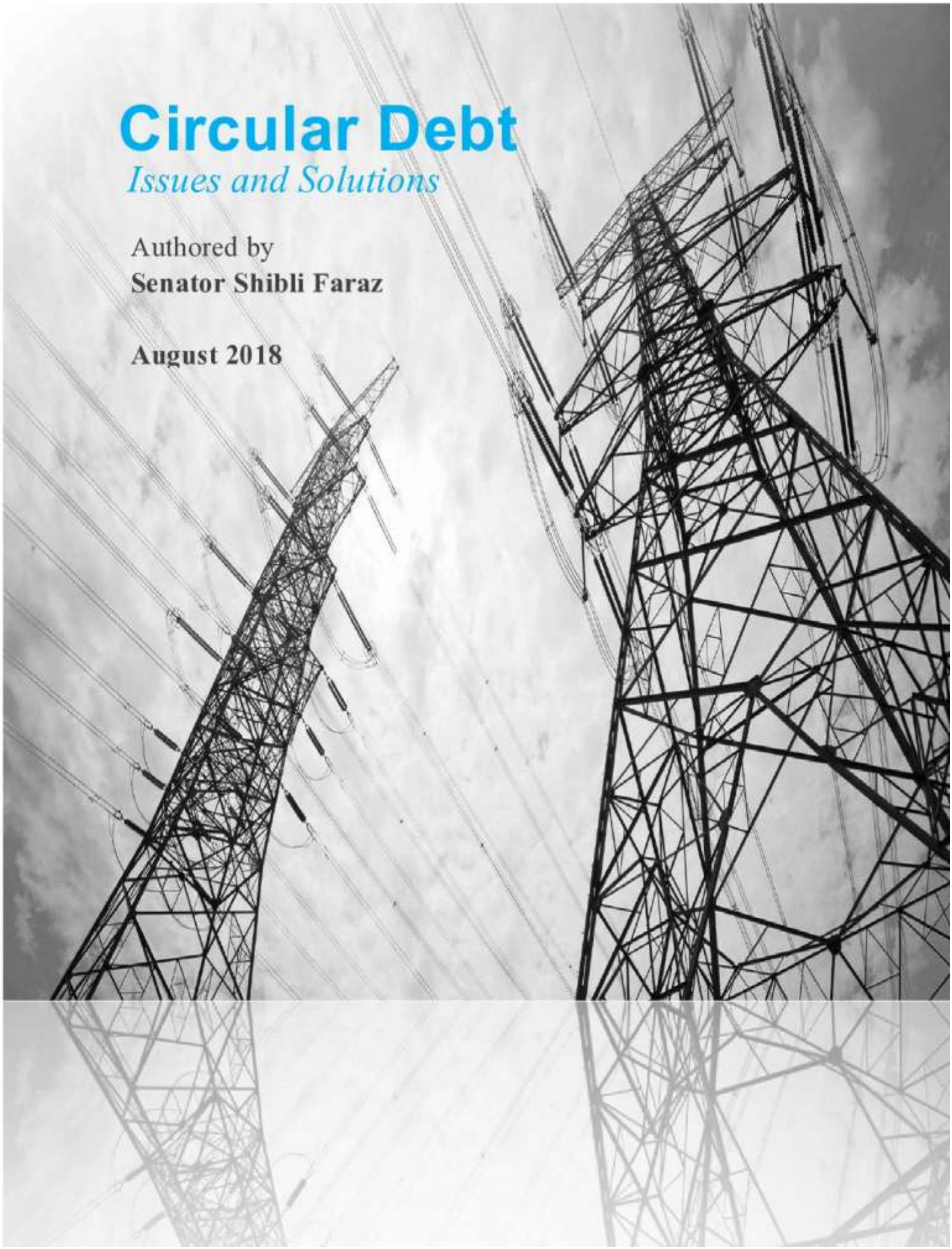
Circular Debt

Issues and Solutions

Authored by
Senator Shibli Faraz

August 2018



SENATE OF PAKISTAN

REPORT OF THE SPECIAL COMMITTEE ON CIRCULAR DEBT

ON

COMPONENTS OF CIRCULAR DEBT, MEASURES TAKEN & REQUIRED TO REDUCE THE SAME

PRESENTED BY

SENATOR SYED SHIBLI FARAZ

SENATE SECRETARIAT

REPORT OF THE SPECIAL COMMITTEE ON CIRCULAR DEBT ON COMPONENTS OF CIRCULAR DEBT, MEASURES TAKEN & REQUIRED TO REDUCE THE SAME

I, Senator Syed Shibli Faraz, Convener Special Committee on Circular Debt, have the honour to submit, on behalf of the Committee, this report developed based on Terms of Reference as specified hereunder, that was referred to Special Committee through No. F.J (4)/2018-2021/C-II dated May 2, 2018 for consideration and report.

a) To examine all individual components of the circular debt and measures taken by the Government to reduce the same.

b) To examine possibility of establishing a high-level monitoring committee to oversee the proposed reforms by the Government to alleviate circular debt and address its underlying causes.

2. The composition of the Special Committee is as under:-

(1) Senator Syed Shibli Faraz – Convener
(2) Senator Sirajul Haq
(3) Senator Dr. Sikandar Mandhro
(4) Senator Bahramand Khan Tangi
(5) Senator Kauda Babar
(6) Senator Sajjad Hussain Turi
(7) Senator Dr. Jehanzeb Jamaldini
(8) Senator Muhammad Usman Khan Kakar
(9) Senator Atta Ur Rehman
(10) Senator Ayesha Raza Farooq
(11) Senator Syed Muzafar Hussain Shah
(12) Senator Mir Kabeer Ahmed Muhammad Shahi
(13) Senator Musadik Masood Malik

3. The Committee held following meetings for understanding circular debt constituents and underlying issues:

- During the meeting dated 29th May 2018, Committee conducted deliberations with power sector stakeholders to understand structure of the power sector and identify issues related to circular debt, its causes and steps taken.

- In the meeting dated 20th June 2018, Committee held detailed discussions with various public office holders, within power sector, on issues pertaining to circular debt and its remedies, understanding Distribution Company (DISCO) loss making zones/ feeders/ grid station and impact of law and order situation & theft on DISCOs. During the meeting Committee also discussed generation cost of thermal power plants with private sector participants.

- The meeting dated 30th July 2018 was held to discuss related issues with government officials with regard to issues faced by DISCOs that contribute towards circular debt their remedies and to understand types of operational constraints faced. During the meeting, Committee also discussed electricity demand supply gap in Pakistan with Ministry of Energy (MoE) and its forecast. During the meeting, Committee also discussed generation cost of renewable energy sector and issues faced by this sector.

- In the meeting dated 1st August 2018, Committee heard the problems being faced by NTDC and various DISCOs on issues related to line losses, recovery losses, Tariff delays, AJK tariff subsidy, Tariff differential subsidy, Agri tube well Subsidy and tax refunds.

- In the meeting held on August 6, 2018, Committee had a detailed discussion with the officials of NEPRA, FBR, Ministry of Finance (MoF), MOE, CPPA-G and DISCOs on the matters related to Tariff delays, implications of different federal taxes on DISCOs viz-a-viz delays in subsidies.

- In the final meeting held on August 27, 2018, Committee had a detailed discussion with the officials of OGRA, SNGPL and SSGCL on the matters related to pricing of oil and gas and its impact on Circular Debt.

- Apart from the official sessions a number of meetings were held with representatives of MOE, NEPRA, CPPA, GENCOs, PSO, IPPs and relevant industry experts.

