

**No. 23/1/2009/SWES
Government of India
Ministry of New and Renewable Energy
Small Wind Energy and Hybrid Systems Programme**

**Block No. 14, C.G.O. Complex,
Lodi Road, New Delhi- 110 001**

Dated: 16.04.2010

To
Head, State Nodal Department /
State Nodal Agencies (SNA's) /
Other concerned Implementing Agencies

Sub: Modified scheme for the programme on "Small Wind Energy and Hybrid Systems(SWES)" during 2010-11 and 2011-12– reg.

I am directed to convey the sanction of the President of India for implementation of the programme on "Small Wind Energy and Hybrid Systems" during the last two years of the 11th Plan i.e. years 2010-11 and 2011-12. The detailed guidelines for implementation of the programme are given as **Annexure - I.**

2.0 Objective

The objective of the programme on "Small Wind Energy and Hybrid Systems" is to develop technology and promote applications of water pumping windmills and aerogenerators/wind-solar hybrid systems.

3.0 Programme Activities

The programme will support the following activities:

- Financial support for setting up water pumping wind mills and aerogenerators/wind solar hybrid systems,
- Field trials & performance evaluation,
- Grid connected SWES on demonstration basis.
- Research & Development.

4.0 Implementation

4.1 Various activities of programme on "Small Wind Energy and Hybrid Systems" will be implemented in association with the State Nodal Agencies (SNAs), manufacturers of SWESs, R&D/ academic/ autonomous institutions, NGOs, Govt. undertakings, and user organizations. The programme on wind solar hybrid systems is also aimed to be implemented in market mode through active involvement of manufacturers of SWESs.

5.0 Targets

Following annual targets for the years 2010-11 and 2011-12 have been fixed:

5.1 Physical: Water pumping windmills – 25 nos.
Aerogenerator/wind-solar hybrid systems - 500 kW

5.2 Financial: Budget Estimate: Rs. 5.00 crores.

6.0 Central Financial Assistance (CFA) and Release of funds

Central Financial Assistance (CFA) will be provided under the programme as per details given in **Annexure - II** and funds will be released as per **Annexure - III**.

7.0 Monitoring Arrangements

- i) Monitoring of project implementation will be carried out through review meetings, field visits, etc. by MNRE.
- ii) Performance monitoring will also be carried out through SNAs and manufacturers. They are advised to set up suitable monitoring arrangements to closely monitor implementation of the programme, performance of the systems installed, and to send reports to MNRE, as per details given in para 13.0 of Annexure-I.
- iii) MNRE may also sponsor independent study on evaluation of the systems installed under the programme for which financial support may be provided on case to case basis from the budget allocation under the scheme .

8.0 Demonstration Projects in N-E, J&K areas

25 SWES projects will be taken up in special areas in N-E including Sikkim and J&K including Leh and Laddakh having capacity in the range of 10 kW on demonstration basis with higher financial support. If required, suitable consultant will be engaged for preparing Detailed Project Report for implementation of these projects.

9.0 Other Activities :

9.1 Various organizations will be involved in organizing awareness, training, demonstration, seminars/workshops survey/assessment studies, preparation of DPRs for mini-grid concept etc. Further, Ministry may also directly sponsor training & awareness programme through selected institutions.

9.2 GPRS/SCADA/Broad-band/other such technologies based system will be taken up for monitoring of the SWES systems on demonstration basis at five locations

9.3 Demonstration projects of SWES will be taken up in a grid-connected mode/mini-grid concept to understand the viability and technical constraints/remedial actions etc. of these systems in grid-connected mode.

10.0 The proposals for CFA will be considered based on technical viability and availability of funds within overall targets for the programme. The decision of the Secretary, MNRE will be final & binding in this regard.

This issues in exercise of the powers delegated to the Ministries and with the concurrence of IFD, MNRE vide their diary no. IFD-2390-09 dated 23.03.2010.

Yours faithfully,

-sd-

(Dilip Nigam)
Director

Copy for information and necessary action to:

1. The Principal Director of Audit, Scientific Departments, DGACR Building, I.P. Estate, New Delhi – 110 002.
2. Chief Executives/Directors of all the State Nodal Agencies/ Corporations/ other Organizations implementing the MNRE programme
3. All Regional Offices of the Ministry of New & Renewable Energy.
4. All the existing manufacturers of the SWESs
5. SPO to Secretary, MNRE
6. AS&FA /All Advisors/JS (GS)/JS(HK)
7. Dir (F)/Dir (DN)/Dir(GU)
8. Individual files of all implementing agencies
9. Sanction folder
10. Guard file

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(Dilip Nigam)
Director

Guidelines for Implementation of the Programme on “Small Wind Energy and Hybrid Systems”**1.0 System Applications**

The programme will support deployment of water pumping windmills (wind pumps) and small aerogenerators/ wind-solar hybrid systems for water pumping applications and generation of electricity in off-grid mode, respectively. Grid connected wind solar hybrid systems may also be taken up for demonstration purpose if state regulatory and other related issues are favorable. GPRS/ SCADA/ Broad – band/ other such technology based systems to be used for remote monitoring of SWES systems on demonstrations basis.

2.0 Eligible Users

All categories of users including individuals, farmers, NGOs, Central / State Government agencies, local bodies and Panchayats, Autonomous Institutions, Research Organizations, Cooperative Societies, Corporate Bodies, Business Establishments, Banks, etc. are eligible for having the systems installed for their use.

