

**15 -ാം കേരള നിയമസഭ**

**10 -ാം സമ്മേളനം**

**നക്ഷത്ര ചിഹ്നം ഇല്ലാത്ത പോദ്യം നം. 763**

**30-01-2024 - ൽ മറുപടിയ്ക്ക്**

**തുടക്കി ആദിവാസി കോളനിയിൽ സോളാർ വിൻഡ് ഹൈബ്രിഡ് സിസ്റ്റം**

ചോദ്യം		ഉത്തരം	
ശ്രീ. ഷാഫി പറമ്പിൽ		ശ്രീ. കെ . കൃഷ്ണൻകുട്ടി (വൈദ്യുതി വകുപ്പ് മന്ത്രി)	
(എ)	പാലക്കാട് തുടക്കി ആദിവാസി കോളനിയിൽ എത്ര കിലോവാട്ട് സോളാർ വിൻഡ് ഹൈബ്രിഡ് സിസ്റ്റം സ്ഥാപിക്കാനാണ് ടെണ്ടർ ക്ഷണിച്ചത്; അതിൽ എത്ര തുകയ്ക്കുള്ള വർക്ക് ഓർഡർ നൽകി; വ്യക്തമാക്കാമോ;	(എ)	താഴെത്തുടക്കി ആദിവാസി കോളനിയിൽ 50kW സോളാർവിൻഡ് ഹൈബ്രിഡ് സിസ്റ്റവും മേലേ തുടക്കി ആദിവാസി കോളനിയിൽ 60 kW സോളാർ/ സോളാർവിൻഡ് ഹൈബ്രിഡ് സിസ്റ്റവും സ്ഥാപിക്കാനാണ് ടെണ്ടർ ക്ഷണിച്ചത്. പദ്ധതി പൂർത്തീകരണത്തിനായി താഴെത്തുടക്കി ആദിവാസി കോളനിയിൽ Rs.1,43,38,800/-രൂപയ്ക്കും, മേലേ തുടക്കി, മേലേ ഗലസ്സി, താഴെ ഗലസ്സി, ഊരാടം തുടങ്ങിയ ഇടങ്ങളിൽ 60 kW പ്ലാന്റ് സ്ഥാപിക്കുന്നതിനായി Rs.3,48,23,836/-രൂപയ്ക്കും വർക്ക് ഓർഡർ നൽകി.
(ബി)	പ്രസ്തുത പ്രോജക്റ്റുമായി ബന്ധപ്പെട്ട് എത്ര പ്രാവശ്യം ടെണ്ടർ ക്ഷണിച്ചു; ഓരോ പ്രാവശ്യവും ടെണ്ടറിൽ പങ്കെടുത്ത കമ്പനികളും തുകയും ഓരോ ടെണ്ടറും ക്യാൻസൽ ചെയ്യാനുണ്ടായ സാഹചര്യങ്ങളും വിശദമാക്കാമോ;	(ബി)	താഴെത്തുടക്കി ആദിവാസി കോളനിയിൽ 50 kW സോളാർ വിൻഡ് ഹൈബ്രിഡ് സിസ്റ്റം സ്ഥാപിക്കാൻ ഒരു പ്രാവശ്യവും മേലേ തുടക്കി ആദിവാസി കോളനിയിൽ 60kW സോളാർ ഹൈബ്രിഡ് പവർപ്ലാന്റ് സ്ഥാപിക്കുന്നതിനായി മൂന്ന് പ്രാവശ്യവും ടെൻഡർ ക്ഷണിച്ചു. ടെൻഡർ സബ്മിഷൻ തീയതി തെറ്റായി രേഖപ്പെടുത്തിയതിനെ തുടർന്ന് മേലേ തുടക്കി ആദ്യ ടെൻഡർ ക്യാൻസൽ ചെയ്യുകയുണ്ടായി.
(സി)	ഏതു കമ്പനിക്കാണ് ടെണ്ടർ ലഭിച്ചതെന്ന് അറിയിക്കാമോ; വർക്ക് ഓർഡറിന്റെ പകർപ്പ്, പേയ്മെന്റ് നൽകിയ ഉത്തരവിന്റെ പകർപ്പ് എന്നിവ ലഭ്യമാക്കാമോ;	(സി)	വിൻഡ് സൂം എന്നർജി ടെക്നോളോജീസ് എന്ന കമ്പനിക്ക് താഴെത്തുടക്കി പദ്ധതി പൂർത്തീകരണത്തിനായി Rs.1,43,38,800/-രൂപയ്ക്കും മേലേ തുടക്കി, മേലേ ഗലസ്സി, താഴെ ഗലസ്സി, ഊരാടം തുടങ്ങിയ ഇടങ്ങളിൽ 60 kW സോളാർവിൻഡ് ഹൈബ്രിഡ് സിസ്റ്റം സ്ഥാപിക്കുന്നതിനായി Rs.3,48,23,836/-രൂപയ്ക്കും വർക്കോർഡർ നൽകി. വർക്ക് ഓർഡറുകളുടെയും നൽകിയ പേയ്മെന്റ് ഓർഡറുകളുടെയും പകർപ്പ് <b>അനുബന്ധമായി (1) ഇതോടൊപ്പം ചേർക്കുന്നു.</b>
(ഡി)	പ്രസ്തുത പദ്ധതിയുമായി ബന്ധപ്പെട്ട് എ.ജി.യുടെ	(ഡി)	എ.ജി.യുടെ പരിശോധനാവിഭാഗത്തിന്റെ റിപ്പോർട്ട്

പരിശോധനാവിഭാഗത്തിന്റെ റിപ്പോർട്ടിലെ പരാമർശങ്ങൾ എന്തൊക്കെയാണ്; പ്രസ്തുത ഭാഗത്തിന്റെ പകർപ്പ് നൽകാമോ?

അനുബന്ധം (2) ആയി ചേർക്കുന്നു.

സെക്ഷൻ ഓഫീസർ



The present audit covers transactions of ANERT for the period 2019-2023. Test check was confined to the records of Head Office.

**Disclaimer**

This Inspection Report has been prepared on the basis of the information furnished and made available by ANERT. The Office of the Principal Accountant General (Audit II), Kerala disclaims any responsibility for any misrepresentation and/or non-information on the part of the audited entity.

**PART-II**  
**(Audit Findings)**

**PART-II-(A)**  
**(Significant Audit Findings)**

**Electrification of Mele thuduki and Ooradam tribal hamlets in Palakkad**

ANERT invited Request for Proposal (RFP) for Design, Supply, Installation, Testing and Commissioning of Solar - Hybrid Power Plants with battery backup at Tribal Hamlets of Mele Thudukki, Galassi in Bhavani Range under Silent Valley Reserved Forest Range and Ooradam Tribal Hamlet of Attappadi Range, Palakkad, Kerala, India on 31 January 2023. Under the tender, proposal was to be submitted for Standalone - Solar Hybrid PV Power plant: (500 Wp Solar Power plant upgradable to 1 kWp in future). ANERT, however, cancelled the tender citing administrative reasons on 08 February 2023.

