

CHAPTER 18

ENERGY

Pakistan is facing severe energy shortages since 2006. The main reasons include inadequate capacity addition, limited exploration, ineffective exploitation of hydro and coal, renewable potential and inefficient use of energy resources. The situation leads to a demand supply gap resulting in load-shedding of electricity and gas. Pakistan continues to suffer from the power crisis as nearly one-third of demand for electricity, during the last year, could not be met due to the supply constraints. On average, the supply deficit of around 5,000 Megawatt (MW) was experienced, while it touched the peak of over 7,000 MW last July.

The development of indigenous energy resources such as coal, hydro, and alternative and renewable sources are critical for sustainable economic growth as envisioned in the Vision 2025. The share of hydro power is 31 per cent of total generation in 2014-15 as compared to nearly 70 per cent in the 1980s. The development of the hydro power projects suffered a slowdown due to controversies about major dams despite the large potential of hydro power generation. According to estimates, Pakistan has a hydro potential of about 60,000 MWs of which only 6750 MW (11.25 per cent) has been harnessed so far. Consequently, thermal power was relied upon, as natural gas was abundant and cheaper than oil, and it was the preferred fuel for generation. However, depletion of indigenous gas has resulted in the increased usage of expensive furnace oil and high speed diesel oil in the electricity generation, adversely affecting its affordability in due course. Thus, special emphasis is to develop hydro potential through mega power projects, like Dasu (2500 MW), Diamer Bhasha (4500MW) and Neelum Jhelum (969 MW). In addition, imported and domestic coal (Thar Coal) has also been given high priority. Further, renewable potential (wind and solar) are under active exploitation. To bridge the gap at the earliest possible, efforts are being made to increase the domestic exploration and development supplemented by imported RLNG.

Similarly, Pakistan's existing primary energy supplies are highly skewed towards more expensive fuels like oil and gas instead of indigenous hydro and coal. Out of 67 MTOE of total primary energy mix for 2013-14, 46.4 per cent share is of natural gas, 35 per cent oil, 11.4 per cent hydro, 5.4 per cent coal and two per cent nuclear, including imported energy. Disproportionate reliance on the imported oil, that is, 85 per cent of the total oil supply, is exerting a strain on the balance of payments besides making the energy mix unfavourable.

Performance review 2014-15

Fuel sector

The overall targets set for oil and gas production have almost been met. Primarily, the private sector has played an important role in the exploration and development of the oil and gas sector. Further, the public sector organisations have been given autonomy and off-loaded from the PSDP for projects, which are now funded from their own resources. An allocation of

Rs166.720 million was made for the Geological Survey of Pakistan (GSP) for their coal exploration projects. The oil and gas production targets and achievements are tabulated below:

S.No	Items	Units	Targets 2014-15	Expected achievement up to 30-06-2015	Achievements (%)
1	Production				
11.1	Crude oil	Million barrels	35.62	35	98.26
11.2	Gas	Trillion cft	1.470	1.460	99.32
11.3	LPG	Tonnes	4,38,000	5,11,000	116.67
2	No. of wells drilled	Numbers	104	80	76.92
32.1	Exploratory	Numbers	54	40	74.07
32.2	Development	Numbers	50	40	80

LNG and Gas

Under the Fast Track LNG Services Project, the Sui Southern Gas Company Limited (SSGCL) and Engro Elengy Terminal (Pvt.) Limited (EETPL) executed an LNG Services Agreement (LSA) for design, construction and operation of three million tonnes per annum (equivalent to 400 MMCFD) as well as its re-gasification and storage. The terminal has been completed and is operational now since March 2015. The terminal capacity can be enhanced up to 600 MMCFD.

Moreover, the Gawadar-Nawabshah LNG Terminal and Pipeline Project envisage laying of 42" 700 kilometre pipeline along with terminal at Gawadar for importing 500 MMCFD. A framework agreement for the project has been signed on the Government-to-Government basis with China during the last visit of the Chinese President to Pakistan in April 2015.

A total of 4,18,410 new consumers were added to the Sui Gas Companies, that is, Sui Northern Gas Company Limited (SNGPL) and SSGCL. Moreover, these Companies have also added 6,799 kms of new transmission and distribution pipelines in their respective jurisdictions. (Gas consumers, transmission, distribution achievements and targets are attached at Annexure-V.)

