5. ENERGY

5.1 POWER

Outlay – ` 3209.00 Cr

5.1.1 In the Annual Plan 2014-15, a sum of ` 3209.00 Cr is earmarked for power sector. Strengthening of distribution system and transmission system, clearing of pending agriculture power connections and conversion of Low Voltage Distribution System (LVDS) into High Voltage Distribution System (HVDS) in agriculture sector are some of the initiatives planned for achieving full and effective rural electrification. The outlay which is 16% of the total plan funds includes ` 1209.00 Cr for transmission, ` 1250.00 Cr for distribution and ` 750.00 Cr for generation. The state government is committed to make Punjab a power surplus state in near future. The present generation capacity of Punjab is 8859 MW including central share of 3071 MW, The State is likely to become power surplus by the year 2015-16 during 12th plan.

5.1.2 Power plays a vital role in the development of the overall economy of the State. In the State of Punjab, not only the industrial sector but the agriculture sector is also heavily dependent on power. In view of the rising living standards of the people of the State, the demand for power is increasing day by day. The main objective is to expand and strengthen the power generation system so that adequate power supply is available on demand to consumers in various sectors of the economy. For this, the strategy for the 12th Five Year Plan is as under:-

(1) Maximum utilization of existing installed capacity by improving the performance of thermal power stations and renovation and modernization of old thermal/hydro power plants.

(2) Expeditious commissioning of new projects.

(3) To initiate advance actions on new schemes to be proposed.

(4) Diversification of source of power generation-use of gas based thermal plants/biomass based plants and establishing nuclear power

plants for Punjab.

(5) Development of captive power plants.

(6) Encouragement of captive power plants and cogeneration plants in the State.

(7) Liberalizing setting up of new renewable energy source (NRES) based plants through attractive tariff and other concessions.

(8) Augmenting and strengthening of the transmission and distribution systems to supply proper quality of power in both urban as well as in rural areas.

(9) Reduction of Aggregate Technical and Commercial (AT and C) losses.

(10) Conservation of energy and load management.

(11) Adoption of information technology in the power sector.

5.1.3 Per capita consumption of electricity in the State has increased from 163 kwh in 1968 to 1291 kwh in 2012-13 and accordingly electricity consumption has increased from700 million units to 37346.80 million units in 2013-14.The total installed capacity in 1967-68 was 614 MW which has increased to 8859 MW by the end of March, 2014. All the 12428 inhabited villages in the State have already been electrified. At present the number of consumers being served upto March, 2014 are 8112286 nos which includes general connections 6759178 nos, industrial connections 124027 nos, agriculture connections 1225066 nos and others connections 4015 nos in the State. In order to create employment/self employment opportunities and also to encourage agro based small scale industries in the rural areas, power supply on urban pattern has already been provided to 18866 villages including 12428 villages and 695 deras and 5743 dhanies through independent feeders in the State. The total no of grid sub-stations (66/33KV) are 676 as on March, 2014 and length of the transmission lines is 19646.45 Ckt km as on 31/3//2014. Besides this, the length of 11kv lines is 209759.04 Ckt km and LT lines is 152497.09 Ckt km ending 31/3/2014. The transmission and distribution losses which were

20.12% in 2009-2010 have been brought down to 16.95% during 2013-14 and aims to bring it down to 15% by the year 2015-16.

5.1.4 An outlay of ` 5963.65 Cr was approved in the 10th Five Year Plan for power sector, the expenditure incurred during the corresponding period was `4928.89 Cr. An outlay of ` 7055.83 Cr was provided under sub-head "Power" in the 11th Plan against which an expenditure of ` 8771.79 Cr has been incurred. An outlay of ` 22673.80 Cr and `3300.00 Cr has been provided in the 12th Plan 2012-17 and Annual Plan 2012-13 respectively. An expenditure of ` 1919.30 Cr was incurred during 2012-13. Against an outlay of ` 3209.00 Cr, an expenditure of ` 2714.75 Cr was incurred during 2013-14. An outlay of ` 3209.00 Cr is provided for Annual Plan 2014-15. Status as on 31/3/2014 is given below:

(1)	Installed Capacity (Own) (Including Common Pool)	5491
(2)	Share from Central Sector Projects	3071
(3)	PEDA and other NRSE project including 10 MW Jalkheri RSTP	297 MW
(4)	Total Installed Capacity	8859
(5)	Maximum Demand Met Within 2013-14	10141
(6)	Energy Sent Out 2013-14	37346.8
(7)	Connected Load	30781.0
(8)	Per Capita Consumption	1225
(9)	Numbers of Villages Provided Urban Pattern Supply including Deras and Dhanis	18866* Nos.
(10)	T and D Losses(Including Commercial)	16.95%
(11)	No of grid Sub Stations	676
(12)	Length of Transmission Lines	19646.4
(13)	Length of 11 KV Lines	209759.
(14)	Number of Distribution Transformers	668205
(15)	Length of LT Lines	152497.
(16)	Number of Connections	811228
	(i) General	675917

	(ii) Industrial	124027
	(iii) Agriculture	122506
	(iv) Others	4015

***Including 12428 villages and 695 deras and dhanis and 5743 additional deras/dhanies having a cluster of 5 or more hous**es.

