



# **KARACHI ELECTRICITY SUPPLY**

**An attempt to unravel the wires**

## **INFONALYSIS**

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**Research & Development Department**

**Karachi Chamber of Commerce & Industry**

*The gateway to economic prosperity...*

## Executive Summary

Karachi is a very vibrant city characterized by well-lighted streets, markets and other public places. To cater to all the electricity needs of this mega city, K-Electric is the sole vertically integrated Transmission and Distribution Company having complete monopoly in the city.

In 2008, UAE-based Abraaj Group acquired a controlling stake of K-Electric which now has ~2.5 million customers and supplies 2,900-3,000MW where the consumer demand varies between 2,800 and 3,200MW. After the acquisition, it recorded a net positive income in FY12 for the first time in 17 years. It posted profit after tax of PKR 2.6Bn in FY12 which surged massively by 1162% to PKR 32.8Bn by FY16 where its net profit margin jumped to 17.3% from mere 1.6% in FY12.

It is interesting to note that when international crude oil (OPEC basket) prices nose-dived by 71.35%, the decline in electricity tariffs was only by 28% from first quarter of 2013 till the end of 2015. This phenomena was the result of the multi-year tariff formula under which the maximum variation in fuel cost was capped at 2.5% which explains one of the reason of steep rise in profit margins of KE. Moreover, since the electricity tariffs were also benchmarked with inflation, when the international price dropped massively, the government raised the level of taxes on petroleum products limiting the drop in local fuel prices due to which neither the cost of production and nor inflation eased off much which also kept the electricity tariffs sturdy at the higher side.

At the time of privatization, it was offered a lucrative Multiyear tariff formula to revive the company from losses. This formula imparted a certain level of assurance to the investor that the revenue accrual from the approved/allowed tariff will not be curtailed by a downward adjustment of tariff till his financial losses in the initial years are recovered along with a reasonable return. This tariff mechanism also included a claw-back clause which allowed certain percentage of surplus return to be shared with the consumers when the 'annual rate of return on the regulatory asset base' (ROA) exceeds the prescribed limits. So far, over PKR 17bn are reported to have been accumulated under claw-back formula but the relief was never passed on to the consumers as KE had taken a stay order from the court against it.

Although, the entity brought in a lot of technological upgrade, improved service quality, and operational efficiencies; a seemingly endless list of consumer complaints continued to persist which sometimes even turned into mass street protests. It was observed that many complaints could have been easily avoided if all the information and standardized policies were made public transparently accompanied by prompt and fair redress of complaints.

As per the report of World Bank's (WB) on Doing Business 2018, Pakistan ranked very poorly at 167 out of 190 in getting electricity revealing inferior performance of KE. The price of electricity stood at 18.8 Cents/Kwh which is among the highest in the region with exorbitant cost of new connection and very high number of time delays. This poor rank of getting electricity pulled back the overall rank of Pakistan in doing business which kept investors at bay and created challenges for the economy.

Therefore, the situation is calling for the law makers and regulatory authorities to revisit the existing laws, rules and regulations and make them more stringent, impose hefty penalties on the Disco in case of violations and even imprisonment of officials involved in wrongdoings to deter the utility company from indulging in malpractices and to rebuild consumer confidence. It will be more appropriate to strengthen control on all the services of the Discos, rationalize all the costs for the consumers, devise a mechanism of reliable third party verification, testing and certifications, and regulate unnecessary time lags and overbilling issues.

In September 2015, Nepra notified the 'NEPRA (Alternative & Renewable Energy) Distributed Generation and Net Metering Regulations 2015'. K-Electric could not operationalize the net-metering facility in Karachi despite a lapse of more than two years whereas other Discos successfully initiated this project a year ago. Though, in the recent MYT decision, upon the request of Govt. of Sindh, Nepra directed KE to ensure net metering arrangement for the consumers. It is yet to be seen as to when it will actually be rolled out for consumers of Karachi in the absence of any announced deadline.

Net-metering is a very lucrative business proposition with an approximate payback period of 2 years which should be made available to the consumers of Karachi. The agreement between net metering customer and the Disco is for a term of 3 years as per the existing law. It is emphasized that this period should be enhanced to at least 10 years with an additional clause stipulating that the Disco will issue a new agreement after the end of a term, if no relevant objections are observed, to encourage investors to take it up as business with better security of investment. However, even in the absence of net-metering option, solar power generation is still a viable option for reducing electricity bill on personal consumption.

There is now need to shift from monopoly to competition for which Pakistan is yet to allow multiple private electricity transmission and distribution companies to operate targeting the same consumers through infrastructure sharing. There are indeed challenges but these should be handled through all-encompassing reforms on war-footing to promote investments which have become very critical for economic prosperity as balance of payments situation of the country is not very promising while China Pakistan Economic Corridor (CPEC) is opening up new opportunities for investment which the country cannot afford to miss.

# TABLE OF CONTENTS

<b>Executive Summary .....</b>	<b>ii</b>
<b>Summing up KESC to K-Electric .....</b>	<b>1</b>
<b>Multiyear Tariff and Tariff Adjustment paradox .....</b>	<b>4</b>
Benefit of claw-back formula for consumers .....	5
<b>Consumer complaints - an unending tale .....</b>	<b>9</b>
<b>Doing Business ranks worse on ‘Getting Electricity’ .....</b>	<b>13</b>
<b>Net Metering – applicability restrained .....</b>	<b>14</b>
Solar power generation as an investment proposition .....	15
<b>Monopoly to competition shift desired.....</b>	<b>18</b>
<b>Efficient and low cost power supply critical for prosperity .....</b>	<b>18</b>
<b>ANNEXURES: K-Electric Financials .....</b>	<b>19</b>



## KARACHI ELECTRICITY SUPPLY- An attempt to unravel the wires

Karachi is known as ‘the city of lights’ for its buoyant lifestyle which keeps it active till late night with well-lighted streets, markets and other public places. To meet the electricity requirement of this vibrant mega city, K-Electric is the sole Transmission and Distribution Company (Disco) having complete monopoly in the city which has its own pros and cons.

When we compare the service quality of K-Electric (KE) as a privatized entity with that of the government owned Karachi Electric Supply Corporation (KESC), there is marked improvement in all respects. Even though, NEPRA (National Electric Power Regulatory Authority) does regulate the utility companies to a certain extent, there are frequent hues and cries relating to issues like over billing, non-provision of services, costly electricity, load shedding, network quality issues and kunda system (theft) etc. This report attempts to gain clarity on electricity issues in Karachi and recommends ways to improve the electricity situation in the city.

### Summing up KESC to K-Electric

Government took the initiative to privatize the KESC in 2005 as the state-run entity was running in heavy losses and had pathetic service quality which was causing severe distress in consumers.

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The Karachi Electric Supply Corporation was formed in September 1913 with a generation capacity of 2.5MW. After many decades of evolution and being run by the public sector, the company was first privatized in 2005 and managed by Al-Jomaih Group and Siemens for three years. In 2008, UAE-based Abraaj Group acquired a controlling stake (71%) in KES Power Limited (the holding company of K-Electric), beginning a turnaround which has thus far seen investments of over \$ 1.4Bn.