Coal

The Thar coal development is being given high priority, and the Sindh government has already constructed airport, improved and widened of roads for movement of heavy machinery and equipment from sea port up to the Thar Coalfield. In the current fiscal year, the provincial government has earmarked Rs21 billion for coal, wind and other energy projects. The Sindh Engro Coal Mining Company (SECMC) has started mining work at the Thar Block-II and about three million cubic meters overburden has been removed.

The GSP is also implementing three coal exploration projects in Sindh, Punjab and Balochistan, which are as follows:

- Appraisal of newly-discovered coal resources of the Badin Coal Field and its adjoining areas of Southern Sindh
- Exploration of tertiary coal in the Central Salt Range, Punjab
- Exploration and evaluation of coal in Raghni, Tehsil Sharig, Balochistan

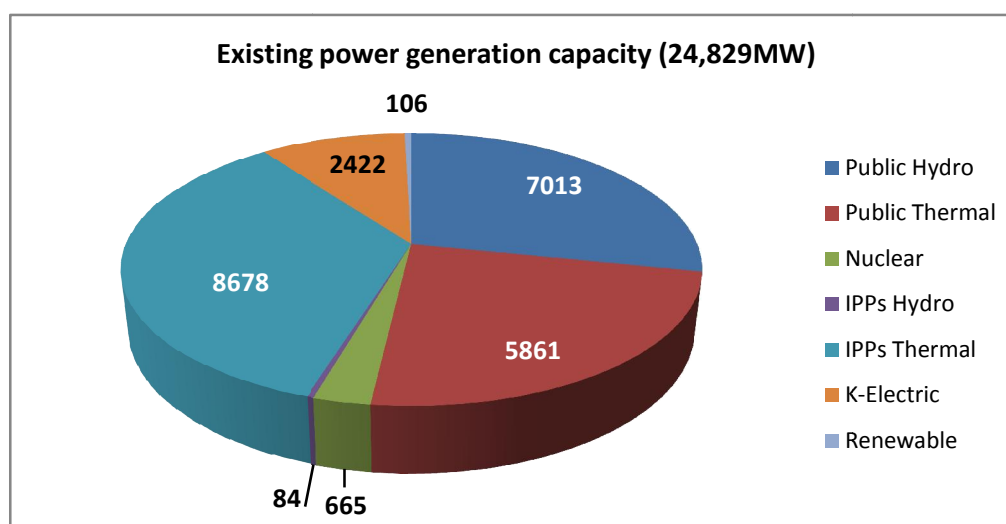
Power sector

An amount of Rs240 billion was allocated for the energy sector development projects in 2014-15. An addition of 536.2 MW out of 675 MW planned in 2014-15 was actualised. The remaining capacity of the Nandipur Combined Cycle Power Plant (138.8 MW) is expected to commission up to June 28, 2015. The power addition in the system is mainly from renewable resources, and is given in the table below.

Capacity addition 2014-15

Sr. #	Name of project	Agency	Fuel	Capacity (MW)
1 (a)	425 MW Combined Cycle Power Plant, Nandipur	NPGL	FO	286.2
(b)	425 MW Combined Cycle Power Plant, Nandipur	NPGL	FO	138.8
2	M/s Three Gorges First Wind Farm Pakistan Pvt. Ltd.	AEDB	Wind	49.5
3	M/s Foundation Wind Energy –I Ltd.	AEDB	Wind	50
4	M/s Foundation Wind Energy –II Ltd.	AEDB	Wind	50
5	Solar power park Bahawalpur	NPGL	Solar	100
Total Addition 2014-15				675

The existing installed capacity is 24,830 MW, including 22,408 MW on the NTDC system and 2,422 MW on the K-Electric. The power generation mix by source is given in the pie chart below. The plant-wise details of power generation are attached at Annexure-I.



Transmission and distribution system

During the year 2014-15, the NTDC transmission has been enhanced by adding 3,150 MVA and 6,277 MVA on 500 kV and 220 kV systems respectively. Further, the transmission lines were extended by 1,944 kms accordingly. The distribution network has been enhanced by adding a total of 12,865 MVA distribution transformers corresponding 3,447 kms of transmission line to cater to the growing demand of all the ten distribution companies, which have also improved

their feeders by optimisation. The details of transmission projects are attached at Annexure-II, while the details of enhancement in distribution capacity of all DISCOs are attached at Annexure-III.