4. The Committee would like to place on record its appreciation to following governmental entities, energy experts, legal experts and private organizations who have provided their valuable inputs during above hearings and individual meetings during preparation of this report:

1.	Ministry of Energy (Power Division)
2.	Ministry of Finance
3.	Federal Board of Revenue
4.	National Electric Power Regulatory Authority (NEPRA)
5.	Oil and Gas Regulatory Authority (OGRA)
6.	National Transmission & Distribution Company (NTDC)
7.	Central Power Purchasing Agency (Guarantee) Limited (CPPA)
8.	Sui Northern Gas Pipelines Limited (SNGPL)
9.	Sui Southern Gas Company Limited (SSGCL)
10.	Pakistan State Oil (PSO)
11.	Pakistan Electric Power Company (PEPCO)
12.	Power Holding (Private) Limited (PHPL)
13.	Peshawar Electric Supply Company (PESCO)
14.	Sukkur Electric Power Company (SEPCO)
15.	Hyderabad Electric Supply Company (HESCO)
16.	Quetta Electric Supply Company (QESCO)
17.	Faisalabad Electric Supply Company (FESCO)
18.	Lahore Electric Supply Company (LESCO)
19.	Islamabad Electric Supply Company (IESCO)
20.	Kot Adu Power Company (KAPCo)
21.	Hub Power Company (HUBCo), Largest thermal power company
22.	Saif Power Limited, Thermal Power Company

23.	Renewable Resources (Private) Limited, Technical Consultants
24.	Axis Law Chambers, Legal Consultants for Power Projects
25.	Bridge Factor (Private) Limited, Financial Consultants to Power Projects
26.	China Three Gorges South Asia Investment Limited (CSAIL) - CPEC Projects
27.	Mr. Shahid Khan, Energy Expert
28.	Dr. Abdullah Malik, Project Development Expert
29.	Mr. Khalid Butt, CEO KAPCo
30.	Mr. Tariq Saddozai, Chairman NEPRA
31.	Mr. Himayat Ullah Khan, Ex-member tariff - NEPRA
32.	Mr. Abid Latif Lodhi, CEO CPPA-G
33.	Mr. Tayyab Tareen, CEO K-Electric

5. Special Committee on Circular Debt submits a detailed report of the understanding, issues and findings on the circular debt and same is attached as Annex-A.

Iffat Mustafa
Secy. Committee

Syed Shibli Faraz
Convener

ANNEX-A

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Summary of Findings & Recommendations

Findings

a. The circular debt started emerging on power sector books from FY 2007. This occurred in the backdrop of the shift from low cost generation (Hydel) to high cost generation (thermal) from 1985 to 2007. Furthermore, in 2007 there was a sharp devaluation of Pak Rupee from PKR 60/US$ to about PKR 75/US$ and a sharp price increase in imported fuels (37% increase in oil prices) which dramatically increased the price of imported fuels. This increase of cost was not entirely passed on to the consumers by GOP, resulting in the emergence of the 'circular debt monster'.

b. The circular debt is also created due to (a) non-recovery & delay of payments of electricity price by consumers, (b) delays by Governments in release of subsidies (c) T&D losses of DISCOs. Issues of subsidies also include receivables of DISCOs relating to supply of electricity to Government of AJK (at a price less than half of the generation cost) and subsidy on agriculture tube wells, which also affects the circular debt level.

c. The fuel suppliers of power sector are the foundation of the existing generation infrastructure and thermal sector supply chain pyramid. In this regard it was noted that pricing of oil & gas is regulated by Oil and Gas Regulatory Authority (OGRA) while NEPRA's ambit is limited to determination of tariffs at every stage of transfer of electricity from one entity to another starting from IPPs and ending on DISCO's & K-Electric. The division within the 'regulatory pricing control structure' does not allow both the regulators (that is NEPRA and OGRA) to have an overall picture to determine pricing keeping in view the overall impact.

d. Federal government through FBR impose taxes on DISCOs, NTDC, SSGCL, SNGPL and CPPA that is passed on to the consumer in the electricity bills. On the other hand, Federal Government gives Tariff differential subsidy, agriculture tube well subsidy and other subsidies to power sector, besides loans to pay-off circular debt. This appears to be a window dressing exercise.

e. Level of circular debt is also directly influenced by the impact of expensive electricity and imported fuel as each unit lost or not paid by consumer has a higher generation price resulting in higher financial loss and ultimately higher circular debt. This fact has been completely ignored by the previous governments while addressing the challenge of circular debt.

f. Level of circular debt and annual shortfall is directly proportional to three main factors:

1. **Electricity Price:** The electricity price is dependent upon (a) type of generation or generation mix of Pakistan, (b) cost of transmission and distribution and (c) losses that are allowed to be built in the electricity price.

   NEPRA regulates electricity pricing at all levels except fuel for thermal (gas, RLNG and RFO and HSD) segment, which is regulated by OGRA. It is important to note that if GoP does not notify consumer end price or delays the price increase this further

aggravates the circular debt issue. In pricing of consumer end tariff, NEPRA allows certain system losses (T&D Loss) to be built in the electricity price. Resultantly, as electricity becomes expensive each unit lost or not paid by consumer has a cost (mainly generation cost) and resultantly higher generation price will result in higher financial loss and ultimately higher circular debt.

2. **System Losses:** During process of transmission and distribution some amount of electricity loss is inevitable that is usually allowed by NEPRA, however there are elements like system inefficiencies and electricity theft (hooks, *Kundas*, meter tampering etc) that are not allowed to be built in the consumer price by NEPRA. Also, there are recovery issues that includes running defaulters, delayed payments, permanent disconnections, delay in different subsidy payments due to various reasons discussed in this report. Loss of revenue due to low recovery rate is not allowed to be included in electricity price (NEPRA issues tariff based on 100% recovery assumption).

3. **Quantity of Electricity**: In the context of circular debt, quantity of electricity is a loss multiplier, the one-unit-Rupee-loss multiples on the number of electricity units passing in the system.

g. To understand simply the significance of electricity price and system losses on the level of circular debt following example is available:

- Electricity generated (about 120,400 GWh)
- Aggregate Technical & Commercial (AT&C) losses (24.8% that is based on T&D Losses of 18.3% and 92% recovery rate),
- therefore electricity revenue collected for only 90,540 GWh
- if average Electricity Sale Price is around Rs 9.78/kWh (Generation price Rs 8.53 estimate for FY 2017, Transmission and Distribution cost of Rs 1.25 / kWh)
- then the annual deficit is Rs 292 Billion which has to be assumed either by GoP or passed on to consumer.

However, NEPRA allows certain losses of 16.3% (of T&D Losses) out of AT&C of 24.8% to be built in the electricity price, impact of this on above example is as follows:

- Electricity Price will increase from Rs 9.78/kWh to Rs 11.37/kWh
- AT&C Losses will reduce from 24.8% to 9.02%
- Resultant financial loss to the economy is split. Consumer bears cost of Rs 175 Billion per annum in their electricity bills and GoP is stuck with an amount of Rs 116.4 Billion per annum, which results in circular debt.

On other hand if generation price increases by Rs 1/kWh due to increase in oil/gas/RLNG prices or devaluation the price to consumer will increase to Rs 12.53 / kWh (from Rs. 11.37/kWh) and financial loss increases by Rs 10.2 Billion for each Rs 1/kWh addition in the price. This Rs 1 /kWh impact will take GoP loss to Rs 126.6 Billion / annum, from Rs 116.4 Billion.

In the socio-economic structure of Pakistan, above discussed increase in energy price will affect paying capacity of consumers that in turn will increase poverty, theft, non-recoverability and result in additional loss say Rs 12 Billion per 1 Rupee increase in electricity price. Resultantly the annual contribution towards circular debt will increase to

Rs 128 Billion/ annum besides impact on GDP and competitiveness in the in international market.

h. Actual generation price at CPPA for FY 2018 was Rs 9.6/kWh (without inclusion of NTDC Use of System Charge and expenses of DISCOs).

i. The major contributor was thermal segment with an average price Rs. 11.1/kWh, highest being HSD at Rs 14.5/ KWh, followed by RFO at Rs 13.6/ KWh, RLNG at Rs 10.6/ KWh, Coal at Rs 10.5/KWh and Gas at Rs 8.2/kWh. GENCOs price with the mixed use (RFO, gas, RLNG) were at Rs 11.7/kWh. It is to be noted that these sources are subject to global commodity prices of fossil fuels (except for local coal plants).

j. Renewable segment contributed at Rs 6.3/kWh. The current generation mix within renewable segment includes wind and solar projects based on older tariffs when prices were high. Average generation price of Installed wind projects is Rs 17.7/KWh and Solar is Rs. 18.6/kWh. However recent tariffs of these technologies are around Rs 7/kWh (for first year). Hydel currently stands at Rs 5/kWh, as debt period of these plants is complete and new hydel tariffs are expected to be around Rs 10.33 /kWh. A summary tariff compassion of different technologies is provided hereunder, shaded rows highlight new tariffs:

Source-wise Comparison Price of Electricity	*CPP (Rs./kWh)*	*EPP (Rs./kWh)*	*Total (Rs./kWh)*	*Remarks*
Hydel Projects				
Old Hydel Projects	4.87	0.11	4.97	Existing Cost
New Hydro Projects	9.69	0.64	10.33	New Tariff
Thermal				
Old RFO Projects	3.14	10.41	13.56	Existing Cost
Gas based Projects	2.46	5.71	8.18	Existing Cost
RLNG Projects	2.07	8.55	10.61	Existing Cost
Imported Coal	3.44	7.08	10.52	Existing Cost
Thar Coal	5.46	5.17	10.63	New Tariff
RE Projects				
Old Solar Tariff	-	18.58	18.58	Existing Cost
Latest Solar Tariff	-	7.15	7.15	New Tariff
Old Wind Tariff	-	17.65	17.65	Existing Cost
Latest Wind Tariff	-	6.77	6.77	New Tariff
Bagasse Tariff	2.69	6.28	8.97	Existing Cost

k. The primary reason for high electricity cost in Pakistan is actually linked to delay in exploitation of hydro power potential in the country. Due to this delay a number of private sector oil-based IPPs were added to the system in 1994 and 2002. While these IPPs provided much-needed new power generation capacity at the time, the country's generation mix tilted heavily towards Fuel Oil/Furnace Oil (FO) that is currently hovering around at a Price of Rs 13.6 kWh.

l. Above issue was further aggravated due to the GOP's policy to divert gas to other sectors of the economy, such as domestic consumers, and to encourage use of compressed natural gas (CNG) for private vehicles which limited the gas supply to the power sector, forcing thermal generators to depend on more expensive fuels. Gas shortages further pushed thermal generation towards more expensive fuels (like RFO).

m. Pakistan's dependence on the fossil fuel is 63% however, if indigenous gas consumption is excluded than imported fuel dependence stands at 55%, based on Pakistan's existing energy mix, which is a threat to energy security. The imported fuel dependence also results in sudden price jumps (due to international price increases and Pak Rupee devaluations) in consumer tariff that impacts consumer affordability levels and recoverability level of Distribution companies.

n. It is evident from above that previous government remained focused on imported fossil fuels and added about 7,900 MW RLNG based capacity mainly in last 14 months (till August 2018), while same is expected to reach 10,000 MW as per MOE data and as per NEPRA State of Industry Report it will reach 12,000 MW in the near future and will further increase reliance on imported fuels.

o. Based on discussions held with various industry professionals it is important that Fuel Supply Agreements (FSA) of all the government run RLNG projects be reviewed, as it seems like that these FSAs for RLNG purchase are structured in a way that even if these plants do not qualify in merit order (the sequence in which government gets electricity to the extent required depending upon the cost of fuel and efficiency rates of plants, cheapest gets priority), and do not generate electricity, these plants still have to make payments to the RLNG suppliers. This could result in a new type of circular debt issue where CPPA under the Energy Purchase Agreement will not be subject to payment of EPP component while the power plant/IPP will be required to make payments to the RLNG suppliers. This conclusion is subject to further review and vetting of the agreements for RLNG plants.

p. Pakistan has vast un-exploited renewable resources in the country, global technological innovation has provided an opportunity to Pakistan to exploit indigenous resources such as Wind, Solar, Bagasse and small hydel which are available in abundance, and reduce the strangle of imported fuel that directly challenge our growth potential. Due to prioritization of energy security, the global shift to renewable energy has seen a considerable increase. For example, India has built up its renewable portfolio to 20% (excluding hydel) of installed capacity, compared to a meagre 4% (excluding hydel) in Pakistan. The current situation in Pakistan could seriously compromise the energy security of the state while placing ever increasing stress on the financial resources of the GoP.

q. Based on capacity additions data provided by MOE it was noted that about 20 GW of electricity generation projects will be added in the system during next 5 years while electricity shortfall will continue till FY 2021 that is for next three years. Further review of the capacity additions indicates addition of 1,200 MW during July 2018 to June 2020 and addition of 1,224 MW of wind projects in FY 2021, however these projects will be delayed because of the decision made by previous Cabinet Committee on Energy ('CCE') in their meeting dated 12 December 2017. Accordingly, the projected electricity deficit in MOE analysis may further aggravate as the previous government stopped all renewable energy projects (small hydel, wind, solar and bagasse) approximately over 1600 MWs under development, which had not signed Implementation Agreement (IA) or Energy Purchase Agreement (EPA) as per the above referred decision of CCE.

r. Furthermore, the above referred decision also states that all projects based on wind, solar, small hydel and bagasse energy "will be awarded through competitive bidding." Some experts suggested that existing projects cannot be included in a classic transparent competitive bidding process since most of the existing projects have their own LOIs, generation license, land lease and technical studies. The usual way to carry out a

competitive bidding process is that the government provides the land and the technical studies, grid connectivity and requests bids based on the said documentation and a base price established by NEPRA which means approximately 3-4 years are required to restart inducting further renewable energy in the system. Resultantly this will delay induction of 1600 MWs of renewable energy projects, who have been awarded tariffs and ready to start construction within 6 months to one year. It will also increase the investor fatigue, as these investors have already spent 2-3 years in developing these much-needed projects.

s. The previous government allowed the Renewable Policy 2006 to expire in March 2018, which had previously been extended multiple times but since the government decided to temporary halt renewable projects it let the policy expire with the view of putting in place a new policy parameters which were provided in CCE decision of 12 December 2017, these parameters in CCE decision were objected to by the provincial governments of Sindh and Khyber Pakhtunkhwa as a result of which no further action was taken. Therefore unless this renewable policy is extended or a new policy put in place no Letter of Support (LOS) can be given for projects in development after they obtain tariff. We were advised that five solar power projects (350 MWp) have been given tariff by NEPRA in the range of Rs 7 / KWh and cannot obtain LOS because of the fact that the Renewable policy has expired in light of the previous government's CCE decision. Recently NEPRA has also approved tariff for some hydel and wind projects and these are also in limbo for the same reason.

t. The previous government drafted a Power Electricity Policy & Plan 2018, which strangely only has a policy but no plan and is circulating at inter-ministerial level for comments. This policy proposes radical changes in the previous policy without considering ground realities and its implications. A power policy usually covers a thirty-year period by structuring a plan on the basis of short, medium and long term which this policy does not address nor does it address the transition of existing projects at advanced stages of development.

u. On NTDC, it is important that existing plans for strengthening transmission network are reviewed in detailed and implemented to connect upcoming powerplants with national grid and meet the electricity shortfall of the country and also balance the load on DISCOs networks. The delay in implementing electricity interconnection plans of NTDC can result in costs and penalties from upcoming projects.

v. The end tail of electricity network is handled by Distribution Companies who are owners of network of 132kV and below voltage. Based on the meetings held and review of reports on their performance it is to be noted that although PESCO, SEPCO, TESCO and QESCO have generally been accepted as poor performers, but facts indicate that better performers like LESCO and MEPCO also require investment in infrastructure as more than 30% of 11 kV feeders were overloaded by more than 80% during FY 2017, while LESCO also has the worst record of overloading of distribution transformers. Similarly, FESCO has very serious issues to tackle with the overloading of its power transformers. These issues indicate a dire need of steps required for investment in distribution infrastructure not only to reduce technical losses but also to make it capable to sustain distribution of power for upcoming power projects.

w. One of the contributors of circular debt is the high transmission and distribution losses in DISCOs viz-a-viz the Authority's allowed targets. The contribution of T&D Loss in the overall level of actual Circular Debt amounts to Rs. 187 Billion, based on the presentations

given by officials of MOE during Committee hearings. The loss has been built-up over last five years as provided below:

YEARS	UNITS	2013-14	2014-15	2015-16	2016-17	2017-18
UNITS SOLD	GWH	71,055	72,642	76,623	81,558	91,902
ALLOWED T&D LOSSES	%age	15.3%	14.2%	15.3%	15.3%	16.3%
ACTUAL T&D LOSSES	%age	18.7%	18.7%	17.9%	17.9%	18.3%
EXCESS LOSSES OF DISCOS	%age	3.3%	4.5%	2.6%	2.6%	2.0%
IMPACT OF EXCESS LOSS	Rs M	39,332	52,562	31,865	33,961	29,389
CUMULATIVE LOSS IMPACT	**Rs M**	**39,332**	**91,894**	**123,759**	**157,720**	**187,109**

x. Above historical analysis indicate that actual T&D Losses of DISCOs could not be reduced below 17.9% in last five years, in fact in FY 2018 the actual T&D Losses has increased to 18.3%. The decrease in the difference between target and actual T&D loss and resultant financial loss during FY 2018 is only due to the reason that NEPRA has increased its target which means that cost of increase in inefficiencies has been passed to the consumer in FY 2018 by increasing the electricity price.