3.0 Technical Specifications**3.1 Water Pumping Windmills**

Broad technical specification and other details of the water pumping windmills being promoted under the programme are given below. However, other models can also be considered based on their quality and performance.

Designs/ models	Broad technical specifications	Estimated Water output versus head	Suitability
Direct drive windmill such as 12 PU 500 and similar other windmills	Rotor diameter – 5 m Nos. of blades – 12 Tower height – 7 m Pump diameter – 150 mm Cut in wind speed –10 km/hr Rated wind speed – 18 km/hr	8000 liters per hour at 7 meter head	For shallow water pumping upto 15 meter head
Gear type windmills	Rotor diameter – 3.3 m Nos. of blades – 18 Tower height – 10 m Pump diameter – 50-100 mm Cut in wind speed –9 km/hr Rated wind speed – 18 km/hr	1000 liters per hour at 20 meter head	For deep well pumping from 16 meter to 60 meter head
AV 55 Auroville direct drive windmills	Rotor diameter – 5.7 m Nos. of blades – 24 Tower height – 9-23 m Pump diameter – 64-160 mm Cut in wind speed –10 km/hr Rated wind speed – 18 km/hr	4000 liters per hour at 15 meter head	For shallow and deep well pumping upto 60 meter head

3.2 Aerogenerators

The rated capacity of individual aerogenerators covered under the programme will be up to a maximum of 100kW, however, MNRE support for installation of aerogenerators will be restricted to a maximum total capacity of 10 kW (project capacity). Both imported & indigenously manufactured/assembled aerogenerators are covered under the programme. The manufacturers will have to get their models empanelled with MNRE based on the testing/certification as per IEC 61400-2 and IEC 61400-12-1 for Design requirement and Power Performance and Safety function test as per the empanelment procedure evolved by the Centre for Wind Energy technology (C-WET), Chennai. A detailed empanelment procedure has been evolved by C-WET in consultation with all the stakeholders and is summarized at Para 6.2.

Only the MNRE empanelled models of the aerogenerators will be eligible for financial support under the scheme.

3.3 Hybrid Systems

Hybrid systems based on a combination of various renewable energy sources like wind and solar photovoltaic are covered under the scheme. The hybrid systems will be designed to meet the annual load requirement with optimum use of resources. The rated capacity of individual aerogenerator covered under the program will be upto a maximum of 100kW, however, MNRE support for installation of a Wind–Solar Hybrid system will be restricted to a maximum capacity of 50kW (system capacity). The wind component of the hybrid system has to be at least 60% of the total capacity. As mentioned above, only the MNRE empanelled models of the aerogenerators will be eligible to be used in Hybrid systems for financial support under the present scheme. The SPV modules to be deployed under the Programme should conform to the relevant IEC Standards. The SPV modules to be deployed under the Programme should conform to the relevant IEC Standards.

4.0 Site Selection

Selection of suitable sites for installation of small wind energy and hybrid systems will be the responsibility of the implementing agency i.e. manufacturers, State Nodal Agencies (SNA) or any other such agency. The broad guidelines for site selection are given below:

4.1 Water pumping windmills

- (i) The site should be free from the obstacles like tall trees, high buildings, electric transmission lines etc. within the radius of about 100 meters.
- (ii) The site should have annual average wind speed more than 10 kmph.
- (iii) The designs/ models of water pumping windmills should be selected in accordance with their suitability for water table depths prevailing at the sites, as given in para 3.0 of technical specification of the windmills.
- (iv) The foundations should be designed and constructed by taking into consideration the soil bearing capacity of the site.
- (v) Recharging capacity of bore well or open well should be around 30 m³/hr.
- (vi) The windmills should be preferably installed in clusters to enable effective repair and maintenance services and to have better demonstration effect.

- (vii) The provision of a storage tank of suitable capacity should be mandatory to ensure supply of water during non-windy periods.

4.2 Aerogenerators/ Wind-Solar Hybrid Systems

- (i) The site should be free from the obstacles like tall trees, high buildings, electric transmission lines etc. within the radius of about 100 meters.
- (ii) The site for installation of aerogenerators should, preferably, have annual average wind speed of about 15 kmph (4.17 m/s) or above, at 20 m height. The wind speed at a particular site has to be obtained from C-WET or any other agency using actual wind data collected by C-WET or by using standard software programme like Wind Atlas etc. The user agency/manufacturer has to provide latitude-longitude of the site and other parameters as needed for this purpose to the verifying agency.
- (iii) Wind and solar resources should be preferably of complimentary nature.
- (iv) The foundations should be designed and constructed by taking into consideration the soil bearing capacity of the site.
- (v) Generally aerogenerators should be avoided to be installed on the roof of a building and if it is installed on the roof of any building, the load bearing capacity, clearance/obstruction from the nearby buildings, electrical wires etc. and other safety related aspects should be carefully examined by technical personnel.

5.0 Eligible Manufacturers/ Suppliers

5.1 Water pumping windmills

The manufacturers/suppliers whose windmills conform to the broad technical specifications, which have already been installed under this Ministry's programme, are eligible to manufacturer, supply and install the windmills. A list of such manufacturers is given in **Annexure IV**

5.2 Aerogenerators/ Wind-Solar Hybrid Systems

Ministry has so far not been insisting for testing and certification of the aerogenerators. The present procedure for empanelment involves furnishing of information by the manufacturers about their company etc. through SNAs. It has been felt that the quality of systems being manufactured, supplied and installed under the MNRE programme is not of very high standards and, therefore, a new method has been evolved for empanelment of manufacturers/suppliers having quality products with Type Testing reports. a list of such eligible manufacture will be issued by the Ministry from time to time.

