

## **CHAPTER - 16**

### **ENERGY**

16.1 Electricity is an essential requirement for all facets of our life and it has been recognized as a basic human need. It is the key to accelerating economic growth, generation of employment, elimination of poverty and human development especially in rural areas. Provision of electricity is essential to cater for requirements of agriculture and other important activities including small and medium industries, khadi and village industries, cold chains, health care, education and information technology.

16.2 The State is deficient in conventional resources of power generation like water, coal, oil and gas for undertaking new power generation schemes. The State has a vast desert area with inhospitable climate conditions. Desert belt is characterized by low population density, long transmission and distribution lines with lesser load. The scanty rainfall and lack of perennial river system has left the State to generate thermal power but long haulage of coal to generating stations has put the State in disadvantaged state. Agriculture is the main stay of the State economy and there being very little scope of surface water for irrigation, farmers largely depend on electric pump sets for this purpose. The annual per capita consumption of electricity during 2009-10 of the State was 631 kWh as compared to all India average of 778.71 kWh.

16.3 However, there is vast potential for power generation from non-conventional energy sources like wind, solar and biomass in the State. Looking to the potential and being environmental friendly, the non-conventional sources need to be given emphasis to supplement the electricity requirements of the State. Accordingly, highest priority is being accorded to exploitation of renewal energy resources for power generation and for evacuation of generated power from renewable energy sources.

16.4 Efforts are being made to encourage public private partnership in power generation and facilitating efforts to reduce the T & D losses and become self-sufficient in power. Efforts would also be made to provide regular and continuous electricity to the farmers on economical rates and provide un-interrupted power supply in all villages like urban areas

16.5 Rajasthan has undertaken impressive reforms in the power sector. The Rajasthan Power Sector Reforms Act unbundled RSEB into one generation, one transmission and three distribution companies at Jaipur, Jodhpur and Ajmer. It also established the Rajasthan Electricity Regulatory Commission. The State is one of the India's most advanced States in terms of metering and collections (more than 98 percent electricity is metered & sustained rate is also about 98 percent).

Strengthening of power network is the highest priority area of the State Government.

16.6 Despite growth in connectivity, there are issues like unconnected households and low consumption of electricity that are being improved. Agriculture accounts for about 39 percent and industry for over 31 percent of total consumption of electricity in the State. Though, almost 75 percent consumers are domestic, they account for only 20 percent of the total consumption. Around 64 percent households have access to electricity. About 91 percent villages are connected but electrification has not penetrated adequately at the household level with around 36 percent still unconnected rural households. The customer rolls have been growing fast since unbundling and now, it stands at 9.52 million.

16.7 The company-wise details of the outlay kept in the XI Plan, actual expenditure incurred during the first four years, likely expenditure in Annual Plan 2011-12 and likely expenditure in the XI Plan are as follows:-

**Table No. 16.1**

(₹ in crore)

S. No.	Company	XI Plan Outlay	Actual Exp. 2007-11	Likely Exp. 2011-12	Likely Exp. XI Plan
1	Raj. Vidyut Utpadan Nigam Ltd.	11443.00	10653.458	3585.00	14238.45
2	Raj. Vidyut Prasaran Nigam Ltd.	6600.00	4664.08	2000.00	6664.08
3	Jaipur Vidyut Vitran Nigam Ltd.	2680.00	4822.36	1762.02	6584.38
4	Ajmer Vidyut Vitran Nigam Ltd.	2432.00	4061.05	1441.11	5502.16
5	Jodhpur Vidyut Vitran Nigam Ltd.	2435.00	4096.62	1551.87	5648.49
<b>Total</b>		<b>25590.00</b>	<b>28297.56</b>	<b>10340.00</b>	<b>38637.56</b>

16.8 The Company wise details of physical targets for the XI Plan and achievement made is as follows:

**Table No.16.2  
Generation**

S. N.	Particular	Unit	XI Plan Target	Actual Ach. 2007-11	Likely Ach. 2011-12	Likely Ach. XI Plan
1.	<b>Generation</b>	MW	3150	1290	-	1290

