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नीवे NIWE

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EDITORIAL



A Global Symphony of Progress: Wind Industry Nears One Terawatt Milestone! As we reach the mid of 2023, the wind industry stands on the precipice of a historic achievement, reaching the awe-inspiring 1TW installed capacity milestone. A testament to over four decades of relentless progress, this resounding celebration marks a turning point in our journey towards a sustainable future. With unstoppable momentum, the industry now sets its sights on the next terawatt, projected to be accomplished in next 7 years, propelling us towards a greener and more promising tomorrow, as reported by the Global Wind Energy Council (GWEC).

In this captivating transformation, India emerges as a renewable energy powerhouse, showcasing rapid growth and ambitious targets, steadfast in its dedication to sustainable development and reducing carbon emissions on the global stage.

NIWE being one of the technical arms of the Ministry of New & Renewable Energy (MNRE) has undertaken R&D projects involving various stakeholders, and multiple research and development initiatives. Notably, the "Wind-Driven Air Storage System" project has undergone successful testing and will soon be operational. NIWE has successfully prepared the 150m wind atlas towards identifying potentially suitable locations for future wind farm developments. The 150m Indian potential map has been officially launched by the honorable secretary of MNRE, New Delhi on the global wind day, June 15, 2023. NIWE has also taken initiatives by the way of developing interactive web portals for Indian

wind potential map at 150m, wind solar hybrid map, RLMM online registration and Vayumitra skill development program towards fast-racking the country's green transition.

To promote interest in renewable energy research among students, 15 students had completed an internship under the NIWE-Academic Associate Programme (NIWE-AAP). Furthermore, NIWE has signed three agreements for testing assignments, and these tests are currently in progress. Additionally, NIWE achieved a significant milestone by completing a hve demonstration of the SCADA system, developed to support the switching off and on the wind farms and handed over to Indian Air Force (IAF), Bhuj first of its kind in the country.

NIWE has been granted continuation and accreditation by NABCB until April 2027 following re-accreditation. Review / verification of documentation for 05 wind turbine models submitted for RLMM have been successfully completed.

As part of the Vayumitra Skill Development Programme, a total of 171 trainees and 1050 participants have received training thus far. Four events were held under Azaadi Ka Amrit Mahotsav during the period from April to June 2023. Notably, 662 students visited the NIWE campus during the quarter to gain insights into Wind Energy.

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

Dr. Rajesh Katyal
Director General (Additional Charge)

