MEMORANDUM OF UNDERSTANDING

FOR THE YEAR 2017-18

BETWEEN

MINISTRY OF NEW AND RENEWABLE ENERGY (MNRE), NEW DELHI

AND

NATIONAL INSTITUTE OF WIND ENERGY (NIWE), CHENNAI

NATIONAL INSTITUTE OF WIND ENERGY, CHENNAI

Memorandum of Understanding - 2017-18

PART – I OBJECTIVES

To serve as the technical focal point for wind power development in India, for promoting and accelerating the pace of utilization of wind energy and support the growing wind power sector in the country.

To develop and strengthen the facilities and capabilities, evolve strategies, promote, conduct, co-ordinate and support research and development programmes to achieve and maintain reliable and cost effective technology in wind power systems.

To analyze and assess wind resources based on the data available from various sources and prepare and maintain wind energy density maps/ wind atlas/ reference wind data.

To prepare and establish Indian standards on wind turbines and to develop and implement certification system in India.

To establish world class facilities, conduct and/or coordinate testing or 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 and operation and safety systems is tested according to agreed protocols.

To undertake Human Resource Development programmes for the personnel working in the wind energy sector.

To promote commercial exploitation of know-how, know-why results and offer various consultancy services to the customers.

To promote the development and commercialization of any other wind energy systems including stand-alone systems.

To carry out any other activity in the area of renewable energy under R&D, as may be assigned by the Ministry from time to time.

PART –II EXERCISE OF ENHANCED AUTONOMY AND DELEGATION OF FINANCIAL POWERS

As per Rule 51 of NIWE MOA, RRs and Bye-Laws the Director General has been delegated with full powers to incur expenditure on all NIWE activities upto the Budget Limit.

PART – III SPECIFIC PARAMETERS AND TARGETS

Whereas the basic function of the Institute is admittedly to serve as a Technical Focal Point in Wind Energy related areas, the Ministry of New and Renewable Energy [MNRE] on its part shall endeavor to provide, besides providing adequate resources, adequate monetary support to the Institute to achieve its aims and objectives relevant to the technological/scientific needs of the Country and play a vital role at the national level, in consonance with Science and Technology Policy/Planning of the Country.

The Institute is committed to perform at its best in all spheres of its areas relating to Wind Energy and will continue to provide assistance and guidance in the Wind Energy related areas and shall maintain high standards of quality in its work.

Research and Development

[a] whereas the Institute recognizes that the process of developments has to relate continuously to

I significant and notable changes that are taking place in the Wind related industry and

II rapidly exploring universe of knowledge in the area

And for that purpose, the Institute has:

1. to survive on specialization, work increasingly in frontline areas that transcend disciplines. The following thrust areas form a part of this effort.

    - Research and Development (NIWE)
    - Wind Resource Assessment and Offshore (WRA&O)
    - Wind Turbine Testing (Both Large and Small)
    - Standards and Certification (S&C)
    - Information, Training and Customized Services (ITCS)
    - Wind Energy & Hybrid System

2. to have a perception and a value system appropriate to the pursuit of high engineering science to meet the critically evaluated needs of the Industry
3. to programme into their activities emerging technological needs with futuristic needs
4. to maintain and foster interactive linkage with leading technological institutions and Institutes of research in India and abroad.

[b] Ministry of New and Renewable Energy [MNRE] on its part shall endeavor, besides providing adequate funding as per the approval of the Governing Council of NIWE for all the approved activities.

1. Industry-academic interaction will be encouraged and whatever incentives that are provided by the other Scientific Institutions to its staff shall be made available to the Institute's staff.

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2. to encourage measures necessary to create situations where the Institute's focus remains engaged within the country as well as outside in challenging tasks
3. to engage the Institute in the relevant thrust areas of research and development; and
4. to encourage the Institute for taking up R&D activities relevant to the industry by strengthening the Institute with required additional manpower.

WORKING AMBIENCE

Whereas the institute shall endeavor to meet the objectives stated above, to the extent possible/feasible, the Ministry of New and Renewable Energy [MNRE] shall work towards

1. to give external support to the Institute's Management for enforcing higher standards of achievements and reward the staff; and
2. to help the Institute to maintain highest standards even if it means modifying some of the Government's policies in the sphere of industrial relations and extent of autonomy.
3. to formulate guidelines by making it mandatory for the wind turbine manufactures to get NIWE clearance compulsorily before introducing any model in India, irrespective of the fact that they have obtained such approval from any institution abroad.
4. to allow NIWE's administrative matters to be settled and decided at the level of Director General, NIWE and wherever considered necessary in consultation with the Chairman GC- NIWE/ Ministry.

