WELCOMES YOU

India's 1st Net Plus Building

State Village Electrification Status

(As on 30.06.2013)

1 . No. of Inhabited Villages	**(as per 2001 Census)**	19744
2 . No. of Electrified Villages		19338
3. Majra-Tola Electrification		24218
4 . Percentage of Village Electrification		98 %
5 . Un electrified Villages	**(as per 2001 Census)**	406

Achievement so far in RE Sector (Rural)

- Electrification of 1476 remote UE villages & hamlets through SPV PP & HLS of total capacity 3066 KW benefiting 58000 families and 9,500 nos. of street light points.

  (the rest 406 UE Villages are being electrified)
- Electrification of 1633 tribal hostels.
- Electrification of 446 health centers.
- Electrification of 256 Remote Police Stations/Camp.
- Installation of 446 SPV Pumps for drinking water Supply in remote villages.
- Installation of 343 SPV Pumps for irrigation in far flung locations from grid.

ELECTRIFIED VILLAGE & MAJRATOLA by CREDA as on 30-06-2013

S. No.	District	No. of Village & Majratola	Benefited Beneficiary	Un-Electrified Villages
1	Raipur	0	0	0
2	Gariaband	128	4265	0
3	Baloda Bazar	22	1535	0
4	Mahasamund	5	165	0
5	Rajnandgaon	51	1401	0
6	Durg	0	0	0
7	Balod	0	0	0
8	Bemetara	0	0	0
9	Kabirdham	67	2795	0
10	Bilaspur	50	1216	0
11	Mungeli	45	2413	0
12	Raigarh	12	552	0
13	Korba	238	9142	0
14	Janjgir-Champa	1	62	0
15	Sarguja	15	721	0
16	Balrampur	2	306	0
17	Surajpur	42	2066	0
18	Jashpur	183	7262	0
19	Koria	123	6354	0
20	Dhamtari	41	1911	0
21	Kanker	114	3179	0
22	Kondagaon	5	324	0
23	Jagdalpur	44	2037	5
24	Sukma	4	430	125
25	Dantewada	215	8562	36
26	Narayanpur	9	170	131
27	Beejapur	23	1100	109
Total		1476	57968	406

Capacity Assessment & Site Selection for SPV PP

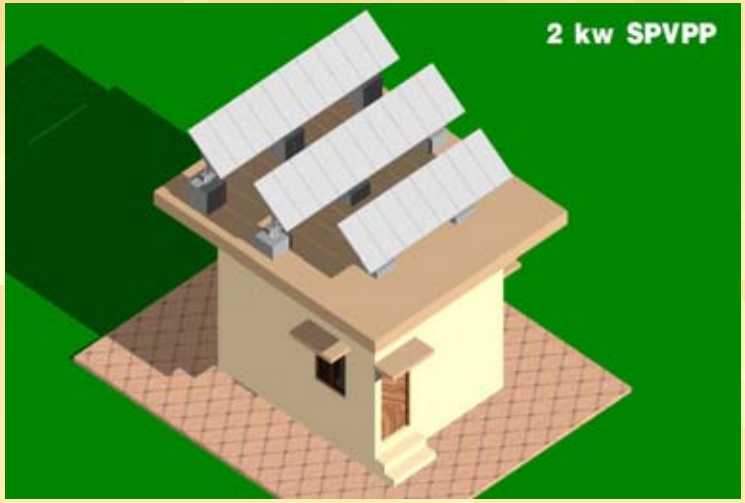
- Detailed household Survey for H/H Demand.
- Village layout survey for PDN & Street Location.
- Based on the H/H Demand & Street lights capacity of plant assessed considering two days autonomy & House Light for 6 Hrs. and Street Light for D/D Operation.
- Location of Plant Selected considering the Safety security , Centrally location for Proper maintenance , power distribution & low line loss with due consultation of villagers.