6.0 Empanelment of manufacturers

6.1 Water Pumping Windmills

The interested manufacturers/suppliers of water pumping windmills may provide detailed information about their firm, product and test report by independent test agency, confirming that the proposed design of the systems is in accordance with the broad technical specifications and performance characteristic, being claimed by themselves. They may submit their proposals to MNRE through SNAs providing all relevant details, as per the format given in **Annexure- V** for empanelment with MNRE.

6.2 Aerogenerators/Wind-Solar Hybrid Systems

C-WET in consultation with manufacturers has devised a scheme for empanelment, which seeks information from manufacturers on registration certificate of company showing legal identity of the company; adequate manufacturing facility; ISO 9001 requirements; simplified technical specification of the turbine; product manual covering details of installation, maintenance, routine inspection and personnel safety etc.; minimum simplified design documents; detailed electrical circuit diagrams; details of number of installations and its performance as per the formats provided by C-WET. The manufactures have to obtain a valid Type Test report for every model. If a valid Type Test Report is not already available with the manufacturer, they will enter into an agreement for Type Testing with C-WET or any other foreign/Indian recognized laboratory as per the IEC stipulations. In case the manufacture already has Type Test report form a recognized laboratory other than C-WET, it need to be submitted to C-WET & get it endorsed by them.

Based on the evaluation of the above details, the particular model of the manufacturer will be recommended by C-WET for empanelment. In case a valid Type Test report is not already available, a provisional empanelment will be granted initially for a period of one year, subject to the results of the Type Testing of machine by C-WET. Projects having systems from empanelled manufactures only will be eligible. Ministry will issue such list from time to time.

The manufacturers are required to contact C-WET for empanelment under intimation to the Ministry.

6.2.1 Dealers of the manufacturers

The empanelled manufacturers may also have their dealers. The dealers will register themselves with the State Nodal Agency (SNA) of the state, they want to operate. They may be registered with more than one state. The dealership letter from the main manufacturer with all its terms and conditions will be a pre-requisite. The SNAs may evolve a system to register a dealer of an MNRE empanelled manufacturer based on the Guidelines mentioned above. The dealers must have necessary capability to take-up the operation, repairs & maintenance of the system. In this case, the operation, repair and maintenance will be the responsibility of main manufacturer through their dealer. The main manufacturer will submit an undertaking in this regard. MNRE empanelled manufacturers will also be deemed registered with all SNAs to operate in a particular state. Ministry will issue such list from time to time.

7.0 Demonstration Projects in N-E, J&K areas

There is lot of potential and utility of Wind-solar hybrid systems in remote locations such as districts on international borders, North-Eastern States including Sikkim, Jammu & Kashmir including Leh & Laddakh at various institutions/organizations and defence/para-military establishments in these areas. 25 SWES projects will be taken up in these areas, as special projects, having capacity in the range of 10 kW on demonstration basis with Central Financial Assistance @ Rs. 2.25 lakh / kW. The balance cost including the cost towards transportation, installation, commissioning and distribution lines would be borne by the concerned beneficiary organizations. If required, suitable Consultants may be engaged for preparing Detailed Project Report for implementation of these projects.

8.0 Other Activities :

8.1 The SNAs, NGOs, technical organizations, Govt. undertakings, manufacturers and user organizations etc. will be involved in organizing awareness, training, demonstration, seminars/workshops survey/assessment studies, preparation of DPRs for mini-grid concept etc. Proposals in this regard will be considered for financial support on case to case basis. Further, Ministry may also directly sponsor training & awareness programme through selected institutions.

On-line performance monitoring system

8.2 As per the existing provisions, the project beneficiaries and SNAs are to submit a periodic performance report of the systems. However it is not being received very regularly. It is desirable that GPRS or SCADA or Broad-band based system may be incorporated in every SWES system to access the generation data through PC or even on a Mobile phone. 5 existing SWES systems may be provided with such systems on demonstration basis with MNRE support. The CFA for this purpose may be decided on case to case basis.

Grid-connected SWES systems

8.3 It has been decided to take up demonstration projects of SWES in a grid-connected/mini-grid concept to understand the viability and technical constraints/remedial actions etc. of these systems in grid-connected mode. MNRE support for such projects may be as per the provisions of the Technology Demonstration Scheme under the R&D Division of the Ministry (50% cost sharing basis). A monitoring system as mentioned above may also be a part of grid-connected systems.

9.0 Warranty

- (i) A warranty for a minimum period of two years from the date of installation of the wind pumps, small aerogenerator systems and hybrid systems will be provided by their respective manufacturers to the user/SNAs against any manufacturing defect and deficiencies in the design, engineering and materials of the components used in the system.
- (ii) The warranty will be applicable on entire system including batteries, electronics, mechanical supports etc.
- (iii) Solar PV modules used in the hybrid system will be warranted for a period of at least 10 years from the date of installation.
- (iv) The beneficiary will be responsible for periodical cleaning of solar panels, water topping of batteries, and cleaning of dusting of all electronic components and cabling etc.

