

No.23/22/2007-SWES
Ministry of New and Renewable Energy
Wind & Biomass Energy Group
(Small Wind Energy & Hybrid Systems Division)

Block No.14, CGO Complex,
Lodi Road, New Delhi – 110 003

Dated: 24/04/2007

To,

**Head,
State Nodal Agencies/other implementing agencies**

Subject: Sanction of continuation of the “Small Wind Energy & Hybrid Systems Programme 2005-06” during 2007-08- reg.

Sir,

Sanction of the President is hereby conveyed for continuation of the “Small Wind Energy & Hybrid Systems Programme” of the Ministry of New and Renewable Energy during 2007-08.

2. The above programme/scheme will be implemented during 2007-08 as per the same funding norms/guidelines and other provisions applicable during 2006-07 as announced vide sanction order No.22/01/2005-06-SWES dated 30/08/2005 and continuation order issued vide No.1/1/2005-P&C dated 26/05/2006 and until such time the same is superseded by fresh/new programmes/schemes which are required to be formulated in alignment with 11th Plan proposals.

3. Release of subsidy/ CFA sanctioned during 2007-08 on the basis of provisions of programmes / schemes of 2006-07 will continue to be governed by the said provisions even after the same is superseded by fresh/new programmes/schemes. Some of these schemes are likely to be replaced by new programmes/schemes during the course of the year to be implemented during the 11th Plan period. As and when such new schemes are approved and conveyed, the old schemes would be replaced and the new norms would apply. Till such time, the existing schemes would continue to be implemented.

4. All State Nodal Agencies (SNAs) are requested to take up schemes for implementation as per the guidelines of 2006-07 till further communication.

5. This issues with the approval of the Minister (NRE), as per the Planning and Coordination Division of MNRE OM No.1/22/2006-P&C dated 23/04/2007.

Yours faithfully,

(Dr. R. Raman)

Director

Copy to:

1. All States/UT Implementing Departments/Agencies
2. SS&FA
3. Principal Adviser & Special Secretary
4. Joint Secretary
5. All Advisers
6. MD, IREDA
7. All Directors
8. Director (Finance)
9. Deputy Controller of Accounts
10. Senior PPS to Secretary, MNRE
11. PS to Minister
12. Cash Section
13. IFD, MNRE
14. All MNRE Regional Offices
15. Sanction Folder

(Dr. R. Raman)
Director

No.22/01/2005-06/SWES
Government of India
Ministry of Non-Conventional Energy Sources
Wind & Biomass Energy Group

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

Dated: 30.08.2005

The Pay and Accounts Officer,
Ministry of Non-Conventional Energy Sources,
New Delhi 110 003

**Sub: Programme on “Small Wind Energy and Hybrid Systems” during 2005-06 –
Sanction Order**

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 year 2005-06. The detailed guidelines for implementation of the programme are given in **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:

- i) Research and Development
- ii) Field trials and performance evaluation
- iii) Demonstration
- iv) Training and Awareness

4.0 Implementation

4.1 Various activities of programme on “Small Wind Energy and Hybrid Systems” will be implemented by the State Nodal Agencies (SNAs), R&D/ academic/ autonomous institutions, NGOs, Govt. undertakings, user organizations and manufacturers.

5.0 Targets for the year 2005-06.

5.1 Physical: Water pumping windmills – 100 nos.
Aerogenerator/wind-solar hybrid systems - 150 kW

5.2 Financial: Budget Estimate: Rs. 2.00 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 by Regional Offices of MNES, review meetings, field visits, etc. by MNES.
- ii) Performance monitoring of the windmills, aerogenerators/wind-solar hybrid systems by SNAs. 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 MNES, as per details given in **para 11.0 of Annex-I.**
- iii) MNES may also sponsor independent study on evaluation of the systems installed under the programme.

8.0 Training and Awareness

The SNAs, NGOs, Govt. undertakings, manufacturers, and user organizations will be involved for organizing training and awareness programmes for beneficiaries, prospective users and technicians. The proposals in this regard will be considered on case-to-case basis. Further, Ministry may also directly sponsor training & awareness programme through selected institutions.

