

वार्षिक रिपोर्ट ANNUAL REPORT 2019-20



नीवे NIWE

राष्ट्रीय पवन ऊर्जा संस्थान
NATIONAL INSTITUTE OF WIND ENERGY

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

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

Annual Report 2019-20



नीवे NIWE

NATIONAL INSTITUTE OF WIND ENERGY

An Autonomous Research & Development Institution
Ministry of New and Renewable Energy, Government of India
Chennai - 600 100

Inside...

Preamble

4	Functional Structure
5	From the Director General's Desk
6	The Charter
7	Governing Council
8	NIWE's Committees

Technological Highlights

12	Wind Resource Assessment
16	Solar Radiation Resource Assessment
18	Projects and Consultancy Services
20	Standards & Regulation
25	Wind Turbine Testing & Research Station
28	Certification of Wind Turbines
30	Wind-Solar Power Forecasting Service
32	Research & Development

Skill Development & Outreach

42	Training
49	Events
53	Awards & Achievement
54	Papers & Publications
56	Deputation Abroad
60	Visitors

Support Services

64	IT Infrastructure
66	Finance & Administration
68	NIWE's Team

Finance Report

72	Balance Sheet
73	Income & Expenditure
74	Receipts & Payments
76	Schedules
94	Auditor's Report



...We walk together, we move together,
we think together, we resolve together and
together we take this country forward...

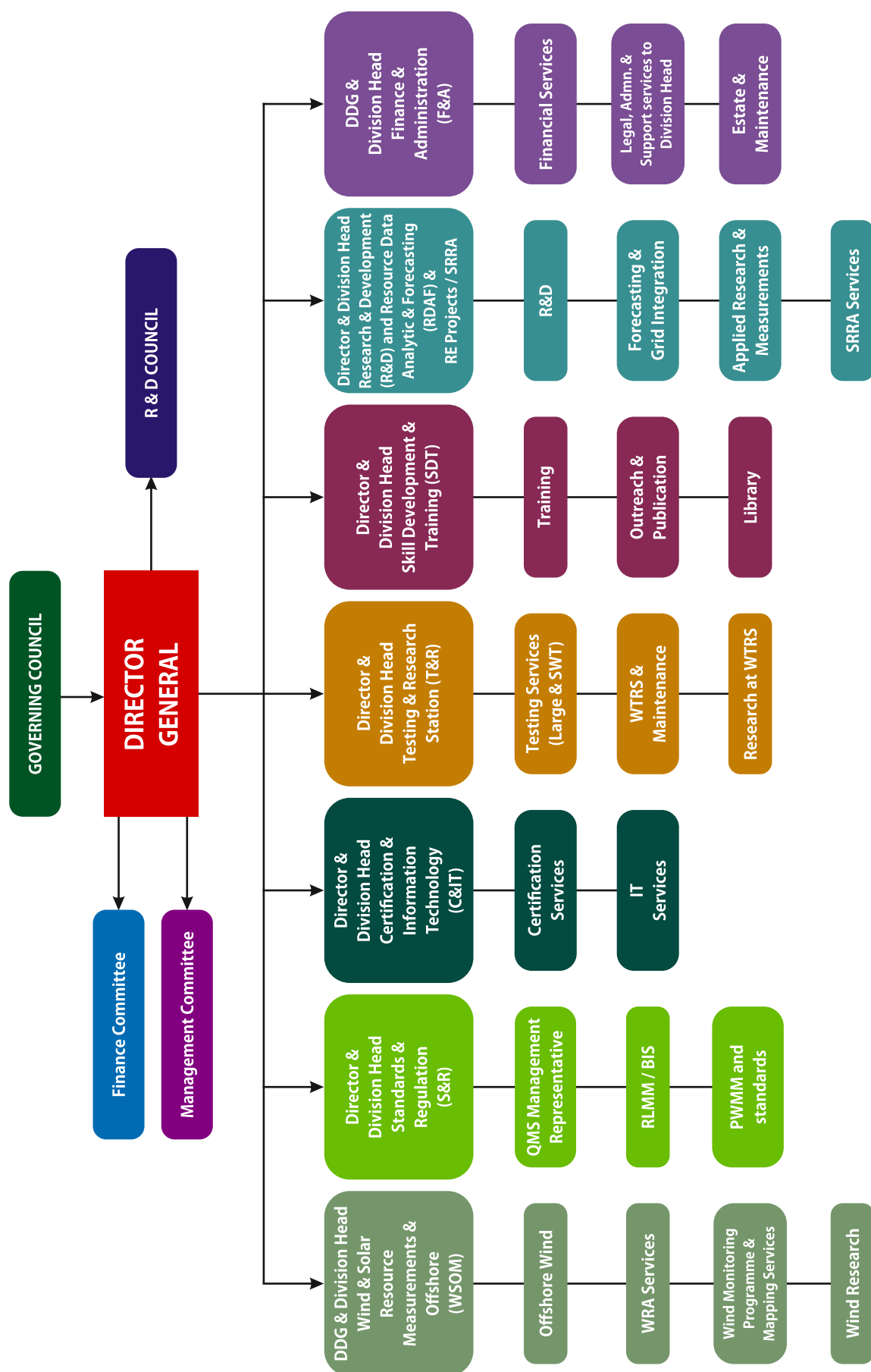
- Hon'ble PM Shri. Narendra Modi

PREAMBLE

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

...India's energy future has four pillars -
Energy access,
Energy efficiency,
Energy sustainability &
Energy security...

- Hon'ble PM Shri. Narendra Modi



From the Director General's Desk



Dr. K. Balaraman

Wind and solar generation has become integral part of energy mix in many countries including India. Both these resources have become grid parity with the technological innovation. The costs of electricity from onshore wind are already competitive at the lower end of the fossil fuel cost range and are even undercutting new fossil fuel-fired power generation costs in many cases. With rapid cost declines in solar PV in recent years and the complementary nature of these two technologies and resource availability over different seasons of a year would yield a very lowest cost of energy. Indian Government has taken many initiatives in scaling up of the renewable energy and NIWE is committed to be significant part of this initiative and strive to fulfil the needs of the country in coming years.

National Institute of Wind Energy (NIWE) has been mandated for resource assessment of both wind and solar. Resource data analytics and forecasting of wind and solar generation has taken up to the next level with MAPE of less than 10% during this year. The other initiative of testing of large and small wind turbines, development of standards in wind energy, certification and skill development is being continued. The continued growth of NIWE is possible only with the continued co-operation and support of MNRE and wind industry and I express my sincere gratitude for the same.

Truly, this is quite a rejuvenating experience to design and go through the contents of the Annual Report of NIWE as it bears the critical landmark events and spectacular niche leads to various wind-related activities and projects. During the reporting period, untiring efforts of NIWE team yielded many projects and its successful implementation. I take this opportunity to acknowledge the efforts and contributions of the entire NIWE team that has given life and substance to this report. Many activities benefiting the wind and solar industry (BSRN, International Training, ISA) have been taken up during the period including international research and consultancy projects.

I would like to convey my heartfelt thanks to the scientists, engineers, administrative and support staff for their determined efforts, wholehearted involvement and the teamwork that kept the institute live and a place most desirable to work.

I am personally delighted and proud indeed in the capacity of Director General, NIWE and as the torch-bearing leader of this Institute to present you with great happiness and privilege the Annual Report of NIWE for the year 2019-20.

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.

PRESIDENT OF THE SOCIETY & CHAIRMAN**Anand Kumar, I.A.S.,**Secretary, MNRE, New Delhi (44th & 45th GC)**MEMBERS****Praveen Garg, I.A.S.,**Additional Secretary and Financial Adviser, MNRE, New Delhi (44th GC)**Vimalendra Anand Patwardhan, I.A. & A.S.,**Joint Secretary & Financial Adviser, MNRE, New Delhi (45th GC)**Bhanu Pratap Yadav, I.A. & A.S.,**Joint Secretary (Wind Energy), MNRE, New Delhi (44th & 45th GC)**Praveen Kumar, I.A.S.,**

Chairman & Managing Director

Indian Renewable Energy Development Agency Limited, New Delhi (44th & 45th GC)**Mohamad Nasimuddin, I.A.S.,**Principal Secretary to Government, Energy Department, Government of Tamil Nadu (44th GC)**A. Karthik, I.A.S.,**

Principal Secretary to Government (Incharge)

Energy Department, Government of Tamil Nadu (45th GC)**Pankaj Joshi, I.A.S.,**Principal Secretary, Energy & Petrochemicals Dept. Government of Gujarat (44th GC)**Sunaina Tomar, I.A.S.,**Principal Secretary, Energy & Petrochemicals Dept., Gujarat (45th GC)**S.K. Soonee**

Advisor & Former CEO, Power System Operation Corporation Limited, New Delhi

Chairman, R&D Council, NIWE (44th GC)**Jitendra J Jadhav**Director, National Aerospace Laboratories, Bangalore (45th GC)**Dr. Raj Kumar**Dy. Director EPSA, Space Application Centre ISRO, Ahmedabad (44th & 45th GC)**Prof. Nagesh R. Iyer**Expert, (former Director CSIR-SERC), Chennai (44th & 45th GC)**Sunil Jain**Chairman, Wind Energy Independent Power Producers Association, New Delhi (WIPPA) (44th & 45th GC)**Tulsi R Tanti**Chairman, Indian Wind Turbine Manufacturers Association, New Delhi (44th & 45th GC)**MEMBER SECRETARY****Dr. K. Balaraman**Director General, NIWE, Chennai (44th & 45th GC)

Finance Committee

Chairman

Additional Secretary / Joint Secretary and Financial Adviser
MNRE, New Delhi

Members

Joint Secretary (WE)
MNRE, New Delhi

Principal Secretary to Govt.
Energy Department, Government of Tamil Nadu, Chennai

Director General
NIWE, Chennai

Director (Wind)
MNRE, New Delhi

Deputy Secretary [IFD]
MNRE, New Delhi

Member Secretary

Deputy Director General (Administration & Finance)
NIWE, Chennai

Research & Development Council

Chairman

Director

CSIR-National Aerospace Laboratories, Bangalore

Members

Joint Secretary (WE)

Ministry of New and Renewable Energy, New Delhi

Director (Wind)

Ministry of New and Renewable Energy, New Delhi

Dr. Sanjay Bajpai

Advisor / Scientist 'G', Head, Technology Mission Division

Department of Science & Technology, New Delhi

Nominee from CSIR

Wind Engineering Laboratory

Structural Engineering Research Centre (SERC), Chennai

Prof. Dr. Rangan Banerjee

Head of the Department, Department of Energy Science and Engineering

IIT Bombay, Mumbai

Dr. M.A. Atmanand

Director, National Institute of Ocean Technology, Chennai

Nominee

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

Dr. K. Balaraman

Director General, NIWE, Chennai

Member Secretary

K. Boopathi

Director & Division Head, R&D, RDAF & SRRA, NIWE, Chennai

Prototype Wind Turbine Models Committee

Chairman

Dr. K. Balaraman, Director General, NIWE

Members

N. Rajkumar, Joint Director, CPRI, Bangalore

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

N. Nallarasana, Senior GM (SO), NLDC, New Delhi

Member Secretary

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

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

Anuradha Babu, Executive Staff Officer, NIWE

G. Arivukkodi, Assistant. Executive Engineer, NIWE

Member Secretary

B. Muthulakshmi, Executive Secretary, NIWE

Hindi Promotion Committee

Chairman

Dr. K. Balaraman, Director General, NIWE

Members

Dr. Rajesh Katyal, Deputy Director General & Head, WSOM, NIWE

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

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

Member Secretary

D. Lakshmanan, Deputy Director General, F&A, NIWE

TECHNOLOGICAL HIGHLIGHTS

- **Wind Resource Assessment**
- **Solar Radiation Resource Assessment**
- **Standards and Regulation**
- **Wind Turbine Testing & Research Station**
- **Certification of Wind Turbines**
- **Wind-Solar Power Forecasting Service**
- **Projects and Consultancy Service**
- **Research and Development**

...The power and energy sectors are the biggest constituents of the infrastructure sector. If you ignore them, no development will happen...

- Hon'ble PM Shri. Narendra Modi



Wind Resource Assessment

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 data generated from all parts of the country are consolidated for the preparation of the National wind resource atlas at various hub heights. Apart from this, all wind resource-related studies on-shore and off-shore using other techniques like models and satellite information are also used for the exploration of wind profile. NIWE is involved in activities related to the development of offshore wind power projects in the country by using the latest and advanced technologies currently available in the world.

During the year, ground measurements of wind & solar were continued covering uncovered / new areas of the country. As on 31.03.2020, 106 wind monitoring stations are operational at 12 States under various wind monitoring projects funded by the Ministry of New and Renewable Energy.

I. Onshore

(a) Wind Resource Assessment Studies in Uncovered / New areas

During the year, 13 Nos. of dedicated wind monitoring stations of heights 50 m & 100 m were established in the State of Gujarat, West Bengal, Tripura, and Manipur and the details are given in Table-1.

Table-1 : List of WMS at 50 m & 100 m level of heights

Sl. No.	State	Height of Wind Monitoring Station	No. of Wind Monitoring Stations installed
1.	Gujarat	100 m	9
2.	West Bengal	100 m	2
3.	Manipur	50 m	1
4.	Tripura	50 m	1
Total			13

(b) Wind Resource Assessment Studies using existing Telecom Towers

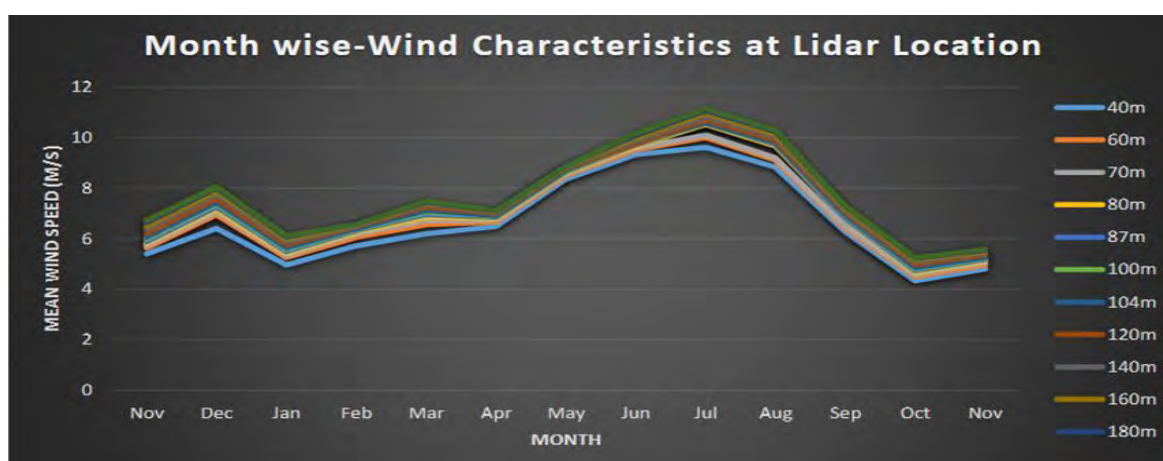
During the year, 43 Nos. of telecom towers in the NE region were mounted with sophisticated wind sensors & data loggers for collecting the wind data and the details are furnished in Table-2.

Table-2 : List of WRA studies of existing Telecom Tower in NE region

Sl.No.	State	No. of Telecom towers installed with wind sensors
1.	Assam	33
2.	Manipur	9
3.	Tripura	1
Total		43

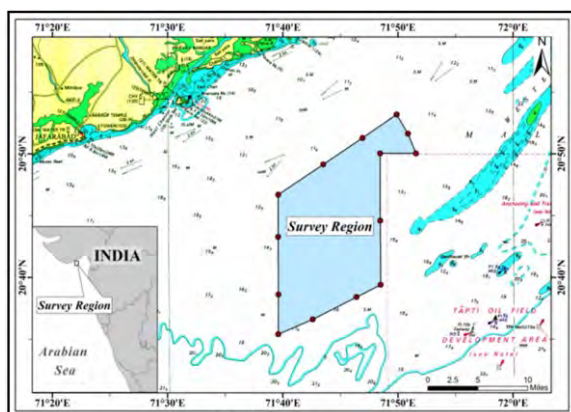
II. Offshore wind power development activities**Offshore measurements off Gujarat coast**

During the year, the measurement campaign at Gulf of Khambhat off Gujarat coast continued and the LiDAR based measurements for 2 year was completed, the raw data files (time series) of LiDAR measurement were uploaded in NIWE website for the benefit of stakeholders (https://niwe.res.in/departmentsom_lidar_raw_data.php).

