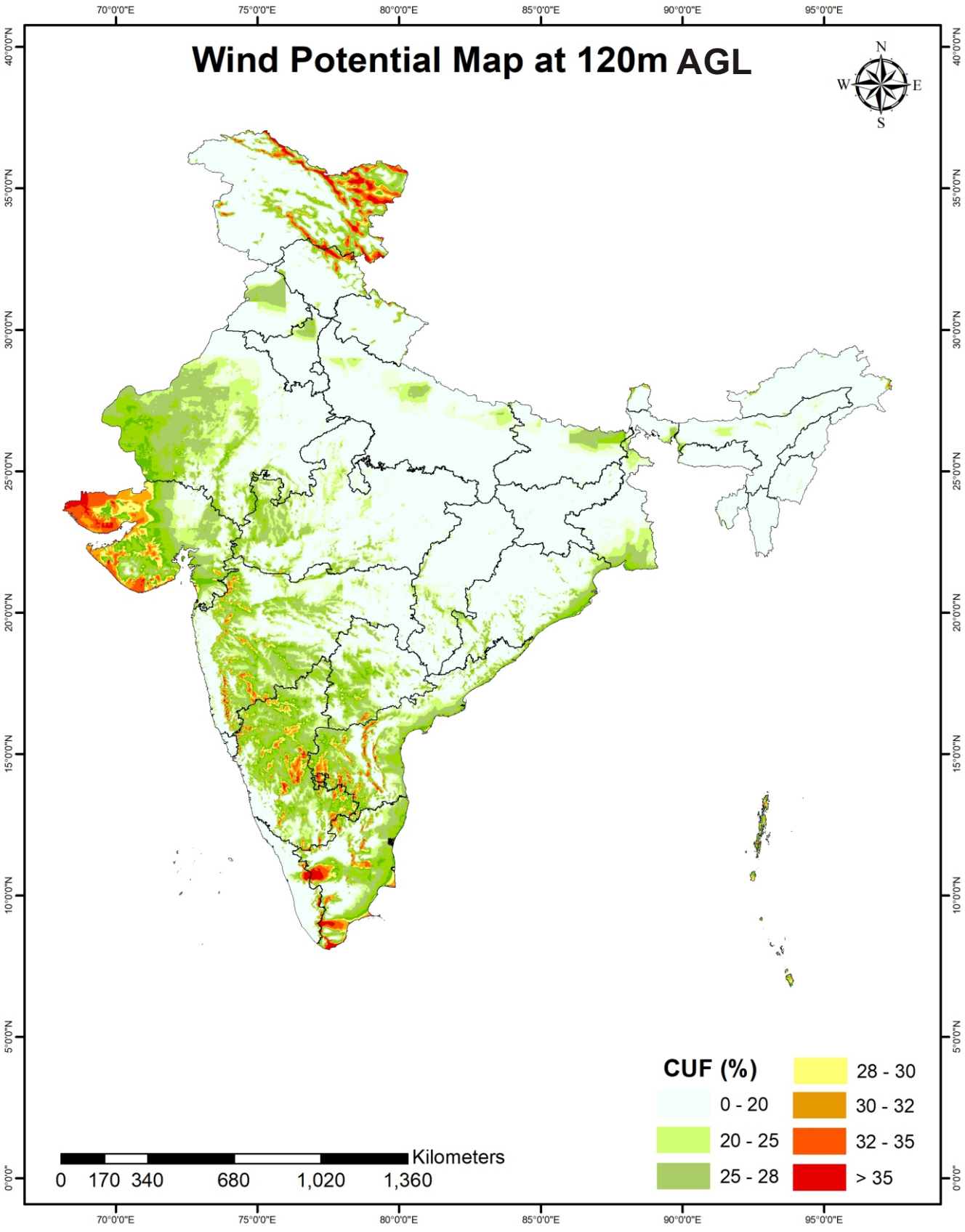
2021-22
ANNUAL REPORT
वार्षिक रिपोर्ट

Source : Tradebel

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


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
2021-22

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

Azadi Ka Amrit Mahotsav

R. JAY HARNI, Amrita Vidyalayam, Chennai, Tamil Nadu

has won 1st Prize for the above drawing titled "Salutations to Wind-Vayu Vandhanam"
under the category of upto 7th Standard in the Painting Competition conducted on 31st May 2021
on the occasion of Azadi ka Amrit Mahotsav to commemorate 75 years of India's Independence

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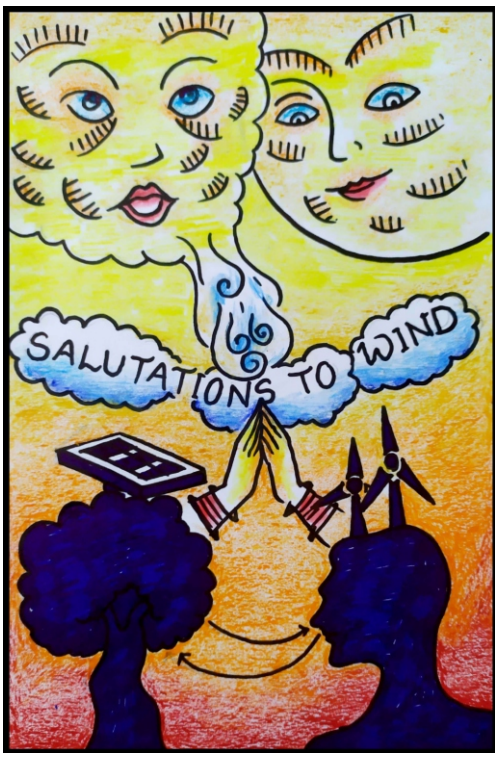
Finance & Administration

Finance Report

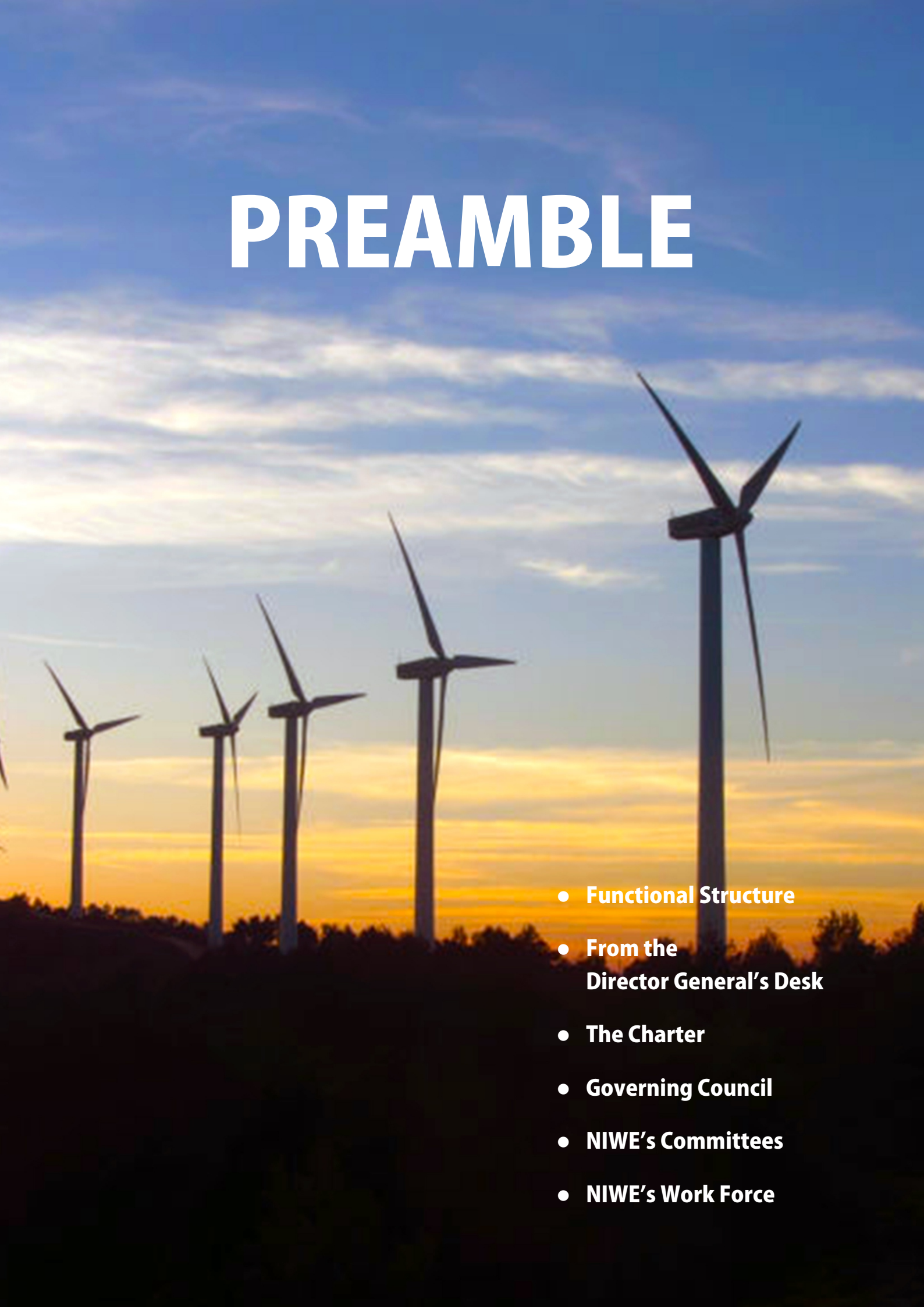
Azadi Ka Amrit Mahotsav



N. SUSHREE SIMRAN SAHU, KV1, CPCRI, Kasaragod, Kerala

has won 2nd Prize for the above drawing titled "Salutations to Wind-Vayu Vandhanam"
under the category of upto 7th Standard in the Painting Competition conducted on 31st May 2021
on the celebration of Azadi ka Amrit Mahotsav to commemorate 75 years of India's Independence

PREAMBLE

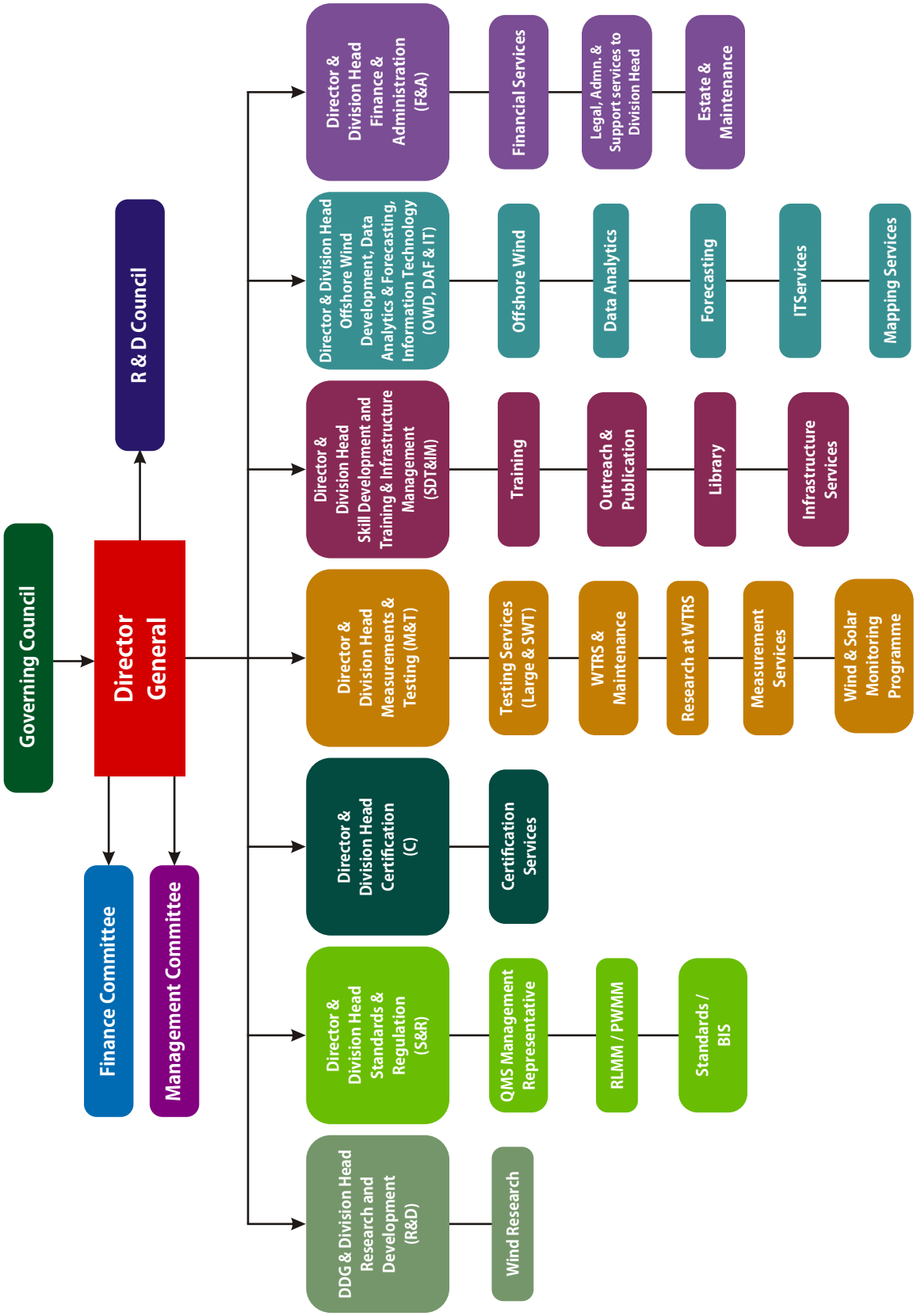


- Functional Structure
- From the Director General's Desk
- The Charter
- Governing Council
- NIWE's Committees
- NIWE's Work Force

N. V. SAHASHRA SENA, Army Public School, Chennai, Tamil Nadu

has won 3rd Prize for the above drawing titled "Salutations to Wind-Vayu Vandhanam"
under the category of upto 7th Standard in the Painting Competition conducted on 31st May 2021
on the celebration of Azadi ka Amrit Mahotsav to commemorate 75 years of India's Independence

FUNCTIONAL STRUCTURE



FROM THE DIRECTOR GENERAL'S DESK

Dr. K. Balaraman

NIWE's journey in supporting Wind Industry is entering its 25th year when the country is celebrating 75th year of Independence. In this momentous year the Country has promised to cut its emissions to net zero by 2070. With this mission in sight, NIWE is thrusting forward in its' support to the wind & solar industry through resources assessment, wind industry in testing, certification and skill development in addition to facilitating development of necessary regulation and standards.

During this year, NIWE has prepared roadmap for offshore wind in India by 2030 for offshore wind farm installation off Gujarat and Tamil Nadu coasts. Further, a joint study with ORE-Catapult for supply chain Analysis for mapping the Indian offshore wind supply chain was carried out. In addition, NIWE is assisting the Ministry in preparing a strategy and roadmap for development of offshore wind projects.

On the research front, two international research projects are progressing on track, Hybridize and Maintenance and Repair Strategy for Wind Energy Development with DTU and other national and international industrial partners. As a part of capacity building, a strategic alliance between India & Denmark has been embarked upon in the field of Offshore Wind Turbine Testing - Power Performance and Load Measurements for its personnel through the INDEP program.

On the resource mapping and measurement front, extensive field visits to various parts of Ladakh and Kargil region carried out towards meeting the vision of Hon'ble Prime Minister of 'Carbon Neutral' Ladakh. Under "Green Islands" program, NIWE has carried out Meso scale based data analysis and identified few locations in Andaman & Nicobar Islands for the development of nearshore wind power projects.

NIWE has been designated, as per the MNRE Lab policy, the lead laboratory in Wind Turbine Testing with a mandate to collaborate and improve the quality in the secondary labs operating in India. As a part of the mandate NIWE had conducted Inter Laboratory Comparison (ILC) for Load Measurements of wind turbine as per the IEC 61400-13 standards along with three labs of International repute namely M/s. Deutsche WindGuard Consulting GmbH, M/s. Garrad Hassan India Pvt Ltd (DNVGL-Energy), M/s. UL International GmbH-DEWI.

With the focus on supporting the needs of academic institutes, PSUs & other governmental organisations who look upto NIWE as an expert body, NIWE has helped in establishing RE plants at their campuses through project management services. NIWE has successfully executed two RE projects at Madurai Kamarajar University – TN State University at Madurai and Indian Institute of Management (IIM), Trichy. Further, in similar lines we are also supporting PSUs like VoC port and also other agencies in getting the wind plants running at their offices.

A noteworthy addition to NIWE was the inauguration of the Renewable Energy Lab and Skill Development Centre at Wind Turbine Test Station at Kayathar, Tamil Nadu. This facility was

inaugurated by Shri. Indu Shekar Chaturvedi, Hon'ble Secretary, MNRE in the presence of the Joint Secretary (Wind) on 20th August, 2021.

In the pursuit of excellence a "Memorandum of Agreement" has been signed between National Institute of Wind Energy (NIWE) and University of Massachusetts Amherst (UMA), USA on 22nd September, 2021. This MoU will establish mutually beneficial collaborative research projects in the service to the nation.

An Online International Training Course on "Wind Energy Technology" and three customised training courses for GAIL (India) Limited, Oil & Natural Gas Corporation Limited and JSW Energy Limited, Mumbai were completed during the period. On request of Skill Council for Green Jobs, New Delhi, NIWE has provided training on "Wind Energy Skill" for five shortlisted candidates who have been selected to participate in "WORLD SKILLS – 2022" to be held at Shanghai, China in October 2022.

Master Trainers both from NIWE and external bodies were trained by Skill Council for Green Jobs for Vayumitra Skill Development Programme (VSDP). The Master Trainers will be training in the ToT - Training of Trainers for VSDP setting in motion a program of national importance in creating the much needed manpower for the RE sector.

NIWE organised eight events, with each event scheduled for a week, to commemorate the Azadi Ka Amrit Mahotsav, an initiative of the Government of India to celebrate and commemorate 75 years of India's independence and the glorious history of it's people, culture and achievements. This Mahotsav at NIWE was dedicated to enabling Hon'ble Prime Minister Narendra Modi's vision of activating India 2.0, fuelled by the spirit of Aatmanirbhar Bharat.

Having come victorious out of the difficult time the country faced the previous year, this year had been a year of pushing forward with a renewed vigour to achieve one step closer to Net Zero, a monumental target set by the country. May all our efforts strengthen the hands of the nation.

Dr. K. Balaraman
Director General

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 2021-22

PRESIDENT OF THE SOCIETY & CHAIRMAN

Shri. Indu Shekhar Chaturvedi, I.A.S.,
Secretary, MNRE, New Delhi

MEMBERS

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

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

Shri. Jitendra J Jadhav
Director, CSIR-National Aerospace Laboratories & Chairman, R&D Council, NIWE

Shri. Tulsi R Tanti
Chairman, Indian Wind Turbine Manufactures Association

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

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

MEMBER SECRETARY

Dr. K. Balaraman
Director General, NIWE, Chennai

Finance Committee

Chairman

Joint Secretary and Financial Adviser
MNRE, New Delhi

Members

Principal Secretary to Govt.
Energy Department, Government of Tamilnadu
Chennai

Joint Secretary (WE)
MNRE, New Delhi

Director General
National Institute of Wind Energy, Chennai

Director (Wind)
MNRE, New Delhi

Deputy Secretary [IFD]
MNRE, New Delhi

Member Secretary

Division Head (Administration & Finance)
National Institute of Wind Energy, Chennai

Research & Development Council

Chairman

Director
CSIR-National Aerospace Laboratories, Bangalore

Members

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

Director / Deputy Director
Ministry of New and Renewable Energy, New Delhi

Representative
Department of Science and Technology

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

Prof. Dr. Rangan Banerjee
Director, IIT - Delhi

Director or Nominee
National Institute of Ocean Technology, 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

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

Prototype Wind Turbine Models Committee

Chairman

Dr. K. Balaraman, Director General, NIWE, Chennai

Members

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

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

Shri. N. Nallarasan, Chief GM, NRLDC-POSOCO, New Delhi

Member Secretary

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

Complaints Committee for Women

Chairman

Dr. Yasodha Shanmugasundaram
Educationist & Ex. Vice Chancellor, Mother Teresa Women's University

Members

Dr. Aruna Dhathathreyan, Retd. Chief Scientist, CLRI

Dr. Vijaya Ravichandran, Scientist 'F', NIOT

Dr. G. Arivukkodi, Assistant Executive Engineer, NIWE

Smt. M.C. Lavanya, Deputy Director (Tech.), NIWE

Smt. Anuradha Babu, Executive Staff Officer, NIWE

Member Secretary

Smt. B. Muthulakshmi, Executive Secretary, NIWE

Invitees

Shri. J.C. David Solomon, Director & Division Head (F&A), NIWE

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

Hindi Promotion Committee

Chairman

Dr. K. Balaraman, Director General, NIWE

Members

Dr. Rajesh Katyal, Deputy Director General & Head, R&D, NIWE

Dr. P. Kanagavel, Director & Division Head, SDT&IM, NIWE

Shri. R. Girirajan, Assistant Director, F&A, NIWE

Member Secretary

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

NIWE's WORK FORCE

- **Dr. K Balaraman,** Director General
- **Dr. Rajesh Katyal,** Deputy Director General
- **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,** Admin & Accounts Officer
- **Dr. G Arivukkodi,** Asst. Executive Engineer
- **S Arulselvan,** Asst. Executive Engineer
- **A R Hasan Ali**, Asst. Executive Engineer
- **Y Packiyaraj,** Asst. Executive Engineer

NIWE's WORK FORCE

- **M Karuppuchamy,** Asst. Executive Engineer
- **B Muthulakshmi,** Executive Secretary-II
- **M R Gunasekaran**, Executive Secretary-II
- **T Sureshkumar,** Assistant Engineer
- **C Stephen Jeremias**, Assistant Engineer (Relieved on 18.03.2022)
- **S Paramasivam,** Assistant Engineer
- **R Vinod Kumar,** Junior Engineer
- **R Naveen Muthu,** Junior Engineer
- **T Sankara Rao,** Junior Engineer
- **C Desingu,** Junior Engineer (Relieved on 10.12.2021)
- **V K Sreeram,** Executive Assistant (Relieved on 11.10.2021)
- **R Sunderesan,** Executive Assistant
- **V Sarathkumar,** Executive Assistant (Relieved on 18.08.2021)
- **A Jaseela Banu,** Executive Assistant
- **K Saranya,** Junior Executive Assistant
- **P Chidambaram,** Junior Executive Assistant (Relieved on 18.08.2021)
- **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
- Certification of Wind Turbines
- Research and Development

ZINIA SIMRIN, Army Public School, Chennai, Tamil Nadu

has won 1st Prize for the above drawing titled "Wind Energy for the Great future"
under the category of 8th to 10th Standard in the Painting Competition conducted on 01st June 2021
on the occasion of Azadi ka Amrit Mahotsav to commemorate 75 years of India's Independence

Wind and Solar Resource Measurements

National Institute of Wind Energy 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 profile. NIWE is also involved in activities related to the development of offshore wind power projects in the country by using the latest and advance technologies currently available in the world.

Under this program of the Ministry, so far 912 dedicated wind-monitoring stations have been established with the support of State Nodal Agencies. In addition, Wind Resource Assessment studies were also carried out using 80 Nos. of existing telecom towers of M/s. Airtel & M/s. BSNL in the North Eastern region and data collection from these towers are under progress. As on date, 43 nos. of Wind monitoring stations are under operation. During the current year, twenty three (23) 100 m wind monitoring Stations were commissioned and data collection is underway.

Further during this year, 21 sites have been registered for wind measurement by private sector from various States in India. The wind data from three (3) private Wind Monitoring stations have been analyzed. Ten consultancy projects focused in various wind farm developmental needs were undertaken for a variety of clients from 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 Hon'ble Prime Minister of 'Carbon Neutral' Ladakh. In this regard, NIWE had carried out extensive field visits to various parts of Ladakh and Kargil region and identified suitable locations for carrying out the ground measurements and development of wind-solar hybrid projects. In addition, NIWE had also identified suitable locations to carry out the Solar Radiation Resource Assessment studies in Ladakh region by installing 2 Nos. of Solar Radiation Resource Assessment Stations (SRRA) at the 10 GW Wind-Solar Hybrid proposed project site. During the year, NIWE had installed a Light Detection & Ranging System

(LiDAR) at Ladakh and a 50 m wind monitoring station at Kargil and data collection from these stations/ sites are underway.