9.0 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, MNES will be final & binding in this regard.

10.0 This issues in exercise of the powers delegated to the Ministries and with the concurrence of IFD, MNES vide sanction No.IFD/SAN/106/269/2005-05 dated 24.08.2005.

Yours faithfully,

(R.P. Sharma)
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 MNES programme
3. All Regional Offices of the Ministry of Non-Conventional Energy Sources.
4. PPS to Secretary, MNES
5. Sr. Adviser/JS&FA /All Advisers/JS (SK)
6. Dir. (F)/Dir. (P&C)/Dir. (RPS)
7. Individual files of all implementing agencies
8. Sanction folder
9. Guard file

(R.P. Sharma)
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.

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, Small 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:

Designs/ models	Broad technical specifications	Estimated Water output vs head	Suitability
Direct drive windmill such as 12 PU 500 and similar other windmills	Rotor dia – 5 m No. of blades – 12 Tower height – 7 m Pump dia – 150 mm Cut in wind speed –10 kmph Rated wind speed – 18 kmph	8000 liters per hour at 7 meter head	For shallow water pumping upto 15 meter head
Gear type windmills	Rotor dia – 3.3 m No. of blades – 18 Tower height – 10 m Pump dia – 50-100 mm Cut in wind speed –9 kmph Rated wind speed – 18 kmph	1000 liters per hour at 20 meter head	For deepwell pumping from 16 meter to 60 meter head
AV 55 Auroville direct drive windmills	Rotor dia – 5.7 m No. of blades – 24 Tower height – 9-23 m Pump dia – 64-160 mm Cut in wind speed –10 kmph Rated wind speed – 18 kmph	4000 liters per hour at 15 meter head	For shallow and deepwell 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 30 kW. Only indigenously manufactured/assembled

aerogenerators are covered under the scheme. The manufacturers of the systems will provide performance curves for every model of aerogenerator for the operating range of wind speeds.

Broad technical specifications of the aerogenerators are as follows:

Unit capacity	Upto 30 kW
No. of blades	2 – 3
Rotor dia	1-10 m
Cut-in wind speed	3-3.5 m/s (11-13 kmph)
Rated wind speed	9-11 m/s (32-40 kmph)

3.3 Hybrid Systems:

Stand-alone hybrid systems based on a combination of various renewable energy sources like wind, solar and biomass etc. with each other 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 unit that can be used in a hybrid system will be to a maximum of 30 KW each.

4.0 Site Selection

Selection of suitable sites for installation of small wind energy and hybrid systems will be the responsibility of the State nodal agencies. 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 metres.
- (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 the "Suitability" columns 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 metres.
- (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.

- (iii) In case the wind resource data is not available within 10 kilometers radius of the proposed site, the SNA will collect data for the proposed site at least for one year before formulating the proposal.
- (iv) Wind and solar resources should be preferably of complimentary nature.
- (v) The foundations should be designed and constructed by taking into consideration the soil bearing capacity of the site.
- (vi) Generally aerogenerators of a capacity of more than 500 W should not be installed on the roof of a building. In case any aerogenerator is to be mounted 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 and reported in the proposal as a site plan.

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 manufacture, supply and install the windmills. A list of such manufacturers is given in **Annexure-IV**.

5.2 Aerogenerators/ Wind-Solar Hybrid Systems

The aerogenerators' technology has not been indigenised fully. Based on technical performance specifications and conforming test reports of various models offered by manufacturers/ suppliers, past experience in installation of the systems, and indigenisation efforts made in manufacture and supply of aerogenerators/SPV systems, MNES has enlisted a few firms for manufacturer, supply and installation of aerogenerators and wind-solar hybrid systems. A list of such manufactures/suppliers of aerogenerators/ wind-solar hybrid systems is given in **Annexure-V**.