16.9 At present, following Thermal/Gas/Hydel Power Generation Stations are operating in the State Sector:

**Table No. 16.3**

<b>S. No.</b>	<b>Generation Power Station</b>	<b>Capacity (MW)</b>
1.	Suratgarh Super Thermal Power Station	1500
2.	Kota Super Thermal Power Station	1240
3.	Dholpur Gas Thermal Power Station	330
4.	Giral Lignite Thermal Power Station	250
5.	Chhabra Thermal Power Station	500
6.	Ramgarh Gas Thermal Power Station	113.50
7.	Mahi Hydrel Power Station	140
8.	Mini-Micro Hydrel Power Stations	23.85
	<b>Total</b>	<b>4097.35</b>
9.	Rana Pratap Sagar Hydrel Power Station*	172
10.	Jawahar Sagar Hydrel Power Station*	99
	<b>Grand Total</b>	<b>4368.35</b>

\* Owned by Rajasthan Vidyut Prasaran Nigam Ltd.

16.10 Rajasthan is promoting power generation in private sector also. A policy for promotion of Private Sector investment for Power Generation Projects in the State has already been issued under which concessions and assistance will be provided to private sector for setting up Thermal Power Projects of 125 MW and above with the condition that at least 50 percent of the power generated will be sold/used in Rajasthan. Four lignite based units owned by M/S Raj-West Power Ltd., each of 135 MW at Barmer, have already been commissioned and 4 units are under various stages of commissioning.

### **Transmission**

16.11 A provision of ₹6600 crore was kept for transmission works for the XI Plan, against which likely expenditure is ₹6664.08 crore. Details of the targets kept for the XI Plan and likely achievements are given in the following table.

**Table No. 16. 4**

<b>S. N.</b>	<b>Particular</b>	<b>Unit</b>	<b>XI Plan Target</b>	<b>Actual Ach. 2007-11</b>	<b>Likely Ach. 2011-12</b>	<b>Likely Ach. XI Plan</b>
<b>1.</b>	<b>Transmission</b>					
(i)	400kV Lines	Km.	2445	2039.80	343	2382.80
(ii)	400 kV S/S	MVA	2205	1890	-	1890
		Nos.	7	5	-	5
(iii)	220kV Lines	Km.	2950	2243.65	600	2843.65
(iv)	220 kV S/S	MVA	2600	2150	1000	3150
		Nos.	26	21	10	31
(v)	132 kV Lines	Km	1750	1834.70	450	2284.70
(vi)	132 kV S/S	MVA	1875	1900	650	2550
		Nos.	75	61	22	83
(vii)	Augmentation	MVA	5000	7294	4200	11494
(viii)	Capacitors	MVAR	-	450.69	222.63	673.32
2.	Generation (Shared Projects)	MW	13.698	-	-	-

16.12 During the first four years of the XI Plan, 5 numbers of 400 KV GSS at Barmer, Bikaner, Bhilwara, Hindaun and Akal (Jaisalmer), 21 numbers of 220 KV GSS and 61 numbers of 132 KV GSS have been commissioned. The achievements in transmission during the XI Plan are quite satisfactory. At the end of the XI Plan, the likely status of Transmission system is as under:

**Table No. 16.5**

<b>S. N.</b>	<b>Scheme</b>	<b>Unit</b>	<b>Level as on 31.03.2011</b>	<b>Likely addition in 2011-12</b>	<b>Likely Level as on 31.03.2012</b>
i.	-400 kV Lines - 400 kV S/S	MVA	2660	343	3003
		MVA	4845	-	4845
		Nos.	9	-	9
ii.	-220 kV Lines - 220 kV S/S	MVA	10662	600	11262
		MVA	15405	3050	18455
		Nos.	74	10	84
iii.	-132 kV Lines - 132 kV S/S	MVA	13852	450	14302
		MVA	18174	2800	20974
		Nos.	310	22	332