Outlook 2015-16

The projects for generating 1,027 MW are expected to come on line by year 2015-16. The demand-supply gap will, however, remain almost the same due to increase in demand, which is expected to grow at a rate of four to five per cent. The Neelum-Jhelum project is at an advanced stage of completion, and will come on line during FY 2016-17 adding 969 MW to the grid, which will reduce the demand-supply gap.

The government has initiated a programme with the assistance of China, where the energy sector has been given high priority to overcome energy shortages by the year 2017-18. The China-Pakistan Economic Corridor (CPEC) is expected to add 10,400 MW to the grid by 2018. The projects include coal, hydro and wind. List of the CPEC projects is attached as Annexure-VI. Not only that it will augment supplies in a major way, but will also significantly change the energy mix, replacing expensive oil and resulting in reduction in the average cost of generation. An important aspect of the CPEC projects is that it will be implemented in the private sector. All finance, equity and debt will be in the domain of project finance, and will not be affecting government debt portfolio. In the current year, the planning activities are expected to be completed and possibly some construction activity may also be started. In fact, on-ground activity has already been initiated on the Thar coal.

An important development in the fuel sector had been a substantial decrease in the international oil prices resulting in 29 per cent reduction in the local petroleum product prices. This development has lowered transport costs and electricity generation cost to the extent of electricity generation based on oil.

The Gas Infrastructure Development Cess (GIDC) bill has been passed by the Parliament. The Cess will increase average cost of gas for all sectors except domestic. However, a aspect of the Cess is that the gas transmission projects will be financed out of it to cater for imported LNG.

The projected demand for oil and gas during 2015-16 is 23 million tonnes (4,73,000 barrels per day) and 2.1 trillion cubic feet (six billion cubic feet per day) respectively. Keeping in view the planned supply of the indigenous oil of only 110,000 barrels per day and 1.5 trillion cubic feet gas, during 2015-16 a supply-demand gap in both oil and gas sectors is required to be met through an import of 18 to 19 million tonnes crude oil and petroleum products. Moreover, the indigenous gas supply will be supplemented through LNG imports to the tune of 400 MMCFD resulting in bridging to some extent the widening gas shortfall of over two billion cubic feet per day.

In line with the Vision 2025, the development of hydro power resources is being actively pursued and about 9551 MW projects are at various stages of construction. These are 4500 MW Diamer Bhasha, 128 MW Keyal Khwar, 106 MW Golan Gol, 2160 MW Dasu Hydropower Project (stage-1), 34.5 MW Harpo, 969 MW Neelum Jhelum, 1410 MW Tarbela 4th Extension, 243 MW 2nd Rehabilitation of Warsak Hydropower station. Similarly 2880 MW nuclear power projects are at various stages of construction.

The pre-feasibility and feasibility studies of approximately 18875 MW hydro projects have been completed. The projects are under various stages of approval, and finances for these projects are being arranged. These are 7100 MW Bunji Hydropower Project, 310 MW Refurbishment and upgradation of the Mangla Generating Unit 1-6, 1100 MW Kohala, 690 MW Shyok Dam, 665 MW Lower Plas Valley, 496 MW Lower Spat Gah, 40MW Basho, 2300 MW Pattan, 4000 MW Thakot, 2100 MW Dasu stage-II 48 MW Jagran, 26 MW Shagarthang.

Approximately, a total of 4445 MW thermal projects in the public sector are under construction. These are 425 MW Power Project Nandipur, 1320 MW Coal fired Power Plant Jamshoro, while two 2400 MW LNG-based power plants at Haveli Bhadur Shah and Balloki have been recently approved by the government, while 300 MW coal-fired Power Plant Gwadar is in the feasibility stage. These plants are expected to be completed by 2017-18.

The Planning Commission has deliberated on various proposals to facilitate and encourage the use of energy efficient LED lights and air conditioners by reducing import duty. Given the nature of the appliances, a reduction in rate of taxes will increase the quantity demanded, which will also result in increasing the overall tax revenue. In this respect, consultative meetings are being carried out to explore more options for energy conservation and efficiency. Also, the Building-Code of Pakistan has been outlined by the Pakistan Engineering Council, which has been done in collaboration with the government departments and ENERCON for implementation to improve energy conservation.

Energy programme for 2015-16

Fuel sector

The crude oil and gas production is planned to be 40 million barrels and 1.5 trillion cubic feet respectively. The Liquefied Petroleum Gas (LPG) production is planned to be 5,84,000 tonnes. Total 126 wells, including 61 exploratory and 65 developmental, are being planned to be drilled by the Exploration and Production (E&P) companies. The four existing OMCs will construct 10 new oil storages at six locations.