50 m wind monitoring station installed at Kargil

LiDAR (Light Detection & Ranging) device at Debring, Ladakh - Oct-2021

Renewable Energy Park, Kutch, Gujarat

NIWE has identified three (3) locations during the year, NIWE had installed and commissioned three (3) Nos. of 100 m integrated wind –solar 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 the wind / solar power projects in the region and achieve the target set by Government of India.

Green Islands

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. As part of this initiative, during the year NIWE has carried out Meso-scale based data analysis and identified few locations in A&N Islands for the development of Near shore wind power projects. Further, NIWE had identified tentative locations in the A&N Islands for carry out in-situ ground measurements by installing 100 m level Wind monitoring stations.

Field visits to A&N Islands

During the year, NIWE had also installed a Sound Detection and Ranging (SoDAR) Device at Guptapara, A&N Islands to ascertain the wind power potential of the region.

Installation of SoDAR at Guptapara site, A&N Islands

Wind Resource Assessment activities in the North-Eastern States

In the North-Eastern states, there are scattered potential pockets available for wind farm development due to the localized Wind flows. To tap these, the Ministry decided to carry out extensive Wind Resource Assessment studies in NE regions including Sikkim. Accordingly, as on 31.03.2022, a total of 92 Wind Resource Assessment instrumentation using 25 meter and 50 meter meteorological masts were carried out at NE regions and the requisite data collection from all these Wind Resource Assessment stations were completed and subsequently closed down. The State-wise break-up is given in table 1.

Table-1: Status of Wind Resource Assessment Centres Set up and Closed Down

State	No. of Stations installed & commissioned	Level of Wind Resource Assessment stations
Arunachal Pradesh	15	25 m & 50 m
Assam	16	25 m & 50 m
Tripura	10	25 m & 50 m
Manipur	15	25 m & 50 m
Mizoram	9	25 m & 50 m
Nagaland	6	25 m & 50 m
Meghalaya	17	25 m & 50 m
Sikkim	4	25 m
Total	**92**	

In addition, Wind Resource Assessments are also carried out at NE region using the existing telecommunication towers. As on 31.03.2022, a total 80 of telecom towers of heights ranging from 40 m to 60 m were utilised for this purpose and the requisite data collection from all these telecom towers were also completed and subsequently closed down. The details are given in table 2.

Table-2: Telecom Tower utilised & Closed Down as Wind Resource Assessment Centers

State	No. of Stations installed & commissioned	Level of Wind Resource Assessment stations
Meghalaya	15	50 m & 60 m
Mizoram	5	40 m & 60 m
Tripura	6	50 m & 60 m
Arunachal Pradesh	5	40 m & 50 m
Nagaland	7	50 m
Manipur	9	40 m & 60 m
Assam	33	50 m & 60 m
Total	**80**	

Offshore wind resource assessment activities

India is blessed with a coastline of about 7600 kms surrounded by seawater on three sides and has tremendous power generation potential from offshore wind energy. Considering this, the Government had notified the National Offshore Wind Energy Policy as per the Gazette Notification dated 6th October, 2015. As per the policy, Ministry of New and Renewable Energy will act as the nodal ministry for development of Offshore Wind Energy in India and work in close coordination with other government entities for Development and Use of Maritime Space within the Exclusive Economic Zone (EEZ) of the country in an effective manner for production of enormous quantity grid quality electrical power for national consumption.

National Institute of Wind Energy (NIWE), Chennai has been designated as the nodal agency to execute various pre-feasibility activities relating to resource assessment, surveys and studies within EEZ (Exclusive Economic Zone), demarcation of offshore potential blocks and facilitating offshore wind energy project developers for setting up offshore wind energy farms.

Present status

- Based on the preliminary assessment from satellite data and data available from other sources, 8 (eight) zones each in Gujarat and Tamil Nadu have been identified as potential zones for exploitation of offshore wind energy. Initial assessment of offshore wind energy potential within the identified zones has been estimated to be about 70 GW off the coast of Gujarat & Tamil Nadu only.

- In order to attract the large investment needed/required for development of the sector in India, Government of India has already announced its intention of developing 30 GW of offshore wind energy project by 2030.
- Data collection (wind, geophysical, geotechnical, oceanographic) for 1.0 GW project capacity equivalent area off Gujarat coast has been completed and the rapid environmental impact assessment studies are also completed.

Studies to Assess the Potential on the Gujarat Coast

Offshore measurements off Gujarat coast

LiDAR based offshore wind potential measurements for 2 years have been completed at Gulf of Khambhat off Gujarat coast. The offshore LiDAR wind data measurement report for the first and second years have been published for benefit of stakeholder. After successful data collection, during the year, the LiDAR along with the Monopile offshore structure is dismantled successfully. Four more LiDARs have been procured by NIWE for carrying out offshore wind resource assessment off Gujarat and Tamil Nadu coast. The LiDARs have already been validated in the WTRS test station, Kayathar. Considering the geotechnical profile of sea bed and depth of Tamil Nadu Offshore wind areas, it is decided to go for Floating LiDAR based measurements and accordingly, NIWE is in the process of procurement of floating structures for carrying out the offshore wind measurement along with other oceanographic measurements.

Dismantling of LiDAR and Offshore Monopile structure, at Gulf of Khambhat off Gujarat coast

Solar Radiation Resource Assessment

Solar Radiation Resource Assessment (SRRA) unit started in the year 2011 as mission mode project fully funded by the Ministry. The project was completed in two phases, 51 stations in Phase-I (2011) and 60 stations in Phase-II (2014). Besides, four Advanced Measurement Stations (AMS) were completed in 2014. All these SRRA stations are fully automatic, grid independent and records one

second data and after integration transmits one-minute data to the Central Server by GPRS. All stations identify and measure both solar & weather parameters. The data received is quality controlled using BSRN protocol and the QC data is made available to the different stake holders as per the Ministry Data Policy. All stations measured GHI, DHI & DNI and Weather parameters, such as, temperature, humidity, pressure, rain fall, wind speed and direction and also host of other derived parameters. The four AMS stations are part of the BSRN Global Network and the data is shared among member countries for climate change activities. Under this program, NIWE had prepared the Solar Radiation Atlas, a first of its kind combining satellite-derived data and the world's largest high quality network of simultaneously measured solar ground data.

During the year, NIWE has carried out calibration of nine Pyranometers under commercial mode at NIWE calibration laboratory and regular AMC of 48 SRRA stations are underway.

RDPAC Project

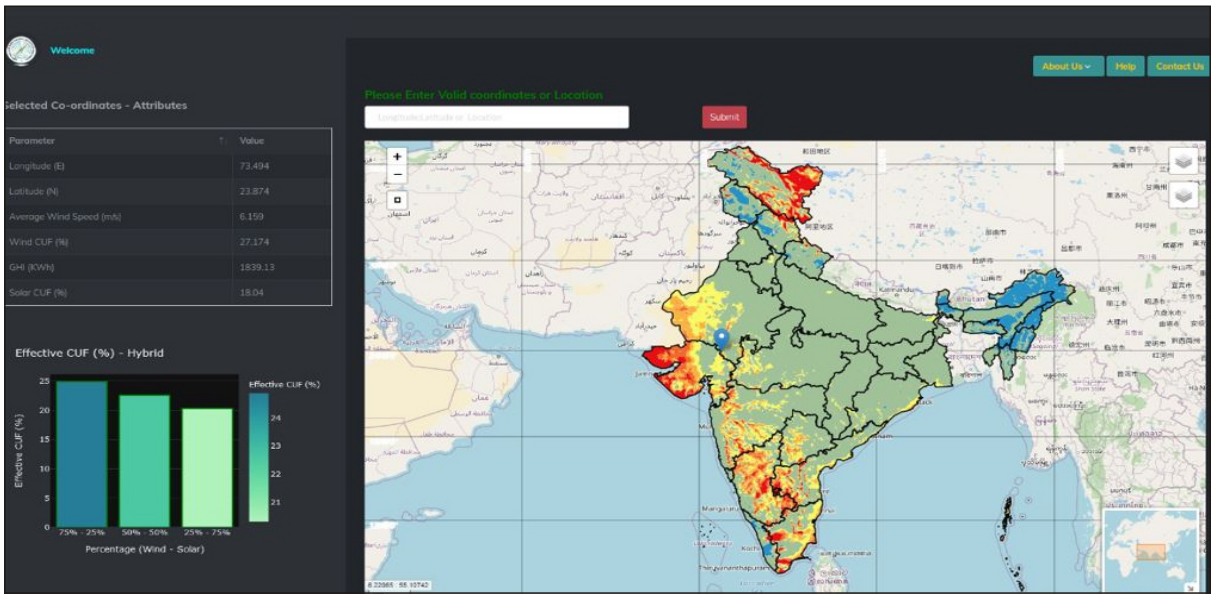
Integrated Wind Solar Resource Assessment Through Measurement and Mapping (IWSRA)

The project supported by MNRE aims at developing a road map to facilitate the policy makers, Private developers, Government Agencies and other stakeholders of the Renewable Industry (Wind & Solar), to move towards achieving the ambitious targets as envisaged by the Government of India.

Preparation of Interactive Web Portal for the Wind-Solar Hybrid Map

As an outcome of the project first of its kind GIS based interactive web portal for the Wind-Solar Hybrid map in order to cater the needs of the stakeholders for fostering the wind and solar hybrid activities has been developed. The portal was developed with updated features such as spatial query, multiple map layer display and effective %CUF query, etc. Presently, the portal has been submitted for the security audit and on completion of the same, the portal will be publicized.

https://wsom-maps.niwe.res.in/hybridmap/

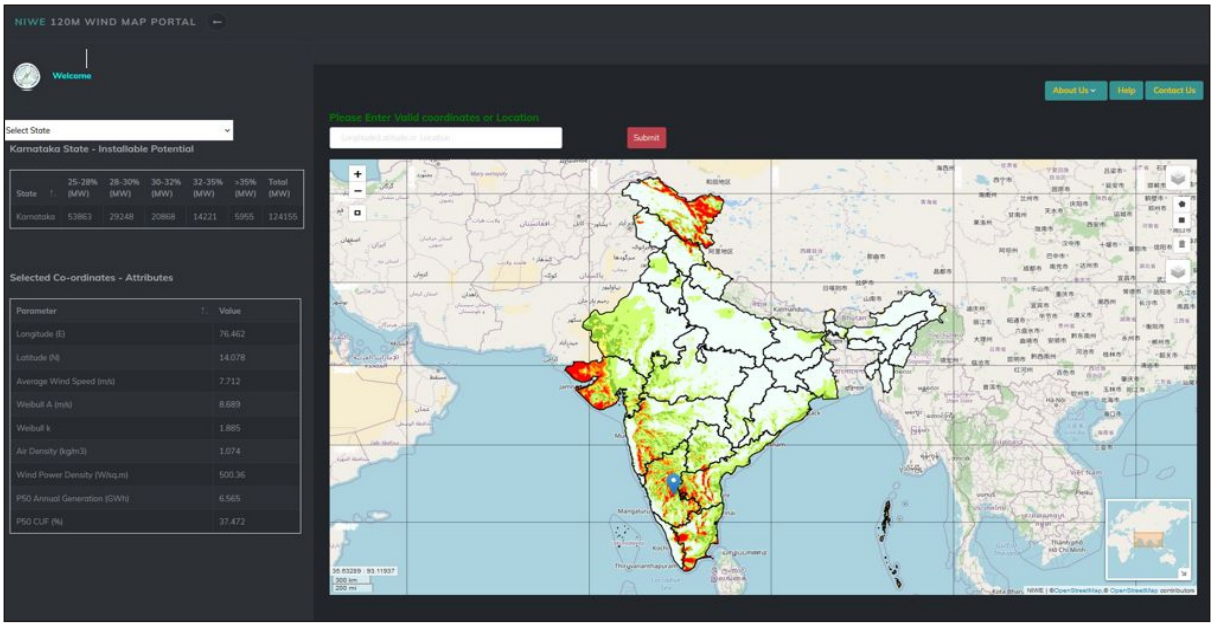


Interactive Wind-Solar Hybrid Portal

Preparation of Interactive Web Portal for the 120m Wind Potential Map

Also first of its kind GIS based interactive web portal for the wind potential map at 120 m AGL for easy and effective access of the stake holders has been developed. The portal was developed with updated features such as spatial query, category-wise potential estimation, windiest land percentage, etc. Presently, the portal has been submitted for the security audit and on completion of the same, the portal will be publicized after the completion of security audit.

https://wsom-maps.niwe.res.in/windmap/



Interactive 120 m Wind Potential web portal

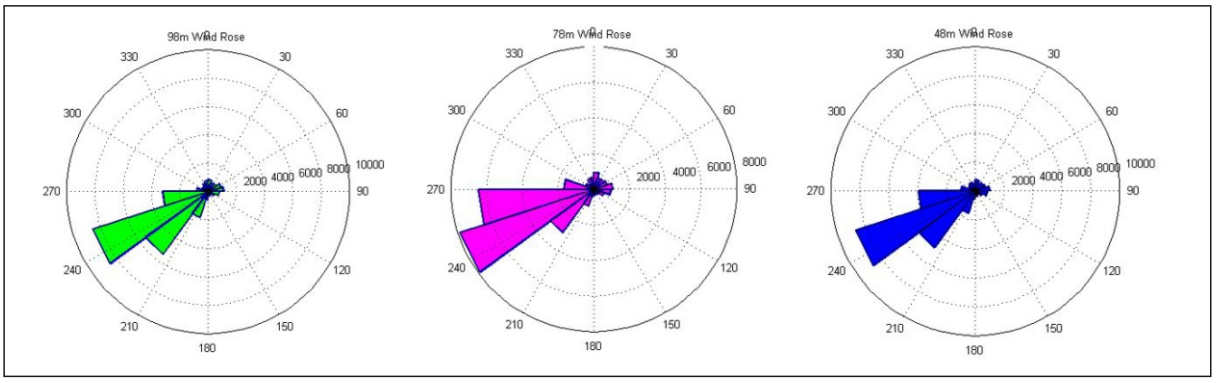
Integrated Wind Solar Towers/Masts

Under the said project NIWE has commissioned 23 Nos. of Integrated Wind - Solar Resource Assessment Stations in Tamil Nadu, Karnataka, Andhra Pradesh, Gujarat, Maharashtra, Rajasthan and Telangana and the data collection from these stations has been successfully completed, the measurement is underway. The remote sensing device Sound Detection and Ranging (SoDARs) have been placed at wind monitoring site to understand the vertical wind shear variation. The details of IWSRA stations are given in following table;

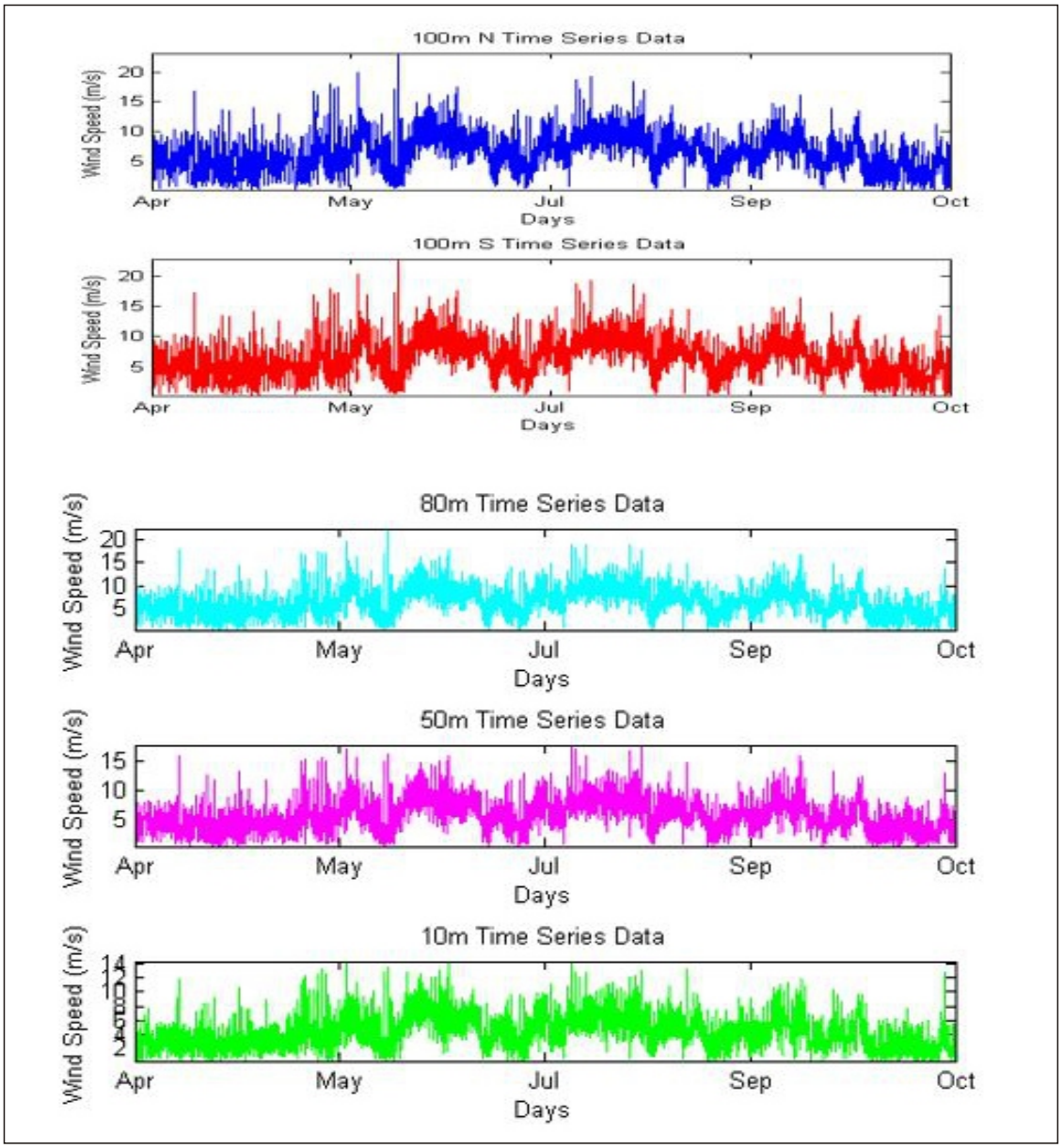
Sl.No.	State	Mast Installed	Mast commissioned
1.	Gujarat	7	7
2.	Maharashtra	3	3
3.	Telangana	1	1
4.	Andhra Pradesh	2	2
5.	Karnataka	4	4
6.	Tamil Nadu	4	4
7.	Rajasthan	2	2
	Total	**23**	**23**

100 Meter Mast

The Interim report for 13 locations covering 9 months data has been prepared and the measurement campaign is underway



Wind Rose



NIWE had identified another 25 new locations (Phase II) where these towers will be relocated after completion of requisite one-year data collection from the present sites and the field visits to the sites, finalization of the sites and obtaining the needed NoCs etc., will be completed in due course.

Phase-II IWSRA Station location Details		
S.No	**State**	**Sites**
1	Andhra Pradesh	3
2	Gujarat	3
3	Hariyana	1
4	Karnataka	2
5	Madhya Pradesh	1
6	Maharashtra	3
7	Odisha	2
8	Punjab	1
9	Rajasthan	1
10	Tamil Nadu	4
11	Telangana	1
12	Uttar Pradesh	1
13	West Bengal	2
Total		**25**

Offshore Wind Development

India is fortunate to have a vast coastline that measures 7600 km (including all of its islands) and an Exclusive Economic Zone (EEZ) that spans approximately 2 million sq km. The United Nations Convention on the Law of the Sea grants India the ability to exercise its sovereign rights inside its Economic Exclusive Zone, which extends out to a distance of 200 nautical miles from the baseline. Within this zone, India is able to engage in activities such as fishing and the generation of energy from ocean currents and wind. In addition, it has the exclusive power to construct, authorize, and regulate the construction, operation, and use of installations that are used for this purpose.

The nation has decided to use offshore wind energy as part of its efforts to reduce the effects of climate change, accelerate the establishment of a sustainable energy supply, achieve greater independence from energy imports, and generate new employment opportunities. The first offshore wind farm in India will make use of the enormous potential offered by the country's extensive coastline in order to generate clean and renewable energy to satisfy the country's growing demand. In order to develop offshore wind power, various studies and surveys have to be carried out.

Centre of Excellence for Offshore Wind and Renewable Energy

India and Denmark established the Centre of Excellence(CoE) for Offshore Wind and Renewable Energy. This is institutionalized as a collaborative venture between the Indian Ministry of New and Renewable Energy (MNRE) and the Danish Energy Agency (DEA). The CoE will play a critical role in enabling and accelerating the implementation of India's offshore wind strategy by bringing together industry, state agencies, and civil society.

To accelerate India's ambitious targets, the CoE has launched a number of supporting initiatives. India may benefit from more than 30 years of Danish experience and expertise in maritime spatial planning and the one-stop-shop strategy for licensing and approvals in offshore wind, which streamlines critical processes in establishing offshore wind projects. Furthermore, investor discussion, auctioning, and de-risking will make investing easier. Under this program, DEA divided four theme areas as

- Spatial Planning and Permitting Process
- Financial Framework and Auction Design
- Grid and Supply Chain Infrastructure

- Technical Standards and Rules for Innovation.

Various activities and studies were carried out within these four thematic areas associated with NIWE.

Marine Spatial Planning for offshore wind farms in Tamil Nadu

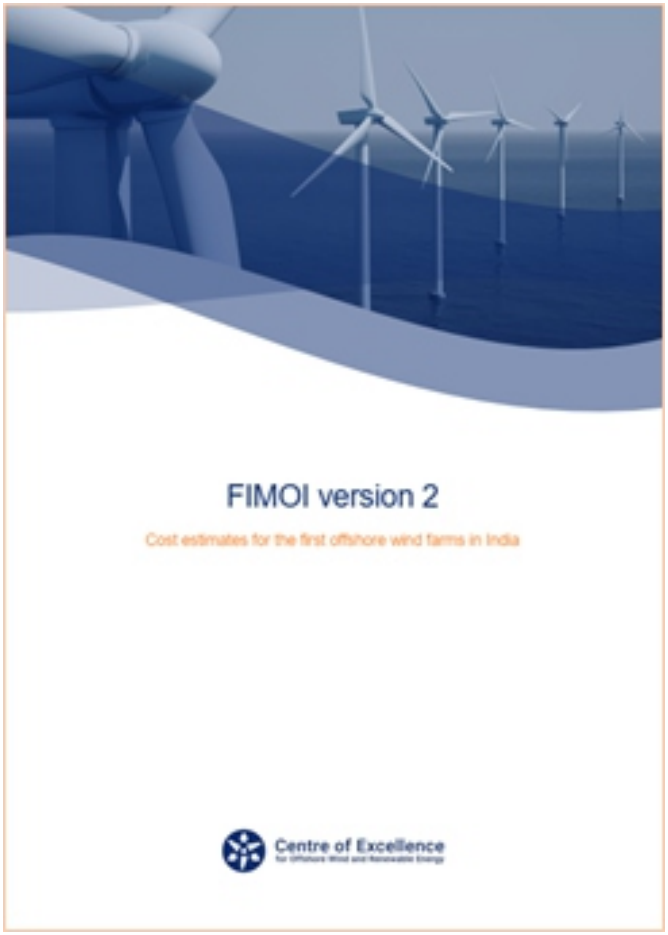
Marine Spatial Planning is one of the activities carried out under the Indo-Danish Energy Partnership Programme's work package on “Enabling framework that streamlines site selection, clearances, and procurement while lowering the risk to investors”. During the year 2021-22, this work package was engaged for the maritime spatial planning for offshore wind farms in Tamil Nadu. The primary objective of this study was to identify and prepare an initial implementation plan for 5 GW of offshore wind projects within Tamil Nadu's defined wind zones to support the overall target of 30 GW by 2030.

- The rough and conceptual planning has been completed using wind speeds greater than 7m/s and water depths ranging from 10 to 50 m as the primary criteria, as well as other considerations such as energy (turbine) density to be used for planning purposes, module size consideration,

Habitats and buffer zone for marine mammals and turtles around selected zones (COWI, 2021)

- Seabed screening, turbine suitability, and port and logistic infrastructure.
- The fine screening will be performed during the next phase of the project to calculate LCOE and rank sites based on the following factors: Seabed and other physical parameters; subject to the availability of geophysical/geotechnical data
- Biological, human, environmental, and socio-economic parameters.
- Electrical and logistical infrastructure considerations
- Annual Energy Production (AEP) calculation

Financial Modeling of Offshore in India (FIMOI) Project



The project was launched in 2018 with the ambition of creating a transparent, encouraging, and enabling environment in India for offshore wind. This project's objective is to collect and publish the best data currently available for the Indian offshore sector in order to describe the existing and projected technical and economic statistics for Indian offshore wind arms. This information will be used for the benefit of the offshore wind industry as well as relevant authorities.

