32/54/2011-12/PVSE
Ministry of New and Renewable Energy

Performance of Grid Solar PV Power Plants under Demonstration Programme

Under the demonstration programme on megawatt size grid solar power plants, announced in January, 2008, a total of six grid connected solar PV power projects have been commissioned in the country. The first plant was commissioned in August 2009 in West Bengal and the latest plant was commissioned in March, 2011 in Andhra Pradesh.

A brief summary of the status of these projects is given below In Table-I

Table-I

Sr. No.	Project Developer	Project site	Nominal Capacity (MW)	PV Technology used	Period of Operation in Days	Actual Generation in kWh
1	WBGEDCL*	Jamuria, Asansol, West Bengal	1	Crystalline Silicon	614	1879900
2	Azure Power	Awan, Amritsar, Punjab	1	Crystalline Silicon	577	3312090
3	Mahagenco	Chandrapur, Maharashtra	1	a-Si Thin Films	448	1654280
4	Reliance Industries	Nagaur, Rajasthan	5	Crystalline Silicon, Thin Films, CPV	352	7473378
5	Saphhire Industrial Infrastructures Pvt Limited	Sivaganga, Tamil Nadu	5	a-Si Thin Films	190	4271319
6	Sri Power	Chittoor, Andhra Pradesh	2	Crystalline Silicon CdTe Thin Films	92	901900

* West Bengal Green Energy Development Corporation Limited.

The number of days of operation of solar plants is different and given in Table-I. It can be seen that four of these plants have completed one year of their operation and for these plants the net capacity utilization factor (CUF) of the plant has been calculated. This data however, does not take into account any impact of non-availability of the grid or downtime / maintenance of the inverter etc. In all the solar

plants installed under the demonstration programme of the Ministry, the PV capacity is reported as the net sum of PV module capacity installed. This capacity is not at the AC side.

The CUF of these four plants is in the range of 12.29% to 18.8%. The plant wise capacity, actual generation over the given period of plant operation and the plant CUF are given in Table-II.

Table-II

Sr. No.	Project Developer	Days	Nominal Capacity (MW)	Actual Generation in units during the period	Actual CUF %
1	WBGEDCL (Sept 09 ï Aug 10)	365	1	1130700	12.29
2	WBGEDCL 2(Sept 10 ï April 11)	242	1	730500	
3	Azure (Dec 09 ï Nov 10)	365	1	1571610	16.92
4	Azure 2 (Dec 10 ï Jun 11)	212	2*	1740480	
5	Mahagenco (May 10- April 11)	365	1	1347840	15.39
6	Mahagenco (May 11 ï June11)	61	1	273640	
7	Reliance (July 10 ï June 11)	352	5	7473378	18.80
8	Saphhire (Dec 10 ï June 11)	190	5	4271319	
9	Sri Power (March 11 ï May 11)	92	2	901900	

* The 2nd MW capacity was added in the month of November, 2010.

From the above Table it is seen that so far the overall performance of the plant in Rajasthan is best at present. Except for the plant in West Bengal, which was the first plant and a part of the initial learning curve, the average CUF of all other plants is in the range of 15% to 19%.

The highest CUF achieved, in any month of a year, for each solar plant is as given below in Table-III. It can be seen from the Table that all the solar plants have reported highest CUF during March-May period. Except for WBGEDCL project where the highest CUF was 14.93%, all other plants have achieved highest CUF in the range of 20.21% to 23.63%.

Table-III

Sr. No.	Project Developer	Month of Highest CUF	Actual Generation in units	Highest CUF % so far
1	WBGEDCL I	March 2010	116600	14.93
2	WBGEDCL II	March 2011	113600	14.54
3	Azure I	April 2010	149265	20.73
4	Azure II	April 2011	300900	20.90
5	Mahagenco I	April 2011	145520	20.21
6	Mahagenco II	May 2011	156560	21.04
7	Reliance Ind.	March 2011	879104	23.63
8	Saphhire	May 2011	733286	20.37
9	Sri Power	March 2011	334440	22.48

The lowest CUF in any month for each solar plant, where 12 months of operation have been completed is as given below in Table-IV.