SPV Power Plant Design Perameter

System Capacity	Max. Allowable WH/Day	Battery Bank Capacity with two days Autonomy	No. of CFL of 11 watt @ 6 hrs./day operation
1 KW	3000 WHr.	48 Volts - 400 AH	30-35
2 KW	6000 WHr	48 Volts - 600 AH	70-75
3 KW	9000 WHr	48 Volts - 900 AH	90-100
4 KW	12000 WHr	96 Volts - 600 AH	140-150
5 KW	15000 WHr	96 Volts - 800 AH	180-200
6 KW	18000 WHr	96 Volts - 1000 AH	240-250

Different Sections of SPVPP

- Control Room
- Solar Photovoltaic Modules with MMS
- Battery Bank
- P C U which include Charge Controller & Inverter
- AJB & MJB
- DCDB & ACDB
- Battery Protection Panel/Isolator
- Feeders separate for house light & street lights.
- Energy Meter
- Timer
- Load Controller Device
- Fencing (if required)
- Power Distribution Network (Trans. / Distribution/Service Lines)
- House light connection with accessories.
- Street Lights.



3-D DRAWING OF THE CONTROL ROOMS OF SPVPPs

PV Array on MS Structure

6KWp SPV POWER PLANT
(I&C IN PROGRESS) AS ON
16.02.2007
Agni Power & Electronics Pvt. Ltd.
Kolkata.

Series Junction Box

Interconnection between SJB & AJB

48V Battery Bank

96V Battery Bank

Electrical Wiring in Control Room

Electrical Wiring in Control Room

Inside Control Room

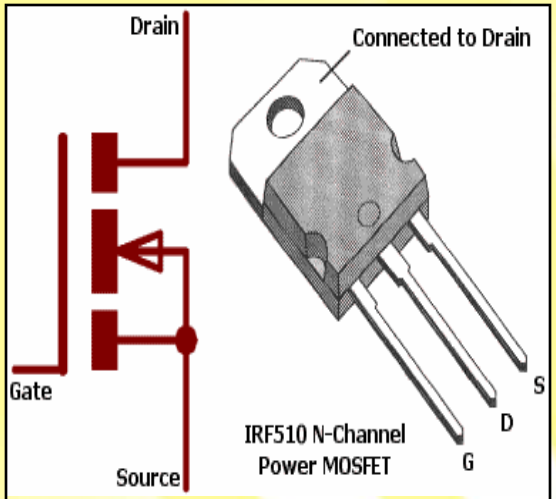
BPP, DCDB & ACDB
INSTALLED IN PREVIOUS YEARS

INSTALLATIONS AT PRESENT

INSTALLATIONS AT PRESENT

TIMERS

Ampere Hour Meter to check the status of the battery health



MOSFET stands for Metal-Oxide Semiconductor Field Effect Transistor

Power Conditioning Unit now onwards

PCU, A SINGLE UNIT

CONSISTING OF

- INVERTER – MOSFET ≤ 6KW & IGBT >6KWp
- CHARGE CONTROLLER

Separate spare control cards (PCBs) to be supplied by parties along with the PCU for quick repairing when ever required.

Power Distribution Network

Power Distribution Network

Reasons of timely completion of project

- Proper planning and review of the factors affecting the activities of project from top to root level
- Strong supervision and quick decisions
- Strict guidelines for contractors and time bond penalty clause.
- Proper support and guidance to the contractors.
- Proper training of staff
- Creation of awareness amongst the probable consumers

Year wise Progress of Solar Remote Village Electrification Programme

Year	No. of Village
2001-02	89
2002-03	38
2003-04	202
2004-05	16
2005-06	5
2006-07	217
2007-08	323
2008-09	297
2009-10	208
2010-11	47
2011-12	25
2012-13	9
Total	1476

SPV Village Electrification

TOTAL ACHIEVEMENT (till 2012-2013)

No. of Villages : 854

No. of Hamlets : 622

Total : 1476

Summary of SPVPP installed in RVE Programme till - 2012- 2013

- Total No. of Villages electrified - 1476
- Total No. SPVPPs - 619
- Total Capacity of SPVPPs installed - 2231 KW
- Total No. of Home Lights provided - 23889
- Total No. of Street Lights provided - 1231
- Total No of Beneficiaries - 57667

Factors / Strategies Contributing to Success of RVE

- State and central financial support for installation of systems.
- Annual Budgetary support from state Govt. for O & M of the installed systems.
- Organizational set up for every plant to ensure functionality & monitoring of systems through service providers .
- Community participation/involvement from site survey to completion of projects. Which encourage ownership of villagers.
- Need/demand based system's capacity assessment and readiness of users /consumers to pay charges.
- Timely completion of projects and capacity enhancement wherever required.