In February 2021, the first FIMOI report was successfully released. The original edition of the paper presented LCoE estimates for India's first offshore wind farm as well as associated risks. Since then, the offshore wind sector has grown even stronger, and the cost of offshore wind has dropped dramatically worldwide. Offshore wind is gaining popularity in the Indian market. The FIMOI project is an iterative process in order to obtain the most recent insights into the offshore wind industry and provide the most appropriate estimation. As a result, an amended Version 2 of the FIMOI report has been prepared for dissemination in March 2022.

Roadmap for offshore wind in India by 2030

NIWE has prepared the trajectory for offshore wind farm installation off Gujarat and Tamil Nadu coasts in India by 2030. The wind potential, water depth, and proximity to the coast have been taken as criteria for demarcating and ranking the zones. Based on the above criteria, sub-blocks have been demarcated off the coast. The MNRE is in the process of finalizing the various models for offshore wind development, and the identified sub-blocks will be auctioned based on these development models. Under this context, MNRE has conducted stakeholders' meetings to finalize the modalities for the development of offshore wind farms in the country.

Offshore Supply Chain Analysis

NIWE has also initiated collaborative research with the UK's ORE-Catapult to map the Indian offshore wind supply chain. This study investigated and outlined both present and upcoming supply chain activities in India for the offshore wind sector. This would aid in identifying future Indian products and

services, as well as areas where international technical assistance may be needed. A survey of the Indian research base was conducted by interacting with key Indian stakeholders investing in offshore wind projects. In this context, ORE-Catapult and the British High Commission hosted the UK India Offshore Wind Technical Summit in March 2022, which was attended by a large number of Indian stakeholders.

Data Analytics

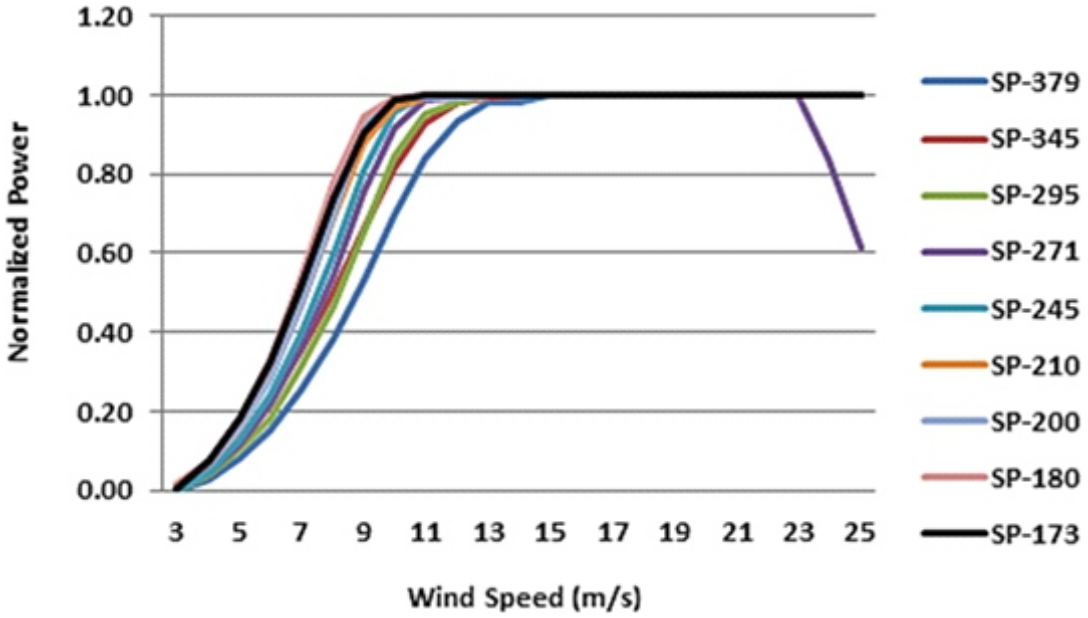
Developing renewable energy projects need a plethora of data about a potential site, including wind and solar resource information at different geographic and temporal scales. The data set is collected from an in-situ measurement for implementing wind and solar energy systems at a particular place to reveal new insights for better decision-making. The Data Analytics unit is working to cater to the resource-related needs of the industry and other stakeholders of the sector by carrying out data analytics and research activities using the largest wind & solar resource data bank available with the institution. Based on different data analyses of any study area, it is observed a lot of places are available where solar radiation and wind velocity are available in abundance. The division also carried out various data analytics services for the stakeholders.

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 modeling analysis. The energy yield calculation was made for P50, P75, P90 & P95 for 1, 10 & 20 years and provided to the client in a report. As a notable outcome, NIWE has been entrusted by V.O. Chidambaranar Port Trust and Kerala State Electricity Board for the Project Monitoring Consultancy Service work for the development of a wind farm at their premises.

Study towards Reduction of Specific Power in Wind Turbines for Indian Conditions

Toward evaluating the prospects of specific power reduction in wind turbines, a specific study has been conducted based on an LSP turbine synthesized close to a target Specific Power (SP) of 100 W/m2 based on ground-based measurements at varying site conditions representing various IEC wind classes. In accordance with the findings, low-specific power wind turbines can improve the capacity utilization factor, lower the cost of electricity, increase the value of wind, and better utilize the transmission system in all wind circumstances, albeit to varying degrees. This analysis further suggests that, under reasonable scenarios, low-specific power turbines could play a significant role in the future wind energy fleet, with their impact being particularly noticeable in low-wind areas of the world.



Initiated study of Data imputation model development for wind data gap filling

Wind energy systems require reliable wind data sources to predict the performance of the plant. Wind data for at least one continuous year of measurement is thus critical. However, missing and erroneous data may occur for various reasons, including communication and signal issues, sensor problems, equipment malfunctions, and maintenance and calibration issues. In case of larger data gaps (month-wide), the measurement needs to be repeated to cover one continuous year period, which is time-consuming and delays the project development. In this regard, a study has been initiated to develop wind data imputation methods for filling such more significant data gaps at varying terrain conditions using Machine Learning & ANN. On successful development, the model may be very much helpful in reducing the time lag in project development.

Forecasting & Information Technology

Wind & Solar Power Forecasting

The government of India has recently announced plans to achieve 50%capacity from non-fossil fuel generation by 2030. Scaling up the share of RE to such high levels in 2030 may have implications for the Grid. Considering this, NIWE and NREL have conducted a collaborative study to review the country's existing institutional framework and suggest improvements considering the 2030 target, best practices, and international experience.

NIWE has developed indigenous wind and solar power forecasting, models. Currently, the missing data are ignoring and proceeding with model training for wind and solar power forecasting. The forecasting output could not be verified during this period, affecting the model's accuracy. In this case, the reason for missing data is majorly due to communication or signal issues at the site. In this regard, to improve the accuracy of the forecasting model, NIWE has carried out a collaborative project with NREL and developed an algorithm to fill the missing gaps in solar data. Similarly, an MoU has been signed with Calcutta University to develop an algorithm to fill the missing gaps in wind data.

The following activities have been carried out during the current year.

- Prepared a report on long-term wind speed analysis in India.
- Developed the PSPI, Smart persistence generalized model for intraday solar power forecasting.
- An MoU has been signed between NIWE and Calcutta University to carry out research work in forecasting and resource data analytics.
- NIWE and NREL are working on a project to review the best practices of forecasting in India and across the globe and its recommendations to achieve the 500 GE green energy target.

Information Technology

Continued to maintain the computing (Hardware, Software, and Networking), Web applications to meet the requirements of the NIWE. Successfully implemented a data backup and recovery mechanism and developed various web applications to support R&D projects.

The following activities have been carried out during the current year

- Developed a NIWE Centralized working environment in NIWE to work in a comfortable and protected environment.
- Designed and developed the framework for implementing software access mechanism in NIWE, Storage & Backup strategies with available infrastructure.
- Developed NIWE IT service portal and created online forms to raise a complaint or IT service requests.
- NIWE cloud application has been developed to share and access files from anywhere through the internet.
- Developed NIWE meet application for online meetings and conferences; currently, testing is in progress.
- Version 2.0 of RLMM online portal development is in progress.

RE Projects

Towards supporting the academic institutions and PSUs, we have also extended our service in developing RE projects in the Wind and Solar sectors, under which NIWE will support the project development and performance monitoring activities.

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

NIWE has successfully commissioned a 2 MW solar power plant and Synchronized it with the Grid at IIM, Trichy, Tamil Nadu. Solar generation units from the commissioned plant at IIM –Trichy are shared with IIM and REC officials on a monthly basis. A work Completion Certificate was issued, and the O&M activities have been initiated for the next five years to monitor the Performance Ratio. Regular Maintenance work of the plant is being carried out.

NIWE had taken up a consultancy project, “Establishment of 1 MW (AC) SPV Power Plant” at MKU, Madurai. The project was successfully designed, verified, installed, and commissioned. The plant was inaugurated by the Hon'ble Chief Minister of Tamil Nadu on 25.01.2022.

NIWE had successfully Synchronized with the Grid on 25.02.2022 at MKU, Madurai, Tamil Nadu. Solar generation units from the commissioned plant at MKU, Madurai, are shared with MKU and REC officials on monthly basis. Work Completion Certificate issued and the O&M activities has been initiated for the next five years to monitor the Performance Ratio.

Inauguration of Solar Plant by Chief Minister of Tamil Nadu

Synchronized with the Grid on 25.02.2022 at Madurai Kamarajar University, Madurai

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 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 11th meeting of Wind Turbines Sectional Committee (ETD 42) of BIS held on 25.03.2022 through video conference under the Chairmanship of DG, NIWE. During the year 2021-22, three Indian standards on wind turbines have been finalized and accepted by BIS for printing. A total of eighteen 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 48 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 standards.

IECRE meetings

Director & Division Head, S&R attended the IECRE 8th REMC meetings held during 01.12.2021 to 03.12.2021 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 30 wind turbine models and the review comments have been submitted to MNRE / RLMM committee. Director & Division Head, S&R along with DG, NIWE participated in Eleven RLMM committee meetings during the year, through video conference and provided technical support for finalizing the recommendations for issuing the RLMM lists.

Development of upgraded RLMM online portal

Based on the implementation experience, the development of an upgraded RLMM online portal has been taken up through IT division of NIWE in order to improve the existing RLMM online portal, and it has been completed successfully. The upgraded RLMM online portal would be implemented after completion of security audit.

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 one prototype wind turbine model viz., AGW 147/4.2, with a rated capacity of 4200 kW has been completed. Further, the division organized the prototype committee meeting and as per the recommendation of the prototype committee, a letter in connection with grid synchronization of the above said prototype wind turbine model was issued for the purpose of Type Testing.

Quality Management System (QMS)

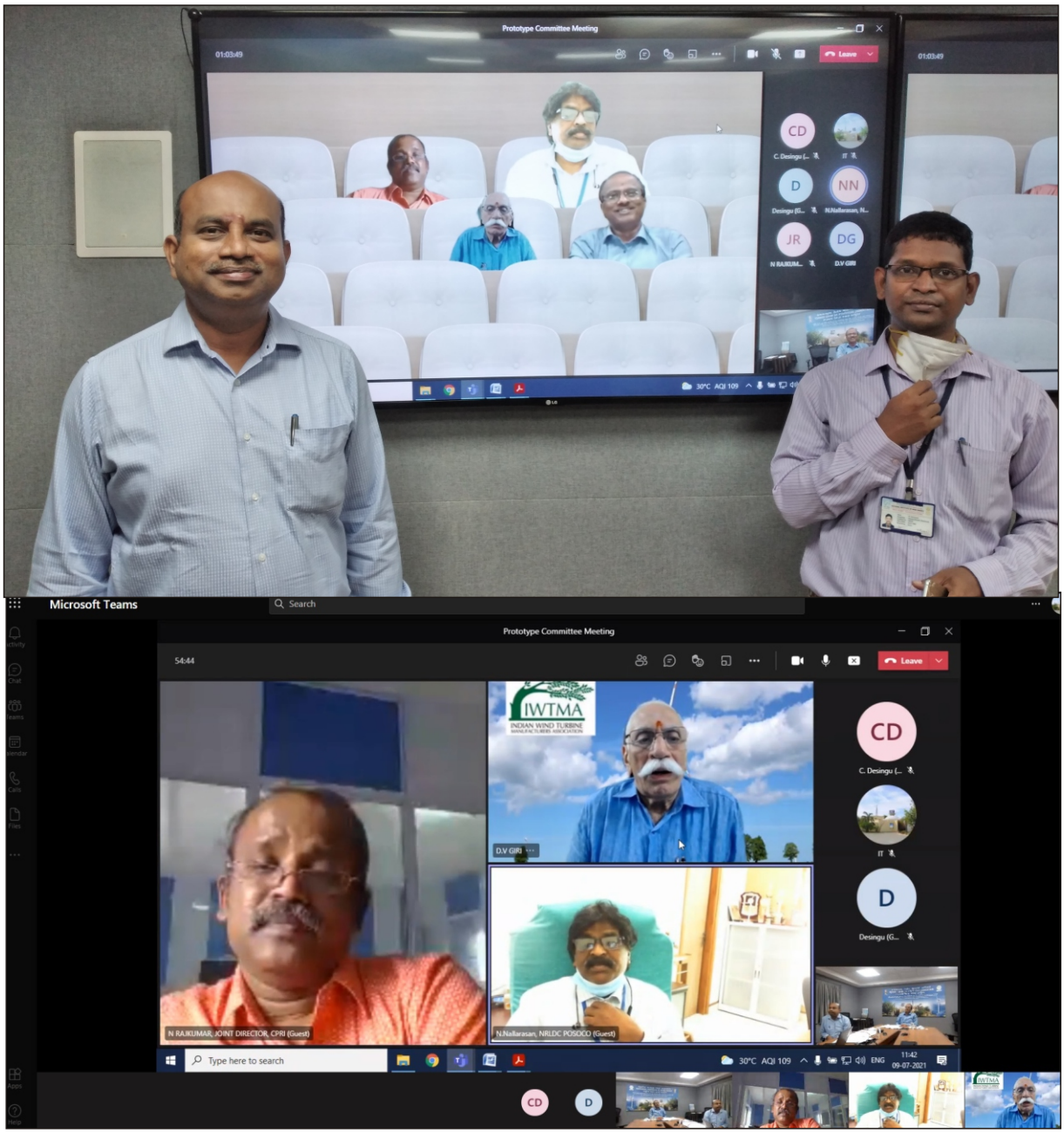
The services offered by NIWE viz., "Provision of type certification, testing and wind resource assessment services related to wind energy" are already certified as per ISO 9001:2015 by DNV. Director & Division Head, S&R, as a Management Representative (MR) of ISO 9001:2015, has carried out various works 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) carried out various works and provided the support for the second periodic audit of quality management system as per ISO 9001:2015 conducted by DNV and successfully obtained the recommendation for continuation of certification. The continual improvement and maintaining the quality management system are ongoing.

Indian Wind Turbine Quality Control Order (IWTQCO)

A comprehensive certification scheme viz., Indian Wind Turbine Certification Scheme (IWTCS) has earlier been prepared by NIWE and submitted to MNRE. During the year, S&R division prepared the replies for all the queries / comments received from various stakeholders for the draft IWTCS document, circulated by MNRE. Based on the above, S&R division also prepared the revised IWTCS document and submitted the same to MNRE. Subsequently, it was decided by MNRE to issue the IWTCS document as Indian Wind Turbine Quality Control Order (IWTQCO). S&R division carried out various works in connection with preparation of the revised draft IWTQCO document and submitted the same to MNRE for further process.

11th ETD – 42 Meeting



Prototype Committee Meeting – through video conference

Testing

Wind Turbine Test Station

Asia's First Large Wind Turbine Test Station was established in NIWE's Wind Turbine Test Station (WTTS) near Kayathar in Tamil Nadu. Also acts as the lead coordinating Lab for Testing Wind Turbines, as per the National Lab Policy of Govt. of India, for arranging Inter Lab Comparison works to ensure the validity of results. The Test Station has the following facilities:

ISO/IEC 17025:2017 accredited Test facility

- Two test beds to test Large wind turbines up to a total capacity of 1650kW with readily available grid connection and met-mast for each test bed.
- Availability of 9 No's of 200kW Micon, one number each of 600 kW Suzlon, 2000 kW Senvion & Inox make wind turbines' for development of new measurements techniques and National Research.
- Four Test beds to test Small Wind Turbines and test beds can be expanded further on request.

The test station 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
- Acoustic Measurements
- Small Wind Turbine Testing (power curve, safety and duration)

Additionally, capable of undertaking User-defined measurements

Large Turbine Testing

- Acoustic Noise Measurement of its model - Pioneer Wincon 750 / 57, 750 kW, 75 m HH at SF No.886, Cheliyanallur Village, Manur Taluk, Tirunelveli District, Tamil Nadu. The measurements have been completed as per the signed agreement. The Final test report issued to the customer.

- Power Curve Measurements of Inox 2000 kW WT with 100 rotor diameter at Rojmal, Rajkot District, Gujarat of M/s. Inox Wind Ltd. The measurements have been completed and Test Report issued as per the signed agreement.
- Type Testing of Pioneer 750 / 57 Rotor diameter at Cheliyanallur Village, Manur Taluk, Tirunelveli District, Tamil Nadu of M/s. Para Enterprises Pvt. Ltd. The measurements have been completed as per the signed agreement. Final Test Reports issued to the customer.
- Type Testing of 3 MW Prototype turbine with 145 meter rotor diameter at Vigodi Village, Taluka - Nakhatrana, District - Kutch, Gujarat of M/s. Inox Wind Ltd. The Site Feasibility Study (SFS) completed on 22.12.2020. Type Testing to be taken up when the turbine is offered at site by the Customer.

Specific Achievement

As a part of continued capacity building, the Lab 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.

Wind Turbine Testing Programme : Building Quality Assurance & Capacity

Measurements & Testing Division of National Institute of Wind Energy (NIWE) under Ministry of New and Renewable Energy (MNRE), Government of India leads the activities wrt adoption of IEC Standards into BIS and also works as MNRE's Primary laboratory in Wind Turbine Type Testing. Under the MNRE Lab Policy mandate NIWE needs to facilitate and coordinate with other active Wind Turbine Testing laboratories in India to strengthen the Quality Assurance in the Testing Services offered to the various Indian Stakeholders. One way of supporting this initiative is through conducting Inter Laboratory Comparison(ILC). The ILC program shall help evaluating the laboratory competence in specific scope and obtaining the accreditation as per ISO/IEC 17025.

- NIWE being the designated primary lab in Wind Turbine Testing had conducted a Inter Lab Comparison (ILC) for Load Measurements of wind turbine as per IEC 61400-13 along with three labs of International repute namely M/s. Deutsche WindGuard Consulting GmbH, M/s. Garrad Hassan India Pvt Ltd (DNVGL-Energy), M/s. UL International GmbH-DEWI. The evaluation of the Inter Lab Comparison is performed by independent examiner and the Z-Score was reported.
- Prepared the report and circulated to Participant Labs for the Comments.
- Final report has been submitted to MNRE.

Participation in International Level Proficiency Testing - Operated By IECRE-MEASNET

Proficiency testing in General is the evaluation of the performance of a laboratory with specific focus on compliance with the underlying IEC standard by inter laboratory comparison. The scope of a proficiency test may cover all aspects of its underlying standard or certain parameters of a standard

(such as methods, procedures etc.). The successful participation of Proficiency Test would help laboratory becoming RETL under the IECRE.

- Proficiency Test on Acoustic Noise Measurements on Wind Turbines was open in MEASNET (recognized by ICERE for organizing PT).
- Activities towards participation (Agreement signing & Fee Payment) Completed with MEASNET.
- Data and Instructions have been received from MEASNET during September 2021.
- Analysis have been carried out and data has been submitted to MEASNET on 22.10.2021.
- Results are under discussion. Corrective Action Report has been prepared and submitted to MEASNET recently.
- NIWE has now applied for the PT on Power Performance and Load Measurements as Type B participants and the PT is expected to start on February 2022 & May, 2022 respectively.
- Data and Instructions have been received from MEASNET for Power Performance PT during end of February 2022.
- Analysis have been carried out and results will be submitted to MEASNET on 01.04.2022 (due date).

DST DTU (Denmark Technical University) Project – Hybridize (three Year Research Project Starting In 2019-20) : Instrumentation Of Wind Turbine And Collection Of Turbine Characteristic Data For Yr.2020 Wind Season (DST Project)

HYBRIDize is an approved DST-IFD (Indo-Danish collaborative) Research project aiming toward the development of design and operational methodology for grid-connected hybrid power plant consisting of wind turbines, PV panels, and battery energy storage systems. Under this Project, an Indian WT OEM has expressed interest to be partner of this project as "Project Partner – External" and installed a 250 kW fixed speed stall regulated wind turbine at WTTS, Kayathar. One of the objectives of the Project is Testing of Wind turbine (to assess electrical and mechanical performance and type Characteristics for comparison after the converter / controller retrofit) Accordingly, Measurements & Testing Division of NIWE is currently carrying out measurements for power performance and Load Measurements as per latest IEC Standards. In addition, 48 m wind turbine tower has also been modelled in STAADPro software for analysis. Also, efforts are being made to build an aero-elastic model of the Wind Turbine in HAWC2 (Software by DTU Wind).

- An agreement signed between NIWE and M/s. Siva Wind Turbine India Pvt Ltd on 06th August, 2020, a (Project Partner External), the DST approved R&D project with their MODEL – SIVA 250 / 50 kW, HH 50.0 m , a wind turbine with 30 m / 32 meter rotor diameter at R&D Measurements to be carried out at the PROJECT PARTNER EXTERNAL - DST'S site at SF No.67, Test Bed B, WTRS wind farm, Ayyanaruthu TNEB SS, Tuticorin District, Tamil Nadu.
- Co-ordination with IIT Kharagpur, Review meetings with Project Partners and recruitment activities are ongoing.

DST wind turbine instrumentation work

Strain Gauging work at tower legs

- PP (E) has completed foundation work. Wind Turbine (WT) Tower material arrived at Site. Erection and commissioning of the research WT is completed by October 2021.
- NIWE M&T Division has completed instrumentation work and currently carrying out calibration of load channels (to be carried out low wind season).
- In addition, based on the information obtained from PP(E), Tip Speed ratio Vs Power Coefficient relation has been calculated based on NREL Code WT-Perf and shared the same to IIT Kharagpur.
- A meeting was organized among NIWE, PP(E) and IIT Kharagpur to understand the control system followed by PP(E) in order to support activities of IIT Kharagpur.
- Measurements are ongoing and expected to be completed by June 2022.

Establishment of Renewable Energy Demo Lab at Wind Turbine Test Station at Kayathar, Tamilnadu

Honorable Secretary to the Government of India, MNRE dedicated RENEWABLE ENERGY DEMONSTRATION Lab at Wind Turbine Test Station (WTTS), National Institute of Wind Energy (NIWE) Kayathar, Tamil Nadu to the nation in the August presence of the Joint Secretary (Wind) and Director General NIWE on 20th August, 2021. The lab is aimed to provide manufacturing, demonstration and testing facility support for Small Wind turbine manufacturers with properly roofed workshop space of 600 Square meters. Also, it will serve the needs of training for running major Upskilling and Reskilling Human Resource programs (eg., Vaayumithra) for the benefit of the Renewable Energy Sector.

Implementing Agreement for IEA With TCP

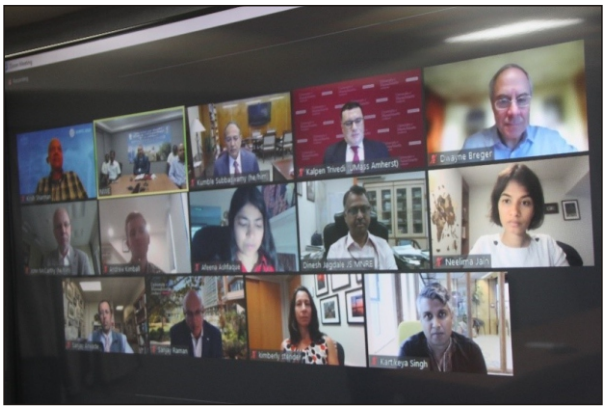
Renewable energy Demo lab building

Inauguration

Implementing agreement of IEA was signed on 13th August, 2021 between National Institute of Wind Energy (NIWE) and International Energy Agency (IEA) Wind TCP for cooperation in the areas of new Research, Development and Global Deployment of Wind Energy Systems.