Table-IV

Sr. No.	Project Developer	Month of Lowest CUF	Actual Generation in kWh in the month	Lowest CUF % reported so far
1	WBGEDCL	Dec 2009	82200	10.52
2	Azure Power	Jan 2010	60795	8.17
3	Mahagenco	May 2010	73620	9.9
4	Reliance Ind.	August 2010	363300	10.17

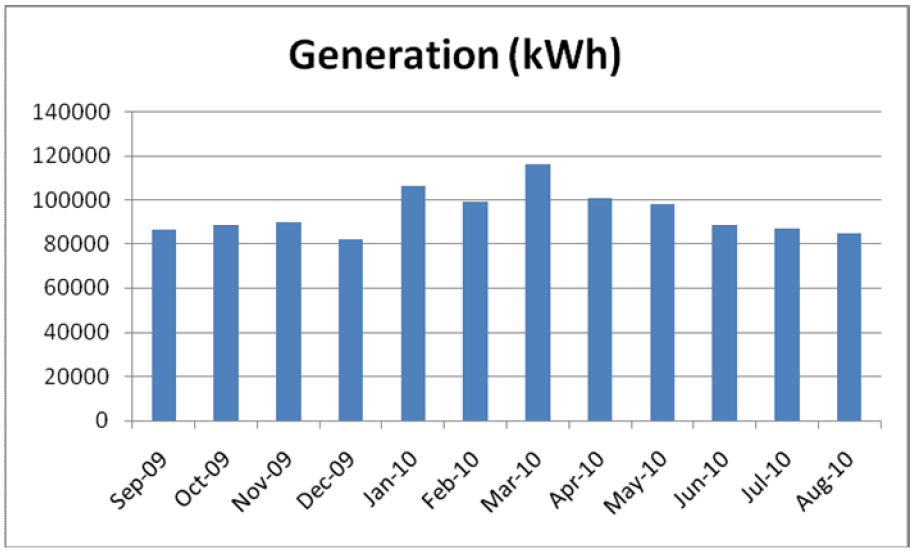
In all cases, except WBGEDCL project, the lowest performance reported so far was within the first two months of the synchronization of the solar plant with the grid.

The specific month-wise performance details of each of the six solar plants, including the choice of technology and the grid connectivity voltage are given in Table V to Table X.

Table -V

Project Developer : West Bengal Green Energy Development Corporation Limited
Location : Seebpore Power Station of DPSC Ltd., Block Jamuria, Asansol, West Bengal
Plant Capacity :1 MW, Crystalline Silicon Modules
Grid Connectivity :11 kV