Statement of Expenditure SPV Rural Village Electrification for the year 2006-07

Sanction No.1/6/2/2006-07-RVE Dated 22.2.07

Sn	Site	No. of H/H	Capacity (in KW)	Cost of PP	Cost of PDN	Total	Share of MNRE	Share of GOCG
1	Surve	43	3	13,68000	4,09066	17,77066	7,74000	10,03066
2	Bimalta	60	5	23,54000	6,56057	30,10057	10,80000	19,30057
3	Dokarmana	51	4	19,01000	5,46829	23,57829	9,18000	14,39829
4	Hirvadoli	40	4	19,01000	2,84888	21,85888	7,20000	14,65888
5	Tapara	34	3	13,68000	2,84655	16,52655	6,12000	10,40655

MNRE CFA - RS 315000/- per Kw Plus Rs. 3150/- for PDN per House Hold

Or

Max Rs. 18000/- per house hold Cost of PP whichever is less

Statement of Expenditure SPV Programme Under JNNSM for the year 2011.12

Sanction No.32/6/2011-12/PVSE (Part-VI) dated 28.09.11							
Sn	Name of Site	Capacity (in KW)	Cost of PP	Cost of PDN & Control Room	Total	Share of GOI @ 150/- per watt *	Share of GOCG
1	Vill- Surhi	4	9,55671	1,63355	11,19026	6,00000	5.19026
2	Vill- Dadaniya	4	9,55671	2,54749	12,10420	6,00000	6.10420
3	Vill- Ataria	4	9,55671	2,51950	12,07621	6,00000	6.07621
4	Vill- Senha	8	18,75629	12,07409	30,83038	12,00000	18.83038
5	Vill- Bhada,	4	10,22671	2,68872	12,91543	6,00000	6.91543

* for the year 2013-14 revised CFA @ 105/- Per watt under Micro Grid

ऊर्जा विभाग

मंत्रालय, दाऊ कल्याण सिंह भवन, रायपुर

रायपुर, दिनांक 18 अगस्त 2005

विषय :—सौर विद्युत संयंत्रों का नियमित रखरखाव व संचालन

क्रमांक 2325/ऊ.वि./अपारं.ऊ./2005.—छत्तीसगढ़ राज्य अक्षय ऊर्जा विकास अभिकरण (क्रेडा) द्वारा प्रदेश के अविद्युतीकृत ग्रामों में आपारंपरिक ऊर्जा स्त्रोतों से विद्युत उत्पादन हेतु स्थापित संयंत्रों के नियमित रख-रखाव एवं संचालन व संधारण सुनिश्चित करने के लिये राज्य शासन एतद्द्वारा निम्नानुसार दिशा-निर्देश जारी करता है :—

(1) क्रेडा द्वारा स्थापित किये जाने वाले सौर ऊर्जा आधारित विद्युतीकरण संयंत्रों के नियमित रख-रखाव व संचालन का कार्य क्रेडा द्वारा किया जावेगा. उक्त संयंत्रों की वारंटी अवधि पूर्ण होने के पश्चात् संयंत्रों के संधारण का दायित्व क्रेडा का होगा. इन संयंत्रों का संचालन व संधारण सुनिश्चित करने हेतु क्रेडा में प्रधान कार्यालय स्तर पर एक संचालन एवं संधारण सेल का गठन किया जाएगा, जो संयंत्रों के नियमित संचालन व संधारण हेतु उत्तरदायी होगी.