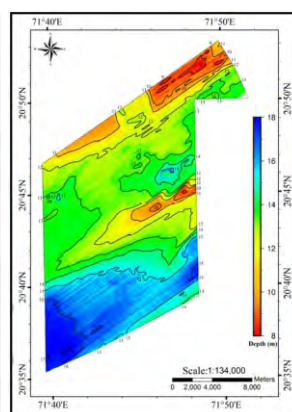


Geophysical investigation at Gulf of Khambhat off Gujarat coast

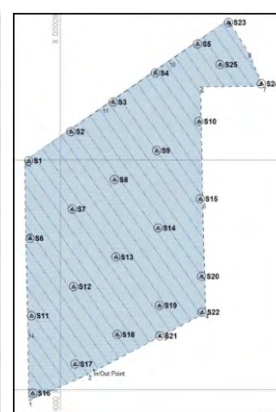
Onsite Geophysical investigation (single beam bathymetry survey, side-scan sonar, sub-bottom profiling, magnetometer survey, and sediment samples) covering the entire area (302 sq.km by NIOT + 67 sq.km by FOWPI) for the 1GW offshore project at Gulf of Khambhat off Gujarat Coast was completed and the preparation of the final report is under progress. The survey will help in ascertaining the nature of subsurface and soil profile available at recommended depths for the design of the foundation of offshore structures.



Geo-physical Investigation proposed area

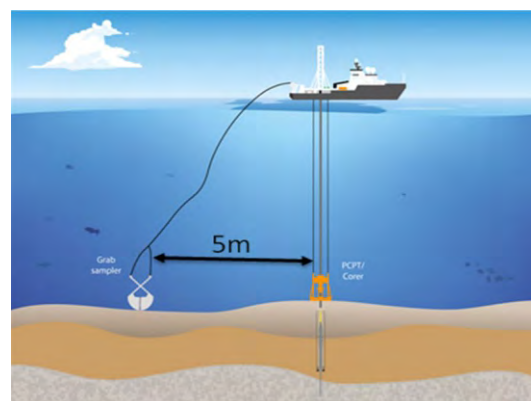


Grab sampling locations

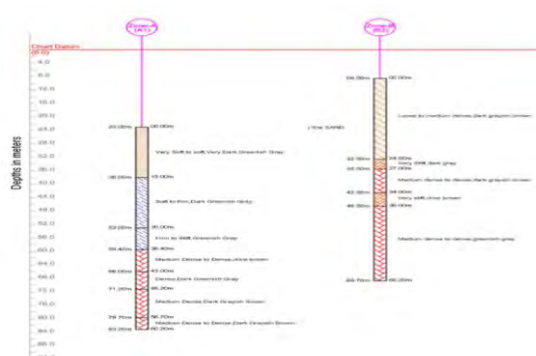


Bathymetry map

Based on the Geophysical investigation results, the recommended 5 No. of bore-hole locations for geotechnical studies were finalized. During the year, NIWE had completed the Geo-technical work which covers cone penetration test / borehole studies in the proposed 1GW offshore wind farm area at Gulf of Khambhat off the Gujarat coast.



Pictorial representation of Geotechnical investigation



Soil profile of Geo-technical Investigation carried out locations at Gulf of Khambhat off Gujarat Coast

Soil samples collected during field investigation and onboard lab tests



Ecologically sensitive habitats



Coastal region near the proposed cablelanding location

Rapid Environmental Impact Assessment for 1 GW offshore wind farm project at Gulf of Khambhat off Gujarat coast

During the year, NIWE along with the National Institute of Oceanography (NIO), Goa had successfully completed the rapid EIA work for 1 GW offshore wind farm project at Gulf of Khambhat off the Gujarat Coast and the final report is submitted to the MNRE.



Solar Radiation Resource Assessment

The Solar Radiation Resource Assessment project was started in the year 2011 as a mission mode project fully funded by MNRE. The project was taken up in two phases, 51 Solar Radiation Resource Assessment (SRRA) stations were established in phase-I in 2011 and 60 SRRA stations along with four Advanced Measurement Stations (AMS) were established in phase-II in 2014. All these 115 SRRA stations are fully automatic, grid-independent, and record one-second data and after integration transmit one-minute data to the central server by GPRS. All stations measure GHI, DHI & DNI, and weather parameters such as temperature, humidity, pressure, rainfall, wind speed, and wind direction and also a host of other derived parameters. Data received is quality controlled using BSRN protocol and QC data is made available to different stakeholders. AMS stations are part of the BSRN Global Network, and the data is shared among member countries for climate change activities. At present, BSRN global network covers 64 stations in contrasting climate zones (latitude of 800N to 900S) and measures solar & atmospheric radiation with instruments of the highest available accuracy and with high time resolution (1 to 3 minutes). India is among the few selected countries to provide the live data for the world climate research program.

The detailed work carried out during the current year includes

- Calibration of 32 Pyranometers & 16 Pyrheliometers and Calibration of 37 Pyranometers & 2 Pyrheliometers were carried out under SRRA and commercial mode respectively.

The Solar Radiation Resource Assessment project was started in the year 2011 as a mission mode project fully funded by MNRE. The project was taken up in two phases, 51 Solar Radiation Resource Assessment (SRRA) stations were established in phase-I in 2011 and 60 SRRA stations along with four Advanced Measurement Stations (AMS) were established in phase-II in 2014. All these 115 SRRA stations are fully automatic, grid-independent, and record one-second data and after integration transmit one-minute data to the central server by GPRS. All stations measure GHI, DHI & DNI, and weather parameters such as temperature, humidity, pressure, rainfall, wind speed, and wind direction and also a host of other derived parameters. Data received is quality



NISE SRRA Stations, Murthal

controlled using BSRN protocol and QC data is made available to different stakeholders. AMS stations are part of the BSRN Global Network, and the data is shared among member countries for climate change activities. At present, BSRN global network covers 64 stations in contrasting climate zones (latitude of 800N to 900S) and measures solar & atmospheric radiation with instruments of the highest available accuracy and with high time resolution (1 to 3 minutes). India is among the few selected countries to provide the live data for the world climate research program.



Projects and Consultancy Services

Project and consultancy services are the critical aspects of capacity building of the team and revenue generation. In this regard, NIWE has taken greater stride in meeting customer expectation and continued its growth. In the last three years, NIWE is in the receipt of over Rs. 58.00 crores with average growth rate of 20% income generation from projects and consultancy services & also from other sources.

A brief highlights of projects undertaken in this period are summarized below :

RIO-SECO Wind Farm, Cuba

NIWE has taken first of its kind international project for preparation of a detailed project report for the establishment of a 50 MW wind farm project from M/s Energoimport at Rio-Seco Cuba and the project is proposed to be financed under the line of credit by the Government of India. As per the agreement, NIWE would carry out evaluation of the wind resource and investigation of the site, preparation of the report on the wind characteristics of the region / site, visit the nearby wind farm, in the region/site to gather data on the field's performance, Design, and Engineering of the wind farm layout and Economic analysis. During the year, as a part of project



Preparation of DPR for establishment of a windfarm at Rio-Seco, Cuba

deliverables, NIWE had prepared and submitted the interim report using six month's real-time measurement from the 100 m met mast at Rio-Seco, Holguin province, Cuba successfully.

Establishment of 2 MW Solar PV Power Plant at Indian Institute of Management Trichy: Indian Institute of Management (IIM), Tiruchirapalli has signed an Agreement with NIWE, Chennai on 29.04.2018 to establish 2 MWp Grid Connected Ground Mounted SPV Power Plant in their campus. 2 MWp solar plant will be established using 5280 monocrystalline 375 Wp SPV panels and invertors of 1000 kVA each. Once the project is completed, it is estimated to generate 3412 MWh / year resulting around 80% of their annual energy savings. Overall the project was expected to be completed by April 2020.

Establishment of Solar PV Power Plant at Madurai Kamaraj University, Madurai: Madurai Kamaraj University signed an Agreement with NIWE, Chennai on 29.08.2019 to establish 1 MWp Ground Mounted Grid Connected SPV Power Plant in their campus. 1 MWp solar plant will be established using monocrystalline and other balance of systems. The solar power plant is estimated to generate 14.71 lakh kWh/year, resulting in annual savings of Rs. 76.80 lakhs. The project is likely to be completed during 2020-21.

Establishment of 1 MWp Rooftop Solar PV Power Plant at 530 MLD Chembarambakkam Water Treatment plant under RESCO Model for Metropolitan Water Supply and Sewage Board Corporation Chennai (CMWSSB): Metro Water Supply and Sewage Board Corporation, Chennai has appointed NIWE as Owner's Engineer for establishing 1 MWp Rooftop Solar PV Power Plant at Chembarambakkam 530 MLD Water treatment plant under RESCO Model. This project once implemented, will substantially bring down the utility bills of CMWSSB. The project is likely to be completed during 2020-21.

The other consultancy projects completed during this period are:

- Verification Procedure of Wind Monitoring for 8 sites
- A 100 m wind monitoring station was Installed and Commissioned for a PSU under consultancy mode
- Energy yield assessment
- Validation of Energy yield assessment
- Energy production demonstration test for 3 sites
- Validation of 24 Nos. of private wind monitoring stations registered as per MNRE guidelines



Standards & Regulation

Introduction

The wind energy sector is rapidly growing in India with the increased unit size and larger rotor diameter and has matured over decades and is presently considered as a mainstream source of renewable power generation in many countries. Standards and regulation play an active role to facilitate the orderly growth of the wind energy sector in India. NIWE has been involved in the preparation of Indian Standards on wind turbines and providing technical support to the Bureau of Indian Standards (BIS). NIWE is also facilitating the installation of prototype wind turbine models by the implementation of the MNRE guidelines.

Standards in wind turbines

Bureau of Indian Standards (BIS) is the National Standards Body which issues Indian Standards. A committee viz. Wind Turbines Sectional Committee (ETD 42) was formulated by BIS for the preparation of Indian standards on wind turbines, under the Chairmanship of Director General, NIWE. NIWE, as part of the committee, provides the technical support to BIS in all the standards related works and for the preparation of Indian Standards on wind turbines. Fifteen (15) Indian standards on wind turbines have been finalized so far and during the year seven (7) Indian standards were finalized.

Wind Turbines Sectional Committee (ETD 42) Meeting

During the year, NIWE organized the 10th meeting of Wind Turbines Sectional

Committee (ETD 42) of BIS at NIWE, Chennai on 24.10.2019 under the Chairmanship of DG, NIWE. The committee formulated working groups to review Indian standards under the convenorship of ETD 42 members. NIWE has been facilitating the working groups to carry out their works in the review of draft Indian standards.

IECTC 88 and IECRE meetings

NIWE officials being members of IEC & IECRC had participated in the IEC TC 88 & IECRE WE-OMC meeting held in Pretoria, South Africa, from 6th to 10th May 2019.

The physical meetings of IEC TC 88 and IECRE meetings scheduled from 16th to 20th March 2020 at Chennai, India were cancelled due to COVID 19 outbreak. However, the online meetings were organized by IEC/IECRE and NIWE officials attended the online meetings of IEC TC 88 and IECRE meetings from 16th to 20th March 2020.

Contribution to IEC / IECRE

NIWE provides the technical support to BIS regularly, on the works related to International Electrotechnical Commission (IEC) standards by reviewing various draft IEC standards / documents and also preparation of voting recommendations for those draft IEC standards / documents of IEC TC 88 Committee on a regular basis. During the year, review of various draft standards / documents of IEC has been completed and voting recommendation for the same has been prepared and sent to BIS for further forwarding to IEC.



IEC TC 88 & IECRE meetings held at Pretoria, South Africa

IEC has formulated a separate system for the renewable energy sector viz., “IEC System for Certification to Standards relating to Equipment for use in Renewable Energy Applications (IECRE system)”. Based on the efforts taken by NIWE and MNRE, BIS has already obtained membership for India in IECRE system. NIWE is providing the technical support regularly to the Central Marks Department (CMD) of BIS on IECRE related works. During the year, review of various draft documents of IECRE has been completed and voting recommendations for the same have been prepared and sent the same to BIS for further forwarding to IECRE.

Electrotechnical Division Council (ETDC) Meeting

NIWE officials attended the meeting of the 22nd Electrotechnical Division council (ETDC) on 08.01.2020 at BIS Head Quarters, New Delhi, which was also attended by Chairmen of various Sectional Committee.

Indian Wind Turbine Certification Scheme (IWTCS)

Indian Wind Turbine Certification Scheme (IWTCS) is the first of its kind certification scheme which covers from the concept to decommissioning of wind turbine & plant. NIWE has prepared the documents and submitted to MNRE for Stakeholders consultation and implementation. The scheme covers Management of IWTCS, ITAM & Recommendation for Grid Synchronization of Prototype wind turbine, Wind Turbine Type Certification, Failure Reporting and Evaluation, Safety and Performance Assessment Certification, and Decommissioning of the wind turbines considering the relevant National and International Standards (IS/IEC/IECRE) and guidelines.



Renewable Energy Integration Course in Power System held at Denmark

During the year, NIWE officials participated in a series of various stakeholder meetings on IWTCS, organized by MNRE. Based on the discussions with MNRE and the stakeholders, the draft IWTCS document was revised and sent to MNRE for their concurrence.

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

NIWE, which is the part of RLMM committee, has been providing technical support to MNRE in handling RLMM related works. During the year, a review of documentation has been completed for 29 wind turbine models and the review comments have been submitted to MNRE/RLMM committee. During the year, NIWE officials participated in ten RLMM committee meetings and provided technical support for finalizing the recommendation for issuing the RLMM list.

In order to streamline the process, NIWE has developed the RLMM online web portal. Based on the directives of MNRE, RLMM online portal has been put into operation and is being used by the wind turbine manufacturers for submission of online application and documentation.

Prototype Wind Turbine Models

The amended guidelines document of MNRE dated 02.06.2016 for the installation of prototype wind turbine models in India is being implemented by NIWE. By implementing the guidelines, NIWE facilitates the installation of Prototype wind turbine models in India to carry out the Type Testing for obtaining Type Certificate and also to carry out the developmental works. During the year, the review/verification of documentation of two prototype wind turbine models in



Meeting with Type Certification and Testing Bodies on CEA Regulation

connection with the installation of prototype wind turbines in India as per MNRE guidelines have been completed. During the year, two prototype committee meetings were organized, and NIWE has issued a recommendation letter, in connection with grid synchronization for one prototype wind turbine model with a rated capacity of 750 kW for the purpose of Type testing .

Quality Management System (QMS)

The services offered by NIWE viz., “Provision of type certification, testing and wind resource assessment services related to wind energy” are already certified as per ISO 9001:2015 by DNV GL. During the year, NIWE has successfully undergone the recertification audit of Quality Management System as per ISO 9001:2015 and the revised ISO certificate for NIWE has been issued with the extended validity till 10.08.2022.



Wind Turbine Testing and Research Station

Introduction

Asia's first wind turbine test and research station was established in NIWE's Wind Turbine Test Station (WTTS) near Kayathar in Tamil Nadu. It is also the primary lab for testing wind turbines, as per the National Lab Policy of Govt. of India.

It was established in the year 1998 with the technical assistance of Danish Technical University (earlier Riso National Laboratory), Denmark under the Danish International Development Agency (DANIDA) grant and with financial assistance and guidance from the Ministry of New and Renewable Energy (MNRE), Government of India. The Test Station presently has the following facilities:

- ISO/IEC 17025:2017 accredited Test facility and the only lab under NABL accreditation since the year 2006 for Wind Turbine Testing in India.
- Two test beds to test Large Wind Turbines up to a total capacity of 1650 kW and are expandable.
- Four test beds to test Small wind turbines and test beds are expandable on request.
- Readily available grid connection for each test bed.
- Readily available adjustable reference met masts in front of each test bed for acquiring meteorological data at the hub heights of the test turbines.
- Two control rooms, one for each test bed with state-of-art data acquisition systems.
- Availability of an office cum workshop building at WTTS with support team & facilities to carry out any needed measurement support.