Ongoing Schemes

State Funded Schemes

PP-01 Transmission System

Outlay – ` 1209.00 Cr

5.1.5 The outlay for transmission includes execution of various 220/132/66/33KV substations andtransmission lines, renovation and modernization works of existing sub stations, various PLC works and evacuation systems for Talwandi Sabo Thermal Plant through PGCIL on Turn Key basis. During 11th Five Year Plan an outlay of ` 2445.74 Cr has been allocated to this component which included distribution, Restructured Accelerated Power Development Programme & Rajiv Gandhi Gramin Viduti karan Yojana. An outlay of ` 2445.74 Cr was provided under this scheme in the 11th Plan against which an expenditure of ` 3570.94Cr has been incurred. An outlay of ` 5777.05 Cr and ` 1095.41 Cr has been provided in the 12th Plan 2012-17 and Annual Plan 2012-13 respectively. An expenditure of ` 783.48 was incurred during 2012-13. Against an outlay of ` 1209.00 Cr, an expenditure of ` 964.19 Cr was incurred during 2013-14. An outlay of ` 1209.00 Cr is provided for Annual Plan 2014-15.

Targets for11 1th and 12th Five Year Plan and achievements upto 3/2014 are as under:-

SN	Item	Units	11th Plan (2007-12)		2012-13	2013-14		2014-15
			Target	Achieve-ments	Achieve-ments	Targets	Achievement	Target
1	2	3	4	5	6	7	8	9
1	400 KV S/S New/ Upgradation/ Augmentation	Nos. (MVA)	-	-	2 (1000.00)	8 (2890.00)	630	2260
2	220 KV S/S New/ Upgradation/ Augmentation	Nos. (MVA)	50 (5000.00)	59 (5076.00)	24 (2729.50)	19 (2000.00)	2264.5	2115

SN	Item	Units	11th Plan (2007-12)		2012-13	2013-14		2014-15
			Target	Achieve-ments	Achieve-ments	Targets	Achievement	Target
1	2	3	4	5	6	7	8	9
3	132 KV S/S New/ Upgradation/ Augmentation	Nos. (MVA)	75 (725.00)	54 (747.50)	12 (195.50)	NIL	246	289
4	66 KV S/S New/ Upgradation/ Augmentation	Nos. (MVA)		495 (4593.70)	139 (1459.95)	169 (1725.00)	151 (1487.0)	160 (1500.00)
5	33 KV S/S New/ Upgradation/ Augmentation	Nos. (MVA)		35 (167.50)			2 (12.00)	10 (30.00)
6	400 KV S/S New/ Upgradation/ Augmentation	Nos. (MVA)	-	-	709.640	666.19	657.97	55.540
7	220 KV Transmission Line New/ Upgradation/ Aug.				382.102	689.902	442.124	711.339
8	132 KV Transmission Line New/ Upgradation/ Aug.				NIL	NIL	NIL	4.704
9	66 KV Transmission Line New/ Upgradation/ Aug.				-	438.00	662.17	650.00
10	33 KV Transmission Line New/ Upgradation/ Aug.	Ckt.Km	1300.00	1696.362		7.00	-	-
11	HT Shunt Capacitors	MVAR	-	657.993	724.604	622.49	438.242	450.00

PP-01(i) Work Relating to Restructured Accelerated Power Development & Reforms Programme (R-APDRP)

Outlay – ` 500.00 Cr

5.1.6 Ministry of Power, Government of India, had sanctioned 26 schemes amounting `715.57 Cr in 2002-03 to 2004-05 under Accelerated Power

Development Reforms Programme (APDRP) for strengthening of transmission, distribution system and replacement of metering equipment. This programme was is operation during the period 2002-03 to 2008-09. Government of India had been providing 25% grant and the balance 75% funds (of the project cost) were contributed by PSEB from internal resources or through availing loans from PFC/REC. Due to launch of Restructured APDRP during 2009-10, all ongoing APDRP schemes were closed as per directions of MoP/GoI. Cumulative expenditure of `4.63 Cr was incurred on this project upto 31/3/2009. Government of India has decided to continue APDRP in the restructured form during 12th plan (APDRP-II) as central sector scheme.