y. Based on benchmarks set in developed countries acceptable T&D loss level is around 10% (as against 18.3% in Pakistan) and if this fact is kept in view all the DISCOs except IESCO, GEPCO and FESCO are not even close to the benchmark ignoring the fact that the cost of the loss is borne by consumers or Government of Pakistan.

z. In terms of identifying DISCOs with highest number of T&D Loss percentage PESCO, QESCO, SEPCO, HESCO fall in range between 22% to 38%. However, it is noted that in absolute terms highest number of electricity units are lost by PESCO 4,079 GWH, followed by LESCO 2,839 GWH and MEPCO 2,698 GWH, and saving of even 1% in T&D Loss in these entities will have more significant positive effect compared to small DISCOs.

aa. It is noted that the DISCOs have obvious lack of managerial capacity and skills, mindset to not go for such projects which may bring drastic improvements in the system; for instance, installing meters at all levels to trace flow of electricity top to down in the system using automatic metering and centralized monitoring tools. In nutshell desire to lower losses, if any, does not seem to have materialized over last five years may be to conceal inefficiencies under the head of T&D Loss. DISCOs seem content with their performance levels, and that approach at this cross-road where the Federal Government has inducted and planned to continue induction of a large generation capacity to the system may drag the whole sector down if immediate steps to correct this position are not taken.

bb. Based on the analysis conducted on the data provided by different power sector entities it was noted that Electricity theft in the system is 3.9% and estimated cost of theft in 2018 is Rs 53.4 Billion based on energy supply of 120,400.5 GWh and unit sale price of Rs 11.37/kWh.

cc. The cumulative receivables of DISCOs as on June 30, 2017 were Rs 669.8 Billion that has increased by Rs. 154.5 B during FY 2018, and has reached Rs 824.3 Billion as of June 30,

2018 that has directly impacted circular debt level during 2018, the underlying issues of these receivables are as under:

CPPA Receivable Break Down	*Amount (Billion)*	*Onus*
Receivables from Federal Government and related entities	**244.3**	
Non-Payment of subsidy by GOB & GOP for Tube well consumers in Baluchistan (NOTE-1)	44.4	GOP/GOB
Non-payment of Tariff Differential Payment by GOP for supply to AJK (Note-2)	99.3	GOP
PESCO's receivable of Rs 18.6 Billion from Government of KPK on account of stay on tariff for Sept 2008 to Sept 2010. (Note-3)	18.66	GoKPK
Delay in payment for Tariff Differential Subsidy for low-income and Industry Support Package. (Note-4)	53.0	GOP
Receivables from Govt. owned entities, departments and DISCOs (Note-5)	29	Different Governments
5.3 M Running Defaulters and 1.3 M Permanent Disconnections (Note-6)	**500.2**	
Receivable from Private Tube well owners (Note-1)	188.5	Agri Cons. QESCO
Defaulters & Disconnections in PESCO jurisdiction (Note-7)	93.8	Residential PESCO
Defaults & losses due to illegal connections (Note-8)	84.6	Residential SEPCO
Delayed Federal Subsidy Payment for Private FATA Consumers (Note-9)	37.0	Comm. & Ind. TESCO
Others Private Defaulters & Disconnections	96.3	Mostly Residential
Receivable due to Instalments, Spill over & Deferred Amount	**79.8**	**Normal Cycle**
Grand Total	**824.36**	

Note-1: As of June 2018, there are 28,088 Agri-Consumers who owe Rs. 188.5 billion while GOB and GOP owed 43.9 billion with regard to Argi-tube well subsidy issue to QESCO. Besides this Rs 55.3 Billion for 27 months (July 2010 to November 2012 because of non-clarity in ECC decision) is not yet been notified as to who is responsible for this amount. The Agri-tube well subsidy program started in 2001 has become one of major contributors to circular debt and Government is now considering solarization of 30,000 Tube wells as a direct subsidy to the farmers.

Note-2 Under the Mangla Raising Agreement signed in 2003 between Government of AJ&K and Government of Pakistan, AJ&K Government is responsible to pay for the electricity supplied by DISCOs at subsidized rate of Rs. 2.59/kWh, this electricity supply at agreed rate continued till 2007. However, in 2007 NEPRA determined tariffs of DISCOs under which GoAJK Tariff was also determined and subsequently notified by the GoP. GoAJK did not agree to

the notified tariff, as AJK does not fall under purview of NEPRA. Due to this reason the Amount notified by NEPRA less funds received from AJK at subsidized rates are accumulating in receivables.

Note-3 In 2008 the KPK Government[1] filed a petition against tariff increase. Despite the fact that it later withdrew the case, PESCO was not able to recover Rs 18.6 billion from KPK consumers for period starting from September 5, 2008 to September 15, 2010 (accrued while the court's stay order was in effect). HESCO faced a similar situation, when Sindh Government filed suit against HESCO in Sindh High Court and managed to block HESCO from receiving payments from Sindh Government for an extended period (the figures of HESCO are not available).

Note-4 As of June 30, 2018, a subsidy amount of about Rs 53 billion was due form GoP, which are considered to be quite material keeping in view the overall size of TDS and ISP. As per MOE presentation an amount of Rs 33.4 Billion out of total subsidy due is outstanding under ISP and has a material impact towards circular debt.

Note-5 Delays in payments against electricity supplied to provincial and governmental departments schools, hospitals, police stations, water sewerage facilities and offices also contribute towards circular debt. Usually these departments delay the payment of electricity bills because of the shortage of funds or try to justify non-payment on the ground if non-reconciliation of electricity bills.

Note-6: There are more than 5.3 Million non-paying electricity connections in Pakistan who are getting electricity and are either willful defaulters or are unable to pay (running defaulters). Cumulative outstanding balance of these defaulters stands at Rs 404.8 Billion (i.e. about 49%) of Rs 824.3 Billion receivables as at June 30, 2018. Besides running defaulters there are more than 1.3 million electricity connections that have been permanently disconnected with payables of Rs. 95 Billion to DISCOs that is about 12% of Rs 824.3 Billion receivables as at June 30, 2018. Review of further breakdown of these default amounts indicate that major concentration of these defaults is in QESCO (40%), followed by PESCO (19%), SEPCO (17%) and HESCO (11%).

Note-7 About 38% of the PESCO Feeders have recovery rates of 70% or less. It was also noted that in most of the instances T&D Losses is also high in the areas with low recovery rates. Majority of loss-making feeders in PESCO region fall in domestic (residential) category. The matter of recovery from private sector in PESCO has become a serious concern affecting circular debt issue and its resolution is possible only with the support of provincial government and local governments.

Note-8 SEPCO's receivables from private sector are increasing at the rate of Rs 8-10 Billion per annum mainly due to non-payments from domestic consumers. Management of SEPCO attributes reasons to poor socio-economic condition in the area, that evolved after super floods in August 2010, combined with shortage of line staff, worst law & order situation and non-cooperation of provincial governments and police departments. SEPCO has even requested deployment of Pak rangers to resolve recovery and illegal connections.

Note-9 TESCO's receivables from private consumers stood at Rs. 37 billion[2] as at 30th June 2018, which mainly seems to relate to commercial and agriculture consumers. The situation is expected to improve in future as law & order situation is improving in the area.

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dd. Review of the cash flow of DISCOs (for FY 2017) indicate Deficit Funding strategy at DISCO books. In FY 2017, GoP raised financing of Rs 71 Billion on the DISCOs books for funding circular debt and levied taxes of Rs 75 Billion on these DISCOs. Please note that tax amount of Rs 75 billion levied in FY 2017 does not include taxes of about Rs 10 Billion levied on IPPs and other taxes and duties levied on oil and gas sector that are then passed to DISCOs and also contribute towards circular debt. The impact of this fund circulation is further aggravated because of the field formation officers of FBR who attach bank accounts of Government owned power sector entities on disputed issues leading to litigation in various cases and practice of not releasing the refunds to these DISCOs.

ee. Due to circulation of funds (injecting as loan / subsidy in power sector and taking out as taxes) results in refund claims of DISCOs that usually are never paid by FBR. These refund related issues usually relate to following discrepancies:

i) Sales Tax

- Levy of Sales Tax on subsidy granted by GOP to DISCOs;

[1] Pakistan Power Sector Circular Debt Report by USAID October 2012

[2] Based on receivable statement of June 30, 2018 from MOE.