- Availability of sensors and transducers as per the requirements of IEC standards which are stored as per the quality management system procedures.
- Availability of nine nos. of 200 kW Micon, one number each of 600 kW Suzlon, 2000 kW Senvion & 2000 kW Inox make wind turbines for research.
- In-house laboratory for calibration and functionality check-up of instruments.
- In-house laboratory for data warehousing, signal conditioning, equipments design, training calibration, etc.

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

- Power Performance Measurement
- Yaw efficiency test
- Safety and functional test
- Load measurements
- User-defined measurements in Mechanical Loads, Acoustics & Power Quality

The above mentioned tests are also offered at customer sites if the site meets the requirements of IEC Standards regarding terrain, obstacles, sector for measurements, and wind conditions. The testing facilities are certified as per the requirements of ISO 9001:2015 and accredited as per the requirements of ISO / IEC 17025:2017.

Projects undertaken

During this period the following test services were carried out:

- Power Curve Measurements of Inox 2000 kW WT with 113 rotor diameter at Savarkundla, Amreli District, Gujarat of M/s. Atria Wind Power (Savarkundla) Pvt. Ltd. The measurements were completed as per the signed agreement and the final test report issued to the customer.
- The measurements are on-going for the 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 are on-going for Type Testing of Pioneer 750 kW at Cheliyanallur Village, Manur taluk, Tirunelveli district, Tamil Nadu of M/s. Para Enterprises pvt Ltd.
- Type Testing of 3 MW wind turbine with 145-meter rotor diameter at Vigodi village,



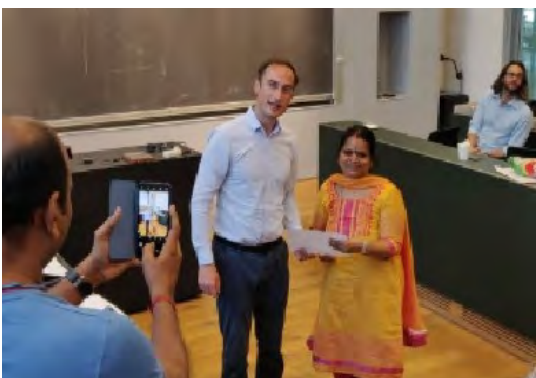
Atria RD113 control room to met mast cable laying – Power Curve Measurements of Inox 2000 kW wind turbine of M/s. Atria Wind Power (Savarkundla) Pvt. Ltd.



Para P57 Blade Load Calibration Test – Type Testing of Para 750 kW wind turbine of M/s. Para Enterprises Pvt Ltd

Taluka - Nakhatrana, District-Kutch, Gujarat of M/s. Inox Wind Ltd. The Site Feasibility Study (SFS) was completed on 19.12.2019 and the offer of Test Turbine awaited.

- Type testing of SM2 (1 kW) at Wind Turbine Research Station, Kayathar, Tuticorin District, Tamil Nadu of M/s. Windstream Energy Technologies India Pvt. Ltd. was completed and the final test report was issued to the customer.
- Type Testing of model Vaata Smart, Vertical Axis WT (5.5 kW) at Wind Turbine Research Station (WTRS), Kayathar of M/s. Vaata Smart Ltd was completed, and the test reports are under preparation.



“Energy Planning and Mapping” arranged by DTU Management Engineering, Denmark under the DFC Scholarship programme (17th June 2019 – 12th July 2019)



Shri Bhukya Ramdas, Shri T. Suresh Kumar & Shri Krishnan attended the course on “Off-Shore Wind Energy” arranged by DTU held from 09th to 22nd September 2019 & from 10th to 24th November 2019 at Denmark

NIWE received its accreditation as per the requirements of ISO/IEC 17025:2017 from NABL for both Electrical and Mechanical parameters (Continuously maintained from the first issue in the year 2006) and is valid from 07.03.2019 to 06.03.2021. NIWE officials undergone special training of GWO Certified Personnel in “Working at Height” & “First Aid” (both theoretical and practical) provided by M/s. Eduforce held on 23rd to 26th April 2019 (first Batch) and 29th April to 02nd May 2019 (second Batch) at WTTs, Kayathar.



Certification of Wind Turbines

Type Certification plays an active role in healthy and orderly growth of wind turbines. Type certificate ensures the structural integrity of a wind turbine under various external conditions (wind and other environmental conditions) and issued to a Wind Turbine Type (Model). The certification division is working to get global recognition for their certification services by its accreditation under ISO/IEC 17065:2012 requirements.

Certification Projects - Pre Evaluation completed in connection with the Type Certification

During the year, NIWE has completed two projects on the Pre-evaluation of documentation in connection with the Type Certification of the wind turbine model as per IS/IEC 61400-22:2010.

Table-3 : List of Pre-Evaluation completed for Type Certification

Sl No.	Manufacturer's Name	Wind Turbine Model / Capacity
1.	M/s. Siemens Gamesa Renewable Power Private Limited	G58-850 kW 50 Hz / 850 kW
2.	M/s. Southern Wind Farms Limited	GWL 225 / 225 kW

Certification - Renewals Completed

NIWE has completed one project on renewal of a certificate of GWL 225 wind turbine model of M/s. Southern Windfarms Limited as per the TAPS-2000 scheme.

Accreditation for Certification Services from NABCB

In order to get global recognition for the certification services NIWE is in the process of obtaining accreditation for the certification services as the ISO/IEC 17065 standard

from the National Accreditation Board for Certification Bodies (NABCB), Quality Council of India. The following major progress made are:

- NIWE submitted the Application along with the requisite documentation to NABCB. NABCB has completed the document review and confirmed that the documentation submitted meets the requirements of ISO/IEC 17065 standard.
- NABCB has visited NIWE for the assessment of competences and to assess the compliance of all the requirements of ISO/IEC 17065 through the process namely Office Assessment.
- As a part of the accreditation process, Certification Engineers of NIWE has carried out manufacturing evaluation at a production plant. The evaluation was assessed and the Witness Assessment (mock) by NABCB was completed successfully by NIWE. Presently, independent technical review by NABCB is ongoing and the accreditation process is expected to be completed shortly.

Certification workshop

A specialized workshop on “Certification of wind turbines for Indian market – Trends, Challenges, and Solutions”, was held on 27th September 2019 at the National Institute of Wind Energy (NIWE), Chennai. The workshop was jointly organized by TÜV Rheinland and the National Institute of Wind Energy (NIWE).



Workshop on “Certification of Wind Turbines for India market – Trends, Challenges and Solutions”



Wind-Solar Power Forecasting Service

NIWE has created a state-of-art in-house developed “Centre for excellence - Variable Generation Forecasting Laboratory” in which, an Indigenous forecast model system has been developed to predict wind & solar power generation up to 7 days-ahead and intra-day revisions to support the integration of wind and solar energy and also to manage the grids efficiently.

As part of the venture, NIWE has developed an in-house Data Management System, indigenous Wind and Solar power forecasting model, monitoring system, web portal, forecast simulation tools, and security system. With these, an operational forecast system was created with simulation tools to predict the wind power up to 7 days ahead. The meteorological input of the NIWE’s indigenous wind and solar power forecasting model is obtained from ISRO-SAC and NCMRWF’s NWP data.

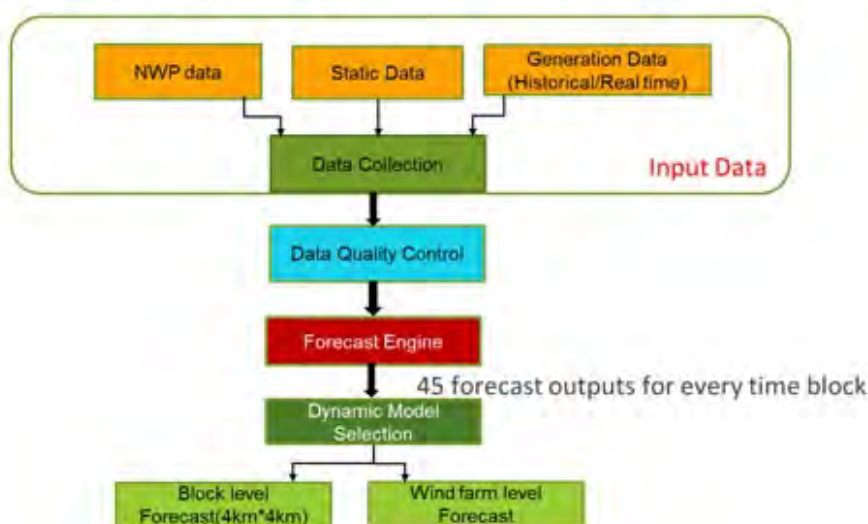
NIWE has signed MoUs with Gujarat, Andhra Pradesh, Karnataka, Maharashtra & SRLDC for providing pilot wind/solar power forecasting services. Currently, NIWE is carrying out various activities to improve/fine-tune the day ahead model from the inputs received during the delivery of pilot operational forecasts to SLDCs.

NIWE is providing VG forecasting services for the whole state of Tamil Nadu on commercial basis to Indian Wind Power Association and pilot forecasting for other RE rich SLDCs as detailed below.

- The pilot operational Wind Power Forecasting services extended for the whole State of Gujarat from April 2019 onwards.

- Initiated the pilot operational Wind Power Forecasting services for the whole State of Karnataka from October 2019 onwards.
- Initiated pilot operational Wind Power Forecasting services for the whole State of Maharashtra from May 2019 onwards.
- Pilot operational Wind Power Forecasting services have been initiated for the whole State of Andhra Pradesh from July 2019 onwards.
- Pilot operational Wind Power Forecasting services extended for the specific solar park P. Kunta from November 2019 onwards.
- Pilot operational Wind Power Forecasting services have been initiated for the specific seven solar parks and one wind farm from December 2018 onwards.
- Aggregated Wind & Solar Power forecasting has been initiated for SRLDC on a Pilot basis.

NIWE Indigenous Forecasting Framework



MoUs signed

- Signed extension of MoU agreement for SRLDC on 9th October 2019.
- Signed extension of MoU agreement for Gujarat on 27th November 2019.
- Signed extension of MoU agreement for Karnataka on 20th December 2019.



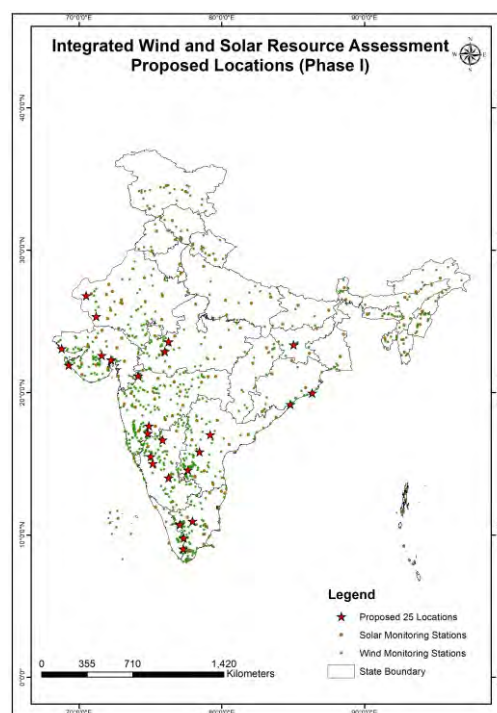
Research & Development

NIWE has undertaken research projects funded by MNRE and international projects along with Denmark Technical University & other partners funded by Danish innovation fund and DST.

I. Research projects under MNRE as part of RDPAC

(a) Integrated wind & solar resource assessment through mapping and measurements

Ministry of New and Renewable Energy (MNRE) with the recommendations of RDPAC, MNRE had sanctioned a project entitled “Integrated wind & solar resource assessment through mapping and measurements” to NIWE, Chennai. The project envisages resource assessment of wind at 120 m & 150 m hub height and enhancing Solar Resource Assessment for hybrid Generation. Under this project, 50 numbers of 100m tall integrated wind-solar monitoring stations (in two phases) with 5 levels of instrumentation are to be installed in the country over a period of three years. Wind resource measurements will also be carried out using SODAR along



Map showing the proposed Wind Solar Monitoring stations

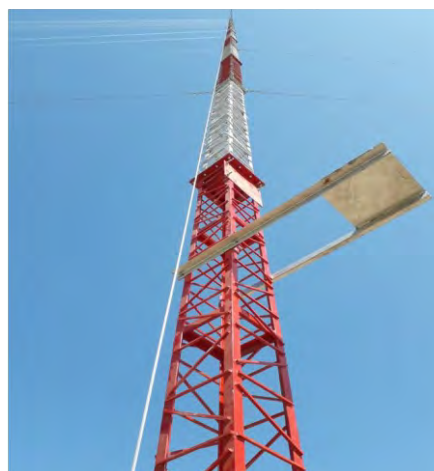
with measurements from integrated wind-solar monitoring stations concurrently for the period of approximately 3 months for the vertical extrapolation of the mast data. The measurements carried out using integrated wind-solar measurements and the SODAR will be used to estimate the wind solar power potential of the country at 150 m level and for the preparation of 150 m wind-solar hybrid Map.

The project team has carried out multi-criteria suitability analysis based on the available data sets and identified 25 Nos. of suitable locations for the installation of integrated measurement stations.

During the year, 16 Nos. of 100 m integrated wind-solar masts were installed at 7 States and the details are in Table-4.

Table -4: 100 m integrated Wind-Solar Masts at 7 states

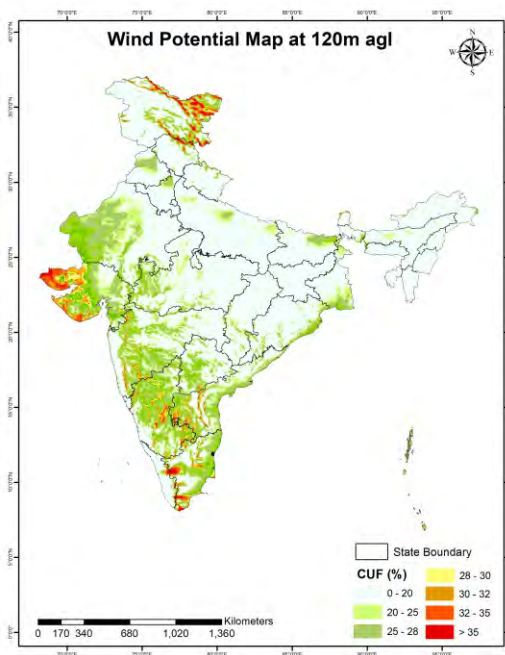
Sl.No.	State	Mast Installed
1.	Gujarat	3
2.	Maharashtra	2
3.	Telangana	1
4.	Andhra Pradesh	2
5.	Karnataka	3
6.	Tamil Nadu	4
7.	Rajasthan	1
Total		16



100 m integrated wind-solar mast installed at Gujarat

120 m Wind Potential Map

The 120 m Wind Potential Atlas is one of the outcomes of the project, and NIWE had published the report on wind potential atlas at 120 m agl in its website for the benefit of various stakeholders. This report is expected to serve as the basis for preliminary site assessment during the prospecting phase of wind project developments in the country, both onshore and offshore. Further, the information will be useful for all stakeholders of the sector including the policy makers, private players, government agencies in their efforts towards achieving the country's ambitious RE goals.