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Research & Development

NIWE funded R&D Projects

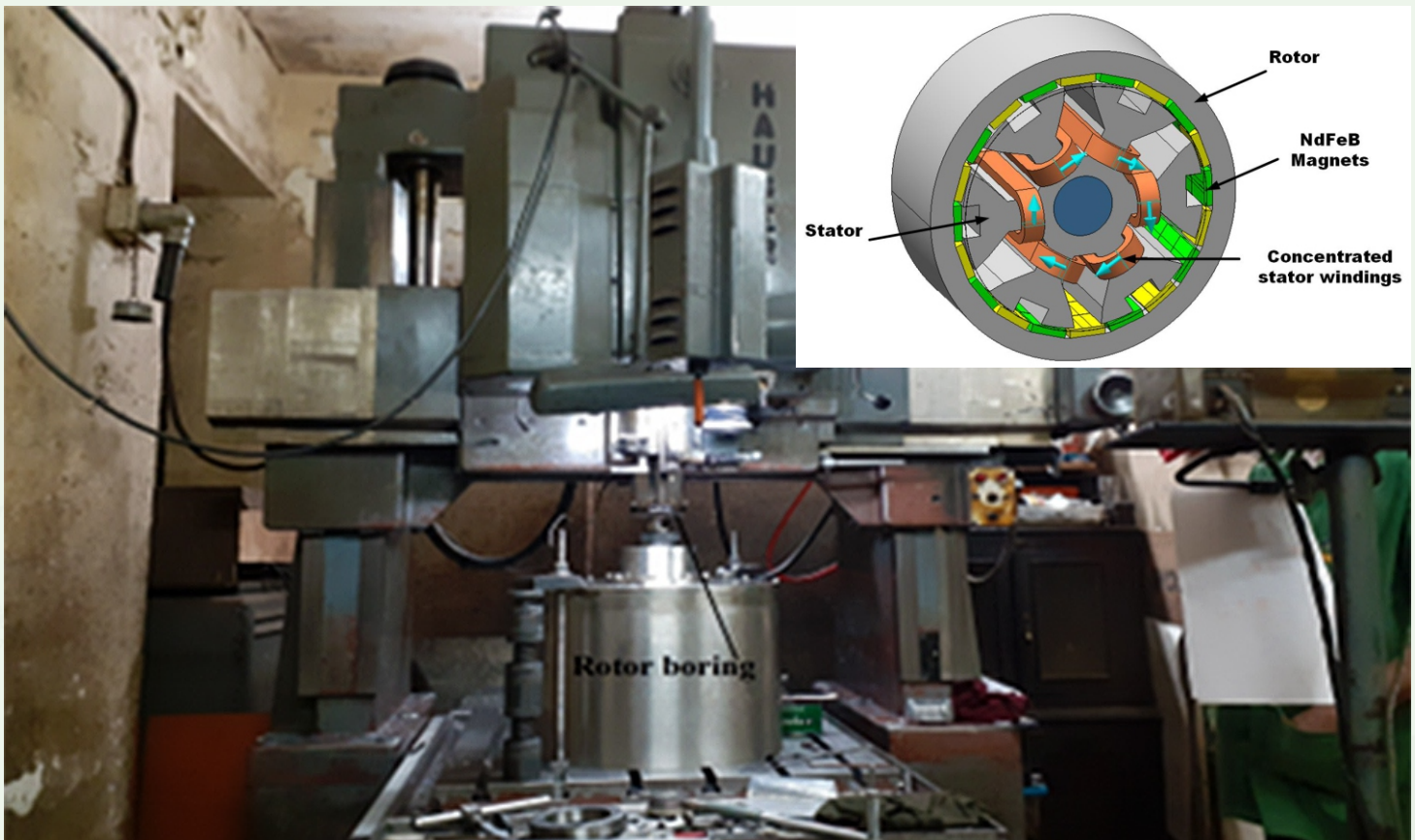
NIWE collaborates with research / academic institutions, universities, industry, research scholars and consultancy organizations to support Research and development programs by promoting the reliable and novel cost-effective technologies in wind power systems. Currently 2 nos. of R&D projects are ongoing.

Wind-Driven Air Storage System

The project aims at a novel scheme to store the wind energy in the form of compressed air. In the proposed system, the rotor of the wind turbine of capacity 5 kW drives the compressor and the excess energy from the wind turbine is stored locally, as compressed air in a storage pressurized tank. The testing of the system has been completed, with the approval of R&D council. The developed system will be functional at College campus.

Direct-Drive Doubly Salient Permanent Magnet Machine for Roof-Top Wind Energy Applications

A novel 3.7 kW Ferrite Vernier PM generator has been designed, simulated, fabricated and the assembly is in progress. The grid integration of the same using a novel switched inductor ultra-sparse matrix converter is simulated and proposed to be implemented in real time, with the developed PM generator.



PM generator Assembly

NIWE Internship Programme

To create awareness and interest in the field of renewable energy research among the young talented sciences, Management and Engineering students. NIWE invites applications from the eligible candidates for the "NIWE-Academic Associate Programme" (NIWE-AAP). During this period 15 nos. of Graduate and Post Graduate students have completed Internship/Project works at NIWE.

Measurements & Testing

Measurements

ANERT

Rectification & Data collection from 50m wind monitoring station in the State of Kerala, (ANERT Ramakkal-medu consultancy site)

NCCR (Kalpsar Dam Project)

Completed the maintenance and data collection from 100m wind monitoring station in the state of Gujarat. (Kalpsar Dam Project)

SODAR

Completed SoDAR Rectification work and Data downloading work in the state of Tamil Nadu (Kayathar).

Uttar Pradesh

- Measurement team carried out an intensive field visit to various parts of Uttar Pradesh (UP) state for identification of locations for installing 100/150m wind monitoring stations.
- Subsequently wind power projects will get developed in potential sites.
- In total, the team has covered 15 previously uncovered locations spread across Uttar Pradesh.

Solar Resource Radiation Assessment

4 Nos. of Pyranometers were calibrated during the period from April to June 2023 for RE Stakeholders use.



ANERT Ramakkalmedu consultancy site



SoDAR Rectification work at Kayathar in progress



In-house Calibration Facility at NIWE

Testing

DST approved R&D Project

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

Type Testing of INOX 3 MW

- An agreement was signed between NIWE & INOX for Type Testing of its Wind Turbine INOX DF/3000/145 3.0 MW Power Booster Mode 3.3 MW Rotor Blade Type SR71 (T-Bolt), Hub Height 100 m IEC WT Class IIIB , Rojmal, Rajkot of M/s. INOX WIND LTD. The draft Interim Reports have been issued to the customer.
- An Additional agreement was further signed between NIWE & INOX for the measurements of the Power Curve at a new configuration of 3.3 MW on the same Test turbine at Rojmal, Rajkot after the completion of the present measurements.