- Disallowance of input tax credit against transmission and line losses;
- Payment of sales tax on accrual basis rather than on collection basis that because of low recovery rates of DISCOs become a double financial hit;
- Demand to charge Sales Tax on supply to AJ&K and Domestic Consumers of FATA on zero rate;
- Chargeability of Sales Tax on Capacity Purchase Price in case of CPPA G.

ii) Income Tax

- Levy of Minimum Tax (Turnover Tax) on DISCOs,
- Transmission of electricity not considered as supply of electricity by tax authorities rather considered as service requiring deduction of withholding tax by CPPA-G on payments to NTDCL.

ff. Based on review of financial statements of some of the Distribution Companies it is estimated that an amount of about Rs 95 – 100 Billion is refundable from Tax authorities by DISCOs.

gg. Due to delay in notification of NEPRA's consumer tariffs by the previous government, it is estimated that an amount of about Rs 108 Billion has affected circular debt as at June 30, 2018.

hh. MOE during Committee sessions presented historical trend of increase in circular debt amount, Committee noted that numbers with regard to circular debt as presented by MOE during committee meetings did not match with CPPA audited balance sheet nor NEPRA State of Industry Reports. Accordingly, for the purpose of independent analysis of the circular debt level circular debt amounts has been calculated based on CPPA's gross receivables from DISCOs after adjusting for equity injections (allocations from budget) by GoP for settlement of circular debt.

ii. A summary of funding gap over last 2 years, based on the review of the financial statements of CPPA-G and PHPL is summarized hereunder:

CIRCULAR DEBT LEVEL EXCLUDING KE RECIEVABLE AND TRS FUNDING	2017 JUNE	2018 JUNE
	Rs in Billion	
1- Gross Receivable from DISCOs	1,068	1,534
2- Funding Sources:		
A- GoP Equity Contribution	318	338
B- Outstanding Commercial Loans	439	583
C- Sub-total	757	921
3. Circular Debt Amount (1 - 2C) payable within supply chain	**311**	**613**
4- Actual Circular Debt Amount (1– 2A) towards suppliers & lenders	**750**	**1,196***

*June 2018, increasing every month

jj. Based on above actual level of circular debt is Rs 1.196 Trillion out of which Rs 613 Billion is outstanding towards IPPs and oil/ gas suppliers. (we understand that MOE recently in presentations made to Finance Minister have accepted the fact that circular debt includes loans).

kk. Cause wise analysis of above funding gap outstanding as gross receivable to CPPA is summarized hereunder:

CIRCULAR DEBT LEVEL CAUSE-WISE ANALYSIS	2018
	Rs in Billion
T&D Losses of last five years	187
Receivables from Federal Government and related entities	244.3
5.3 M Running Defaulters and 1.3 M Permanent Disconnections	500.2
Receivable due to Instalments, Spill over & Deferred Amount	79.8
Estimated FBR Tax Refunds	100
Delays in NEPRA's Consumer Tariff by Previous Government	108
Previous delays in tariff notification and excess losses in DISCOs funded through equity injections by previous governments	338
Grand Total	**1,557**

ll. Based on meetings with NTDC, PSO, OGRA, SNGPL and SSGCL, Committee is of the view that receivables of these entities from generation companies was around Rs 354 Billion as at June 30, 2018:

CIRCULAR DEBT JUNE 2018 FUNDING REQUIREMENT OF POWER SECTOR FUEL SUPPLIERS	2018
	Rs in Billion
NTDC Receivable against Use of System Charge	38
PSO Receivable from GENCOs, HUBCO, KAPCO & Other RFO based thermals	195.8
Late Payment Surcharge of PSO	86
SSGCL receivable from GENCOs for supply of Gas	3.5
SNGPL receivable from GENCOs & IPPs for domestic gas	21
SNGPL receivable from GENCOs & IPPs for RLNG for onwards payment to PSO	10
Grand Total	**354.3**

mm. Out of Rs. 354 Billion it is estimated that about Rs 100 - 120 Billion would pertain to normal working capital with these fuel suppliers and the overdue fuel payments will be in the range of Rs. 234-254 Billion. In addition to fuel costs other IPPs are estimated to owed in over-due payments of Rs. 30-40 Billion. The total immediate problem of circular debt is estimated to be in the region of Rs 260 to 295 Billion.

nn. There is neither any consolidation of power sector entities nor reconciliation of balances available between these entities in individual financial statements. An example to this fact is that even the principal loan amounts reported by CPPA, DISCOs and PHPL do not reconcile with each other.

oo. This is no consolidated financial model in place that can project financial position, performance and results of power sector based on key assumptions such as price sensitivities, change in prices of imported fuel, PKR devaluation impact, interest rates,

impact of Capital expenditure to reduce T&D losses, improvement in recoveries, change in subsidy levels, etc. Absence of this model does not give a consolidated picture for effective decision making.

Recommendations

a. **Power Sector Lacks Consensus, Cohesiveness and Continuation (3 Cs)**: Various steps have been taken with regard to circular debt including relating to reduction in Transmission and Distribution (T&D) losses and improving recovery rates, however power sector seriously lacks a high-powered monitoring body that ensures *Consensus, Cohesiveness and Continuation* with regard to decisions and policy alignment amongst various stakeholders.

b. **Provincial Governments should be Stakeholders in Power Sector**: It is essential that provincial governments need to be stakeholders of the decisions at DISCO level while in consideration, to this power sharing with the Federal Government, Provincial Governments need to ensure maximum recovery (of previous receivables and present receivables) and minimal theft level at DISCOs. Any shortfall in recoveries or theft should be linked with a financial adjustment formula between the Federal Govt. and Provincial Governments through the national pool to ensure delivery from provincial governments. A minimum level of power sharing could be through involving relevant provincial line ministries at the Boards of DISCOs operating in the jurisdiction of relevant governments; while a maximum level of power sharing formula could be handing over of DISCOs to provincial governments however a mid-way could be transition that is starting by involving provincial governments at DISCOs Board and finally handover of DISCOs to provincial governments or privatizations or Public Private Partnerships for the DISCOs through Privatization Commission of Pakistan.

c. **Monitoring of DISCO Operations**: In any case Boards and functions of DISCO should be monitored through a high-powered committee or an institution. The said committee should be mandated to oversee strengthening of transmission and distribution networks of the DISCOs, monitoring of performance benchmarks and getting independent studies undertaken for DISCOs. World renowned experts in the area can be engaged or retained by the Committee/ entity for this purpose. Detailed mandate of the committee/ entity may be drafted, however following concepts can be considered for inclusion that are based on global best practices however are subject to further technical debate:

- Utilization of Capacity
- Move to Higher Voltages
- Shorter and more direct lines
- Demand management
- Balancing 3 phase loads
- Explore new technologies
- Eliminating multiple transformation levels
- Smart Grid for real time monitoring and controlling the systems.
- Innovative financing solutions

Besides above, the committee will also facilitate DISCOs in coordinating with governments (Federal, provincial and local governments) on various issues including subsidies, energy payments, police & law enforcement and right of way etc.

The issues at DISCOs with regard to T&D Losses have two dimensions that require appropriate approach (1) HR strengthening and introduction of incentive schemes to curb theft

and promote motivation (2) the other important aspect is the seriously lagging investment in the infrastructure. During Committee meetings it was observed that in past, GoP's investment approach towards circular debt has remained focused towards funding the gap rather than investing in infrastructure – a permissive - reactive approach rather than a preemptive approach. Going forward it is recommended that in high loss making areas of PESCO, SEPCO, HESCO and QESCO Jurisdictions. It is further recommended that proposed monitoring committee should assess the viability of smart metering combined with Aerial Bundle Cables and if viable should be installed with the support of police and provincial/ local governments. For this purpose, the monitoring committee, in parallel, should be able to provide political solution in consultation with the local governments and elders of the related areas.