10.0 Repairs and Maintenance

- (i) The manufacturers/suppliers are required to provide “on-site” training to the users in O&M of the systems, and equip them to attend to the minor repair themselves. (A certificate from the beneficiary/SNA/ implementing agency to this effect shall be provided by the supplier/manufacturer along with the commissioning/completion report to the ministry)

- (ii) The beneficiary will award annual maintenance contract (AMC) of at least 3 years, after the expiry of the warranty period. It shall be mandatory on the part of supplier/manufacturer to provide AMC for at least 3 years after warranty period at a reasonable cost to the beneficiary.
- (iii) Necessary maintenance spares for 3 years trouble-free operation will be supplied by the respective manufacturers/ suppliers of the systems.

11.0 Scope of Supply

11.1 Water Pumping Windmills (Wind Pumps)

The scope of supply will cover the design, manufacture, testing, supply, transportation, installation commissioning and performance monitoring of the complete water pumping windmills (comprising rotor, transmission, security mechanism, pump, tower, GI delivery pipe of suitable diameter and length, mandatory spares for three years trouble free operation, as identified by the manufacturer before supply) and user's tools & tackles kit. The manufacturer/suppliers of water pumping windmills will also supply a copy of a comprehensive manual to the user providing information on O&M and the recommended Dos and Don'ts for trouble free operation of the system.

11.2 Aerogenerators and Wind-Solar Hybrid Systems

The scope of supply of aerogenerators/wind-solar hybrid systems will cover the design of system-configuration, manufacture/supply, testing, transportation, installation, commissioning and performance monitoring of the complete system comprising aerogenerator, SPV modules, batteries, inverters, control systems, tower, cables, necessary instrumentation for monitoring of the field performance etc. The manufacturers/supplier will also supply spares for three year trouble free operation, user's tools & tackles kit, and a copy of comprehensive users manual providing information on performance data, power curve, O&M and recommended Dos and Don'ts for trouble free operation of the system. It has been noted that the suppliers do not take care of repair/maintenance of the systems. Both the parties should, therefore, make necessary provision in the Contract at the time of award of work so that trouble free operation of the system is ensured. The critical spare parts like inverter card etc. must be supplied by manufacture at the time of commissioning so that uninterrupted functioning of the system takes place.

Installation of Energy Meters

It has been noted that energy meter is installed only for the energy consumed from the systems by the load i.e. after the storage system(Battery). This does not give the information about the total energy generated by the system. It is therefore decided that one additional energy meter will be installed which will measure the total energy generated by the system.

Unique Identification Number (UIN)

It has been decided to introduce a Unique Identification Number (UIN) to be put on every aerogenerator. Every manufacturer will have a UIN for every aerogenerator having

five alphabets and ten digits (e.g. UD/MAH/0001/241209) as per following structure to be issued to every aerogenerator and clearly and visibly displayed by painting it vertically on the pole of the aerogenerator.

- First two alphabets : Indicating manufacturer's name (viz. UD,UE)
- Next three alphabets : Indicating State's name where it is installed (viz. Mah, Goa)
- Next four digits : Indicating serial number of the machine supplied by the manufacturer starting with 0001 (to begin with effect from issue of this scheme)
- Next six digits : Indicating date of commissioning (day-month- year)

12.0 Submission of Proposals and Project Implementation

12.1 Water Pumping Windmills (Wind Pumps)

- (i) Proposals for installation of water pumping windmills will be taken up on project-to-project basis received from State Nodal Agencies (SNAs).
- (ii) Proposals must accompany commitment of SNAs / each beneficiary for meeting the remaining part of the project cost other than MNRE's CFA.
- (iii)** The SNAs will submit proposals as per the format given at **Annexure - VI**
- (iv) After sanction of the projects by MNRE, the SNAs will complete the process of awarding the work for manufacture, supply, installation and post installation services of water pumping windmills within 4 months from the date of sanction, and submit the copy of work order (s) and acceptance of manufacturer (s) to MNRE for release of first installment of CFA.
- (v) During project implementation, the SNAs will ensure, through regular field visits, physical verification, and enforcing such terms and conditions that the quality-standards are maintained by the manufacturers/suppliers during manufacturing, supply, installation and handing over of the system to beneficiaries.
- (vi) The SNAs will obtain feedback on performance/functioning of windmills regularly through their field visits, etc., and send the same to MNRE quarterly.
- (vii) The SNAs will arrange for immediate repair of the system, in the event of its major break down, through manufacturers/ suppliers.
- (viii) The SNAs will ensure that the project is completed with in 9 months after placing the work order (s) and acceptance by supplier (s).

12.2 Aerogenerators and Wind-Solar Hybrid Systems

- (i) SNAs/manufacturers/beneficiaries may send bundled proposals alongwith Feasibility reports for deployment of the system in a "Project Mode" for different users such as Tribal Hostels, Primary Health Care Centers, Nursing homes Police Communication Centers, Anganwadis, Literacy Centers, Panchayati Raj Institutions including private individuals & corporate sector etc. In a bundled proposal, separate feasibility reports have to be submitted for separate projects/sites.
- (ii) Proposals must accompany a written commitment of SNAs /other government bodies/ each beneficiary for meeting the remaining part of the project cost other than MNRE's CFA.
- (iii) The manufacturers/SNAs will get prepared a feasibility report providing information as per **Annexure – VII** and after verifying the suitability of the site

and system based on site visits considering the load requirements. The manufacturers/SNAs will submit the proposals to MNRE along with feasibility report.