(2) सौर फोटोवोल्टेइक संयंत्र के नियमित व पूर्ण क्षमता के साथ संचालन के लिये फील्ड कार्यकर्त्ता एवं अर्थ संसाधनों की व्यवस्था क्रेडा द्वारा की जावेगी, इस हेतु हितग्राहियों से क्रेडा या क्रेडा के प्राधिकृत प्रतिनिधि द्वारा निम्नानुसार शुल्क प्राप्त किया जाएगा :—

1. उपभोग	–	घरेलू	रुपए 30/- प्रतिमाह
		व्यावसायिक	रुपए 60/- प्रतिमाह
2. कनेक्शन हेतु आवेदन शुल्क (प्रथम बार)	–	गरीबी रेखा के नीचे	रुपए 100/- प्रतिमाह
		सामान्य	रुपए 200/- प्रतिमाह
		शास./अर्द्ध शास./ व्यावसायिक	रुपए 500/- प्रतिमाह

विद्युत उत्पादन संयंत्र, पथ प्रकाश संयंत्र, बैटरी रख-रखाव एवं कन्ट्रोल यूनिट की मरम्मत के लिये आवश्यक व्यय क्रेडा द्वारा किया जाएगा. संयंत्रों के रख-रखाव में होने वाले आकस्मिक व्यय, जिनकी प्रतिपूर्ति ग्राम में एकत्रित होने वाले राजस्व से संभव न हो (जैसे समस्त बैटरियों को बदलना, पैनल बदलना आदि), की पूर्ति क्रेडा के वार्षिक बजट से की जायेगी. संयंत्रों के रख-रखाव के लिये क्रेडा के वार्षिक बजट में पृथक से प्रावधान किया जाएगा.

(3) राज्य शासन द्वारा सौर ऊर्जा आधारित ग्रामीण विद्युत संयंत्रों के संचालन/संधारण हेतु क्रेडा को ग्रामीण विद्युतीकरण मद में उपलब्ध बजट में से स्थापना लागत का 5% प्रतिवर्ष की दर से राशि विमुक्त की जाएगी.

छत्तीसगढ़ के राज्यपाल के नाम से तथा आदेशानुसार,
पी. के. मिश्रा, संयुक्त सचिव.

(10)

छत्तीसगढ़ शासन, ऊर्जा विभाग,
दाऊ कल्याण सिंह भवन, मंत्रालय, रायपुर

क्र. 1009 /ऊ.वि./अपारं.ऊ./2007 रायपुर, दिनांक 19 जून 2007

अधिसूचना

विषयः- सौर विद्युत संयंत्रों का नियमित रखरखाव व संचालन।

ऊर्जा विभाग द्वारा जारी अधिसूचना क्र. 2325/ऊ.वि./अपारं.ऊ./2005, दिनांक 18 अगस्त 2005 की कंडिका (2)(1) में निम्नानुसार आंशिक संशोधन किया जाता है:-

"सौर फोटोवोल्टेईक संयंत्रों से विद्युतीकृत ग्रामों में घरेलू हितग्राहियों से रु. 30/- प्रति माह के स्थान पर रु. 05/- प्रति माह की दर से विद्युत उपभोग शुल्क प्राप्त किया जायेगा।"