Further a detailed recovery plan based on following parameters can be evolved by the proposed monitoring committee with provincial governments:

- Listing of difficult / hard areas and areas with concentration of defaulters;
- Two step media campaign: Phase-1 focusing on warning messages and Phase-II sharing of defaulter's names and locations on media;
- Assessment of legislative reforms if required for recovery under Land Revenue Act 1967;
- Establishment of a "Provincial Level Recovery Task Force", directly supervised by high grade officers in provincial governments, who should be assigned to recover amounts due from defaulters in hard areas, in consultation with provincial governments;
- Stage wise incentive schemes to be designed for recovery of arrears, considering following parameters;

  - Line staff can be incentivized to collect arrears with 2 months to six months
  - Local governments and tehsildars can be given incentives for recovery where default period is above six months and less than one year
  - Matters can be handed over to Recovery Task Force where recovery period is above 1 year

d. **Consolidated Reporting Practice:** A practice of consolidated balance sheet & financials need to be introduced and implemented. The consolidation process will compile financial results and positions of all the government owned power sector entities (after netting inter-organizational balances), as currently this financial information is spread over different organization and restricts timely and appropriate decision making. The concept of consolidated picture would also allow government functionaries to keep a check on the liabilities (on and off-balance sheet) generated by different entities of the power sector. This function of maintenance of consolidated balance sheet and liability register is to be delegated to any one of the public sector institutions or to a special cell at Ministry of Energy, so as to make all future decisions on the basis of this consolidated picture of the power sector.

e. **Simplification of tax structure:** The cumulative taxation impact (included in O&L price, generation, transmission and distribution levels) is also a significant contributor towards circular debt. Also, the resultant tax refunds at distribution companies are never received from tax authorities, which has a multiplying effect on circular debt when combined with T&D Losses, non-recoveries and delay in subsidies. In order to avoid this window dressing exercise and to reduce cash mismatch at DISCOs due to tax issues, the Federal Government has two choices: (a) It can either, at the CPPA level make a consolidated net adjustment with regard to taxes and subsidies, or (b) the Federal Government should neither charge taxes nor directly

give the subsidy. Consolidated financials of power sector will help in simplifying the current tax regime of FBR.

In recent past a series of meetings were held between Ministry of Energy (Power Division) and Federal Board of Revenue to discuss various Tax issues and a summary has been moved by Ministry of Energy to ECC for approval on April 2018, however these proposals and recommendations did not include consideration of consolidated tax approach for DISCOs.

f. **Use of Financial Modeling Techniques for Decision Making:** The basket (average) price of electricity generation has an impact on the quantum of circular debt. Accordingly, the energy mix and electricity demand & supply plan is crucial with regard to management of the circular debt in future years. Committee observed that the demand & supply plans developed by public offices are based on projects in pipeline and forecasting of demand at different growth rates say 4% and 7% etc. This planning method needs to be corrected and should be based on objective based planning. The objective based thinking and planning can be achieved in the following manner through financial modeling techniques:

- Forecasting Supply: The supply scenarios should be based on financial modeling techniques to forecast basket price of electricity over five to ten years keeping in view various factors like changing commodity prices (Oil, Gas, RLNG and Coal etc.) and dollar devaluations impacts. The dictating factors of future energy mix and supply levels should be based on forecasted 'basket electricity price' and demand levels, rather than quick fixes that subsequently turn into incorrect decisions.

- Forecasting Demand: This should be made after compilation of inputs from NTDC, DISCOs and planning division. These forecasts should be based on expected electrification in rural & urban areas, increase in electricity consumption levels based on forecasted GDP growth levels, impact of CPEC on Pakistani economy and other factors like expected level of solarization / net-metering in Pakistan.

- Projecting financial performance & position of power sector: Besides the above mentioned factors, the proposed financial model should take into account system losses, recovery rates, annual energy flows, sale tariff and project cost streams of transmission and distribution companies to project consolidated balance sheet, income statements and cashflows of the government owned entities under power sector.

The TORs for development of this financial model should immediately be developed and tender floated for participation of power sector experts who can develop this model and maintain it on behalf of the MoE. This model should become available within 9 months.

g. **Scope of Regulators:** The scope of two price control regulators that is OGRA and NEPRA need to be reconsidered either through merger of the two or through establishing procedures wherein impact of change in price of oil, gas and RLNG are considered by OGRA after considering its effect on electricity price for the consumers.

h. **NEPRA Act:** The NEPRA Act was recently amended by the previous government to bring it under its control rather than to allow it to continue as an autonomous agency. In the process it reduced the experience level to become a member of the authority and put other curbs on its independence. In most authorities in the world such as NEPRA there is a requirement of at-least 15 years of experience in related field and the members have extended continuity to ensure understanding and depth of policy making. The NEPRA act should be revisited.

i. **Demand-Supply Gap and Renewable Energy**: The current electricity supply demand gap will aggravate if renewable energy projects under development are kept at halt. Decisions of CCoE of the previous Government halting renewable energy projects should be revisited on the grounds that the electricity prices of the renewable sector are far less than the basket price of energy (and inclusion of renewable projects will have a positive impact on circular debt). Since the competitive bidding process require another 1-2 years for launching, 'Cost Plus Tariff' approved by NEPRA for small hydro, solar and wind projects should be implemented without delay by renewing the alternative energy policy 2006 for two years and issuing LOS to the projects in pipeline. Simultaneously AEDB/PPIB along-with the related provincial government entities to develop the competitive bidding documentation so that future renewable energy projects can be developed under the competitive bidding framework after 2020.

j. **Gas Allocations to GENCOs:** Proposed committee should also monitor domestic gas allocation, which is a cheap resource, for power generation for more efficient use in power generation.

k. **Minimize Use of Thermal Power Plants based on imported fuel and low efficiency rates**: Based on the consolidated reporting and financial model forecasts, discussed above, GoP should evolve a strategy to minimize the use of thermal power plants based on imported fuel and lower efficiency rates. This will reduce the price of electricity and circular debt level.

l. **New Power Policy & Plan**: The present draft of the power policy should be withdrawn from circulation and draft of the new power policy and plan reviewed by the present government in light of recommendations of the proposed committee and with input from experts who should be engaged through a competitive process to assist the government to finalize the policy and plan.

m. **RLNG FSAs:** Fuel Supply Agreements (FSA) of the government run RLNG projects and underlying guarantees need to be reviewed to understand implications of these agreements in case RLNG plants does not qualify on the merit order. Appropriate decisions will need to be taken at relevant forums for amending these agreements based on the review. For review of these agreements, independent consultants (consortium of technical, legal and commercial) may be engaged after developing TORs and following the requisite tendering process.

n. **AJ & K subsidized electricity rate:** In July 2017, Federal Government established a committee that has considered the tariff differential issue with GoAJK and Water Use Charges paid to GoAJK. The committee recommended raising of water use charges for GoAJK to Rs 1.1/kWh from existing Rs 0.15/KWh (in line with NHP agreed with provinces) and on recommended supply of electricity to AJK directly from CPPA rather than from DISCOs, as is done for K-Electric, based on tariff rates determined by NEPRA. Based on the recommendations of said committee the existing tariff differential subsidy by GoP as provided to consumers of Pakistan will also be extended to AJK, while Government Subsidy for AJK tariff differential will be eliminated. The recommendations were forwarded to ECC for approval and needs to be reviewed by the new government so that matter can be amicably resolved and implemented through execution of an agreement for amending the original Mangla Raising Agreement. The resolution of this issue will have an immediate impact on circular debt level.

o. **Agricultural Tube-wells:** Proposed monitoring committee (as discussed above) should investigate solution to end Agri tube well subsidies. Committee understands that currently a

plan for solarization of Agri tube wells (currently grid connected) is under consideration. It is noted that maintenance of solar panels and solar system by an uneducated farmer, who has received this system without incurring any cost seems to be waste of resources. A study should be conducted to setup a state-of-the-art solar power park of 500 MWp in Baluchistan under IPP mode (by any entity with global experience in this business) that can provide electricity to GoP for 25 years for onward provision of free electricity for these 30,000 tube wells. This will cost about Rs 6.5 B per annum to GoP (at current solar tariff rate) for provision of free electricity to Agri-tube wells, viability of which need to be assessed in comparison to current situation. On other hand GoP can make free/discounted electricity conditional that the existing Agri-defaulters clear at least (say) 10%-20% of their existing dues and/or adoption of modern Agri-techniques to conserve water tables of Baluchistan.

If the study confirms that a 500MWp park is better than the solarization of each tube well then the Government can follow a competitive bidding process for a 500 MWp power plant in Baluchistan under IPP mode. The generation price of electricity from power plant will cost Rs 6/kWh.

p. **ISP Subsidy:** The last government announced a subsidy[3] of Rs 3/Kwh for the Industrial Sector for enhancing the export base of the country. However, there were questions on the viability of the ISP subsidy for which a committee was constituted by ECC keeping in view the proposals of power division that the payment of ISP claims from cross subsidizing against negative fuel price adjustments could not continue after December 2017 and owing to financial difficulties, the support package is not sustainable after December 2017 till improvement in the financial health of the sector. The findings of the committee and viability of the ISP subsidy need to be revisited by new government.

q. **Reforms in legislative framework of Power Sector**: Pakistan is today facing an energy crisis, which is partly attributable to an outdated legislative framework which has been amended in an ad-hoc manner from time to time when an urgency in the need for legal amendment is felt. However, such knee jerk reactions tend to address urgent issues, but often overlook the importance of cross verification of laws against related legislation, and at times with other provisions of the law itself. While the world has developed its legislative frameworks in a manner which is suited to accommodate newer technologies and research, the power sector legislative framework has not kept pace with global developments. Accordingly, in order to address this issue and establish a sound legislative framework in Pakistan, a process to revamp the relevant electricity laws is to be initiated. The process should be based on through research of existing legal framework, contains cross jurisdictional analysis, and also documents in detail the rationale and need for each and every proposed change in the law.

r. **Socio-Economic Impact:** Unreliable and expensive electricity impacts output and profitability of the local industries, livelihood of laborers and farmers, competitiveness of locally produced goods and services globally, level of imports and trade balance. Government should strive to provide cheap and reliable electricity to people of Pakistan, it has the potential to change nations direction.