6.0 Market Development

6.1 The enlisted manufacturers/ suppliers of the water pumping windmills and small aerogenerators/wind-solar hybrid systems may also identify the beneficiaries, interested in getting these systems installed for their use. They may report details or submit the proposals along with the feasibility/site selection reports to the concerned SNA: The SNA may include them, after reassessing the feasibility in their proposals for submission to MNES for financial assistance. This will facilitate manufacturers in developing markets for their systems on their own, using the admissible CFA available to beneficiaries, through the SNAs.

Empanelment of manufacturers

6.2 The interested manufacturers/suppliers of water pumping windmills and aerogenerators/wind-solar hybrid systems 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 MNES through SNAs providing all relevant details, as per the format given in **Annexure-VI** for empanelment in MNES.

7.0 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 state nodal agencies will take all appropriate actions to ensure that the manufacturers / suppliers of these systems meet warranty obligations.

8.0 Repair 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.
- (ii) The SNAs will award **annual maintenance contract (AMC)** of 3 to 5 years, after the expiry of the warranty period.
- (iii) Necessary maintenance spares for 3 years trouble-free operation will be supplied by the respective manufacturers/ suppliers of the systems.

9.0 Scope of Supply

9.1 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.

9.2 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 (for one year) of the complete system comprising aerogenerator, SPV modules, batteries, inverters, control systems, tower, cables necessary instrumentation for monitoring of the field performance. 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.

10.0 Submission of Proposals and Project Implementation

10.1 Water Pumping Windmills (Wind Pumps)

- (i) Proposals for installation of water pumping windmills will be taking up on project-to-project basis received from State Nodal Agencies (SNAs).
- (ii) The SNAs will submit proposals as per the format given in **Annexure-VII**.
- (iii) After sanction of the projects by MNES, the SNAs will complete the process of awarding the work for manufacture, supply, installation and post installation services of water pumping windmills, and submit the details (copy of supply order and acceptance of manufacturers) along with confirmation about deposit of beneficiaries's contribution to MNES for release of first installment of CFA.
- (iv) The SNAs will be responsible for arranging the remaining part of the project cost (total project cost - CFA) through state government subsidies/beneficiaries share.
- (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 MNES 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 purchase orders and acceptance by manufacturers/suppliers.

10.2 Aerogenerators and Wind-Solar Hybrid Systems

- (i) Proposals for installation of Aerogenerators/Wind-Solar Hybrid Systems will be taken up on project-to-project basis received from SNAs.
- (ii) The SNAs will submit the proposals to MNES after adequate site survey, resource assessment, determination of loads and selection of a suitable system. The proposal will contain a detailed project feasibility report, which may be prepared by the state nodal agencies/ user agencies directly or through a consultant, providing information as per **Annexure-VIII**.
- (iii) 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.
- (iv) After sanction of the projects by MNES, the SNAs will complete the process of awarding the work for manufacture, supply, installation and post installation services of aerogenerators/wind-solar hybrid systems, and submit the details (copy of the supply order and acceptance of manufacturer/supplier) along with confirmation about the deposit of balance cost to MNES for release of first installment of CFA.
- (v) The SNAs will be responsible for arranging the remaining part of the project cost (total project cost - CFA) through state government subsidies/beneficiaries share.

- (vi) During project implementation the SNAs will ensure, through regular field visit, physical verification and enforcing such terms and conditions that the quality-standards are maintained by the manufacturers/supplier during manufacturing, supply, installation and handing over of the system to beneficiaries.
- (vii) The SNAs will obtain feedback on performance/operation of the systems, regularly, through their field, visits, etc., and send the same every quarter.
- (viii) The SNAs will arrange for immediate repair of the system in the event of it failure, through the manufacturers/ suppliers.
- (ix) The SNAs will ensure that the project is completed with in 9 months after placing the purchase orders and acceptance by manufacturers/suppliers.
- (x) The SNAs, in association with manufacturers/suppliers, will monitor the performance of those systems of 1 kW and above for one year after commissioning, which have been newly introduced during the scheme recently. Such monitoring will only enable the SNAs to claim the amount of Rs.15,000/- as monitoring charges. All models of aerogenerators, which have already been installed under the scheme so far, are not eligible to get grant for monitoring activities. Collection of data for one year monitoring of the systems may not be taken up for those models of the aerogenerator systems, which are already installed in the field and covered in the scheme so far.