Implementing Agreement between NIWE & UMASS

A "Memorandum of Agreement" has been signed between National Institute of Wind Energy (NIWE) and University of Massachusetts Amherst (UMA), USA on 22nd September, 2021 to establish mutually beneficial collaborative research projects.



MoA between NIWE & UMASS

National Test Centre for Offshore Wind Turbines and Greening of Rameshwaram Island : Preparation of Road Map/project Report on Establishment of National Test Centre (NTC) for Offshore WTS and Greening of Rameshwaram Island

The Indian and Danish government initiated a government-to-government partnership in 2018 within offshore wind power to collaborate on developing the Indian offshore wind industry. The Indian partners are Ministry of New and Renewable Energy, the National Institute of Wind Energy, while the Danish partners are the Ministry of Climate, Energy and Utilities and the Danish Energy Agency (DEA).

The knowledge acquired and lessons learned during the development of wind power in Denmark for more than 25 years, in particular offshore wind power, can be valuable to the Indian government in establishing and expanding the country's offshore wind sector and enabling it to achieve its renewable

energy goals. Therefore, the National Institute of Wind energy has expressed a strong desire to gain value from the Danish experience and draw lessons learned from the planning and operation of Denmark's Offshore Wind Test Center Østerild. The Technical University of Denmark - Wind Energy is responsible for the operation and maintenance of the centre. The operation of the test centre is done in close cooperation with industry and authorities.

For defining the full scope and objective of the National Test Centre for Offshore Wind Turbines at Dhanuskodi, the National Institute of Wind Energy has launched a questionnaire survey to know the views of all Stakeholders in the Offshore Wind Energy Development in India with respect to availing services related Testing and Certification of Wind engineering assets by using the facility to be developed at Dhanuskodi.

- Under Indian Danish Energy Partnership (INDEP) Programme, based on the NIWE feedback, a revised report on 'Assessment of Site Specific Wind conditions – Dhanuskodi test site – India' was issued by DTU Wind.
- Two interactive sessions with DTU Wind on "IEC Classification on Dhanuskodi" and "Advanced Measurements – Vertical Profiling LIDAR, 3D Sonic etc.," are completed.
- Further, an interview with OEM was conducted.
- Stakeholder consultation and preparation of pre-feasibility report on Dhanuskodi are under progress.
- Recently a committee has been constituted by MNRE to examine the proposal on Greening Rameshwaram Island (offshore Test Station cum Demonstration Plant).
- First Virtual Task Force Meeting on Greening Rameshwaram Island held on 30.12.2021. The Joint Secretary, MNRE requested that TANGEDCO to provide information on the preferential tariff for the special project.
- A letter has been sent MNRE on 04th February, 2022 requesting in principle approval for EIA Study and Grid evacuation for Offshore Wind Demonstration Plant – Greening Rameshwaram Island Project.

Awards / achievements by Division Staff

Dr. G. Arivukkodi successfully completed PhD on the topic "A Study on Broadband Noise Impact of Wind Turbines on Plain and Complex Terrain in India" from Anna University.

Expansion Plans On The Card

- Asia Pacific's first Offshore National Test Facility at Dhanuskodi, Rameshwaram, TN for Offshore wind turbine testing.
- ILC on Acoustic Noise Measurement (IEC 61400-11) is being undertaken based on explicit request from the Labs
- Additional Test Station at Dhanuskodi

Secretary, MNRE visited on 20th August 2021 Dhanuskodi site, Rameshwaram

- Test facility for Wind Turbine blades upto 120 m
- Creation of Blade Test Centre (for Large Wind Turbine)
- Drive Train Test Facility
- Controllable Grid Interface
- RSD Calibration facility

New Customer Business Enquiries

- Acoustic noise Measurements on Senvion 2.7 M130 turbine as per IEC 61400-11 standard.
- Special Load Measurements on Hybrid Tower of M/s. Inox Wind Ltd – wind turbine model DF-2000-113 (HH-120) at Dayapar, Gujarat.
- Power Curve and Load Measurements of its MODEL GWL 225 of M/s. Southern Wind Farms Ltd, a wind turbine with 29.8 meter rotor diameter at Pavoorchatram Site, Tenkasi District, Tamil Nadu.

Certification of Wind Turbines

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 for the certifications services has benefited the wind industry to avail accredited certifications services for wind turbines within India in line with international practices and has 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 accredited Type Certificates have been issued by NIWE.

S.No.	Name of the Indian WT manufacturer	Wind Turbine model	Certification Scheme
1.	M/s. Siva Wind Turbine India Private Limited	Siva 250/50	IS/IEC 61400-22:2010
2.	M/s.Southern Wind Farms Limited	GWL225	IS/IEC 61400-22:2010
3.	M/s. Siva Wind Turbine India Private Limited	Siva 225/40	IS/IEC 61400-22:2010

Second Surveillance Assessment by NABCB

NIWE has obtained accreditation on 16th April 2020 for the certification services valid up to 15th April 2023 as per the ISO/IEC 17065 standard from the National Accreditation Board for Certification Bodies (NABCB), Quality Council of India. As per accreditation requirements, NIWE has successfully completed the 2nd Surveillance Assessment by NABCB on 24th and 25th of January 2022 and the Accreditation has been recommended to be continued till the date of validity. The continual improvement and maintenance of the Accreditation System are ongoing as per the requirements of ISO/IEC 17065.

Windfarm Due Diligence Project

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 Periyapatti site, Tamil Nadu on 29th March 2022.

Agreement For Co-operation

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 the routine interaction is ongoing.

Quality Management System

Wind Turbine Type Certification services of NIWE are certified as per the requirements of ISO 9001: 2015 by Det Norske Veritas (DNV), Norway. During the year, the certification division has successfully undergone the Second Periodic Audit and has been recommended for the continuation of certification issued by DNV. The continual improvement and maintaining the Quality Management System are ongoing.

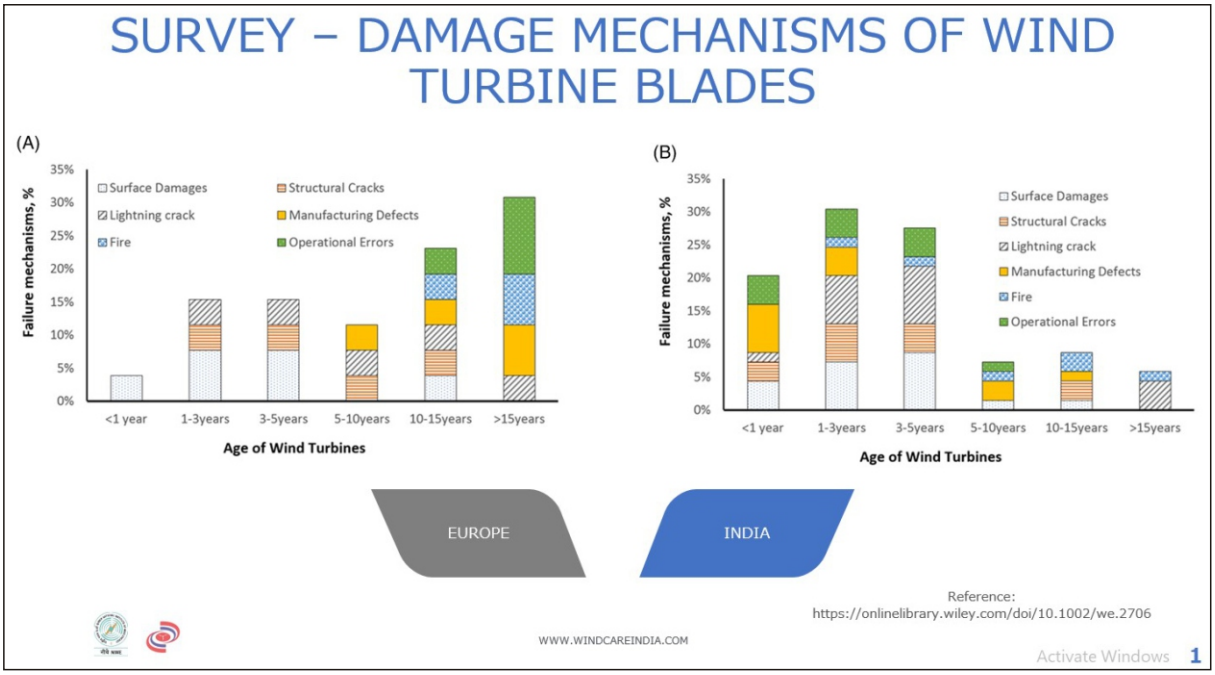
Research and Development

INDO DANISH Project

A Research collaboration project on “Maintenance and Repair Strategy for Wind Energy Development” has been sanctioned under Danish Innovation Fund.

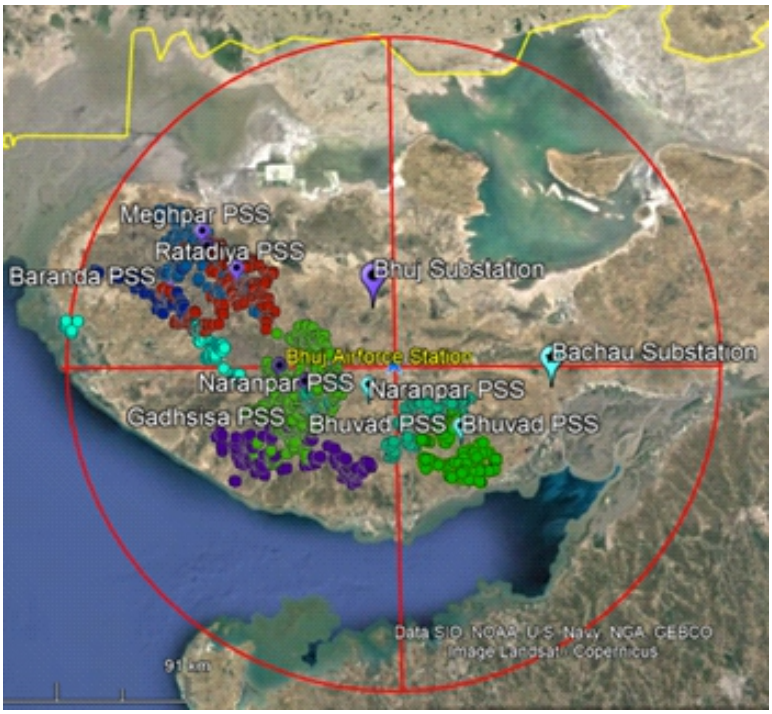
The following activities have been carried out during the current year.

- Consolidated results of Survey 01, 02 & questionnaire on the effect of monsoon on O&M. (Survey 01: Wind Turbine Operations and Maintenance Challenges. Survey 02: Blade O&M Challenges)
- The presentation was done at the Wind Energy Science Conference 2021 (WESC), regarding NIWE's MAINTAINERGY survey results
- Completed 97% of MAINTAINERGY NIWEs Work packages 01 & 02
- Published a paper on “Failure mechanisms of wind turbine blades in India: Climatic, regional, and seasonal variability” in Wiley's Open Access Wind Energy Journal.



- Presented a PPT on "Failure mechanisms of Wind Turbine Blades in India: Climatic, Regional and Seasonal variability" during Symposium on leading-edge erosion organized by DTU, Denmark on 03.02.2022.

Research Project development of controller / interface system to control different OEM WTG in the Bhuj area



Wind farms are often installed in remote areas of India, with some wind farms located near the country's borders. Each wind turbine manufacturer has a unique preparatory SCADA controller to remotely control their MW-class modern wind turbines. Because of this, there is no centralized wind farm controller system accessible to connect remotely with various OEM wind turbines in order to control the wind turbines during emergency situations in the Indian Air force. In order to develop a system to control all the wind turbines at the airforce station, data from various stakeholders have been collected and discussed various modalities to switch off the wind farm/wind turbines.

Wind-driven Air Storage System

Objective

A novel scheme to store the wind energy in the form of compressed air. 5 kW capacity (Class III) Wind Turbine for 5HP compressor (to store energy). A 1 kW Generator is coupled to 5 kW Wind Turbine for feeding lighting loads.

Outcome & Benefits

In the proposed system, the rotor of the wind turbine drives the compressor and the excess energy from the wind turbine is stored locally, as compressed air in a storage pressurized tank. Piston displacement air compressor is used to store and extract energy, which operates nearly at isothermal conditions to have maximum efficiency storage. This concept demonstrates a novel technology of storage using compressed air.

Status

The erection of the proposed system at KCG college campus is in progress. The project is underway and is likely to be completed in next six months.

Experimental set up NIT Durgapur

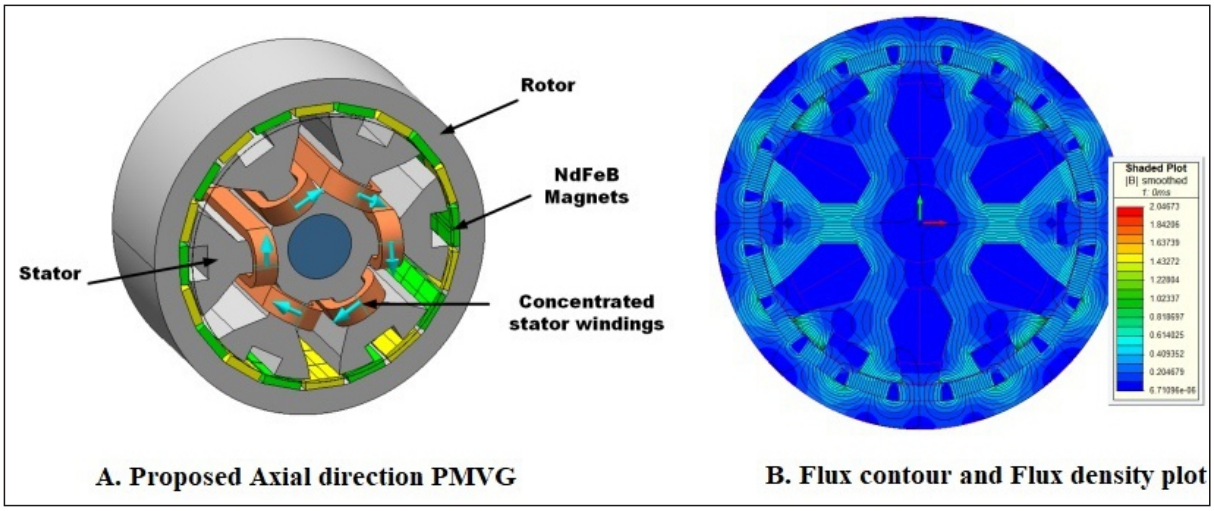
Control of Multi-input Converter for Hybrid Wind Solar battery based system

Objective

The aim of this work is to propose a multi-input DC/DC converter for the hybrid wind / Photovoltaic (PV) / Storage based power system in order to interface multiple DC sources/ storage to simplify the power system and reduce the cost.

Status

A novel de-coupler based PI controller as proposed has been developed, tested and implemented in real time for a multi-input convertor. The validation and optimization of the same is in progress.



Experimental set up IIT GOA

Direct Drive doubly salient permanent magnet machine for roof-top wind energy application

Objective

Indigenous design and development of "Direct-drive rare-earth free double salient PM machine" for roof-top wind power generation with high efficiency and power density.

Outcome benefits

- Lower installation and maintenance costs due to fewer mechanical drive components.
- Improved positional accuracy due to the absence of backlash
- The absence of the field winding in an PM machine significantly minimizes the overall losses and making rare-earth free lowers the cost at higher rates.

Status

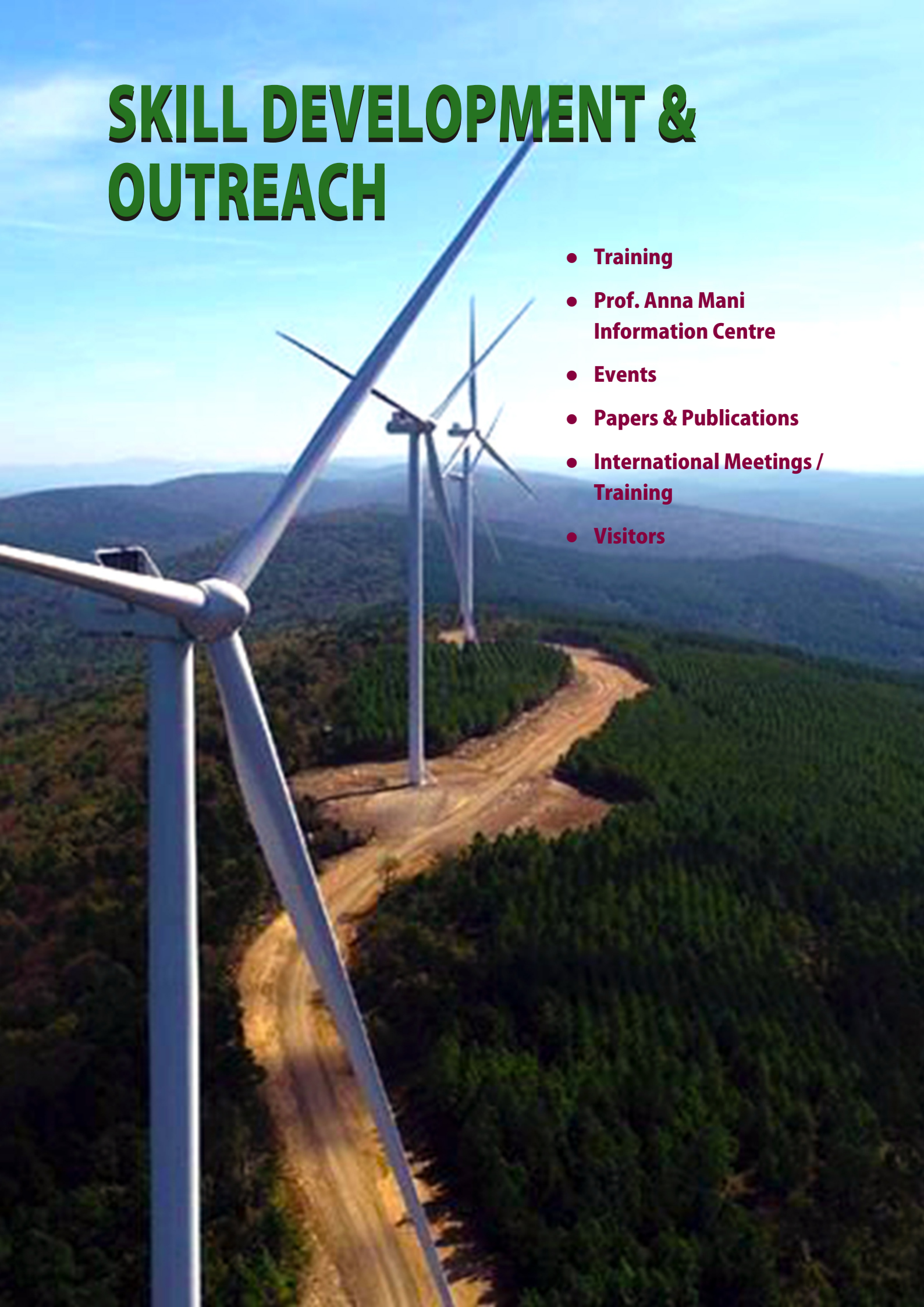
- A novel 3.7 kW Ferrite Vernier PM generator has been designed, simulated and processed for fabrication. The grid integration of the same using a novel switched inductor ultra-sparse matrix converter is simulated and proposed to be implemented in real time, with the developed PM generator.
- As an outcome of the project four numbers of research papers have been published in the international conferences.

Student Internship & Final Year Project

To encourage students to choose renewable energy as their career option, NIWE has been providing Internships in the field of renewable energy every year. The internship will be called "NIWE- Academic Associate Programme (AAP)". NIWE-AAP will provide opportunities for the students to work with scientists/engineers on NIWE's projects.

During the financial year 2021-22, Eighty graduate/postgraduate students and Research Scholars have completed their internship / project work. Presently, twenty-five graduate/post-graduate students and Research Scholars are pursuing internship/project work through online and offline mode in the field of Wind and Solar energy, mentored by various subject matter experts of NIWE Scientific staff.

SKILL DEVELOPMENT & OUTREACH



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

P. DEVAPRIYA, KV-1, CPCRI, Kasaragod, Kerala

has won 2nd Prize for the above drawing titled "Wind Energy for the Great future"
under the category of 8th to 10th Standard in the Painting Competition conducted on 01st June 2021
on the occasion of Azadi ka Amrit Mahotsav to commemorate 75 years of India's Independence

Training

The Skill Development & Training (SDT) is the focal point for information dissemination and Skill Development Programme to create skilled / trained manpower not only in the country but also at international level. The Division is also creating awareness among the students and general public in promoting wind energy through academic promotion and outreach activities such as Library services, education visit, student projects, awareness lecture, knowledge forum, Global Wind Day celebration, IREDA-NIWE Awards for wind energy, sponsorship, advertisement and participation in relevant exhibitions.

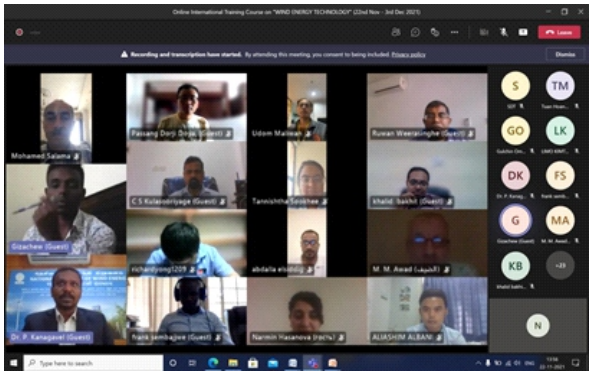
Infrastructure Management (IM) has been established for NIWE's infrastructure development and multi-disciplinary engineering services starting with Civil and Electrical. It mainly executes the construction works of basic amenities like new floor space for fresh recruits/expanded areas of work, enhancement of security apparatus / infrastructure & upkeep of existing infrastructure both civil and electrical related.

International Training Course

Online International Training Course on "Wind Energy Technology"

The Skill Development and Training & Infrastructure Management (SDT & IM) Division of NIWE has successfully conducted the Online International Training Course on "Wind Energy Technology" during 22nd November – 03rd December 2021, sponsored by Ministry of External Affairs (MEA), Government of India under e-ITEC programme. The course addressed all aspects of Wind Power starting from introduction to wind and its technology, wind resource assessment, installation and commissioning,

Dr. K. Balaraman delivering the inaugural address



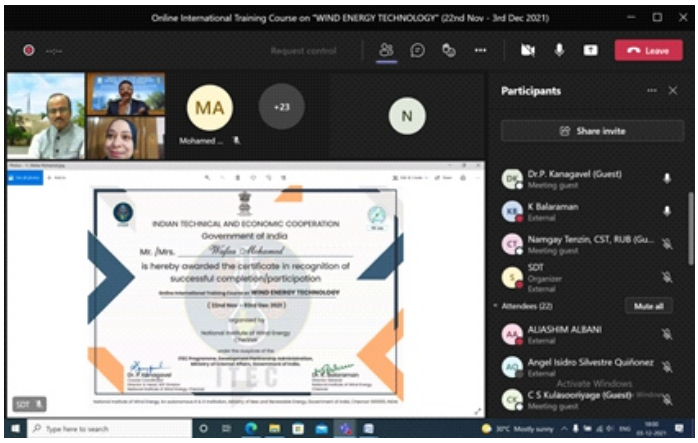
Participants during Inauguration

Grid integration, operation and maintenance of wind farms, financial and policy aspects along with testing and certification of wind turbines. The course was attended by 36 participants from 18 ITEC countries, Azerbaijan, Bangladesh, Bhutan, Egypt, Ethiopia, Ecuador, Guatemala, Kenya, Lebanon, Malaysia, Mauritius, Namibia, Panama, Sri Lanka, Sudan, Thailand, Uganda and Vietnam.

The training course was inaugurated through virtual mode by Dr. K. Balaraman, Director General, NIWE in the presence of Course Coordinator Dr. P. Kanagavel, Director and Head, SDT & IM, NIWE on 22nd November 2021.

During the 10 days of the course, 20 lectures were scheduled. The course content of the training was imparted by Scientists, Engineers of NIWE, wind turbine manufacturers and academicians from premier institutions, who have many years of experience in the field.

Dr. K. Balaraman, Director General, NIWE delivered the Valedictory Address and distributed E-certificates through virtual mode to the participants.