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[3] https://fp.brecorder.com/2018/05/20180529375521/

Chapter-1 Understanding the Circular Debt Issue

1.1. 'Circular debt' is an issue which has eluded policymakers in last decade, and in fact is still continuing to do so. Conceptually, circular debt arises when one party in a supply chain does not having adequate cash flows to discharge its obligations to its suppliers, when the payment is not made or delayed, it affects the supply chain, resulting in operational difficulties and liquidity crunch for all players in the sector, none of whom are then able to function properly. This liquidity shortfall ultimately ends up at the 'supplier in the chain' who cannot withhold payments and who resultantly either stops buying and supplying or defaults.

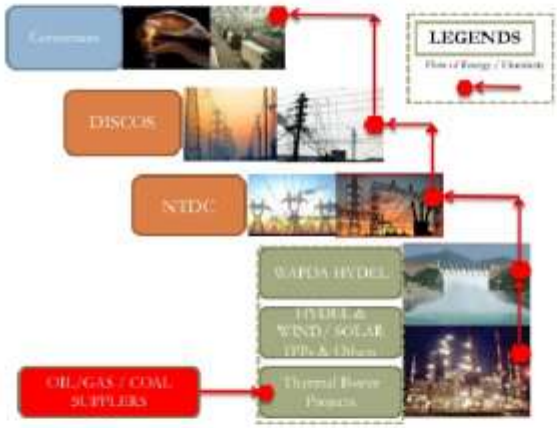
1.2. To understand how circular debt emerges and the solutions that might be possible to eliminate or reduce the circular debt one has to understand the power supply chain (generation, transmission and distribution).

Brief on Power Sector Supply Chain:

1.3. The supply chain of power sector is understood from two perspectives (1) Energy flow perspective, and (2) Funds Flow Perspective.

Energy Flow in Power Sector Supply Chain

1.4. From energy flow perspective the contribution in circular debt emanates from loss of electricity during the process of transfer and supply to the ultimate consumers. This loss or resultant contribution towards circular debt can be recovered if the price to the consumer is increased by the amount of loss. However since the regulator (NEPRA) does not allow all these losses originating either (a) from transmission of electricity by NTDC or (b) during distribution or because of theft of electricity at DISCOs level, then the extent to which these losses are not included in the consumer price, results in increase in the amount of circular debt every year. Such losses are usually referred to as Transmission & Distribution Losses (T&D) losses in the power sector. The extent to which these losses are allowed in the tariff by regulator are referred as targeted T&D losses which are compared with actual T&D Losses to understand the cash flow impact on DISCOs.



1.5. From the standpoint of circular debt, type of fuel used in electricity generation is also important. Accordingly, energy flow in power sector needs to be further dissected in (a) electricity flow from imported fuel-based electricity generation and (b) electricity flow from renewable and other domestic sources.

1.6. Electricity generated by imported fuel-based power plants has more significant impact on the economy of Pakistan as the related circular debt gets adversely affected when the

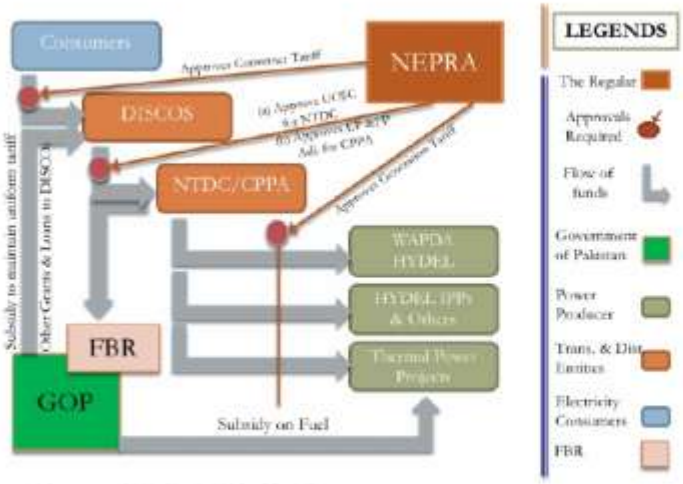
international prices of oil, gas and coal rises. The impact is further aggravated, when the local currency devalues.

1.7. On the other hand renewable and domestic fuel-based energy generation (hydel, wind, solar and bagasse) is immune to such price fluctuations (in related commodities) in the international market. Due to these reasons, energy security and environmental friendliness of renewable energy, all developed and underdeveloped countries including China, USA, Germany, Denmark, France, Egypt, India, UAE, KSA etc. have achieved or are in process of achieving an energy mix with substantial weight given to the renewable energy segment and to other indigenous resources.

1.8. As of date the generation mix[4] of Pakistan has about 63% weight towards thermal segment, while Hydel is about 27% followed by others. A detailed analysis of generation mix is provided in the next chapter of this report.

Funds Flow in Power Sector Supply Chain

1.9. The payments against electricity bills are collected by DISCO's for meeting their own expenditures and for onward payments to NTDC / CPPA against power transmission and electricity purchase cost. In this regard, CPPA performs the 'agency function' on behalf of DISCO's with regard to purchase and transmission of electricity to DISCOs. Accordingly, payments are made by CPPA to these generation and transmission companies, on DISCO's behalf.



1.10. As discussed above, in case of thermal power generation companies, funds generated by DISCOs are routed through CPPA for onward payments to IPPs and their fuel suppliers (PSO, SNGPL, SSGCL and Mari Gas).

1.11. These fuel suppliers are the foundations of the thermal sector supply chain pyramid, however pricing of oil & gas is regulated by Oil and Gas Regulatory Authority (OGRA) while NEPRA's ambit is limited to determination of tariffs at every stage of transfer of electricity from one entity to another starting from IPPs and ending on DISCO's & K-Electric. Taxes emanating from oil and gas segment also contribute towards circular debt issue. Furthermore, the division within the 'regulatory pricing control structure' does not allow both the regulators (that is NEPRA and OGRA) an overall picture.

Understanding Major Reasons Behind Circular Debt:

[4] Based on information regarded installed and de-rated capacities as provided by Ministry of Energy (MOE) through email dated August 9, 2018

1.12. Level of circular debt and annual shortfall is directly proportional to three main factors

a) Electricity price passed to consumer
b) Electricity quantity passing in the system
c) Aggregate Losses of the System (T&D Loss and Recovery Shortfall)

1.13. **Electricity Price:** The electricity price is dependent upon (a) type of generation or generation mix of Pakistan, (b) cost of transmission and distribution and (c) losses that are allowed to be built into the electricity price. As discussed above NEPRA regulates electricity pricing at all levels (except of fuels for thermal segment that is done by OGRA). It is important to note that if GoP does not notify consumer end price, as approved by NEPRA, this also results in circular debt. In pricing of consumer end tariff, NEPRA allows certain system losses (T&D Loss) to be built in the electricity price. Resultantly, as electricity becomes expensive each unit lost or not paid by consumer has a cost (mainly generation cost) and resultantly higher generation price will result in higher financial loss and ultimately higher circular debt.

1.14. **System Losses:** During process of transmission and distribution some amount of electricity loss is inevitable that is usually allowed by NEPRA, however there are elements like system inefficiencies and electricity theft (hooks, *Kundas*, meter tampering etc) that are not allowed to be built in consumer price. Also, there are recovery issues that includes running defaulters, delayed payments, permanent disconnections, delay in different subsidy payments due to various reasons discussed in this report. Loss of revenue due to low recovery rate is not allowed to be included in electricity price (NEPRA issued tariff based on 100% recovery assumption).

1.15. **Quantity of Electricity**: In the pretext of circular debt, quantity of electricity is a loss multiplier, the one-unit-Rupee-loss multiples on the number of electricity units passing in the system.