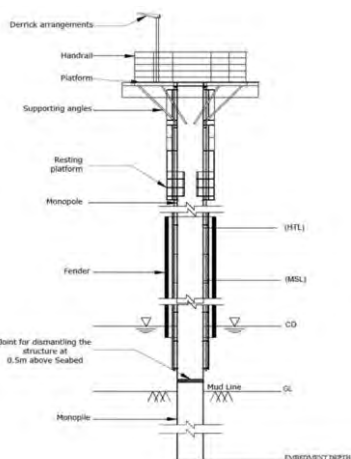


120 m Wind Potential Map

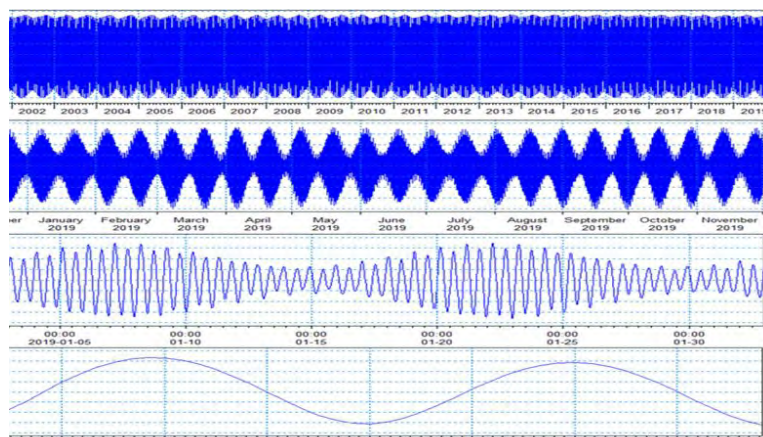
(b) Met-Ocean measurements (Wind, Wave, Tide, Current, Water level, etc) at Gulf of Khambhat and Gulf of Mannar for fostering the growth of offshore wind in the country.

Under this research project NIWE is in the process of exploring the largest seabed areas off Gujarat and Tamil Nadu coasts with an objective to identify the potential subzones / blocks for the promotion of offshore wind farm development in the country. During the year, NIWE has finalized the four (4) LiDAR locations based on multi-criteria analysis at both off the coast of Gujarat & Tamil Nadu and obtained all requisite clearances. For the purpose, 4 Nos. of LiDARs were also procured (2 Nos. for Gujarat and 2 Nos. for Tamil Nadu) to carry out extensive wind resource assessment. Further, the design of offshore sub-structure for wind resource measurement using LiDAR for both the locations at Zone A1 and B2 at Gulf of Khambhat off the Gujarat coast was also completed during the year.

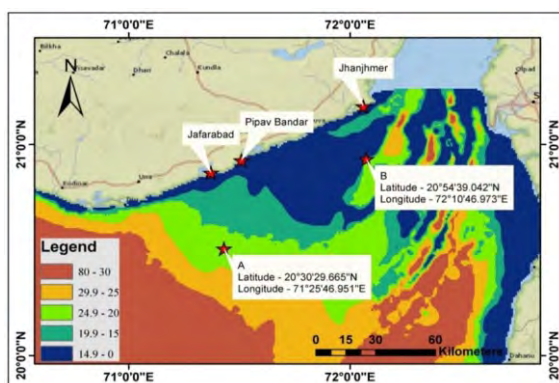
Based on the design, the Monopile diameter for A1 and B2 locations are 2.2 m and 1.4 m respectively, Weight of the Monopile / steel takeoff of A1 and B2 locations would be 220T and 60T.



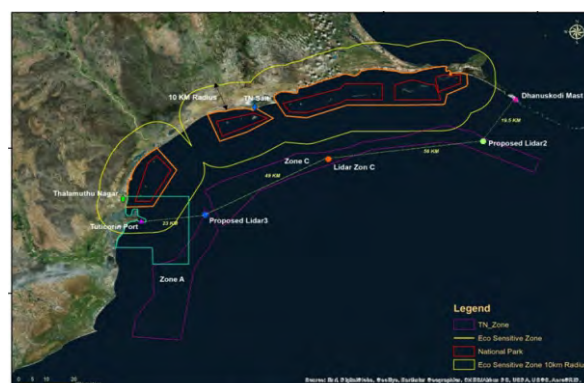
Design of Monopile structure with platform



Wave pattern for B2 LiDAR location



Proposed met-ocean locations in Gulf of Khambhat, Gujarat



Proposed met-ocean locations in Gulf of Mannar, Tamil Nadu

II. Indo Danish project

NIWE had taken up an Indo-Danish Research Project on "Maintenance and Repair Strategy for Wind Energy Development" in collaboration with Denmark Technical University and industrial

partners with a grant of DKK of 4682078. The project envisaged providing the Indian wind energy industry with guidelines and approaches for efficient repair, ensuring the long-term integrity and reliable work of wind turbines.

III. DST DTU (Denmark Technical University) project

During the year, NIWE had taken up an R&D project “Optimized Design and Operation of Hybrid Power Plant (HYBRIDize)” - with three (3) years project duration. The in-house / collaborative R&D proposal was approved by DST & Danish innovation fund. The objective of the project is to provide a framework for the promotion of a large grid connected wind-solar PV hybrid system for optimal and efficient utilization of transmission infrastructure and land, reducing the variability in renewable power generation and achieving better grid stability.

IV. Research project through academic institute

As part of encouraging research among the students and faculties of educational institutions, research projects were initiated with academic institution. A brief overview of projects are given below.

(a) Wind Driven Air Storage System

A compressed air storage system has been developed in association with KCG Engineering College, Chennai. Laboratory level experiments and optimization is in progress. As directed by the 28th R&D council, comments for the erection of the turbine has been requested from PMC member.

(b) Control of Multi-Input Converter for Hybrid Wind Solar Battery Based System by NIT Durgapur:

Real time implementation of the controllers was achieved for the multi input converter. The Results are analyzed and successfully validated in real time environments. Final report compilation and submission is in progress.

(c) Direct Drive Doubly salient permanent magnet machine for Rooftop Wind energy application by IIT Goa:

As per the first milestone deliverables in R&D agreement, a detailed literature review on Axial Flux machines and Radial flux machines was done and their corresponding theoretical analysis is in progress. The respective machine performance analysis with 2-D finite element analysis is also in progress.

(d) A Novel Hybrid Energy System for Supplying Isolated loads with FPGA based Energy Management Scheme.

National Institute of Technology (NIT), Tiruchirappalli, has completed the design and development of a microgrid system, based on hybrid renewable energy sources for stable remote power supply. The developed integrated system consisted of 3 kW DFIG, 3 kW SCIG, and

2 kW SPV panel interfaced with the rotor of the DFIG. The D-STATCOM was powered by the PV system for reactive power compensation and a fraction of active power to the microgrid. As per the sanction order, the PI has completed the prototype development and laboratory level experiments along with 5 research publications in the refereed journals.

(e) Health / condition monitoring at experimental / R&D wind farm at Kayathar on 2MW wind turbine.

The health / condition monitoring system has been designed for the drive train and blades on the 2 MW experimental / research wind turbine at Wind Turbine Research Station, Kayathar facility in association with Design Desk of India. Condition detection algorithm was developed using different techniques to identify or predict the component's early failure, thereby establishing preventive maintenance of the wind turbine.

Research Council of NIWE

NIWE convened the twenty-eighth meeting of its R&D council on 10.02.2020 under the chairmanship of Shri Jitendra J Jadhav, Director, CSIR-National Aerospace Laboratories, Bangalore.

The following eight R&D proposals were placed and approved/recommended for further consideration by the committee.

- Exploring the possibilities of repowering of wind farms in Tamil Nadu and Gujarat through a pilot study
- Establishment of national test facility to carry out static and fatigue tests of wind turbine blades up to 120 m
- Establishment of centre for excellence in solar power forecasting
- Development of a prototype controller to control different OEM WEG SCADA
- Centre for excellence in wind power forecasting
- Establishment of the centre for excellence in resource data analytic
- Establishment of predictive maintenance system with real-time monitoring and control of smart wind farm
- Development of an efficient hybrid prediction tool for medium-term and long-term wind speed forecasting

Research projects in pipe-line

(a) Establishment of smart Re-micro grid with Integrated Resource and Building Management System (IRBM) at National Institute of Wind Energy, Chennai

The project will provide a platform to undertake various Research and development studies such as RE sources effective utilization and integration, Microgrid Energy Management, Performance and stability Analysis, load Forecasting, Grid integration, Power quality issues,

Management of Micro Grids using smart IOT technologies, the study of power flow in a microgrid, Energy Accounting and Measurements, which improves energy security and a better understanding of smart Microgrid. To meet the installed load capacity of 383 kW and daily demand of 1500 kWh, it is proposed to build a 300 kW Solar PV plant together with 50 kW and adequate Battery Energy Storage Systems.

- Existing and additional Load Analysis of NIWE campus is completed.
- Existing RE generation analysis is completed.
- The design engineering calculation for the sizing of solar and wind requirements to meet out the demand for NIWE campus is completed.
- Land requirement and spacing criteria assessment has been carried out.
- Layout diagram of the project has been completed.
- BESS design criteria and load growth model.
- Preparation of Technical Specification report for 300 kW Microgrid System is completed
- Preparation of Technical Specification report for 100 kW Microgrid System is completed
- 100 kW on-grid Micro system intend has been prepared and approved
- An Expert Committee has been formulated to finalize the specification for installation of 100 kW Solar PV panel in NIWE and to monitor the project

(b) IoT Based Smart wind farm to enable the real-time remote monitoring and control

- Technical specification has been prepared. EOI will be floated for the sensors and Intelligent electronic device (IED) instrumentation as per the design and the requirement of NIWE is in progress.
- Design document framework (Rev.0) has been completed
- IoT communication hardware module has been procured and tested with the 200 kW WTG control system at NIWE lab is in progress.
- A prototype for data acquisition has been developed.
- Dashboard for remote monitoring has been developed.
- The real-time remote monitoring and control system is tested successfully at WTRS Kayathar for 200 kW Micon Machine.
- Implementation of real-time monitoring for all Wind turbines at WTRS Kayathar is under process.

(c) Development of Long-term Wind Speed Forecasting using Hybrid Model

- Literature survey on long term data collection is in progress
- Developing a script to automatically extract and download long term data is in progress.

- Pre-processing of data along with visualization dashboard
- Prepared review paper based on the literature survey report and submitted it to the Springer conference.
- Comparative analysis of existing wind speed forecasting models and their performance evaluation
- Establishment of big data frame work and development of visualisation tool is in progress

PAN India research meet and Brainstorming of R&D initiative

As per the Research council guidelines, NIWE has initiated a sustained discussion with various Industry and premier Academia groups to identify R&D areas and to create the hub of synergy for all wind-related research in India. In order to establish this amalgamation and to step forward for a good number of collaborative R&D funded projects, NIWE has organized 2nd PAN India Research Network meet at MNIT campus, Jaipur on 6th January 2020.

In addition, R&D Brainstorming meeting has been conducted on “R&D and Design & Development of Wind Turbine” on 24.06.2019 at NIWE, Chennai concerning the various challenges faced by the wind sectors such as components being outsourced and replications of it in the costing, capacity building facilitation. The formation of the steering committee has been discussed, the committee members would have passionate experts from the various domains in the research and development area.



Inaugural session of 2nd PAN India Research Network meet at MNIT campus, Jaipur



Brainstorming meeting on 24.06.2019 at NIWE, Chennai

The steering committee would address the thrust areas listed out by the expert pool committee, define a clear framework that would include a clear objective, structure and outcome, decide if the project could be taken up as an in-house R&D project by sharing the best practices to be adopted.

The steering committee would put up the project proposal in front of the RC council of NIWE in consultation with academicians in their expertise field. They would get the opportunity to apply for MNRE/DST funding. In this way, the common issues could be streamlined through this channel and the academicians would get opportunity to take up these research areas in Masters and Ph.D.

Further the activities to promote research undertaken by NIWE are

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.

Table-5 : List of collections at Prof. Annamani information centre

Description	Quantity
Book	2129
Standards (ISO, IEC & IS, NABL)	350
Technical reports	347
Conference proceedings	425

Description	Quantity
Annual reports	160
Manuals	33
Digital resources	208
Periodicals (Journals & Magazines)	48
Newspapers	11
Industrial / Institutional Membership	03
e-Journals	25

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

Student internship & final year project

To encourage students to choose renewable energy as their career option, NIWE is 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. An internal committee has been constituted for scrutiny and review of the applications.

During the year 2019-20, One hundred and fifty-five (155) graduate & postgraduate students / faculties have completed their internship / project work and nine (9) graduate and post-graduate students are presently pursuing Internship and project work at NIWE in the field of renewable energy mentored by various subject matter experts.

SKILL DEVELOPMENT & OUTREACH

- Training
- Events
- Awards and Achievements
- Papers & Publications
- Deputation Abroad
- Visitors

...About 800 million people in India are below the age of 35 years. Their aspirations, energy, enterprise and skills will be the force for India's economic transformation...

- Hon'ble PM Shri. Narendra Modi



Skill Development and Training

One of the prime activities of NIWE is to conduct training courses for National and International participants. NIWE has so far conducted 32 National and 40 International Training courses and trained 1399 National and 855 International participants from 98 countries.

During the year 2019-20, seven training courses (one National and six International training courses) were conducted. Lectures were delivered by experienced faculties, Scientist and expert drawn from NIWE, academics, and other wind energy professionals. As part of the training course, a Course Material Book (compilation of write-ups of all the presentations/lectures) is prepared and provided to all the participants as ready reference material for reference during and after the training course.

National Training Course

24th National Training Course

NIWE had conducted the 24th National Training Course on “Wind Resource Assessment” from 10th to 14th February 2020. The course was attended by 13 participants from six States (Gujarat, Karnataka, Madhya Pradesh, Maharashtra, Tamil Nadu and Uttar Pradesh).

As part of the training, the practical training at the field and laboratories was arranged for site selection, mast installation and instrumentation of sensors, collection of data and its validation, processing, analysis, and reporting.



DG, NIWE inaugurating the 24th National Training Course Demonstration of Wind Resource Assessment equipment

The Renewable Energy facilities available in the NIWE Campus were also showcased to the participants for practical exposure, wherein they had an opportunity of understanding the Wind Resource Assessment set up and how the Hybrid System works, etc.

Mr. Roberto Alfonso Zapata Quiroz, Secretariat of Energy, Honduras was the Guest of Honour for Valedictory Function, and he had distributed the Course Certificates to all the participants after his valedictory address.



Course Certificate distribution

International Training Courses

24th International Training Course

NIWE has conducted the 24th International Training Course on "Wind Turbine Technology and Applications" from 23rd October to 19th November 2019, sponsored by the Ministry of External Affairs (MEA), Government of India under ITEC program. The course addressed all aspects of Wind Power starting from basic of wind generation and its technology, Wind resource assessment, installation and commissioning, operation and maintenance aspects of wind farms in a focused manner along with financial and policy aspects. The course was attended by 28 participants from 18 ITEC countries.

During the 28 days' course, 41



Participants at M/s. Suzlon SCADA Centre, Thattapparai

classroom lectures and 7 practical sessions at different laboratories were held apart from study visits to wind farm and wind turbine manufacturing factory. The course content of the training was handled by experts, faculties, scientists, engineers of NIWE, wind turbine manufacturers, and academicians. The participants were taken to the



Participant climbing up Met mast
at Wind Turbine Research Station, Kayathar

Wind Turbine Test Station and Wind Turbine Research Station at Kayathar, where they got exposure on small and large wind turbine testing process apart from visiting wind farms in and around Kanyakumari and Thenkasi, where wind turbines are installed in large numbers in different capacity, make and models.

4th Special International Training Course on Wind Resources

NIWE had conducted the 4th Special International Training Course on "Wind Resource Assessment and Wind Farm Planning" from 28th August to 20th September 2019. This is a special training course for ITEC partner countries sponsored by the Ministry of External Affairs (MEA), Government of India under ITEC program. The course was attended by 16 participants from nine countries.



Participants at Wind – Solar Hybrid System at WTTTS, Kayathar

The course started with a briefing about Wind Turbine Technology aspects and detailed deliberation on various characteristics of wind resource assessment, wind resource assessment techniques, site selection for wind monitoring stations (WMS), installation, instrumentation, and commissioning of WMS, met mast, and modern measurement techniques including measurement using remote sensing instruments (SODAR & LiDAR), data collection, analytics and processing, software tools used for wind data analysis, design and layout of wind farms, wind resource mapping, forecasting and wind energy production.

As part of the study visit, all the participants were taken to the Wind Turbine Test Station (WTTS) / Wind Turbine Research Station (WTRS) located at Kayathar, apart from visiting Met Mast and operating wind turbines of various models, capacities and makes.