ANERT invited (08 February 2023) new tender and scope of work included Supply, Installation and Commissioning of 60 Nos of Standalone Solar - Hybrid System with battery backup to be executed by the EPC contractor under the supervision of ANERT. Tender evaluation would be on two bid system. Tender was invited for Standalone - Solar Hybrid PV Power plant: (500 Wp Solar Power plant upgradable to 1 kWp in future. ANERT through tender corrigendum changed (20 February 2023) the scope of work as follows:

1. The minimum capacity of power plant would be 1 kW wherein it is mandatory to have 500 Wp of solar power and balance 500 W can be from any other sources.



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2. The rate for two proposals must be submitted by the bidders- considering 1 kWp solar and another for a combination of 500 Wp- 500 W from another renewable energy source. In case there is no possibility of having another source, full plant can be from Solar only.

As against the tender, five firms submitted bid and two bidders M/s. Windstream Energy Technologies and M/s. Kompetent Biz Experts submitted proposal for 500 Wp Solar and 500 W Windmill with battery backup. M/s. Power One Micro Systems submitted 1 kW solar power plants and M/s. BSS Community Industries submitted proposal for on grid power plant. Technical bid of M/s. Kompetent Biz Experts was rejected due to non- submission of documents pertaining to Pre -Qualification/ previous experience. ANERT also rejected bid submitted by M/s. BSS Community as it was on grid plant.

Project Engineer (RTS) proposed a Quality and Cost Based Selection (QCBS) with 60:40 ratio in terms of Technical to Financial score taking in to account the complexity of the work and the remoteness of the site. As per the proposal, an evaluation committee was to be constituted for the evaluation of the three short listed proposals. The technical evaluation will provide weightage to criteria such as previous work experience, financial strength, experience in working in remote tribal conditions and importantly, the quality and viability of the systems proposed.

Technical Head (T2) ANERT ( Note 14) proposed (03 March 2023) constitution of an evaluation committee with PE in charge of tenders, ACTM, CTM, CFO and an external member.

CEO, ANERT approved (03 March 2023) the proposal with following changes:

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1. to give weightage to additional Renewable Energy Source
2. Methodology of the calculation of the financial score
3. Since, the project is in remote area and quality of system needs to be ensured L1 need not always be the best and there is a chance that quoting would have been done even without visiting the site or remoteness. Hence, the financial scoring should be in such a way that there is not much score variation between L1 and L3.

As per the approved criteria, only bidders obtaining scores above 70 are eligible for financial opening and accordingly, only two bidders, M/s. Power One and M/s. Windstream Energy are qualified for financial opening. The financial bids of the two qualified bidders were opened;



M/s. Power One has quoted for 1 kW Solar Power plant and M/s. Windstream Energy have submitted quotes for 1 kW Solar as well as 1 kW Solar-Wind hybrid power plant (500 Wp Solar and 500 W Windmill). Rate quoted by M/s. power one was ₹1.94 crore and M/s. Windstream was ₹ 3.48 crore.

For evaluation, the cost of 1 kW Solar in both cases are considered. As per the QCBS criteria proposed, the weightage in the ratio of 60:40 is to be followed. The normalised commercial score and the final score are as below:

Bidder	Technical Score	Financial Bid (₹)	Normalised Financial Score	Final Score (60:40)	
Power One	86	19459800	100	91.60	L1
Windstream	93	23793523*	81.79	88.51	L2

\*Rate for only Solar Plant

In the QCBS evaluation also M/s. Power One became L1. However tender was cancelled by CEO for ensuring wind component and directed (24 March 2023) to invite fresh tender.

Accordingly fresh tender was invited on 20 April 2023 and as per scope of work bidder had to Supply, Installation and Commissioning of 60 Nos of Standalone Solar - Hybrid System with battery backup and shall be executed by the EPC contractor under the supervision of ANERT. However, Scope did not include provision for wind plant. Further, the Evaluation criteria proposed to be adopted would be Quality cum Cost Based System (QCBS) where Technical Bid Score will get a weightage of 75 per cent and Commercial Bid Score a weightage of 25 per cent.

The retender was published in the Kerala tenders portal and there were three bidders - M/s. Kompetent Biz Experts<sup>1</sup>, M/s. Suntastic Engineering Pvt LTd<sup>2</sup> and M/s. Windstream Energy Technologies<sup>3</sup>.. No documents pertaining to Pre Qualification nor previous experience submitted by M/s. Kompetent Biz Experts. Accordingly, final evaluation is done with the bid

<sup>1</sup> Proposal for 500 W Solar and 500 W Windmill with battery backup

<sup>2</sup> Proposal for 1 kW Solar power plant in poles with battery backup

<sup>3</sup> Proposal for 500 Wp Solar and 500 W Windmill with battery backup



submitted by M/s. Windstream Energy Technologies and M/s. Suntastic Engineering Pvt LTD as shown below:

For Solar Only						
Bidder	Financial Bid (₹)	Technical Score	Financial Score	Final Score (60:40)	Final Score (75:25)	
Suntastic	19200000	75	100	85	81.25	L2
Windstream	20793175	89	92.34	90.33	89.83	L1
For Solar plus Wind						
Bidder	Financial Bid (₹)	Technical Score	Financial Score	Final Score (60:40)	Final Score (75:25)	
Suntastic	27000000	75	100	85	81.25	L2
Windstream	35824822	89	75.37	83.55	85.59	L1

Accordingly work order was placed (May 2023) on M/s. WindStream Energy Technologies India Pvt Ltd for the Electrification of Mele Thudukki, Galassi and Ooradam Colonies. The work is in progress.

In this connection Audit observed the following:

1. As per the initial proposal, only solar panel was submitted. Later this has been changed to 500 Wp Solar and 500 W wind. The cost difference between solar and solar plus wind is ₹ 1.63 crore (difference between ₹ 1.95 crore obtained in first tender and ₹3.58 crore obtained in the last tender). No feasibility study had been conducted by analyzing wind data, expected power generation from the wind plant compared to solar plant etc. in the specific locality before awarding the work costing almost double the cost. Instead only wind solar hybrid map of National Institute of Wind Energy (NIWE) had been considered. However, NIWE study report was based on wind assessment made at 150 m height level and since these wind plant is to be installed on or near the individual houses at lower heights, separate wind study should have been conducted to assess the potential wind generation from the plant before awarding the work. Audit also noticed that ANERT has installed solar (45 kW)- Wind hybrid 5 kW ) at Thazhe Thudi Colony and total power generated from solar plant is 4872 units and 226 units from wind plant during the period 22 March 2023 to 28 September 2023. As such wind plant will generate only 0.1 unit power per day from 500 W plant.