Month-wise Generation Details



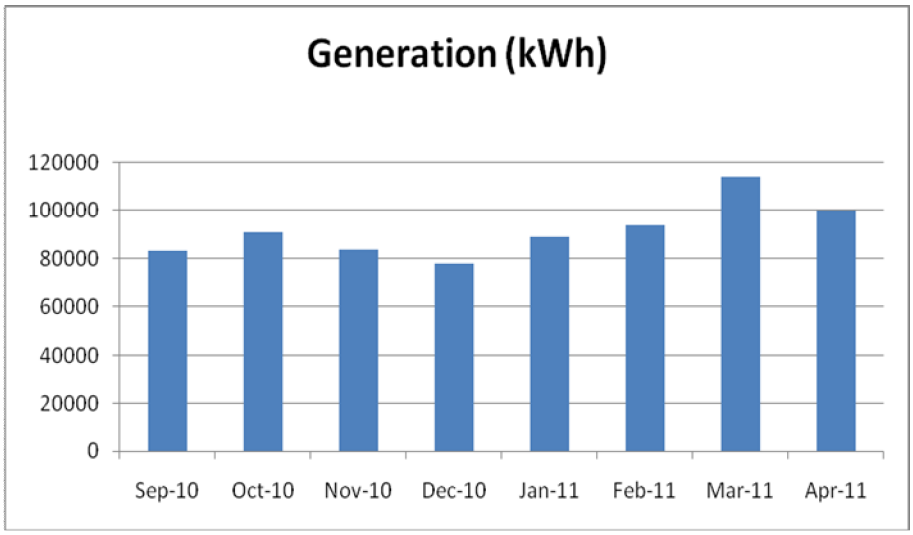
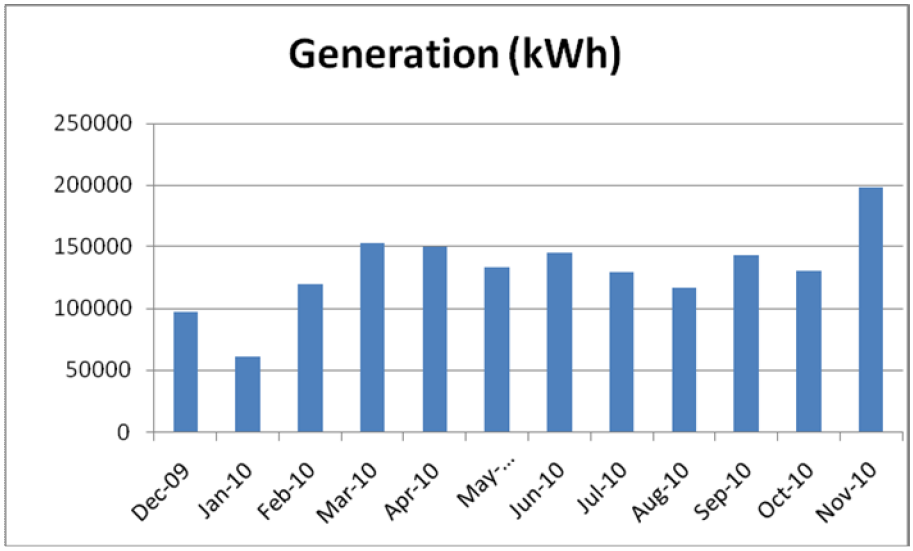


Table-VI

Project Developer : Azure Power Pvt. Ltd., New Delhi
Location :Village : Ahwan, Tehsil :Ajnal, Dist. : Amritsar, Punjab
Plant Capacity : 2 MW (1 MW in first year), Crystalline Silicon Modules
Grid Connectivity :11 kV

