

National Wind Resource Assessment Programme
Year 200_ - 200_

Guidelines for
WIND RESOURCE ASSESMENT
IN UNCOVERED / NEW AREAS
(FOR STATE NODAL AGENCY)

1. BACKGROUND

1. The Ministry of New and Renewable Energy [MNRE] launched a National Programme of Wind Resource Assessment way back in 1986 using dedicated 20/25m tall masts and automated instrumentation. The programme was taken up to assess the wind potential in the country especially in the known windy states. Subsequently the programme was extended to all the states and union territories. In 2003 the programme was rechristened to Wind Resource Assessment in uncovered /new areas to enable to cover those areas or states hitherto uncovered in the earlier programmes. Under this programme fifty metre tall tubular masts are employed with speed and direction sensors at 10, 30 and 50 magl. The Ministry has been sanctioning projects every year since 2003-2004 and details are given below. Apart from this the Ministry has sanctioned an exclusive programme for Northeastern states also.

Sl. No	WRA programme	No. Of States/UT considered	No. Of stations sanctioned
1	2003-2004	12 [Including Goa]	22
2	2004-2005	10	20
3	2005-2006	17	50
4	2006-2007	13	43
5	2006-2007- NE states	8	20

- 1.1.** The Ministry is planning to continue the program with the modified implementation methodology. Details are given below.

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2. IMPLEMENTATION METHODOLOGY

2.1. The SNA shall prepare a project proposal as per their requirements in the format attached herewith and send to C-WET for the recommendation. The CWET will review the proposal and forward it to the Ministry with their recommendations. The final approval will be given by the Ministry.

The responsibility assigned to the C-WET and SNAs are given below.

2.2. Responsibility –SNA

- Send the proposal with number of stations required, details of proposed sites and the fund requirement, positively in the given format.
- Clearance of the sites for taking up the project.
- Procure necessary masts (50m or 80m) as per the design and specification approved by a competent authority. The procurement has to be done as per Government rules/guidelines/procedure in force. The masts already available under earlier projects could also be utilized if it is in good condition.
- Transport the mast materials to the site, civil works and installation of the mast with instruments.
- Safe keeping of the masts and instruments including watch & ward, insurance coverage, fencing etc. during entire project period.
- Lowering of the masts during the course of data collection for rectification work if any. C-WET will provide necessary instruments/sensors for replacement. Any other hard wares if required are to be procured by the SNAs.
- Monthly MSD (Memory Storage Device) collection from the stations including battery replacement.
- Send MSDs to C-WET regularly.
- Send statements of expenditure and UC to C-WET every year.
- Dismantling of the mast at the end of the data collection and safe keeping of masts and instruments.

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2.3. Responsibility –C-WET

- Examine and forward the proposals received from the SNAs to the Ministry with recommendation.
- Selection/finalization of sites with active participation of the SNAs.
- Procure necessary instruments and hand over it to the SNAs at the time of installation.
- Provide necessary blank MSDs to SNAs regularly for data collection
- Process MSDs received from the SNAs, compile data and prepare report at the end of the specified data collection period.
- Impart training to the officials of SNAs for handling the instruments and the routine O & M of the stations.
- Release of necessary funds to the SNAs for the implementation of the project on submission of Utilization certificates and request for release of fund.

2.4. As the wind measurements have to be made close to the hub height of the wind turbines in use, the SNAs have a choice (50m or 80m) to take action to procure masts. The measurements levels will be three viz 10, 30 and 50 in the case of a 50m tall mast and 30, 50 and 80 m in the case of 80 m tall mast. For standardization and declaration of potential sites, 50m level measurement is a mandatory.

2.5. The location for study could be hilly or plain, island or coastal areas. However it is to be made sure that the areas suggested are generally unrepresented. The basic data that will be collected would be the time series data on wind speed, direction and standard deviation based on ten minutes / one hour average. The data sampling will be at 0.5Hz. Apart from wind measurement, temperature and solar radiation data collection could also be a part of the programme as an exclusive mast is used with a data logger that has provision for multichannel reception. Manual replacement of MSD is

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envisaged as it will make ensure the health of the entire wind monitoring systems as the sites are visited on a regular basis.

2.6. Tubular masts / Lattice towers (appropriate height) with guy wires are proposed for installation. However tubular masts are preferred. Brand new masts with ease of transportation, civil works and installation/dismantling would be suggested under the programme. Masts available from the earlier programmes would also be utilized in the programme if it is well fit for utilization. The instruments will be procured from the reputed manufactures based on their technical and cost consideration.

3.0 BUDGETARY REQUIREMENTS

The programme will be implemented in a cost-sharing ratio of 80:20 with 80% (Central Finance Assistance-CFA) and 20% SNA share. The Ministry would release eighty percent of the CFA share to C-WET in a phased manner. Twenty percent of the project cost has to be shared by SNAs from their own source. The state share is for the operation and maintenance of the stations as per the responsibilities allocated to them and no need to release to C-WET. C-WET will coordinate the programme with the active co-operation of the state nodal agencies.