Shale oil and gas

In order to supplement the convention oil and gas exploration and production, a study has been initiated with the financial assistance of the USAID, which is expected to be completed by the end of 2015. The study will provide assessment and allied aspects of the shale oil and gas resources in the country, ultimately leading to development of a comprehensive and investment-friendly shale oil and gas policy.

Gas transmission and distribution

Both the SNGPL and SSGCL have plans to add total of 419,430 new consumers to their respective systems during the year 2015-16. In addition, the SNGPL and SSGCL have intended targets to lay down 7,332 kms in total of new transmission and distribution pipelines in their respective networks. In order to transmit the imported LNG to up-country, the SSGCL will construct 42" pipelines, which are expected to be completed by the end of 2016.

Gas losses and theft control

In addition to the Criminal Law (Amendment) Act 2011 by amending the Pakistan Penal Code 1860 and Code of Criminal Procedure 1898, the Gas (Theft Control and Recovery) Bill 2014 is under consideration in the National Assembly. After its passage from the Parliament, the law

will help in curbing the theft and reducing the gas losses, while also improving the arrear recovery from the consumers. In addition, to improve the operational efficiency of both the gas utility companies, a restructuring programme envisaging unbundling and separation of the transmission from the distribution is under active consideration.

LNG imports

During 2015-16, the LNG import will be enhanced from 400 to 600 MMCFD with further investment to be made by the public and private sectors in developing additional terminals. The pricing and other related matters, including allocation and its distribution through existing and new pipelines, will be undertaken by the Oil and Gas Regulatory Authority (OGRA) and sui gas companies.

The Gas Infrastructure Development Cess (GIDC) Bill 2015, passed by the both Houses of the Parliament, has enabled the government to collect additional revenue from the gas consumers, excluding domestic. The collection of revenue under the GIDC will be spent on gas infrastructure required for the imported LNG, and IP and TAIPI projects.

In order to reduce an immense pressure on the limited supply of the indigenous gas, the government has allowed CNG sector to import LNG at a reduced GST of five per cent. Accordingly, the CNG sector has formed a gas company for the purpose, and is finalising the modalities for the LNG import. In addition, the fertilizer sector has also been persuaded to consider utilisation of syngas obtained from the Thar coal gasification.

Provincial participation in exploration and development of oil and gas

Under the 18th Constitutional Amendment, the provinces have been given equal and joint ownership over the oil and gas resources. The provincial energy departments are making all efforts to enhance oil and gas exploration in their respective jurisdictions. The KPK government has established the KP Oil and Gas Company Ltd (KPOGCL). The Sindh government, through the Sindh Energy Holding Company Ltd (SEHCL) and Sindh Petroleum Ltd (SPL), is planning to explore oil and gas in the province.

In order to facilitate and encourage the participation of locals in the development and security of oil and gas fields, a proposal for supplying gas to the community residing within five-km-radius of the gas fields, under a joint funding mechanism of gas utility companies and respective provincial governments, is being submitted of the Council of Common Interests (CCI) for consideration and approval.

Coal sector

The execution of the following three projects will be continued by the GSP and Ministry of Petroleum and Natural Resources.

- Appraisal of the newly-discovered coal resources of Badin coal field and its adjoining areas of Southern Sindh (PSDP allocation 2015-16: Rs30 million)
- Exploration of the Tertiary Coal in the Central Salt Range, Punjab (PSDP allocation 2015-16: Rs23.93 million)
- Exploration and evaluation of coal in Raghni area, Tehsil Sharig, Balochistan (PSDP allocation 2015-16: Rs15 million)

Thar Coal Development

The Thar Coal Projects have been enlisted as early harvest projects by the CPEC. The Sindh Engro Coal Mining Project (SECMC) and Sino-Sindh Resources have been prioritised to be financed by the Chinese institutions. Besides the SECMC, other block lease holders are also actively working.