As per the list of un-electrified ST colonies of KSEBL ( November 2021) there were 31 colonies having 854 houses in which grid connection is not possible and solar/ and other Decentralized Distributed Generation (DDG) is the only option. The reason for non-



electrification of these colonies was shortage of fund. The decision to incur extra expenditure without proper study lacked justification as the extra expenditure incurred for the wind plant could have been used for electrification of more unelectrified houses. Following irregularities were noticed in the tendering process:

- i. First tender invited on 31 January 2023 was cancelled before technical evaluation citing administrative reasons. Reason for cancelling the tender were not available in the records furnished to audit.
- ii. In the second tender through tender amendment it was clarified that the minimum capacity of power plant would be 1 kW wherein it is mandatory to have 500 Wp of solar power and balance 500 W can be from any other sources. However, the rate for two proposals must be submitted by the bidders- considering 1 kWp solar and another for a combination of 500 Wp- 500 W from another RE source. In case there is no possibility of having another source, full plant can be from Solar only. This tender also was cancelled as LI bidder had quoted for Solar plant only. However, no condition was included in the third tender in respect of submission of bids for solar and wind as mentioned in the second tender instead invited tender only for Standalone Solar - Hybrid System with battery backup. The work was awarded to M/s. Windstream who submitted wind plus solar plant. Since tender did not include provision for wind plant, awarding the work for wind plus solar component lacked justification.
- iii. . Reason for changing the 60:40 ratio with 75:25 ratio for QCBS is not on record..
- iv. As per the tender all the equipment should conform to the BIS or IEC or equivalent international specifications. Project Engineer reported ( June 2023) that the particular inverter of M/s. Wind stream is not having BIS certificate and have provided a declaration that they have submitted the application filed with BIS for certification. However, ANERT qualified M/s. Windstream in the technical evaluation and awarded the work. Thus technical qualification of M/s Windstream was irregular.
- v. As per CVC guidelines tender document should neither be made very stringent nor very lax to restrict/facilitate the entry of bidders. However, as per tender evaluation criteria marks were given to compliance to technical requirement



specifications (20 marks), experience (20 marks), design and technical approach (35 marks) and quality of the proposal and methodology (25 marks). In experience component, 10 marks were given for experience in remote locations and five marks were given for experience in remote locations in Kerala. The above clause will restrict the entry of bidders from outside Kerala in participating in the tender. Further, giving separate marks for compliance to technical requirement specifications (20 marks) will also compromise transparency as there are chances for biased evaluation. Bids submitted by the technically qualified bidders only need to be processed further.



2) **Electrification of Thazhe Thudukki Tribal hamlet**

Based on an inspection conducted by District Engineer Palakkad at THAZHAE THUDUKKI TRIBAL HAMLET " in the Bhavani range under the Silent Valley Forest range, Palakkad, a proposal was made for a MicroGrid of 65 kW for 44 Tribal Hamlets in December 2021. The estimated cost for the proposed 65 kW solar plant was ₹1.65 crore.

ANERT invited Request for Proposal for the Survey, Design, Supply, Installation, Testing and Commissioning with remote monitoring system of 50 kW Micro Grid system (Solar -Wind Hybrid Power Plant with battery backup) at Thazhae Thudukki Tribal Hamlet on 21 December 2021. ANERT amended the tender condition and insisted that out of the total 50kW Hybrid System, one of the sources of Alternate Renewable Energy should be minimum of 10 per cent.

As against the tender, two bidders - M/s. Windstream Energy Technology private Limited and M/s. Precis Accubiz submitted bids. Bid submitted by M/s. Precis Accubiz was rejected under technical evaluation due to non- submission of relevant documents. The work was awarded (19 January 2022) to M/s. Windstream for an amount of ₹ 1.43 crore . M/s. Windstream completed the work in March 2023. Cost of the work was met from plan fund of ANERT for the period 2022-23.




In this connection Audit observed the following:

1. As per the tender,

- Prices quoted by the Bidder shall be fixed during the bidder's performance of the contract and not subject to variation on any account. A bid submitted with an adjustable/ variable price quotation will be treated as non - responsive and rejected.
- The rate quoted should be all inclusive including delivery of materials, the cost of materials and labour for the civil works, Installation and Commissioning, 5-year Warranty, fee for approval from the Electrical Inspectorate if any, Solar Meter, Remote monitoring facility, Insurance, GST and all other expenses deemed necessary for the proper implementation of the conditions and specification in-corporated in the tender.
- Due to its location in designated forest area, the site is slightly difficult for its approach for conventional electrification.

However, Governing Body in its meeting held on 19 July 2023 directed to put up a comprehensive proposal to Government for reimbursement of additional expenditure of ₹27.66 lakh incurred by M/s. Windstream Energy Technology private Limited. As per the agenda notes, reason for additional expenditure include additional manpower, engagement of tribes, non- availability of labour etc. Recommendation to sanction additional expenditure lacked justification as the same is against the tender conditions. Further, studying the site conditions before submission of bid is a prerequisite in any tender.

2. Out of the two bids received, bid submitted by M/s. Precis Accubiz was rejected due to non qualification in the technical evaluation. ANERT has not explored the possibility of obtaining competitive rate by retendering the work.
3. . Reasons for including the wind component, including details of study on wind data and feasibility study, if any conducted with regard to the area was called for and awaited.

  
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अनिल अ. शर्मा



അനേർട്ട് - 1


**അനേർട്ട്**  
**ANERT**

Agency for New and renewable Energy Research and Technology  
 നവീനവും പുനരുപയോഗയോഗ്യമായ ഊർജ്ജ ഗവേഷണങ്ങൾക്കും സാങ്കേതിക വിദ്യകൾക്കുമുള്ള ഏജൻസി  
 DEPARTMENT OF POWER, GOVERNMENT OF KERALA  
 Law College Road, PMG, Thiruvananthapuram 695033 • director@anert.in • www.anert.gov.in  
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Proceedings of O/O CEO ANERT  
 (Present: NARENDRA NATH VELURI I F S)

### ABSTRACT

ANERT - Survey, Design, Supply, Installation, Testing and Commissioning with remote monitoring system of 50 kW Micro Grid system (Solar-Wind Hybrid Power Plant with battery backup) at Thazhae Thudukki Tribal Hamlet in Bhavani Range Under Silent Valley Reserved Forest Range, Palakkad, Kerala, India- Release of 10% payment to M/s Windstream Energy Technologies India Pvt Ltd - Sanctioned - Orders Issued

A.F. No. 1678/2023/ANERT

05-10-2023

- Read:
1. G.O.(Rt)No.91/2021/POWER dtd 12/07/2021
  2. G.O.(Rt)No.214/2021/POWER dtd 20/12/2021
  3. Work Order No. ANERT-WYD/13/2021-DE(WYD) dtd 02/03/2022
  4. Invoice No. 22/2021-22 dtd 24/03/2022
  5. AF No. 520/2022/ANERT dtd 27/03/2022
  6. AF No. 911/223/ANERT dtd 08/05/2023

### ORDER

1. ANERT had issued work order for the Survey, Design, Supply, Installation, Testing and Commissioning with remote monitoring system of 50 kW Micro Grid system (Solar-Wind Hybrid Power Plant with battery backup) at Thazhae Thudukki Tribal Hamlet in Bhavani Range Under Silent Valley Reserved Forest Range, Palakkad, Kerala, India vide ref cited 3<sup>rd</sup> to M/s Windstream Energy Technologies India Pvt Ltd for an amount of Rs 1,43,38,800/-.
2. As per reference cited 5<sup>th</sup> & 6<sup>th</sup>, 80% of the payment was released to the work awarded agency. As per work order, 90% of the payment is to be released upon commissioning of the power plant. Hence, they are eligible for another 10% of the payment as the power plant is commissioned.
3. Based on the above, the agency is eligible for payment as below:

Payment Summary			Remarks
Amount Payable	:	1,43,38,800	
Less: License Fee including GST	:	4,22,995	Already transferred.
Contract Value	:	1,39,15,805	



1678/2023/ANERT

10% Gross Amount payable to agency	:	13,91,580.50	
Less: GST TDS @ 2%	:	25,200	
Less: Income Tax TDS @ 2@	:	25,200	
Net amount payable to agency	:	13,41,180.50/-	To be released to M/s Windstream Energy Technologies India Pvt Ltd

Sanction is hereby accorded to pay an amount of Rs. 13,91,580.50/-. This amount includes 10% payment to M/s. Windstream Energy Technologies India Pvt Ltd, Income tax TDS and GST TDS. This work comes under "Solar Electrification of unelectrified colonies".