K-Electric now has 2.5 million customers in Karachi and adjoining areas and supplies 2,900-3,000MW where the consumer demand varies between 2,800 and 3,200MW. The demand has considerably outrun the KE’s generation capacity which used to be much below in 1990s. The number of consumers have doubled in 20 years while the company managed to bring down the T&D losses over the period.

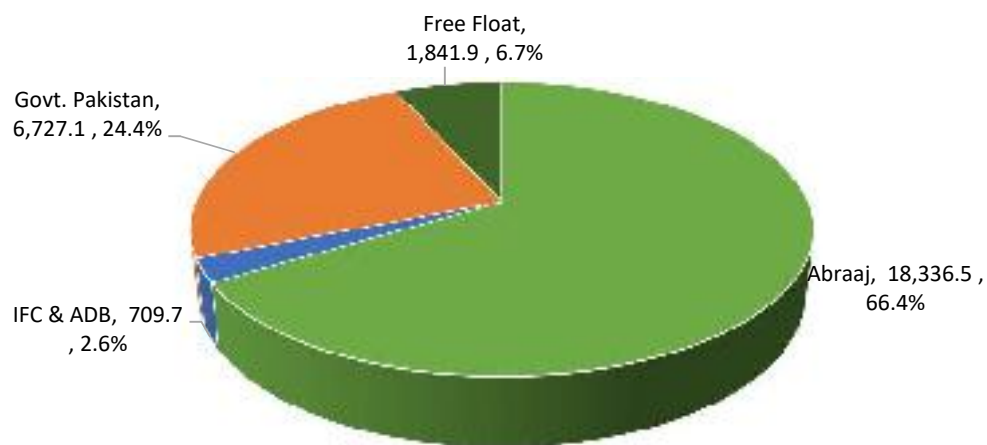
## KARACHI ELECTRICITY SUPPLY – An attempt to unravel the wires

KE's historical Performance of Electricity Supply							
Particulars	Units	1995-96	2000-01	2005-06	2010-11	2015-16	Growth
		Pre-Privatization	Al-Jomaih	Abraaj Group Era	1996-2016		
Revenue from Energy	PKR Mn	15,968	28,118	41,422	130,722	189,629	1088%
KESC Installed (own)	MW	1,738	1,756	1,756	2,026	2,267	30%
KESC Effective	MW	1,553	1,400*	1,324	1,584	1,855	19%
Karachi peak demand	MW	1,445	1,885	2,223	2,565	3,195	121%
KESC Generation	GWH	8,067	7,989	9,130	7,826	10,323	28%
KESC Power Purchase	GWH	1,329	3,688	5,370	7,605	6,981	425%
Units Billed	GWH	6,021	6,924	9,060	10,059	12,865	114%
KESC Consumers	Mn	1.3	1.7	2.0	2.1	2.5	96%
T&D Losses	%	31.2	36.8	34.4	32.2	22.2	-29%
Approx. Average Tariffs	PKR/kwh	2.7	4.0	6.5	11.5	15.6	478%

*\*Rough Estimate* *Source: KCCI Research; KE, NEPRA*

In October 2017, China's Shanghai Electric Power signed a deal with Abraaj Group to acquire a majority stake (18.335Bn shares or 66.4% stake) in K-Electric for \$1.77 Bn. Shanghai Electric had also shown intent of investing more than \$9 billion over a period of 10 years<sup>1</sup>. However, after the much lower than expected tariff notified by Nepra under the recent multi-year tariff decision, the deal is facing uncertainty.

### Shareholding Pattern of K-Electric (Shares in Mn)



<sup>1</sup> <https://www.brecorder.com/2017/08/10/364278/record-profits-at-k-electric/>

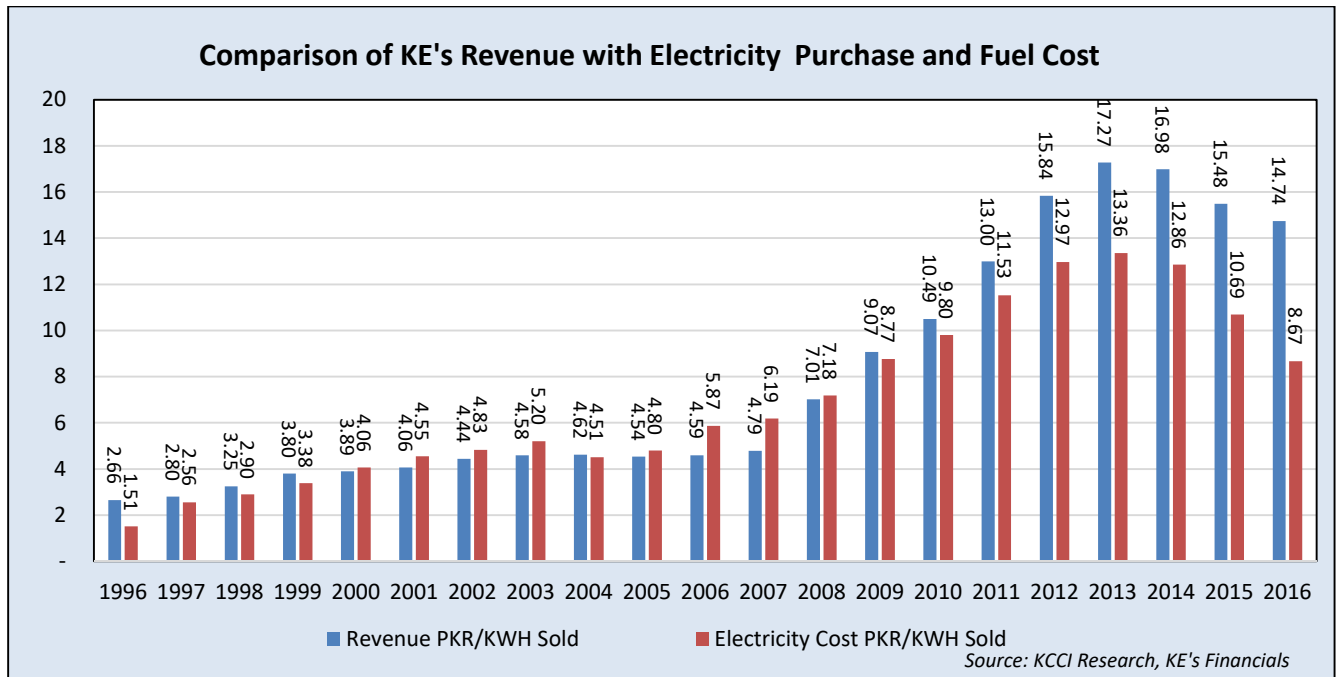
### Financial performance of K-Electric

In FY12, K-Electric recorded a net positive income for the first time in 17 years and since then has continued to generate positive financial metrics on a year on year basis and demonstrated sustained growth.