5.1.7 R-APDRP (2009-2012): The focus of the programme on the establishment of reliable/automated baseline & reduction of Aggregate Technical & Commercial losses. It will cover urban areas with population above 30,000. The activities are being taken up in two parts A and B. Part A covers consumer indexing, GIS Mapping and Automatic Data Logging for all distribution transformers and feeders as well as establishment of IT enabled consumer service centres. For Part-A 47 schemes/works costing ` 354.11 Cr have been approved and loan amount of ` 272.83 Cr has been sanctioned. M/s Wipro Ltd has been engaged as IT consultants. M/s Spanco has been selected as IT implementation agency and work has been started. For this part 100% financial assistance is admissible by way of loan which is convertible into grant after successful implementation of the project within an agreed time frame of 3 years from the date of approval of the DPRs Part-B covers strengthening of sub-transmission and distribution system of 47 towns. For the part 25% funds will be provided by GoI as loan and remaining 75% are to be arranged by PSPCL from its own resources or from the financial institutions. Entire GoI loan plus 25% of the state contribution is convertible into grant. Schemes of 46 towns stands submitted to PFC and all the 46 schemes sanctioned by Steering Committee of GoI/MoP costing `1632.70 Cr have been approved and loan sanctioned by PFC is ` 408.18 Cr . The work for meters to be shifted outside is under progress and work of installation of LT Shunt Capacitor has been completed. PSPCL has already placed work orders on 10.05.2013 on M/s L&T Ltd., M/s Godrej & Boyce Mfg. Co. and consortium of M/s A2Z, M/s Star Transformer Ltd. & M/s Shivalik Telecom Ltd., for implementation of

R-APDRP (Part-B) in 39 towns with total project cost amounting to ` 1314.44 Cr s. As per completion schedule incorporated in contract agreement, the contractors are required to complete works within 26 months i.e by 09.07.2015 for balance 6 cities, tenders have been floated & work orders are likely to be awarded by October 2014. An expenditure of ` 103.23 Cr has been incurred during 11th Plan. An outlay of ` 2680.00 Cr and ` 680.00 Cr has been provided in the 12th Plan 2012-17 and Annual Plan 2012-13 respectively. An expenditure of ` 22.26 Cr was incurred during 2012-13. Against an outlay of ` 500.00 Cr , an expenditure of ` 270.00 Cr was incurred during 2013-14. An outlay of ` 500.00 Cr is provided for Annual Plan 2014-15.

PP-02 Generation

PP-02(i) Renovation and Modernization of GNDTP unit III and IV based on Residual Life Assessment (RLA) study (Phase-II) –Bathinda:

Outlay – ` 105.00 Cr

5.1.8 For renovation and modernization of Units-II and IV Residual Life Assessment (RLA) study has been carried out and a project report amounting to `290.00 Cr (at 2002-03 level) on the basis of this study has been submitted to CEA, New Delhi for finalization. In this scheme renovation and modernization works on boiler, turbine and instrumentation etc are to be carried out to upgrade the capacity of GNDTP Units-III and IV from 110 MW to 120 MW each. Final memorandum for price negotiation with M/S BHEL has been approved. PO and work order were placed upon M/s BHEL on 14/11/2006. Design and drawing work is in progress. However latest cost of the project is ` 490.00 Cr at price level 2006-07. After completion of renovation & modernization activities, capacity will be up rated from 110 MW to 120 MW, plant availability factor will improve, operational efficiency will increase and auxiliary consumption will reduce. An outlay of ` 609.00 Cr was provided under this scheme in the 11th Plan against which an expenditure of ` 318.71 Cr has been incurred. An outlay of ` 177.00 Cr and ` 177.00 Cr has been provided in the 12th Plan 2012-17 and Annual Plan 2012-13 respectively. An expenditure of ` 61.5was incurred during 2012-13. Against an outlay of ` 105.00 Cr , an expenditure of ` 90.73 Cr was incurred during 2013-14. An outlay of ` 105.00 Cr is provided for Annual Plan 2014-15.

PP-02(ii) GHTP Stage II Lehra Mohabat (2x250 MW):

Outlay – ` 23.00 Cr

5.1.9 To meet with the acute power shortage in Punjab the project has been installed at village Lehra Mohabbat Distt. Bathinda with a capacity of 2x250 MW. This project is being executed by BHEL on erection, procurement and commissioning mode (EPC) basis. The Third & Fourth unit of this project has achieved COD on 16/10/2008 & 25.01.2011 respectively. An outlay of `1431.05 Cr lacs was provided under this scheme in the 11$^{th}$ Plan against which an expenditure of ` 1256.67 Cr has been incurred. An outlay of ` 22.15 Cr and ` 22.15 Cr has been provided in the 12th Plan 2012-17 and Annual Plan 2012-13 respectively. An expenditure of ` 4.65 Cr was incurred during 2012-13. Against an outlay of ` 23.00 Cr, an expenditure of ` 30.97 Cr was incurred during 2013-14. An outlay of ` 23.00 Cr is provided for Annual Plan 2014-15.