Power sector

An amount of Rs317,177 million has been allocated for various power projects for 2015-16 of the Ministry of Water and Power, Ministry of Kashmir affairs and Gilgit Baltistan, Pakistan Atomic Energy Commission and Pakistan Nuclear Regulatory Authority. The WAPDA, NTDC, GENCOs and DISCOs will invest Rs174,950 million from their own resources. The installed power generating capacity is planned to be increased from 24,830 MW in June 2015 to 25,857 MW in June 2016 through an addition of 1,027 MW in system. The break up is given below:

Capacity addition 2015-16 (MW)

Sr. #	Name of project	Agency	Fuel	Capacity (MW)	Commissioning date
1.	Chashma-III Nuclear Power Plant	PAEC	Nuclear	340	April 2016
2.	Quaid-e-Azam Solar Park Phase-II	PTDB	Solar	300	2015-16
3.	Nandipur CCPP (Subject to gas availability)	GENCO	Gas conversion	100	2015-16
4.	Sapphire Wind Power Company (Pvt) Ltd	AEDB	Wind	49.5	Dec 2015
5.	Chiniot Power Ltd	AEDB	Bagasse	62.4	Dec 2015
6.	RYK Mills Limited	AEDB	Bagasse	30	Dec 2015
7.	Hamza Sugar Mill Limited	AEDB	Bagasse	15	Dec 2015
8.	Yunus Energy Ltd	AEDB	Wind	50	June 2016
9.	Tapal Wind Energy (Pvt.) Ltd	AEDB	Wind	30	June 2016
10.	Metro Power Co. (Pvt) Ltd,	AEDB	Wind	50	June 2016
Total Addition 2015-16				1,027	

Transmission and distribution system

To enhance the transmission capacity during 2015-16, about 10,970 MVA transformers of 500 and 220 kV systems will be installed along with 1,236 km of transmission lines as per details given below. Moreover, under the power distribution, energy loss reduction and village electrification programmes include: installation of 15,686 MVA of the distribution transformers and 5,424 km of HT/LT transmission line. Detail is attached as Annexure-IV.

Sr. No.	Voltage Level	Addition in transformation Capacity (MVA)				Addition in T/Line (km)	Estimated Cost (MUS\$)	Amount Incurred (MUS\$)	Balance Amount (MUS\$)	Expected Completion
		New	Aug.	Ext	Total					
1-	500kV	3900	300	-	4,200	549	1084	370	714	2015-16
2-	220kV	5870	900	-	6,770	687				

Energy efficiency and conservation

The Planning Commission has deliberated on various proposals to facilitate and encourage the use of energy efficient LED lights and air conditioners by reducing duty. Given the nature of the

appliances, a reduction in the rate of taxes will increase the demand; thereby, increasing the overall tax revenue. In this respect, consultative meetings are being carried out to explore more options for energy conservation and efficiency.

Energy sector reforms

A number of consultative meetings with the ministries and divisions concerned were held on the enlisted-below agenda of the energy sector reforms:

- Merger of NEPRA and OGRA
- Definition of relationship of regulatory action and government policy
- Appellate Tribunals for the energy sector
- Regulatory Advisory Committees (RAC)
- Reorganisation of the NEPRA and OGRA, federal oversight and merit-based transparent and efficient appointment process in the energy sector
- Tariff-setting reforms in the regulatory process
- KE tariff reforms and restructuring
- Reorganisation of the energy sector ministries
- Delinking of transmission and distribution from SNGPL and SSGC
- Recognising, encouraging and rewarding energy efficiency and conservation
- Assist in the development of the local engineering design and manufacturing capabilities
- To encourage development of an integrated GIS framework of the energy sector
- To build inland water ways for transport of raw materials (coal) for the energy sector