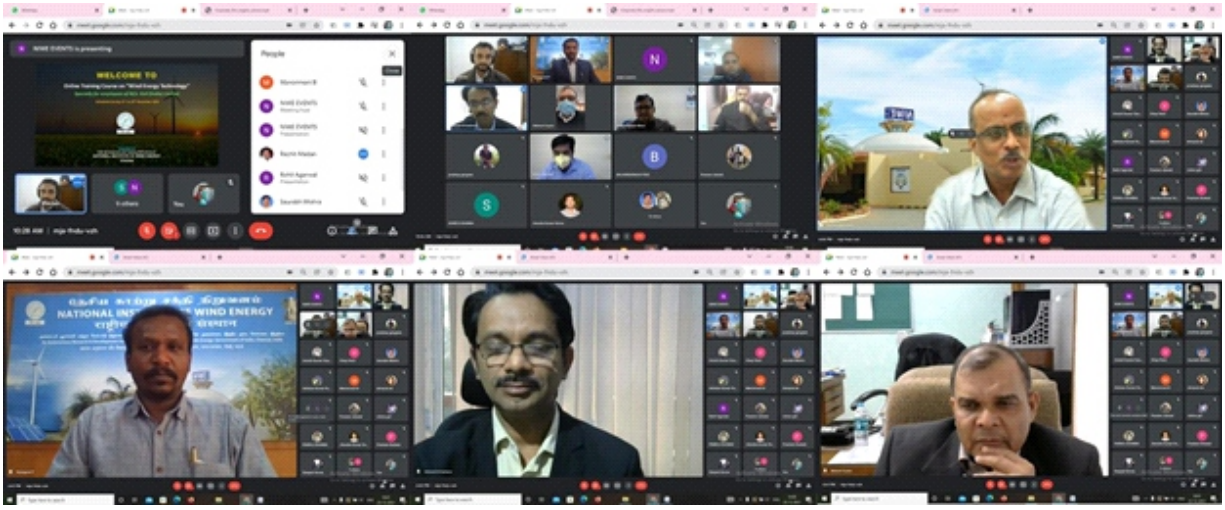
Virtual distribution of the Course Certificate

The participants were very much satisfied with the quality of lectures and support from the organizing team.

Customized Training Courses

Online Customized Training Course on "Wind Turbine Technology" held during 21st – 23rd December 2021 for the officials of GAIL (India) Limited

The course addressed all aspects of Wind Power starting from introduction to wind energy technology, wind resource assessment, installation and commissioning, Grid integration, operation and



Glimpse of the Gail training

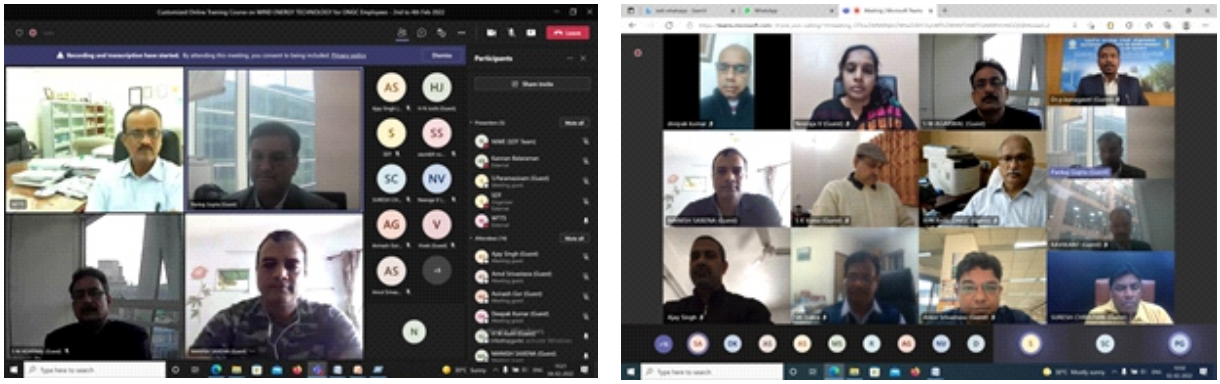
maintenance of wind farms, financial and policy aspects along with testing and certification of wind turbines. The course was attended by 26 participants. During the 3 days of course, 12 lectures were scheduled and experienced Scientists, Engineers of NIWE, wind turbine manufacturers and academicians from premier institutions handled the sessions in the training programme.

During the valedictory session, Dr. P. Kanagavel had delivered course summary, Dr. K. Balaraman, Director General, NIWE delivered the Valedictory Address and officials of GAIL had expressed their appreciation and thanked the organizers.

Online Customized Training Course on "Wind Energy Technology" held during 2nd to 4th February 2022 for the officials of Oil & Natural Gas Corporation Limited

The course addressed the following aspects: 1) Introduction of Wind Power and its technology 2) Wind resource assessment 3) Installation and Commissioning 4) Grid integration 5) Operation and Maintenance of wind farms 6) Financial and Policy aspects and 7) Testing and certification of wind turbines. The course was attended by 16 participants. The course content of the training was handled by Scientists, Engineers of NIWE, wind turbine manufacturers and academicians from premier institutions, who have many years of experience in the field.

Dr. P. Kanagavel delivered the course summary, Dr. K. Balaraman, Director General, NIWE delivered the Valedictory Address and ONGC officials had expressed their appreciation and thanks to NIWE for the wonderful training with expertise.



Glimpse of the ONGC training

Customized Training Course on "Wind Resource Assessment and Software Application" held during 28th March - 09th April 2022 for the officials of JSW Energy Limited, Mumbai

The course was inaugurated by Dr. K. Balaraman, Director NIWE on 28th March 2022 by lighting the lamp, Kuthuvilakku after his inaugural address in the presence of Dr. P. Kanagavel, Course Coordinator, Director & Division Head of 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 inauguration and distributed to all the participants. The course was attended by 15 Participants.

The following topics were covered during the training :

- Introduction to Wind Energy and Global Wind Energy Scenario

- Overview of Wind Turbine Components and Aerodynamic aspects of Wind Turbine
- Wind Turbine Gear Box, Generators and Electrical Systems
- Installation and Commissioning of Wind Turbine
- Control and Protection System in Wind Turbine
- Offshore Wind Power Development
- Wind Turbine Testing & Measurement Techniques
- Type Certification of Wind Turbines
- Operation and Maintenance Aspects of Wind Farms
- Grid Integration of Wind Turbines
- Forecasting of Wind and Energy Production
- Economic Analysis of Wind Power Development
- Wind Turbine Tower and Foundation
- Wind Resource Assessment and Site Selection for Wind Monitoring Stations

Release of Course Material

Course Certificate distributed by Dr. P. Kanagavel

- Wind Measurement and Instrumentation including Remote Sensing Devices
- Basics of Wind Data Analysis and Long term data correction using MCP
- Wind Measurement Standards IEC 61400-12-1 and Calibration of Sensors

Participants infront of NIWE Campus

- Hands on Session on Data Analysis using Windographer
- Introduction to Wind flow modelling using linear and Non- linear tools
- Wind Farm Layout Design and Energy Yield Estimation
- Application of Satellite Data in WRA
- Indian Wind Energy Policies and Schemes

Dr. P. Kanagavel, Course Coordinator, Director & Head, SDT & IM Division along

with Dr. K. Boopathi, Director & Head, OWD, DAF & IT Division, NIWE distributed the Course Certificates to all the participants during the Valedictory function. Few participants shared their feedback in the valedictory function and appreciated the quality of lectures and practical sessions.

Training Programme on "Wind Energy Skill"

Based on the request from Chief Executive Officer, Skill Council for Green Jobs (SCGJ), New Delhi, NIWE provided training from 7th to 18th March 2022 on "Wind Energy Skill" for five shortlisted candidates who were selected to participate in "WORLD SKILLS – 2022" to be held at Shanghai, China in October 2022. The training programme was organized by NIWE as an official training partner of SCGJ. NIWE has offered a detailed training covering major topics on wind energy which would enable the shortlisted participants to compete and win an award in "World Skills - 2022", the purpose for which these participants were selected.

Vayumitra Skill Development Programme

NIWE has submitted a proposal on "Vayumitra Skill Development Programme (VSDP)" to MNRE to develop skilled manpower for the wind industry. This program is also designed to prepare candidates to become new entrepreneurs in Wind Energy sector thus creating larger value chain. Under the programme, MNRE / NIWE will be rolling out the "VSDP" towards creating skilled workforce for the wind energy sector to have trained manpower for the development & operation of wind farms/ as per the industry demand/needs so as to achieve the Government of India targets and other future targets. This programme aims to training 5010 participants and 690 Trainers in O&M Electrical & Instrumentation Technician, O&M Mechanical Technician and Site Surveyor for Wind Power Plants and 34 Assessors. The syllabus for the proposed "VSDP" will be the approved Qualification Packs of the Ministry of Skill Development and Entrepreneurship, Government of India. NIWE has proposed to train 5010 Vayumitrans during the year 2021-22 to 2023-24.

As part of this activity and as a first step, Master Trainers were identified. Accordingly, online Master Trainers training programme was conducted for the 22 identified experts both from NIWE and external experts from 15th to 17th March and from 19th to 20th March 2022 by Skill Council for Green Jobs. At the end of the training there was an assessment and evaluation done by SCGJ and certificates were issued as Certified Master Trainers. The Master Trainers will be training the Training of Trainers for which the process is under way as a next step to the VSDP activities.

Students Visits

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 were encouraged to visit the campus. During the period from October to December 2021, the following visits were coordinated.

- 40 students & 2 staff of Veltech High Tech Dr. Rangarajan Dr. Sakuntala Engineering College, Chennai on 9th November 2021.
- 40 students & 2 staff of Veltech High Tech Dr. Rangarajan Dr. Sakuntala Engineering College, Chennai on 13th November 2021.

Prof. Anna Mani Information Centre

NIWE has state of the art library named after renowned meteorologist Prof. Anna Mani as information Centre. The Library has following collections.

Description	Quantity
Books	2200
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
Membership	02
E-Journals (Online)	18
News Paper	13

NIWE Library has been computerized with automation software and online public access catalogue (OPAC) facility. Interested students / research scholars / academicians and public can access NIWE's Library with prior permission at free of cost without borrowing.

Events

IREDA-NIWE Annual Awards for Wind Energy

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 has been announced under three broad categories.

Awardees of the IREDA-NIWE Awards for Wind energy for the years of 2019, 2020 and 2021 has already been selected by the constituted Jury Committee by following due procedures.

Global Wind Day Celebration 2021

NIWE organizes the Global Wind Day celebration, on 15th June of every year. As part of 2021 Global Wind Day celebration, Drawing and Quiz Competitions on different topics were organized for school students. 1455 students enrolled for the competitions. 470 students have participated in the Drawing competition from 54 schools and 89 students have participated in the Quiz competition from 24 colleges from different districts and states through online platform.

The list of Winners in each category are as follows :

Category	First	Second	Third
DRAWING COMPETITION WINNERS			
I (Grade 1st to 7th)	**S. ABINAV** Class-4 LM Dadha School Chennai	**R. PRITHIKA** Class-3 Shri B.S. Mootha Senior Secondary School Chennai	**M. PRADHIKSHA** Class-1 Sairam Vidyalaya Chennai
II (Grade 8th to 12th)	**V. MYTHILI** Class-10 SBOA School and Junior College, Chennai	**AISHA PANDA** Class-9 Buxi Jagabandhu English Medium School, Odisha	**NANDITA M.K.** Class-12 Sairam Vidyalaya Chennai
QUIZ COMPETITION WINNERS			
COLLEGE LEVEL	**SHIVANI GOPIKA K** Sri Sairam Engineering College Chennai	**SATHMIKAN** Sri Sairam Engineering College Chennai	**MAHMOODU MURSHID ABDULLAH I** Sri Sairam Engg. College, Chennai

The Award Ceremony to distribute the Awards to the winners is usually held on 21st March of every year on the Foundation Day of NIWE. It was postponed due to the outbreak of COVID-19 and lockdown restrictions.

It is planned to distribute the Awards along with the fifth and sixth edition of IREDA-NIWE Awards for the year 2020 and 2021 in the Award Ceremony planned either at Chennai or at New Delhi.

Azadi Ka Amrit Mahotsav

As per MNRE directions, NIWE has scheduled eight events (each event is scheduled for a week) to commemorate the 75 years of India's Independence (Azadi ka Amrit Mahotsav).

The announcement about the events along with the instructions and venue were hosted on NIWE website and circulated through Social Media along with the respective Flyers. Google Form was designed for every event registration of the participant. After scrutiny of the registration, confirmation mail was sent to the participants and e-Certificates were distributed to all the participants who had attended the event.

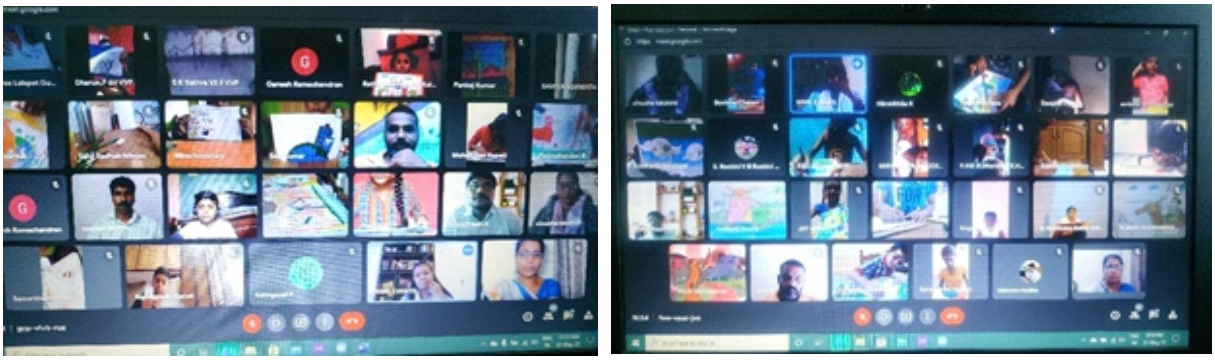
1st Event – Painting And Essay Competition

The first event, Painting and Essay Competitions for students was conducted successfully held during 31st May to 4th June 2021.

A good response of 682 students from all over India had registered for the competitions. The following were the categories, themes and registration details of the competitions;

S. No.	Categories	Themes	No. of Registration	State wise Registration	Event Date
PAINTING COMPETITION					
1	Up to 7th standard	Salutations to Wind-Vayu Vandhanam	240	Tamil Nadu-154 Kerala-83 Karnataka-2 Andhra Pradesh-1	31/05/2021
2	8th to 10th Standard	Wind energy for the great future	267	Tamil Nadu-263 Andhra Pradesh-2 Karnataka-1 Gujarat-1	01/06/2021
3	11th & 12th standard	Energy Transition & Wind Energy	64	Tamil Nadu-63 Andhra Pradesh-1	02/06/2021
ESSAY COMPETITION					
4	11th & 12th standard	Let Wind do the task	72	Tamil Nadu-70 Kerala-2	03/06/2021
5	UG Students	Think outside the Barrel-Wind Energy & Electric vehicles	39	Tamil Nadu-35 New Delhi-2 Chattisgarh-1 Andhra Pradesh-2	04/06/2021

The Jury Committee scrutinized all the Paintings and Essays and awarded marks for each participant based on originality, creativity and relevance to the given theme and selected top 3 winners in each category based on their marks scored. The winners were awarded with cash prize of Rs.1000/- as First Prize, Rs.750/- as second prize and Rs.500/- as third Prize along with Certificates. Other participants awarded with participation certificates. The winners list has been published in NIWE website.



Glimpse of the 1st Event on "Painting and Essay Competition"

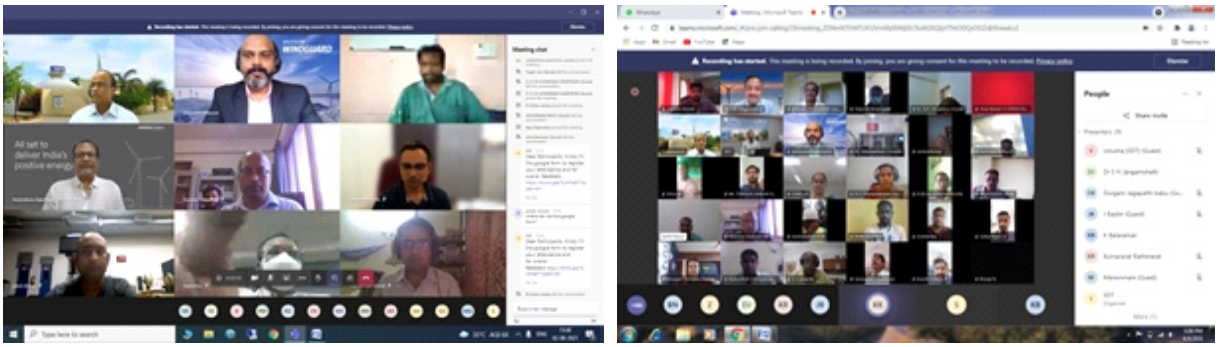
2nd Event – Moderate Discussion

The second event, Moderate discussion with research and educational Institutions, Fireside chat with experts on the topic "Research Opportunities in Wind Energy" held during 02nd to 6th August 2021 was conducted successfully.

The below are the registration details for the event against the announcement.

Sl. No.	Events	No. of Participants Registration	No. of Participants attended	Date
1.	**EASTERN AND CENTRAL INDIA** (Andaman and Nicobar Islands, Bihar, Jharkand, Odisha,West Bengal, Chattisgarh, Madhya Pradesh)	53	42	02-08-2021
2.	**WESTERN INDIA** (Dadra and Nagar Haveli, Daman and Diu, Goa, Gujarat and Maharashtra)	40	34	03-08-2021
3.	**SOUTHERN INDIA** (Andhra Pradesh, Karnataka, Kerala, Lakshadweep, Puducherry, Tamil Nadu and Telangana)	161	78	04-08-2021
4.	**NORTHERN INDIA** (Chandigarh, Delhi, Haryana, Himachal Pradesh, Jammu and Kashmir, Ladakh, Punjab, Rajasthan, Uttar Pradesh, Uttarakand)	51	33	05-08-2021
5.	**NORTH EAST INDIA** (Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, Tripura and Sikkim)	48	35	06-08-2021

The session was very lively and interactive. The panel members shared their inputs on Research opportunities in Wind Energy for 5-10 minutes time and Q&A session was opened after for the participants to interact with the speakers. There were many questions, which was very useful for the researcher and academicians to get in to the wind sector which will lead to the orderly growth of wind industry. All the participants were satisfied with the knowledge transferred though the events and expressed happiness through their feedback. Participation e-certificates were distributed to the participants and panel members.



Glimpse of the 2nd Event

3rd Event – Boot Camp at Kayathar

The third event, Boot Camp at Kayathar – To explore Wind Energy Technology and its Techniques, Wind Farm Development (Wind Resource Assessment and Research & Development - for 13 & 19 years age group (two sessions) held during 20th to 25th September 2021 conducted successfully.

The programme schedule of the event

Date	Participant's Category	Time	Activity
20.9.2021 and 21.9.2021	1st Session (for Students 13 years age group) Registration	10.00 am to 5.00 pm	About NIWE
			Introduction to Wind Energy
			Introduction to Wind Resource Assessment
			Introduction to Wind Farm Development
			Overview of Wind Turbine Research Station facilities
22.9.2021 and 23.9.20210	2nd Session (for Students 19 years age group)		Field visit to Small Wind Turbine
			Testing Facilities
			Field visit to Large Wind Turbine
			Testing Facilities
			Field visit to Wind Monitoring Station
			Field visit to Research Wind farms facility (200 kW, 600 kW and 2000 kW Wind Turbines
			Field visit to Wind – Solar Hybrid system
			Field visit to Sub- station

The 1st session of the Boot Camp was held on 20th & 21st September 2021 for the students in the 13 years age group and was attended by 29 students and 2 staff members from Government High School, Ayyanaruthu, Tamil Nadu and Government High School, Kayathar, Tamil Nadu.

The 2nd session of the Boot Camp was held during 22nd & 23rd September 2021 for students in the 19 years age group and was attended by 91 students and 6 staff from Loyola Institute of Science & Technology, Kanyakumari, Tamil Nadu.

NIWE engineers had explained about NIWE's Role in Wind Industry and gave lecture about introduction to Wind Energy, Wind Resource Assessment and Wind Farm Development. The students visited Wind Turbine Test Station, Wind Turbine Research Station, Wind Monitoring Station, Research Wind Farms facility (200 kW, 600 kW and 2000 kW Wind Turbines), Wind – Solar Hybrid system and Sub-station, where they got to know the small and large wind turbine testing process and basic knowledge of Wind Industry. The camp was very much appreciated by students.

Glimpse of the 3rd Event

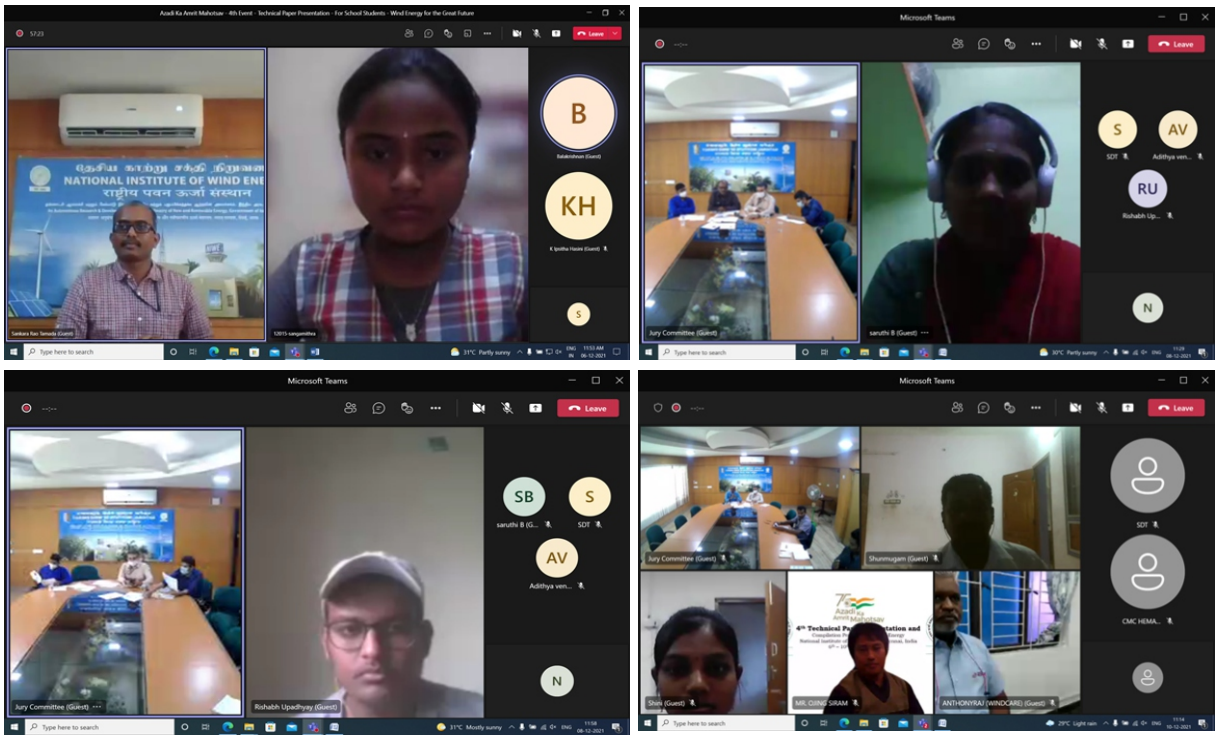
4th Event – Technical Paper Presentation

The fourth event, Technical Paper Presentation and Compilation pertaining to Wind Energy was held during 6th to 11th December 2021 and was conducted successfully.

Against the announcement, 221 registrations were received for all the three categories and only 29 participants had submitted the full length paper for presentation and the details are given in the below table along with programme schedule.

Category	Date	Time	Registration Received	Paper submitted	Selected Papers presented
School Students (Wind Energy for the Great Future)	06.12.2021	11.00 am to 12.00 noon	16	05	2
UG & PG Students (Energy Transition & Wind Energy)	08.12.2021	11.00 am to 12.30 pm	170	13	3
Research Scholars & Others (Latest Trends & Techniques in Wind Energy)	10.12.2021	11.00 am to 01.00 pm	35	11	4
Total			**221**	**29**	**9**

All the 29 papers submitted were reviewed by the Technical Review Committee and only 11 papers were selected from all the categories for presentation in the event. All the 11 selected participants were asked to present the submitted papers in front of the Review Committee for evaluation and to select the Best Paper Award. Out of 11 selected participants, only 09 had presented the papers with detailed explanations. The lively presentations moved with healthy interactions. The committee members asked many questions and provided fruitful tips to the participants leading to the improvement in the quality and technical aspect of the papers.