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

An agreement was signed between NIWE and M/s. Southern Wind Farms for Measurements of its model GWL 225, a wind turbine with 29.8m rotor diameter Varapatti Village, Sultanpet Post, Suler Talak, Coimbatore District. The Interim Reports on Power Performance Measurements & Load Measurements have been prepared and updated to the customer namely M/s. Southern Wind Farms periodically.

Acoustic Noise Measurements of Senvion 2.3M130/2.7 MW

An agreement was signed between NIWE & SENVION for Acoustic Noise Measurement of its model – Senvion 2.3M130 / 2.7 MW turbine, (HH 120m, RD 130m at Tithawa, Gujarat of M/s. Senvion Wind Technology Private Limited. Measurements are to start in the ensuing windy season.

Small Wind Turbine

Enquiries from 3 manufacturers received for testing of their SWT models at WTTS, Kayathar. NIWE has responded to the enquiries with details and awaiting confirmation from OEM.

Achievement

As per MNRE Lab Policy, a Inter Lab Comparison (ILC) on Electrical Characteristics Measurements (ECM) as per IEC 61400-21 with Indian Labs was completed with 5 Laboratories namely, DNVGL, Windguard, UL, Profec Ventus, NIWE. All labs were within the Z-Score requirements of ISO/IEC 17043. The activity was lead by Shri Bhukya Ramdas, Deputy Director (Technical), Unit Chief, Electrical Characteristics Testing (ECT) under Measurements & Testing Division.



Offshore Wind Development, Data Analytics and Forecasting & Information Technology

Research Activities

Maintenance and Repair Strategy for Wind Energy Development

- Weekly meetings are being held with the representatives of Windcare and discussed various aspects & development of the project. The possibility of organizing a virtual workshop and training session on the topic of "Maintenance and Repair Strategy of Wind Turbines in India" was also deliberated.
- Prepared the project status and financial statement for the year of 2022.
- Preparing a journal paper on the assessment of wind turbine blade damage in Indian conditions.

The SCADA control system at Bhuj, Gujarat

- Successfully completed a live demonstration of the SCADA system at IAF, Bhuj, wherein a 300 MW capacity wind farm was switched off and on.
- Convened meetings with the developers for Phase II activities for the implementation of the SCADA system at other pooling substations of Bhuj.

Offshore Wind Development

- On June 14, 2023, a meeting chaired by Shri R. K. Singh, Minister of Power and New & Renewable Energy, was held at New Delhi to address issues related to offshore wind energy projects. The meeting was attended by the Secretary of MoP, Secretary of MNRE, Chairman of CEA, CMD, and PGCIL, as well as senior officials from CTU, PGCIL, and CEA. The discussion focused on grid connection, timeline, and bidding under various models.
- On June 16, 2023, the Hon'ble Secretary and Joint Secretary of MNRE visited NIWE to ensure sustainable development of offshore work in India.



Met Ocean Measurement

- The Project Monitoring Committee has recommended that the proposal for the "Met-Ocean Measurements (Wind, Wave, Tide, Current, Water Level, etc.) at Gulf of Mannar" project be revised. They also recommended exploring the possibility of altering the project's scope and adjusting the location for LiDAR measurements.
- The committee has suggested / recommendation by reframing the proposal to design a floating buoy that can support NIWE's marine grade LiDAR.
- Additionally, they proposed developing a local manufacturer capable of meeting the project's needs. Currently, the process of implementing the suggestions is underway.