Existing power generation

Existing installed capacity			
Sr. No.	Name of power station	Fuel	Installed capacity (MW)
Hydel WAPDA			
1	Tarbela	Water	3,478
2	Mangla	Water	1,000
3	Ghazi Barotha	Water	1,450
4	Warsak	Water	243
5	Chashma Low Head	Water	184
6	Allai Khwar HPP	Water	121
7	Jinnah Low Head	Water	96
8	Small Hydels5	Water	106
9	Khan Khwar HPP	Water	72
10	Dubair Khwar HPP	Water	130
Sub-Total (WAPDA Hydel)			6,902
Others			
11	Jagran Hydel	Water	30
12	Malakand-III Hydel	Water	81
Total Hydel			7,013
GENCOs			
13	TPS Jamshoro #1-4	Gas/FO/RFO	850
14	GTPS Kotri #1-7	Gas/HSD	174
Sub-Total GENCO-I			1,024
15	TPS Guddu Steam #1-13	Gas/FO	1,655
16	Guddu 747	Gas	747
17	TPS Quetta	Gas	35
Sub-Total GENCO-II			2,437
18	TPS Muzaffargarh #1-6	RFO/FO/Gas	1,350
19	NGPS Multan #1&2	Gas/RFO/HSD/FO	195
20	GTPS Faisalabad #1-9	Gas/HSD	244
21	SPS Faisalabad #1&2	FO/Gas/ RFO	132
22	Shahdara G.T.	Gas	44
23	Nandipur	RFO	286
Sub-Total GENCO-III			2,251
24	FBC Lakhra	Coal	150
Sub-Total GENCO-IV			150
Sub-Total GENCOs			5,862
Nuclear			
25	Chashma Nuclear (PAEC)-I	Uranium	325
26	Chashma Nuclear (PAEC)-II	Uranium	340
Sub-Total (Nuclear)			665
Hydel IPPs			
27	New Bong Escape	Water	84
Sub-Total (Hydel IPPs)			195
Thermal IPPs			
28	KAPCO	RFO/Gas/HSD	1,638
29	Hub Power Project (HUBCO)	RFO	1,292
30	Kohinoor Energy Ltd. (KEL)	RFO	131

Existing installed capacity			
Sr. No.	Name of power station	Fuel	Installed capacity
31	AES Lalpir Ltd.	RFO	362
32	AES Pak Gen (Pvt) Ltd.	RFO	365
33	SEPCOL	RFO	135
34	Habibullah Energy Ltd. (HCPC)	Gas	140
35	Uch Power Project	Gas	586
36	Rousch (Pak) Power Ltd.	Gas	450
37	Fauji Kabirwala (FKPCL)	Gas	157
38	Saba Power Company	RFO	134
39	Japan Power Generation Ltd.	RFO	135
40	Liberty Power Project	Gas	235
41	Altern Energy Ltd. (AEL)	Gas	31
42	Attock Generation PP	RFO	163
43	ATLAS Power	RFO	219
44	Engro P.P. Daharki, Sindh	HSD/Gas/FO	226
45	Saif P.P. Sahiwal, Punjab	Gas/HSD	225
46	Orient P.P. Balloki, Punjab	Gas/HSD	225
47	Nishat P.P. Near Lahore	RFO	200
48	Nishat Chunian Project. Lahore	RFO	200
49	Foundation Power	Gas	175
50	Saphire Muridke	Gas/HSD	225
51	Liberty Tech	RFO	200
52	Hubco Narowal	RFO	220
53	Halmore Bhikki	HSD/Gas	225
54	Uch-II	Gas	375
55	Davis	Gas	10
56	Sub-Total Thermal IPPs		8,678
Wind Power Projects			
57	Fauji Wind Power	Wind	50
58	Zorlu Energy Wind Power	Wind	56
	Total Wind Power Plants		106
	Total Installed Capacity (Public+Private)		22,408
	Total Installed Capacity K-Electric		2,422
	Grand Total (Sub Total + K-Electric)		24,830

Transmission system expansion plan

Sr. No.	Name of the project	MVA capacity	Addition in T/L (km)	Approved PC-I cost million (Rs US \$)	Expected completion
1	220kV Gharo G/S and Extension at 500kV Jamshoro G/S	2x250 (Gharo) + 1x450 (Jamshoro)	85	7,952 80	2016-17
2	Evacuation of Power from 1320 MW Imported Coal based PP at Sahiwal	1x600	0.5	1413 14	2016-17
3	Replacement of existing 220 kV Tarbela-Burhan D/C T/L (35km) Replacement of existing 220 kV Tarbela-Burhan-ISPR D/C T/L (62.5km) In/Out of one circuit of 220kV Mansehra-ISPR D/C T/L (40km)	-	138	3,568 36	2016-17
4	Evacuation of Power from 1200 MW LNG Based Power Project at Bhikki	-	03	02	2016-17
5	Evacuation of Power from 1200 MW LNG Based Power Project at Balloki	750	40	31	2016-17
6	Evacuation of Power from 1200 MW LNG Based Power Project at Jhang (Haveli Bahadur Shah)	-	28	15	2016-17
7	Power Dispersal from 1200 MW Thar Coal Power Plant (500 kV Thar – Matiari T/L & Matiari 500 kV S/Station)	-	270	185	2017-18
8	Evacuation of Power from 1320 MW Bin Qasim Project	-	180	107	2017-18
9	Extension/Augmentation of 220/132kV Rewat substation (2x160 to 2x250 + 1x250)	430	-	7	2017- 18
10	500 kV Faisalabad West G/S along with allied T/Ls	3x250 + 2x750	125 (220 kV) 32 (500 kV)	72	2017-18
11	500 kV Islamabad West G/S along with allied T/Ls	3x250 + 2x750	35 (220 kV) 27(500 kV)	55	2017-18
12	220kV Mirpur Khas G/S along with allied T/Ls	2x250	70	32	2017-18
13	500kV Chakwal G/S along with allied T/Ls	2x250	20	30	2017-18
14	220kV Mastung G/S along with allied T/Ls	2x250	120	43	2017-18
15	Evacuation of Power from Tarbela 5th Extension	-	77	40.5	2017-18