PP-02(iii) Mukerian Hydro Electric Project-II (18 MW):

Outlay – ` 85.00 Cr

5.1.10 This Project is under execution and is being funded from loan of `211.576 Cr taken from REC. This loan amount is for all the civil, electrical & mechanical works. Mukerian Small Hydel Project Stage-II is located at RD-880 M of the Mukerian Small Hydel Stage-II, which takes off from Mukerian Hydel Channel Stage-I at RD-35500 M. The project site is located about 5 KM from Unchi Bassi and 12 KM from Dasuya Township. Two Machines of 9 MW Kaplan Bulb Turbine are proposed for the project. The turbines are designed with net head of 8.23 M. The project envisages average annual generation of about 214.85 MUs at approximate generation cost of ` 1.85/KWh & ` 1.74/KWh with interest subsidy. Detailed work order for civil works have been allotted to M/S P&R Infra projects Ltd, Chandigarh. Supply-cum-Works Contract Agreement for E&M works of Mukerian Stage-II on Turnkey basis had been issued to M/s BHEL. Energy benefits provided by this project will be 214.85 MUs./ per year at 89.33% PLF.

5.1.11 Land, Construction of Power House building and its allied works, Hydraulic works, Pucca Road works, Purchase of Steel and cement, O–miscellaneous, Protection works, Maintenance of vehicles and Payment to work charge employees are to be carried out during the financial year 2014-15.

5.1.12 In the 10th Plan, the expenditure incurred was ` 38.82 Cr. An outlay of ` 101.29 Cr was provided under this scheme in the 11th Plan against which an expenditure of ` 36.97 Cr has been incurred. An outlay of ` 90.00 Cr and ` 65.00 Cr has been provided in the 12th Plan 2012-17 and Annual Plan 2012-13 respectively. An expenditure of ` 43.11 Cr was incurred during 2012-13. Against an outlay of ` 85.00 Cr , an expenditure of ` 79.58 Cr was incurred during 2013-14. An outlay of ` 85.00 Cr is provided for Annual Plan 2014-15.

PP-02(iv) Renovation and Modernization of GGSSTP, Ropar Phase I and II :

Outlay – ` 43.20 Cr

5.1.13 Guru Gobind Singh Super Thermal Power Plant, Ropar is in operation for the past about 25 years. Due to continuous running of plant and up-gradation of technology certain renovation and modernization activities are planned to be executed so as to improve the efficiencies, PLF and availability factor of Plant. The total cost of the renovation and modernization works involving all 6 units is approximately ` 568.00 Cr and work is purposed to be completed during 12th Five Year Plan through 13 Nos schemes already formulated. In the 10th Plan, the expenditure incurred was ` 87.89 Cr. An outlay of ` 96.60 Cr was provided under this scheme in the 11th Plan against which an expenditure of ` 62.31 Cr has been incurred**.** An outlay of ` 455.96 Cr and ` 56.15 Cr has been provided in the 12th Plan 2012-17 and Annual Plan 2012-13 respectively. An expenditure of ` 21.35 Cr was incurred during 2012-13. Against an outlay of ` 43.20 Cr , an expenditure of ` 47.67 Cr was incurred during 2013-14. An outlay of ` 43.20 Cr is provided for Annual Plan 2014-15.

PP-02(v) Renovation and Modernization works at Thermal Plant as per Residual Life Assessment (RLA) study of GNDTP (Unit I and II) GNDTP– Bathinda:

Outlay – ` 10.00 Cr

5.1.14 Before renovation and modernization unit I & II of Guru Nanak Dev Thermal Plant were running at 90/95 MW i.e. below their rated capacity of 110 MW each. After renovation & modernization these are running at their rated capacity of 110 MW each and also plant load factor and plant availability factor have been improved considerably. Major renovation & modernization works of

Unit I & II have been completed. Unit –II has taken over normal operation w.e.f. 20/1/06 and Unit-I has been taken over w.e.f. 31.5.07. Funds have been provided under this scheme for replacement of existing tools and machinery which have become obsolete with usage. In the 10th Plan, the expenditure incurred was ` 177.95 Cr. An outlay of `84.00 Cr was provided under this scheme in the 11th Plan against which an expenditure of `329.50 Cr has been incurred. An outlay of ` 11.65 Cr and `9.02 Cr has been provided in the 12th Plan 2012-17 and Annual Plan 2012-13 respectively. No expenditure was incurred during 2012-13. Against an outlay of ` 10.00 Cr , an expenditure of ` 35.02 Cr was incurred during 2013-14. An outlay of ` 10.00 Cr is provided for Annual Plan 2014-15.