Data Analytics

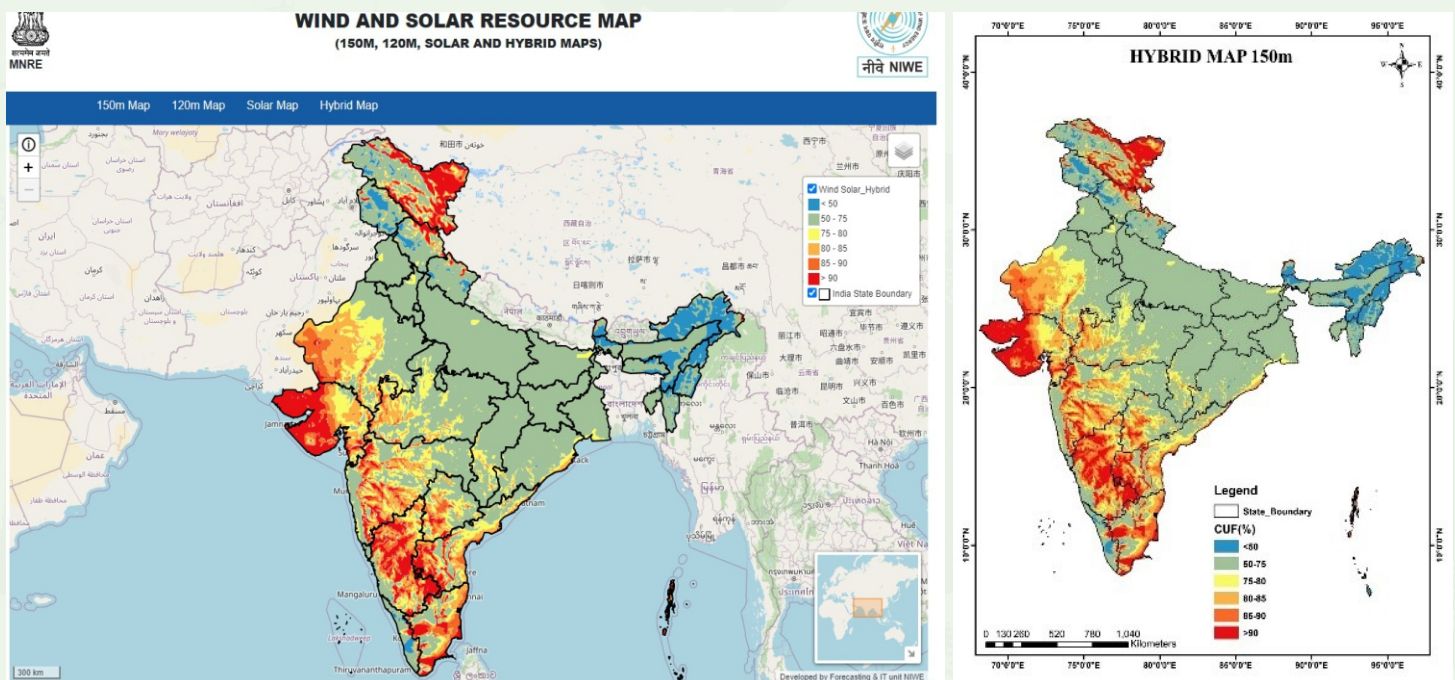
Consultancy projects

Data Analytics has been executed for 6 nos. of consultancy projects and currently handling 11 nos. of ongoing consultancy projects towards supporting the stakeholders of the wind industry. The activities include;

- Verification of wind monitoring procedure
- Energy Yield Estimation
- Tender document preparation & Technical Bid evaluation
- Wind-Solar Hybrid

Preparation of 150m Hybrid Map

- Prepared a Wind-Solar Hybrid Map by combining the wind potential map at 150 meters above ground level and the solar atlas prepared by NIWE. This hybrid map is intended for the benefit of the public and stakeholders and is presented in terms of CUF at a spatial resolution of 500 meters.
- The Wind-Solar Hybrid Map was officially launched by the Secretary of MNRE in New Delhi on June 15th, 2023. The division also developed an interactive portal that displays the hybrid map, which will aid stakeholders in prospecting



new wind-solar hybrid project areas throughout the country. Additionally, the same portal is expected to be helpful for repowering and upgrading existing Wind and Solar farms.

- A video film has been prepared to help users as how to use the 150 m, Hybrid Maps and portal.
- On June 16th, 2023, the web portal was launched by the Secretary of MNRE at NIWE in Chennai.

Forecasting & Information Technology

Information Technology

- Transferred data from the old storage to the new storage and ensured that the new storage was fully operational.
- Regularly backed up all virtual machines & data and successfully restored them when necessary.

Wind and Solar data sale and geotagging

- Prepared a data availability report for various customers for the sale of Wind and Solar data.
- Geotagging of wind turbines is being carried out.

RE Projects

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

- Monitoring the daily generation of data
- Visited the site and checked the activities done as per the Operational and maintenance agreement.