- (iv) The feasibility report will provide all technical details of aerogenerator, solar PV modules, batteries, inverter, control system, cables and tower etc. and other components covered under the project. In the case of battery storage, only tubular plate lead acid batteries will be permitted.
- (v) There could be following modes of submitting the proposal to MNRE :

(A) Implementation through Manufacturers

The manufacturers will identify suitable beneficiaries, prepare a bundled proposal having a minimum cumulative capacity of 30 kW and a minimum number of 3 systems and submit to MNRE. Proposal with higher capacity (30 kW or more) with single beneficiary can also be considered. After examining the proposal, the Ministry will issue an “in principle approval” indicating the amount of subsidy for the project. The beneficiary in this route will necessarily have to go for financing through banks/financial institutions for meeting full/part of the cost of the project. The eligible subsidy would be released after the concerned manufacturer obtains the necessary documents regarding project completion report as per **Annexure VIII** and Project Monitoring report for at least three months period of the system as per the format given at **Annexure IX** from the Bank/Financial Institution and submits the same to the Ministry. The manufacturer will also ensure submission of quarterly monitoring reports as per the **Annexure IX** for at least one year of the operation.

(B) Implementation through SNAs

The State Nodal Agencies could also submit proposals on a project mode to the Ministry (bundled proposal having a minimum cumulative capacity of 30 kW and a minimum number of 3 systems; proposal with higher capacity (30 kW or more) with single beneficiary can also be considered). In this case also, the Ministry would issue an approval in principle for the eligible subsidy. The eligible subsidy will be released to the SNA for onward transmission to the concerned beneficiary after commissioning of the system and receipt of the prescribed documents regarding project completion report as per Annexure VIII and Project Monitoring report for at least three months period of the system as per the format given at Annexure IX . The SNA will also ensure submission of quarterly monitoring reports as per the Annexure IX for at least one year of the operation. The stipulation contained in the earlier scheme to provide work order by the State Nodal Agencies based on a competitive tender procedure will not be required as the beneficiaries/beneficiary institutions will be free to select the system from the list of the empanelled manufacturers following their own purchase procedure.

An administrative charges @ 2% of CFA will be provided to SNAs at the time of final release.

(C) The manufacturers may also bundle the proposals for beneficiaries, who do not wish to avail the Bank Loan and submit to Ministry through SNAs (with an advance copy to Ministry). The SNAs may forward the same to Ministry. The Ministry may consider issuing an approval in principle for the proposal, for such cases even if the SNA does not forward it after a reasonable time. The subsidy will be released to the Bank Account of the beneficiary after commissioning of the system and based on documents regarding project completion report as per **Annexure VIII** and Project Monitoring report for at least three months period of the system as per the format given at **Annexure IX** by a Designated Agency (DA) including the SNAs. The Ministry will empanel the Designated Agency in due course and suitable service charges will be paid to the services of such DA. The DA will also ensure submission of quarterly monitoring reports as per the **Annexure IX** for at least one year of the operation.

(D) Ministry may also consider the proposals in “Project Mode” directly from Govt. organizations based on the above mentioned modalities.

- (vi) In all above cases, the manufacturers/SNAs/beneficiary **will complete the project within one year** after in principle sanction of the project is issued by MNRE.

13.0 Submission of quarterly monitoring reports, completion reports, audited Statements of Accounts

- (i) After completion of the projects, the SNAs/manufacturers/DA/other implementing agency are required to submit project monitoring reports to MNRE as per the format given in **Annexure IX** on quarterly basis for at least one year. The manufacturers/SNAs/DAs/other implementing agencies are also requested to inform MNRE about difficulties, if any, faced by them and the proposed corrective actions.
- (ii) The SNAs/manufacturers will also submit an audited statement of expenditure on entire project cost by the user as per format given in **Annexure - XI**.

14.0 Field Trials and Performance Evaluation of New designs/developments and proto types

Field trials and performance evaluation of new designs of wind pumps, small aerogenerator systems, hybrid systems and their sub systems, parts, components used in such systems and proto-types when developed under a R&D project or independently developed by a manufacturer through its own R&D efforts will be fully supported financially by the Ministry. Field trials and evaluation of such new developments will be fully supported by the Ministry in a project mode meeting all costs relevant to the project. In case of systems/components developed by industry through their own R&D, the Ministry will meet the cost of the small wind energy system and cost of the relevant monitoring equipment and other expenses relating to the monitoring of the system. The remaining cost of the project will be met by the user organization. A maximum of 5 units of a system/sub system/ proto type may be tried out under this arrangement in a year.

Pattern of Central Financial Assistance (CFA)

1. Water Pumping Windmills (Wind Pumps)

- (a) The MNRE will meet up to 50% of the ex-works cost of water pumping windmills, except for unelectrified islands & North eastern States including Sikkim for which up to 90% of the ex-works cost, subject to the following upper ceilings for each approved design of the windmill (wind pump):

Type of Windmill	Maximum MNRE support	
	General Area	Island
(1) Direct drive gear-less windmills such as Modified 12 PU 500 and similar other Windmills	Rs.20,000/-	Rs.30,000/-
(2) Gear type windmill	Rs.30,000/-	Rs.50,000/-
(3) AV55 Auroville type windmill	Rs.45,000/-	Rs.80,000/-

- (b) The Ministry will determine the CFA for other designs of water pumping windmills at the time of evaluation of the performance of the new model/design.