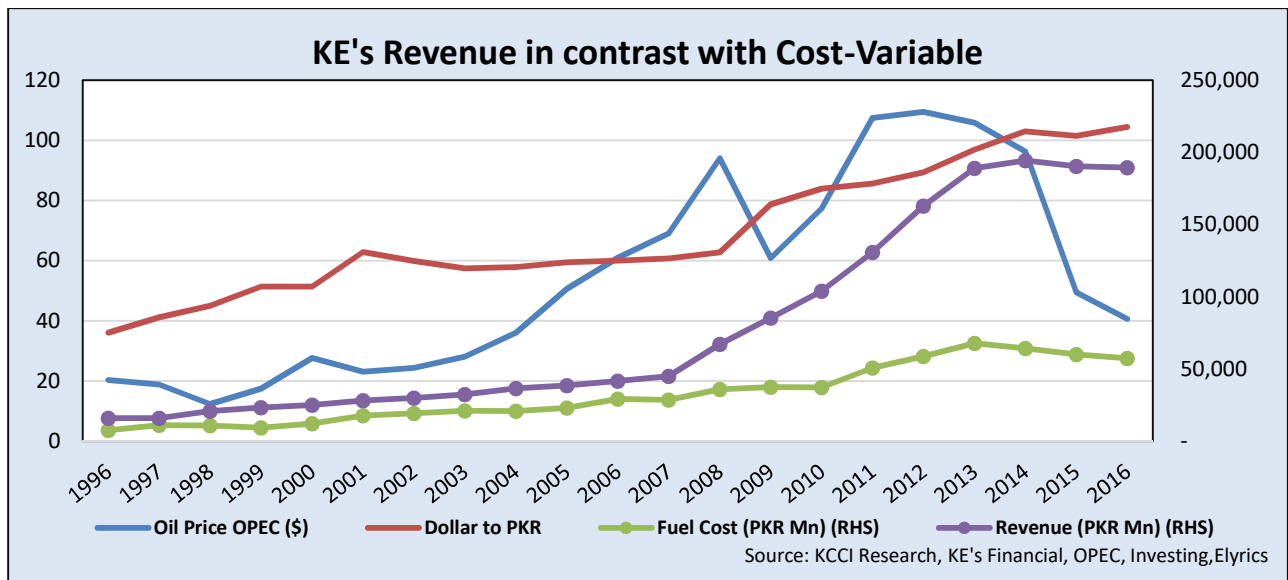
Turnaround of Karachi Electric from loss making to a profit making is a major achievement attributed to Abraaj Group Management of KE. In FY12, K-Electric recorded a net positive income for the first time in 17 years and since then it has continued to generate positive financial metrics on a year on year basis and demonstrated sustained growth in profitability. It posted profit after tax of PKR 2.6Bn depicting a yearly increase of 127.9% in FY12 which surged massively by 1162% to PKR 32.8Bn by FY16 where its net margin jumped to 17.3% from mere 1.6% in FY12.

It is interesting to note that K-Electric received benefit of PKR 6.9Bn in FY16 which was PKR 13.3Bn in FY15 arising from huge tax reversals after netting off all taxes payable which contributed to further boost its bottom line.

In the post 2008 era, the revenue witnessed a steeper growth relative to units sold, electricity purchase cost or cost of fuel and oil. It is evident from the fact that the revenue per kwh sold increased from PKR 4.6 in FY04 to PKR 17.27 in FY13 increasing by 265% while the gross margin also continued to widen even afterwards (Please see the graph below).



The graph below shows the rising trend of the revenues of KE even when the international crude oil were nose-diving, while Pak Rupee and CPI inflation were relatively stable.



The reason for this anomaly was a very complex Multiyear Tariff (MYT) formula which somewhat guarantees growth in profitability for the Discos. Despite all the intricacies, we made an attempt to decipher the MYT to the best of our understanding and analyze its impact on the financials of the company and billing of the consumers.

### Multiyear Tariff and Tariff Adjustment paradox

The MYT formula also provided for a claw-back mechanism whereby profits above a pre-determined rate of return had to be shared with the customers by way of reduction in tariff.

**MYT 2003-2009:** The MYT tariff formula was initially introduced in NEPRA's decision of September 2002 which was an Automatic Tariff Adjustment (ATA) Formula based on Consumer Price Index minus an efficiency factor (CPI-X) indexation for adjusting tariff components other than fuel and purchased power costs. The MYT formula also provided for a claw-back mechanism whereby profits above a pre-determined rate of return had to be shared with the customers by way of reduction in tariff.

The purpose of the MYT was to impart a certain level of assurance to the investor that the revenue accrual from the approved/allowed tariff will not be curtailed by a downward adjustment of tariff till his financial losses in the initial



years are recovered along with a reasonable return over the period prior to the next review.

The consumer end tariff was determined by the formula:  $Go + Po + To + Do$  where Go or 'generation owned by KE' included (a) Fuel Cost adjusted to compensate for change in fuel cost due to variation in fuel price and (b) CPI adjusted Operation and Maintenance (O&M) cost; while Transmission (To) and Distribution (Do) Expenses were also adjusted for CPI – X factor; Po is Power Purchase cost;. The X factor was taken at lower of X factor percent or 30% of change in CPI.

The following formula was applied for tariff determination as notified by NEPRA where the O&M component of each segment of tariff had to be varied to the extent of the year on year change in CPI.

Tariff Determination with application of CPI-X										
Tariff Component	Symbol	Avg. Sale Rate Base Year (Paisa/kwh)	O&M Component (Paisa/kwh)	X factor applicable to O&M Component						
				X1*	X2	X3	X4	X5	X6	X7...
Generation Owned	Go	243	10	0	0	0	2	2	2	2
Power Purchase	Po	148								
Transmission	To	30	4	0	0	0	2	2	2	2
Distribution	Do	53	32	0	0	0	3	3	3	3
<b>Consumer Avg. Tariff</b>	<b>Paisa/kwh</b>	<b>474</b>	<b>46</b>							

\*X factor applicable percentage Source: KCCI Research, NEPRA

The fuel cost adjustment due to fuel price variation was calculated by applying the new fuel price on actual basis to the units generated in the past quarter and the latest price of the last quarter applied to the expected units generated in the future three quarters where the maximum variation in fuel was capped at 2.5%.

### Benefit of claw-back formula for consumers

The possible but only slight respite available to consumers was in the form of the claw-back clause which allowed that the surplus return would be shared with the consumers when the 'annual rate of return on the regulatory asset base' (ROA) exceeds the prescribed limits which were as follows:

- i. When pretax ROA exceeds 12% but less than 15%; 25% of the profit value in excess of 12% ROA will be transferred to the consumers.

The maximum variation in fuel was capped at 2.5%.

- ii. When pretax ROA exceeds 15% but less than 18%; in addition to (i) above, 50% of the profit value in excess of 18% ROA will be transferred to the consumers.
- iii. When pretax ROA exceeds 18%; in addition to (i) and (ii) above, 75% of the profit value in excess of 18% ROA will be transferred to the consumers.

### **MYT 2010-2016:**

The Multiyear tariff continued for another 7 years with little changes in the formula. The claw-back mechanism remained intact under which over PKR 17bn were reported to have been accumulated but the relief was not passed on to the consumers as KE took a stay order from the court in this regard.<sup>2</sup>

The decline in electricity tariffs was 28% from first quarter of 2013 till the end of 2015 as against international crude oil prices which nose-dived by 71.35%.