PP-02(vi) Additional works of GNDTP Bathinda

Outlay – ` 77.00 Cr

5.1.15 In this scheme works like Dry Fly Ash Handling system of GNDTP, Raising of Ash Dyke GNDTP, Augmentation of Fire Protection System of GNDTP, Procurement and installation of 2nd "In motion weighing system at GNDTP and Capital works other than R&M works like replacement of CTs, PTs and replacement/addition of 3 phase 4 wire energy meters at GNDTP are proposed to be carried out. Under this scheme an amount of `50.00 Cr was provided in the revised estimates of Annual Plan 2011-12, but no expenditure was incurred. An outlay of ` 173.98 Cr and ` 70.24 Cr has been provided in the 12th Plan 2012-17 and Annual Plan 2012-13 respectively. No expenditure was incurred during 2012-13. Against an outlay of ` 77.00 Cr , no expenditure was incurred during 2013-14. An outlay of ` 77.00 Cr is provided for Annual Plan 2014-15.

PP-02(vii) Renovation and Modernization of Bhakra PHs and Associated works:

Outlay – ` 72.00 Cr

5.1.16 All the 5 units of Bhakra Right Bank have been up-rated from 132 MW each to 157 MW each giving an additional power of 125 MW against which PSEB will be getting 63.6 MW of the additional installed capacity. 5 No. of Units of Bhakra Left Bank Power House of 90 MW capacity were commissioned during 1960-61. The units were however up- rated to 108 MW by changing the stator winding having class-B with Class-F insulation during the period 1980-85

enabling use of high cross-section of copper in some slots. Since these machines have already outlived their useful life and are also experiencing fall in turbine efficiency, the machines are thus due for carrying out renovation & modernization nd up- gradation works. The works relating to renovation & modernization are to be taken in the 12th Five Year Plan. With the upgrading of 5 units of 108 MW each to 126 MW, it is estimated to have an extra-generation capacity 90 million units, equivalent to approximately annual revenue of `21.00 lac to the partner states. An outlay of ` 16.10 Cr was provided under this scheme in the 11th Plan against which an expenditure of ` 131.38 Cr has been incurred. An outlay of ` 62.00 Cr and ` 62.00 Cr has been provided in the 12th Plan 2012-17 and Annual Plan 2012-13 respectively. An expenditure of ` 2.52 Cr was incurred during 2012-13. Against an outlay of ` 72.00 Cr, an expenditure of ` 47.38 Cr was incurred during 2013-14. An outlay of ` 72.00 Cr is provided for Annual Plan 2014-15.

PP-02(viii) Shahpur Kandi Dam Hydro Electric Project (206 MW):

Outlay – ` 242.14 Cr

5.1.17 The Shahpur Kandi project is a sister project of Ranjit Sagar Dam project (which is now completed). The construction of Shahpur Kandi Dam project is essential to get the optimum benefits of power and irrigation potential created by Ranjit Sagar Dam project. The proposed dam is situated on the river Ravi, downstream of the Ranjit Sagar Dam and 8 km. upstream of the Madhopur Head Works. The concrete dam is flanked by two head regulators on its right and left abutments falling in J & K and in Punjab.

5.1.18 Shahpur Kandi Dam project has been declared as National project by the Ministry of Water Resources, Government of India. Planning Commission, Government of India has accorded investment clearance of the project during 2010 amounting to `2285.81 Cr. As per guidelines for the National Projects, 90% of the cost of the irrigation component is being provided by Ministry of Water Resources, Government of India as central assistance & balance 10% of the cost of the irrigation component is to be provided by the state government. Power component of the project which is 71.39% of the total cost is being provided by Punjab State Power Corporation Limited. Power Finance Corporation has already given approval for 80% of the cost of power component

as loan and remaining 20% of the cost of power component shall be arranged by Punjab State Power Corporation Limited. The project will be completed in four years from 2013-17. After completion of the project the potential of 5000 Ha in Punjab State and 32713 Ha. in J&K State shall be created. With the completion of Shahpur Kandi Dam project, the full generation capacity of the R.S.D. Project (600 MW) will be utilized when all the turbines at the project will be made functional. An outlay of ` 2156.77 Cr lac was provided under this scheme in the 11th Plan against which an expenditure of ` 20.00 Cr has been incurred. An outlay of ` 2054.29 Cr and ` 242.14 Cr has been provided in the 12th Plan 2012-17 and Annual Plan 2012-13 respectively. No expenditure was incurred during 2012-13. Against an outlay of ` 242.14 Cr , an expenditure of ` 110.00 Cr was incurred during 2013-14. An outlay of ` 242.14 Cr is provided for Annual Plan 2014-15.