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

- Monitoring the Daily Generation Data
- Visited the site and checked the activities done as per the Operational and maintenance agreement.
- Convened a meeting and discussed with MKU officials regarding various activities/issues with the contractor in connection with O&M activities at 1MW solar power plant at MKU through virtual mode on 26.06.2023.

Achievements

- Successfully completed the live demonstration of SCADA system at IAF, Bhuj. Switched off and on the turbine capacity of 300 MW.



- Successfully launched Hybrid & 150 m MAPs.
- Successfully launched Hybrid & 150 m MAP Web portals.

MoU

- MoU has been signed between NIWE & NCMRWF for use and development of NWP model based forecast applications in the field of wind and solar power forecasting at NCMRWF on 18.04.2023.



Certification

- NIWE has signed an Agreement with M/s. Siva Wind Turbine India Private Limited for Pre-evaluation of documentation in connection with the Type Certification of 'SIVA U57' wind turbine model as per the requirements of IS/IEC 61400-22 : 2010. The Pre-evaluation has been completed.
- Re-Accreditation Office Assessment was conducted on 6th & 7th of March 2023 by NABCB, QCI as per the requirements of ISO/IEC 17065:2012 in connection with the renewal of the PCB accreditation of NIWE. The assessment findings were successfully completed and accepted by NABCB. NABCB has granted the continued accreditation to NIWE for a further period of four years valid upto 15-04-2027.
- As part of the re-accreditation process, NABCB conducted the Witness Assessment of NIWE Certification Engineers namely Shri S. Arulselvan and Shri S. Paramasivan during the Manufacturing Evaluation (mock) of Wind Turbine Blade Plant. The Division Head (Certification) participated as Observer.

Visits

- Shri S.A. Mathew visited M/s. INKEL Limited in connection with the evaluation of the technical bid for 14 MW Wind energy project.
- Shri S. Paramasivan conducted physical verification of Hub and Nacelle Assembly, Rotor Blade at VOC Port, Tuticorin.

Standards and Regulation

- Completed the review of documentation of one prototype wind turbine model viz., “MWL-160-5.2MW HYT-140m” of M/s. Mundra Windtech Limited (MWL) in connection with installation of prototype wind turbine in India, as per MNRE guidelines. Subsequently, a letter has been issued in connection with grid synchronization of the said prototype wind turbine model, as decided by the Prototype Committee.
- Completed the review of set of documentation for one prototype wind turbine model viz., “S144 3.0MW - HLT” of M/s. Suzlon Energy Limited (SEL) in connection with installation of prototype wind turbine in India as per MNRE guidelines. Based on the review, comments were communicated seeking clarification/documentation to SEL.



PWMM committee meet



PWMM committee meet

- Review of documentation has been completed for 05 wind turbine models submitted by various wind turbine manufacturers for RLMM. Further, technical support has been provided to MNRE for implementation of Revised Lists of Models and Manufacturers of wind turbines (RLMM) process.
- Based on the works carried out, seven numbers of new Indian standards on wind turbine including a standard on Life extension of wind turbines have been finalized during the ETD 42 committee meeting held on 21.04.2023 (through Video Conference) under the Chairmanship of DG, NIWE.
- Provided technical support to Bureau of Indian Standards (BIS) in connection with the works related to standards. Further, the works related to preparation of draft Indian standards / IEC standards & IECRE documents are under progress.
- The continual improvement and maintaining the quality management system are ongoing.



ETD 42 Committee Meeting

Skill Development and Training & Infrastructure Management

NIWE has scheduled the following National and International Training Courses during the calendar year 2023-24 and the necessary preparatory works are on for the successful conduct of the courses.

Customized Training

- Customized Training Course on Wind Energy Technology and its Applications specially for the officials of NTPC Limited from 4th July to 7th September 2023

International Training

- 27th International Training Course on Wind Turbine Technology and Applications for ITEC Countries from 2nd to 18th August 2023
- 28th International Training Course on Wind Turbine Technology and Applications for ITEC Countries from 6th to 22nd September 2023
- 29th International Training Course on Wind Turbine Technology and Applications for ITEC Countries from 24th January to 9th February 2024

Vayumitra Skill Development Program (VSDP)

Ministry of New & Renewable Energy (MNRE), Government of India has assigned National Institute of Wind Energy (NIWE), Chennai as the nodal agency to implement “Vayumitra Skill Development Program (VSDP)” in eight windy states and Kerala. The objective of the programme is to create skilled workforce for the Indian wind energy sector especially the trained manpower for the operation & maintenance of wind farms in the country as per the industry demand/needs so as to achieve the Government of India targets.