3rd Special International Training Course on Small Wind Turbine

NIWE had conducted the 3rd Special International Training Course on "Design, Installation, and Maintenance of Small Wind Turbine" from 28th August to 24th September 2019, sponsored by the Ministry of External Affairs (MEA), Government of India under ITEC program. The objective of the International Course was designed in such a way that the participants themselves would design the parts/components of the Small Wind Turbines from the low cost and locally available materials, and also construct, install, commission, and erect the turbine to produce power along with operation & maintenance practices. The course was attended by 26 participants from nine different countries.



Glimpse of Hands on Training on Small Wind Turbine making process

During the 28 days' course, sixteen classroom lectures were held apart from practical training, study visits to the wind farm, and Wind Turbine manufacturing factory. The participants had themselves designed the parts/components of the Small Wind Turbines.

7th Special International Training Course

The 7th Special International Training Course on "Wind Turbine Technology and Applications" especially for African countries was conducted by NIWE during 24th October to 21st November 2019, sponsored by the Ministry of External Affairs (MEA), Government of India under India Africa Forum Summit – III (IAFS-III). The course addressed all aspects of wind power starting from introduction to the wind and its technology, wind resource assessment, installation and commissioning, operation and maintenance aspects of wind farms in a focused manner along with financial and policy aspects.



Participants at M/s. Vestas Training Centre, Chennai

Dr. Neena Malhotra, Joint Secretary, E&SA Division, Ministry of External Affairs, Government of India were the Chief Guest for the Valedictory Function and distributed the course certificates to all the participants after the intellectual Valedictory Address.



Dr. Neena Malhotra distributing the Course Certificate

Special International training course

The Special International Training Course on "Solar Resource Assessment and Development of Solar Power Plant" especially for ISA member countries was conducted by NIWE from 27th November to 20th December 2019. This course was sponsored by the Ministry of External Affairs (MEA), Government of India under the ITEC Programme. The Course addressed all aspects of Solar Power starting from introduction to solar and its technology, Solar resource assessment,



Glimpse of Special International training course on "Solar Resource Assessment and Development of Solar Power Plant

Installation, and commissioning, Operation and maintenance aspects of the solar power plant in a focused manner along with financial and policy aspects. The course was attended by 34 participants from 21 countries, Burundi, Cambodia, Cote D'Ivoire, Dominican Republic, Egypt, Eritrea, Ethiopia, Guyana, Kenya, Lebanon, Maldives, Mali, Nigeria, Peru, Sao Tome, Sri Lanka, Sudan, Tanzania, Uganda, Venezuela, and Zambia.

As part of the study tour, all the participants were taken to Thiruvananthapuram to visit the Agency for Nonconventional Energy and Rural Technology (ANERT) to know about the different kind of rural and urban solar projects and also to the southern part of Tamil Nadu to visit Solar Power Pump at Aralvoimozhi, Wind Solar Rooftop System at Rohini Engineering College, Kanyakumari, 75 kW Wind Solar Hybrid Systems and 100 MW Solar Power Plant in and around Kayathar.

25th International Training Course on Wind Turbine Technology

NIWE had conducted the 25th International Training Course on "Wind Turbine Technology and Applications" from 29th January to 25th February 2020, sponsored by the Ministry of External Affairs (MEA), Government of India under ITEC program. The course addressed all aspects of wind power starting from basics of wind power generation and its technology, wind resource assessment, installation and commissioning, 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 29 participants from 18 ITEC countries.



Glimpse on 25th International Training Course

The participants were taken for factory visits to M/s. Siemens Gamesa Renewable Energy Pvt. Ltd., Mamandur, where they had a chance of getting practical knowledge about wind turbine nacelle assembling from the industry experts and also visited the assembling unit.

The participants also attended the live practical sessions on Wind Monitoring Station Installation, Assembling of Sensors, Data collection, and Analysis, and also the Wind Turbine Training System.

The participants were arranged to visit the Wind Turbine Test Station and Wind Turbine Research Station at Kayathar, where they got exposure on small and large wind turbine testing process apart from visiting wind farms in and around Kanyakumari where wind turbines are installed in large numbers with different technology, capacity, make and models.



Events

IREDA-NIWE Awards 2020

The third edition of the IREDA-NIWE Annual Award for Wind Energy 2020 was planned well in advance and the invite for nominations for the following category were announced through NIWE/IREDA websites, advertisement through national daily newspapers and group communications.

The categories for which the nominations received were as follows -

- Best Performing State Nodal Agencies for the Year - 1 No.
- Best Institution of Higher Learning in Wind Energy - 3 Nos.
- Best Research Work in Wind Energy – 12 Nos.

The selection of the awardees for all the three categories of awards was done through an eminent Jury Committee consisting of technocrats from the Wind energy field and Mass media. The awards were supposed to be distributed to awardees on the Foundation Day of NIWE on 21st March 2020 but due to the COVID-19 outbreak the award event has been postponed.

Prof. Dr. Annamani Centenary Celebration

To pay tribute and celebrate the birth centenary of Prof. Dr. Anna Mani, NIWE organized the International Conference on “Wind and Solar Resource Assessment” held on 13th and 14th December 2019 at the National Institute of Ocean Technology (NIOT), Chennai. The conference initiated the amalgamation of national and international countries' thoughts, leaders, engineers, and professionals working in



International Conference on Wind & Solar Resource Assessment

this field. This event made an open platform for the exchange of ideas, learning technical advancement, sharing of experience to step forward to the next paradigm with the following sessions. Overall, more than 150 International and National participants, speakers have participated in the conference.

Vigilance Awareness Week

Vigilance awareness week for the year 2019 was observed in NIWE during 28th October to 02nd November 2019 and all the employees have taken a pledge as instructed by the Central Vigilance Commission.

On the eve of the Vigilance awareness week, an Essay Competition was conducted on 31.10.2019 on the topic - "Integrity – A way of Life"



Swachhta Hi Seva Week

Swachhta Hi Seva Week for the year 2019 was observed in NIWE. Swachhta related activities was carried out by NIWE staff members from 1st June to 15th June 2019.



Constitution Day

Constitution Day was celebrated in NIWE with various activities and all the employees have taken a pledge at the beginning of the celebration. Activities like Essay writing competition, Reading of preamble and Fundamental duties, Distribution of pamphlets to create awareness about the constitution are some of the activities performed during the event.



NIWE staff taking pledge on Constitution Day

Women's Day

On the eve of Women's Day, various events were conducted for all the women employees in NIWE on 07.03.2020.



Welfare and Safety Measures

Fire safety mock drills have been conducted on 12.07.2019 & 18.02.2020 at NIWE for the Fire Safety awareness.

Official Languages Act

NIWE has been an active member of the Town Official Language Implementation Committee, Chennai. The Hindi version of "PAVAN", the Quarterly News Bulletin of NIWE is circulated since January 2006.

Hindi fortnight was celebrated in NIWE from 03.09.2019 to 16.09.2019. Various competitions like Hindi Essay writing, Handwriting, Stenography, Quiz, etc. were conducted and prizes were distributed.

During the year 2019-20, two (2) regular staff members passed Prabodh and three (3) regular staff passed Praveen and two (2) regular staff members passed Pragya Examination, conducted by Hindi Teaching Scheme.

Continuous hindi classes are being conducted at NIWE to improve upon spoken Hindi and also to prepare staff members for appearing in the examinations (Prabodh/Praveen/Pragya) towards the implementation of official language.

International Yoga Day

In consonance with the Gol instructions, International Yoga Day was celebrated in NIWE on 21.06.2019. As a part of the Celebration, Yoga Session was conducted at NIWE. Yoga classes are being conducted in the campus of NIWE twice a week to all the regular members.



International Yoga Day 2019 organised by NIWE



Awards & Achievements

- Received Excellent paper award for the paper "Studying the Renewable Energy Resource Characteristics and Shear factors for plain, complex and coastal sites in India" during ARSSS International Conference held at Pune on 5th May 2019.
- Received "NIWE-Best State-Wide Forecaster" award for forecasting project by Indian Wind Power Association, Chennai.
- Received Certificate of Merit for "Solar Power Forecasting" under Smart Technology Award Category awarded by ISGF innovation awards 2020.





Papers & Publications

1. Rangaraj A.G., Boopathi K. & Balaraman K., “Statistical comparison of Numerical Weather Prediction Models for a typical solar plant during summer”, *Renewable Energy and Green Technology* [23 August 2019].
2. Rajesh Katyal, Krishnan B, Sankara Rao Tamada, “Wind variability and power capacity assessment for the first offshore wind farm project in India”, *Offshore Renewable Energy* [29-30 August 2019].
3. Prasun Kumar, Karthik Ramanathan & Balaraman K., “Day Ahead Solar PV Power forecasting based on a combination of Statistical and Physical modeling utilizing NWP data for solar parks in India”, *Large-Scale Grid Integration of Renewable Energy in India* [05 September 2019].
4. Prasun Kumar, Giridhar G. & Balaraman K., “Formulation of performance of invertors for solar photo voltaic power plants: Indian case study”, *Large-Scale Grid Integration of Renewable Energy in India* [05 September 2019].
5. Prasun Kumar, Karthik Ramanathan & Balaraman K., “Integrated regional solar PV forecasting by hybrid method: case study of Indian study”, *Large-Scale Grid Integration of Renewable Energy in India* [05 September 2019].

6. Rangaraj A.G., Srinath Y., Boopathi K. & Balaraman K., "Validation and bias correction techniques to improve Numerical Weather Prediction wind speed data", *Grid Integration of Renewable Energy* [06 September 2019].
7. Prasun Kumar Das & Giridhar G., "Formulation of Efficiency of Inverters for Solar Photovoltaic Power Plants: Indian Case Study", *PEEIC* [19 October 2019].
8. Lavanya M.C, Boopathi K, "Comparative Analysis of Switching Characteristics of Non-Isolated converters using MOSFET and IGBT", *International Research Journal of Engineering and Technology (IRJET)* [06 (08), 425-431, 2019].
9. Bhukya R, Saravanan S, David Solomon J.C, & Balaraman K., "A New Technique for Wind Turbine Power Curve Incomplete Bin Evaluation", *Advances in Renewable Energy and Sustainable Environment* [85-100, 2020].
10. Boopathi K, Ramasamy S, Kanagavel P., "Repowering opportunity of wind Turbine in the State of Tamilnadu, India: A systematic review", *Juni Khyat* [10 (5), 170-184 et.al. 2020].
11. Pavel Yu Grehev, Aleksey S. Kanagavel P., "New stator construction and simulation of high efficiency wind turbine generators", *IEEE Transaction on Industry Applications* [56 (2), 1-8 et.al. 2020].



Deputation Abroad

S.No.	Name of the Official	Place of Visit	Purpose	Period
1	Dr. K. Balaraman Director General	Pretoria, South Africa	For attending the IEC TC 88 and IECRE meetings conducted by SABS	04.05.2019 to 12.05.2019
		Cuba	For carrying out the preparation of Technical and Economic Feasibility Report for 50 MW Rio Seco Wind Farm in Cuba	17.05.2019 to 30.05.2019
2	Dr. Rajesh Katyal Deputy Director General & Division Head, WSOM	Cuba	For carrying out the preparation of Technical and Economic Feasibility Report for 50 MW Rio Seco Wind Farm in Cuba	17.05.2019 to 02.06.2019
		Copenhagen Denmark	Participated in the Inter- governmental Forum on Offshore Wind Regulation and Policies in connection with the Wind Europe Offshore 2019 conference organized by Danish Energy Agency, Denmark as part of Strategic Sector Cooperation on Offshore wind held	25.11.2019 to 28.11.2019

S.No.	Name of the Official	Place of Visit	Purpose	Period
3	S. A. Mathew Director & Division Head, Certification & IT	Pretoria, South Africa	For attending the IEC TC 88 and IECRE meetings conducted by SABS	06.05.2019 to 10.05.2019
		Germany	Participated in annual experience meeting of Certification body – Wind Turbines and electrical Workshop at M/s TUV, Germany	02.06.2019 to 09.06.2019
4	A. Senthil Kumar Director & Division Head, Standards & Regulation	Pretoria South Africa	For attending the IEC TC 88 and IECRE meetings conducted by SABS	06.05.2019 to 10.05.2019
		Copenhagen Denmark	Participated in the Intergovernmental Forum on Offshore Wind Regulation and Policies in connection with the Wind Europe Offshore 2019 Conference organized by Danish Energy Agency, Denmark as part of Strategic Sector Cooperation on Offshore wind	25.11.2019 to 28.11.2019
5	David Solomon .J.C. Director & Division Head Testing & Research Station	Copenhagen Denmark	Participated in the Intergovernmental Forum on Offshore Wind Regulation and Policies in connection with the Wind Europe Offshore 2019 Conference organized by Danish Energy Agency, Denmark as part of Strategic Sector Cooperation on Offshore wind	25.11.2019 to 28.11.2019
6	Deepa Kurup Additional Director, WSOM	Copenhagen, Denmark	Attended the course “Renewable Energy - Integrated in Power Systems” arranged by DTU Electrical Engineering under DFC Scholarship programme/Danish Ministry of Foreign Affairs	17.06.2019 to 28.06.2019

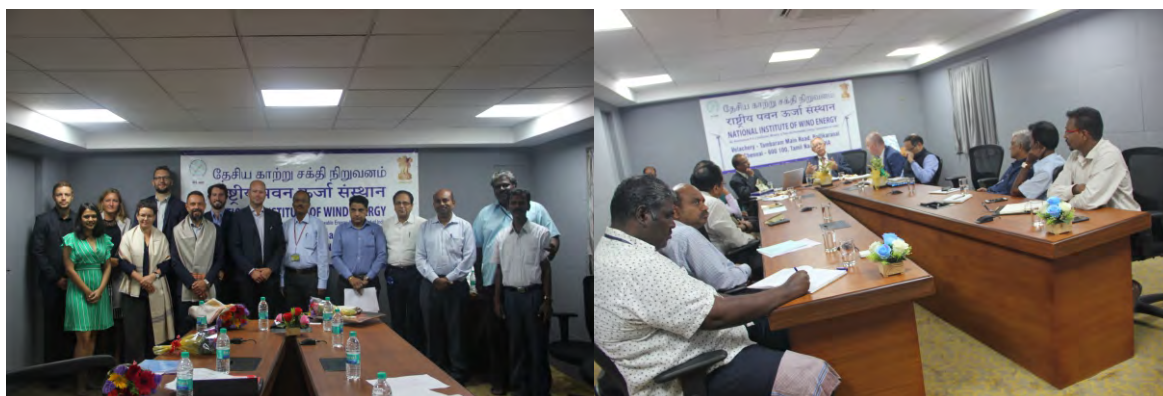
S.No.	Name of the Official	Place of Visit	Purpose	Period
7	N. Rajkumar Additional Director, Testing & Research Station	Copenhagen Denmark	Participated in the Intergovernmental Forum on Offshore Wind Regulation and Policies in connection with the Wind Europe Offshore 2019 Conference organized by Danish Energy Agency, Denmark as part of Strategic Sector Cooperation on Offshore wind	25.11.2019 to 28.11.2019
8	Hari Bhaskaran. A Deputy Director (Technical), WSOM	Netherlands & Denmark	Participated in EU-India Clean energy and Climate partnership (CECP) study tour on Offshore	21.11.2019 to 29.11.2019
9	Bhukya Ramdas Deputy Director (Technical), Testing & Research Station	Denmark	Attended the course "Off-shore Wind Energy" arranged by DTU under DFC Scholarship Programme/Danish Ministry of Foreign Affairs	09.09.2019 to 22.09.2019 & 10.11.2019 to 24.11.2019
10	M. Saravanan Deputy Director (Technical), Standards & Regulation	Denmark	Attended the "Renewable Energy Integration in Power System" arranged by DTU under DFC Scholarship Programme/Danish Ministry of Foreign Affairs	17.06.2019 to 28.06.2019 & 26.08.2019 to 06.09.2019
11	J. Bastin Deputy Director (Technical), WSOM	Denmark	Attended the course "The Balmorel model" arranged by DTU Management Engineering under DFC scholarship programme/Danish Ministry of Foreign Affairs	29.04.2019 to 10.05.2019
12	B. Krishnan Assistant Director (T) WSOM	CUBA	For carrying out the preparation of Technical and Economic Feasibility Report for 50 MW Rio Seco Wind Farm in Cuba	17.05.2019 to 02.06.2019 to
		Denmark	Attended the DFC sponsored Offshore Wind Energy Course at DTU, Roskilde	08.09.2019 TO 21.09.2019 & 09.11.2019 to 24.11.2019