Account Summary			Amount
Beneficiary Name	:	Windstream Energy Technologies India Pvt Ltd	13,41,180.50/-
Branch	:	Jubilee Hills, Hyderabad	
Account No.	:	007605004209	
IFSC	:	ICIC00000076	

The expenditure in this regard is to be met from ANERT's own funds with DE Palakkad and recouped to him through plan funds

Signed by  
**CHIEF EXECUTIVE OFFICER**  
Narendra Nath Veluri I F S

Date: 05-10-2023 16:55:39

Copy to:

1. Windstream Energy Technologies India Pvt Ltd
2. Finance Manager / Cashier
3. Office Copy





**അനേർട്ട്**  
**ANERT**

Agency for New and renewable Energy Research and Technology  
നവീനവും പുനരുപയോഗയോഗ്യമായ ഊർജ്ജ ഗവേഷണങ്ങൾക്കും സാങ്കേതിക വിദ്യകൾക്കുമുള്ള ഏജൻസി  
DEPARTMENT OF POWER, GOVERNMENT OF KERALA  
Law College Road, PMG, Thiruvananthapuram 695033 • director@anert.in • www.anert.gov.in  
Tel.: (+91-471) 2336077, 2334122, 2333124, 2331803 • Fax: (+91-471) 2329853



**PROCEEDINGS OF THE CHIEF EXECUTIVE OFFICER**

(Present: NARENDRA NATH VELURI I F S)

Abstract

ANERT - Survey, Design, Supply, Installation, Testing and Commissioning with remote monitoring system of 50 kW Micro Grid system (Solar-Wind Hybrid Power Plant with battery backup) at Thazhae Thudukki Tribal Hamlet in Bhavani Range Under Silent Valley Reserved Forest Range, Palakkad, Kerala, India- Release of 30% payment to M/s Windstream Energy Technologies India Pvt Ltd - Sanctioned - orders issued

File no.: ANERT-TECH/424/2021-PE2(RTS)

A.F. No. 684/2023/ANERT

25-03-2023

Read: -

1. G.O.(Rt)No.91/2021/POWER dtd 12/07/2021
2. G.O.(Rt)No.214/2021/POWER dtd 20/12/2021
3. Work Order No. ANERT-WYD/13/2021-DE(WYD) dtd 02/03/2022
4. Invoice No. 22/2021-22 dtd 24/03/2022
5. A.F.No.520/2022/ANERT dtd.27.3.2022

ORDER

ANERT had issued work order for the Survey, Design, Supply, Installation, Testing and Commissioning with remote monitoring system of 50 kW Micro Grid system (Solar-Wind Hybrid Power Plant with battery backup) at Thazhae Thudukki Tribal Hamlet in Bhavani Range Under Silent Valley Reserved Forest Range, Palakkad, Kerala, India vide ref cited 3<sup>rd</sup> to M/s Windstream Energy Technologies India Pvt Ltd for an amount of Rs 1,43,38,800/-.

As per 5<sup>th</sup> cited above 50% payment released to the agency against the material delivery and installation completed and is now eligible for next 30% payment.

Based on the above, the agency is eligible for payment as below:

Payment Summary		
Amount Payable		1,43,38,800
Less: License Fee including GST	:	4,22,995




Contract value	:	13915805
Gross Amount payable to agency	:	41,74,742
Less: GST TDS	:	75,600
Less: Income Tax TDS	:	75,600
Net amount payable to agency	:	40,23,542

Sanction is hereby accorded to pay an amount of Rs. 41,74,742/-. This amount includes 30% payment to M/s. Windstream Energy Technologies India Pvt Ltd, Income tax TDS and GST TDS. This work comes under the AS ref cited 2<sup>nd</sup> as item No. A.1(f) - Solar Electrification of ST colonies.

Account Summary		Amount
Beneficiary Name	: Windstream Energy Technologies India Pvt Ltd	40,23,542
Branch	: Jubilee Hills, Hyderabad	
Account No.	: 007605004209	
IFSC	: ICIC0000076	

The expenditure in this regard is to be met from the Head of Account "2810-00-800-90-06-35-00 for the FY 2021-22.

  
NARENDRA NATH VELURI I F S  
CHIEF EXECUTIVE OFFICER

Copy to:

1. Windstream Energy Technologies India Pvt Ltd
2. Finance Manager / Cashier
3. Office Copy





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DEPARTMENT OF POWER, GOVERNMENT OF KERALA  
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Tel.: (+91-471) 2338077, 2334122, 2333124, 2331803 • Fax: (+91-471) 2329853



Proceedings of O/O CEO ANERT  
(Present: Narendra Nath Veluri I F S)

### ABSTRACT

ANERT - Survey, Design, Supply, Installation, Testing and Commissioning with remote monitoring system of 50 kW Micro Grid system (Solar-Wind Hybrid Power Plant with battery backup) at Thazhae Thudukki Tribal Hamlet in Bhavani Range Under Silent Valley Reserved Forest Range, Palakkad, Kerala, India- Release of 50% payment to M/s Windstream Energy Technologies India Pvt Ltd - Sanctioned - Orders Issued

A.F. No. 520/2022/ANERT

27/03/2022

- Read:
1. G.O.(Rt)No.91/2021/POWER dtd 12/07/2021
  2. G.O.(Rt)No.214/2021/POWER dtd 20/12/2021
  3. Work Order No. ANERT-WYD/13/2021-DE(WYD) dtd 02/03/2022
  4. Invoice No. 22/2021-22 dtd 24/03/2022

### ORDER

1. ANERT had issued work order for the Survey, Design, Supply, Installation, Testing and Commissioning with remote monitoring system of 50 kW Micro Grid system (Solar-Wind Hybrid Power Plant with battery backup) at Thazhae Thudukki Tribal Hamlet in Bhavani Range Under Silent Valley Reserved Forest Range, Palakkad, Kerala, India vide ref cited 3<sup>rd</sup> to M/s Windstream Energy Technologies India Pvt Ltd for an amount of Rs 1,43,38,800/-. The agency has supplied the materials and is eligible for 50% of the payment.
2. As per the work order, 2.5% of the total amount is payable to ANERT as license fee and is to be transferred to ANERT A/C No. 67242882331. The balance, 50% of the contract value is to be paid after completion of installation of power plant and evaluation of performance of the plant in phases and upon completion of the 5-year warranty period thereafter.
3. Based on the above, the agency is eligible for payment as below:

Payment Summary		Remarks
Amount	1,43,38,800	

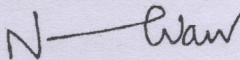


Payable		
Less: License Fee including GST	4,22,995	To be transferred to ANERT Account 67242882331
Less: 50% Retention	69,57,903	
Gross Amount payable to agency	69,57,902	
Less: GST TDS	1,26,000	
Less: Income Tax TDS	1,26,000	
Net amount payable to agency	67,05,902	To be released to M/s Windstream Energy Technologies India Pvt Ltd

Sanction is hereby accorded to pay an amount of Rs. 69,57,902/-. This amount includes 50% payment to M/s. Windstream Energy Technologies India Pvt Ltd, Income tax TDS and GST TDS. This work comes under the AS ref cited 2<sup>nd</sup> as item No. A.1(f) - Solar Electrification of ST colonies.