Under VSDP the following three major areas / job levels were identified namely (1) O&M Electrical & Instrumentation Technician – WPP (SGJ/Q1503) (2) O&M Mechanical Technician – WPP (SGJ/Q1502) and (3) Site Surveyor – WPP



(SGJ/Q1202). Under VSDP, a total of 5010 participants are proposed to be trained through Training of Participants (TOP). The TOP training courses will be conducted through 22 identified institutions located close to the Wind Farms of windy States. To train the participants, NIWE will conduct Training of Trainers (TOT) programme and train 690 trainers who will train the participants. It is also scheduled to conduct two Orientation to Assessors (OTA) programmes for 34 Assessors.

- 6 nos. of TOT programmes have been conducted and trained 171 Trainers.
- 35 nos. of TOP programmes have been completed and trained 1050 participants.

Azadi ka Amrit Mahotsav-2022-23

NIWE with the support of MNRE has scheduled sixteen events to commemorate 75 years of progressive Independent India (Azadi Ka Amrit Mahotsav).

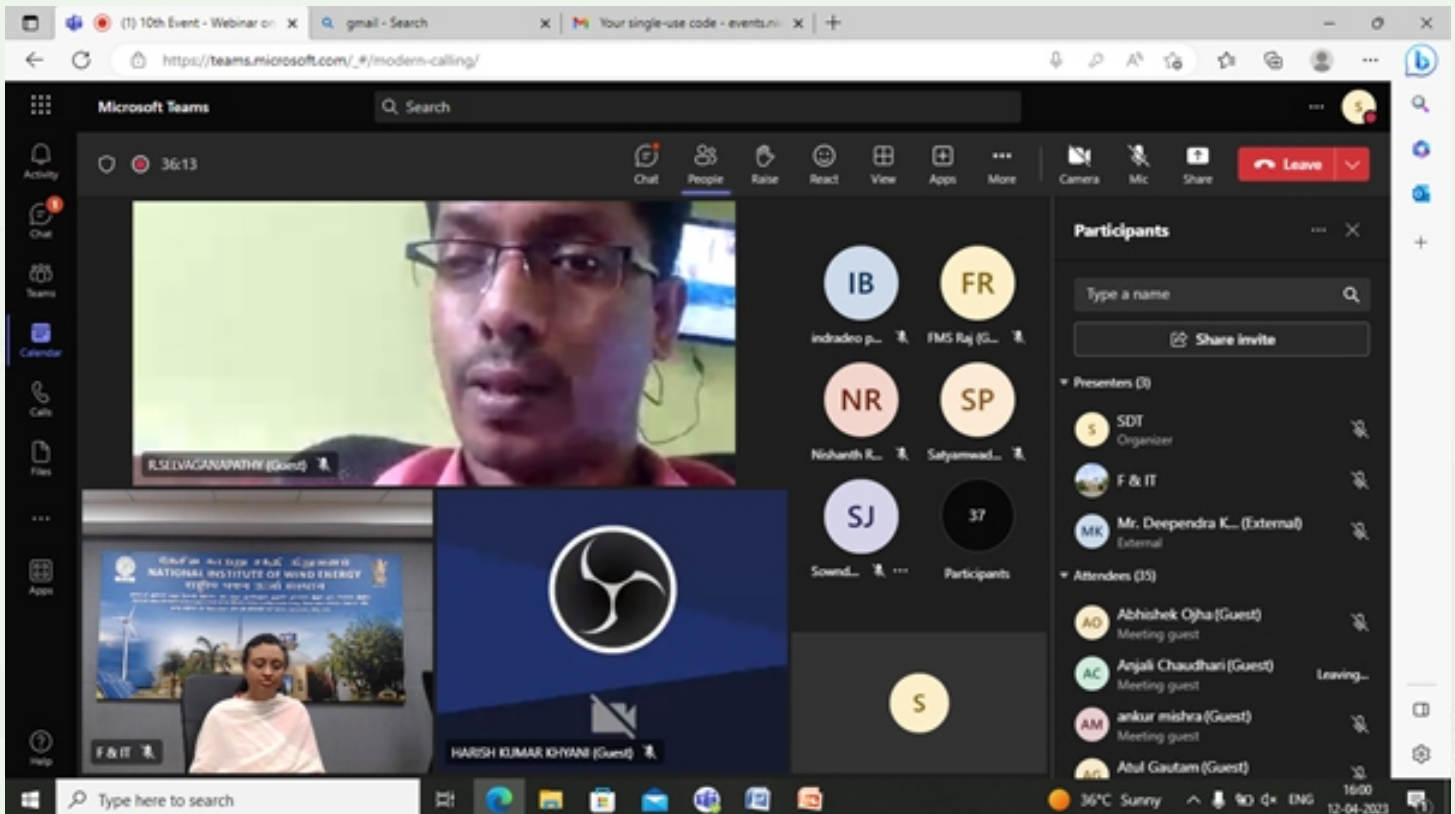
The announcement about the event carrying the instructions was hosted in NIWE website and circulated through Social Media pages along with the Flyer.