The details are given below.

I-INSTRUMENTS

(Scope of CWET- CWET will provide the budgetary details to the Ministry along with the proposal)

SL. No	Description	Remarks
1	Data loggers (with spares)	To be procured from standard instruments suppliers. If instruments are available from the earlier projects the total numbers to be procured should be reduced accordingly
2	Anemometers (with spares)	" For 2 years of operation only.
3	Wind Vane (with spares)	"
4	Pyranometer (with spares)	"
5	Temperature sensor with shield (with spares)	"

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6	SCM card for Pyranometer (with spares)	..
7	SCM card for temperature sensor (with spares)	..
8	Data kit for data down loading and processing (with spares)	..
9	Memory cards	..
10	Other requirements (Infrastructure etc)	..

II- COST OF MAST, OPERATION & MAINTENANCE OF STATION

(Scope of SNA) [SNAs shall provide the budget details]

SI No	Description	Remarks
1	Procurement of mast with all accessories, transportation, civil works & installation (Can be a package)	Masts to be procured as per the criteria / Guidelines.
2	TA/DA in connection with site inspection/ civil works / installation / memory device collection/dismantling	All the locations are expected to be visited once in a month for data collection and inspection.
3	Cost of battery	Battery to be replaced every month
4	Watch and ward	Security guard is expected to be in place at all the stations.
5	Lowering & hauling up of mast for rectification of defects during course of data collection	From previous experience, it is seen that at one or two locations, some technical problem could crop up during data collection that may lead to the lowering of the mast and it's hauling up.
6	Dismantling of the mast at end of data collection and transportation to a safer location.	At the end of data collection the mast is to be lowered, dismantled and transported to a secured place for storage for further use. If the mast materials are not fit for further use it is to be condemned as per the procedure.
7	Fencing	Fencing is expected to be in place at all the Stations
8	Insurance of mast & instruments	The masts and instruments are to be insured
9	Other requirements	In case masts are available from the earlier programmes this has to be utilized. So necessary hardwares are to be procured and transported to a new site for its utilization.

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The C-WET would release the fund to the respective nodal agencies at the following three stages

1. Rs. 1.50 lakhs per station along with the sanction order.
2. The next installment will be released after submitting statement of expenditure along with order copy of the procurement of wind mast by the SNAs.
3. Balance will be based on the progress report, statement of expenditure and Utilization certificate by 30th June of the financial year as given in the annexure.

4.0 DURATION OF THE PROJECT

The data collection will be for a continuous period of 24 months with a total project period of 30 months. Four months are given prefix and two months are given suffix to the 24 months for necessary groundwork and data processing respectively. Detailed time schedule is given in the annexure

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FORMAT FOR THE PROJECT PROPOSAL

1	Name of the State		
2	Name of the Agency with full address/Phone/fax nos		
3	Details of the last three WRA projects (MNRE)	No. of stations approved by MNRE	No. of stations commissioned
	2004-05 2005-06 2006-07		
4	Name of the Principal Investigator		

**Signature of
Principal Investigator**

**Signature of
Director**

Office Seal

Date:

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1 A) A site inspection report is to be submitted for each site.

SITE INSPECTION REPORT

1	Site name			
2	Tehsil/ district / State			
3	Date of visit			
4	Team of officials visited and agency represented	Name of the officials		
5	GPS details / SOI details map	Latitude (^o N)	Longitude (^o E)	Elevation (masl)
6	Topo-Sheet No.			
7	Any land marks			
8	Nearest Town/City			
9	Nearest Railway station / Airport			
10	Type of road to reach the site from the nearest town/city and accessibility			
11	Topography of the site/Exposure of the site and ownership of site			
12	Details of wind farm nearby, if any			
13	Details of photograph taken.			
23	Remarks			

Inspected By: Name :
 Designation :
 Signature :

Name and Signature of Principal Investigator
With office seal

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Annexure-II

2) Cost of instruments [This will be filled by C-WET]

SL. No	Description	Unit price (Rs)	Quantity Required	Total Amount (Rs)
1	Data loggers - (with 25% spares)			
2	Anemometer (with spares)			
3	Wind Vane (with spares)			
4	Pyranometer (with spares)			
5	Temperature sensor with shield (with spares)			
6	SCM card for temperature sensor (with spares)			
7	SCM card for Pyranometer (with spares)			
8	Data kit (with spares)- for data downloading & processing			
9	Memory devices (with spares)			
10	Other requirements (Infrastructure etc)			
	Sub Total			
	Contingency			
	Grand Total			

Name and Signature of Principal Investigator
With office seal

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Annexure-III

3) Cost of Mast, Operation & maintenance of the stations [This will be filled by the SNA]