Account Summary		Amount
Beneficiary Name	Windstream Energy Technologies India Pvt Ltd	67,05,902
Branch	Jubilee Hills, Hyderabad	
Account No.	007605004209	
IFSC	ICIC0000076	
Beneficiary Name	CEO, ANERT	4,22,995
Branch	SBI Pattom	
Account No.	67242882331	
IFSC	SBIN0070212	

The expenditure in this regard is to be met from the Head of Account "2810-00-800-90-06-35-00 for the FY 2021-22.

  
Chief Executive Officer

Copy to:

1. Windstream Energy Technologies India Pvt Ltd
2. Finance Manager / Cashier
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Agency for New and Renewable Energy Research and Technology

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(Department of Power, Government of Kerala)

No. ANERT-TECH/424/2021-PE2(RTS)

19/01/2022

To

M/s Windstream Energy Technologies India Pvt Lt  
Plot 289, 2<sup>nd</sup> floor, Prakruthi Nivas,  
Road No-78, Prashasan Nagar,  
Jubilee Hills, Hyderabad - 500096

WORK ORDER

Sir,

Sub:ANERT – Work Order for the Survey, Design, Supply, Installation, Testing and Commissioning with remote monitoring system of 50 kW Micro Grid system (Solar-Wind Hybrid Power Plant with battery backup) at Thazhae Thudukki Tribal Hamlet in Bhavani Range Under Silent Valley Reserved Forest Range, Palakkad, Kerala, India- reg

Ref: 1. Tender ID: 2021\_ANERT\_462374\_1

2. Your Bid No. 1183876 dtd 29/12/2021

Attention is invited to the references cited. Your offer for the Survey, Design, Supply, Installation, Testing and Commissioning with remote monitoring system of 50 kW Micro Grid system (Solar-Wind Hybrid Power Plant with battery backup) at Thazhae Thudukki Tribal Hamlet in Bhavani Range Under Silent Valley Reserved Forest Range, Palakkad, Kerala is accepted. You are requested to carry out the work as detailed below subject to the following terms and conditions.

#	Site of Installation	Capacity (kW)	Total
1	Site Survey, Design, Supply, Installation, Testing and Commissioning with remote monitoring system of 50 kW Micro Grid system (Solar-Wind Hybrid Power Plant with battery backup) at Thazhae Thudukki Tribal Hamlet in Bhavani Range Under Silent Valley Reserved Forest Range, Palakkad, Kerala	50	1,43,38,800/-



	TOTAL	1,43,38,800 /-
<b>Rupees One Crore Forty-Three Lakh Thirty-Eight Thousand Eight Hundred only</b>		

An agreement has to be executed by you in the prescribed form (enclosed as Annexure - I) on Kerala Stamp paper worth Rs. 200/- within 7 days of the receipt of this work order for the fulfilment of the contract along with a security deposit of Rs. 4,30,164/- (Rupees Four Lakh Thirty Thousand One Hundred and Sixty-Four only) being the 3% of contract value (Rounded off) of Rs. 1,43,38,800/- on Demand Draft/Bank Guarantee in favour of CEO, ANERT. You have to pay all expenses incidental to the execution of the above agreement.

### 1. SCOPE OF WORKS

- i. The scope covers Survey, Design, Supply, Installation, Testing, Commissioning with remote monitoring system of 50 kW capacity Micro Grid system (standalone Solar-Wind / Solar + any other RE source Hybrid Power Plant with battery backup) with comprehensive maintenance contract for 5 years. The battery must be designed so as to **deliver 100 kWh output** with desired working life of minimum 7 years, suitably interconnected as required to obtain the required DC system voltage.
- ii. The plant shall feed AC power to the Low Tension (LT) distribution micro-grid.
- iii. The individual string / array combiner boxes and DC cabling shall be installed on ground within the allotted space. Construction of 7ft. height solar fencing for providing protection from wild animals with approval of the Forest officials as well as the community inhibits for the power plant & control room for inverter, battery and monitoring system at site for power project.
- iv. Installation, testing & commission of solar power plants at site, street lights, internal wiring of Anganwadi and Community kitchen. Service connection along with installation of energy meter, installation of off-grid street lights etc for consumption for 365 days
- v. Supply of components for households
  - LED tube lights of 20 W - 2 Nos
  - LED bubs of 7 W - 2 Nos
  - Provision of fan connection [supply of fan not included] - 1
  - Mobile charging point load
  - 20 W Solar Street lights - 15 Nos including Poles
  - Supply of LED TV (42 inch or above) at Anganawadi along with DTH service



provision

- vi. Construction of control room for safe storage of Battery based storage system, DC and AC distribution boxes, DC and AC cabling, energy meters and data acquisition system shall be installed in the control room. Control room shall have proper ventilation and locking system.
- vii. Remote Monitoring System (RMS) with GSM is necessary and bidder shall provide quarterly generation report up to 5 years after commissioning at ANERT HQ / ANERT District Office or manual data extension system is compulsorily to be deployed.
- viii. For transportation of materials from within the Bhvani range to the actual site of installation, it is mandatory to avail the service of the local person on payment basis in consultation with the Forest/Tribal Department.
- ix. Any other work required for the successful commissioning of the power plant which are not mentioned in this document and are required as per prevailing laws & regulations in the country.

**b. Maintenance Part**

- i. Comprehensive Maintenance of the power plants over the period of 5 years
- ii. Supply of electricity to identified households including the public / community / social establishments
- iii. Training the local staff for meter reading, O&M, etc.
- iv. Training the local staff to maintain the account of power generation, consumption by all the consumers etc.

**2. SCHEDULE OF SUPPLY, INSTALLATION & COMMISSIONING:**

- i. The items should be delivered and installed at Thazhae Thudukki Tribal Hamlet in Bhavani Range Under Silent Valley Reserved Forest Range, Palakkad as specified by ANERT, under prior intimation and supervision of ANERT.
- ii. The Design and Engineering for the Power Plants considering all the site aspects of the site along with shade analysis reports should be provided within 14 days of the issue of this work order. The detailed Engineering drawings as mentioned in the tender also be submitted prior to start of works.
- iii. The Solar PV modules to be used must be from the ALMM list published by MNRE from time to time.
- iv. The agency shall submit the timeline for completion along with the agreement and security deposit. This timeline must be followed and no extension of time for completing the installation will be granted. Although, time extension may be granted for things beyond the control of your agency.
- v. The detailed Bill of Materials along with datasheets & Test certificates of PV



Modules, Inverter, etc must be provided well in advance and must be approved by ANERT before material despatch.

- vi. The Supply, Installation and Commissioning of the Power Plant must be completed within **75 days from the issue of work order.**
- vii. The additional works/requirements at the site as mentioned in the Tender and the corrigendum issued thereafter need to be completed.
- viii. Penalty for delay in supply and installation will be imposed at 0.5 % per week up to a maximum 10 %. In case of delay in supply and installation, CEO, ANERT may cancel the contract and take recourse to other action as deemed appropriate.

### 3. INSTALLATION

- i. The installation work of the solar power plant must be in compliance with the Technical Requirements and Standards as mentioned in the Tender.
- ii. A display board (size 4 ft x 3 ft) should be displayed with contents to be provided by the concerned official at ANERT is to be placed at the site.