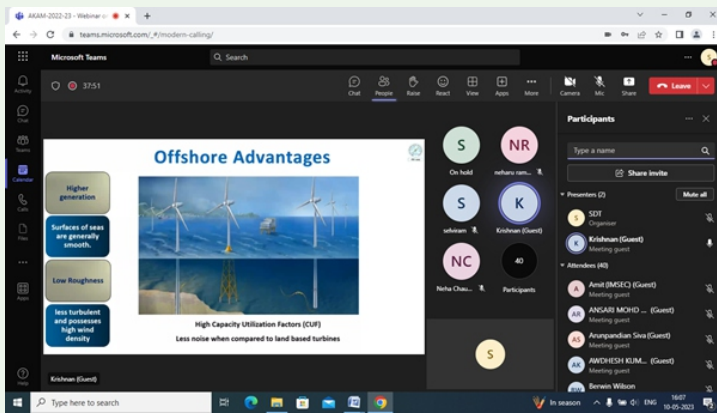
The event was conducted online, enabling large number of participants to take part in the Webinar.

The following tenth, twelfth and fourteenth events were of webinar in nature and was conducted in a similar way. The speakers gave a detailed presentation on different aspects of the respective theme. It was followed by Q&A session, which was open for the participants to chat and interact with the speakers. All the doubts and queries raised by the participants were clearly explained and clarified by the speaker. The answers were very useful to the participants to have a feel about the sector. The participants were very much satisfied with the presentation and had reciprocated the same by appreciating and thanking the speaker.

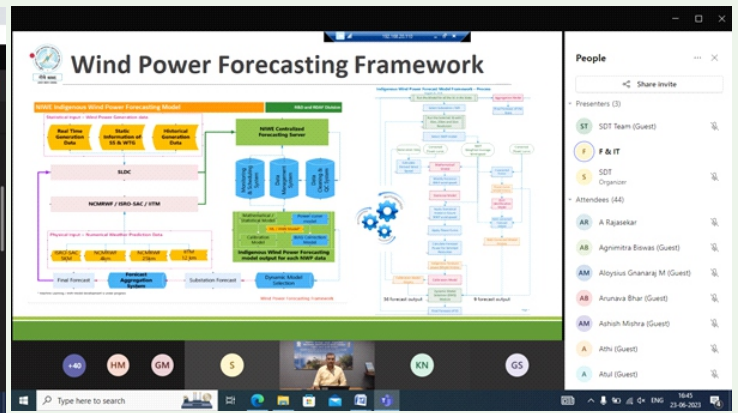
TENTH EVENT - “Webinar on Grid Integration of Renewable Energy”

The tenth event, “Webinar on Grid Integration of Renewable Energy” by Smt. Deepa Kurup, Additional Director & Division Head (RE-Grid Integration) & Division Head (In-charge) (R&D), NIWE was successfully conducted on 12th April 2023. 211 candidates had registered and 75 participants had attended the event.





12th Event



14th Event

TWELFTH EVENT -“Webinar on Offshore Wind Energy”

The twelfth event, “Webinar on Offshore Wind Energy” by Shri. B. KRISHNAN Assistant Director (Technical) Offshore & Data Analytics Unit, NIWE was successfully conducted on 10th May 2023. 207 candidates had registered and 72 participants had attended the event.

FOURTEENTH EVENT -“Webinar on Forecasting of Renewable Energy Production”

The fourteenth event, “Webinar on Forecasting of Renewable Energy Production” by Shri. A.G. RANGARAJ, Deputy Director (Technical) & Unit Chief, Forecasting & Information Technology, NIWE was successfully conducted on 23rd June 2023. 75 candidates had registered and 51 participants had attended the event.