11.0 Submission of Monthly Progress Reports, Completion Reports, Audited Statements of Accounts and Utilization Certificates

- (i) During implementation of the project, the SNAs are required to submit the monthly progress reports to MNES regarding progress of installation of the systems, as per the **Annexure-IX**.
- (ii) After completion of the projects the SNAs are required to submit completion reports to MNES as per the format given in **Annexure-X**.
- (iii) The SNAs are also required to inform MNES about difficulties, if any, faced by them and the proposed corrective actions.
- (iv) The SNAs are also required to submit financial year wise audited statement of expenditure and Utilization Certificate as per GFR – 19 A.

12.0 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 by the Ministry through grants. 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.

Pattern of Central Financial Assistance (CFA) for 2005-06

1. Water Pumping Windmills (Wind Pumps)

- (a) The MNES will meet up to 50% of the ex-works cost of water pumping windmills, except for unelectrified inlands 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 Amount of MNES Share	
	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 MNES will provide service charges of 2,500 per windmill (wind pump) to the state agency.

2. Aerogenerators/Wind-Solar Hybrid Systems

- (a) The MNES will provide financial support as per the details given below. However, the CFA for installation of the systems will be restricted to that available for a maximum capacity of 5 kW for aerogenerators and 10 kW for hybrid system.

Sl. No.	Application	Maximum Amount of MNES Support
1.	Community Use, and Direct use by Central/State Govt., Defence, para military etc.	75 % of ex-works cost subject to a maximum of Rs.2.00 lakhs per kW; In case of islands 90% of ex-works cost subject to a maximum of Rs.2.40 lakhs per kW
2.	Individuals, Industrial users, R&D and academic institutions	50 % of ex-works cost subject to a maximum of Rs.1.25 lakhs 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 met by the state nodal agency and /or users of the system. In case of community use, in addition to the state agency share, the beneficiaries will also meet a part of the cost of the system through initial deposits and/or monthly payments, to ensure beneficiaries' stake in the system.

3. Reimbursement of CFA for feasibility report for Aerogenerator/Wind-solar Hybrid Systems above 1 kW capacity.

On approval of the project proposal, MNES will reimburse an amount of Rs.10,000/- towards preparation of feasibility report to the state nodal agency / user agency for each eligible approved project proposal, along with the first installment.

4. CFA for field performance report of newly introduced designs of Aerogenerator/ Wind-solar Hybrid Systems.

The MNES will release an amount of Rs.15,000/- to the agency/organization directly responsible for the collection of field performance data and submission of quarterly/final reports to MNES for eligible systems, on submission of the performance report.

Release of Central Financial Assistance

I. Water pumping windmills

- (a) 80% of the CFA, and 50% of service charges (for water pumping windmills) to SNAs on receipt of a copy of purchase order along with its acceptance by the manufacturers/ suppliers of the systems, 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 (for water pumping windmills) on physical verification of installation and commissioning of the systems by the SNAs as per DPR norms/approved project proposal, and submission of Utilization certificates (Form 19-A GFR), audited statement of expenditure and completion report, as per the format given at **Annexure-X**.
- (c) The SNAs will ensure that they have already sent the Utilization certificates (Form 19-A GFR) 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 MNES 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) 75% of the CFA and Rs.10,000/- for feasibility reports to SNAs on receipt of a copy of purchase order along with its acceptance by the manufacturers/ suppliers of the systems.
- (b) Remaining 25% of the CFA on physical verification of installation and commissioning of the systems by the SNAs/Regional Offices of MNES, and submission of Utilization certificates (Form 19-A GFR), audited statement of expenditure and completion report, as per the format given at **Annexure-X**.
- (c) The SNAs will ensure that they have already sent the Utilization certificates (Form 19-A GFR) and audited consolidated statement of expenditure for the programme of previous years, before sending the request for release of the final 25% CFA of the projects as mentioned in point '**(b)**' above. The MNES will consider release of the funds only after receipt the above documents relating to the projects of the previous years.
- (d) CFA for performance monitoring of aerogenerators/ wind-solar hybrid systems on submission of the reports.