PP-02(ix) Renovation and Modernization of PSEB Hydel Projects:

Outlay – ` 45.00 Cr

5.1.19 It covers renovation and modernization of activities like capital maintenance of machinery, replacement of existing AVR with new technology, replacement of existing relay panels, annunciation panels, turbine control panels & control desk etc of PSEB hydel projects namely Shanan HEP (110 MW), Mukerian Hydel Project-1, UBDC HEP- I&II (91.35 MW), Anandpur Sahib HEP (134 MW), Ranjit Sagar Power Project (600 MW). An expenditure of ` 34.64 Cr has been incurred during 11th plan. An outlay of ` 134.29 Cr and ` 45.00 Cr has been provided in the 12th Plan 2012-17 and Annual Plan 2012-13 respectively. An expenditure of ` 2.84 Cr was incurred during 2012-13. Against an outlay of ` 45.00 Cr, an expenditure of ` 49.36 Cr was incurred during 2013-14. An outlay of ` 45.00 Cr is provided for Annual Plan 2014-15.

PP-02 (x) Gas based Power Plants at Ropar

Outlay – ` 1.66 Cr

5.1.20 Under the scheme no outlay has been provided in the 12th Plan 2012-17 and Annual Plan 2012-13. No expenditure was incurred during 2012-13. Against an outlay of `1.66 Cr , no expenditure was incurred during 2013-14. An outlay of ` 1.66 Cr is provided for Annual Plan 2014-15.

PP-02 (xii) Renovation & Modernization of GHTP Stage I

Outlay – ` 25.00 Cr

5.1.21 ` 10 Cr are proposed for the renovation & modernization of Guru Har Gobind Thermal Plant, Lehra Mohabbat stage-I. Works like improvement in lighting system for energy efficiency, replacement of conventional bolted type clamps, replacement of station building, handling plant, raising of plant boundary wall, procurement of spare 6.6KV HT motors for Stage-II etc, are some of the works planned during 2012-13 for GHTP Stage-I, Lehra Mohabbat. An expenditure of ` 5.89 Cr was incurred during 11th Plan. An outlay of ` 136.92 Cr and ` 20.89 Cr has been provided in the 12th Plan 2012-17 and Annual Plan 2012-13 respectively. No expenditure was incurred during 2012-13. Against an outlay of ` 25.00 Cr, no expenditure was incurred during 2013-14. An outlay of ` 25.00 Cr is provided for Annual Plan 2014-15.

PP-02(xiii) 1320 MW State Sector Thermal Plant near Mukarian

Outlay ` 15.00 Cr

5.1.22 The Punjab Govt. has approved the development of 1320 MW (2x660 MW) Thermal Power Project with Super-Critical technology as a State Power project at Hazipur (Mukerian), Punjab.

5.1.23 To deal with the activities like conducting the various studies, preparation of project information report, obtaining the requisite clearances, preparation of bid documents, rafting of agreements and assistance in the bid process for the project, it is proposed to appoint a Consultant for the Project. This project will take approx. 6.5 years to complete and commission. The total project cost shall be around ` 7000 Cr . The 90% cost of project shall be met by raising loans from PFC/REC and balance 10% shall be arranged by PSPCL through its own resources/raising loans from market. An outlay of ` 5910.00 Cr and ` 10.00 Cr has been provided in the 12th Plan 2012-17 and Annual Plan 2012-13 respectively. No expenditure was incurred during 2012-13. Against an outlay of ` 15.00 Cr , an expenditure of ` 2.50 Cr was incurred during 2013-14. An outlay of ` 15.00 Cr is provided for Annual Plan 2014-15 for preliminary studies and clearances.

PP-02(xiv) Computerization of Thermal Power Plants

Outlay ` 1.00 Cr

5.1.24 For efficient functioning & Management of thermal plants, M/s TCs, New Delhi has been engaged by PSPCL for the work of on-line Computerization of Thermal Plants, Thermal Designs & Director/G office4 (Cost `6.5 Cr approx.) TCS is to supply, install & commission Hardware & Networking Hardware components and various System Software's as pet the qty. indicated in the W.O. In addition firm has to develop & configure Application Software having modules like Financial accounting, Purchase Management, Inventory Management, Operation & maintenance, Fuel Management, HRMS, Generation of MIS reports etc. for all the plants (GNDTP Bathinda, GHTP Lehra Mohabbat and GGSSTP Ropar),Thermal Designs Patiala & Director/G office. Imparting/G office. Imparting training. Job of data conversion/data entry. Operation & Support. AMC is also to be provided by TCS. An outlay of ` 5 .00 Cr and ` 1.00 Cr has been provided in the 12th Plan 2012-17 and Annual Plan 2012-13 respectively. No expenditure was incurred during 2012-13. Against an outlay of ` 1.00 Cr , an expenditure of ` 2.35 Cr was incurred during 2013-14. An outlay of ` 1.00 Cr is provided for Annual Plan 2014-15 for pending works of computerization, pending works of office connectivity.