ELEVENTH EVENT -“Awareness Programme on Wind Energy for School Teachers”

The eleventh event, “Awareness Programme on Wind Energy for School Teachers” was successfully conducted on 28th April 2023. 61 registrations were received and 52 teachers attended the Event.

As part of the event, a lecture was presented by Dr. P. Kanagavel, Director and Head, Skill Development and Training & Infrastructure Management Division, on the foundation and basic principles of green energy which included the concept of greenhouse effect and global warming and how it affects our environment. Also basics on wind energy technology was explained during the lecture. The participants had evinced great interest on the subject and many doubts were clarified during the session. The event was very helpful to the participants and created a valuable forum for dialogue and open exchange of views.



Dr. P. Kanagavel delivering the lecture



Visit to the Solar Radiation Resource Assessment Station



Explaining the working of LIDAR



Visit to the Biomass Plant



Visit to the Solar Calibration Laboratory

The participants were also taken for a visit to the Renewable Energy facility available in the NIWE campus, which included Wind and Solar Measurement station, wind turbine nacelle, Water Pumping Wind Mill, Wind – Solar Hybrid System and Solar Calibration Laboratory. The participants were very much satisfied by the quality of the content they got from the programme, campus visit and expressed thanks to NIWE and MNRE for arranging the event under the Azadi Ka Amrit Mahotsav.

THIRTEENTH EVENT - “Interactive Session with Wind Industry Experts”

The thirteenth event, “Interactive Session with Wind Industry Experts” was successfully conducted on 26th May 2023. 290 candidates had registered and 110 participants had attended the event.

Programme Schedule

Date & Time	Theme of Interactive Session	Panel Members
26 th May 2023 & 4.00 - 5.00 pm IST	Interactive Session with Wind Industry Experts on the topic “ Harnessing 140GW Wind installed capacity by 2030 in India”	Shri. A. Karanth Wind Energy Consultant
		Dr. R. Kumaravel MD - Country Manager, Wind Guard
		Shri. Rahul Rawat* Scientist, MNRE
		Dr. K. Boopathi ** Director & Division Head, OWD, DAF & IT, NIWE

*/** Both the experts could not join the discussion due to unavoidable official exigency. However, Dr. P. Kanagavel, Director & Division Head, NIWE joined the panel discussions.

The session was very lively and interactive. The panel members shared their inputs on the topic, “Harnessing 140 GW Wind Installed capacity by 2030 in India” through a presentation followed by Q&A session and the participants evinced interest in raising questions and clarifying their doubts.

The Team of experts who have worked in various wind energy projects, took part in the discussions and it was an excellent forum for the stakeholders to understand the various issues and challenges faced towards the roadmap on the topic and the future achievements in India.

The event has provided a wonderful learning experience for the participants for the project development in harnessing 140 GW wind installed capacity by 2030 in India. All the participants were satisfied with the knowledge transferred through the panel discussion on different aspects of the roadmap of the topic and expressed their happiness to NIWE and MNRE for arranging the Interactive Sessions with the Wind Industry Experts under the events of Azadi ka Amrit Mahotsav.

Students & Training Participants Visit

To create awareness and to motivate towards research on wind energy, achieving the indigenization and also to create awareness about the activities and services of NIWE, schools and college students are encouraged to visit the campus.

During the period from April to June 2023, the following visits were scheduled and coordinated.

S.No.	No. of Students	No. of Staff	Institution Name	Visited on
1	58 students	2 staff	Jerusalem College of Engineering, Chennai	18 th April 2023
2	59 students	2 staff	Jerusalem College of Engineering, Chennai	20 th April 2023
3	57 students	2 staff	Jerusalem College of Engineering, Chennai	25 th April 2023
4	57 students	2 staff	Jerusalem College of Engineering, Chennai	28 th April 2023
5	59 students	2 staff	Mohamed Sathak AJ College of Engineering, Egathur	3 rd May 2023
6	72 students	2 staff	Jerusalem College of Engineering, Chennai	10 th May 2023
7	59 students	2 staff	Jerusalem College of Engineering, Chennai	12 th May 2023
8	57 students	2 staff	Jerusalem College of Engineering, Chennai	16 th May 2023
9	57 students	2 staff	Jerusalem College of Engineering, Chennai	18 th May 2023
10	60 students	1 staff	VIT, Chennai	23 rd May 2023
11	60 students	2 staff	VIT, Chennai	01 st June 2023
12	7 participants	1 coordinator	NITTTR	22 nd June 2023



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