IMPLEMENATION OF ACTION POINTS

[A] In consideration of action points to be implemented, the Institute shall endeavor:

- To absorb the establishment related expenditure from its internal earnings that is over and above the sanctioned grant by the Ministry under this head;
- To increase the internal generation of revenue by at least 10 to 20% every year.
- To levy User charges including overhead/institutional charges/management fee in respect of Consultancy/Sponsored Project, wherever the output or benefit of services are utilized by others are levied at appropriate rates as per amended GFR Rule No.47 and display the same in the website.
- To achieve self-sufficiency in the matter of meeting expenditure on account of implementation of 7th Central Pay Commission recommendations as per instructions contained in Ministry of Finance, Department of Expenditure New Delhi OM No.1/1/2016-EIII[A] dated 13.01.2017. [This clause has been fully achieved]
- To seek approval of the Ministry for signing of MOU with any other party abroad.

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- Ministry shall hold a quarterly review meeting with NIWE at MNRE to review Physical and Financial targets.
- The institute shall project expenditure pattern for its Internal Revenue Generation and anticipated earnings during the year.
- The institute shall follow the policy level decision(s) of GC/ MNRE with regard to programme implementation and abide by the advice of the FC as approved by GC from time to time
- Proposed expenditure and internal revenue generation as approved by FC on 04-05-2017 are below; as and when those numbers are revised by the Competent Authority, terms of MoU would be understood to be modified to that extent

DETAILS OF EXPENDITURE TO BE INCURRED DURING 2017-18

[Figures in lakhs]

Sl. No.	Details of expenditure to be incurred during 2017-18	BE 2017-18	Description of Inputs	Targeted outputs in measureable terms
1	Capital expenditure	200.00	Computers, Civil repairs Structure, Software, Journals and capacity building.	Infrastructure additions at NIWE and WTRS Kayathar.
		280.00	Renewable Energy Demo Lab cum Training Lab.[To be executed through CPWD Chennai]	Capacity building / Small wind turbine models show casing for students/interns. Such facility will be first of its kind open to student community and others.
2	Wind Resource Assessment	150.00	Remote sensing instruments Solar/LIDAR .	To measure the wind profile at the specified locations.
			Preparation of Offshore Wind Atlas.	Identification of exact potential location on offshore wind.
3	Testing	600.00	Establishment of Low Voltage Right Through [LVRT] Testing facilities	Mandatory requirement as per CERC guidelines for carrying out LVRT testing on wind turbines. Such facility will be first of its kind.
		30.00	Instruments on Power quality, noise measurement, Development of LIDAR based control strategies for	Capacity Building

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Sl. No.	Details of expenditure to be incurred during 2017-18	BE 2017-18	Description of Inputs	Targeted outputs in measureable terms
			wind turbine Annual Energy Production (AEP) optimization, Power Curve Measurement using Nacelle Mount LIDAR, equipment's and software for load measurement nacelle mounted LIDAR.	
4	Standards & Certification	20.00	Standards, Certification Software/Hardware, and Capacity building.	Updating of existing standards Enhancement of technical capability
5	Information Training [ITCS], Dissemination, awareness creation and IT related services	50.00	Purchase of journals, augmentation of facilities like server etc.	Up-gradation of facilities, information/dissemination etc.
6	Recurring expenditure	600.00	Maintenance, up-keep expenses of the Centre [Chennai/Kayathar]	Essential need based expenditure.
	TOTAL	**1930.00**		

DETAILS OF BUDGET REQUIREMENT FOR THE YEAR 2017-18-
INTERNAL REVENUE GENERATION

[Figures in lakhs]

Sl. No.	Details of expenditure to be incurred during 2017-18	BE 2017-18	Description of Inputs	Targeted outputs in measureable terms
1	Consultancy Project Expenses	550.00	Expenditure of TA/DA, Calibration charges, Maintenance of Materials, Meeting Expenditure, Hospitality etc	Completion & Submission of Reports to the Industries on time.
2	Establishment Expenses	600.00	Expenditure of Salaries & Allowances	
3	Capital Expenditure	*1,200.00*	Procurement of One Wind Turbine for R&D related activities at Kayathar, TamilNadu	To carry out R&D related Activities in NIWE / WTRS, Kayathar
	TOTAL EXPENDITURE	2,350.00		
4	PROJECTED INCOME	*1344.68*	Income earned from Wind Resource Assessment, Wind Turbine Testing, Standards & Certification, Solar Radiation Resource Assessment Consultancy Services	

Note:
1. For Sl.No.3, Rs.1200 Lakhs will be utilized from the Reserves & Surplus created out of Internal Revenue Generation of NIWE. (Please refer Schedule - 2 of Balance Sheet).
2. Projected Internal revenue Generation will be Rs.1344.68 Lakhs. (Ref. Annexure - D)

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TARGETS AND ACHIEVEMENTS DURING 2016-17