- (c) The MNRE will provide administrative charges of 2,500 per windmill (wind pump) to the state agency.

2. Aerogenerators/Wind-Solar Hybrid Systems

- (a) The MNRE support for aerogenerators/wind solar hybrid systems will be provided on per kW basis. The support will be provided on the basis of type of users. Following two slabs of CFA will be available:

Govt./Public/Charitable, R&D, academic and other non-profit making institutions	Rs 1.50 Lakh per kW
Other beneficiaries not covered above (Individuals and private/ corporate sector will come under this category)	Rs 1.00 Lakh per kW

- (b) The remaining cost of the system and all other expenditure related to packing & forwarding, transportation, installation and commissioning of the system will be a part of the system and will be met by the beneficiary of the system.
- (c) In case of installation of systems to be done through SNAs, an administrative charge @ 2% of CFA will be provided to SNAs at the time of final release.

3. Other Activities

- a) For the purpose of organizing awareness, training, demonstration, seminars/workshops survey/assessment studies,

preparation of DPRs for mini-grid concept etc, proposals for financial support will be considered on case to case basis.

- b) Financial support for 5 demonstration projects for monitoring of SWES with a GPRS/SCADA/ Broad-band/other such technologies based system may be provided on case to case basis.
- c) Demonstration projects of SWES in a grid-connected mode (mini-grid) will be taken up. MNRE support for such projects may be as per the provisions of the Technology Demonstration Scheme under the R&D division of the Ministry (50% cost sharing basis).
- d) Financial support will also be provided to take up R&D projects incorporating the possible improvements in the electronics and other components of wind solar hybrid system, particularly to make such systems workable in extreme and hazardous conditions.

Release of Central Financial Assistance

I. Water pumping windmills

- (a) 80% of the CFA, and 50% of service charges to SNAs on receipt of a copy of work order (s) along with its acceptance by the supplier (s) of the system (s), provided Utilization Certificates for the earlier years/releases have been submitted to the Ministry.
- (b) Remaining 20% of the CFA, and 50% of the service charges on physical verification of installation and commissioning of the systems by the SNAs as per DPR norms/approved project proposal, and submission of Project completion report; Utilization Certificates (**Annexure – X**), audited statement of expenditure **Annexure-XI**.
- (c) The SNAs will ensure that they have already sent the Utilization Certificates and audited consolidated statement of expenditure for the programme of previous years for settlement of accounts, before sending the request for release of the 20% CFA of the projects as mentioned in point '**(b)**' above. The MNRE will consider release of the funds only after receipt the above documents relating to the projects of the previous years.

II. Aerogenerator/Wind-Solar Hybrid Systems

- (a) No release will be made alongwith the in principle approval.
- (b) 100% CFA will be released after receipt of the required documents including project completion/commissioning certificate, performance monitoring certificate, audited statement of expenditure for the entire expenditure on the project as per the format given as **Annexure XI**.

III. Other activities

For all other activities under the programme, release pattern will be decided on case to case basis.

Annexure IV**List of Eligible Manufacturers for Supply, Installation & Commissioning of Water Pumping Windmills (Wind Pumps)**

Sl. No.	Name & address	Tel No.	Fax No.	Type of windmill
1	Kamal Engineering Works, Bhatt Market Block 'C', Bharopar, Ramchandrapur, Biharsharif, Nalanda, Bihar			Modified 12 PU 500
2	Nalanda Engineering Works, Bhainsasoor, Ranchi Road, Biharsharif, Nalanda, Bihar			Modified 12 PU 500
3	Sarvodaya Engineering Works, Industrial Estate, Ramchandrapur, Opp. Ajanta Cinema, Biharsharif – 803 101 (Nalanda), Bihar	06112 - 222506		Modified 12 PU 500
4	Vikas Engineering Works, At & P.O. Mirchaiganj, Nalanda, Bihar			Modified 12 PU 500
5	Aureka, Aspiration Auroville, 605 101, Tamilnadu.	0413 – 2622278, 2622134, 2622651 aureka@auroville.org.in	0413 - 2622274	AV 55 Auroville
6	Amey Industries, W-77, MIDC, Additional Industrial Area, Ambad – 422 010	0253 – 2381912,6565903 mukundamey@rediffmail.com	0253-2381912 2	Gear type
7	Om Engineering Works, Near Ganga Gate, Near Ambaji Temple, At & P.O. Anjar, District Kutch, Gujarat.			Gear type
8	Prototype Development Training Centre, Aji Industrial Estate, Bhavnagar Road, Rajkot, Gujarat.			Gear type
9	Rural Engineering School, At: Rojmal, Tal: Gadhada (Swa.) , District Bhavnagar – 364 750, Gujarat	02847 – 294127 ruralschool@rediffmail.com	02847 - 253535	Gear type
10	Scientific Instrument Co. Ltd. B-1 Site 2, Loni Road, Mohan Nagar, Ghaziabad – 201 007.	2732644 2732954 sicogzb@del3.vsnl.net.in	2736235	Gear type

11	Wind Fab, 447 Avanashi Road, Peelamedu, Coimbatore-641004, Tamilnadu	0422 – 2572079		Gear type
12	Shreeji Agro Industries, At Post: Ramlechi, Ta. Talala (Gir) – 362 150 zdist. Junagadh, Gujarat	02877-222608 09925729186 (M) shreejiurja@yahoo.co.in		Gear type