16.13 The evacuation schemes for the following 8 generation projects were approved during the XI Plan.

**Table No. 16.6**

<b>S. N.</b>	<b>Project</b>	<b>Capacity (MW)</b>
1.	Chhabra Thermal Power Station Stage-I	2x250
2.	Ramgarh Gas Thermal Power Station (160 MW)	160
3.	Composite Evacuation System for Chhabra Super Thermal Power Station & Kalisindh Thermal Power Station	2x660 & 2x600
4.	Kawai Super Critical Thermal Power Station	2x660
5.	Suratgarh Super Critical Thermal Power Station	2x660
6.	Banswara Super Critical Thermal Power Station *	2x660
7.	Solar & Wind Power Projects in Jaisalmer, Jodhpur and Barmer)	4240
8.	Wind Power Projects in Pratapgarh & Banswara	551

\* Under private sector

16.14 During the XI Plan period, a generation capacity of 3150 MW was planned for capacity addition, out of which 1290 MW from the following projects has already been added:

- |    |  |        |
|----|--|--------|
| 1. | Dholpur GTPP Unit 2 & 3                | 220 MW |
| 2. | Suratgarh TPS Unit-6                   | 250 MW |
| 3. | Kota TPS Unit-7                        | 195MW  |
| 4. | Giral LTPS Stage-I Unit-2              | 125 MW |
| 5. | Chhabra TPS Stage-I Phase-1 Unit-1 & 2 | 500 MW |

16.15 The remaining capacity of 1860 MW will be added from the following projects in the year 2012-13:

1. Kalisindh TPS unit-1	600 MW
2. Chhabra TPS Stage-I Phase 1 unit-3	250 MW
3. Ramgarh GTPS Stage -III (GT)	110 MW
4. Ramgarh Gas Thermal Power Station(ST)	50MW
5. Chhabra Thermal Power Station Unit-4	250 MW
6. Kalisindh Thermal Power Project Unit 1	600 MW

16.16 Due to heavy investment required in expansion of transmission system, private sector participation is required. The State Government is promoting development of transmission system in private sector. Two transmission projects of 400 KV capacities at Deedwana and Alwar and one 220 KV project at Nawalgarh have been awarded to private entrepreneurs.

### **Distribution**

16.17 An outlay of ₹7547 crore was kept for all the three distribution companies for the XI Plan, against which likely expenditure is ₹17735.03 crore. Physical targets kept for the XI Plan and likely achievements are given in the following table.

**Table No. 16.7**

<b>S. N.</b>	<b>Particular</b>	<b>Unit</b>	<b>XI Plan Target</b>	<b>Actual Ach. 2007-11</b>	<b>Likely Ach. 2011-12</b>	<b>Likely Ach. XI Plan</b>
1.	33/11 kV S/S	MVA	5847.8	4659.95	1439.5	6099.45
		Nos.	1430	1088	430	1518
2.	33kVLines	Km.	9031	6932.45	2290	9222.45
3.	Village Electrification	Nos.	2750	1811	932	2743
4.	Well Energisation	Nos.	3.10 lacs	2.42 lacs	0.65 lacs	3.07 lacs

### **Feeder Renovation Program (FRP)**

16.18 The distribution system suffers from very high losses as well as poor quality of infrastructure, which needs to be improved by making proper capital investment on a techno-economic consideration to finally affect a turn around of the Distribution Companies. Distribution losses in the State were 40.22 percent in 2005-06. A massive Feeder Renovation Program was launched for renovation of distribution feeders to bring down Transmission & Distribution losses up to 15 percent renovated distribution with the aim to:

1. Providing reliable power supply to all.
2. Reducing Transmission & Distribution losses.
3. Reducing burning rate of distribution transformers.

4. Reduction of Peak Demand in agriculture season.
5. Reliable supply to rural household at par with urban area.

16.19 For achieving the above aims, following activities are being undertaken.

1. Segregation of rural household and agriculture feeders by installation of single phase transformers to feed domestic and non-domestic load in rural areas.
2. Providing 25/40 KVA distribution transformers with a distribution box attached to its body having meters, MCBs and capacitor.
3. Introducing HVDS by replacing LT overhead with 11 kV lines and laying direct insulated service line (AB cable) to each agricultural consumer from distribution transformers.
4. Replacing existing, obsolete service line by consumers by armoured PVC/XLPE cables.
5. Installing push-fit meters by replacing the existing sluggish meters.