Sr. No.	Name of the project	MVA capacity	Addition in T/L (km)	Approved PC-I cost million (Rs US \$)	Expected completion
16	T.M Khan to Hala Road 220kV D/C T/L	-	10	2	2017-18
17	Evacuation of Power from Karot and Azad Pattan HPPs	-	10	5	2018-19
18	Evacuation of Power from 1320 MW HUB Power Company Ltd	-	25	15	2018-19
19	Evacuation of Power from 350 MW Siddiqsons Ltd	-	32	20	2018-19
20	Evacuation of Power from 660 MW Lucky Electric Power Company Ltd.	-	32	20	2018-19
21	Evacuation of Power from 2160 MW Dasu Hydro Power Project (Phase-I)	-	615	560	2019-20
22	Interconnection Scheme for CASA-1000 (HVDC Part)	-	100km (HVDC)	167	2019-20
23	500 kV Peshawar New G/S along with allied T/Ls (HVAC Part of CASA-1000)	2x750	15 (500 kV) 24 (220 kV)	35	2019-20
24	Evacuation of Power from Suki Kinari HPP	-	200	107	2019-20
25	220kV Kohat G/S along with allied T/Ls	2 x 250	50	35	2019-20
26	220kV Jamrud G/S along with allied T/Ls	2 x 250	10	15	2019-20
27	220kV Kamra G/S along with allied T/Ls	2 x 250	5	12.5	2019-20
28	220kV Shadman G/S along with allied T/Ls	2 x 250	15	50	2019-20
29	220kV Jauhrabad G/S along with allied T/Ls	2 x 250	10	12.5	2019-20
30	220kV H.Faqiran G/S along with allied T/Ls	2 x 250	58	39	2019-20

Annexure-III

Investment requirements for Grids and T/L in DISCOs 2014-15

DISCO	Projected Demand (MW)	Trans. Line (KM)	Power Transformer (MVA) Cost of T/L and Power Transformer (Rs. Mill)	HT Line (KM)	LT Line (KM)	Distribution Trans-Former (MVA)	Cost of HT/LT & Dist. Transformer (M.Rs)	Cost of replacement of meters (M.Rs)	Cost of installation of AMI (M.Rs)	
FESCO	3059	187	642	6629	528	754	580	2683	94	-
MEPCO	4250	47	350	3000	70835	46776	7331	1560	700	580
HESCO	1290	97	217	1074	350	170	90	486	175	10
GEPCO	2386	2468	3885	955	22327	17917	3568	516		
TESCO	585	58	130	1630	250	192	8	616	0.5	5
IESCO	2565	313	247	5765	690	170	55	1577	365	0
QESCO	1715	84	92	425	522	51	430	996	31	4
PESCO	2894	52	312	2700	1644	1796	30	3695	28	20
SEPCO	1180	73	44	1195	347	88	426	861	230	1
LESCO	5022	68.1	269	1937.2	594	436	348	1301	40	0
	24946	3447.1	6188	25310.2	98087.24	68349.95	12865.367	14290.73	1663.3	619.3