### 4. PAYMENT

- i. No advance payment will be given. All the documents submitted should be certified by the concerned District Office of ANERT. This will be applicable for works issued through individual work order for installations done through Plan and Deposit work scheme of ANERT.
- ii. The terms of payment shall be:
  - a. 2.5 % of the invoice amount shall be charged by ANERT as non-refundable license fee and the remaining amount shall be treated as contract value for further payment.
  - b. Upon delivery of major components (PV Modules, Inverter, MMS, Wind turbines etc) at the site, 60 % of the contract value will be released as first part payment, if requested. The supplier shall submit the invoice for the materials (including serial numbers and delivery chalan) duly certified by the concerned District Office along with a report regarding the supply of materials.
  - c. On commissioning of the system, 30% of the contract value will be released. All documents related to the completion of the work including commissioning report and commissioning certificate shall be submitted for the release of the amount. The supplier shall submit the invoice for the materials supplied and all documents related including the Project Completion Report to the completion of the work certified by the district office shall be submitted for the release of the amount.
  - d. The remaining 10% shall be retained as performance security and will be



released as given below. This period will be considered only from the date of commissioning.

- i. 50% of performance security shall be paid after one year on request along with the preventive maintenance reports.
- ii. The remaining 50% shall be paid after the five-year warranty period on request along with the preventive maintenance reports for the 5 years.
- iii. The security deposit of 3% furnished along with the contract agreement shall be released on successful completion of supply, installation and commissioning.
- iv. Income tax, contribution to workers' welfare fund and other statutory deductions shall be made from the payment as per prevailing norms.

#### 5. WARRANTY

- i. 5 years' warranty should be provided by the supplier for the system and components or part of the system has to be provided
- ii. PV modules used in solar power plants/ systems must be warranted for their output peak watt capacity, which should not be less than 90 % at the end of 10 years and 80% at the end of 25 years
- iii. The Warranty Card to be supplied must contain all the details of the system supplied. The OEM warranty card of all the equipment must also be submitted along with the warranty certificate issued in your letter head.

#### 6. OPERATION MANUAL

- i. An Operation, Instruction and Maintenance Manual, in English and Malayalam should be provided with the system.
- ii. The following minimum details must be provided in the manual:
  - a. About solar power plant – its components and expected performance.
  - b. About PV module
  - c. About electronics
  - d. About charging and significance of indicators
  - e. DO's and DON'T's
  - f. Clear instructions on regular maintenance and troubleshooting of solar power plant
  - g. Name and address of the contract person in case of non-functionality of the solar power plant.



**7. SERVICE AND MAINTENANCE**


- i. The faulty system or components should be replaced/ repaired within 7 days of fault reporting. The servicing should be carried out at the site of installation.
- ii. Any Delay in servicing beyond 7 days of fault reporting would attract penalty at the rate of at the rate fixed by CEO, ANERT and further actions will be initiated against the agency.
- iii. A designated contact Telephone Number and address should be submitted for reporting faults during the warranty period.

**8. INSURANCE**

- i. The power plant must be insured at every stage of operation – from Material dispatch, storage, completion of installation and till 5 years after commissioning. The insurance coverage on handing over of the system must include all conditions of **Standard Fire and Special Perils Policy (Material Damage)**. In addition, the damages from wildlife and natural calamity are also to be covered.
- ii. The insurance premium for the 5 years of warranty is to be paid by your agency. On handing over of the system, the original insurance policy is to be handed over to the authorised person at ANERT District Office. The annual premium payment receipt must be handed to the authorised person at the District Office of ANERT.

*Not Withstanding the terms and conditions stipulated above, it is to be noted that the conditions in the tender document shall prevail;*

Yours faithfully



*for* Chief Executive Officer





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**DEPARTMENT OF POWER, GOVERNMENT OF KERALA**  
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**PROCEEDINGS OF THE CHIEF EXECUTIVE OFFICER**  
(Present: NARENDRA NATH VELURI I F S)

Abstract

ANERT - Design, Supply, Installation, Testing and Commissioning of Solar based Hybrid Power plants with battery backup at Tribal Hamlets of Melethudukki, Galassi in Bhavani Range under silent valley Reserved forest range and Ooradam tribal hamlet of Attappadi range, Palakkad - 60% payment for 20 systems to M/s Windstream Energy Technologies India Pvt Ltd - orders issued  
File no.: ANERT-PKD/1/2023-DE(PKD)

**A.F. No. 1969/2023/ANERT**

**30-11-2023**

- Read:
1. G.O.(Rt)No.144/2022/POWER dtd 20-08-2022
  2. Work Order No: ANERT-PKD/1/2023-DE(PKD) dtd 26/05/2023
  3. Invoice No. 14 /2023-24 dtd 30.07.2023
  4. Invoice No. 12 /2023-24 dtd 30.07.2023
  5. Invoice No. 13 /2023-24 dtd 30.07.2023
  6. Invoice No. 11 /2023-24 dtd 30.07.2023

**ORDER**

ANERT had issued work order for the Design, Supply, Installation, Testing and Commissioning of Solar based Hybrid Power plants with battery backup at Tribal Hamlets of Melethudukki, Galassi in Bhavani Range under silent valley Reserved forest range and Ooradam tribal hamlet of Attappadi range, Palakkad vide ref cited 2<sup>nd</sup> to M/s Windstream Energy Technologies India Pvt Ltd - for an amount of Rs . 3,48,23,836 /-. The agency has delivered the materials in 20 sites and have submitted the invoice vide ref cited 3<sup>rd</sup> to 6<sup>th</sup> .They are eligible for 60% payment as per work order. As per the work order, 2.5% of the total amount is payable to ANERT as license fee and is to be transferred to ANERT A/C No. 67242882331.

Based on the above, M/s Windstream Energy Technologies India Pvt Ltd - is eligible for payment as below:

Particulars	Amount (in INR)
Work Order Amount	3,48,23,836
<b>Gross amount (20 sites out of 60 sites)</b>	<b>1,16,07,946</b>
Less: License Fee including GST	3,42,434
Gross Amount Payable-20 sites (Contract	



Value after deduction of license Fee)	1,12,65,512
<b>60% Payable</b>	<b>67,59,307</b>
Less: GST TDS @ 2%	1,22,404
Less: Income Tax TDS @ 2%	1,22,404
<b>Net amount payable to agency</b>	<b>65,14,499</b>

Sanction is hereby accorded to pay an amount of **Rs.71,01,741/- (Rupees Seventy One Lakhs One Thousand Seven Hundred and Forty One only)** being 60% on material delivery. Out of this, **Rs. 1,22,404 /-** is deducted as **IT TDS** and **Rs.1,22,404/-** is deducted as **GST TDS** and **Rs.3,42,434/-** is deducted as **License fee** and balance of **Rs. 65,14,499/- (Rupees Sixty Five Lakh Fourteen thousand Four hundred and Ninety Nine only)** may be disbursed to **M/s Windstream Energy Technologies India Pvt Ltd.**

Account Summary			Amount (in INR)
Beneficiary Name	:	M/s Windstream Energy Technologies India Pvt Ltd	Rs.65,14,499 /-
Branch	:	ICICI	
Account No.	:	007605004209	
IFSC	:	ICIC0000076	
Beneficiary Name	:	CEO, ANERT	Rs.3,42,434/-
Branch	:	SBI Pattom	
Account No.	:	67242882331	
IFSC	:	SBIN0070212	

This work comes under the AS cited 1<sup>st</sup> as item no. 1.iii.a -Promotion of Renewable Energy Systems : Solar Electrification of unelectrified tribal hamlets).