16.20 So far, 8413 feeders have been renovated out of 8850 feeders by providing 3.72 lac small three phase transformers 1.50 lac single phase transformers, 1.12 lac km. AB cable and 17.37 lac push fit meters. Over 32 thousand villages are getting rural domestic supply at par with urban areas where Transmission & Distribution losses are below 20 percent.

### **Rajiv Gandhi Gramin Viduyutikaran Yojana (RGGVY)**

16.21 The Government of India had launched the scheme of RGGVY in April, 2005. As per objective of the scheme, all the villages/hamlets had to be electrified during the next 5 years and provide access of electricity to rural households including BPL families. Connections to BPL families had to be given free of cost. Under the scheme, 90 percent cost is being provided as grant by the Central Government and balance 10 percent as loan. Rural Electrification Corporation is nodal agency for implementation of this scheme. The salient features of the scheme are as follows:

1. Villages are being electrified as per new definition of village electrification effective from April, 2004.
2. District-wise schemes incorporating electrified, un-electrified villages and dhanies are framed.
3. Funds @ ₹ 6.50 lac per village and @ ₹1 lac per dhani are being provided.
4. Introduction of Franchiesee system after electrification of villages otherwise conversion of grant in to loan.
5. The schemes are being implemented on Turn-key basis.

16.22 Forty schemes for all 33 districts and one for Panchayat Samiti Ladnu were sanctioned by the REC amounting to ₹ 1307.15 crore of 4388 villages and 7238 dhanies covering 10,82,891 BPL households, 5,83,922 general households. So far, 90 percent work has been completed and remaining work will be completed by the end of the plan. Supplementary schemes of dhanies having population between 100 to 300 covering 5.35 lac BPL households and 10 lac APL households, are pending with REC for sanction.

**Thrust Areas For the Twelfth Five Year Plan:**

16.23 During the XII Five Year Plan, the main thrust areas of power sector will be as follows:

1. Bridging the gap between demand and supply of power by increasing the generation capacity and ensuring availability of quality power.
2. Strengthening of transmission and distribution network.
3. Reducing Transmission & Distribution losses up to the level of 15 percent.
4. Tariff rationalization and reducing the subsidy requirement
5. Achieving financial turn-around by the Distribution Companies for which, financial restructure plan is under preparation.
6. Improving customer satisfaction by quality supply, network strengthening and using new techniques/Information Technology.
7. Introducing IT up to Sub Division level under RAPDRP for automation, loss reduction and transparent service delivery.
8. Private Sector participation in generation and transmission.
9. Promoting non conventional sources of power generation.

**Demand Projections:**

16.24 Based on the inputs of RVPN & looking to the National scenario, CEA in its 18<sup>th</sup> EPS draft report, projected the demand projections for Rajasthan State for XII Plan & XIII Plan period. The brief details are as under:

**Table No. 16. 8**

<b>Year</b>	<b>Energy Requirement (MU)</b>	<b>Peak Demand (MW)</b>
2011-12	49549	8522
2012-13	54243	9396
2013-14	59382	10360
2014-15	65007	11422
2015-16	71166	12594
2016-17	77907	13886
2021-22	110483	19692

## Proposals for the XII Plan and the Annual Plan 2012-13

### A. Generation Works

16.25 A generation capacity of 11497 MW is required to be added during the XII Plan period to meet the peak demand. However, a capacity addition of 14450.65 MW has been planned during XII Plan period from various projects identified so far in the State, as per the details given below:

**Table No. 16.9**

S. N.	Particular	Capacity Planned (MW)
1.	State Sector*	9610
2.	Shared Projects	13.65
3.	Central Sector	2047
4.	Private Sector	3840
	<b>Total</b>	<b>15510.65</b>

\* Inclusive of 900 MW slipped over from XI Plan.

16.26 In addition to above, 6055 MW capacity addition is proposed from non-conventional energy sources viz. Biomass, Solar and Wind.