Annexure-IV

Investment requirements for Grids and T/L in DISCOs 2015-16

DISCO	Projected Demand (MW)	Trans. Line (KM)	Power Transformer (MVA)	Cost of T/L and Power Transformer (Rs. Mill)	HT LINE (KM)	LT LINE (KM)	DISTRIBUTION TRANSFORMER (MVA)	COST OF HT/LT & DIST. TRANSFORMER (M.RS)	Cost of replacement of meters (M. Rs)	Cost of installation of AMI (M. Rs)
FESCO	3261	202	806	6801	730	819	605	2859	108	18
MEPCO	4460	178	1507	9200	71511	46896	9833	3351	700	760
HESCO	1343	490	78	6058	604	252	114	675	340	0
GEPSCO	2423	2548	4546	2645	22477	18142	3654	1277	500	1000
TESCO	627	120	52	1491	300	220	10	636	0.6	5
IESCO	2702	313	544	8909	755	177	55	1715	365	101
QESCO	1768	958	104	9943	602	54	456	1387	32	4
PESCO	3125	82	520	4200	1870	1158	33	4470	30	21
SEPCO	1250	330	210	2722	445	104	545	1094	230	1
LESCO	1312.5	203.44	1668	11797.72408	640	370	381	1416	248	131
	22271.5	5424.44	10035	63766.72408	99934.07	68191.59	15686.518	18880.445	2554	2041.618

**Gas consumers, transmission and distribution addition
Achievements and targets**

Sr#	Items	Units	Targets 2014-15	Expected achievement up to 30-06- 2015	Achievement (%)	Targets 2015-16
Gas consumers added						
SNGPL						
	Domestic	Nos.	300,000	300,000	100	300,000
	Commercial.	Nos.	-	71		1,000
	Industrial	Nos.	-	-		20
	Sub-total SNGPL	Nos.	300,000	300,071	100.02	301,020
SSGCL						
	Domestic	Nos.	10,700	96,084	897.98	118,000
	Commercial.	Nos.	320	309	96.56	375
	Industrial	Nos.	25	9	36	35
	Sub Total SSGCL	Nos.	11,045	96,402	872.81	118,410
	Total SNGPL + SSGCL	Nos.	311,045	396,473	127.46	419,430
Transmission & Distribution extension by gas companies						
SNGPL						
	Transmission	Kms	114	111	97.37	111
	Distribution and service	Kms	4,675	4,675	100	5,274
	Sub-total SNGPL	Kms	4,789	4,786	99.94	5,385
SSGCL						
	Transmission	Kms	164	41	25	168
	Distribution and Service	Kms	1,846	780	42.25%	1,779
	Sub Total SSGCL	Kms	2,010	821	40.85%	1,947
	Total SNGPL + SSGCL	Kms	6,799	5,607	82.47%	7,332

Annexure-VI

Projects of the CPEC

Energy projects			(\$ million)	
Sr.	Projects	MW	Estimated cost	Category
1	Sinohydro Resource Limited & Al Mirqab Capital	1320	1,980	Priority
2	Sahiwal 2x660MW Coal-fired Power Plant	1320	1,600	Priority
3	Engrothar 2x330MW Coal-fired	660	1,000	Priority
	Surface mine in Block II of Thar Coal field,3.8 million tons/year		860	Priority
4	Gawadar Coal Power Project	300	360	Priority
5	Muzaffargarh Coal Power Project	1320	1,600	Priority
6	Rahimyar Khan Coal Power Project	1320	1,600	Priority
7	SSRL Thar Coal Block 6.5mpta & CPIH Mine Mouth Power Plan	1320	1,300	Priority
8	Quaid-e-Azam 1000MW Solar Park	1000	1,350	Priority
9	Dawood 50MW wind Farm	50	125	Priority
10	UEP 100MW wind Farm	100	250	Priority
11	Sachal 50MW Wind Farm	50	134	Priority
12	Sunnec 50MW wind Farm	50	125	Priority
13	SukiKinari Hydropower Station	870	1,802	Priority
14	Karot Hydropower Station	720	1,420	Priority
Total (Priority) Projects		10400	15,506	
		MW		
15	Gaddani Power Park Project			Actively promoted
(i)	4x660MW	2640	7,920	Actively promoted
(ii)	Jetty + Infrastructure		1,200	Actively promoted
(iii)	Transmission Line to Lahore and Faisalabad		3,000	Actively promoted
16	ChichokiMallian 525MW Combined-cycle Power Plant		550	Actively promoted
17	KohalaHydel Project	1100	2,397	Actively promoted
18	Pakistan Wind Farm II (Jhampir, Thatta)	100	150	Actively promoted
19	HUBCO coal power plant	660	970	Actively promoted
20	Salt Range Mine Mouth Power Project including mining	300	800	Actively promoted
21	Thar mine mouth oracle	1320	1,300	Actively promoted
Total (actively promoted)		6120	18,287	