PP-02(xv) Institute of Power Management (IPMP) Patiala

Outlay ` 5.00 Cr

5.1.25 Institute of Power Management (IPMP) is being setup at Patiala for providing in house training facility for both new as well as existing staff of Punjab State Power Corporation. An outlay of ` 19.00 Cr and ` 10.00 Cr has been provided in the 12th Plan 2012-17 and Annual Plan 2012-13 respectively. No expenditure was incurred during 2012-13. Against an outlay of ` 5.00 Cr, an expenditure of ` 5.00 Cr was incurred during 2013-14. An outlay of ` 5.00 Cr is provided for Annual Plan 2014-15 for construction of multistoried integrate office complex, Patiala.

PP-03 Distribution

Outlay – ` 750.00 Cr

5.1.26 During the past 30 years, more emphasis was laid on generation

side as compared to distribution system. The maximum amount of plan outlays was allocated to addition in generation capacity. PSPCL has vast network of 11KV lines, 11KV transformers, general connections i.e GSC, ISC, bulk supply and other, tubewell connections and it has connected all villages for 24-hour urban pattern power supply. It has now been proposed to give priority to the distribution system till the distribution system is brought to the level of delivering qualitative supply to ultimate consumers in the State. The length of 11 KV lines, which was 1,27,734 ckt km in 2007-08 has been increased to 209759 ckt km as on 31/03/2014. Similarly, the number of 11 KV transformers, which was 2,74,637 in 2007-08 are increased to 668205 as on 31/03/2014. A total no of 52.40 lac meters will be shifted in pillar boxes which include 38.10 lac meters in rural areas and 14.30 lac meters in urban areas. For shifting 20.81 lac meters in non-APDRP area, REC has provided loan of ` 649 Cr s i.e. 90% of scheme amount against 19 no. schemes. For shifting balance 17.29 lac meters in non-APDRP area, the total cost of 18 no. schemes is ` 1005.27 Cr, out of which ` 752.42 Cr has already been sanctioned by REC in the form of loan and balance loan amount is under sanction. 10% of project cost will be spend by the PSPCL from its own sources. It will result in following benefits:-

5.1.27 Improvement of voltage at tail end Minimal damage of transformers Minimum Fuse off complaints Reduction of LT Losses by 1-1.5% saving of 500 to 600 Mu's /yr (` 180 Cr /Yr). An expenditure of ` 2757.15 Cr has been incurred during 11th Plan. An outlay of ` 4939.50 Cr and ` 769.00 Cr has been provided in the 12th Plan 2012-17 and Annual Plan 2012-13 respectively. An expenditure of ` 968.13 Cr was incurred during 2012-13. Against an outlay of ` 750.00 Cr, an expenditure of ` 970.00 Cr was incurred during 2013-14. An outlay of ` 750.00 Cr is provided for Annual Plan 2014-15.

5.2 NON CONVENTIONAL SOURCES OF ENERGY

Outlay- ` 0.04 Cr

5.2.1 The major portion of the country's energy requirement is met from conventional energy sources like coal and petroleum. However, the vast majority of our rural population still depends upon the locally available non-conventional sources of energy like animal dung, crop waste and fuel wood. In order to ensure

the efficient use of these energy resources in an environmental friendly manner, it is important to promote the programmes of non-conventional sources of energy.

5.2.2 The state government has accorded top priority to the development of new and renewable sources of energy (NRSE). 32 mini hydel plants of 38.00 MW capacity have already been commissioned on different canals in the state. 18 more projects have been allocated to various agencies on BOO basis and are under execution.

5.2.3 7 biomass power projects of 62.5 MW total capacity have been commissioned in the state and another 14 MW capacity projects are under installation. 47 biomass co-generation power projects of 404.19 MW capacity have been commissioned in distilleries/ paper and pulp/ rice shellers/ sugar mills in the state and another 5 projects of 23.9 MW capacity are under implementation.

5.2.4 Considerable potential for energy conservation exists in the state in industry, agriculture, conservational and domestic sectors where energy conservation can be realized to a large extent at the lowest cost. As per the central and state government guidelines, PEDA has made a special programme to undertake the conservation of energy in domestic, commercial, agriculture and industrial sector for effecting saving of about 20% by the end of 12th Plan, equivalent to generation capacity of 1000 MW. Steps have been taken for introduction of CFL's and energy efficient LED lighting in the state. The incandescent lamps are being replaced with energy efficient CFL in domestic sector. About 16.00 lac incandescent lamps have been replaced with CFLs. Besides, about 1.60 lac incandescent lamps have been replaced on agriculture tubewell kothas.