#### A1. State Sector Projects:

16.27 The present generation capacity under state sector is 4368.35 MW and 1860 MW will be added in the year 2012-13. Following 5 Super Critical Power Projects and 4 Gas Based Combined Cycle Power Projects have also been administratively sanctioned by the State Government:

**Table No. 16.10**

S. N.	Project	Capacity (MW)
1.	Suratgarh Super Power Project Unit 7 & 8	2x660
2.	Suratgarh Super Power Project Unit 9 & 10	2x660
3.	Chhabra Super Power Project Unit 5 & 6	2x660
4.	Kalisindh Super Power Project Unit 3 & 4	2x660
5.	Banswara Super Power Project Unit 1 & 2	2x660
6.	Dholpur Gas Based Combined Cycle Power Project Stage-II	330
7.	Kota Gas Based Combined Cycle Power Project	330
8.	Chhabra Gas Based Combined Cycle Power Project	330
9.	Ramgarh Gas Based Combined Cycle Power Project Stage-IV	160
	<b>Total</b>	<b>7750</b>

16.28 Therefore, additional capacity of 9610 MW has been proposed for the XII Plan. Union Ministry of Power has intimated that gas availability up to 2015-16 has already been allocated and gas for new projects will be allocated after availability of additional gas. Long Term Linkage of coal for Super Critical Power Projects is yet to be made by the Union Ministry of Coal. All necessary formalities for obtaining environmental clearances for Supercritical projects have been completed.



## **A2. Shared Projects:**

16.29 Rajasthan Vidyut Prasaran Nigam Ltd. will make investment in shared generating projects outside of Rajasthan. The works of following shared generation projects are likely to be carried during the XII Plan period:

1. Bhakra Beas Management Board Works: Up rating of 5 units of Bhakra Left Bank are proposed from 108 MW to 126 MW. Rajasthan will get its share of 13.65 MW during the XII Plan.
2. Chambal Development Plan Phase-II (Rahu Ghat Hydro Electric Project): In the XII meeting of MP-Rajasthan Inter-State Control Board held on 3rd June 1999, it was decided to take up Survey & Investigation of the following four hydel projects down stream of Kota Barrage:

i. Devipura (Rajasthan)	31 MW
ii. Gujjapura (MP)	10 MW
iii. Jaitapura (MP)	10 MW
iv. Barsala (MP)	16 MW
<b>Total</b>	<b>67MW</b>

16.30 Clearance for conducting Survey & Investigation works has been obtained from the Union Ministry of Forest & Environment and work has been awarded to CWC. Work of EIA studies has been awarded to WAPCOS. Expenditure of these works will be equally shared by Madhya Pradesh and Rajasthan. Clearance for conducting Survey & Investigation works and EIA studies is awaited from the National Wild Life Board and State Wild Life Board as the project area falls under Ghadiyal Sanctuary.

## **A3. Central Sector Projects:**

16.31 A total of 2047 MW allocation is likely to be added through Central Sector projects i.e NTPC, NPC, NHPC/THDC/SJVNL. Details of which are as follows:

<b>a. NTPC &amp; NLC</b>	<b>(654 MW)</b>
i. Kol Dam	70 MW
ii. North Karanpura	166 MW
iii. Barth	186 MW
iv. Rihand Stage-II	100 MW
v. Barth Stage-II	132 MW
<b>b. NPC (RAPP Unit (7 &amp; 8))</b>	<b>700 MW.</b>
<b>c. NHPC &amp; Others</b>	<b>(693 MW)</b>
i. Parbati Stage-III	52 MW
ii. Parbati Stage-II	76 MW
iii. Tehri Pump Storage Plant	60 MW
iv. Subansiri Lower HEP	200 MW

v.	Kameng HEP	60 MW
vi.	Kotlibhet Stage 1B	25 MW
vii.	Rampur HEP	25 MW
viii.	Kotlibhet Stage-1A	25 MW
ix.	Kotlibhet Stage-ii	35 MW
x.	Bursor	85 MW
xi.	Lata Tapovan	50 MW

#### A4. Private Sector Projects:

16.32 Generation capacity of 3840 MW is expected to be available from private sector projects during the XII Plan period from the following projects:

i.	M/S Adani Power	1200 MW
ii.	Banswara TPP	1320 MW
iii.	Gurha TPP	70 MW
iv.	Giral LTPS	250 MW
v.	Keshoraipatan GTPS	1000 MW.