Sl. No	Details	Unit price (Rs)	Quantity Required	Total Amount (Rs)
1	Tubular masts with all accessories including instrument support systems, cables, lightning kit, data logger housing, transportation, civil works and installation (To be considered as a package))			
2	TA/DA in connection with site inspection/civil works/ installation/memory device collection/dismantling			
3	Cost of battery			
4	Watch & ward			
5	Lowering& hauling up of mast for rectification of defects during course of data collection			
6	Dismantling of the mast at the end of data collection and transportation to another location			
7	Fencing			
8	Insurance of mast & instruments			
9	Other requirements (reconditioning of available mast, procurement of hardware's for the utilization of available mast etc)			
	Sub total			
	Contingency			
	Grand Total			

Name and Signature of Principal Investigator
With office seal

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Annexure-IV

TIME SCHEDULE CHART FORMAT															
Project Name: National Wind Resource Assessment Programme 200_ - 200_															
Name of the SNA:															
SI No	Description	Months													
		1	2	3	4	5-10	11	12-16	17	18-22	23	24-27	28	29	30
1	Sanction / Order														
2	Receipt of advance														
3	Final Site Selection														
4	Procurement of Instrument/accs.														
5	Procurement of mast/accs.														
6	Completion of civil works														
7	Commissioning of Stations														
8	Chip Collection														
9	Inspection visit														
10	Submission of Interim report (CWET)														
11	Decommissioning of Stations														
12	Submission of final report (CWET)														

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GUIDELINES FOR SITE SELECTION

1.	The site can be in any orographical region – homogeneous or heterogeneous topography
2.	It should have open environment all around or at least to the sectors of prevailing wind direction so that the data collected will be representative of the area under consideration.
3.	The site should not be in forest area with very high roughness that retards wind. Also forest areas with open appearance that subsequently may not be available for power project should not be considered. However such areas in case available can be considered for assessment of the wind potential in the region as a whole for academic reason.
4.	Sites with enough area for commissioning of power projects of mw capacity needs to be given preference.
5.	In case of sites being selected in non-flat terrain, sites needs to be located in probable locations which have the advantages of accelerated flow due to the complexity of the region. The probable locations in such region could be ridges, hills, and mountains that are suitably oriented to the prevailing wind direction. Passes, gaps and valleys that can enhance winds also can be considered.
6.	Sites prone to environmental hazards such as frequent thunderstorms, severe icing and snow, floods, land slides, severe salt spray and areas of blowing dust, earth quake etc can be avoided to a certain extent if better alternatives are not available
7.	Areas of high turbulence, strong wind shear and extreme winds are to be considered with caution
8.	Easy accessibility to the site is an important criterion. In case a site offers good potential with considerable area availability but lacks accessibility in the beginning, this is to be considered as road formation at a later stage may be viable
9.	The area considered needs to be near a load Centre and have facility to evacuate power generated at a later stage with out much expense.
10	The area considered should not be very close to habitation to avoid flying objects causing damages to life and property when wind farms come up
11	Consideration of ecological indicators like the deformation of vegetation by winds in regions where there is no wind data available can be used to locate windy sites.
12.	Analysis of all available data of the region considered along with contour maps are to be studied to locate probable windy locations for detailed wind monitoring
13.	Feed back on the winds from the inhabitants of the region under consideration is also to considered before finalizing a site for wind monitoring

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STATEMENT OF EXPENDITURE

NAME OF THE ORGANISATION :

PROJECT TITLE :

STATUS AS ON 31.03.200_ :

Attach a status report separately

(Amount in Rs.)

Sanctioned budgeted outlay	Sl. No.	Item wise Budget Head	Total Expenditure
Unspent balance	1.		
	2.		
Less: Grants-in-aid utilized			
Balance of Grants-in-aid as on		Total	

**Principal Investigator
Name & Signature**

**Head (Finance)
Name & Signature**

**Director
Name & Signature**

(Office Seal)

Signature of Nominated Chartered Accountant of SNA with Name, Full Address & Seal

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UTILIZATION CERTIFICATE FOR THE FINANCIAL YEAR ENDING
31ST MARCH 200_

1.	Title of the Project – Scheme	(Central Financial Assistance)
2.	Name of the Organization	
3.	Principal Investigator	
4.	Ministry of New and Renewable Energy sanction no. and date	
5.	Amount brought forward from the previous financial year quoting CWET/ MNRE letter No. and date in which the authority to carry forward the said amount was given.	Rs.
6.	Amount received from CWET/MNRE during the financial year (please give no. & date of sanctions showing the amount paid	
7.	Refund to the CWET/Ministry	
8.	Total amount that was available for expenditure (excluding commitment) incurred during the financial year i.e. Sl. No. 8.	
9.	Actual expenditure (excluding commitment) incurred during the financial year	
10.	Unspent balance refunded, if any, (please give details of cheque no. etc.)	
11.	Balance amount available at the end of the financial year	
12.	Amount allowed to be carried forwarded to the next financial year vide their no.	

Date:

Principal Investigator
Name & Signature

Head (Finance)
Name & Signature

Director
Name & Signature

Signature of Nominated Chartered Accountant of SNA:.....

Name:

Full Address & Seal: