

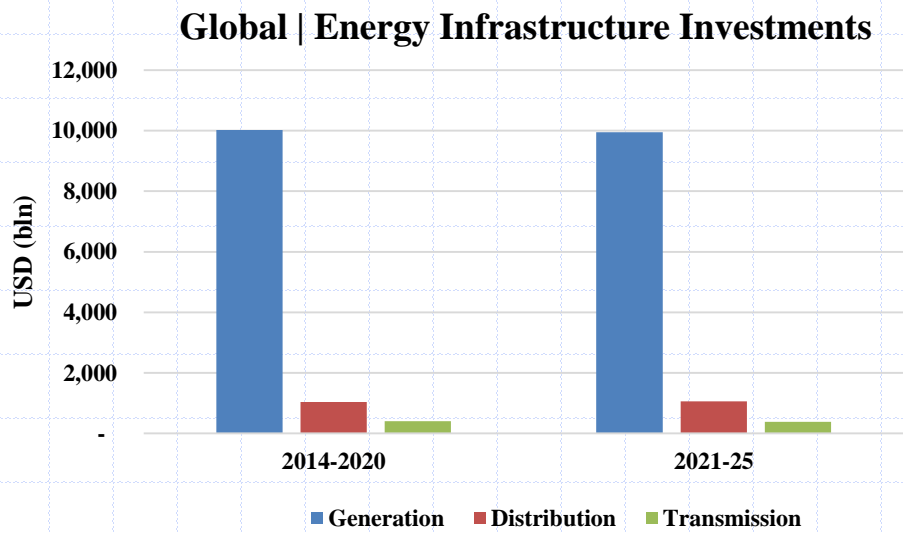
Electrical Engineering Sector Overview



December 2017

Global Energy Infrastructure Investments¹

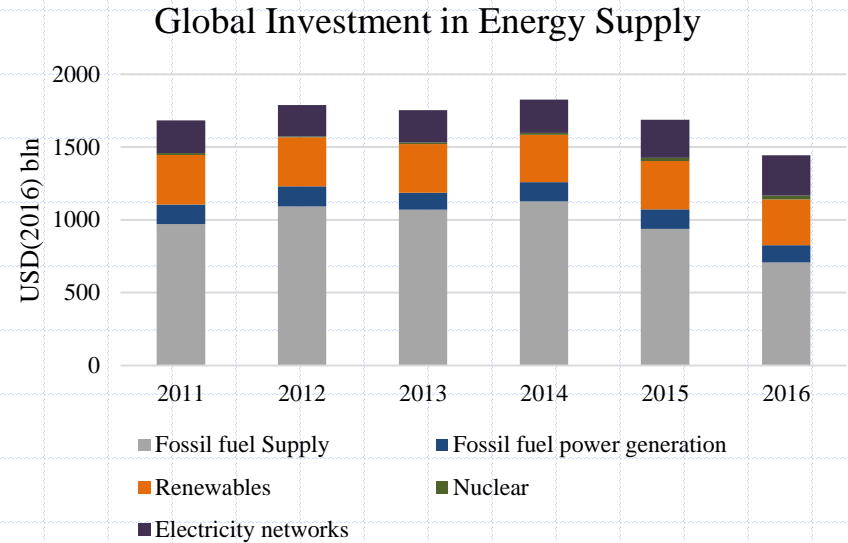
- USD 6.8 trillion investment planned in global Transmission & Distribution till 2035
- 26% investment in Transmission & 74% investment in Distribution
- Asia contributes to 52% of future investments
- Major growth expected in the industry



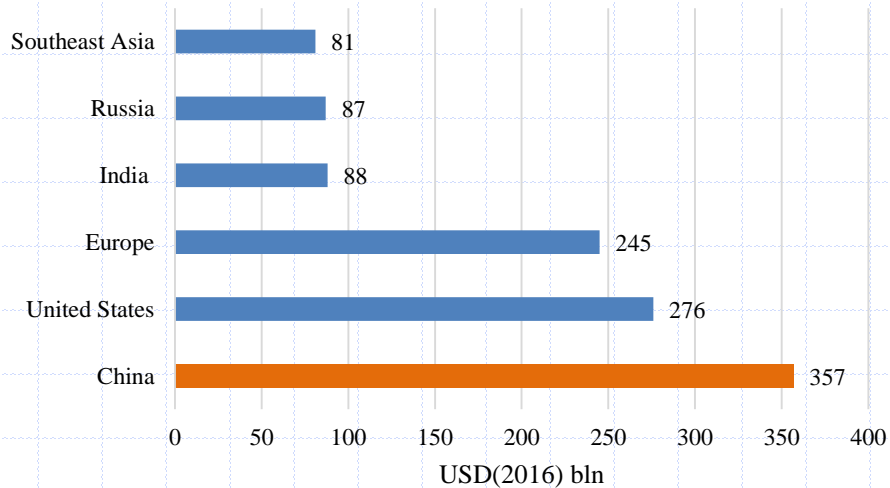
Global Investment in Energy Infrastructure, 2014-2035 (USD bln)							
	Transmission			Distribution			T&D
	Additions	Refurbishment	Total	Additions	Refurbishment	Total	Total
Asia	689	229	918	1,759	877	2,636	3,554
North America	153	171	324	263	433	696	1,020
Europe	63	94	157	180	409	589	746
Latin America	96	31	127	216	92	308	435
Africa	115	20	135	240	46	286	421
Oceania	24	40	64	130	219	349	413
Middle East	45	16	61	131	34	165	226
Total	1,185	601	1,786	2,919	2,110	5,029	6,815

Global Energy Infrastructure Investments²

- **Worldwide Electricity investment decreased by just under 1% to \$718 bln, with an increased spending on networks partially offsetting the drop in power generation**
- **Investment in new renewables-based power capacity, at \$297 bln, remained the largest area of electricity spending**
- **In Renewables based power capacity, additions were 50% higher and the expected output from this capacity was 35% higher due to decline in unit costs and technological advancements**



World Energy Investment by region, 2016



- **Energy investment was the largest in China, 21% of the global total**
- **Energy investment in India increased by 7%, cementing its place as the third largest behind the US due to a strong government push**
- **The fast growing economies of Southeast Asia together represent over 4% of global energy investment**
- **Despite a sharp decline in oil and gas investment, the share of the United States in global energy investment rose to 16%**
- **Investment declined in Europe by 10%**

Pakistan | Electricity Production and Demand ³

- Supply deficit country
- Sustainable demand growth potential
- 16,515 MW capacity expected to be added in next 5 years
- Alternative Energy sources – RLNG, Coal – are expected to cater the rising generation capacity

	Actual		
	Generation Capability (MW)	Demand during Peak Hours (MW)	Surplus / (Deficit) (MW)
FY12	12,230	18,940	(6,710)
FY13	14,600	18,827	(4,227)
FY14	16,170	20,576	(4,406)
FY15	16,500	21,701	(5,201)
FY16	17,261	22,559	(5,298)
	Projected		
	Generation Capability (MW)	Demand during Peak Hours (MW)	Surplus / (Deficit) (MW)
FY17	20,106	23,816	(3,710)
FY18	24,640	25,140	(500)
FY19	26,663	26,439	224
FY20	29,059	27,725	1,334
FY21	33,776	29,082	4,694

Pakistan | Infrastructure Investment ^{3 & 4}

NTDC (including K-Electric) Grid Station Investment								
New Grid Station								
Period of report	500/200 kV Grids				220/132 kV Grids			
	Nos.	MVA Capacity	Expected COD	Estimated Cost PKR mln	Nos.	MVA Capacity	Expected COD	Estimated Cost PKR mln
2016-17	1	1,500	2019-20	3,500	7	4,250	2016-17	23,816
2017-18	4	6,500	2017-18	28,302	2	1,000	2017-18	9,750
2018-19	-	-	-	-	1	500	2018-19	3,710
Extension and Addition/Reinforcement of Transformers at Overloaded Grid Stations								
Period of report	500/220 kV Grids			220/132 kV Grids			Estimated Cost PKR mln	
	MVA Capacity	Expected COD	MVA Capacity	Expected COD				
2016-17	1,800	2017-18	250	2017-18	147,022			

Table 4

Description	Amount Injected (in PKR mln) to Reinforce/Expand 220 KV K-Electric's Transmission System						Investment Plan (in USD mln) to Reinforce/Expand 220 KV K-Electric's Transmission System					
	2014-15			2015-16			2016-17			2017-18		
	FC	LC	Total	FC	LC	Total	FC	LC	Total	FC	LC	Total
Grid Stations	-	-	1,568	-	-	2,439	20	24	44	23	20	43
Transmission	-	-	425	-	-	3,524	45	26	71	29	27	56
SCADA	-	-		-	-	293	3	3	6	3	3	5
Reinforcement	-	-	-	-	-	3,679	45	30	75	51	37	88
Others	-	-	30	-	-	-	-	41	41	-	23	23
Total	-	-	2,023	-	-	9,935	113	124	236	107	109	216

FC: Foreign Currency

LC: Local Currency

SCADA: Supervisory control and data acquisition

Pakistan | Electrical Engineering | Industry Players

Units	9MCY17	CY16	CY15	CY14	CY13
Electric Meters	1,527,091	1,475,919	1,272,143	1,366,953	897,343
Switch Gears	9,378	12,350	11,796	9,629	10,757
Electric Transformers	35,332	30,908	24,197	21,970	19,707

Market Shares of Switch Gears		
	CY16	9MCY17
PEL	25%	25%
Siddiq Sons	20%	20%
FICO	18%	18%
Schneider	16%	16%
Pem Pak	11%	11%
Seimens	10%	10%
Total	100%	100%

Market Shares of Distribution Transformers		
	CY16	9MCY17
PEL	39%	40%
Transfopower	24%	24%
Elmetec	10%	10%
JF Industries	8%	8%
Pan Power	7%	7%
Skypower	7%	0%
Others	5%	11%
Total	100%	100%

Market Shares of Power Transformers		
	CY16	9MCY17
PEL	80%	81%
Heavy Electrical Complex	20%	19%
Total	100%	100%

Market Shares of Energy Meters		
	CY16	9MCY17
Creative	19%	19%
Micro Tech	16%	16%
KBK	15%	15%
PEL	13%	18%
Accurate	9%	9%
Others	28%	23%
Total	100%	100%

- PEL market leader in transformers & switch gears
- Presence of both foreign & domestic players
- Exit of Siemens from Distribution Transformers in CY15
- Rise in share of PEL in energy meters

- + **High investment in infrastructure**
- + **Significance of energy sector for growth**
- + **Demand growth potential is high**
- **Delay in planned increase of country's generation capacity**
- **Outdated transmission & distribution infrastructure**

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