S.No.	Name of the Official	Place of Visit	Purpose	Period
13	S. Arulselvan Assistant Executive Engineer, Certification & IT	Germany	Participated in annual experience meeting of Certification body – Wind Turbines and Electrical Workshop at M/s TUVR, Germany	02.06.2019 to 09.06.2019
		Denmark	Attended the “Energy Planning and Mapping Course” arranged by DTU under DFC Scholarship Programme/Danish Ministry of Foreign Affairs	17.06.2019 to 12.07.2019
14	G. Arivukkodi Assistant Executive Engineer (Technical), Testing & Research Station	Denmark	Attended the “Energy Planning and Mapping Course” arranged by DTU under DFC Scholarship Programme/Danish Ministry of Foreign Affairs	17.06.2019 to 12.07.2019
15	T. Suresh Kumar Assistant Engineer (E&M), Finance & Administration	Denmark	Attended the course “Off-shore Wind Energy” arranged by DTU under DFC Scholarship Programme/Danish Ministry of Foreign Affairs	09.09.2019 to 22.09.2019 & 10.11.2019 to 24.11.2019
16	S. Paramasivan Junior Engineer, Certification & IT	Germany	Participated in annual experience meeting of Certification body – Wind Turbines and Electrical Workshop at M/s TUVR, Germany	02.06.2019 to 09.06.2019
17	Y. Srinath Assistant Director (Technical) R&D, RDAF	Denmark	Attended the course “The Balmorel model” arranged by DTU Management Engineering under DFC scholarship programme/Danish Ministry of Foreign Affairs	29.04.2019 to 10.05.2019



Visitors

- Mr. Safakhan, Oxford Policy Management UK-GIZ project on climate change and energy resources
- Ms. Anitha Pramila, CEO, Danish Business Services (P) Ltd & CTO MHI Vestas offshore wind
- EU Ambassador, Mr. Edwin Koekkock, Councillor, Energy & Climate
- Prof. Heienenmann, University of Oldenburg Germany
- Mr. Stephen Haupt, HOD, Renewable Certification DNU-GL Energy
- Mr. Stephen Skare Enevoldsen, Danish Embassy
- Dr. Hans Peter (IGOR) Wald, MD Overspeed GmBH Germany
- Delegates from the State of Massachusetts, USA visited NIWE and discussed on Test Facility Development (Blade Test Centre) at Wind Energy Test Center (WTTC)
- Dr. Kaushik Das and Dr. Poulsorensen from DTU has been attended Kick Off meeting for the Project "HYBRIDIZE" at NIWE, Chennai
- His Excellency Mr. Hans Jacob Frydenlund, Ambassaor, along with Delegation from Norway
- Mr. Murray Bainbridge, International Trade Expert for Energy, Scottish Development International visited NIWE and discussed of their product on 915



MW of operational Offshore wind including the world's first floating offshore wind farm

- Ms. Tania Friederichs, First Counsellor and Head of Research & Innovation along with Delegation
- Mr. MA Xiaohmi, GM MENA Region
- Prof. Krish Thiagarajan Sharman, Endowed Chair in Energy and Professor, Department of Mechanical and Industrial Engineering, University of Massachusetts Amherst
- Ms. Jennifer Fagan, First Secretary, Trade and Investment and Sh Dinesh Kr Arya, Senior Sector Manager for Energy and team of British High Commission
- Dr. Detlev Heinemann, Head, Energy Meteorology Group, University of Oldenburg, Germany
- Dr. Pierre Pinson, Professor at the Technical University of Denmark (DTU), Department of Electrical Engineering
- Dr. Bernhard Ernst, Fraunhofer Institute for Energy Economics and Energy System Technology

Students Visits

To create awareness and to motivate towards research on wind energy, schools, and college students are encouraged to visit the campus. During the year 2019-20, 425 students have visited through the following visits coordinated by the SDT division.

S.No.	Name of the Institution	No. of Student	Date of Visits
1.	National Productivity Council Aavin Dairy Road, Ambathur, Chennai – 600050	15	04.03.2019
2.	Hiranandani Upscale School, Navallur, Chennai.	33	03.04.2019
3.	National Institute of Technical Teachers Training & Research (NITTTR), Taramani, Chennai	25	19.06.2019
4.	RMK ENGG College, Srikakulam Highway RSM Nagar, Gummidipoondi Taluk Tiruvallur District, Kavaraipettai Tamil Nadu – 601206.	24	26.06.2019
5.	Kings Engineering College Irrangattakotai, Tamil Nadu	35	26.07.2019
6.	Anna University, Guindy, Chennai	52	05.08.2019
7.	Murugappa Polytechnic College Sathyamurthy Nagar, Avadi, Chennai Tamil Nadu- 600062.	67	13.08.2019
8.	PVM School, Balaji Nagar Pallikarani, Chennai	73	21.10.2019
9.	Govt. Higher Secondary School Pallikarani, Chennai	71	21.10.2019
10.	Vellore Institute of Technology, Vellore	30	22.10.2019

SUPPORT SERVICES

- IT Infrastructure
- Finance and Administration
- NIWE's Team

...Lakhs of families in the country are deprived of energy connectivity. Fruits of development will not reach the common man until energy connectivity reaches every last household of the country. In the age of globalization, we have no option but to make a quantum leap in energy production and connectivity...

- Hon'ble PM Shri Narendra Modi



IT Infrastructure

NIWE is developing IT infrastructure to cater to the needs of scientist and other staff members in managing work flow and also spare out in create big data frame work for forecasting resources, data analytics, testing services etc., in this required various initiative were undertaken and are summarized below:

- NIWE Website has been migrated from HTTP to HTTPS to be in line with emerging technologies and security.
- NIWE has established Aadhaar Enabled Biometric and IRIS Attendance System (AEBAS) in NIWE, Chennai campus and WTTS, Kayathar campus.
- NIWE has established state-of-the-art Smart Rack Solution for addressing the Data Centre (DC) Devices at NIWE, Chennai (Primary and Secondary Server room) and Disaster Recovery (DR) at WTTS, Kayathar.
- NIWE has established a new Data Centre (DC) at NIWE, Chennai and Disaster Recovery (DR) at WTTS, Kayathar. All the Software have been migrated from individual Desktops to the DC. The Forecasting project has been configured with required computational capability in the DC.
- NIWE has migrated from standalone endpoints to Zero client based shared IT Infrastructure wherever the computational requirements were basic. NIWE has established File sharing system among the Teams / Divisions / NIWE for effective Data Management and users have been advised to work from the DC.
- NIWE had successfully completed the Vulnerability Assessment and Penetration Testing (VAPT) on RLMM online portal <https://rlmmonline.niwe.res.in> by CERT-IN empanelled Security Auditor. The portal is up and running.

- During the COVID-19 Pandemic NIWE staff has been provided with Secured Virtual Private Network(VPN) to connect to their respective endpoints in order to Work From Home (WFH) as per the approved IT policy.

The IT infrastructure in NIWE has been overhauled completely with an approach of a paradigm shift to enable the Engineers of NIWE to carry services for the wind industry by incorporating the following changes -

- New IT infrastructure such as High Computing Servers, Additional Networks, N-Computing Devices, Work Stations, Laptops and Printers have been procured and installed.
- Active directory has been installed in all the Desktops and Laptops available in NIWE and the IT division facilitates all the devices 24*7 to ensure effective reliability and security.
- All Engineering software have been centralized and installed in server for speedy computing. Access rights are provided based on requirements and information received by various Divisions, which enables seamless access to Scientists & Engineers.
- In order to tackle any unlikely adversity in the NIWE Database and to ensure the safety and security, a Data Centre and Disaster Recovery System has been established at WTTS, Kayathar.
- In order to enhance and streamline the digital usage in NIWE with more transparent and secured way, the IT division has drafted an IT Policy for NIWE and the same is under review by the committee constituted by the competent authority for implementation.

Web portal

NIWE has created the RLMM (Revised List of Models and Manufacturers) portal for which the IT Division has carried out an audit by a CERT-In Approved Security auditor for evaluating the vulnerabilities and has put in place mitigation strategies.

In addition, during the year, the following portals were developed to facilitate various internal activities of NIWE.

- Developed a web portal for the staff work update.
- Developed a web portal for the sports events.
- Developed a web portal for consultancy project management
- Developed a web portal for Internship.
- Developed a web portal for recruitments.
- Developed the web portal for inline data availability for solar and wind monitoring stations.



Finance & Administration

Serving as the artery connecting scientific divisions of this Institute, the activities of F&A 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 upgradations.
- Statutory compliances on EPF, gratuity, contract labour, societies registration, bills of establishment, facility management, activities related to official language, maintenance of vehicle, security and housekeeping.
- 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

Committee for prevention of sexual harassment of women at work place

In accordance with Government instructions, a complaints committee for women for redressal of complaints concerning sexual harassment in the work place has been constituted in NIWE. The committee met at regular intervals and visited all the women employees on the campus.

Reservation of Policy

Members / Representatives

- | | | | |
|----|---------------------------|------|---------|
| 1. | J.C. David Solomon | ---- | OBC |
| | Director & DH, T&R | | |
| 2. | K. Boopathi | ---- | SC / ST |
| | Director & DH, R&D, RDAF | | |

Implementation of Persons with Disabilities Act 1995

The following facilities are being made available to persons with disabilities.

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

Director General's Office

⇒ Dr. K. Balaraman	Director General
⇒ Anuradha Babu	Executive Staff Officer
⇒ P. Chidambaram	Junior Executive Assistant
⇒ A. Mani	Driver

Wind Solar Resource Measurements/Offshore (WSOM)

⇒ Dr. Rajesh Katyal	Deputy Director General
⇒ Deepa Kurup	Additional Director
⇒ A. Haribhaskaran	Deputy Director (Technical)
⇒ J. Bastin	Deputy Director (Technical)
⇒ B. Krishnan	Assistant Director (Technical)
⇒ M.R.Gunasekaran	Executive Secretary-II
⇒ R. Vinod Kumar	Junior Engineer
⇒ Tamada Sankara Rao	Junior Engineer
⇒ B. Senthilkumar	Technician
⇒ M. Nandakumar	Technician

Standards & Regulation

⇒ A. Senthil Kumar	Director
⇒ M. Saravanan	Deputy Director (Technical)

Certification & IT

⇒ S.A. Mathew	Director
⇒ S. Arulselvan	Assistant Executive Engineer
⇒ S. Paramasivan	Assistant Engineer
⇒ C. Stephen Jeremias	Assistant Engineer

Testing & Research Station (T&R)

⇒ J.C. David Solomon	Director
⇒ N. Rajkumar	Additional Director
⇒ Bhukya Ramdas	Deputy Director (Technical)
⇒ G. Arivukkodi	Assistant Executive Engineer
⇒ M. Karuppuchamy	Assistant Executive Engineer
⇒ A.R. Hasan Ali	Assistant Executive Engineer

➤ Y. Packiyaraj	Assistant Executive Engineer
➤ R. Naveen Muthu	Junior Engineer
➤ K.A. Haji Abdul Ibrahim	Record Keeper

R&D and RDAF Division

➤ K. Boopathi	Director
➤ A. G.Rangaraj	Deputy Director (Technical)
➤ M.C. Lavanya	Deputy Director (Technical)
➤ Yelchuri Srinath	Assistant Director (Technical)

Skill Development & Training (SDT) Division

➤ Dr. P. Kanagavel	Director
➤ A. Jaseela Banu	Executive Assistant

Finance & Administration (F&A)

➤ D. Lakshmanan	Dy. Director General (F&A)
➤ R. Girirajan	Assistant Director (F&A)
➤ K. Tamilselvi	Administrative Officer (S&P)
➤ B. Muthulakshmi	Executive Secretary II
➤ T. Sureshkumar	Assistant Engineer (E&M)
➤ V.K. Sreeram	Executive Assistant
➤ R. Sunderesan	Executive Assistant
➤ V. Sarathkumar	Executive Assistant
➤ K. Saranya	Junior Executive Assistant
➤ M. Selvakumar	Record Keeper
➤ M. Malaravan	Transport Co-ordinator

Solar Radiation Resource Assessment

➤ Dr. G. Giridhar	Dy. Director General
-------------------	----------------------



FINANCE REPORT

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

...The focus is on enhancing sustainability,
resilience and improving efficiency...

- Hon'ble PM Shri. Narendra Modi

NATIONAL INSTITUTE OF WIND ENERGY

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

BALANCE SHEET AS AT 31ST MARCH, 2020

(Amount in Rs.)

FUND AND LIABILITIES	Schedule	31st March, 2020	31st March, 2019
CAPITAL ASSET FUND	1	26,75,46,544	23,07,03,992
RESERVES AND SURPLUS	2	44,49,51,924	42,67,59,782
CURRENT LIABILITIES AND PROVISIONS	3	31,05,63,950	29,65,43,319
TOTAL		1,02,30,62,418	95,40,07,093
ASSETS			
FIXED ASSETS			
(a) Created out of Central Governments Grants	4	24,52,98,185	17,88,58,380
(b) Out of Internal Generation Grants		2,22,48,359	5,18,45,612
CURRENT ASSETS, LOANS AND ADVANCES	5	75,55,15,874	72,33,03,101
TOTAL		1,02,30,62,418	95,40,07,093
SIGNIFICANT ACCOUNTING POLICIES	13		
NOTES ON ACCOUNTS	14		

For National Institute of Wind Energy

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

Sd/-
J.C. David Solomon
Division Head
(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, 2020

[illegible]

For National Institute of Wind Energy

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

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

Sd/-
J.C. David Solomon
Division Head, (F&A)

Sd/-
Dr.K.Balaraman
Director General

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

Income & Expenditure

NATIONAL INSTITUTE OF WIND ENERGY

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

RECEIPTS AND PAYMENTS ACCOUNT FOR THE YEAR ENDED 31ST MARCH, 2020

(Amount in Rs.)

RECEIPTS	FY 2019-20	FY 2018-19
I. Opening Balances		
(a) Cheques in hand	-	-
(b) Bank balances	-	-
i) In Current Account	4,57,699	13,57,22,855
ii) In Savings Bank Account	20,04,52,703	13,26,49,730
iii) In Deposit Accounts	42,56,38,667	59,62,50,000
iv) In Deposit Accounts (SRRA)	-	2,00,00,000
iv) Cash in hand	6,735	4,77,672
(c) Stamps in hand	-	-
	62,56,40,406	88,51,00,257
II. Grants Received / Unutilised Grants		
(a) From Government of India for Grant	23,00,00,000	6,56,913
(g) From Government of India for SRRA Project	36,00,000	2,12,07,201
(h) Grants in Aid from DST	39,06,992	-
III. Investments Withdrawn		
IV. Interest Received		
(a) On Bank deposits	2,32,05,879	4,57,42,631
(b) On Bank deposits (SRRA)	-	11,40,565
(c) On Savings A/C	64,45,968	-
V. Other Income		
(a) Fees for services Including Advances	12,73,71,147	15,55,38,037
(b) Fees for services Including Advances (SRRA)	-	-
(c) Income from publications	-	1,04,670
(d) Energy receipts	2,25,09,631	3,42,03,018
(e) Misc. Income	3,63,35,538	2,74,20,560
(f) Misc. Income (including SRRA Income)	-	-
(f) Award Fund - IREDA	3,14,941	9,17,271
(g) SUBSCRIPTION	26,250	-
VI. Amount borrowed		
VII. Any other receipts		
(a) Fees received in advance on CFA	-	-
(b) Fees received in advance on Consultancy projects	2,20,00,000	-
(c) Fees received in advance on Consultancy projects (SRRA)	-	-
(d) Security deposit / Earnest money deposits received	2,69,18,690	15,64,327
(e) TDS to be remitted	73,53,741	-
(f) Expenses/Salary Payable/S.Creditor/Advance	1,84,58,990	-
(g) Receivable from Debtors/other payments/Branch division	31,24,87,187	-
(h) Advances and Deposits-IE	49,08,961	-
(i) Advances and Deposits-Grants	2,43,798	-
(j) Other Liabilities	21,38,894	-
(k) Sundry Creditors	49,68,546	-
(l) Interest Accrued	61,94,765	-
(m) Project Advance	4,026	-
	84,09,34,954	28,84,95,193
TOTAL	1,46,65,75,360	1,17,35,95,449

For National Institute of Wind Energy

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

Sd/-
J.C. David Solomon
Division Head
(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

RECEIPTS AND PAYMENTS ACCOUNT FOR THE YEAR ENDED 31ST MARCH, 2020

(Amount in Rs.)