The expenditure in this regard is to be met from the Head of Account " 2810-00-800-90-06-35-00 for the FY 2023-24.

Signed by  
Narendra Nath Veluri I F S  
Date: 30-11-2023 14:15:41  
NARENDRA NATH VELURI I F S  
CHIEF EXECUTIVE OFFICER

Copy to:

1. M/s Windstream Energy Technologies India Pvt Ltd -
2. Finance Manager / Cashier
3. Office Copy



V17759/2023



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Agency for New and renewable Energy Research and Technology  
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DEPARTMENT OF POWER, GOVERNMENT OF KERALA  
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Tel.: (+91-471) 2338077, 2334122, 2333124, 2331803 • Fax: (+91-471) 2329853



No. ANERT-PKD/1/2023-DE(PKD)

26-05-2023

To

M/s Windstream Energy Technologies India Pvt Ltd  
Plot 289, 2<sup>nd</sup> floor, Prakruthi Nivas,  
Road No-78, Prashasan Nagar,  
Jubilee Hills, Hyderabad - 500096

**WORK ORDER**

Sir,

Sub: ANERT - Work Order for the Design, Supply, Installation, Testing and Commissioning of Solar - Hybrid Power Plants with battery backup at Tribal Hamlets of Mele Thudukki, Galassi in Bhavani Range Under Silent Valley Reserved Forest Range and Ooradam Tribal Hamlet of Attappadi Range, Palakkad, Kerala, India- reg

- Ref: 1. Tender ID: 2023\_ANERT\_554224\_3  
2. Your Bid No. 1540073 dtd 24/04/2023

Attention is invited to the references cited. Your offer for the Design, Supply, Installation, Testing and Commissioning of Solar - Hybrid Power Plants with battery backup at Tribal Hamlets of Mele Thudukki, Galassi in Bhavani Range Under Silent Valley Reserved Forest Range and Ooradam Tribal Hamlet of Attappadi Range, Palakkad, Kerala is accepted. You are requested to carry out the work as detailed below subject to the following terms and conditions.

SN	Site of Installation	No of Families	Total
Design, Supply, installation, Commissioning of 1 kW Solar-Wind Hybrid Power Plant (500 Wp Solar + 500 W Windmill) with LFP battery along with 5-year warranty complying all terms and conditions for the Electrification of the Tribal Hamlets as per tender at the following sites			
1	Mele Thudukki	50	3,48,23,836
2	Mele Galassi	6	
3	Thazhe Galassi	3	
4	OOradam	1	
TOTAL		60	3,48,23,836/-
Rupees Three Crore Forty-Eight Lakh Twenty-Three Thousand Eight Hundred and Thirty Six only			



A tripartite agreement has to be executed by you in the prescribed form (enclosed as Annexure - I) on Kerala Stamp paper as per the Kerala Government order - G.O.(P) No.113/2019/TD dtd 24/07/2019 (One rupee for every Rs 1000 or part thereof on the contract amount, subject to a minimum of rupees 200 and a maximum of rupees one lakh) within 7 days of the receipt of this work order for the fulfilment of the contract along with a security deposit of **Rs. 10,44,720/- (Rupees Ten Lakh Forty-Four Thousand Seven Hundred & Twenty only)** being the 3% of contract value of **Rs. 3,48,23,836/-** on Demand Draft/Bank Guarantee/NEFT transfer in favour of CEO, ANERT. You have to pay all expenses incidental to the execution of the above agreement.

### 1. SCOPE OF WORKS

The Works to be performed by the contractor shall include but not limited to

- a. Supply, Installation and Commissioning of **60** Nos of Standalone Solar - Hybrid System with battery backup as described below and shall be executed by the EPC contractor under the supervision of ANERT.
- b. The system is to be designed to be installed at a minimum 4m height mounting from the ground with proper platform and housing to place inverter, battery bank and other controls. There should be proper accessibility and serviceability to the solar hybrid system.
- c. The sites do not have any vehicle accessibility and the workmen and material can only reach the site by foot. The walking trails are hilly type and adequate precaution must be taken to ensure that men and material reach site without damage and delays. The sites are inside forest area so safety from wild animals should also be given top priority for men, material and the for the power plant.
- d. The vendor shall employ local villagers for material transport or for casual labour after confirming rates with them and the forest department. Providing local employment will be an indirect benefit of such projects.

### 2. SCHEDULE OF WORKS:

- i. The items should be delivered and installed for each house in the hamlet, under prior intimation and supervision.
- ii. The successful bidder should complete the Supply, Installation, Testing and Commissioning of the whole system within 120 days from the date of issue of work order.
- iii. The detailed Engineering drawings as mentioned in the tender also be submitted prior to start of works. The rates mentioned above is inclusive of all additional works required for the successful commissioning of the power plant and no



request for enhancement of rates will be entertained.

- iv. Supply of the SPV module must be from the ALMM list issued by MNRE from time to time. It is required to use Mono PERC Half cut cells – 500 Wp or above for the works. The Solar PCU and charge controller should meet the General and Technical specifications as mentioned in the tender.
- v. The agency shall submit the timeline for completion along with the agreement and security deposit. This timeline must be followed and no extension of time for completing the installation will be granted. Although, time extension may be granted for things beyond the control of your agency.
- vi. The detailed Bill of Materials along with datasheets & Test certificates of PV Modules (Mono PERC), Grid Tie Inverter etc must be provided well in advance and must be approved by ANERT before material dispatch. ANERT reserves the right to reject the materials if the same are not in compliance with the requirements of the tender. In case, the successful bidder delivers the materials without BoM approval, they may have to take back the materials at their own cost and no time extension without penalty will be provided for completion of works.
- vii. The Supply, Installation and Commissioning of the Power Plant must be completed within the timeline mentioned above. This is the time period for handing over the system to ANERT with Grid connectivity.
- viii. In case of no valid reason, extension of time of completion that can be granted at a time shall will be 25% of the original time. The maximum extension that can be granted for a work shall be limited to half the original time of completion.
- ix. When the contract period has to be extended wholly or partly due to default on the part of the bidder, the Agreement Authority may sanction extension of time after imposing fine as mentioned below;

Period	Rate of Fine
First Extension	1% of the work order amount subject to a minimum of Rs. 1000/- and maximum of Rs. 50,000/-.
Second Extension	2% of the work order amount subject to a minimum of Rs. 2000/- and maximum of Rs. 1,00,000/-

- x. Penalty for delay in supply and installation will be imposed at 0.5 % per week up to a maximum 10%. In case of delay in supply and installation, CEO, ANERT may cancel the contract and take recourse to other action as deemed appropriate.

### 3. INSTALLATION

- a. The Design, Engineering, Manufacture, Supply, Installation, Testing and Performance of the equipment shall be in accordance with latest appropriate IEC/Indian Standards as detailed in the tender document. Where appropriate



Indian Standards and Codes are not available, other suitable standards and codes as approved by the MNRE / authorised Government agency shall be used.