The quarterly tariff adjustments after rising steeply reflected a decline in the second quarter of 2013 when the international commodity prices plummeted leading to low inflation figures. However the decline in electricity tariffs of 28% from first quarter of 2013 till the end of 2015 was very less when compared to the international crude oil (OPEC basket) prices which had nose-dived from an average of \$109.15/bbl on Jan 03, 2013 to \$ 31.27/bbl by the end of December 2015 depicting a drop of 71.35%.

This phenomena was the result of the multi-year tariff formula under which the maximum variation in fuel cost was capped at 2.5% which explains one of the reason of steep rise in profit margins of KE.

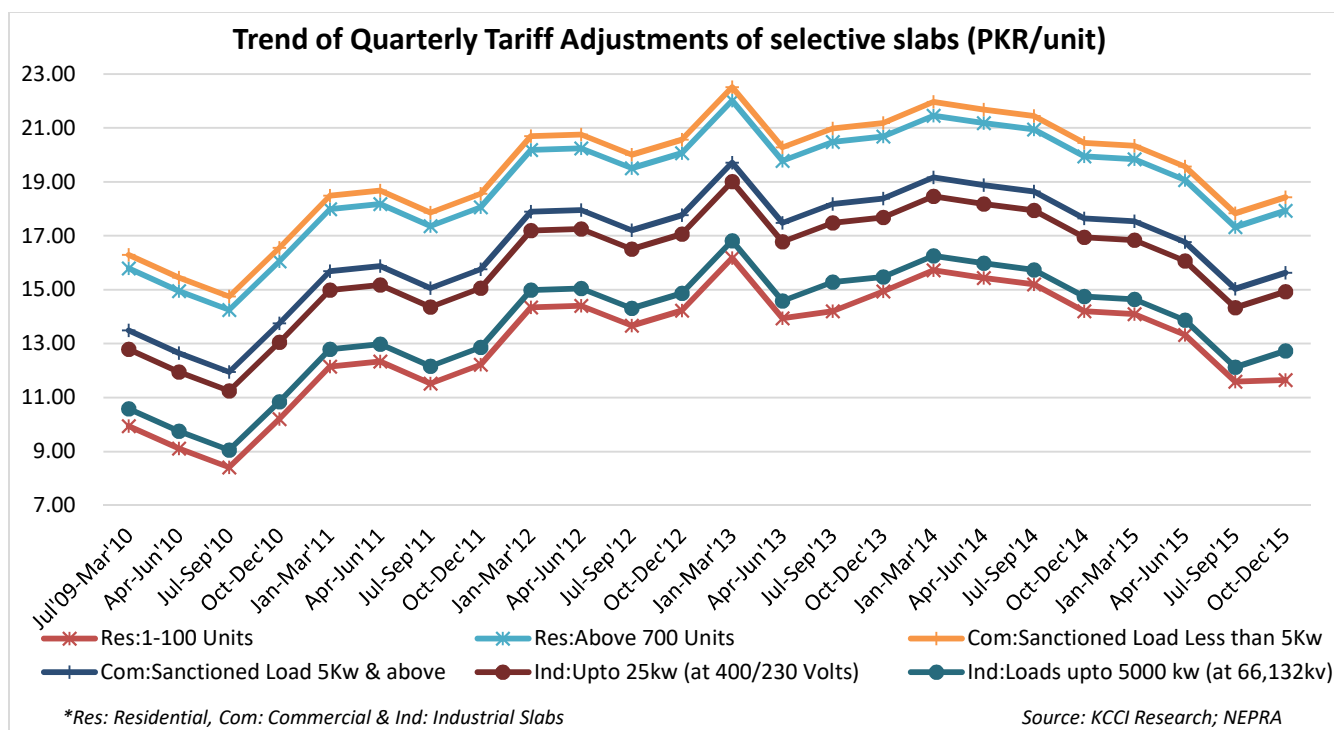
Moreover, since the overall electricity prices were benchmarked with CPI, when the international price dropped massively, the government raised the level of taxes on petroleum products limiting the drop in local fuel prices due to which neither the cost of production and nor the inflation eased off in tandem while kept the electricity tariffs at the higher side. Consequently, the consumers not only bore the additional burden of higher taxes on fuel to govt. but also paid relatively more on electricity tariff to Discos.

On the other hand, as the cost of production did not come down in line with the global trend, the local industrial production became uncompetitive in the world market which led to the decline in exports of Pakistan, a surge in imports and increased the economic challenges for policy makers to manage the current account and fiscal position.

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<sup>2</sup> <https://fp.brecorder.com/2017/01/20170117124522/>

## KARACHI ELECTRICITY SUPPLY – An attempt to unravel the wires



**MYT 2017-2023:** On October 09, 2017, Nepra notified the decision on new MYT for KE for another 7 years with some amendments. The average applicable tariff was kept at PKR 12.77/kwh.

KE Tariff w.e.f. July 01, 2016				
Tariff Components	Remarks	PKR/Kwh	Remarks	PKR/Kwh
Generation	at Bus Bar	7.6974	At Units Sold basis	9.7312
Transmission	At Transmission sent outs	0.4827	At Units Sold basis	0.6023
Distribution	At Units sold	1.378	At Units Sold basis	1.3780
Base Rate Adjustment Component			At Units Sold basis	1.0590
<b>Tariff applicable w.e.f. July 01, 2016</b>				<b>12.7706</b>

Source: KCCI Research; NEPRA

In the new decision of MYT, the Claw Back mechanism was revised based on the predetermined returns (WACC: 13.83%) on assets which would allow K-Electric to hold back more profit in the initial years.

Profit Sharing with consumers under revised Claw Back formula							
	1st Year	2nd Year	3rd Year	4th Year	5th Year	6th Year	7th Year
EBIT/RAB*	23.00%	18.62%	13.07%	10.97%	10.84%	10.82%	11.3%
Sharing 25%	23%-26%	18.62%-21.62%	13.07%-16.07%	10.97%-13.97%	10.84%-13.84%	10.82%-13.82%	11.3%-14.3%
Sharing 50%	>26%-29%	>21.62%-24.62%	>16.07%-19.07%	>13.97%-16.97%	>13.84%-16.84%	>13.82%-16.82%	>14.3%-17.3%
Sharing 75%	>29%	Over 24.62%	>19.07%	>16.97%	>16.84%	>16.82%	>17.3%

\*EBIT: Earnings Before Interest & Taxes; RAB: Average Regulatory Asset Base;

Source: KCCI Research; NEPRA

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It also apparently means that, in case, the entity is sold to the prospective buyer like Shanghai Electric, the new buyer will reap lesser benefits and the new company will have to increase its asset base through higher investments in order to retain the profits to itself. The comparison of the tariffs under MYT in the table below depicts a rising trend under different slabs.