16.33 Outlays of ₹47246 crore and ₹7250 crore are proposed for generation projects for the XII Plan and the Annual Plan 2012-13 respectively. Project-wise details of outlays proposed for the XII Plan and the Annual Plan 2012-13 are given in the following table.

**Table No. 16.11**

(₹ in crore)

S. No.	Item/ Project	Outlays Proposed	
		XII Plan	2012-13
1.	Chhabra Thermal Power Project Stage-I, Unit 1 to 4 (4x250 MW)	868.00	868.00
2.	Kalisind Thermal Power Project Unit -1 & 2 (2x600 MW)	2719.00	1862.00
3.	Ramgarh Gas Thermal Power Project Stage III 160 MW	169.00	169.00
4.	Dholpur Gas CCPP Stage II (3x110 MW)	1210.00	-
5.	Chhabra Supercritical Power Project Unit-5 & 6 (2x660 MW)	7605.00	1250.00
6.	Suratgarh Supercritical Power Project Unit-7& 8 (2x660 MW)	7625.00	1250.00
7.	Kalisindh Supercritical Power Project Stage II Unit -3 & 4 (2x660 MW)	7920.00	573.00
8.	Surtagrah Supercritical Power Project Stage VI Unit -9 & 10 (2x660 MW)	7920.00	573.00
9.	Kota Gas CCPP (3x110 MW)	1320.00	0.00
10.	Chhabra Gas CCPP (3x110 MW)	1320.00	0.00
11.	Banswaa Supercritical Power Project Unit 1 & 2 (2x660MW)	7880.00	620.00
12.	Ramgarh Gas Thermal Power Project Stage IV	640.00	75.00
13.	Survey Investigation Schemes & Carried Over Liabilities	50.00	10.00
	<b>Total</b>	<b>47246.00</b>	<b>7250.00</b>

## B. Transmission Works

16.34 Looking to the generation capacity likely to be added during the XII Plan, the main emphasis of RVPN will be on construction of Evacuation System of Generating projects. The works on evacuation system for Chhabra Super Critical TPS unit 5 & 6, Kalisindh TPS Unit 1 & 2, Suratgarh Super Critical TPS Unit 7 & 8, Kawai Super Critical TPS and Ramgarh TPS is in under progress. The work of New Solar and Wind Power Projects shall also start soon. Commissioning of these works will be matching with the commissioning of generating Projects. The evacuation schemes of other generation projects envisaged in the XII Plan shall also be approved very soon.

16.35 Besides above, the construction of 220 KV & 132 KV Sub-stations and its associated lines and augmentation of capacity of existing GSS on the basis of load growth and requirement of Distribution Companies shall also be carried out. RVPN has adopted a new technology of using EHV cables, construction of GIS/Hybrid GSS and automation/SCADA system in construction of Grid Sub-Stations in the XI Plan will continue during the XII Plan. Installation of capacitor banks, expansion in IT activities, Research & Modernization of existing GSS will also be carried out by replacing obsolete/old equipments.

16.36 The outlay proposed for 12<sup>th</sup> plan and Annual Plan 2012-13 for RVPN are as under:

**Table No. 16.12**

(₹ in crore)			
S.No.	Particular	12 <sup>th</sup> Plan	Annual Plan 2012-13
1	Transmission	12500	2780
2	Generation	100	20
	<b>Total</b>	<b>12600</b>	<b>2800</b>

16.37 The physical targets for transmission works during the 12<sup>th</sup> plan and Annual Plan 2012-13 are as under:

**Table No. 16.13**

S.No.	Head / Schemes	Unit	Target 12 <sup>th</sup> Plan	Target 2012-13
1	Transmission :			
	- 765 kV lines	kms	426	-
	- 765 kV S/S	MVA	7500	-
		Nos.	2	-
2	Transmission :			
	- 400 kV lines	kms	5800	20
	- 400 kV S/S	MVA	5040	-
		Nos.	8	-
3	Transmission :			
	- 220 kV lines	kms	3650	700
	- 220 kV S/S	MVA	4600	920
		Nos.	40	8
4	Transmission :			
	- 132 kV lines	kms	2150	425
	- 132 kV S/S	MVA	2875	550
		Nos.	100	20
5	Augmentation	MVA	7500	1500