PAYMENTS	FY 2019-20	FY 2018-19
I. Expenses		
(a) Employee related Expenses	5,74,10,058	6,80,85,634
(b) Administrative Expenses	6,84,63,711	6,47,00,115
II. Payments made against funds for various projects		
Out of CFA		
(a) In house R&D project expenses	3,16,07,840	1,88,55,822
Out of Grants for projects		
(a) From Government of India for Grant	2,09,92,687	5,15,87,554
(b) From Government of India (Met-Ocean Measurement)	5,33,78,123	1,37,305
(c) From Government of India (Integrated Wind & Solar Research Assessment)	1,05,67,401	1,37,366
(d) IREDA Award Fund	-	3,64,853
(e) From Government of India - North East Project	-	64,95,407
(f) From Government of India for SRRA Project	1,68,65,410	2,73,22,831
III. Investment and Deposits made		
IV. Expenditure on Fixed assets & Capital Work-in-Progress		
(a) Purchase of Fixed assets including Advances (Grants)	7,85,80,823	10,98,47,101
(b) Purchase of Fixed assets (Internal Generation)	1,41,448	49,23,952
(c) Purchase of Fixed assets (SRRA)	35,282	7,08,174
V. Refund made during the year		
(a) Balance of Grants-in-aid to Government of India	-	12,45,19,235
(b) Interest Earned	65,52,634	-
VI. Other Payments		
(a) Refund of Security deposits / Performance Guarantee / Earnest money deposit Internal Generation	3,49,20,825	-
(b) Expenditure on Consultancy Projects	8,79,80,266	6,79,01,108
(c) Advance & Deposits from Grants	64,24,536	-
(d) Advance & Deposits from SRRA	7,09,807	-
(e) Advance & Deposits from Internal Generation	1,21,42,368	-
(f) Payment of TDS (Grants)	84,35,113	-
(g) Payment of TDS (Internal Generation)	72,58,335	-
(h) GST remittance	29,15,071	-
(i) Receivable from Debtors/other payments /Branch Division	34,82,52,350	-
VI. Changes in Working Capital	-	22,62,964
VII. Closing Balances		
(a) Cheques in hand	-	-
(b) Bank Balances	-	-
i) In Current Account	93,200	4,57,699
ii) In Savings Bank Account	17,89,52,120	20,05,58,325
iii) In Deposit Accounts	43,38,95,951	42,56,38,666
(c) Cash in hand (NIWE Canteen)	-	6,735
(d) Stamps in hand	-	-
TOTAL	1,46,65,75,360	1,17,35,95,449

For National Institute of Wind Energy

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

Sd/-
J.C. David Solomon
Division Head
(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 2020

(Amount in Rs.)

SCHEDULE 1 - CAPITAL ASSET FUND	CFA-Capital	NE Region	SRRA	IE	31.03.2020	31.03.2019
Opening Balance						
Balance as at the beginning of the year	11,93,96,929	27,50,878	5,67,10,575	5,18,56,024	23,07,14,406	35,04,31,469
ADD : Prior period adjustment	-	-	-	-	-	-
ADD : Addition from Capital Grant	14,23,64,329	44,04,655	-	-	14,67,68,984	-
Add : Addition from Internal Revenue Generation prior years	-	-	-	-	-	-
Add : Addition from Capital Grants SRRA	-	-	35,282	-	35,282	7,22,531
Add : Addition from Capital Grants MNRE	-	-	-	-	-	2,06,58,145
Add : Addition from Internal Revenue Generation	-	-	-	1,61,988	1,61,988	49,23,952
Less : Deletion from Internal Revenue Generation				17,096	17,096	
Less: Deletion from Capital Grants	1,09,843	-	-	-	1,09,843	31,963
Less: Deletion from Capital Grants SRRA	-	-	19	-	19	54,485
Less: Depreciation on assets purchased out of Grants MNRE	4,33,45,289	9,00,815	-	-	4,42,46,104	3,30,68,067
Less: Depreciation on assets purchased out of Internal generation	-	-	-	2,97,52,555	2,97,52,555	5,91,18,183
Less: Depreciation on assets purchased out of Grants SRRA	-	-	3,60,08,498	-	3,60,08,498	5,37,59,408
TOTAL	21,83,06,126	62,54,718	2,07,37,340	2,22,48,360	26,75,46,544	23,07,03,992

For National Institute of Wind Energy

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

Sd/-
J.C. David Solomon
Division Head
(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 2020**

(Amount in Rs.)

SCHEDULE 2 - RESERVES AND SURPLUS	31st March, 2020	31st March, 2019
General Reserve Fund		
Balance at the beginning of the year	42,58,69,075	41,22,12,016
Addition during the year being surplus	1,81,02,843	1,36,57,059
	44,39,71,918	42,58,69,075
Welfare Fund (General Reserve)	9,80,006	8,90,707
TOTAL	44,49,51,924	42,67,59,782

For National Institute of Wind Energy

As per our Report attached

Rajesh & Ganesh

Chartered Accountants

Firm Regn No.008640S

Sd/-

S. Rajesh

Partner

Membership No.208090

Sd/-

R Girirajan
Asst. Director
(F&A)

Sd/-

J.C. David Solomon
Division Head
(F&A)

Sd/-

Dr.K.Balaraman
Director General

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

SCHEDULES FORMING PART OF BALANCE SHEET AS AT 31ST MARCH 2020

SCHEDULE 3 - CURRENT LIABILITIES AND PROVISIONS										(Amount in Rs.)	
	Schedule	CFA-Capital	CFA - Revenue	NE Region	MOM -	IWSRA -	SRRA	Hybridize	IE	31/03/2020	31/03/2019
A. CURRENT LIABILITIES											
Sundry Creditors for expenses:											
Expenses payable		-	2,99,559	-	-	-	-	-	22,96,898	25,96,457	8,25,738
Salary Payable		-	-	-	-	-	-	-	23,37,727	23,37,727	32,44,874
Security Deposit, EMD & PG		-	-	-	-	-	-	-	35,33,268	35,33,268	33,29,801
Advances Received on Projects		-	-	-	-	-	-	-	2,33,12,600	2,33,12,600	2,40,54,261
Statutory Liabilities		-	-	-	-	-	-	-	13,36,78,217	13,36,78,217	8,66,56,837
Other Current Liabilities		2,82,06,921	1,35,59,153	-	-	-	-	-	1,35,20,812	1,36,38,533	26,83,688
Other Payables		18,56,169	-	-	-	-	-	-	3,99,308	4,21,65,381	19,13,950
NIWE-IREDA Award Fund		1,14,50,132	-	-	-	-	-	-	2,125	18,58,294	-
Welfare Fund Payable		-	-	-	-	-	-	-	-	1,14,50,132	1,11,10,064
TOTAL (A)		4,15,13,222	1,38,58,712	1,17,721	0	0	0	0	17,90,80,955	23,45,70,610	13,38,21,338
UN UTILISED GRANTS											
Central Finance Assistance MNRE (Grants-in-Aid)	3.1	6,04,447	-7,02,009	-	4,03,00,948	2,38,04,739	-	38,80,442	-	6,78,88,567	15,39,54,413
Earmarked Projects SRRA USP											
TOTAL (B)		6,04,447	-7,02,009	-	4,03,00,948	2,38,04,739	-5,69,602	38,80,442	-	6,73,18,965	15,39,54,413
TOTAL { (A)+(B) }		4,21,17,668	1,31,56,703	1,17,721	4,03,00,948	2,38,04,739	-5,69,602	38,80,442	17,90,80,955	30,18,89,575	28,77,75,751
B. PROVISIONS											
Gratuity		-	-	-	-	-	-	-	39,52,531	39,52,531	73,23,408
Leave Encashment		-	-	-	-	-	-	-	47,21,844	47,21,844	14,44,159
Bonus & Ex-gratia		-	-	-	-	-	-	-	-	-	-
TOTAL (C)		-	-	-	-	-	-	-	86,74,375	86,74,375	87,67,568
GRAND TOTAL { (A)+(B)+(C) }		4,21,17,668	1,31,56,703	1,17,721	4,03,00,948	2,38,04,739	-5,69,602	38,80,442	18,77,55,330	31,05,63,950	296,543,319

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 2020

(Amount in Rs.)

SCHEDULE 3.1 - UNUTILISED GRANT CFA	CFA - Capital	CFA - Revenue	NE Region	MOM - Capital	MOM - Revenue	IWSRA - Capital	IWSRA - Revenue	SRRA	Hybridize	As on 31/03/2020	As on 31/03/2019
Balance as at the beginning of the year	(9,17,905)	(10,69,314)	29,76,070	4,18,66,469	6,26,62,397	2,99,34,707	71,64,344	1,19,45,911	15,45,62,679	50,72,76,829	2,18,64,114
Add : Grants received during the year	12,50,00,000	10,50,00,000						36,00,000	39,06,992	23,75,06,992	5,36,417
Add : Misc. Income on Grants	5,88,612							62,281		6,50,893	
Add : Interest Earned on Grants	4,40,856	1,79,389		1,281,106	1,921,659	1,149,811	243,658	281,333	43,727	55,41,539	2,21,58,109
Add : Interest Accrued on Grants											4,63,031
Add : Profit on Sale of Assets	4,22,274									4,22,274	(21,514)
Less: Grants from Government of India allocated for Capital				2,18,87,737		87,57,248					
Less: Grants from Government of India allocated for Revenue expenditure		5,47,42,093			4,08,76,775		35,78,527		70,277	9,92,67,672	9,87,93,024
Less: Grants from Government of India allocated for NER	2,93,69,496		29,63,360							3,23,32,856	
Less: Grants from Government of India allocated for SRRA								1,77,25,637		1,77,25,637	
Less : Expenditure relating to Grants from Government of India for the inhouse projects during the year	7,99,485	4,91,53,342								4,99,52,827	1,88,55,822
Less: transfer to capital asset fund	8,44,81,228							35,263		8,45,16,491	2,13,34,356
Less: Interest earned on Grants refunded to Ministry				18,66,469	27,99,702	13,34,707	2,70,423	2,81,333		65,52,634	12,45,19,235
TOTAL (A)	1,08,83,628	2,14,639	12,710	1,93,93,369	2,09,07,579	2,09,92,563	35,59,052	-21,52,708	38,80,442	7,76,91,275	28,87,74,549
Add: Expenses Payable		2,12,400						9,104		2,21,504	64,64,426
Add: Security Deposits & Performance Guarantee								15,98,581		15,98,581	22,86,482
Add: Sundry Creditors		-1,30,053					2,124	-17,551		-1,45,480	21,30,299
Less: Advances paid	1,11,97,086	20,68,309	12,710				7,49,000	79,130		1,41,06,235	14,08,08,473
Add: Other Current Liabilities	9,17,905	10,69,314								19,87,219	
Less: Deposits											
Less: Prepaid Expenses								500		500	40,33,970
Add: Salary Payable / EPF Payable											10,15,789
TOTAL (B)	(1,02,79,181)	(9,16,648)	(12,710)	0	0	0	(7,46,876)	15,83,106	0	(1,03,72,309)	(13,48,20,136)
GRAND TOTAL { (A)+(B) }	6,04,447	(7,02,009)	0	1,93,93,369	2,09,07,579	2,09,92,563	28,12,176	(5,69,602)	38,80,442	6,73,18,966	15,39,54,413

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

FIXED ASSETS

(Amount in Rs.)

SCHEDULE 4 - FIXED ASSETS

Description of Assets	Gross Block			Depreciation			Net Block	
	As on 01.04.2019	Addition	Deletion/ Adjustment	As on 31.03.2019	Addition	Prior Period Adjustment	Total as on 31.03.2020	As on 31.03.2020
OUT OF GRANTS (CFA)								
Land	1,15,79,939	-	-	1,15,79,939	-	-	-	1,15,79,939
Building	7,31,28,434	-	-	7,31,28,434	18,09,036	-	6,08,07,699	1,23,20,735
Furniture & Fitting	1,27,08,002	2,85,311	-	1,29,93,313	6,63,525	-	1,09,50,173	20,43,140
Instruments & Equipments	14,00,75,984	6,63,46,062	4,21,257	20,60,00,647	2,27,45,172	3,11,692	10,20,74,820	10,39,25,828
DANIDA Instruments & Computers (Free of Cost)	1,26,69,970	-	-	1,26,69,970	-	-	1,26,69,949	21
MNRE Asset (Free of Cost)	21,445	-	-	21,445	-	-	21,444	1
Computers	12,00,29,843	3,14,96,682	1,04,07,176	14,11,19,349	1,59,31,745	15,96,160	11,24,61,233	2,86,58,115
Vehicles	42,16,143	-	4,85,275	37,30,868	2,45,227	4,85,274	29,94,575	7,36,293
R&D Wind Turbine	10,98,26,430	-	-	10,98,26,430	-	-	10,98,26,415	15
Infrastructure Facilities	3,20,10,460	72,952	-	3,20,10,460	26,42,853	-	2,01,88,321	1,18,97,348
Books	14,29,742	8,04,290	-	14,29,742	9,03,878	-	15,93,401	6,40,632
Capital Work In Progress	31,45,038	4,33,59,023	-	4,65,04,060	-	-	-	4,65,04,060
TOTAL (A)	52,08,41,431	14,23,64,319	1,13,13,708	65,10,14,658	4,49,41,435	1,12,04,013	43,35,88,029	21,83,06,127
OUT OF GRANTS (NER)								
Instruments & Equipments (All)	33,95,155	44,04,655	-	77,99,810	9,00,815	-	15,45,092	62,54,718
Total (B)	33,95,155	44,04,655	-	77,99,810	9,00,815	-	15,45,092	62,54,718

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

SCHEDULE 4 - FIXED ASSETS (Continuation)