Schedule of Electricity Tariff of K-Electric under Multi-Year Tariff Decisions									
S. No.	Tariff Category / Particulars	Fixed (PKR/kw/M)			MYT Variable Charges PKR/kwh				
		FY03-10	FY11-16	FY17-23	FY03-10	FY11-16	FY17-23		
<b>A-1 GENERAL SUPPLY TARIFF – RESIDENTIAL</b>									
<b>a.</b>	For Sanctioned Load Less than 5Kw								
<b>i</b>	Up to 50 Units	-	-	-	1.40		2.00		4.00
	For Consumption exceeding 50 Units								
<b>ii</b>	1-100 Units	-	-	-	2.49		7.00		10.10
<b>iii</b>	101-200 Units	-	-	-	3.39		9.00		11.35
<b>iv</b>	201-300 Units *Prev. 101-300 Units slab	-	-	-	3.39		9.00		12.10
<b>v</b>	301-700 Units	-	-	-	5.67		11.00		13.10
<b>vi</b>	Above 700 Units	-	-	-	5.67		13.00		14.45
	Above 1000 units *Slab removed later	-	-	-	6.91				
<b>b.</b>	For Sanctioned load 5 Kw and above								
<b>c.</b>	Time of Use					14.00	8.00	14.45	12.60
<b>A-2 GENERAL SUPPLY TARIFF - COMMERCIAL</b>									
<b>a.</b>	For Sanctioned Load < 5Kw *pre. first 100 units	-	-	-	7.10		13.50		12.40
<b>b.</b>	For Sanctioned Load 5Kw & above *pre. > 100	-	400	400	7.46		10.70		12.60
						Peak	Off-P	Peak	Off-P
<b>c.</b>	Time of Use	-	400	400		15.00	11.30	14.45	11.30
<b>B INDUSTRIAL SUPPLY TARIFFS</b>									
<b>B1 (a)</b>	Upto 25kw (at 400/230 Volts)	300	-	-			10.00		12.45
<b>B2 (a)</b>	25-500kw (at 400 Volts) *Pre. 41-500kw	300	400	400	3.93		8.60		10.70
<b>B3 (a)</b>	For all loads upto 5000 kw (at 11,33kv)	290	380	380	3.76		8.20		10.20
<b>B4 (a)</b>	For all loads upto 5000 kw (at 66,132kv)	280	360	360	3.52		7.80		9.40
<b>c.</b>	Time of Use					Peak	Off-P	Peak	Off-P
<b>B1 (b)</b>	Upto 25kw (at 400/230 Volts)	300	-	-	5.24	14.00	7.75	14.45	10.20
<b>B2 (b)</b>	25-500kw (at 400 Volts)	300	400	400	5.24	14.00	7.75	14.45	10.30
<b>B3 (b)</b>	For all loads upto 5000 kw (at 11,33kv)	290	380	380	4.76	13.50	7.25	14.45	9.35
<b>B4 (b)</b>	For all loads upto 5000 kw (at 66,132kv)	280	360	360	4.56	13.00	7.00	14.45	8.65
<b>B5</b>	For All loads (at 220 kv & above)	273	340	340	4.51	12.50	6.75	14.45	8.00
<b>D AGRICULTURE TARIFF</b>									
<b>D1</b>	For all loads	72	200	200	3.45		6.50		10.50
<b>c</b>	Time of Use					Peak	Off-P	Peak	Off-P
<b>D2</b>	For all loads	176	200	200	2.61	12.50	4.50	14.45	9.35
*Pre: previously					Source: KCCI Research; NEPRA				

Interest will be paid to consumers on their security deposits.

The decision of MYT FY17-23 brought in some respite for the consumers of KE which are summarized as under:

- ✓ Discontinue charging bill collection charges separately from the consumers in future.
- ✓ Pay interest on security deposits to consumers through their bills.
- ✓ Stop charging meter rent from consumers who have paid their cost of meter.
- ✓ Apply weighted average method for calculating monthly fuel adjustments.
- ✓ Develop a plan on competitive market regime in two years.
- ✓ Minimize total cost of generation by building online dispatch, control and monitoring center to determine the most efficient, low cost and reliable operation of power system.
- ✓ Make available ToU metering to consumers with sanctioned load of 5kW and above.
- ✓ Provide mobile testing labs having exactly calibrated equipment at door step of the affected consumer to check the accuracy of meter in case of doubt.
- ✓ Refrain from disconnecting supply of consumers due to under-utilization of their sanctioned load till the finalization of the review.

A plan of competitive market regime will be developed in two years.

The impact of these changes on consumers and how transparently it would be implemented are yet to be seen. It is still not clear how will the interest on security deposit be paid to consumers; whether a competitive market regime will indeed be a good news for consumers after a long wait of two years or it will be a beginning of a new era of perplexity.

### Consumer complaints - an unending tale

As a general perception, more efficiency, professionalism and transparency is expected from a privatized, listed and foreign held entity. Ten years' span is a decent time to completely transform a company after privatization on the generally accepted international best practices and corporate governance standards.

However, while surveying the issues faced by the consumers, there was a long list of complaints which could have been easily avoided if complete details of policies, procedures, applicable and minimum acceptable standards, explicit time durations of provision of services, verifiable costs of equipment and comparable rate sheets, applicable rates and pricing procedures, third party



Developing the consumer trust is critical for the success of any utility company.

meter and equipment certifications were available in black and white on the website. There should also be available explicitly written policies in case of any common or unavoidable discrepancies at the consumer-end to ensure absolute transparency accompanied by prompt and fair redress of complaints by the entity as well as more stringent control of the authority.

There should have been negligible discretion of inspectors and other company officials to do away any doubts of over-billing, unaccounted payments or unnecessary delays to pressurize consumer to pay extra as bribes or make them pay a higher cost of any equipment.

Though there is significant improvement in many areas, there is still a wide scope of making the policies more transparent, fair and justifiable, incorporating all possible scenarios with full disclosures based on past experiences so that the entity does not get blamed for any misappropriation or injustice by the consumers as developing the consumer trust is critical for the success of any utility company. The consumers don't consider KE as a reliable source of electricity due to which almost 95% of the offices, factories and homes keep diesel / petrol generators as an alternate backup for electricity.

Following are some examples of complaints which were brought to light during a survey of the consumers.

- In case of under construction house, if the applicant seeks legal temporary connection, he is made to pay roughly estimated variable charges at a high rate without any meter installed for the purpose. It normally exceeds PKR 4,000 per month along with an undertaking that he will only be using a bulb and a motor.
- Before a formal connection, even if the entire construction is done through a personal generator and no temporary connection from KE is taken, the consumer is made liable to pay an unexplained hefty amount as construction dues under the implied assumption that the consumer might had taken access to electricity on illegal connection.
- Unnecessary delays in regularizing connections even after the completion of all formalities in a bid to continue sending ad hoc inflated bills where KE had initially allowed temporary connections.
- Consumers are made to pay a higher cost of the equipment like electric cables which are available at a comparatively much cheaper rate in the retail market but the consumer are not allowed to procure it from anyone other than K-Electric itself, not even from the same equipment

supplier and exactly matching the specifications and brand to rationalize the costs.