Glimpse of the 4th Event on "Technical Paper Presentation"

The Review committee recommended 2 Papers for the Best Paper Award. The awardees are,

- K. Ipsitha Hasini
  for the paper "Wind Energy: A transition to clean energy for our great future"
- M/s. Wind Care India Private Limited
  for the paper "Nacelle Crane – A Significant cost Effective Solution for Component Replacement in Wind Turbines"

All the 11 papers selected for presentation were compiled as Compendium on Wind Energy and the printed document has been sent to MNRE and placed in NIWE Library.

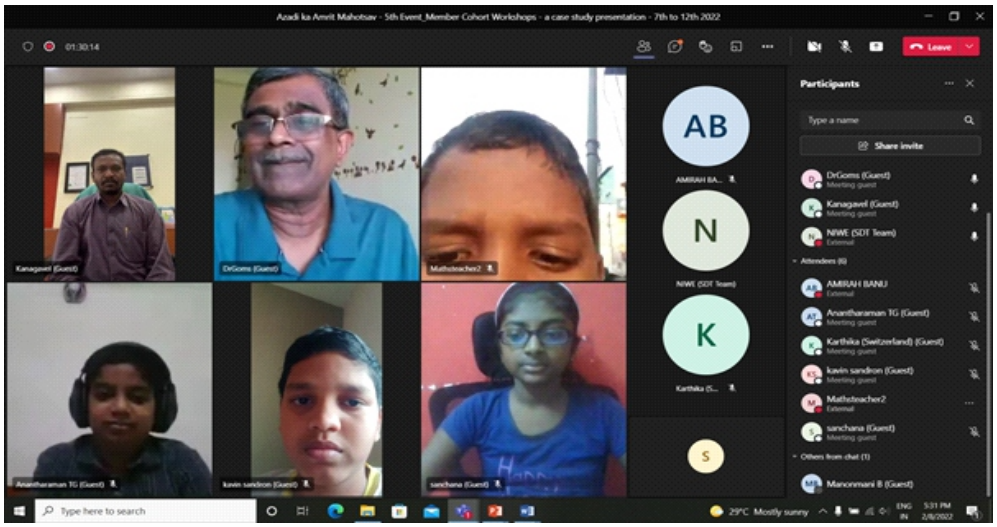
5th Event – Member Cohort Workshops

The fifth event, Member Cohort Workshops and Case Study Presentation was held during 7th to 12th February 2022 and was conducted successfully.

Against the announcement, 195 registrations were received for all the three categories and totally 62 participants have attended and the details are given in the below table;

Category	Theme	Total Registration Received	Attended Participants
School Students	1	195	07
	2		00
UG & PG Students	1		15
	2		11
Research Scholars	1		16
	2		13
Total	**6**	**195**	**62**

SCHOOL STUDENTS



Theme : Wind Energy Contribution to mitigate Global Warming

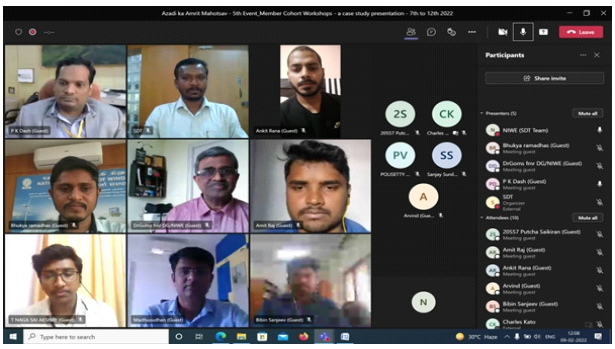
The workshops were scheduled as per the following programme held during 7th – 12th February 2022.

Date	Session Timings	Theme	No of Students	No of Batches	Moderators
School Students					
08.02.2022	Session 1: 04.30 to 5.30 pm	Wind Energy Contribution to mitigate Global Warming	07	01	Dr. S. Gomathinayagam former DG, NIWE
UG and PG Students					
08.02.2022	Session 1: 10.00 to 11.30 pm Session 2: 12:00 to 01.30 pm	Role of Wind Energy in in Sustainable development	26	02	Shri. A.S Karanth Consultant Shri. N. Rajkumar Additional Director & Unit Chief, NIWE
09.02.2022	Session 1: 10.00 to 11.30 pm Session 2: 12:00 to 01.30 pm	500 GW clean energy development - Roadmap, challenges & mitigation measures	29	01	Dr. Prabhir Kumar Dash, Scientist-D, MNRE Shri. Bhukya Ramdas, Deputy Director (Technical), NIWE
Research Scholars					
10.02.2022	Session 1: 10.00 to 11.30 pm Session 2: 12:00 to 01.30 pm	Main streaming wind generation in the Grid Roadmap, challenges & mitigation measures	RS-T1-B1(09) RS-T1-B2(08)	01	Dr. R. Kumaravel, Managing Director, WindGuard Shri. A.G. Rangaraj Deputy Director (Technical) & Unit Chief, NIWE
10.02.2022	Session 1: 10.00 to 11.30 pm	Grid inter connection of modern wind turbine	RS-T2-B1(14)	01	Dr. Suresh H. Jangamshetti, HOD, Bashveswar Engineering College Shri. M. Saravanan Deputy Director (Technical), NIWE

In all the sessions, moderators have managed the sessions very well setting the background towards the respective topics of the sessions and clarified the queries / clarifications raised now and then by the participants. The sessions were very interactive and went lively with fruitful discussions and new ideas. There were many questions, which was very useful for the researcher and academicians to get in to the wind sector which will lead to the orderly growth of wind industry. All the participants were satisfied with the knowledge transferred through the sessions.

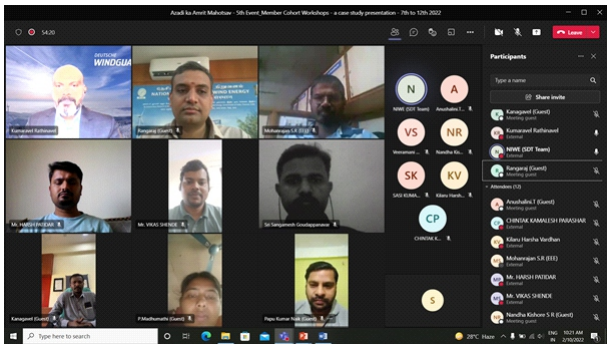
UG AND PG STUDENTS

Theme : Role of Wind Energy in Sustainable development

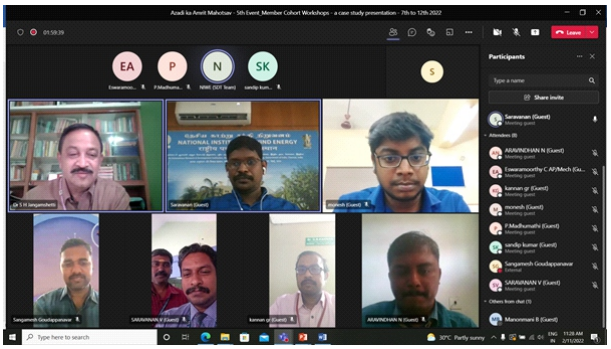


Theme : 500 GW clean energy development - Roadmap, challenges & mitigation measures

RESEARCH SCHOLARS



Theme : Main streaming wind generation in the Grid



Theme : Grid inter connection of modern wind turbine

6th Event – National Re Camp at Kayathar

The sixth event, National RE Camp at Kayathar for Designing of Small Wind Turbine (students will be asked to construct a small wind turbine) held during 28th March to 02nd April 2022 was conducted successfully.

Against the announcement, 144 registrations were received and 37 participants were selected. Among them under first come first serve basis all the selected participants have attended the camp at Kayathar.

The camp were scheduled as per the following programme.

S.No	Date	Time	Activity
1	28.03.2022 and 02.04.2022	10 AM to 05 PM	Registration
			About NIWE
			Introduction to Wind Energy
			Introduction to Small Wind Turbine
			How to build a Small Wind Turbine
			Hands on Training on the following area :
			• Build Winding Mould
			• Carve Blades

S.No	Date	Time	Activity
			• Moulds for Rotor & Stator
			• Assemble Stator Winding
			• Align Rotor, Stator & begin Turbine Assembly
			• Assemble Turbine, Balance and Calibration
			• Final Calibration, Static Balance & Wiring
			• Electrical Testing of Turbine
			• Tower erection and commissioning
			• Testing of assemble Turbine

The main objective of the camp was to provide practical training to the student participants as to how to design a small wind turbines on their own. Also a session on O&M and installation & commissioning of small wind turbines was conducted.

NIWE arranged the special expert Mr. Jorge Ayarza, Engineer and Founder of Minvayu, Auroville, Tamil Nadu along with NIWE Engineers to train the participants in designing of small wind turbine with locally available low cost materials. All the participants had shown tireless interest in the

6th Event Glimpse

Explaining about manufacturing of wooden blade

Student fabricating the wooden blade

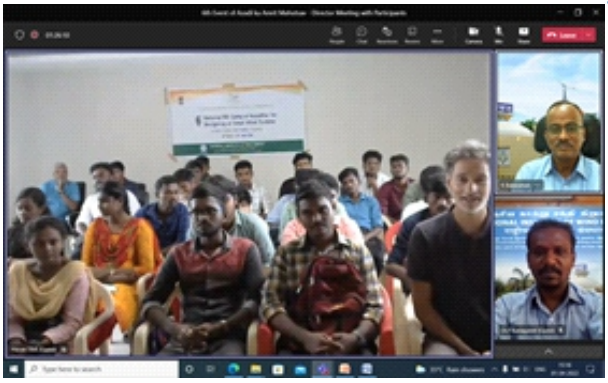
Stator coil winding by the students

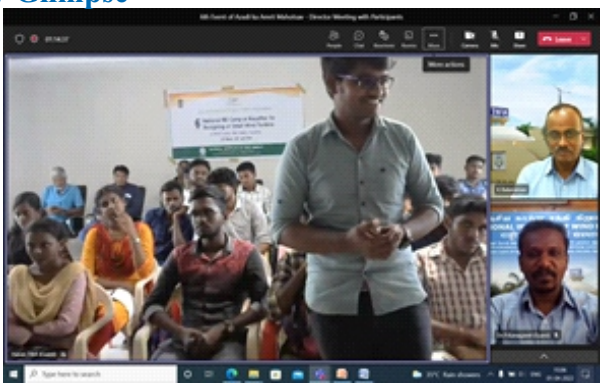
Assembling the Rotor blade

Erection of the Small Wind Turbine

Assembled Rotor done by the students at the camp

Valedictory Glimpse





Certificate Distribution

Participants are at infront of WTTS Building, Kayathar

manufacturing session and had designed and completed the Small Wind Turbine. This was a good opportunity for the participants to increase their self-reliance to design, construct their own turbines, using locally available materials and run their own business serving their respective villages/areas.

Dr. K. Balaraman, Director General of NIWE delivered the Valedictory address after the welcome address by Dr. P. Kanagavel, Director & Division Head, SDT & IM on a virtual mode. Few participants came forward to share their feedback and they were very much interested to construct the small wind turbine for their own use when they go back. Mr. Jorge Ayarza distributed the Course Certificates to the participants after the virtual programme.

7th Event – Re Camp On Operations Of Wind Turbine

The seventh event, "RE Camp on the Operations of Wind Turbine at Kayathar for 15 and 19 years age group (1 week)" was scheduled from 30th May to 04th June 2022.

8th Event – Re Camp On Operations Of Wind Turbine

The eighth event, "Interactive sessions on Off-shore Wind Power" was scheduled from 8th to 13th August 2022.

MoU Signed

- A Memorandum of Understanding (MoU) has been signed between NIWE and SJVN for providing Technical Consultancy services for Development of Solar, Wind, Hybrid (Wind & Solar) and Hybrid (Wind, Solar & Battery storage) Energy projects by SJVN on 14.06.2021 for three years.
- MoU signed between Association of Renewable Energy Agencies of States (AREAS), New Delhi & NIWE on 27.08.2021 which will remain in force unless revoked by the consent of the parties.
- MoU signed between NIWE & University Of Massachusetts, AMHREST on 22.09.2021 for five years. (Photos attached).
- MoU signed between WAPCOS Ltd., New Delhi & NIWE on 15.12.2021 for three years.
- MoU signed between University of Calcutta & NIWE on 22.12.2021 for five years.
- MoU signed between MNRE & NIWE for one year.

Papers & Publications

1. Balaraman, K. (2021). "Economic investigation of Repowering of the existing Wind Farms with Hybrid Wind and Solar Power plants: A case study". *Springer, DOI:10.1007 / s40095-021-00391-3*

2. Balaraman, K. (2021). "Failure mechanisms of wind turbine blades in India: Climatic, regional, and seasonal variability". *Wiley, https://doi.org/10.1002/ we.2706*

3. Balaraman, K. (2021). "A short-term Solar Forecasting platform using a Physics-based smart persistence model and data imputation method". *National Renewable Energy Laboratory, https://www.nrel.gov/docs/fy22osti/81421.pdf*

4. Bastin, J. Rajesh Katyal, Vinoth Kumar, R. Yuvaraj Lakshmi, P. (2021). "Inter Annual Variability of wind speed in India". *International Journal of Ambient Energy, DOI:10.1080 / 01430750.2021.1945492*

5. Rajesh Katyal. (2021). "Comparison of Structural Aspects of Monopile and Tri-Piles for Offshore Observation Platforms", *Wind world Energy conference.*

6. Boopathy K., Akshita Gupa. Arun Kumar. "Day ahead and intraday wind power forecasting based on feedback error correction". *IET Renewable Power Generation, DOI : 10.1049/rpg2.12211*

7. Boopathy, K. Ramasamy, S. Kirubakarab, V. Uma, K. Saravanan, G. Thyagaraj, S. Balaraman, K. (2021). "Economic investigation of Repowering of the existing Wind Farms with Hybrid Wind and Solar Power plants: A case study". *Springer, DOI:10.1007/s40095-021-00391-3*

8. Suruti Kumari,K. Boopathy,K. Nabin Sarmah (2021). "Repowering of Wind Farm and its Economic Feasibility: A case study". *Advances in Thermofluids and Renewable Energy, pp.535-547. https://link.springer.com/chapter/10.1007/978-981-16-3497-0_43*

9. Sourav Malakar. Saptarsi Goswami. Bhaswati Ganguli. Amlan Chakrabarti. Sugata Roy. Boopathy, K. Rangaraj, A. (2021). "A Novel Feature Representation for Prediction of Global Horizontal Irradiance using a Bidirectional Model". *MDPI, https://doi.org/10.3390/ make3040047*

10. Boopathy, K. Leon Mishnaevsky, Jr. Bose Sumantraa, S. Anthonyraj Premkumar. Krishnaraj, T. Balaraman, K. (2021). "Failure mechanisms of wind turbine blades in India: Climatic, regional, and seasonal variability". *Wind Energy, https://doi.org/10.1002/ we.2706*

11. Srinath Yelchuri. Rangaraj, A.G. Yu Xie, Aron Habte. Mohit Chandra Joshi. Boopathi, K. Manajit Sengupta. Balaraman, K. (2021). "A short-term Solar Forecasting platform using a Physics-based smart persistence model and data imputation method". *A product of the South Asia Group for Energy. https://www.nrel.gov/docs/fy22osti/81421.pdf*

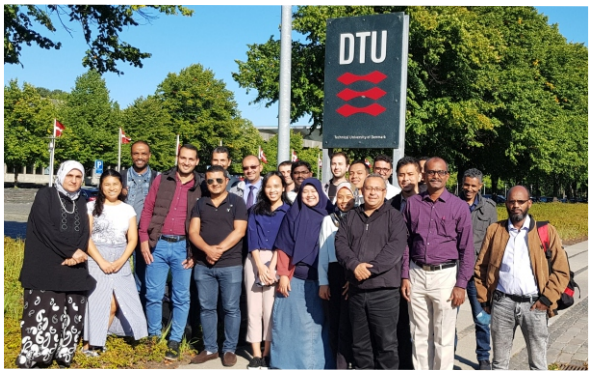
12. Hari Bhaskaran, A. Rajesh Katyal. Bastin, J. Krishnan, B. Deepa Kurup. (2021). "Small Wind Turbines to Power Telecom Towers: A Case Study in Rajasthan, India". *1st International Conference on Materials, Energy, and Mechanical Engineering.*

International Meetings / Trainings

- NIWE staff attended DTU "Energy Planning course under the DFC Scholarship during 16th August to 10th September 2021 in Denmark
- NIWE staff attended DTU "Offshore Wind Energy" course under the DFC Scholarship during 27th September to 15th October 2021 in Denmark.
- NIWE staff attended DTU " Renewable Energy Integration in Power Systems" course under the DFC Scholarship during 01st to 26th November 2021 in Denmark.
- Shri N. Rajkumar, Shri Bhukya Ramdas, Shri R. Naveen Muthu and Shri A.R. Hasan Ali attended the online Power Quality Training (IEC 61400-21-1)-Session1 held on 17th January 2022.
- Shri N. Rajkumar, Shri Bhukya Ramdas, Shri R. Naveen Muthu, Shri. M. Karuppuchamy, Shri A.R. Hasan Ali and Shri Y. Packiyaraj attended the training on "The Basics of Strain Gauge Installation and Strain Gauge Measurement Technology" conducted by M/s. HBK Hottinger Bruel & Kjaer on 17th & 18th March 2022 in Chennai.
- Shri David Solomon.J.C. attended the VSDP Master Trainer training program for the qualification pack of "O&M Electrical & Instrumentation Technician – Wind Power Plant", "Wind Resource Assessor and Site Surveyor – Wind Power Plant" and "O&M Mechanical Technician Wind Power Plant" conducted by Skill India held on 15th to 17th and 19th & 20th March 2022, respectively.

Dr. G. Arivukkodi, Shri A.R. Hasan Ali & Shri Y. Packiyaraj attended DTU " Offshore Wind Energy" course under the DFC Scholarship during 27th September to 15th October 2021 in Denmark

Shri Bhukya Ramdas & Shri M. Karuppuchamy attended the DTU " Renewable Energy Integration in Power Systems" course under the DFC Scholarship from 01st to 26th November 2021 in Denmark



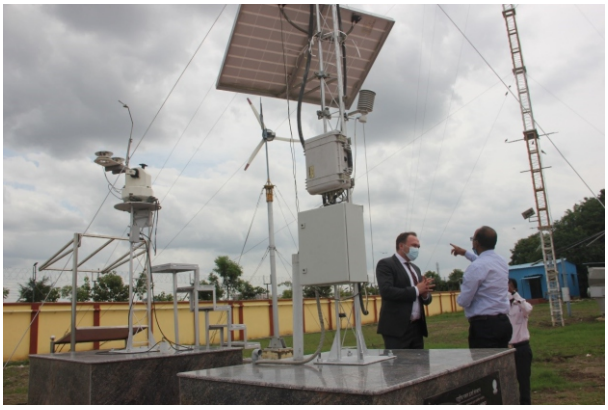
Attended the training on "The Basics of Strain Gauge Installation and Strain Gauge Measurement Technology" conducted by M/s. HBK Hottinger Bruel & Kjaer on 17th & 18th March 2022 in Chennai

- "Integration of Renewable Energy in Power Systems" conducted by DTU Electrical Engineering, Denmark during 31.10.2021 to 28.11.2021 held at Copenhagen, Denmark which was attended by Shri. S. Arulselvan.
- "Energy Planning" conducted by DTU, Denmark during 16.08.2021 to 10.09.2021 held at Copenhagen, Denmark which was attended by Shri. S. Paramasivan.

Visitors

Delegates visited to NIWE

DENMARK Visit of Danish Minister and his delegation to NIWE on 8th September 2021.



FRANCE

Visit of the French Senator and French Consul General to NIWE (Mr. Damien Regnard, Senator for French citizens living abroad; Ms. Lise Talbot Barre, Consul General, Consulate General for France in Pondicherry and Chennai; Mr. Bruno Nguyen, Deputy Consul General and Head of Bureau of France in Chennai; Mr. Nicolas Joffroy, Communication Attache; Mr. Lorenzo Biagini, Trainee Officer; Ms. Vijayasaraswathi, Press and Protocol Attached) on 2nd December 2021.




AUSTRALIA

Visit of Ms Amy Keough, First Secretary (Geo-economic) – Australian High Commission (New Delhi) on 15th December 2021.


GERMANY

Visit of German Consul General Mrs. Karin Stoll, accompanied by Mr. Stephan Grabherr, Deputy Head of Mission, German Embassy in New Delhi to NIWE on 17th February 2022.

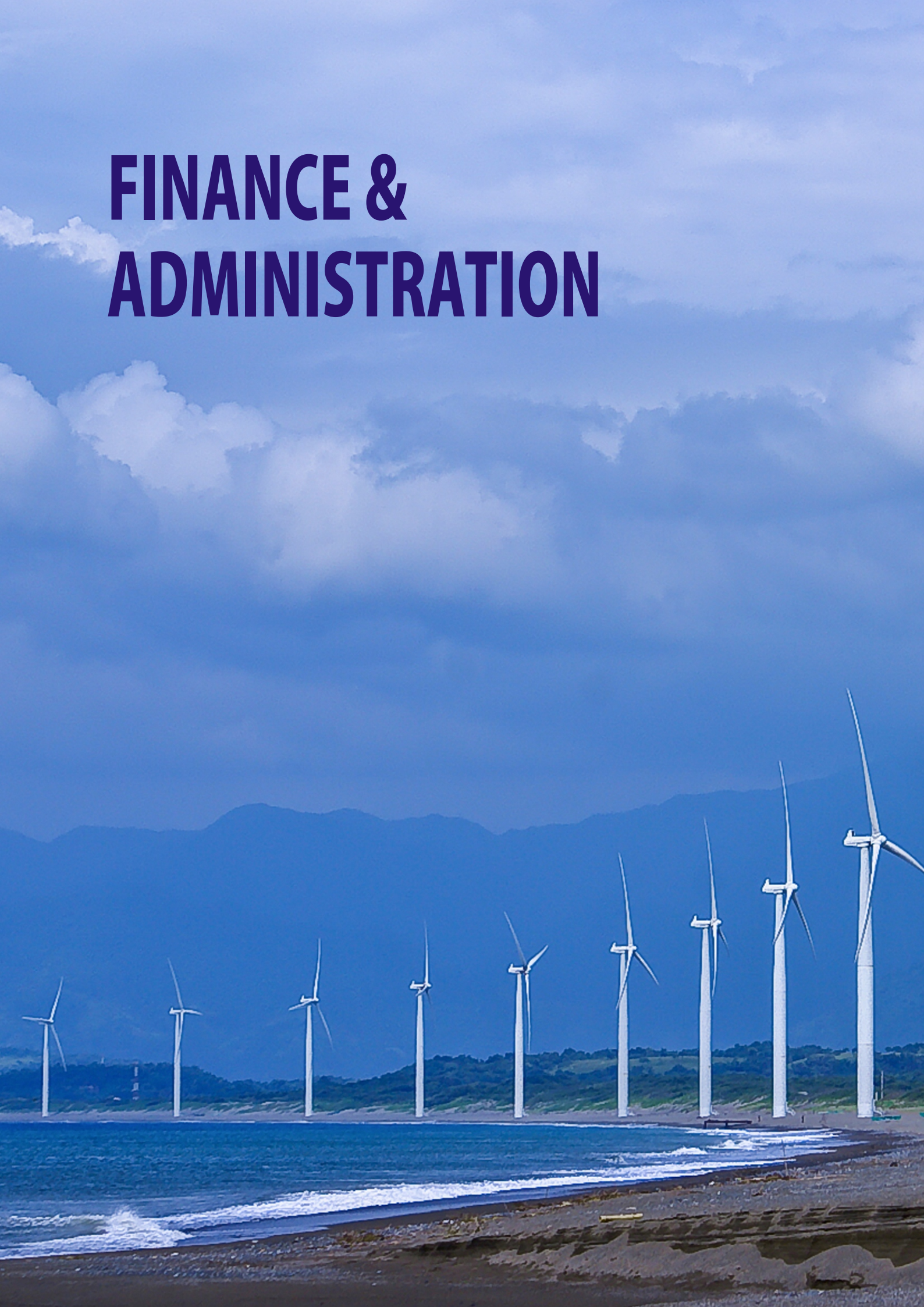
UNITED KINGDOM

Visit of ORE Catapult to NIWE on 31st March 2021

R. ROSHINI, The Children's Garden Hr. Sec. School, Chennai, Tamil Nadu

has won 3rd Prize for the above drawing titled "Wind Energy for the Great future"
under the category of 8th to 10th Standard in the Painting Competition conducted on 01st June 2021
on the occasion of Azadi ka Amrit Mahotsav to commemorate 75 years of India's Independence

FINANCE & ADMINISTRATION



Azadi Ka Amrit Mahotsav

P. KHUSHI, Velammal Vidyalaya, Paruthipattu, Chennai, Tamil Nadu

has won 3rd Prize for the above drawing titled "Wind Energy for the Great future"
under the category of 8th to 10th Standard in the Painting Competition conducted on 01st June 2021
on the occasion of Azadi ka Amrit Mahotsav to commemorate 75 years of India's Independence

Finance & Administration

Serving as the artery connecting scientific divisions of this institute, the activities of F&A division are briefed under:

- Budget & Revised estimates for Grants-in-Aid, Allocation & Re-appropriation of funds, Expenditure management & budget control, Project financial management.
- Statutory compliances on GST and Income Tax etc., Dealing with audits, Drawing up balance sheet, laying of audited accounts on the table of Parliament.
- Framing of Rules, Schemes and Grievance Redressal, Contract Management, Legal issues, Court Cases & RTI, Recruitment, Promotion and up-gradation.
- Statutory compliances on EPF, Gratuity, Contract Labour, Societies Registration, Bills of Establishment, Facility Management, Activities related to Official Language, Maintenance of Vehicle, Security and House-keeping.
- Stores & Purchase section which is part of Finance & Administration is committed to organize procurement of items required for projects of the Institute in time at competitive rates consistent with requirement, availability of finance and in a transparent manner. Procurements (Indigenous & Imports) & Service Contracts

Swachhta Hi Seva Week

The Swachhata Pakwada was observed from 01.06.2021 to 15.06.2021. As a part of the observance, the Swachhata activities like cleaning of NIWE Campus at Chennai & Kayathar were carried out with limited number of Attendance due to COVID-19 pandemic.