Format for empanelment of the manufacturers of water pumping windmills in MNRE

The manufacturers will submit following information for empanelment :

- I. Technical specifications of water pumping windmill/ aerogenerator with testing report from independent testing agency/ foreign principals.
- II. Performance characteristics of water pumping windmill under different total pumping heads and varying wind speeds
- III. Performance curve of aerogenerator for its operating range of wind speed.
- IV. In case of technology transfer from abroad, copies of agreement/MOU entered into with foreign company / collaborator.
- V. Cost details of windmills/ aerogenerators.
- VI. Copy of registration as SSI unit/ SIA registration.
- VII. Details of infrastructure/ manufacturing/ assembly/ testing facilities/ marketing network/ arrangement for after sales support available with the company. Company to provide warranty details for the product.
- VIII. Copies of support documents indicating performance of the products.
- IX. Recommendation of state nodal agency on the following:
 - a) Infrastructure facilities available with the company.
 - b) Technical capabilities of the company.
 - c) Manufacturing / assembling/ testing facilities available with the company.
 - d) Marketing network of the company.
 - e) After sales support mechanism adopted by the company.
 - f) Over-all comment about accepting/ rejecting the proposal of the company.

Format for submission of project proposals by SNAs (for windmills)

1. Name of State Nodal Agency:
2. No. of windmills proposed to be installed:
3. Type of windmills:
4. Site identification/selection: As per the Proforma enclosed (*).
5. Project cost:
 - (ii) Total estimated ex-works cost of the windmills:
 - (iii) Total estimated ex-works cost of the windmills including transportation, installation, foundation, storage tank, insurance, etc.:
6. Cost sharing arrangements:
 - (i) Central Financial Assistance (CFA):
 - (ii) State Government share:
 - (iii) Beneficiaries' share:
7. Proposed Methodology of implementation:
8. Project duration (maximum 9 months):
9. Installation in cluster/dispersed mode:
10. Monitoring arrangements:
11. Post installation services/repair & maintenance arrangements proposed:

(*) Proforma for site selection

Sl. No.	Name of beneficiary and site address	Amount of Beneficiaries contribution to be deposited with SNA	Water table depth	Type of water source (open/borewell/pond)	Annual average wind speed	Purpose of windmills (drinking water, minor irrigation, salt farming, etc.)	Type of windmill proposed	Provision of storage tank and capacity	Estimated cost of windmill	
									Ex-work cost	Total cost

**Proforma for Feasibility Report for Aerogenerator/
Wind Solar Hybrid Systems**

1. Title of the project and the details of the project site:

- Name of the organization:
- Address of site with Taluk/ district etc.
- Name of the contact person with telephone number, fax no. email etc.
- Type of establishment : Please provide brief details of the establishment.
- Category of the beneficiary : Profit making/ Not profit making

2. Wind and Solar resources data of the identified site:

Month	Air temperature	Daily solar radiation horizontal	Atmospheric pressure	Wind speed *	Heating degree-days	Cooling degree-days
	°C	KWh/m ² /d	kPa	M/s	°C-d	°C-d
January						
February						
March						
April						
May						
June						
July						
August						
September						
October						
November						
December						
Annual						
Measured at (M agl)						

* Please enclose the supporting details verifying the wind data (report by C-WET/ other institution)

3. Estimated Energy Requirement at the proposed site:

TYPE OF LOAD	USAGE TIME Hrs.	QTY.	PER DAY ENERGY REQUIREMENT (kWh)

4. System Design Details.

Battery Bank Total Energy Consumption /day Voltage configuration Power factor	
--	--

Battery efficiency Depth of discharge Battery capacity required	
Inverter Total Load Power factor Inverter efficiency Inverter capacity required	

5. Final design configuration of the _____ kW capacity wind-solar hybrid system:

a) Number, Capacity, specification and power curve of Aerogenerator proposed:

Aerogenerator Capacity Make & Model No. Type Test report available: Yes/No Does this model appear in MNRE empanel: Yes/No Rated wind speed Peak power Start generating wind speed Survival wind speed Propeller diameter Propeller material & No. of blades Generator Weight Voltage controller Over speed protection No. of machines	
--	--

b) Number & specification of SPV Modules

SPV Modules Capacity Make Peak power per module Weight Dimension W x H x D Temperature Wind Load Humidity No. of SPV Modules	
---	--

c) Details of various equipment/ sub-systems

- d) Monitoring of system and spares.**
6. Methodology of project implementation.

7. Details of the estimated cost of the system:

Sl. No.	Item	Cost (Rs. in lakhs)
1.	Aerogenerators	
2.	Photovoltaic Panels	
3.	Cabling from SPV module to control center and cabling from Aerogenerator to control center	
4.	Invertors *** KVS	
5.	Tower & Erection material	
6.	Batteries **v/*** Ah	
7.	Photovoltaic Panels structure with fencing	
8.	Instrumentation (ammeter, voltmeter, energy meter, wind and solar monitoring equipment, Ah meter, battery level indicator)	
9.	Wind charge controller and solar photovoltaic charge controller	
10.	Ex-Work Cost Total (total of 1 to 9)	
11.	Transportation	
12.	System, Design, Erection, Testing, Commissioning	
13.	Civil Work	
14.	Total (total of 11 to 13)	
15.	Grand Total (10+14)	

8. Proposed Sources of financial assistance.

Sl. No.	Details	Cost (Rs. in lakhs)
(i)	MNRE support	
(i)	State govt subsidy, if any*	
(ii)	User share*	
	Total	

* Please enclose the necessary letters from the supporting agency/user

10. Project Implementation Schedule.

The project implementation schedule to be given indicating different stages of implementation with dates. The project has to be completed within one year from date of sanction of the project by MNRE.