### C. Distribution Works

16.38 The three distribution companies viz. Jaipur, Ajmer and Jodhpur are making investments in expansion of distribution network and rural electrification. With a view to remove past deficiencies and reducing Transmission & Distribution losses, a new thrust for improvement of sub-transmission and distribution system in rural areas, Gram Panchayat Vidyut Vitran Yojana is under implementation to provide 800 new 33 KV Sub-Stations & separate 11 KV feeder for each Panchayat to promote participation of rural mass in distribution business.

16.39 The State Water Policy has been issued on the basis of National Water Policy and the suggestions of the expert committee in view of changing scenario of water sector i.e. depleting layer of water table etc. in the State. The Agriculture Connection Policy is being considered to revise to release connections to those applicants who adopt modern techniques of water management. This will encourage conservation of scared ground water resources. Drip & Sprinkler irrigation system and three star or above energy efficient pump sets are being promoted for efficient and optimum utilization of water & energy resources.

16.40 The outlays proposed for the XII Plan and the Annual Plan 2012-13 for different activities of the distribution companies are given in the following table:

**Table No. 16.14**

(₹ in crore)

Particular	JVVNL		AVVNL		JdVVNL	
	XII Plan	2012-13	XII Plan	2012-13	XII Plan	2012-13
Sub transmission & Distribution	1500.00	300.00	1132.00	215.00	412.00	100.00
Rural Electrification						
a. Normal RE	1275.00	275.00	1184.00	230.00	1670.00	385.00
b. FRP		-	10.00	10.00		-
c. RGGVY	121.00	81.00	60.00	30.00	150.00	50.00
d. RAPDRP-A	245.00	167.00	19.00	15.00	669.00	150.00
e. RAPDRP-B	465.00	160.00	345.00	105.00	-	-
Transition Support	862.00	160.00	640.97	120.00	707.28	120.00
Interest Free Loan	560.00	180.00	420.00	135.00	420.00	13500
<b>Total</b>	<b>5028.00</b>	<b>1323.00</b>	<b>3810.87</b>	<b>860.00</b>	<b>4028.28</b>	<b>940.00</b>

16.41 Company wise physical targets for the XII Plan and the Annual Plan 2012-13 are given in the following table.

**Table No. 16.15**

S. No	Particular	Unit	Plan	JVVNL	AVVNL	JdVVNL	Total
1.	33/11 kV S/S	MVA	12 <sup>th</sup> Plan	1600	1600	1600	4800
			2012-13	320	320	320	960
		No.	12 <sup>th</sup> Plan	400	400	400	1200
			2012-13	80	80	80	240

S. No	Particular	Unit	Plan	JVVNL	AVVNL	JdVVNL	Total
2.	33 kV Lines	Kms.	12 <sup>th</sup> Plan	2000	2000	2000	6000
			2012-13	400	400	400	1200
3.	Urban Household Connections	Nos.	12 <sup>th</sup> Plan	180000	160000	160000	500000
			2012-13	36000	32000	32000	100000
4.	Rural Household Connections	Nos.	12 <sup>th</sup> Plan	375000	250000	375000	1000000
			2012-13	75000	50000	75000	200000
5.	Energization of Wells	Nos.	12 <sup>th</sup> Plan	45000	20000	35000	100000
			2012-13	9000	4000	7000	20000

### **Non-Conventional Energy Sources**

16.42 Power generation from Non-conventional Energy Sources is environmental friendly and saves the environment from global warming. The State Government has been according priority for development of Non-Conventional Energy Sources. Rajasthan Renewal Energy Corporation is the State Nodal Agency for promotion of NES and energy conservation in the State.

#### **A. Solar**

16.43 An outlay of ₹16.75 crore was kept in the XI Plan for non-conventional energy sources, against which an expenditure of ₹13.67 crore is likely to be incurred on the activities of Rajasthan Renewal Energy Corporation Ltd., a nodal agency for implementation of non-conventional energy activities.