List of Eligible Manufacturers**Water Pumping Windmills (Wind Pumps)**

S.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	Auto Spares Industries, No.4 Kalathiswaran Koil Street, Pondicherry 605001	0413 – 2334554 2338791 ajmindia@eth.net	0413 - 2333447	Geared type
7	Marut Energy Equipments Pvt. Ltd., D1/18, MIDC Ambad, Nasik-422 010	0253 – 2380436, 2380061 e-mail- marketing@solarecindia.com	0253 – 2380061, 2384061	Geared type
8	Om Engineering Works, Near Ganga Gate, Near Ambaji Temple, At & P.O. Anjar, District Kutch, Gujarat.			Geared type
9	Prototype Development Training Centre, Aji Industrial Estate, Bhavnagar Road, Rajkot, Gujarat.			Geared type
10	Rural Engineering School, At: Rojmal, Tal: Gadhada (Swa.) , District Bhavnagar – 364 750, Gujarat	02847 - 22104	02847 - 22104	Geared type
11	Scientific Instrument Co. Ltd. B-1 Site 2, Loni Road, Mohan Nagar, Ghaziabad – 201 007.	2732644 2732954 sicogzb@del3.vsnl.net.in	2736235	Geared type
12	Wind Fab, 447 Avanashi Road, Peelamedu, Coimbatore-641004, Tamilnadu	0422 – 2572079		Geared type
13	Shreeji Agro Industries, At Post: Ramlechi, Ta. Talala (Gir) – 362 150 zdist. Junagadh, Gujarat	02877-22997, 22998,		Geared type