ANNEXURE-VIII

PROFORMA FOR PROJECT COMPLETION REPORT OF AEROGENERATOR/WIND-SOLAR HYBRID SYSTEM

1.	System Details	
	(a) MNRE Sanction No. and date:	
	(b) Capacity of the system (kW) Aerogenerator Component (kW) SPV Component (kW)	
	c) Name of Manufacturer/ Supplier	
	d) Commissioning Date	
	e) System's design (line sketch)	
	f) System's photograph (at least 5)	
2.	Estimated Energy Requirement	
	a) Type of Load	
	b) Usage time (Hours)	
	c) Quantity	
	d) Per Day Energy Requirement (kWh)	
3.	Technical Details of the System Installed	
	a) Aerogenerator Total capacity Capacity of single machine No. of machines Make & Model No. MNRE's reference number/ date of issue of inclusion in MNRE list Rated wind speed Rated Peak power UIN of each aerogenerator Generator Specification Voltage controller Over speed protection	
	b) SPV Modules Total capacity Capacity of each Module Nos. of SPV Modules Make Peak power per module Weight Dimension W x H x D Temperature Wind Load	
	c) Number and Place of Installation of Energy Meters	
	d) Battery Bank Total Energy Consumption /day Voltage configuration Power factor Battery efficiency Depth of discharge	

	Battery capacity required	
	e) Inverter Total Load Power factor Inverter efficiency Inverter capacity required	
	f) Balance of System (give details)	
	g) Details of spares provided	
4.	Training Details	
	a) Whether training provided by manufacturer/ Supplier to the user	Yes/No.
	b) Whether documents provided by manufacturer / Supplier to the user	Yes/No.
	c) Whether system is properly maintained by the user	Yes/No.
	d) Overall satisfaction of the user	

Signature _____
Name _____
Designation _____
Head of State Nodal Agency/ Manufacture
with seal
Date _____

Signature _____
Name _____
Designation _____
User Agency/ Beneficiary.
Date _____

Signature _____
Name _____
Designation _____
Bank or Financial Institution/Designated Agency
for monitoring with Seal
Date-----

ANNEXURE-IX

PROFORMA FOR PROJECT MONITORING REPORT OF AEROGENERATOR/WIND-SOLAR HYBRID SYSTEM

1.	System Details					
	(a) MNRE Sanction No. and date:					
	(b) * Total Capacity of the system (kW) * Nos/unit capacity of aerogenerator * Total Aerogenerator Capacity (kW) * UINs of aerogenerator * Nos of module/unit capacity of a module * Total SPV Capacity (kW)					
	c) Name of Manufacturer/ Supplier					
	d) Commissioning Date					
Performance Details						
Month/Year	Aerogenerator		SPV		Total No. of Units (kWh) generated	Total No. of Units (kWh) consumed
	Average Wind Speed	No. of Units (KWh) generated	Average solar insolation	No. of Units (KWh) generated		
Are all the aerogenerators/SPV modules are functioning ?						
Whether system is properly maintained by the user						
Overall satisfaction of the user						
Satisfaction of Monitoring Team about the performance						
Any other information to be provided						

Signature _____
 Name _____
 Designation _____
 Head of State Nodal Agency/ Manufacture
 with seal
 Date _____

Signature _____
 Name _____
 Designation _____
 User Agency/ Beneficiary.
 Date _____

Signature _____
 Name _____
 Designation _____
 Bank or Financial Institution/Designated Agency
 for monitoring with Seal
 Date-----

GRF 19-A
[See Rule 212(1)]

Format of Utilization Certificate

Sl. No.	Letter No. _____ and date _____	Amount
	Total	

Certified that out of Rs. _____ of Grants-in-Aid sanctioned during the year _____ in favour of (Name of SNA) under this Ministry Department letter No. given in the margin and Rs. _____ on account of unspent balance of the previous year, a sum of Rs. _____ has been utilized for the purpose of (programmes Name) for which it was sanctioned and that the balance of Rs. _____ Remain un-utilized at the end of the year has been surrender to Government (Vide No.... dated...)/ will be adjusted towards the Grants-in-aid payable during the next year.

2. Certified that I have satisfied myself that the conditions on which the Grants-in-aid was sanctioned have been duly fulfilled/ are being fulfilled and that I have exercised the following checks to see that the money was actually utilized for the purpose for which it was sanctioned.

Kinds of checks exercised.

- 1.
- 2.
- 3.
- 4.

Signature:

Name :

Designation of the head of the institutuion:

Dated:

Proforma for submitting the audited Statement of Expenditure

Statement of Expenditure

(on the letter head of the Chartered accountant indicating his registration number)

MNRE Sanction No. dated

NAME OF THE PROJECT SITE :

System Details , capacity etc. :

Break-up of the total Expenditure on the project is as under:

Sl. No.	Item	Expenditure (Rs.)
Total		

This is to certify that a total expenditure of Rs.....has been made/is to be made on the project, out of which Rs.....has already been released to the manufacturer/supplier and remaining Rs.....will be released after receipt of the MNRE support. (enclose supporting documents).

Name and Signature of the Chartered Accountant with his seal