- There is no rate sheet or specifications made publicly available on website by the KE for the needed equipment which has to be purchased on whatever rate it is billed to consumer which is believed to be too much overpriced than the market.
- The overall cost assigned to the consumers is estimated by the surveyor individually on pure discretion basis which cannot be challenged or verified in any way.
- K-Electric demands security deposit which is said to be charged at PKR 1,220 per KW depending upon the sanctioned load which is believed to be always significantly overstated to maximum possible. Although the security deposit is refundable, these services are generally never discontinued and the company utilizes this amount for its own use and can also earn interest over it indefinitely.
- Consumers are sometimes overbilled without giving any reason and their complaints remain unaddressed at the KE. If the consumer approaches Nepra, the Court or the Ombudsman, KE elaborates that either the meter was tampered like with chemical or the consumer was involved in electricity theft after which proper investigations are initiated. In most cases, the genuine complainant manages to get the decision in his favor after a long strenuous struggle but this practice of unexplained billing by KE continues unrestrained.
- There are accusations that KE delays meter readings which increases the billing slab for the month and the consumer is charged a higher tariff which can be avoided by taking the meter readings on the same date each month.
- Even in areas where there is near 100% recovery, consumers face frequent electricity breakdowns which lasts 10 to 15 minutes only, sometimes accompanied by voltage fluctuations which severely damage household electronic items and cost the consumers heavily.

'The Regulation of Generation, Transmission and Distribution of Electric Power (Amendment) Bill 2017 includes punishment of imprisonment up to 3 years for those distribution companies' employees who are involved in overbilling and wrong billing.

There is seemingly endless list of consumer complaints which have become the talk of the town. Numerous cases are enlisted/decided in Nepra, Sindh High Court and the Ombudsman against the entity while many did not have the stamina, knowledge or time or the amount was too low to make economic sense for them to take the pain of fighting a case. Frequently, the agitated consumers even take to the streets to protest against the utility.

Under such a situation there is an emergent need for the law makers and regulatory authorities to revisit the current laws, rules and regulations and make them more stringent, impose hefty penalties on the Disco in case of violations and even imprisonment of officials involved in wrongdoings to deter the utility company from indulging in malpractices and to rebuild consumer confidence.

In realization of the gravity of issue, National Assembly Standing Committee approved 'The Regulation of Generation, Transmission and Distribution of Electric Power (Amendment) Bill 2017 in October 2017 which was related to the severe punishment of imprisonment up to 3 years for those distribution companies' employees who are involved in overbilling and wrong billing. Though, it bodes well for the consumers, there is still a lot more to be done.

For instance, Nepra has issued the consumer service manual to elaborate the rules related to getting new connections but they are very general. It states that the Disco should state information regarding new connection on its website, it does not elaborate much on the extent of the information that should be made available particularly the pricing and specification of required equipment, service charges and requisite standards and certifications and ways to get them.

Likewise it allows the consumer to procure the specified meter on his own if it is not available with the Disco, however, it does not mention whether he could exercise this right in case the Disco is overcharging for the meter and associated equipment or unnecessarily delaying the installation or he has doubts on the quality or efficiency of the meters provided by the utility. Since meters are calibrated by KE at its own lab, it lacks transparency and creates doubts for the consumers. Meters should be calibrated at an accredited 3rd party lab, e.g. SGS, TUV-NORD etc.

'There is need to rationalize all the costs for the consumers, devise a mechanism of reliable third party verification, testing and certifications, regulate unnecessary time lags.

If Nepra can take the pain of implementing such a complex multiyear tariff for the consumers, it will be more appropriate to further extend its control on other related services of the Discos, rationalize all the costs for the consumers, devise a mechanism of reliable third party verification, testing and certifications, regulate unnecessary time lags and revisit all the related rules and policies to ensure more stringent control of the authority over the Discos.

It has become even more critical as the country is now being linked to One-Link-One-Road project through China Pakistan Economic Corridor (CPEC) wherein investments will play a central role in the economic framework. For

this purpose, it is inevitable that the cost of doing business is rationalized along with infusing efficiency.

As per WB report on doing business, Pakistan ranks very poorly at 167 out of 190 in getting electricity, with price of electricity at 18.8 Cents/Kwh which is among the highest in the region.

### Doing Business ranks worse on ‘Getting Electricity’

World Bank (WB) has released its report on ‘Doing Business 2018’ in which Pakistan secured a very poor rank of 147 out of 190. Getting electricity is a very important variable of World Bank’s (WB) rankings on Doing Business’ which has direct impact on the country’s overall ranking of doing business. It is in the national interest to improve the performance of K-Electric, which becomes the basis of these rankings, especially when the country is struggling to improve investments and exports.

As per WB report, Pakistan ranks very poorly at 167 in getting electricity, with price of electricity at 18.8 Cents/Kwh which is among the highest in the region. KE not only has exorbitant cost of new connection; the price of electricity and the time delay are also way too high in the region (*Please see the table below*).

Comparison of K-Electric (KE) with regional economies in WB Getting Electricity Rankings								
	KE (Pak)	UAE	Malaysia	India	China	Indonesia	Singapore	Thailand
Country Rank	<b>147</b>	21	24	100	78	72	2	26
Getting Electricity Rank	<b>167</b>	1	8	29	98	38	12	13
Price of Electricity (Cents/Kwh)	<b>18.8</b>	12.3	12.9	20.3	12.7	11.1	10	13.5
Procedures (Number)	<b>5</b>	2	4	5	5	4	4	4
Time (days)	<b>215</b>	10	31	47	145	34	30	32
Cost (% of income per capita)	<b>1,665.5</b>	25.2	28	18.7	355.8	276.1	25.3	63.1
Reliability of supply & transparency of tariff index (0-8)	<b>0</b>	8	8	7	6	5	7	7

*Source: KCCI Research, WB Doing Business 2018*

When we compare KE’s performance with that of UAE (as we know KE is being managed by UAE based Abraaj Group), there is simply no match in costs and performance. It appears that KE is just a source of minting money and fleecing the consumers with extremely exorbitant costs topped up with extraordinary time delays (*Please see the table below*). Under such a situation, it would be quite difficult to turn the economy on the path of prosperity with thriving industries, growing exports and booming investments.

## KARACHI ELECTRICITY SUPPLY – An attempt to unravel the wires

Comparison of Cost & Time KE (3-phase, 4-wire Y connection of 140-kVA) with India & UAE								
K-Electric			Mumbai (India)			UAE (Dubai)		
Procedures	Days*	Costs (PKR)	Procedures	Days*	Costs (INR)	Procedures	Days*	Costs (AED)
Submit application to K-Electric Ltd. and await site inspection	30	200	Submit application to utility and await site inspection	7	75	Submit application to DEWA** and obtain external works	8	-
Obtain site inspection by K-Electric Ltd. and await estimate	21	-	External works of meter board conducted by customer's electrical contractor	7	8,000	Apply & receive internal wiring inspection & obtain meter installation & final connection	2	35,000
Obtain wiring inspection	14	10,000	Receive external site inspection by Reliance Power & await estimate	8	-			
Pay estimate to KE, & submit the internal wiring test report & the delivery orders of the material	30	2,701,422	Submit electrical contractor's wiring and test report and make payment of connection cost estimate to utility	1	12,000			
Await external works, meter installation & electricity flow.	120	-	Pay security deposit and receive external connection and electricity flow	30	1,121			

\*Completion in Calendar Days; \*\*DEWA= Dubai Electricity and Water Authority; *Source: KCCI Research, WB Doing Business 2018*

### Net Metering – applicability restrained

In September 2015, Nepra notified the 'NEPRA (Alternative & Renewable Energy) Distributed Generation & Net Metering Regulations 2015'.