Annexure-V

1.1 Aerogenerators

S.N.	Name & address	Tel No.	Fax No.	Capacity range/ model nos.
1	Auto Spares Industries, Wind Machine Division, No. 4, Kalathiswaran Koil Street, Pondicherry	0413 – 2334554, 2338791 E mail: ajmindia@eth.net	0413 - 2333447	1 - 5 kW
2	Auroville Energy Products Auroshilpam, Centre for Scientific Research, Auroville- 605 101	0413 – 2622582 E mail: aep@auroville.org.in kantha@phocos.com	0413 - 2623445	1.5 - 10 kW
3	Bharat Heavy Electricals Ltd., Corporate Research and Development, Vikas Nagar, Hyderabad-500593	040 – 23882230, 23773476, 23774494 E mail: ccx@bhelrnd.co.in	040 23778634, 23776320	4 kW
4	Jindesh International, 6/8 Shanti Niketan, New Delhi	011 –24111651 E mail: jindeshinternational@yahoo.com		72 W
5	Machinocraft, 1, Ambegao (Bk), Katraj-Dehu Road Bypass, Opp. Ashok Leyland Showroom, Pune-411 046, Maharashtra.	020 – 24317400/32910794 E mail : machinocraft@yahoo.com www.machinocraft.com	20 - 24219816	1- 10 kW (M-500, M-1000, M-2000, M-3000, M-5000, M-10000 and M-20000)
6	Marut Energy Equipments Pvt. Ltd., D1/18, MIDC Ambad, Nasik-422 010	0253 – 2380436, 2380061, 09822425853 E-mail- marketing@solarecindia.com	0253 – 2380061, 2383958	72 W – 10 kW
7	Unitron Energy Systems Pvt. Ltd., No. 12, A1 Building, Indira Park Nagar Road, Pune- 411 006	020 – 26687006, 26684399 E mail: unitron@pn3.vsnl.net.in	020 – 26687006 26684399	1 - 10 kW (UE-6, UE-15, UE-33 and UE-42)
8	Vistar Electronics P Ltd. 42A/1B, Erandawana, Nilgiri Apartments, Karve Road, Pune – 411 038.	020 – 25439267/, 25431207 E mail: Vistar.electronics@gems.vsnl.net.in	020- 25434704	52W – 630 W
9	Exide Industries Ltd., Exide House 59 E Chowringhee Road, Kolkata 700 020	033 – 22832120/2133/2136	033- 22832632/ 37	up to 3.2 kW
10	M/s. Lotus Solar Solutions Pvt. Ltd., C-366, C, Sushant Lok-I, Gurgaon – 122002	95124 – 5045157 e-mail- lotussolar@hotmail.com Mr.Puri-09818827371	95124 - 4044657	
11	M/s. Square Engineering Pvt. Ltd., Survey No.39, Hissa 27/1, Duttanagar – Ambegaon Road, Amdebaon BDK, Pune – 411 046	020-24318185 E-mail: admin@squareengg.net		5 kW, 25 kW (Kestrel 600 W, Kestrel 800 W, Kestrel 1000 W and Kestrel 3000 W)
12.	M/s. Supernova technologies Private Limited, Registered Office: Arvind House, C.S.No.180/1, Next to Sewree Polic Station at Reay Road East, Quay Street, Darukhana, Ready road, Mumbai – 400 010 Gujarat Factory/Office: 1/103, Phase-4, Zone, B-9, G.I.D.C. Easte, B/H Swiss Glasscoat, Vitthal Udyognagar, District – Anand, Gujarat – 388 121	022 – 23757090 E-mail: milton1@mtnl.net.in 02692 – 248624, 9426303105, 9426030903 E-mail: srswg@yahoo.com srswg@rediffmail.com	022- 23757095	1 - 5 kW (700W, 1.4 kW and 5.0 kW (SNT-50 Model))
13.	M/s. U.D. Energy Systems Pvt. Ltd., Unit No.1, Adit Enclave, Lane 5, Off. South Main Road, Koregaon Park, Pune – 411 001	09890698888 apalak2000@yahoo.com	020- 30580676	0.40kW, 3.2 kW

1.2 Wind- Solar Hybrid Systems

1. All SPV module manufacturers, who have experience in design, integration and installation of SPV power plants (minimum capacity 1 kW PV array) are eligible to design, integrate, supply and install wind-SPV hybrid systems, provided they procure the small aerogenerator from any of the manufacturers as listed in item no. 1.1 of this **Annexure**. They will be required to provide the necessary information to state agency / user agency about their experience in PV power plants installed by them during the last three years.
2. All manufacturers of small aerogenerators listed in (item No. 1.1 of this Annexure) are also eligible to supply wind-solar hybrid systems, subject to the condition that they will furnish details of systems supplied and installed by them during the last three years.
3. The following list gives names of some of the manufacturers who have developed/installed wind solar hybrid systems

S.N.	Name & address	Tel No.	Fax No.
1	Auto Spares Industries Wind Machine Division, No. 4, Kalathiswaran Koil Street, Pondicherry	0413 – 2334554 2338791 E mail: ajmindia@eth.net	0413 – 2333447
2	Auroville Energy Products Auroshilpam, Centre for Scientific Research, Auroville- 605 101	0413 – 2622582 E mail: aep@auroville.org.in	0413 – 2622582
3	Bharat Heavy Electricals Ltd. Corporate Research and Development, Vikas Nagar, Hyderabad-500593	040 – 23882230 23773476 E mail: ccx@bhelrnd.co.in	040 23778634 23776320
4	Machinocraft, 1, Ambegao (Bk), Katraj-Dehu Road Bypass, Opp. Ashok Leyland Showroom, Pune- 46,	020 – 24317400 32910794 E mail: :machinocraft@yahoo.com www.machinocraft.com	20 - 24219816
5	Rajasthan Electronics & Instruments Limited, 2, Kanakpura Industrial Area, Sirsi Road, Jaipur 302 012	0141-2203038, 2203562 E mail: reiljp@reiljp.com	0141-2202701 0141-2352841
6	Tata BP Solar India Ltd., Plot No. 78, Electronic City, Hosur Road, Bangalore 561 229	080-8520082/3, 8520973/4 E Mail: subramk@tatabp.com	080-8520972 /116
7	Unitron Energy Systems Pvt. Ltd. No. 12, A1 Building, Indira Park Nagar Road, Pune- 411 006	020 – 26687006 26684399 E mail: unitron@pn3.vsnl.net.in	020 – 26687006 26684399
8	Vistar Electronics P Ltd., 42A/1B, Erandawana Nilgiri Apartments, Karve Road Pune – 411 038.	020 – 5439267,5431207 E-Mail: Vistar.electronics@gems.vsnl.net.in	020- 5434704
9	Exide Industries Ltd.,	033 – 2478320, 2479819	033- 2479819