उक्त संशोधन 01 अप्रैल 2007 से प्रवृत्त हुए समझे जायेंगे।

छत्तीसगढ़ के राज्यपाल के नाम से तथा आदेशानुसार,

19/6
(अनिल टुटेजा)
संयुक्त सचिव, ऊर्जा विभाग

पृ.क्र. 1010 /ऊ.वि./अपारं.ऊ./2007 रायपुर, दिनांक 19 जून 2007

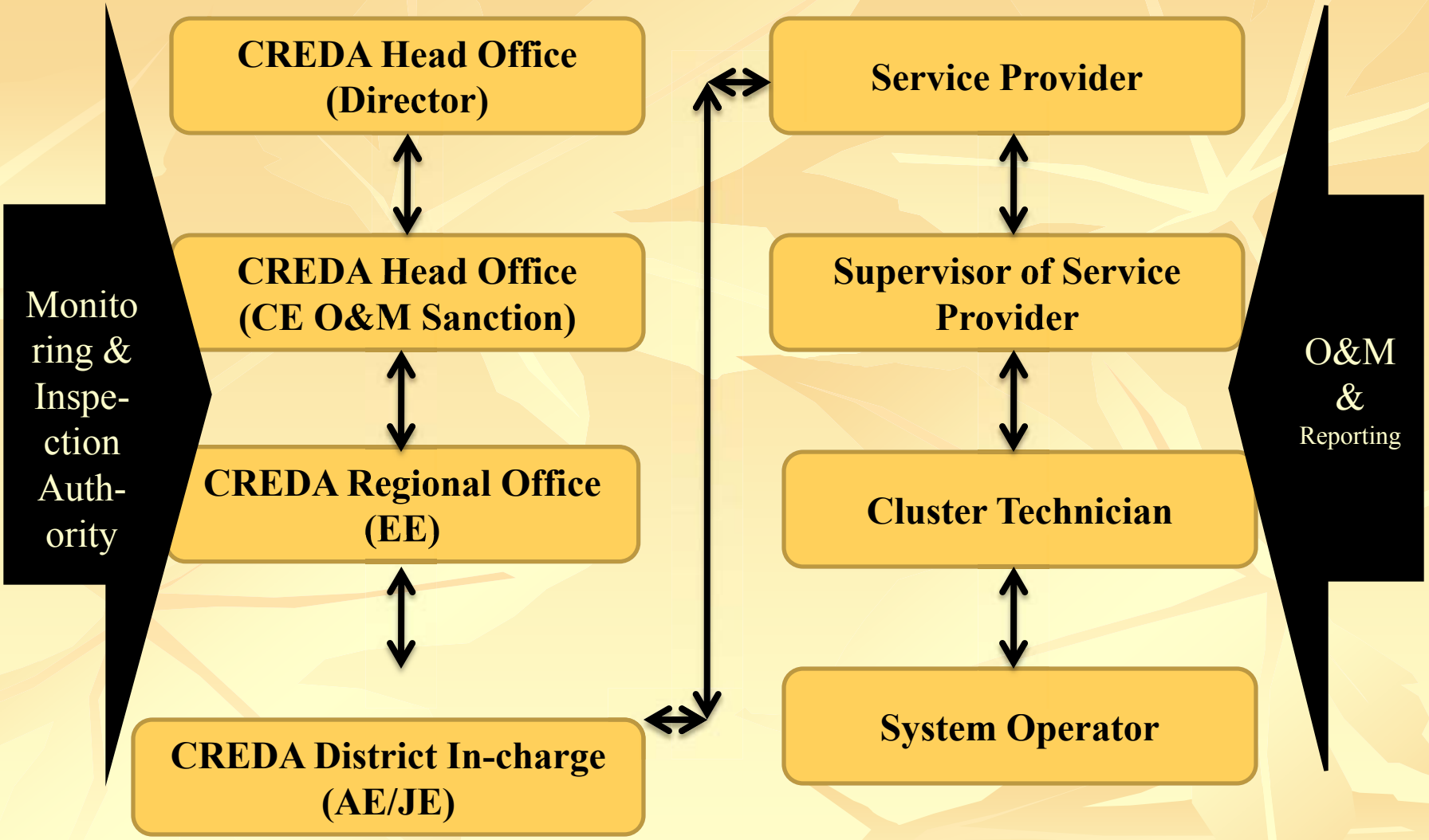
प्रतिलिपि :-

1. माननीय मुख्यमंत्रीजी/मंत्रीजी, ऊर्जा विभाग/अध्यक्ष, क्रेडा को सूचनार्थ।
2. मुख्य सचिव, छत्तीसगढ़ शासन, मंत्रालय, रायपुर।
3. शासन के समस्त विभागों के अतिरिक्त मुख्य सचिव/प्रमुख सचिव/सचिव।
4. सचिव, वित्त, वाणिज्य कर, योजना, आर्थिक एवं सांख्यिकी विभाग, रायपुर।
5. सचिव, महामहिम राज्यपाल का सचिवालय/मुख्यमंत्री सचिवालय/विधानसभा सचिवालय।
6. मुख्य कार्यपालन अधिकारी, क्रेडा, मंत्रालय, रायपुर को सूचनार्थ एवं आवश्यक कार्यवाही हेतु।
7. सचिव, छत्तीसगढ़ राज्य विद्युत मंडल, डंगनिया, रायपुर।
8. मुख्य विद्युत निरीक्षक, छ.ग. शासन, रायपुर।
9. संचालक, जनसम्पर्क को सूचनार्थ एवं आवश्यक कार्यवाही हेतु।