#### **Special Area Demonstration Program**

16.44 Four projects under SADP program for demonstration for promotion of Renewal Energy devices at Dargah sharif of Hazrat Khawaja Gharib Nawaz, Ajmer, Chittorgarh Fort, Raj Bhawan, Jaipur and Keoladeo National Park, Bharatpur have been established during the XI Plan period costing ₹247 lacs. Under this program, SPV Power Plants of 89 KW, SWH System of 9000 LPD, 12 SPV Pumping Systems, 98 Solar Lantern and 55 SPV Street Light Systems have been established at the above four places.

#### **Rural Electrification Program (SPV Domestic Lighting System)**

16.45 Solar Photo Voltaic Home Lighting System is becoming increasingly popular in the villages as well as in the areas where electric power supply is unreliable and non-feasible. 47974 nos. of SPV DLH are likely to be installed during the XI Plan period in the State with the help of subsidy provided by the Government of India under SPV program and by the State Government under Rural Electrification Program. The system consists of 37 W SPV Module, 40 AH Battery and 2 CFL points of 9 watt capacity. This system is designed for operation of 20 Watt load for working for 4-5 hours per day.

**SPV Pumping Systems:**

16.46 SPV Pumping System was introduced by the State Government on pilot basis in 2010-11 in horticulture sector. Under the scheme, 86 percent subsidy is provided to the beneficiaries, 30 percent subsidy under off-grid solar application program of the Central Government and 56 percent under Rastriya Krishi Vikas Yojana. 31 SPV Pumping Systems were installed in farming fields using drip irrigation in 2010-11. 1000 Pumping Systems are likely to be installed in 2011-12.

**Remote Village Electrification Program:**

16.47 The RVE Program of the Central Government was launched in 2005-06 with the objective of electrification of un-electrified remote census villages and hamlets where grid connectivity is either not feasible or not cost effective through conventional energy sources. Up to the year 2010-11, financial assistance of up to 90 percent of the benchmark costs of the system was provided by the Central Government and with effect from 2011-12, the financial assistance has been fixed at ₹ 8990/- per DLS ( module 37 W) and the balance cost is equally borne by the State Government and the beneficiary. Installation of 24148 DLS is likely to be achieved during the XI Plan period.

**Solar Power Generation:**

16.48 Rajasthan is blessed with maximum solar radiation intensity about 6-7 KWh/m<sup>2</sup>/day and maximum sunny days (more than 325 days) in a year with very low average rainfall and capable of producing millions – Giga watts of electricity from solar. Thus the state known for its dry desert is now fast emerging as biggest hub of solar power due to the effective Rajasthan Solar Energy Policy 2011. Solar plants will be set up in the State under the National Solar Mission and Rajasthan Solar Energy Policy 2011. It is expected that an additional power capacity of 3480 MW would be set up during the XII Plan with private investment of ₹ 36800 crore. Thus, 3680 MW solar power capacity would be available by the end of 12<sup>th</sup> plan.

**B. Wind Power**

16.49 To identify more potential locations, the State Government is promoting wind assessment studies at 36 locations. Looking to the immense wind potential in the State, it is proposed to carry out wind assessment studies at 10 more locations during the XII Plan under financial supported program of the Central Government. The State Transmission Utility is developing strong transmission network in the western region of the Sate. The State Regulatory Commission has also prescribed a minimum renewable energy purchase obligation in the State. It is expected that an additional capacity of 2215 MW wind power would be installed during the XII Plan. This would be in the private sector with an estimated investment of ₹11075 crore. Given an average plant-

load factor of 20 percent, it would contribute an additional 443 MW power annually to the State.

### **C. Biomass Power**

16.50 Studies regarding availability of surplus biomass such a mustard stalk, rice husk & other agro wastes as well as Juliflora, which can be utilized to run power plant have been conducted in all the districts of the State. The "State Policy for Promoting Generation of Electricity from Biomass 2010" has been launched. It is expected that an additional power capacity of 160 MW would be set up in the State during the XII Plan in the biomass power sector through private sector with an investment of ₹ 880 crore.