	Exide House, 59 E Chowringhee Road, Kolkata 700 020		
10	M/s. Lotus Solar Solutions Pvt. Ltd., C-366, C, Sushant Lok-I, Gurgoan – 122002, Haryana	95124 – 5045157 E-mail- lotussolar@hotmail.com	95124 - 5045158
11	M/s. Square Engineering Pvt. Ltd., Survey No.39, Hissa 27/1, Duttanagar – Ambegaon Road, Ambegaon BDK, Pune – 411 046	020-24318185 E-mail: admin@squareengg.net	
12.	M/s. Supernova technologies Private Limited, Registered Office: Arvind House, C.S.No.180/1, Next to Sewree Polic Station at Reay Road East, Quay Street, Darukhana, Ready road, Mumbai – 400 010 Gujarat Factory/Office: 1/103, Phase-4, Zone, B-9, G.I.D.C. Estate, B/H Swiss Glasscoat, Vitthal Udyognagar, District – Anand, Gujarat – 388 121	022 – 23757090 E-mail: milton1@mtnl.net.in 02692 – 248624, 9426303105, 9426030903 E-mail: srswg@yahoo.com srswg@rediffmail.com	022- 23757095
13.	M/s. U.D. Energy Systems Pvt. Ltd., Unit No.1, Adit Enclave, Lane 5, Off. South Main Road, Koregaon Park, Pune – 411 001	09890698888 E mail: apalak2000@yahoo.com	020-30580676
14.	M/s. Sustainable Power Developers (I) Pvt. Ltd., #18, 2 nd Floor, 59 th Cross, 5 th Block, Rajajinagar, Bhashym Cricle, Bangalore – 560 010	080 - 32005514	080-22927063

Format for empanelment of the manufacturers of water pumping windmills, aerogenerators and wind-solar hybrid systems in MNES

1. Technical specifications of water pumping windmill/ aerogenerator with testing report from independent testing agency/ foreign principals.
2. Performance characteristics of water pumping windmill under different total pumping heads and varying wind speeds.
3. Performance curve of aerogenerator for its operating range of wind speed.
4. In case of technology transfer from abroad, copies of agreement/MOU entered into with foreign company / collaborator.
5. Cost details of windmills/ aerogenerators.
6. Copy of registration as SSI unit/ SIA registration.
7. 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.
8. Copies of support documents indicating performance of the products.
9. 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.

Annexure - VII

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:
 - (i) Total estimated ex-works cost of the windmills:
 - (ii) 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

Format for preparation of Feasibility Report for Aerogenerator and Hybrid Systems