Sl. No.	Unit	Physical Delivery Targets for the year 2016-17	Details of Achievement
1.	WRA	Near-shore wind met masts/uncovered/urban wind 25 masts & 50 masts & 50 masts in North Eastern region	**Near shore Wind Resource Assessment at Gujarat:** A site has been identified for installing a 100 m wind monitoring station in Gujarat coast and NOC obtained. **Wind Resource Assessment in Uncovered / New Areas: Chhattisgarh** - Erection of 9 nos. of 100m mast and commissioning is in progress. **Telangana & Kerala** – Site selection completed and awaiting NOCs from the respective SNAs **Wind Resource Assessment Studies at 50 M Level in North Eastern States including Sikkim:** 1. 32 NOCs obtained. 2. Mast materials with accessories transported to the 32 locations and erection of 50 m WMS are completed in 7 locations and civil foundation work are completed in 8 locations.
2.	WRA	Wind Potential GIS map for 120m level	• Preliminary wind potential map has been developed at 120m for the whole country. The map is under validation and fine-tuning needs to be done. • Initial version of Web Portal for the 120m map display has been developed
3.	WRA	125 consultancy projects on WRA	118 consultancy projects focused on various wind farm developmental needs, such as, micro siting, technical due diligence, installation and commissioning of wind monitoring stations, Wind Power Density Map, power curve guarantee test, Wind Power Forecasting and Pre-feasibility study were undertaken for a variety of clients from public/government/private sector during this period.
4.	KSM/ WTRS	Establishment of 2 Research wind turbines 2 MW and 800 Kw	• The installation of INOX 2 MW WEG was completed on 21.12.2016 and the machine was put on continuous operation from 21.03.2017 onwards after 3 months stabilization period. • The procurement process for the Gearless wind turbine of ≥700kW is underway in NIWE.
5.	WTRS	75 kW WIND Solar Hybrid projects in Kayathar	Solar PV modules (75 kWp) has been integrated with existing lower capacity WEG (200 kW Micon wind turbines) on 30.09.2016 and successfully commissioned.

6.	Testing	2 type tests of Wind Turbines and 2 power curve measurements	One Type testing assignment M/s. Inox Wind Ltd (2000 kW, 113 rotor diameter), one power curve measurement campaign M/s. Regen Powertech Pvt Ltd (1500 kW WT with 89 rotor diameter) and one site calibration assignment for power curve measurement (GE/103 (1700 kW WT with 103m rotor diameter) of M/s. TUV India Pvt Ltd during low wind season at Badval, Kadapa District, Andhra Pradesh) were completed during the year. One type testing assignment was initiated during the year and is ongoing M/s. Xyron Technologies Ltd (1000 kW, 55.02 rotor diameter).
7.	ITCS	Conducting 5 wind energy soft skills training for NIWE staff, 20 student projects (internship/ME/MTech thesis), Solar Energy & resource training for 200 participants from ISA member Countries, Wind Energy/Technology courses for 100 National and 50 International participants (ITEC-MEA)	**Wind Energy Soft Skills training for NIWE Staff:** Training on software for power system and grid studies with renewable energy system conducted for 22 nos. of Scientists / Technical Staff and Project staff of NIWE. **Student Projects:** A total number of 16 M.Tech / ME students have done their internship at NIWE, Chennai. 10 M.E. students completed their Project Thesis work. **Research Project work by Foreign Students:** Five students carried out their Research Project work. **Wind Energy / Technology Courses for National and International participants (ITEC-MEA):** ITCS Unit, NIWE had successfully organized three National training courses and trained **122** participants and 4 International training courses and trained **86** participants from **47** countries. The Special Training Course on "Wind Resource Assessment and Wind Farm Planning" was successfully conducted for Officials of Ministry of Energy and Mineral Department (MEMD), Uganda.
8.	S&C	NIWE-TUV Rheinland Certification projects - 2	Certification - Manufacturing Inspection for Hub & Nacelle Assembly Unit, and wind turbine tower unit for M/s. Regen Powertech Private Limited in connection with Type Certification of their wind turbine model viz., VENSYS 115 / 2000 kW. Certification - Manufacturing Inspection of the Production of the Delta make Converter for 2100 kW wind turbine.
9.	OSW&IB	Offshore activities : Construction of monopile together with platform for mounting the offshore LIDAR at Gulf of Khambhat, Gujarat for wind profile measurements	Completed the construction of monopile together with platform for mounting the offshore LIDAR. The Installation & commissioning work of LiDAR by FOWIND will be carried out after the monsoon season of 2017. The measurement campaign will be carried out for a period of 2 Years after commissioning of LIDAR.
10.	KSM/SWT	Completion of type testing of two small wind turbines underway at WTRS, Kayathar.	Type testing on one wind turbine was completed and one short closed based on request by customer.