Operation - Monitoring & Reporting

- Daily energy meter reading & recording at plant level by plant operator.
- Routine maintenance of plant & PDN by operator .
- Weekly checking & maintenance of complete plant and PDN by cluster technician.
- Attending complaints by Cluster technician at call.
- Supervisor of service provider visits each plant on monthly basis to ensure the operation & maintenance and record the energy meter reading and he submits the monitoring report in prescribed format to concern office of CREDA through service provider.
- Service provider is paid the maintenance charges @ Rs.45/- per connection for the functional connections/systems.

O&M Set-Up


Monito ring & Inspe- ction Auth- ority
CREDA Head Office (Director)
CREDA Head Office (CE O&M Sanction)
CREDA Regional Office (EE)
CREDA District In-charge (AE/JE)
Service Provider
Supervisor of Service Provider
Cluster Technician
System Operator
O&M & Reporting

Roles & Responsibility of Plant Operator

1. Cleaning of module Batteries & Control room & Checking of Distilled water in batteries .
2. Work with cluster Electrician in the Roster day.
3. Communicate users & Technicians.
4. Break down call Reporting

Roles & Responsibility of cluster Electrician

1. Responsibility for Power Plants in the cluster for complete O&M.
2. Routine Maintenance:-

A. Cleaning of Modules & Batteries.
B. Battery checking , Top-up.
C. Checking & maintenance of Other instruments such-as AJB, MJB, ACDB,DCDB .

3. Maintenance of complete PDN work
4. Follow the guidelines given with the Tender.
5. Visit and work as per the Roster.
6. Fill report / Formats.
7. Attend the Breakdown calls / Repairs .
8. Supervision of Operator .

Roles & Responsibility of Service Provider

1. Service provider will be responsible for Operation, maintenance, Repair, Monitoring & Reports.
2. Its includes Routine Maintenance, Periodical Maintenance & Cleaning of SPV Modules PV Arrays, Batteries and Control rooms.
3. He is also Responsible for Complete PDN lines and connection in each house and street lightening system load management.
4. Engaging one Electrician and one helper for AMC work at one cluster level.
5. The Technician should be trained for operation & maintenance and small rectification / repairs of the system & PDN work .
6. He will have to provide all tool & instrument required for AMC work .
7. He will have to appoint a experienced & qualified supervisor for monitoring the maintenance work and submitting the records and reports in the perscribe formats .
8. Conveyance for cluster Electrician and helper .
9. Regular and timely payment to the Operator ,Cluster Electrician and Helper

Expenditures Detail of SPV Power Plant at Vill. Rawan

- Capacity of System : 4 KW
- Date of installation : 20.03.2004
- No. of Beneficiaries : 44
- No. of Street Lights : 07

Capital Cost :

- Total cost of System : Rs. 14,13,500
- PDN Cost : Rs. 2,91,184
- MNRE Share : Rs. 7,92,000
- **State Share : Rs. 6,21,500**

O&M Expenditure from the date of Installation to till date :

- Service provider Payment : Rs.1,58,400
- Inverter and PDN Repairing Cost : Rs. 50,000
- Battery Replacement : Rs. 4,53,024
- BOS Maintenance : Rs. 43,600
- Total : Rs. 7,05,024

Socio- Economic Benefits

- Employment opportunity in rural areas .
- Reduction in GHG Emission.
- Improved quality of life and living standard.
- Lighting & Energy Security.
- Increased information flow through TV, Mobile , Radio and literacy improvement .
- Electricity enables access to educational information and information communications.

contd…

Socio- Economic Benefits
contd……

- Street lighting improves safety especially for women and girls.
- Lighting enables community activities and studying in night time also. This facilitates the women and children with additional time for house hold work and studies, recreation, sports and social activities.
- Improvements in health clinic facilities and services.
- Safer homes for children and household work due to increased quality of lighting.
- Reduction in indoor air pollution due to decreased fuel burning for indoors lighting .
- Lighting permits income-generating activities beyond daylight hours.
- Using energy to power machinery . Reduction of manual labour ,Increased productivity in enterprises.