- b. Any supplies which have not been specifically mentioned in this Contract but which are necessary for the design, engineering, manufacture, supply & performance or completeness of the project shall be provided by the Bidder without any extra cost and within the time schedule for efficient and smooth operation and maintenance of the SPV plant. The installation work of the solar power plant must be in compliance with the Technical Requirements and Standards as mentioned in the Tender.
- c. A display board with contents to be provided by the concerned official at ANERT is to be placed at the site.
- d. Any other work required for the successful commissioning of the power plant which are not mentioned in this document and are required as per prevailing laws & regulations in the country

#### 4. PAYMENT

- A. No advance payment will be given. All the documents submitted should be certified by the concerned District Office of ANERT. This will be applicable for works issued through individual work order for installations done through Plan and Deposit work scheme of ANERT.
- B. The terms of payment shall be:
  - a. 2.5 % of the invoice amount shall be charged by ANERT as non-refundable license fee and the remaining amount shall be treated as contract value for further payment.
  - b. Upon delivery of major components (PV Modules, Inverter, MMS, battery bank etc) at the site, 60 % of the contract value will be released as first part payment, if requested. The supplier shall submit the invoice for the materials (including serial numbers and delivery chalan) duly certified by the concerned District Office along with a report regarding the supply of materials.
  - c. On commissioning of the system, 30% of the contract value will be released. All documents related to the completion of the work including commissioning report and commissioning certificate shall be submitted for the release of the amount. The supplier shall submit the invoice for the materials supplied and all documents related including the Project Completion Report to the completion of the work certified by the district office shall be submitted for the release of the amount.
  - d. The remaining 10% shall be retained as performance security and shall be released in parts of 2% for the 5 years upon submission on performance reports



of the installations.

- e. The security deposit of 3% furnished along with the contract agreement shall be released on successful completion of supply, installation and commissioning.

C. Income tax, contribution to workers' welfare fund and other statutory deductions shall be made from the payment as per prevailing norms.

## 5. TECHNICAL SPECIFICATIONS

**Stand-alone - Solar Hybrid PV Power plant: (500 Wp Solar and 500W Windmill)**

**The Stand-alone Solar Hybrid PV System** is proposed with the following components:

- a. Solar Array: 500Wp
- b. Windmill - 500W
- c. Inverter: Min 1 kVA Hybrid MPPT Inverter
- d. Battery Bank: 1200 Wh Li Fe Po4 battery bank with BMS.
- e. Cabinet enclosure of adequate IP rating for housing Battery and Inverter as these are to be placed outdoor. This should be easily extendable for future upgradation.
- f. The Mounting structure frame should be easily extendable to accommodate additional upgradation of 500wp panel. (Bidder must demonstrate this in the proposal). The single or double pole structure must have enough strength and durability along with foundation to handle the additional load in future.
- g. Other BoS include Mounting Structures, Cables, Junction Boxes, DCDB, ACDB, Control & Protections etc. All the equipment should conform to the BIS or IEC or equivalent international specifications, wherever such specifications are available and applicable.

## 6. SOLAR STREET LIGHTS

Solar Streetlights for lighting the Power Plant and control room area to be provided separately so that ample light will be available in case, the power plant is not functional. The detailed specification of Solar Streetlighting System is below:

Solar Module	:	120 Wp
Battery (Lithium Ferro Phosphate)	:	700 Wh (+20% permissible)
Luminary	:	20 W (+25% permissible)
Pole (GI pole with Rubber coated paint)	:	Height - 4m, Dia -4"

White Light Emitting Diode (W-LED) is a solid-state device which emits light when forward electric current passes through it. A LED based solar street lighting system consists of a PV Module, control electronics, battery, and W-LED based



Luminaire, all suitably mounted on a Pole. The battery is charged by electricity generated through the PV module during day time and the luminaire provides light from dusk to dawn.

LED	White Light Emitting Diode (W-LED) (SMD LED) with minimum luminous efficacy 150 lumen/watt
Luminaire	Minimum luminaire efficacy should be 100 lumen/watt
Colour Temperature	White colour (colour temperature 5000°-6500°K), the illumination should be uniform without dark bands or abrupt variations, and soothing to the eye. Higher light output will be preferred. Uniformity should be greater than 30%.
Lux level	Minimum 14 lux within a rectangle when measured at a distance of 5m from the pole along (on either side of the road) and 4m from the pole across
Electronics Efficiency	Min 85% total.
Duty cycle	Dusk to dawn.
Make of LED	NICHIA/ CREE/ OSRAM/ PHILIPS or equivalent
Charge Controller	MPPT / PWM

## 7. HOUSEHOLD INTERNAL WIRING

- MCBs shall be used as load limiters as incoming protection device of 0.5A Single Pole Type C MCB for 100 W for domestic consumers which may vary as per the load of the consumer. MCBs of appropriate ratings are to be installed as the main incomers for other loads.
- One circuit with 1 sq. mm cable can be used for installations up to 1kW. The wire shall be of 600 V grade insulation.
- Standard switches designed for 230 V AC shall be used.
- PVC Conduits should be used wherever mechanical protection is needed for the wires and it can be clipped onto the wooden parts for running on the roof section.
- The following bill of material to provide internal wiring, and switches:

S/N	Item / Specification
1	6 Amp One Way Switch
2	6 Amp, 2 in 1, Five-point socket
3	6 Amp Angle Holder
4	PVC conduit / pipe ½" 10'
5	PVC L / T Bend, box
6	0.5 Sq. mm, CU, PVC Wire

## 8. WARRANTY



- a. 5 years' warranty should be provided by the supplier for the system and components or part of the system has to be provided for the Solar Power plant
- b. The SPV modules used must be warranted for their output peak watt capacity, which should not be less than 90 % at the end of 10 years and 80% at the end of 25 years
- c. The Warranty Card to be supplied must contain all the details of the system supplied. The OEM warranty card of all the equipment must also be submitted along with the warranty certificate issued in your letter head.

#### 9. OPERATION MANUAL

An Operation, Instruction and Maintenance Manual, should be provided with the system. The following minimum details must be provided in the manual:

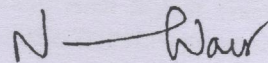
- a. About solar power plant - its components and expected performance.
- b. DO's and DON'T's
- c. Cleaning of Solar PV Modules in regular intervals
- d. Clear instructions on regular maintenance and troubleshooting of solar power plant
- e. AS built Drawings for the Installation
- f. OEM Warrantee Certificates of Inverters, PV Modules, Batteries etc.
- g. Specification of PV Plant
- h. Data Sheets of major equipment like PV Module, Inverter etc.
- i. Name and address of the E.P.C Contractor and the contract person in case of non-functionality of the solar power plant.

#### 10. DISPLAY BOARD

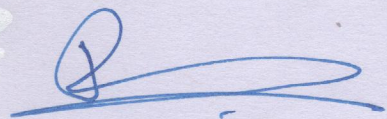
- a. The logo of ANERT and details of the scheme as specified in the work order are to be provided in each of the Solar Street Lighting Systems as well in each of the households.
- b. The board shall be made of GI/SS of min thickness 20 SWG having size 60cm x 30 cm. The matter is to be printed in RGB combination

*Not Withstanding the terms and conditions stipulated above, it is to be noted that the conditions in the tender document shall prevail;*

Yours faithfully



NARENDRA NATH VELURI I F S  
CEO ANERT



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