In September 2015, Nepra notified the 'NEPRA (Alternative & Renewable Energy) Distributed Generation and Net Metering Regulations 2015'. It was a much needed move in the right direction. This step was taken to generate more electricity through an environment friendly mode, reducing the country's overall electricity shortfall and also to create an avenue to consumers to make money by undertaking it as a business, thus a win-win situation for all.

It was in the national interest to launch it as the electricity so produced will not entail any debt borrowing which burdens the economy of the country nor does it require government guarantees with hefty returns like in case of IPPs. Unlike coal and thermal power plants, solar power generation also does not add pollution or contribute to global warming which has become a serious national and international concern endangering human health and leading to increased floods and natural calamities.

Right after promulgation of the Net-Metering regulations, this concept was quickly adopted across the country where as many as 176 licenses were issued to consumers who had applied for the net metering licenses within a year or so. 74 licenses were awarded in Lahore, 74 in Islamabad, 13 in Multan, 4 in Gujrat, 4 in Faisalabad and further 7 licenses were awarded to consumers in



176 licenses of Net-Metering have been issued to consumers in other cities but this facility has not been launched in Karachi.

The agreement between net metering customer and Disco should be enhanced from 3 years to at least 10 years with an additional clause that the Disco will issue a new agreement after the end of a term, if no relevant objections are observed.

Bahria Town. Unfortunately, the consumers of Karachi remained deprived due to reluctance of K-Electric to launch this facility.

It is difficult to assimilate that despite apparently being technically, financially, administratively and management-wise more sound than other government owned Discos, K-Electric could not operationalize the net-metering facility in Karachi despite a lapse of more than two years whereas Lahore (LESCO), Islamabad (IESCO), Multan (MEPCO), Gujranwala (GEPCO) and Faisalabad (FESCO) Discos successfully initiated this project a year ago.

Even NEPRA which boasts of safeguarding consumer rights remained totally helpless in forcing the entity to initiate this facility despite having all the might and authority. Though, in the recent MYT decision, upon the request of Govt. of Sindh, Nepra directed KE to ensure net metering arrangement for the consumers. It is yet to be seen as to when it will actually be rolled out for consumers of Karachi in the absence of any announced deadline or will continue to linger on indefinitely.

### **Solar power generation as an investment proposition**

However, even without net-metering, solar power generation can still be considered as a viable option for saving money by reducing monthly electricity bill. A consumer can shift his entire or partial electricity load on solar generation system either with battery backups or directly utilize solar power to run their electrical appliances during the day time without installing batteries as they are expensive and have a shorter life (~2 years) which nullifies a portion of the benefit due to high recurring cost.

Once the net-metering facility is rolled out in Karachi, hopefully soon, an individual or entity will be able to opt for net-metering for the purpose of saving as well as investment.

In case of net-metering, any domestic, commercial or industrial consumer having 3 phase 400V or 11kV connection is permitted to submit an application to interconnect its own solar or wind power generation facility of up to 1MW with the distribution network of the Discos like K-Electric after obtaining a license from NEPRA to operate as a 'distributed generator'.

The agreement between net metering customer and the Disco is for a term of 3 years under the current law. However, it is emphasized that this period should be enhanced to at least 10 years with an additional clause stipulating that 'the Disco will issue a new agreement after the end of a term, if no

The State Bank of Pakistan also provides refinance to local banks who offer loans at the reduced rate of 6% to net metering customers for up to 12 years.

relevant objections are observed’ to encourage investors to take it up as business with better security of investment.<sup>3</sup>

To execute net-metering, the Disco is required either to stall a single meter with the capability of recording two way electricity or two separate meters one for selling the electricity to the consumer and other for purchasing electricity from the same consumer who is a licensed distributed generator. The rate at which the Disco has to buy the electricity from the consumer is determined at the consumer’s latest applicable off-peak rate as determined by Nepra.

The State Bank of Pakistan also provides refinance to local banks who offer loans at the reduced rate of 6% to net metering customers for up to 12 years with installations of 4-1,000kW as per IH&SMEFD Circular No. 03 of 2016 from June 20th, 2016.<sup>4</sup>

A sample plan of costs and equipment is presented in the table below to apprise readers who may be interested in setting up net metering business.

Net-Metering 5Kva Solar System (For sale on grid without battery backup)		
Particulars	Description	Rate
Solar Panel Cost (PKR)	4800 Watt (16 x 300W@PKR 13,000) from poly crystalline 20-25 years life	208,000
Hybrid Inverter Cost (5KVA) (PKR)	5Kva Homage solar inverter	63,000
Installation, Licensing & Misc. costs	Variable (PKR)	50,000
Solar panel stand / frame	Variable @ PKR 3000-5000	48,000
<b>Estimated Total Cost (PKR)</b>		<b>369,000</b>
KE net-metering Rate (PKR)	Residential off-peak tariff for 5 Kw & above	12.6
Solar Panel Output	Watts per hour	4800
Hours of Sun	(~10-12 hours sun in Pakistan)	8
Total electricity units	Kw/hour/month	1,152
<b>Monthly return on Solar Panels (PKR)</b>		<b>14,515.2</b>
<b>Payback in years</b>		<b>2.12</b>

*\*Note: These estimates are taken from different sources, the actual values may vary widely on case to case basis*

The payback period varies significantly depending upon the solar resource availability, ratio of sunny days along with size, utilization, and optimal operations and maintenance of the system. However, in our base case assumption of 5kva solution, it came out to be around 2 years which makes it a very lucrative investment opportunity.

<sup>3</sup> <http://www.aedb.org/images/RoadmapRolloutNetMetering2016.pdf>

<sup>4</sup> <http://www.aedb.org/images/NetmeteringGuidelinesforConsumers.pdf>

## KARACHI ELECTRICITY SUPPLY – An attempt to unravel the wires

The payback of net-metering business is around 2 years which makes it a very lucrative investment opportunity.

This solution has the capability to run equivalent load of 30 Energy Savers, 12 Fans, 1 Refrigerator (12 Cu.ft.), 1 Split Ac (1 Ton), and 1 washing machine. If it is installed on the rooftop, it also keeps the accommodation cooler underneath by reducing the heat impact of the sun on the roof, thereby reducing the need of air conditioning.

In the USA, third-party owned model for net metering is also popular in the residential sector, where house owner provides rooftop space and turnkey installers lease solar power plants to them who in turn pay them a monthly lease rental. The electricity generated is used to meet the on-site captive load while the excess generation is put into the grid on net metering basis.

Even KE itself should look at inducting more Wind and Solar power into its system to improve its Energy Mix as these are amongst the cheapest sources of energy.



Pakistan is yet to allow multiple private electricity transmission and distribution companies to operate targeting the same consumers through infrastructure sharing.