International Yoga Day

In pursuance of Ministry of Ayush, GoI, International Yoga Day was observed on 21st June 2021. Banners & Posters were displayed depicting the Yoga Postures under common Yoga Protocol.

Independence Day

As per the precedence followed by NIWE, Independence Day was celebrated at NIWE on 15th August 2021 by following Covid-19 protocols.

Vigilance Awareness Week

Vigilance awareness week for the year 2021 was observed in NIWE from 26th October 2021 to 1st November 2021 as instructed by the Central Vigilance Commission and the pledge was taken virtually by the employees of NIWE.

On the observance of Vigilance Awareness Week, an Essay Competition was conducted on 28.10.2021 on the theme "Independent India @ 75 : Self Reliance with Integrity" and cash award was presented to the winners.

Constitution Day

The Constitution Day was celebrated on 26th November 2021. As a part of the observance, the employees of NIWE have read the Preamble of Constitution of India through virtual mode.

Republic Day

As per the precedence followed by NIWE, Republic Day was celebrated at NIWE on 26th January 2022 by following the Covid-19 protocols.

Glimpse of Republic Day Celberation - 26th January 2022

Martyrs' Day

As a part of observance followed by NIWE, two minutes silence was observed at NIWE on 30th January 2022 at their work places in memory of those who gave up their lives in the struggle of India's freedom.

Women's Day

To celebrate the spirit of women empowerment every year, the Women's Day was celebrated on 8th March 2022 at NIWE. The women's day was celebrated by organizing Seminars and Talk by eminent professionals on Financial Awareness, Legal Issues and Role of Science and Research for Women.

Internal Complaints Committee (ICC) at Work Place

In accordance with Government 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 Committee.

Welfare and Safety Measures

As a preventive measure to combat Covid-19 pandemic, the following activities have been carried out regularly at NIWE.

1. Sanitizing of the campuses on daily basis.
2. PPE kits have been procured for the persons those who are sanitizing entire campus.
3. 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.
4. NIWE with the great support of the Greater Chennai Corporation Authorities at Corporation Primary Health Centre, Pallikaranai, COVID Vaccination camp were arranged and Vaccination was administered for NIWE staff and their family members on 9th September 2021 & 23rd October 2021.
5. Free Eye Screening Camp was conducted by Dr. Agarwal's Eye Hospital, Chennai on 26.11.2021. About 60 staff members took part in the camp and were benefitted.

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 14.09.2021 to 29.09.2021. 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 Official Language exams.

Right to Information Act

During the year 2021-22, 10 applications were received seeking information under RTI Act, 2005 and requisite details have been given. No appeals has been preferred against the decision of CPIO.

Implementation of Persons with Disabilities Act 1995

The following facilities are being available to Persons with Disabilities

1. 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.
2. A separate ramp has been provided to enable use of crutches / wheel chairs.
3. Low level steps laid by the side of the lift for easy access.
4. Post based reservation for physically handicapped are being followed by NIWE as per GOI rules.

Glimpse of Eye Camp at NIWE

FINANCE REPORT

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

B. SARULATHA, Vidyodaya Girl's Higher Secondary School, Chennai, Tamil Nadu

has won 1st Prize for the above drawing titled "Energy Transistion & Wind Energy"
under the category of 11th & 12th Standard in the Painting Competition conducted on 02nd June 2021
on the occasion of Azadi ka Amrit Mahotsav to commemorate 75 years of India's Independence

NATIONAL INSTITUTE OF WIND ENERGY

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

BALANCE SHEET AS AT 31ST MARCH, 2022

(Amount in Rs.)

FUND AND LIABILITIES	Schedule	31st March, 2022	31st March, 2021
CAPITAL ASSET FUND	1	23,12,52,543	25,15,59,937
RESERVES AND SURPLUS	2	42,90,20,129	44,65,24,759
CURRENT LIABILITIES AND PROVISIONS	3	39,91,61,436	16,23,07,739
TOTAL		**1,05,94,34,108**	**86,03,92,435**
ASSETS			
FIXED ASSETS			
(a) Created out of Central Governments Grants	4	19,02,73,383	21,24,41,865
(b) Out of Internal Generation Grants		4,09,79,159	3,91,18,072
CURRENT ASSETS, LOANS AND ADVANCES	5	82,81,81,566	60,88,32,498
TOTAL		**1,05,94,34,108**	**86,03,92,435**
SIGNIFICANT ACCOUNTING POLICIES	13		
NOTES ON ACCOUNTS	14		

For National Institute of Wind Energy

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

Sd/-
Dr.K.Balaraman
Director General

As per our Report attached
Rajesh & Ganesh
Chartered Accountants
Firm Regn No.008640S
Sd/-
S. Rajesh
Partner
Membership No.208090

NATIONAL INSTITUTE OF WIND ENERGY

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

INCOME AND EXPENDITURE ACCOUNT FOR THE YEAR ENDED 31ST MARCH, 2022

(Amount in Rs.)

INCOME	Schedule	CFA - Revenue 1	MOM - Revenue 2	IWSRA - Revenue 3	NE Region 4	SRRA 5	NIWE IREDA FUND 6	Hybridize 7	VAYU-MITRA 8	TOTAL GRANTS 31/03/2022 (1+2+3+4 +5+6+7+8)	IE 31/03/2022	TOTAL GRANTS 31/03/2021	IE 31/03/2021
Income from Services	6	-	-	-	-	-	-	-	-	-	**13,57,80,652**	-	**14,13,31,397**
Income from publication	7	-	-	-	-	-	-	-	-	-	**5,338**	-	-
Interest Earned	8	-	-	-	-	-	-	-	-	-	**1,52,46,076**	-	**2,65,19,120**
Other Income	9	-	-	-	-	-	-	-	-	-	**65,34,717**	-	**19,59,760**
Interest Earned & Other Income (Grant)		1,01,284	16,267	81,424	3,77,031	-	7,94,255	38,040	-	**14,08,301**	-	**35,08,039**	-
Grants from Government of India allocated for Revenue expenditure during the year	3.1	10,00,00,000	12,43,74,000	23,42,408	-	-		-	2,80,00,000	**25,47,16,408**	-	**19,96,25,528**	-
Grants - Adjustment previous year payment		-	-	-	-	-	-	-	-	-	-	-	-
Add:EMD,SD,PG Received		-	-	-	-	-	-	-	-	-	-	-	-
Closing stock		-	-	-	-	-	-	-	-	-	-	-	-
TOTAL (A)		**10,01,01,284**	**12,43,90,267**	**24,23,832**	**3,77,031**	**-**	**7,94,255**	**38,040**	**2,80,00,000**	**25,61,24,709**	**15,75,66,783**	**20,31,33,567**	**16,98,10,277**
EXPENDITURE													
Opening stock		-	-	-	-	-	-	-	-	-	-	-	-
Establishment Expenses	10	-	-	-	-	-	-	-	-	-	**8,06,68,293**	-	**7,94,20,891**
Consultancy Project Expenses	11 (b)	-	-	-	-	-	-	-	-	-	**8,73,70,997**	-	**6,74,89,089**
Other Administrative Expenses	11 (a)	3,23,03,852	-	-	-	-	-	-	-	**3,23,03,852**	-	**4,21,50,956**	-
Expenditure from Grants		-	1,80,541	39,78,577	-	4,23,140	-	1,26,928	18,030	**47,27,216**	-	**11,83,71,244**	-
On Advances/Deposits/Prepaid /EMD,SD,PG's etc.,		69,38,776	-	-	-	-	-	-	-	**69,38,776**	-	**26,96,732**	-
Refunded to Ministry		27,98,438	16,267	81,424	3,77,031	-	-	1,89,614	-	**34,62,774**	-	**30,26,298**	-
In house project expenditure	3.1	4,62,22,627	-	-	-	-	-	-	-	**4,62,22,627**	-	**7,41,14,605**	-
Expenditure for Earmarked Project		1,44,62,672			(1,44,62,672)								
Expenditure out of Previous Year Advance		-	-	-	-	-	-	-	-	-	-	**3,67,007**	-
TOTAL (B)		**10,27,26,366**	**1,96,808**	**40,60,001**	**(1,40,85,641)**	**4,23,140**	**-**	**3,16,542**	**18,030**	**9,36,55,246**	**16,80,39,289**	**24,07,26,842**	**14,69,09,980**
Balance being excess of Income over Expenditure (A-B)											**(1,04,72,506)**	-	**2,29,00,297**
EMD,Performence Guarnatee, Security Deposit Returned		-	-	-	-	-	-	-	-	-	-	-	-
Add: Opening Balance B/f (C)	3.1	26,65,920	69,063	26,57,603	(1,44,62,672)	(46,47,545)	1,20,94,235	15,03,898	-	(1,19,498)	-	**3,87,45,388**	-
Prior period adjustment	12	-	-	-	-	-	-	-	-	-	-	-	-
Transfer to Capital Asset Fund (D)	4	-	-	-	-	-	-	-	-	-	**71,07,282**	-	**2,13,94,470**
Transfer to Welfare Fund		-	-	-	-	-	-	-	-	-	-	-	-
BALANCE BEING SURPLUS TRANSFERRED TO GENERAL RESERVE FUND {A- (B+D) }		-	-	-	-	-	-	-	-	-	(1,75,79,788)	-	15,05,827
UN-UTILIZED GRANTS OUT OF GOVT. GRANTS FOR REVENUE EXPENDITURE { (C+A)-B }		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	-	1,89,90,719	-
SIG. ACCOUNTING POLICIES	**13**												
NOTES ON ACCOUNTS	**14**												

For National Institute of Wind Energy

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

Sd/-
Dr.K.Balaraman
Director General

As per our Report attached
Rajesh & Ganesh, Chartered Accountants
Firm Regn No.008640S

Sd/-
S. Rajesh, Partner
Membership No.208090

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.)

RECEIPTS	FY 2021-22	FY 2020-21
I. Opening Balances		
(a) Cheques in hand	-	-
(b) Bank balances	-	-
i) In Current Account	99,970	93,200
ii) In Savings Bank Account	8,08,25,497	18,04,12,251
iii) In Deposit Accounts	43,30,95,951	43,30,95,951
iv) Cash in hand	1,620	2,080
(c) Stamps in hand	5,549	-
	51,40,28,587	**61,36,03,482**
II. Grants Received / UnUtilised Grants		
(a) From Government of India for Grant	41,07,15,355	20,99,05,080
(b) From Government of India for SRRA Project	-	2,23,00,000
(c) Grants in Aid from DST	-	-
III. Investments Withdrawn	**-**	**-**
IV. Interest Received	**-**	**-**
(a) On Bank deposits	1,68,45,927	2,54,07,457
(b) On Savings A/C	46,25,577	47,00,314
(c) On IT Refund	2,18,371	-
V. Other Income	-	-
(a) Fees for services Including Advances	7,09,91,299	10,69,00,044
(b) Income from publications	-	-
(c) Energy receipts	6,250	4,71,47,405
(d) Misc. Income	78,46,391	1,13,71,009
(e) Award Fund - IREDA	-	6,48,603
(f) Subscription	-	25,300
VI. Amount borrowed	-	-
VII. Any other receipts	-	-
(a) Fees received in advance on Consultancy projects	14,06,000	3,11,98,563
(b) Security deposit / Earnest money deposits received	1,09,86,686	30,01,372
(c) TDS to be remitted	51,85,775	-
(d) Expenses/Salary Payable/S.Creditor/Advance	5,588	12,05,911
(e) Receivable from Debtors/other payments/Branch division	21,02,62,988	19,33,62,074
(f) Advances and Deposits-IE	10,68,81,181	8,26,679
(g) Advances and Deposits-Grants	5,52,16,890	-
(h) Other Liabilties	1,42,28,749	3,58,612
(i) Sundry Creditors	-	20,620
	91,54,23,027	**65,71,73,132**
TOTAL	**1,42,94,51,614**	**1,27,07,76,614**

For National Institute of Wind Energy

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

Sd/-
Dr.K.Balaraman
Director General

As per our Report attached
Rajesh & Ganesh
Chartered Accountants
Firm Regn No.008640S
Sd/-
S. Rajesh
Partner
Membership No.208090

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 2021-22	FY 2020-21
I.	**Expenses**		
	(a) Employee related Expenses	1,29,25,083	7,94,74,915
	(b) Administrative Expenses	4,92,62,321	4,12,09,161
II.	**Payments made against funds for various projects**	-	-
	Out of CFA	-	-
	(a) In house R&D project expenses	3,32,24,157	7,42,21,554
	Out of Grants for projects	-	-
	(a) From Government of India for Grant	78,01,150	1,33,18,938
	(b) From Government of India (Met-Ocean Measurement)	1,79,840	6,69,19,634
	(c) From Government of India (Integrated Wind & Solar Research Assessment)	32,58,495	2,54,03,012
	(d) From Government of India for SRRA Project	4,52,418	2,45,67,179
III.	**Investment and Deposits made**	-	-
IV.	**Expenditure on Fixed assets & Capital Work-in-Progress**	-	-
	(a) Purchase of Fixed assets including Advances (Grants)	4,07,76,216	71,30,801
	(b) Purchase of Fixed assets (Internal Generation)	1,30,90,817	2,15,90,190
	(c) Purchase of Fixed assets (SRRA)	-	1,50,000
V.	**Refund made during the year**	-	-
	(a) Balance of Grants-in-aid to Government of India	1,69,68,330	-
	(b) Interest Earned	13,18,197	79,53,095
VI.	**Other Payments**	-	-
	(a) Refund of SD /PG/EMD - From Internal Genertation	81,07,295	38,42,850
	(b) Expenditure on Consultancy Projects	7,58,60,410	6,71,28,741
	(c) Advance & Deposits from Grants	1,41,33,979	1,23,62,720
	(d) Advance & Deposits from SRRA	-	-
	(e) Advance & Deposits from Internal Generation	10,76,48,815	73,35,194
	(f) Payment of TDS (Grants)	25,86,118	64,14,962
	(g) Payment of TDS (Internal Generation)	1,41,15,818	1,57,98,198
	(h) GST remittance	98,45,902	95,95,436
	(i) Receivable from Debtors/other payments /Branch Division	30,34,42,654	27,23,31,448
	Advance Paid + Payable Staff	-	-
	Advance Project/ Other Payment	-	-
	Branch Payment	-	-
	Sundry Creditors	-	-
	Other Payment	-	-
	Expenses payable	-	-
	Payment Deposit	-	-
	(j) Deposit to Employee benefit fund	38,37,081	-
VII.	**Changes in Working Capital**	-	-
VIII.	**Closing 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	31,67,24,590	43,30,95,951
	iv) In Deposit Accounts (SRRA)	1,10,00,000	-
	(c) Cash in hand (NIWE Canteen)	1,620	1,620
	(d) Stamps in hands	3,705	5,549
	TOTAL	**1,42,94,51,614**	**1,27,07,76,614**

For National Institute of Wind Energy

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

Sd/-
Dr.K.Balaraman
Director General

As per our Report attached
Rajesh & Ganesh
Chartered Accountants
Firm Regn No.008640S
Sd/-
S. Rajesh
Partner
Membership No.208090

NATIONAL INSTITUTE OF WIND ENERGY

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

SCHEDULES FORMING PART OF BALANCE SHEET AS AT 31ST MARCH 2022

(Amount in Rs.)

SCHEDULE 1 - CAPITAL ASSET FUND	CFA-Capital	NE Region	SRRA	IE	31.03.2022	31.03.2021
Opening Balance						
Balance as at the beginning of the year	20,53,54,291	51,30,673	19,56,901	3,91,18,072	**25,15,59,937**	**26,75,46,543**
Add : Prior period adjustment				6	**6**	**-**
Add : Addition from Capital Grant	2,71,75,406			-	**2,71,75,406**	**3,44,46,017**
Add : Addtion from Internal Revenue Generation prior years				2,326	**2,326**	-
Add : Addtion from Capital Grants SRRA	-	-	-	-	**-**	**1,50,000**
Add : Addtion from Capital Grants MNRE	-	-	-	-	-	-
Add : Addtion from Capital Grants MoM	-	-	-	-	-	-
Add : Addtion from Internal Revenue Generation	-	-	-	1,33,44,406	**1,33,44,406**	**2,13,94,470**
Less : Deletion from Internal Revenue Generation	-	-	-	-	-	-
Less: Deletion from Capital Grants	-	-	-	-	-	-
Less: Deletion from Internal Revenue Generation	-	-	-	62,37,124	**62,37,124**	-
Less: Deletion from Capital Grants SRRA	-	-	-	-	-	-
Less: Depreciation on assets purchased out of Grants MNRE	4,76,31,923	11,00,045	-	-	**4,87,31,968**	**6,74,52,336**
Less: Depreciation on assets purchased out of Internal generation	-	-	-	52,48,527	**52,48,527**	**45,24,757**
Less: Depreciation on assets purchased out of Grants SRRA			6,11,920	-	**6,11,920**	**-**
TOTAL	**18,48,97,774**	**40,30,628**	**13,44,981**	**4,09,79,159**	**23,12,52,543**	**25,15,59,937**

For National Institute of Wind Energy

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

Sd/-
Dr.K.Balaraman
Director General

As per our Report attached
Rajesh & Ganesh
Chartered Accountants
Firm Regn No.008640S

S. Rajesh
Partner
Membership No.208090

NATIONAL INSTITUTE OF WIND ENERGY

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

SCHEDULES FORMING PART OF BALANCE SHEET AS AT 31ST MARCH 2022

(Amount in Rs.)

SCHEDULE 2 - RESERVES AND SURPLUS	31st March, 2022	31st March, 2021
General Reserve Fund		
Balance at the beginning of the year (A)	44,54,78,650	44,39,72,822
Addition during the year being surplus (B)	(1,75,79,788)	15,05,827
(A+B)	**42,78,98,861**	**44,54,78,650**
Welfare Fund (General Reserve) (C)	11,21,268	10,46,109
TOTAL (A+B+C)	**42,90,20,129**	**44,65,24,759**

For National Institute of Wind Energy

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

Sd/-
Dr.K.Balaraman
Director General

As per our Report attached
Rajesh & Ganesh
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Firm Regn No.008640S

S. Rajesh
Partner
Membership No.208090

NATIONAL INSTITUTE OF WIND ENERGY

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

SCHEDULES FORMING PART OF BALANCE SHEET AS AT 31st MARCH 2022

(Amount in Rs.)

SCHEDULE 3 : CURRENT LIBILITIES AND PROVSISIONS:	Schedule	CFA - Capital	CFA - Revenue	NE Region	MOM	IWSRA	SRRA	NIWE IREDA Fund	Hybridize	VAYU-MITRA	TOTAL IE	As on 31/03/2022	As on 31/03/2021
A. CURRENT LIABILITIES													
Sundry Creditors for expenses:					-	-	28,243				1,24,47,041	1,24,75,284	80,92,543
Expenses payable					-	-					-	-	2,60,058
Salary Payable					-	-					37,50,386	37,50,386	38,86,829
Security Deposit, EMD & PG					-	-					1,83,92,679	1,83,92,679	1,77,16,793
Advances Received on Projects					-	-					2,67,93,983	2,67,93,983	5,60,92,001
Statutory Liabilities					-	-	1,430				10,09,302	10,10,732	11,05,831
Other Current Liabilities		88,61,109	1,08,04,848	19,45,362	-	28,97,693	1,19,556		24,56,704		1,26,942	2,72,12,214	3,95,65,894
Other Payables					-	-					-	-	27,98,495
NIWE-IREDA Award Fund					-	-					-	-	-
Welfare Fund Payable		-	-	-	-	-	-	-	-		-	-	84
Branch Division Payables					-	-	80,37,586				58,82,808	1,39,20,394	3,39,23,232
TOTAL (A)		**88,61,109**	**1,08,04,848**	**19,45,362**	**-**	**28,97,693**	**81,86,815**	**-**	**24,56,704**	**-**	**6,84,03,141**	**8,96,35,278**	**12,95,18,528**
UN UTILISED GRANTS											-	-	
a) Central Finance Assistance MNRE (Grants-in-Aid)"	3.1	8,67,78,382	40,838		15,64,36,152	1,26,39,407	(50,70,685)		12,25,396	2,79,81,970	-	28,00,31,459	73,16,051
Earmarked Projects SRRA USP											-	-	-
IREDA NIWE FUND								1,28,88,490			-	1,28,88,490	1,20,94,235
TOTAL (B)		**8,67,78,382**	**40,838**	**-**	**15,64,36,152**	**1,26,39,407**	**(50,70,685)**	**1,28,88,490**	**12,25,396**	**2,79,81,970**	**-**	**29,29,19,949**	**1,94,10,286**
TOTAL { (A)+(B) }		**9,56,39,491**	**1,08,45,686**	**19,45,362**	**15,64,36,152**	**1,55,37,100**	**31,16,130**	**1,28,88,490**	**36,82,100**	**2,79,81,970**	**6,84,03,141**	**38,25,55,228**	**14,89,28,814**
B. PROVISIONS		-	-	-	-	-	-	-	-				
Gratuity		-	-	-	-	-	-	-	-		1,18,38,784	1,18,38,784	90,92,408
Leave Encashment		-	-	-	-	-	-	-	-		47,67,425	47,67,425	42,86,517
Bonus & Ex-gratia		-	-	-	-	-	-	-	-		-	-	
TOTAL (C)		**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1,66,06,209**	**1,66,06,209**	**1,33,78,925**
GRAND TOTAL { (A)+(B)+(C) }		**9,56,39,491**	**1,08,45,686**	**19,45,362**	**15,64,36,152**	**1,55,37,100**	**31,16,130**	**1,28,88,490**	**36,82,100**	**2,79,81,970**	**8,50,09,350**	**39,91,61,436**	**16,23,07,739**

For National Institute of Wind Energy

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

Sd/-
Dr.K.Balaraman
Director General

As per our Report attached
Rajesh & Ganesh, Chartered Accountants
Firm Regn No.008640S

Sd/-
S. Rajesh, Partner
Membership No.208090

NATIONAL INSTITUTE OF WIND ENERGY

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

SCHEDULES FORMING PART OF BALANCE SHEET AS AT 31st MARCH 2022

(Amount in Rs.)