Month wise Generation details



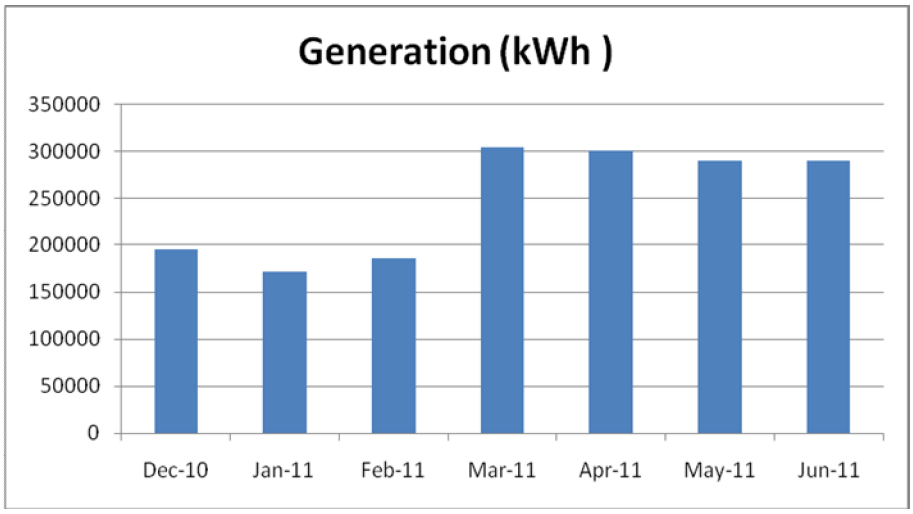
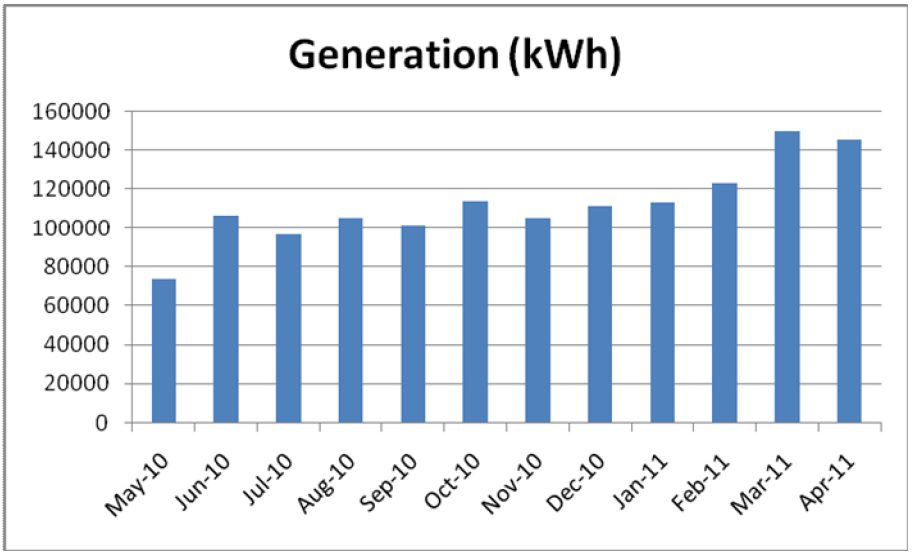


Table-VII

Project Developer : Maharashtra State Power Generation Corporation Limited
Location :Chandrapur STPS, Chandrapur, Maharashtra
Plant Capacity :1 MW, Amorphous Silicon Thin Film Modules
Grid Connectivity :33 kV

Month wise Generation details



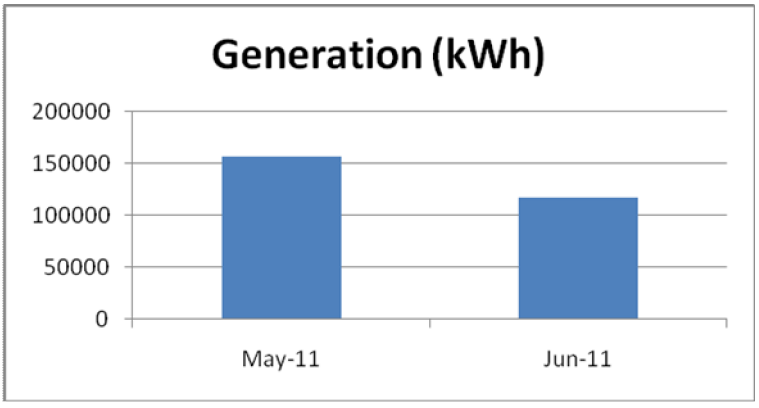


Table-VIII

Project Developer :Reliance Industries Limited, Navi Mumbai
Location :Khasra No. 1133, Village Khimsar, Tehsil : Khimsar, Dist. : Nagaur, Rajasthan
Plant Capacity :5 MW,
(4.8 MW crystalline Silicon Modules, 200 kWp Thin Films and CPV,
5 MW capacity was connected in three stages)
Grid Connectivity :33kV