5.2.5 PEDA is successfully implementing Biogas Development & Solar Water Heating Programme under which 1.6 lac biogas plants and 29 Lac Litre Per Day Solar Water Heating Systems have been installed. Besides, 6,500 Solar Street Lights and 1,950 Solar Water Pumps have also been installed in the state. PEDA has allotted 32 solar power projects of 250 MW capacity to private companies on BOO basis which are planned to be commissioned before 31st January, 2015. At

present, 9 solar power plants of 18.02 MW capacity are commissioned and operational in the state. The state has also successfully partnered the completion of 7.5 MW solar plant on a single roof which is the largest such plant in India. The state is shortly going to notify net-metering guidelines on solar power which will provide a major thrust to the Solar Rooftop programme in the state. The policy has been approved by the Cabinet.

5.2.6 Against an expenditure of ` 1.28 Cr incurred during 11th Five Year Plan, an outlay of ` 26.65 Cr is provided for 12th Five Year Plan. An expenditure of ` 0.93 Cr has been incurred during 2012-13. An outlay of ` 0.04 Cr is provided for the Annual Plan 2014-15, for the following schemes:-

Ongoing Schemes

State Funded Schemes

NC-03 Solar Photovoltaic Demonstration Programme in Punjab (CS:SS: Beneficiary) (30:30:40)

Outlay - ` 0.01 Cr

5.2.7 Solar photovoltaic (SPV) technology converts sunlight directly and instantaneously into Direct Current (DC) electricity in an environmentally clean and reliable manner. Under this programme, solar lanterns, SPV street lighting systems, domestic lighting systems, SPV power plant for village electrification etc are being installed. Against an expenditure of ` 0.95 Cr incurred during 11th Five Year Plan, an outlay of ` 8.70 Cr is provided for 12th Five Year Plan. An expenditure of ` 0.93 Cr has been incurred during 2012-13. A token provision of ` 0.01 Cr has been made for the Annual Plan 2014-15.

NC-06 Implementation of Energy Conservation Act, 2001 (CS:SS) (50:50)

Outlay- ` 0.01 Cr

5.2.8 Government of India enacted the Energy Conservation Act, 2001 which came into force from March, 2002. State government has declared PEDA as designated agency to coordinate, monitor and enforce Energy Conservation Act, 2001 in the state. As per requirement of GoI, the state has established “Punjab State Energy Conservation Fund” for promotion of efficient use of energy and its conservation within the state. An outlay of ` 10.00 Cr is provided for 12th

Five Year Plan. A token provision of ` 0.01 Cr has been made for the Annual Plan 2014-15.

NC- 09 SPV Water Pumping Programme under Jawaharlal Nehru National Solar Mission (JNNSM) (CS:SS: beneficiary) (30:40:30)

Outlay- ` 0.01 Cr

5.2.9 Water is an absolute necessity for human survival. Tapping water with economical and pollution free energy sources has become almost mandatory for rural development and agricultural self reliance. Fossil fuels are fast depleting, therefore, it is essential to develop renewable sources of energy to meet our long term energy requirements. Sun is the biggest source of energy capable of meeting growing demand of energy. Solar Photovoltaic (SPV) devices, which produce electricity directly from sunlight, are ideal source to meet future energy requirements. Solar water pumping systems in particular are totally pollution-free and require very little maintenance as compared to the diesel operated pump sets. The solar water pumping systems function only during the sunshine hours, thereby eliminating the use of costly battery bank. These pumping systems are ideal for small & middle farmers to meet their irrigation needs.

5.2.10 Govt. of India has launched Jawaharlal Nehru National Solar Mission (JNNSM) in year 2010-11 by providing 30% subsidy on installation of solar projects including solar water pumping systems of capacity 0.5 KWp to 5 KWp . There is proposal for installation of 500 SPV water pumping systems in the state.

5.2.11 An outlay of ` 13.80 Cr is provided for 12$^{th}$ Five Year Plan. A token provision of ` 0.01 Cr has been made for the Annual Plan 2014-15.

NC-11 Development of Amritsar city as a Model solar city (CS:SS) (50:50)

Outlay - ` 0.01 Cr

5.2.12 The proposed Programme on "Development of Solar Cities" would support/ encourage Urban Local Bodies to prepare a Road Map to guide their cities in becoming ‘renewable energy cities' or 'solar cities' or 'eco/green cities'. The MNRE, GoI has already initiated various programmes in the Urban Sector for promoting solar water heating systems in homes, hotels, hospitals and industry; deployment of SPV systems/ devices in urban areas for demonstration and

awareness creation; establishment of “Akshaya Urja Shops"; design of solar buildings and promoting urban and industrial waste/ biomass to energy projects. The programme aims to consolidate all the efforts of the Ministry in the Urban Sector and address the energy problem of the urban areas in the holistic manner. A token provision of ` 0.01 Cr has been made for the Annual Plan 2014-15.