Barriers in implementation of SPVVE Programme

- Sites are tough to reach.
- Sites are difficult to approach for about 3 months during rainy season.
- Sometimes unfriendly atmosphere in villages.
- Unavailability of material for masonry work in site.
- Increase in demand due to additional load i.e bulbs, TV,etc.

PROPOSED COST AND SUBSIDY FOR RVE PROJECTS

HH in Village	50
Total Domestic Load in WH (50 Watt per HH for 8 Hrs)	12000
Nos of Street Lights	10
Total S.L. Load in WH (15 Watt per SL for 12 Hrs)	1800
Other Load (10%) in Watts	1380
Approx. Losses 15% in Watts	2277
Total Daily Load of Village in WH	17457
Capacity of SPVPP in Watts	4987.7
Proposed Capacity of SPVPP in KWp	5
Cost of SPVPP (in Lakh)	12
Cost of Control Room (in Lakh)	4
Cost of PDN (in Lakh)	12
Cost of COM for 5 Years (in Lakh)	2.8
Cost of Spares (in Lakh)	2.4
Misc. (in Lakh)	0.5
Total Cost of Project (in Lakh)	33.7
Cost per Watt (in Rs)	674
Proposed CFA (in Rs per Watt)	400

No. 5/23//2009-P&C (Pt. III)

भारत सरकार/ **Government of India**

नवीन और नवीकरणीय ऊर्जा मंत्रालय/ **Ministry of New & Renewable Energy**

***

Block No.14, C.G.O.Complex, Lodhi Road,
New Delhi-03, Dated 30th May **2013.**

To

The Pay & Accounts Officer
Ministry of New & Renewable Energy
New Delhi -110 003.

Subject: **Amendment in the bench mark cost for "Off-grid and Decentralized Solar Applications Programme" being implemented under the Jawaharlal Nehru National Solar Mission (JNNSM) During 2013-14.**

Sir,

In continuation of this Ministry's sanction order of even of even number dated 22nd Nov. 2012 reg. additions/amendments in the above mentioned scheme , I am directed to convey the sanction of the President of India for re-fixing / revising the benchmark cost of the following systems, with immediate effect and accordingly the existing provisions in paragraph 5.3 of the aforesaid scheme which was earlier amended vide sanction order of even number dated 22.11.2012, will be further amended as under, for implementation during the Financial year 2013-14:-

Sno.	SPV System		Capacity	Existing Benchmark cost (Rs./Wp)	Revised Benchmark cost(Rs./Wp)
1.	Solar lighting System- street lights home lights, lanterns, Power packs (Multi use)	CFL	Up to 300 Wp	270	270
2.		LED	Up to 300 Wp	270	450
3*.	Solar Water Pumping System		Upto 5kWp	190	190
4**.	SPV Power Plants (with battery bank having 6 hours autonomy)		>300 Wp to 1Kwp	240	210
			>1 kWp to 10 kWp	220	190
			>10 kWp to 100 kWp	200	170
5.	SPV Power Plants (Without Battery)		Up to 100 kWp	160	100
			>100kWp to 500kWp	130	90
6.	Micro Grid (DC)		Up to 10 kWp	500	350
7.	Mini Grid		>10 to 250 kWp	-	300
8	Street Lights through SPV power Plant		Up to 100 kWp	270	300

** with DC motor. In case AC motor is used there will be a reduction of 15% in the benchmark cost.*

*** In case battery bank is of lower capacity then there will be reduction on proportionate basis taking 50% of the benchmark cost as pertains to battery.*

Thanks

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