Description of Assets	Gross Block			Depreciation			Net Block			
	As on 01.04.2019	Addition	Deletion/ Adjustment	As on 31.03.2019	As on 01.04.2019	Addition	Prior Period Adjustment	Total as on 31.03.2020	As on 31.03.2020	As on 31.03.2019
OUT OF INTERNAL GENERATION (IE)										
Computers	1,21,70,827	50,703	-	1,22,21,530	1,18,00,819	2,21,874	-	1,000	1,20,23,693	1,97,837
R&D Wind Turbine	22,22,55,060	-	-	22,22,55,060	19,72,66,862	2,49,88,196	-	-	22,22,55,058	2
WTTS Land	57,01,000	-	-	57,01,000	-	-	-	-	-	57,01,000
INFRASTRUCTURE FACILITIES	4,98,757	-	-	4,98,757	77,061	49,876	-	-	1,26,937	3,71,820
Vehicle (All)	48,74,209	-	-	48,74,209	20,90,479	6,12,191	-	-	27,02,670	21,71,539
Project Vehicle & Battery Operated Vehicle	-	-	-	-	-	-	-	-	-	-
Instruments & Equipments (All)	2,49,43,535	90,745	-	2,50,34,280	75,89,928	38,24,192	-	-	1,14,14,120	1,36,20,160
Instruments & Equipments	2,09,66,934	90,745	-	2,10,57,679	64,00,856	31,93,308	-	-	95,94,164	1,14,63,515
Instruments & Equipment (Jyoti)	3,500	-	-	3,500	3,500	-	-	-	-	1,45,66,078
Instruments & Equipment (50M Mast)	6,97,468	-	-	6,97,468	5,92,321	1,04,620	-	-	6,96,941	527
Instruments & Equipment (10M R&D Mast)	11,999	-	-	11,999	7,397	1,800	-	-	9,197	2,802
Instruments & Equipment - TESTING	44,240	-	-	44,240	2,677	41,563	-	-	44,240	-
Instruments & Equipment - SRRA-IE	32,19,394	-	-	32,19,394	5,83,177	4,82,901	-	-	10,66,078	21,53,316
Instruments & Equipments	17,094	20,540	-	37,634	5,207	22,638	-	-	27,853	9,781
Furniture & Fittings	3,85,272	-	-	3,85,272	1,80,674	28,378	-	-	2,09,052	11,887
Total (C)	27,08,62,848	1,61,988	-	26,53,06,742	21,90,11,030	2,97,47,345	-	1,000	24,87,59,383	2,22,48,359
SOLAR RADIATION RESOURCE ASSESMENT - UNIFIED SOLAR PROJECT (SRRA)										
Computers (USP)	77,75,999	-	14,97,712	62,78,287	72,87,893	4,06,239	14,97,695	3,43,843	58,52,594	4,25,693
Furniture & Fitting (USP)	12,79,997	-	-	12,79,997	8,18,878	97,064	-	-	9,15,942	3,64,055
Instruments & Equipments (USP)	41,51,00,991	35,282	-	41,51,36,273	36,13,74,102	3,54,43,465	-	-	39,68,17,567	1,83,18,705
Infrastructure Facilities (USP)	40,55,703	-	-	40,55,703	20,21,242	4,05,573	-	-	24,26,815	16,28,887
Total (D)	42,82,12,690	35,282	14,97,712	42,67,50,260	37,15,02,115	3,63,52,341	14,97,695	3,43,843	40,60,12,918	2,07,37,340
Current Year Figures (A+B+C+D)	1,22,33,12,125	14,69,66,244	1,28,11,420	1,35,08,71,470	99,25,54,282	11,19,41,936	1,27,01,708	19,88,653	1,08,99,05,422	26,75,46,544
Previous Year Figures	1,19,73,00,995	263,04,629	2,93,499	1,22,33,12,125	84,68,76,646	14,59,85,786	2,54,295	-	99,26,08,137	2,307,03,992
										35,04,24,349

For National Institute of Wind Energy

Sd/-

R Girirajan

Asst. Director, (F&A)

Sd/-

J.C. David Solomon

Division Head, (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 2020

SCHEDULE 5 - CURRENT ASSETS, LOANS & ADVANCES	CFA Capital	CFA Revenue	NE Region	MOM	IWSRA	SRRA	Hybridize	IE	31.03.2020	31.03.2019
A. CURRENT ASSETS										
Sundry Debtors	-	-	-	-	-	-	-	6,58,53,113	6,58,53,113	5,28,29,596
Inventories										
Stock of Stationery	-	-	-	-	-	-	-	-	-	1,73,407
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	-	-	-	-	-	-	-	-	-	1,856
Closing Stock	-	-	-	-	-	-	-	-	-	15,25,070
Bank Balances										
With Scheduled Bank	-	-	-	-	-	-	-	-	-	-
In Current Account	-	-	-	-	-	-	-	93,200	93,200	(4,57,699)
In Savings Bank Account	26,38,941	17,29,425	-	4,03,00,948	2,38,05,883	27,04,887	38,80,483	10,38,91,552	17,89,52,119	20,04,52,703
In Cash	-	-	-	-	-	-	-	-	-	6,735
In Deposit Account	1,00,00,000	-	-	-	-	-	-	42,38,95,951	43,38,95,951	42,56,38,666
TOTAL (A)	1,26,38,941	17,29,425	-	4,03,00,948	2,38,05,883	27,04,887	38,80,483	59,41,91,163	67,92,51,729	68,06,27,680
B. LOANS, ADVANCES AND OTHER ASSETS										
Advances and other amounts recoverable in cash or in kind or for value to be received										
a) Prepayments	-	-	-	-	-	-	-	4,73,975	4,73,975	525,687
b) Interest accrued on term deposits	-	-	-	-	-	-	-	-	-	37,61,941
c) Advances	2,82,06,921	1,23,63,216	13,29,000	-	-	3,27,269	-	50,00,245	4,72,26,651	95,96,919
d) Consultancy WIP	-	-	-	-	-	-	-	36,58,391	36,58,391	50,82,655
e) Balance with Govt. Authority - TDS	3,36,917	3,208	-	-	-	3,50,691	-	2,42,14,312	2,49,05,127	2,37,08,218
TOTAL (B)	2,85,43,838	1,23,66,424	13,29,000	-	-	6,77,960	-	3,33,46,923	7,62,64,145	4,26,75,421
GRAND TOTAL { (A)+(B) }	4,11,82,778	1,40,95,849	13,29,000	4,03,00,948	2,38,05,883	33,82,847	3,880,483	62,75,38,086	75,55,15,874	72,33,03,101

For National Institute of Wind Energy

Sd/-
R Girirajan
Asst. Director, (F&A)Sd/-
J.C. David Solomon
Division Head, (F&A)Sd/-
Dr.K.Balaraman
Director GeneralAs per our Report attached
Rajesh & Ganesh, Chartered Accountants
Firm Regn No.008640S
Sd/-
S. Rajesh, Partner
Membership No.208090

SCHEDULES FORMING PART OF INCOME & EXPENDITURE ACCOUNT FOR THE YEAR ENDED 31ST MARCH, 2020

(Amount in Rs.)

	31 st March, 2020	31 st March, 2019
SCHEDULE 6 - INCOME FROM SALES / SERVICES		
Income from Services		
Income from Scientific & Technical Consultancy Services	9,60,31,479	6,88,81,199
Energy receipts	3,28,83,750	3,42,03,018
TOTAL	12,89,15,229	10,30,84,217
SCHEDULE 7 - INCOME FROM PUBLICATION		
Sale of Books & Reports	-	1,04,670
TOTAL	-	1,04,670
SCHEDULE 8 - INTEREST EARNED		
On Term Deposits with Scheduled Banks	2,28,25,013	2,24,51,939
On Savings Bank account with Scheduled Banks	10,77,424	22,73,148
TOTAL	2,39,02,437	2,47,25,087
SCHEDULE 9 - OTHER INCOME		
Interest Received	-	17,952
Participation Fees	3,11,45,613	2,38,24,754
Registration Fees	1,20,000	3,30,000
Miscellaneous Income	15,26,758	31,75,472
Application Fees	0	72,381.86
TOTAL	3,27,92,371	2,74,20,560
SCHEDULE 10 - ESTABLISHMENT EXPENSES ADMINISTRATION AND R&D STAFF		
Salaries and Allowances	5,65,85,435	5,10,38,845
Contribution to Provident Fund (EPF)	55,42,381	46,69,325
Contribution to Pension & Gratuity (With LIC)	(24,71,779)	72,79,514
Incentives to Employees	-	10,000
Leave travel concession	3,11,368	18,86,300
Children Education Allowance	9,32,815	2,02,500
Medical reimbursement	1,73,985	7,66,922
Newspaper reimbursement	1,55,840	1,23,073
Leave Salary (Contribution to LIC)	48,32,113	16,45,312
LIC Admin. Charges (Gratuity & Leave Encashment)	2,46,533	4,20,643
Staff welfare expenses	41,256	43,200
TOTAL	6,63,49,947	6,80,85,635

For National Institute of Wind Energy

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

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

Sd/-
J.C. David Solomon
Division Head
(F&A)

Sd/-
Dr.K.Balaraman
Director General

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, 2020**

(Amount in Rs.)

SCHEDULE 11 - OTHER ADMINISTRATIVE EXPENSES	31st March, 2020	31st March, 2019
Advertisement and Publicity	11,10,154	6,73,347
Auditor's Remuneration	82,600	75,000
Bio Gas Expenses	8,000	22,938
Electricity and Power	30,14,447	25,30,040
Expenses on Books, Data & Periodicals	42,12,132	13,16,296
Expenses on Fees (Sitting Fees & Honorarium)	2,67,994	4,04,400
Expenses on Seminar & Meetings	54,61,361	88,37,572
Hospitality Expenses	1,72,165	4,21,825
Ineligible Input Tax Credit - GST	-	73,54,084
Loss on Exchange Fluctuation	625	29,403.43
Office expenses & Maintenance	1,69,22,448	1,90,11,651
Other Expenses (Hindi Prom.,OLA Act, Bk Chrg.)	3,40,250	5,31,398
Parliamentary / Standing Committee Expenses	8,05,440	10,77,730
Postage & Courier	88,114	2,75,790
Printing and Stationery	17,66,906	17,53,456
Professional Charges	10,85,904	8,28,442
Rates & taxes/ Licence Fee	8,72,721	17,93,367
Repairs (AMC etc.,)	65,48,409	58,64,486
Security Charges	63,41,181	43,01,253
Telephone and Communication Charges	11,31,291	9,06,474
Training and Development	25,96,765	16,76,527
Travel & Conveyance and Taxi hire	38,06,890	38,00,310
Vehicles Running and Up Keeping	6,68,235	7,22,130
Water Charges	6,67,459	4,92,196
TOTAL (A)	5,79,71,491	6,47,00,115
CONSULTANCY PROJECT EXPENSES		
Expenses on In Consultancy Projects (B)	9,94,70,189	6,79,01,108
GRAND TOTAL { (A)+(B) }	15,74,41,680	13,26,01,223

For National Institute of Wind Energy

Sd/-
R Girirajan
Asst. Director
(F&A)Sd/-
J.C. David Solomon
Division Head
(F&A)Sd/-
Dr.K.Balaraman
Director GeneralAs 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, 2020**

(Amount in Rs.)

SCHEDULE 12 - PRIOR PERIOD ADJUSTMENT	31st March, 2020	31st March, 2019
Prior Period Expenses/ Income	-	-
TOTAL	-	-

For National Institute of Wind Energy

As per our Report attached

Rajesh & Ganesh

Chartered Accountants

Firm Regn No.008640S

Sd/-

S. Rajesh

Partner

Membership No.208090

Sd/-

R Girirajan
Asst. Director
(F&A)

Sd/-

J.C. David Solomon
Division Head
(F&A)

Sd/-

Dr.K.Balaraman
Director General

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. 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
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.

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 Panickerkulam 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 Deputy Director General [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 2018-19, the review of internal control procedures by the Deputy Director General [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 Resource Assessment, 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 (Internal Earnings):-

The Centre has taken list of inventory spares during the current year and valued it at cost as detailed below:

Instrument Name	QTY	Amount (Rs)
Connectors	8532	17,83,073
Total	8532	17,83,073

The above stocks of spares are accounted in the financial statements as Closing Stock in Income & Expenditure Statement. They were purchased out of Internal Earnings.

(b). 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	114	52,87,816.00
Wind Vane	16	9,42,955.66
Temperature Sensor	51	3,89,695.00
Pressure Sensor	41	6,75,539.00
EOL Zenith Data Logger	35	54,72,818.00
CR - 3000	1	2,08,173.40
Pyranometer	44	8,93,010.80
Relative Humidity & Temp.	2	43,204.00
Davis make rain gauge	1	17,545.00
	305	1,39,30,756.86

The above instruments & Equipments 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)

Income generated	18,56,10,037
Less: Salary component of service functions	6,63,49,947
Consultancy Project Expenses	9,94,70,189
Transfer to Capital fund	1,61,988
Stock	15,25,070
Balance transferred to General Reserve Fund	1,81,02,843

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 2019-20, a sum of Rs.3,28,83,750/- (Ref: Energy Receipt - Sch.6) has been earned.
11. The total interest income earned is Rs.2,39,02,437 /-. Out of which Rs.2,28,25,013/-, earned from Term Deposit with Scheduled Banks and Rs.10,77,424/- 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, 2020 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/-
R Girirajan
Asst. Director
(F&A)

Sd/-
J.C. David Solomon
Division Head
(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



Rajesh and Ganesh
Chartered Accountants



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 31.03.2020, 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 the 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.

Landline : 044-4212 4342
Mobile : +91 98400 52031

II Floor, Sterling Point, No 124, G N Chetty
Road, T. Nagar, Chennai — 600 017.
E-Mail: raieshganesh@yahoo.com



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 said Indian laws and the Rule made there under.

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, 2020;
 - 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.
- e. 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)

Sd/-

S Rajesh
Partner
Membership No:208090

Place: CHENNAI
Date: 07/12/2020

Expertise and Research & Development for Wind and Solar Energy Stakeholders

Resource Assessment

Wind Energy

- ◆ Carry out Nationwide Wind Resource Assessment
- ◆ Estimation of Wind Potential in the country through Wind Atlas preparation
- ◆ Design and implement the comprehensive Resource Assessment Programme
- ◆ Analysis of wind data to identify Wind Farmable locations
- ◆ Verification and vetting of wind data generated by private entrepreneurs
- ◆ Consultancy services for Feasibility Studies, Technical Due Diligence, Micro-siting and preparing DPR for Wind Farming and Repowering assessment

Offshore Wind Energy

- ◆ Nodal Agency for Offshore Wind Energy development in India
- ◆ Met-Ocean Measurement.
- ◆ Demarcation of Offshore Wind Energy Blocks
- ◆ Geophysical and Geotechnical Studies

Solar Energy

- ◆ Solar Radiation Resource Assessment
- ◆ Investor & bankable grade Solar / Meteorological data
- ◆ GIS enabled Indian Solar Atlas
- ◆ Calibration of solar sensors as per International Standards
- ◆ Consultancy on Solar Energy Projects

Forecasting

- ◆ Wind Power Forecasting Services
- ◆ Solar Power Forecasting Services

Testing (Large & Small)

- ◆ Power Performance measurements
- ◆ Load measurements
- ◆ Power Quality measurements
- ◆ Safety and function tests
- ◆ Yaw efficiency test
- ◆ User defined measurements
- ◆ Duration Test

The services are as per internationally accepted procedures & stipulations and certified as per the requirements of ISO 9001 & NABL accredited as per the requirements of ISO/IEC 17025 : 2005

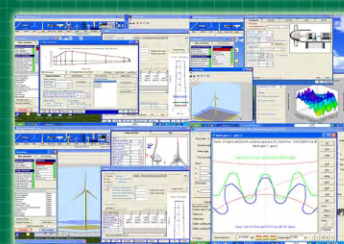
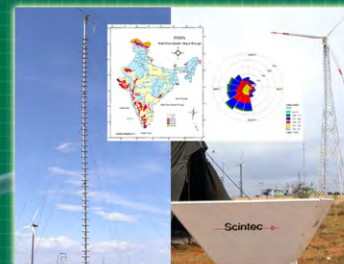
Standards & Certification

- ◆ Preparation of Indian standards on wind turbines
- ◆ Accord Type Certification to Wind Turbines. Type Certification Services are certified as per ISO 9001
- ◆ Issue the recommendation for grid synchronization to facilitate installation of prototype wind turbines
- ◆ Technical Due Diligence for Wind Farm Projects

Training

National, International and Customized Training on:

- ◆ Wind and Solar Resource Measurement & Analysis
- ◆ Wind and Solar Energy Technology
- ◆ Testing and Certification of Wind Turbines
- ◆ Installation, Commissioning and Operation & Maintenance of Wind Turbines
- ◆ Grid Integration of Renewable Energy System
- ◆ Forecasting of Wind and Solar Energy Production
- ◆ Seminar / Workshops on Wind and Solar Energy



नीवे NIWE

NATIONAL INSTITUTE OF WIND ENERGY

An Autonomous Research & Development Institution under the Ministry of New and Renewable Energy, Government of India
Velachery - Tambaram Main Road, Pallikaranai, Chennai - 600 100

Phone : +91-44-2246 3982 / 83 / 84 Fax : +91-44-2246 3980 E-mail : info.niwe@nic.in Website : <http://niwe.res.in>



नीवे NIWE

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

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

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

Phone / दूरभाष : +91-44-22463982 / 22463983 / 22463984 Fax / फैक्स : +91-44-22463980

E-mail / ईमेल : info.niwe@nic.in Website / वेबसाइट : <http://niwe.res.in>