1. Title of the project and the details of the project site.
2. Wind and solar resources data of the identified site:
*Please include information on source of data for wind and solar resources of the identified sites. Please specify the distance of the place from the proposed site (**which should be within 10 kilometer of aerial distance**) of installation for which the solar / wind data has been taken. Please specify the period for which wind data has been collected.*
3. Estimated energy requirement at the site:
Please provide the details including the type of loads and their duty cycle. In case of community use or electrification projects site map including the details of distribution arrangement may also be provided.
4. System design details:
Please indicate if only a wind machine is to be installed at the site or a hybrid system is proposed. In all cases what will be the system capacity including the storage and electronics requirement and how that has been calculated. Please provide information on estimated month wise energy generation from the system for at least one-year cycle. In case of hybrid systems information should be provided for month wise energy generation separately from the PV component and the aerogenerator component of the system to meet the proposed load. For the hybrid systems please provide details of system capacity giving month wise generation if the entire load is to be met through only a PV system or aerogenerator system. This information is relevant to assess if optimum capacity of hybrid system has been proposed.
5. Final design configuration of the wind-solar hybrid system or aerogenerator system:
Please include information on (a) Numbers, capacity, specifications and power curve of aerogenerators proposed; (b) numbers, capacity and specifications of SPV modules; (c) details of electronic controllers and power conditioners (capacity, efficiency, waveform, charge controller, etc.); (d) Type of storage batteries, their capacity, DOD and number of days of storage; (e) mounting structures and tower details, cables and other balance of system, (iv) monitoring system and (v) spares.
6. Methodology of project implementation:
The work of manufacture/supply, installation and commissioning of the systems may be awarded on tender basis, from any of the empanelled manufacturers.
7. Details of the estimated cost of the system:
Please provide cost break up for aerogenerator, tower, SPV modules, mounting structure, electronic control system, batteries, inverter/charge controller, cables, etc., which will be eligible under the ex-works cost of the system, Details for other costs of the project including cost of transportation, civil works, erection, commissioning may also be provided separately.
8. Proposed MNES Financial Assistance towards:

- (i) Ex-works cost (provide item wise details).
- (ii) Feasibility report (if applicable) and
- (iii) Performance monitoring charges.

9. Details of remaining cost sharing arrangements:

Please indicate the amount of available state subsidy and beneficiary's share.

10. Project implementation schedule:

(Projects are to be completed within 9 months from the date of placing supply order/date of acceptance of the manufacturers).

Annexure IX

Monthly Progress Report for Installation of Water Pumping Windmills, Small Wind Energy Systems and Hybrid Systems

(may please be sent to MNES by 10th of the succeeding month)

-
- * Progress Report for the month of:.....
 - * Name of the Nodal Agency:
 - * Financial Year in which Water pumping windmills
small aerogenerators, hybrid systems were sanctioned:.....

Cumulative Achievement upto previous month	Installation during the month	Cumulative total
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- (i) Windmills (No)
 - (ii) Aerogenerators (kW, No
and name of the site)
 - (iii) Hybrid system (kW, No
and name of the site)
-

Signature and Seal of Director/
Chief Executive of the State Nodal Agency

Annexure X

Format for applying for release of second installment of CFA, and submission of completion report.

1. Name of State Nodal Agency:
2. No. of windmills/kW capacity sanctioned:
3. MNES sanctioned letter No. and date:
4. Total amount of CFA and service charge/feasibility report/ monitoring charges sanctioned (give details as per MNES sanctioned order):
5. Total funds released by MNES/received by SNAs (give details as per MNES sanctioned order):
6. Project duration- from:_____ to _____.
7. Data of completion of the project:
8. In case of delay in project completion, whether extension of project period was sought, if so, the details:
9. Brief description of implementation methodology followed, any difficulty encountered, measures taken ensure installation of system:
10. Status of submission of year-wise Utilization Certificates and audited Statement of Expenditure for the funds already released:
11. Detailed list of installation of windmills/ aerogenerators/hybrid systems to be enclosed, giving information on name of beneficiaries and site addresses, windmill type/ kW capacity of aerogenerator or wind-solar hybrid system, name of manufacturer, total cost/ ex-works cost/ CFA, state subsidy/beneficiary share, date of installation, system application, functionality status, along with descriptive photograph(s):
12. Repair and maintenance arrangements made:

Certificate

It is certified that all the systems enlisted in the enclosed installation list have been inspected and physically verified. The systems have been installed as per the provisions of the scheme and found to be working satisfactorily.

Date:

Signature and Seal of Director/
Chief Executive of the State Nodal Agency