TARGETS FOR THE YEAR 2017-18

Sl.No.	Unit	Target		Time line
		Activity	Numerical Target/ deliverables	
1.	Wind Resource Assessment & Offshore	**I. Offshore WRA** a. Installation of LiDAR for offshore wind resource measurements at Gulf of Munnar at Tuticorin, Tamil Nadu.	One LiDAR	31.03.2018
		b. Data collection and analysis for offshore wind resource measurement using LiDAR installed at Gulf of Khambhat off Gujarat coast.	A Report on four months data to be submitted.	31.03.2018
		II. Onshore WRA c. Wind Resource Assessment in North East States using existing telecom towers of BSNL/Airtel	50 nos. of telecom towers	31.03.2018
		d. Preparation of DPR/Geo Spatial tools to identify wind power potential sites in 7 States in India for achieving target of 60GW by 2022.	Development of Geo-Spatial tool will be completed and a report will be submitted.	31.03.2018
		e. Geo Tagging / Online Registry of Wind Turbines	Development of Online portal with all wind turbine (100%) in India	31.10.2017
		f. Repowering studies for existing wind turbines installed in Muppandal area of Tamil Nadu.	Report on the study to be submitted.	01.02.2018
		g. Carrying out wind resource assessment in uncovered areas	NE region - 50 nos. Chhattisgarh 10 nos. Telangana - 5 nos. Kerala - 3 nos.	31.03.2018
		h. SNA Training / Workshop	one number	31.12.2017
2.	Testing & Forecasting	**I. Testing** a. LVRT testing facility establishment	one LVRT test facility	31.03.2018
		II. Wind Forecasting a. Establishment of Centre of Excellence in Renewable Forecasting at NIWE	Centre to be created in NIWE	31.03.2018
		b. Development of indigenous wind power forecasting model.	Development of the model to give forecasting output better than the limits specified in Regulations, as applicable.	31.10.2017

Sl.No.	Unit	Target		Time line
		Activity	Numerical Target/ deliverables	
4.	S&C and R&D/S&T	WTG Certification Projects	Two projects will be taken up	31.03.2018
		Review of RFP proposals received from various academic institutions and Industry	20 no. of R&D projects will be reviewed, evaluated.	31.03.2018
		Evaluation / Monitoring of RC Approved Projects	Five number of Projects. Report on the detailed status of the projects to be submitted	31.12.2017
5.	Wind Turbine Research Station (WTRS). Kayathar.	Establishment of 25 kW grid connected wind solar hybrid system at WTRS, Kayathar as Technology Demonstration Project.	Installation of One number of 25 kW Grid connected hybrid system	31.03.2018
		Operation & Maintenance of WEG's for the uninterrupted operation of the machines windy season 2017.	Nine numbers of 200 kW MICON, one number of 600 kW SUZLON, one number of 2000kW KENERSYS and one number of 2000 kW INOX	31.03.2018
		Grid Integration of 75 kWp Solar PV power with already existing 200 kW MICON WEG using available land, transmission line, and transformer for the connected load of 200 kW for increasing overall CUF of the machine.	One number of Hybrid system (75 kWp Solar PV power with already existing 200 kW MICON WEG) and submission of report	31.01.2018
6.	Solar Radiation Resource Assessment	Development of indigenous Solar Power Forecasting model for the benefit of Solar Power Industry.	Development of the model to give forecasting output better than the limits specified in Regulations, as applicable.	31.03.2018
		Setting up of SRRA stations as gap fillers in the country to ensure uniform coverage of the country with an estimated budget of Rs.15 crores.	20 additional SRRA stations	31.03.2018
7.	Information, Training and Customized Services	Establishment of Renewable Energy Demo Lab. Small wind turbine models showcasing for students/interns.	RE Demo Lab.	31.01.2018
		International training programmes sponsored by MEA	Four International/ Special Training	28.02.2018

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Sl.No.	Unit	Target		Time line
		Activity	Numerical Target/ deliverables	
		on "Wind Turbine Technology and Applications" for ITEC/ SCAAP Countries.	Programme	
		National Training Programmes on "Wind Turbine Technology and Applications"	Two training programmes	31.03.2018

PART – IV **COMMITMENTS ASSISTANCE FROM THE GOVERNMENT [MNRE].**

The MNRE would take all possible measures within its means to enable NIWE to function effectively to attain its Objectives set forth in this MOU.

PART – V **ACTION PLAN FOR IMPLEMENTATION AND MONITORING OF THE MOU.**

The information on actual performance against targets set in the MOU would be reviewed by the GC-NIWE and follow-up action taken accordingly.

Director General
NIWE, Chennai

Secretary
MNRE, New Delhi

Place: New Delhi
Date: 21/09/2017.

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