### Monopoly to competition shift desired

Many issues of electricity in Karachi are inherent of any monopoly which cannot be addressed unless competition is induced. Pakistan is yet to allow multiple private electricity transmission and distribution companies to operate targeting the same consumers through infrastructure sharing thereby infusing a healthy competition. Although efforts were initiated to get the vertically integrated monopoly - KE unbundled, it was strongly resisted by KE by terming it 'not a commercially or practically viable option'.

On the other hand, to promote competition in India, the Indian Electricity Act 2003 laid down a roadmap for utilities to transform from vertically integrated monopolies to unbundled autonomous entities. It supported private participation in electricity distribution by providing for multiple distribution licensees and non-discriminatory open access for consumers. Resultantly, like in case of Mumbai, a competitive service environment has been created, where at least 3 electricity companies compete to gain consumers to provide power through better services and lower tariffs.

### Efficient and low cost power supply critical for prosperity

Pakistan is passing through a critical phase where it is envisaging heavy investments from China and other investors under the umbrella of China Pakistan Economic Corridor (CPEC), huge spending on power and infrastructure are already underway. On the other hand, it is facing difficulties in managing its balance of payment position due to unprecedented increase in imports and sluggish export performance along with heavy debt foreign repayments in the pipeline.

Under such a situation, there is immense responsibility on the government authorities to bring in efficiencies in every sector of economy where power sector is at the center stage. It is, therefore, crucial to manage the upfront issues in this sector on war footings to minimize the damage to the economy, promote investments as well as protect the consumers' interests. There are indeed challenges but these can be handled through all-encompassing reforms and ensuring prompt implementation.

## ANNEXURES: K-Electric Financials

<b>K-Electric Limited - Balance Sheet</b>					
<i>Value in PKR Mn.</i>	<b>2012</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>
Fixed assets	169,218	165,332	173,144	214,039	223,576
Current Assets	103,358	113,547	133,171	138,874	118,367
<b>TOTAL ASSETS</b>	<b>272,576</b>	<b>278,879</b>	<b>306,316</b>	<b>352,914</b>	<b>341,943</b>
<b>EQUITY AND LIABILITIES</b>					
Share capital	92,958	96,262	96,262	96,262	96,262
Reserves	-	-	-	-	-
Capital reserves	509	509	509	509	509
Share Premium	-	1,500	1,500	1,500	1,500
Revenue reserve	5,372	5,372	5,372	5,372	5,350
Accumulated losses	(82,855)	(74,675)	(59,742)	(29,569)	7,307
Other Reserves	(621)	(490)	(360)	-	-
<b>SHARE CAPITAL AND RESERVES</b>	<b>15,363</b>	<b>28,478</b>	<b>43,541</b>	<b>74,074</b>	<b>110,928</b>
SURPLUS ON REVALUATION OF FIXED ASSETS	27,095	25,237	27,426	54,141	49,967
Non-Current Liabilities	83,789	64,504	60,376	66,164	60,532
Current Liabilities	146,329	160,660	174,973	158,534	120,516
<b>TOTAL EQUITY AND LIABILITIES</b>	<b>272,576</b>	<b>278,879</b>	<b>306,316</b>	<b>352,914</b>	<b>341,943</b>

*Source: KCCI Research, K-Electric Financials*

<b>K-Electric Limited - Profit and Loss Account</b>					
<i>Value in PKR Mn</i>	<b>2012</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>
Sale of Energy-Net	92,569.73	112,165.87	139,112.61	148,514.25	166,747.75
Tariff Adjustment	70,029.16	76,615.19	55,377.62	41,844.71	22,880.85
Rental of meter and quip.	216.75	217.59	-	-	-
<b>Revenue</b>	<b>162,815.63</b>	<b>188,998.65</b>	<b>194,490.23</b>	<b>190,358.95</b>	<b>189,628.60</b>
<b>Expenditure</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
Purchase of Elec.	(74,657.98)	(78,371.65)	(82,970.90)	(71,487.15)	(54,309.23)
Consumption of Fuel & Oil	(58,596.69)	(67,807.84)	(64,335.94)	(59,950.31)	(57,266.32)
Expenses Gen., Trans. & Dist.	(13,301.24)	(13,997.87)	(14,983.06)	(15,657.68)	(19,876.73)
<b>Gross Profit</b>	<b>16,259.71</b>	<b>28,821.29</b>	<b>32,200.34</b>	<b>43,263.81</b>	<b>58,176.33</b>
Consumer service & Admin Exp.	(12,218.25)	(15,400.35)	(16,247.07)	(21,738.50)	(30,714.93)
Other Operating Exp.	(910.56)	(646.51)	(1,483.99)	(3,021.95)	(3,120.46)
Other Income	7,140.07	5,090.34	6,381.03	6,332.85	6,660.30
	(5,988.74)	(10,956.52)	(11,350.04)	(18,427.60)	(27,175.09)
<b>Profit before Finance Cost</b>	<b>10,270.98</b>	<b>17,864.77</b>	<b>20,850.30</b>	<b>24,836.21</b>	<b>31,001.24</b>
Finance Cost	(7,702.42)	(13,960.44)	(11,275.21)	(9,759.73)	(5,099.52)
<b>Profit Before Tax</b>	<b>2,568.56</b>	<b>3,904.33</b>	<b>9,575.09</b>	<b>15,076.48</b>	<b>25,901.72</b>
Taxation	51.78	2,824.31	3,312.15	13,248.23	6,855.91
<b>Net Profit</b>	<b>2,620.34</b>	<b>6,728.64</b>	<b>12,887.24</b>	<b>28,324.71</b>	<b>32,757.63</b>

*Source: KCCI Research, K-Electric Financials*



<b>K-Electric Limited – Cash Flow Statement</b>				
<i>Value in PKR Mn</i>	<b>2012-13</b>	<b>2013-14</b>	<b>2014-15</b>	<b>2015-16</b>
<b>CASH FLOW FROM OPERATING ACTIVITIES</b>	4,001	9,575	15,076	25,902
<b>ADJUSTMENT FOR NON CASH ITEMS</b>	-	-	-	-
<b>OPERATING PROFIT BEFORE WORKING CAPITAL CHANGES</b>	32,679	36,266	43,894	58,430
<b>(INCREASE)/DECREASE IN CURRENT ASSETS</b>	(17,717)	(27,015)	(15,845)	11,655
<b>(INCREASE)/DECREASE IN CURRENT LIABILITIES</b>	(1,979)	13,624	(1,475)	(24,153)
<b>NET CASH GENERATED FROM OPERATING ACTIVITIES</b>	(11,572)	(10,208)	(7,988)	(4,835)
<b>NET CASH USED IN INVESTING ACTIVITIES</b>	(3,133)	(8,588)	(14,847)	(28,654)
<b>NET CASH USED IN FINANCING ACTIVITIES</b>	(3,034)	(329)	(7,023)	(10,795)
<b>NET INCREASE/(DECREASE) IN CASH</b>	(4,755)	3,750	(3,285)	1,648
<b>CASH AT BEGINNING</b>	(2,173)	(4,755)	(3,178)	(6,463)
<b>CASH AT END</b>	(6,927)	(1,005)	(6,463)	(4,815)

*Source: KCCI Research, K-Electric Financials*

## KARACHI ELECTRICITY SUPPLY – An attempt to unravel the wires

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