SCHEDULE 3.1 : UNUTILISED GRANT - CFA	CFA - Capital	CFA - Revenue	NE Region	MOM Capital	MOM Revenue	IWSRA Capital	IWSRA Revenue	SRRA	NIWE IREDA Fund	Hybridize	VAYU-MITRA	As on 31/03/2022	As on 31/03/2021
Funds													
Balance as at the beginning of the year	(5,51,693)	26,65,920	(1,44,62,672)	1,73,58,681	69,063	27,22,796	26,57,603	(46,47,545)	15,03,898	1,20,94,235		1,94,10,285	7,84,64,156
Add : Grants received during the year	10,00,00,000	10,00,00,000		2,40,00,000	12,43,74,000	3,19,98,947	23,42,408				2,80,00,000	41,07,15,355	21,89,77,775
Add :Misc. Income on Grants	50,51,200	62,393										51,13,593	3,65,908
Add :Interest Earned on Grants	3,53,373	38,891	3,77,031	6,10,027	16,267	67,267	81,424		38,040	7,94,255		23,76,575	37,30,784
Add: Interest Accrued on Grants	68,057											68,057	-
Add: Profit on Sale of Assets												-	-
Add: Transferred from Earmarked Projects		(1,44,62,672)	1,44,62,672									-	-
Add: SNA Refund												-	11,83,941
Add:EMD,SD,PG Received	-											-	-
Total (A)	**10,49,20,937**	**8,83,04,532**	**3,77,031**	**4,19,68,708**	**12,44,59,330**	**3,47,89,010**	**50,81,435**	**(46,47,545)**	**15,41,938**	**1,28,88,490**	**2,80,00,000**	**43,76,83,865**	**30,27,22,564**
Less : Refunds												-	
Interest earned on Grants refunded to Ministry	3,53,373	38,891	3,77,031	6,10,027	16,267	67,267	81,424		1,89,614			17,33,894	82,36,657
Other Income Earned refunded to Ministry		93,627										93,627	4,22,274
Refund of Unutilized Grants		26,65,920										26,65,920	6,04,447
Total (B)	**3,53,373**	**27,98,438**	**3,77,031**	**6,10,027**	**16,267**	**67,267**	**81,424**	**-**	**1,89,614**	**-**	**-**	**44,93,441**	**92,63,378**
Total Fund Available (C= A-B)	10,45,67,564	8,55,06,094	-	4,13,58,681	12,44,43,063	3,47,21,743	50,00,011	(46,47,545)	13,52,324	1,28,88,490	2,80,00,000	43,31,90,424	29,34,59,186
Less: Expenditure												-	
Grants from Government of India allocated for Capital	1,77,89,182			91,85,051		2,31,03,770						5,00,78,003	3,06,92,072
Grants from Government of India allocated for Revenue expenditure		3,23,03,853			1,80,541		33,22,269	4,23,140	1,26,928		18,030	3,63,74,761	14,06,66,217
Grants from Government of India allocated for NER												-	1,29,16,906
Grants from Government of India allocated for SRRA												-	-

For National Institute of Wind Energy

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

Sd/-
Dr.K.Balaraman
Director General

As per our Report attached
Rajesh & Ganesh, Chartered Accountants
Firm Regn No.008640S

S. Rajesh, Partner
Membership No.208090

NATIONAL INSTITUTE OF WIND ENERGY

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

SCHEDULES FORMING PART OF BALANCE SHEET AS AT 31st MARCH 2022

(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	NIWE IREDA Fund	Hybridize	VAYU-MITRA	As on 31/03/2022	As on 31/03/2021
Expenditure relating to Grants from Government of India for the inhouse projects during the year		4,62,22,627										4,62,22,627	7,41,14,605
Transfer to capital asset fund												-	-
Transfer to Income & Expenditure												-	-
Excess of Expenditure out of Previous Year Advance												-	3,67,007
EMD,Performenc Guarnatee,Security Deposit Returned	-											-	-
Sub Total (i)	**1,77,89,182**	**7,85,26,480**	**-**	**91,85,051**	**1,80,541**	**2,31,03,770**	**33,22,269**	**4,23,140**	**1,26,928**	**-**	**18,030**	**13,26,75,390**	**25,87,56,807**
Less: Payables												-	
Expenses Payable												-	2,60,058
Security Deposits & Performance Guarantee												-	15,98,159
Sundry Creditors												-	66,231
Other Current Liabilities												-	1,430
Advances received												-	-
Salary Payable / EPF Payable												-	-
Sub Total (ii)	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**12,70,440**
Less: Advances & Deposits												-	
Less: Advances paid		69,38,776					6,56,308					7,595,084	1,40,19,029
Less: Deposits												-	500
Less: Prepaid Expenses												-	2,124
Sub Total (iii)	**-**	**69,38,776**	**-**	**-**	**-**	**-**	**6,56,308**	**-**	**-**	**-**	**-**	**7,595,084**	**1,40,21,653**
Total (D) [i+ii+iii]	**1,77,89,182**	**8,54,65,256**	**-**	**91,85,051**	**1,80,541**	**2,31,03,770**	**39,78,577**	**4,23,140**	**1,26,928**	**-**	**18,030**	**14,02,70,474**	**27,40,48,900**
UNUTILIZED GRANT (Refundable to Ministry)	8,67,78,382	40,838	-	3,21,73,630	12,42,62,522	1,16,17,973	10,21,434					25,58,94,779	2,54,74,063
UNUTILIZED GRANTS (Receivable from Ministry)								(50,70,685)				(50,70,685)	(1,96,61,910)
UNUTILIZED GRANTS / Funds (Others)									12,25,396	1,28,88,490	2,79,81,970	4,20,95,856	1,35,98,133

For National Institute of Wind Energy

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

Sd/-
Dr.K.Balaraman
Director General

As per our Report attached
Rajesh & Ganesh, Chartered Accountants
Firm Regn No.008640S

S. Rajesh, Partner
Membership No.208090

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 01.04.2021	Addition	Deletion/ Adjustment	As on 31.03..2022	As on 01.04.2021	Addition	Deletion/ Adjustment	Prior Period Adjustment	Total as on 31.03.2022	As on 31/03/2022	As on 31/03/2021
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	6,24,99,831	15,94,159			6,40,93,990	90,34,444	1,06,28,603
Furniture & Fitting	1,30,32,853			1,30,32,853	1,13,99,488	3,73,735			1,17,73,223	12,59,630	16,33,365
Instruments & Equipments	21,19,62,090	2,02,15,921		23,21,78,011	12,63,57,891	2,82,77,428			15,46,35,319	7,75,42,693	8,56,04,200
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	14,22,68,733	6,73,406		14,29,42,139	12,95,01,206	1,24,71,743			14,19,72,949	9,69,189	1,27,67,526
Vehicles	37,30,868			37,30,868	32,39,802	2,45,227			34,85,029	2,45,839	4,91,066
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	2,34,13,064	44,90,133			2,79,03,197	2,27,74,785	2,72,64,918
Books	22,34,032			22,34,032	20,54,533	1,79,498			22,34,031	1	1,79,499
Capital Work In Progress	4,91,75,015	62,86,079		5,54,61,094	-				-	5,54,61,094	4,91,75,015
TOTAL (A)	**68,63,37,916**	**2,71,75,406**	**-**	**71,35,13,322**	**48,09,83,623**	**4,76,31,923**	**-**	**-**	**52,86,15,546**	**18,48,97,776**	**20,53,54,293**
NER											
Instruments & Equipments (NER)	77,99,810			77,99,810	26,69,137	11,00,046			37,69,183	40,30,627	51,30,673
TOTAL (B)	**77,99,810**	**-**	**-**	**77,99,810**	**26,69,137**	**11,00,046**	**-**	**-**	**37,69,183**	**40,30,627**	**51,30,673**
SRRA USP											
Computers (USP)	62,78,287			62,78,287	59,37,913	3,259			59,41,172	3,37,115	3,40,374
Furniture & Fitting (USP)	12,79,997			12,79,997	10,10,870	83,901			10,94,771	1,85,226	2,69,127
Instruments & Equipments (USP)	41,52,86,273			41,52,86,273	41,51,62,189	1,24,083			41,52,86,272	1	1,24,084
Infrastructure Facilities (USP)	40,55,703			40,55,703	28,32,385	4,00,679			32,33,064	8,22,639	12,23,318
TOTAL (C)	**42,69,00,260**	**-**	**-**	**42,69,00,260**	**42,49,43,357**	**6,11,922**	**-**	**-**	**42,55,55,279**	**13,44,981**	**19,56,903**

For National Institute of Wind Energy

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

Sd/-
Dr.K.Balaraman
Director General

As per our Report attached
Rajesh & Ganesh, Chartered Accountants
Firm Regn No.008640S

S. Rajesh, Partner
Membership No.208090

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 01.04.2021	Addition	Deletion/ Adjustment	As on 31.03..2022	As on 01.04.2021	Addition	Deletion/ Adjustment	Prior Period Adjustment	Total as on 31.03.2022	As on 31/03/2022	As on 31/03/2021
Internal Revenue Generation											
Computers	1,26,05,527		3,49,400	1,22,56,127	1,22,38,339	8,788			1,22,47,127	9,001	3,67,188
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	1,76,813	49,877			2,26,690	2,72,067	3,21,944
Vehicle (All)	48,74,209			48,74,209	31,60,201	4,50,492			36,10,693	12,63,516	17,14,008
Project Vehicle & Battery Operated Vehicle	-			-	-				-	-	-
Instruments & Equipments (All)	4,56,39,679	1,33,05,406	58,65,724	5,30,79,361	1,51,60,821	46,55,079	-	1,800	1,98,14,100	3,32,65,261	3,04,80,658
Instruments & Equipments	4,12,80,114	1,32,96,847	55,99,875	4,89,77,086	1,28,41,226	46,69,482			1,75,10,708	3,14,66,378	2,84,38,888
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	10,997			1,800	9,197	-	-
Instruments & Equipment - TESTING	44,240			44,240	44,240				44,240	-	-
Instruments & Equipment - SRRA-IE	35,76,960	8,559	2,65,849	33,19,670	15,63,390	-14,403			15,48,987	17,70,683	20,13,570
Instruments & Equipment - SECI	28,200			28,200	-				-	28,200	28,200
Instruments & Equipments(CANTEEN)	37,641			37,641	29,950	4,435			34,385	3,256	5,354
Furniture & Fittings (IE)	5,95,152	39,000	22,000	6,12,152	2,53,172	60,285			3,13,457	2,98,695	3,41,980
Furniture & Fittings (CANTEEN)	1,95,720			1,95,720	9,786	19,572			29,358	1,66,362	1,85,934
Total (D)	**29,24,02,745**	**1,33,44,406**	**62,37,124**	**29,95,10,027**	**25,32,84,140**	**52,48,527**	**-**	**1,800**	**25,85,30,867**	**4,09,79,160**	**3,91,18,068**
Current year figures (A+B+C+D)	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
Previous Year Figures	1,35,08,71,469	6,76,43,357	1,25,30,111	1,41,34,02,563	1,08,99,05,422	7,19,74,766	2,258	-	1,16,18,77,930	25,15,59,937	26,75,46,545

For National Institute of Wind Energy

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

Sd/-
Dr.K.Balaraman
Director General

As per our Report attached
Rajesh & Ganesh, Chartered Accountants
Firm Regn No.008640S

S. Rajesh, Partner
Membership No.208090

NATIONAL INSTITUTE OF WIND ENERGY

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

SCHEDULES FORMING PART OF BALANCE SHEET AS AT 31st MARCH 2022

(Amount in Rs.)

SCHEDULE 5 : CURRENT ASSETS, LOANS & ADVANCES:	CFA - Capital	CFA - Revenue	NE Region	MOM	IWSRA	SRRA	NIWE IREDA Fund	Welfare Fund	Hybridize	VAYU-MITRA	TOTAL IE	As on 31/03/2022	As on 31/03/2021
A. CURRENT ASSETS:												-	-
Sundry Debtors						3,27,269					5,77,99,584	5,81,26,853	4,54,58,575
Inventories										-	-	-	
Stock of Stationery		1,13,494									-	1,13,494	1,46,730
Stock of Stores and Spares											-	-	-
Stock of Wind Atlas Book											4,57,346	4,57,346	4,57,346
Cheques in hand											-	-	-
Stamps in hand		3,705									-	3,705	5,549
Closing Stock											-	-	-
Bank Balances:											-	-	-
With Scheduled Banks:											-	-	-
In Current Account											2,08,000	2,08,000	99,970
In Savings Bank Account	8,13,06,014	18,68,557	1,81,452	15,64,36,152	1,33,51,792	24,95,318	21,57,058	5,80,139	12,25,396	2,79,81,970	9,50,94,755	38,26,78,603	8,08,25,495
In Cash											1,620	1,620	1,620
In Deposit Account							1,00,00,000	10,00,000			31,67,24,590	32,77,24,590	43,30,95,951
Branch Division Receivables	50,51,200	2,741			10,000		4,74,110				83,82,342	1,39,20,393	3,39,23,243
TOTAL (A)	**8,63,57,214**	**19,88,497**	**1,81,452**	**15,64,36,152**	**1,33,61,792**	**28,22,587**	**1,26,31,168**	**15,80,139**	**12,25,396**	**2,79,81,970**	**47,86,68,236**	**76,93,14,211**	**56,00,91,236**
B. LOANS, ADVANCES AND OTHER ASSETS													
Advances and other amounts recoverable in cash or in kind or for value to be received:													
a) On Capital Account											-	-	
a) Prepayments											-	-	91,461
b) Interest accrued on term deposits							2,57,322				38,220	2,95,542	-
c) Advances	92,82,277	88,27,188	17,63,910		21,69,646	1,12,593			24,56,704		1,68,81,126	4,14,93,444	2,97,51,950
d) Consultancy WIP											-	-	25,98,466
e) Balance with Govt. Authority - TDS		30,000			5,662	1,80,950		15,239			1,68,46,518	1,70,78,369	1,62,99,385
TOTAL (B)	**92,82,277**	**88,57,188**	**17,63,910**	**-**	**21,75,308**	**2,93,543**	**2,57,322**	**15,239**	**24,56,704**	**-**	**3,37,65,865**	**5,88,67,355**	**4,87,41,262**
GRAND TOTAL { (A)+(B) }	**9,56,39,491**	**1,08,45,685**	**19,45,362**	**15,64,36,152**	**1,55,37,100**	**31,16,130**	**1,28,88,490**	**15,95,378**	**36,82,100**	**2,79,81,970**	**51,24,34,101**	**82,81,81,566**	**60,88,32,498**

For National Institute of Wind Energy

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

Sd/-
Dr.K.Balaraman
Director General

As per our Report attached
Rajesh & Ganesh, Chartered Accountants
Firm Regn No.008640S

Sd/-
S. Rajesh, Partner
Membership No.208090

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, 2022

(Amount in Rs.)

	31st March, 2022	31st March, 2021
SCHEDULE 6 - INCOME FROM SALES / SERVICES		
Income from Services		
Income from Scientific & Technical Consultancy Services	10,37,79,711	10,69,00,044
Energy receipts	3,20,00,941	3,03,36,073
Wind Power Forecasting Receipts	-	40,95,280
TOTAL	**13,57,80,652**	**14,13,31,397**
SCHEDULE 7 - INCOME FROM PUBLICATION		
Sale of Books & Reports	5,338	-
TOTAL	**5,338**	**-**
SCHEDULE 8 - INTEREST EARNED		
On Term Deposits with Scheduled Banks	1,28,16,965	2,47,11,518
On Savings Bank account with Scheduled Banks	24,29,111	18,07,602
TOTAL	**1,52,46,076**	**2,65,19,120**
SCHEDULE 9 - OTHER INCOME		
Interest Received	22,519	8,88,248
Participation Fees	26,91,672	9,13,500
Registration Fees	80,000	1,25,000
Miscellaneous Income	37,40,526	33,012
TOTAL	**65,34,717**	**19,59,760**
SCHEDULE 10 - ESTABLISHMENT EXPENSES ADMINISTRATION AND R&D STAFF		
Salaries and Allowances	6,17,22,277	5,57,47,622
Salaries and Allowances - Contract Staff	13,09,130	36,82,308
Contribution to Provident Fund (EPF)	64,92,178	50,35,416
Contribution to Pension & Gratuity (With LIC)	42,62,459	71,48,862
Incentives to Employees	55,000	50,000
Leave travel concession	9,59,547	21,80,915
Children Education Allowance	8,64,000	9,18,000
Medical reimbursement	19,08,590	7,23,628
Newspaper reimbursement	1,77,480	1,96,060
Leave Salary (Contirbution to LIC)	25,15,050	33,61,839
LIC Admin. Charges (Gratuity & Leave Encashment)	2,87,602	2,53,064
Encashment of Earned Leave	65,566	-
Staff welfare expenses	49,414	1,23,176
TOTAL	**8,06,68,293**	**7,94,20,891**

For National Institute of Wind Energy

As per our Report attached
Rajesh & Ganesh
Chartered Accountants
Firm Regn No.008640S

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

Sd/-
Dr.K.Balaraman
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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, 2022

(Amount in Rs.)

SCHEDULE 11 - OTHER ADMINISTRATIVE EXPENSES	31st March, 2022	31st March, 2021
Advertisement and Publicity	4,44,228	4,64,502
Auditor's Remuneration	75,000	88,500
Bio Gas Expenses	24,000	52,498
Electricity and Power	29,13,734	30,77,625
Expenses on Books, Data & Periodicals	15,22,384	57,27,535
Expenses on Fees (Sitting Fees & Honorarium)	62,500	67,500
Expenses on Seminar & Meetings	3,45,513	2,19,867
Hospitality Expenses	3,36,733	1,29,560
Office expenses & Maintenance	69,55,926	1,05,68,540
Other Expenses (Hindi Prom.,OLA Act, Bk Chrg.)	2,47,635	1,27,325
Postage & Courier	73,189	44,652
Printing and Stationery	5,53,114	4,88,104
Professional Charges	5,83,070	5,71,938
Rates & taxes/ Licence Fee	10,45,391	25,31,047
Repairs (AMC etc.,)	35,12,388	62,97,057
Security Charges	85,78,311	74,66,558
Telephone and Communication Charges	18,28,961	26,30,550
Training and Development	16,333	46,640
Travel & Conveyance and Taxi hire	19,66,222	7,03,129
Vehicles Running and Up Keeping	8,09,608	6,23,948
Water Charges	4,09,614	4,83,939
TOTAL (A)	**3,23,03,852**	**4,24,11,014**
CONSULTANCY PROJECT EXPENSES		
Expenses on In Consultancy Projects (B)	8,73,70,997	6,74,89,089
GRAND TOTAL { (A)+(B) }	**11,96,74,849**	**10,99,00,103**

For National Institute of Wind Energy

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

Sd/-
Dr.K.Balaraman
Director General

As per our Report attached
Rajesh & Ganesh
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Firm Regn No.008640S

S. Rajesh
Partner
Membership No.208090

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, 2022

(Amount in Rs.)

SCHEDULE 12 - PRIOR PERIOD ADJUSTMENT	31st March, 2022	31st March, 2021
Prior Period Expenses/ Income	-	-
TOTAL	**-**	**-**

For National Institute of Wind Energy

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

Sd/-
Dr.K.Balaraman
Director General

As per our Report attached
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Sd/-
S. Rajesh
Partner
Membership No.208090

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 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

Tangible Assets	Percentage of Depreciation
Computers (Including Computer Software)	40
Renewable Energy Device – Wind/Solar	40
Library Books	60

6.2 In respect of additions to / deductions from fixed assets during the year, depreciation is considered on pro-rata basis.

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. 75,000/- 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 2021-22, 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	101	56,06,421
WIND VANE	48	19,44,000
TEMPERATURE	50	5,22,442
PRESSURE	34	4,45,742
MICROCOMM	2	80,000
PYRANOMETER	41	20,43,832
RAIN GAUGE	10	1,02,500
	286	**1,07,44,937**

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			**15,75,66,783**
Less:	Salary component of service functions	8,06,68,293	**17,51,46,572**
	Consultancy Project Expenses	8,73,70,997	
	Transfer to Capital fund	71,07,282	
Balance transferred to General Reserve Fund			**(1,75,79,789)**

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 2021-22, a sum of Rs. 3,20,00,941 /- **(Ref: Energy Receipt - Sch.6)** has been earned.

11. The total interest income earned is Rs.1,52,46,076 /-. Out of which Rs.1,28,16,965 /-, earned from Term Deposit with Scheduled Banks and Rs.24,29,111 /- 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, 2022 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/-	As per our Report attached
R. Girirajan	Dr. K. Balaraman	Rajesh & Ganesh
Addl. Director	Director General	Chartered Accountants
(F&A)		Firm Regn No.008640S
		Sd/-
		S. Rajesh
		Partner
		Membership No.208090

Place : Chennai

Date : 21.10.2022

Rajesh & Ganesh
Chartered Accountants

II Floor, Sterling Point, No. 124, G.N.Chetty Road
T. Nagar, Chennai - 600 017
☎ +91-44-4212 4342, +91-44-2834 5500(Dir)
E-Mail : rajeshganesh@yahoo.com

The Chairman,

Governing Council
National Institute of Wind Energy
Chennai — 600 100.

INDEPENDENT AUDITORS REPORT

Sir,

We have audited the attached financial statements of National Institute of Wind Energy (NIWE) formerly known as Centre for Wind Energy Technology (C-WET), Velachery — Tambaram, Pallikaranai, Chennai, which comprise the Balance sheet as at 31.03.2022, the Income & Expenditure Account and the Receipts and Payments Account for the year then ended and a summary of significant accounting policies and other explanatory information.

Management's Responsibility:

NIWEs' Management is responsible for the preparation of these financial statements that give a true and fair view of the financial position, financial performance and receipts and payments of NIWE in accordance with the Accounting Standards issued by the Institute of Chartered Accountants of India. This responsibility also includes maintenance of adequate accounting record in accordance with the provisions of the Indian laws applicable to NIWE for safeguarding the assets of the Institution 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.

Auditors' Responsibility:

Our responsibility is to express an opinion on these financial statements based on our audit. We have taken into account the provisions of the Indian law's applicable to NIWE, the accounting and auditing standards and matters which are required to be included in the audit report under the provisions of Indian laws and the Rules made thereunder. We conducted our audit in accordance with the Standards on auditing issued by the Institute of Chartered Accountants of India. Those standards require that we comply with the ethical requirements and plan and perform the audit to obtain reasonable assurance about whether the financial statements are free from material misstatements. An audit involves performing procedures to obtain audit evidence about the amounts and the disclosures in the financial statements.

The procedures selected depend on the auditor's judgment, including the assessment of the risks of material misstatement of the financial statements, whether due to fraud or error. In making those risk assessments, the auditor considers internal financial control relevant to NIWEs' preparation and fair presentation of the financial statements in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the NIWEs' internal finance control.

An audit also includes evaluating the appropriateness of the accounting policies used and reasonableness of the accounting estimates made by the management, as well as evaluating the overall presentation of financial statements. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion

Opinion:

a.In our opinion and to the best of our information and according to the explanations given to us, the aforesaid financial statements, including the Balance Sheet, Income & Expenditure Account and Receipts and Payments Account dealt with by this report read together with schedules, accounting policies and notes thereon give a true and fair view in conformity with the accounting principles generally accepted in India:

i. In the case of Balance Sheet, of the state of affairs of the above-mentioned Institution as at 31st March, 2022;
ii. In the case of Income & Expenditure account of the Excess of Income over expenditure of this Institution for the year ended on that date; and
iii. In the case of Receipts and payments Account of the Receipts and Payments of this Institution for the year ended on that date

Report on Other Legal and Regulatory Requirements

We report that:

a. We have obtained all information and explanations which to the best of our knowledge and belief were necessary for the purpose of our audit
b. In our opinion, proper books of account have been kept by the above-mentioned Institution so far as appears from our examination of the books
c. The Balance Sheet, Income & Expenditure Account and Receipts and Payments Account referred to in this report are in agreement with the books of accounts;

d. In our opinion the Balance Sheet, Income and Expenditure Account and Receipts and Payments Account dealt with by this report are prepared in accordance with the applicable Accounting Standards issued by the Institute of Chartered Accountants of India.

According to the information and explanations given to us, in respect of statutory dues, NIWE has generally been regular in depositing statutory dues, including Provident Fund, Income-tax, Goods & Services Tax as well as compliance of the respective laws and other material statutory dues applicable to it with the appropriate authorities

For Rajesh and Ganesh

Chartered Accountants

(Firm Registration No: 008640S)

Rajesh Srinivasan

Partner

Membership No: 208090

UDIN:

Place: Chennai

Date: 21.10.2022

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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Fax : +91-44-2246 3980 E-mail : info@niwe.res.in Website : http://niwe.res.in

AZADI KA AMRIT MAHOTSAV

75 YEARS OF INDIA'S INDEPENDENCE DAY CELEBRATION

नीवे NIWE

ISO 9001 : 2015

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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