Month wise Generation details

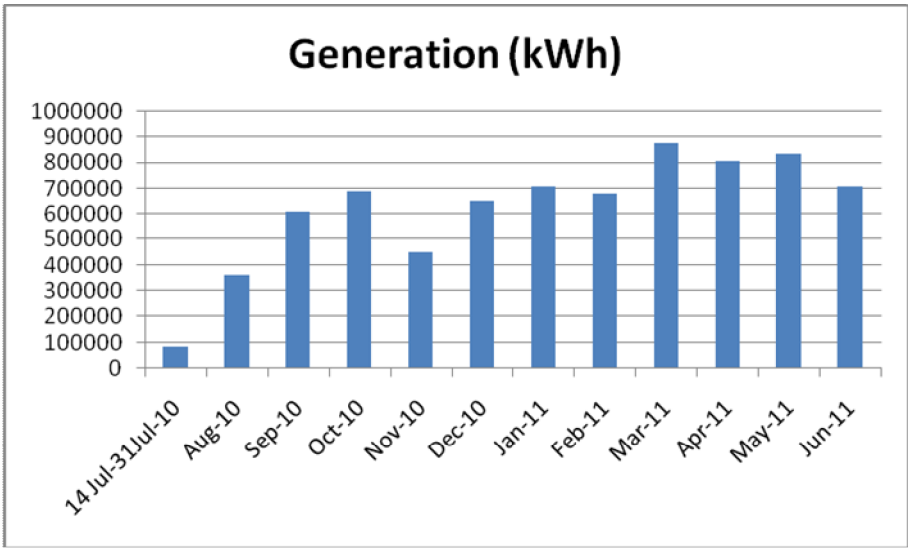


Table-IX

Project Developer : Sapphire Industrial Infrastructures Private Limited, New Delhi
Location :Village Rettai Pillai, Iynarkulam, Taluk New Kallttthur Sivagangai, Dist. ;Sivanganga, Tamil Nadu
Plant Capacity :5 MW, Amorphous Silicon Thin Film Modules
Grid Connectivity :110 kV

Month wise Generation details

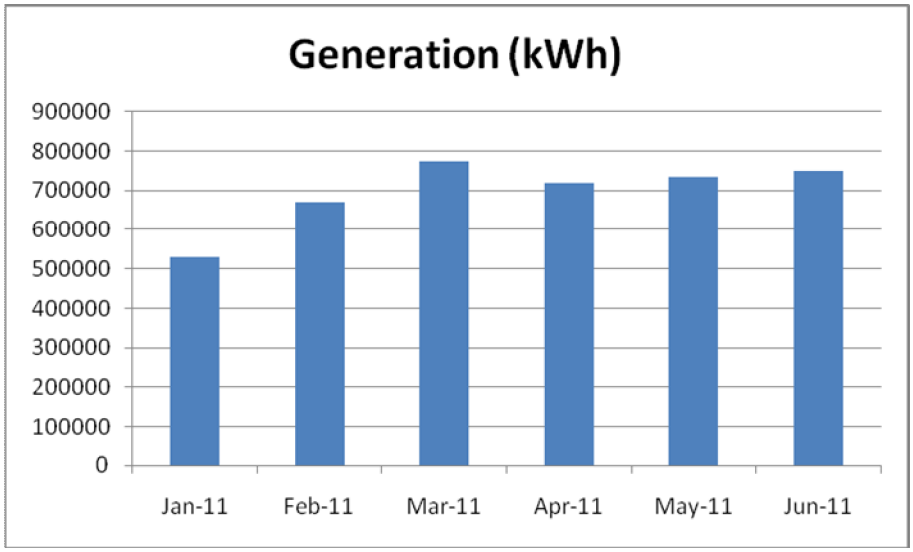


Table - X

Project Developer : Sri City Power Generation (TN) Pvt. Ltd.
Location : Varadayapalem Mandal, Dist. : Chittoor, Andhra Pradesh
Plant Capacity :2 MW,
(1.3 MW Crystalline Silicon Modules, 0.7 MW CdTe Thin Film Modules)
Grid Connectivity : 33 kV

Month wise Generation details