1.16. **Case Example**: To understand simply the significance of electricity price and system losses on the level of circular debt following example is available:

- Electricity generated (about 120,400 GWh)
- Aggregate Technical & Commercial (AT&C) losses (24.8% that is based on T&D Losses of 18.3% and 92% recovery rate),
- therefore electricity revenue collected for only 90,540 GWh
- if average Electricity Sale Price is around Rs 9.78/kWh (Generation price Rs 8.53 / kWh, Transmission and Distribution cost of Rs 1.25 / kWh)
- then the annual deficit is Rs 292 Billion which has to be assumed either by GoP or passed on to consumer.

However, NEPRA allows certain losses of 16.3% (of T&D Losses) out of AT&C of 24.8% to be built in the electricity price, impact of this on above example is as follows:

- Electricity Price will increase from Rs 9.78/kWh to Rs 11.37/kWh
- AT&C Losses will reduce from 24.8% to 9.02%
- Resultant financial loss to the economy is split. Consumer bears cost of Rs 175 Billion per annum in their electricity bills and GoP is stuck with an amount of Rs 116.4 Billion per annum, which results in circular debt.

On other hand if generation price increases by Rs 1/kWh due to increase in oil/gas/RLNG prices or devaluation the price to consumer will increase to Rs 12.53 / kWh and financial loss increases by Rs 10.2 Billion for each Rs 1/kWh that will take GoP loss to Rs 126.6 Billion / annum (from Rs 116.4 Billion).

In the socio-economic structure of Pakistan, above discussed increase in energy price will affect paying capacity of consumers that in turn will increase poverty, theft, non-recoverability and result in additional loss say Rs 12 Billion per 1 Rupee increase in electricity price. Resultantly the annual contribution towards circular debt will increase to Rs 128 Billion/ annum besides impact on GDP and competitiveness in the in international market.

History and Status of Circular Debt:

1.17. The circular debt started emerging on power sector books from FY 2007. This occurred in the backdrop of the shift from low cost generation to high cost generation from 1985 to 2010. The contribution of hydro power as a cheap source of power declined from 52% to 30% and generation become more focused towards thermal power.

1.18. Furthermore, in 2007 there was a sharp devaluation of Pak Rupee from PKR 60/US$ to about PKR 75/US$ and a sharp price increase in imported fuels (37% increase in oil prices) which dramatically increased the price of imported fuels. This increase of cost was not entirely passed on to the consumers by GOP, resulting in the emergence of the circular debt monster. A summary the difference between NEPRA determined tariffs and GoP notified tariffs during 2007 to 2010 are provided hereunder:

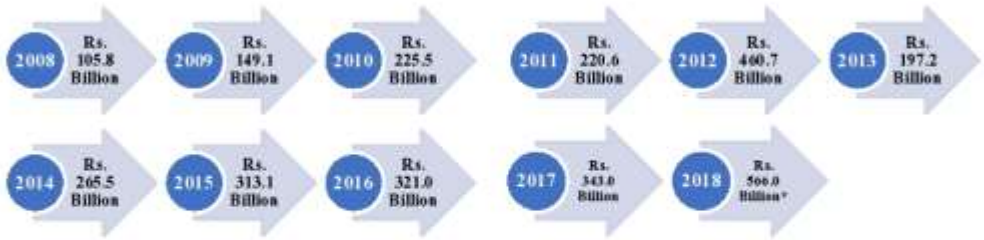
TARIFF EFFECTIVENESS RS / KWH	NEPRA DETERMINED TARIFF	NOTIFIED BY GOP	GAP
Feb 2007	5.14	4.25	0.89
March 2008	5.60	4.78	0.82
September 2008	8.42	5.58	2.84
February 2009	8.42	5.63	2.79
October 2009	8.42	5.96	2.46
January 2010	10.09	6.67	3.39

Source: NEPRA State of Industry Report 2010

1.19. During 2008 the electricity sale was 65,540 MkWh and gap of approximately Rs 1.1 / kWh which contributed Rs 76 Billion[5] in circular debt for 2008 and increased cumulative circular debt level to Rs 168 Billion during that year. MOE during presentations to committee provided historical trend of circular debt numbers which do not reconcile with NEPRA State of Industry Report.

1.20. As per Ministry of Energy (Power Division)[6], the term circular debt is the amount of cash shortfall within the Power Purchasing Agency (CPPA), which it cannot pay to the power supply/service companies. The Companies include i) Oil marketing companies, ii) Gas distribution companies, iii) IPPs, iv) Nuclear Power Plants, v) WAPDA Hydel and NTDC. As per the Power Division, historic build-up of circular debt has occurred in the following manner;

[5] NEPRA State of Industry Report 2010
[6] Presentation in Circular Debt to the Senate Committee by Ministry of Energy (Power Division)



Source: MOE (Power Division) Presentations

1.21. Above numbers were presented by MOE during committee meetings however it is pertinent to highlight that numbers appearing in CPPA audited balance sheet & NEPRA State of Industry Reports do not reconcile with the MOE presented figures. Accordingly, for the purpose of independent analysis of circular debt level in this report has been calculated as CPPA's gross receivables from DISCOs after adjusting for equity injections by GoP for settlement of circular debt. Kindly note that receivable from K-Electric and funding from tariff rationalization surcharge has not been assumed in the analysis conducted hereunder to maintain the objectivity and identify reasons towards circular debt and measures taken to reduce the same.

For understanding purposes, Tariff Rationalization Surcharge is levied by GoP with an aim to maintain uniform tariff across the country and minimize / eliminate subsidy within industrial, commercial and bulk consumers. The collection of this surcharge is deposited in Tariff Rationalization Fund for discharging liability of Power Producers. During FY 2017 CPPA utilized Rs 21 Billion while in FY 2018 a negligible amount of Rs 0.3 Billion was utilized for payment of IPPs.

1.22. Based on the above, CPPA financial statements were reviewed and it was noted that actual gross receivables of CPPA from the DISCOs' as at June 30, 2017 stood at Rs. 1.067 trillion (before netting of government equity and loan injections) that has crossed Rs 1.5 Trillion mark[7] in June 2018. During the process of built-up of these gross receivables of CPPA, the GoP resorted to different quick-fix solutions as stated below.

1.23. In 2012-13 GoP injected about Rs. 342 Billion[8] as equity in the distribution companies for meeting circular debt requirements, while Rs. 23.96 B were subsequently reversed in 2016, accordingly as on 30th June 2017 GoP's equity contribution in the DISCO's towards circular debt issue stood at Rs 318 B (approx.). It is highlighted that the indicators of circular debt started appearing from 2008, and no investment in infrastructure or assets were made to reduce underlying issues rather funds were injected towards sunk cost with no return in shape of equity investment. Because of this reason the related equity investment stands eroded at the balance sheets of DISCOs. During FY 2018, GoP has injected further equity of Rs 20 Billion that has increased GoP's cumulative equity contribution to Rs 338 Billion invested towards settlement of circular debt.

1.24. Besides equity contribution, GoP has raised loans through Power Holding (private) Limited from local banks at commercial terms and injected these funds in DISCO's towards settlement of circular debt. By end of FY 2017 (i.e. June 30, 2017), the total loans raised by PHPL and allocated to DISCOs amounted to Rs. 439 billion[9], backed by GoP Guarantee. During FY 2018, GoP has raised further loans of Rs 144 Billion because of which total debt burden on DISCOs has reached Rs. 583.5 billion[10] as at June 30, 2018.

[7] Financial Statements of CPPA-G FY 2018 and 2017
[8] Financial Statements of CPPA-G FY 2018 and 2017
[9] Financial Statements of PHPL for the year ended on June 2017
[10] Unaudited Financial Statements of PHPL for the year ended on June 2018

1.25. Based on above total funds injection by GoP (equity plus debt) was Rs 757 billion as at June 30, 2017 that has increased to Rs. 921 billion by the end of financial year 2018. Had this amount been injected towards betterment of systems and infrastructure the same would have resulted in a significant improvement in the power sector and reduction in circular debt.

1.26. There is a dire need for consolidation and reconciliation of balances between power sector entities. An example to this fact is that even the principal loan amounts reported by CPPA, DISCOs and PHPL do not tie in with each other.

1.27. A summary of funding gap over last 2 years, based on the review of the financial statements of CPPA-G and PHPL is summarized hereunder:

CIRCULAR DEBT LEVEL EXCLUDING KE RECIEVABLE AND TRS FUNDING	2017	2018
	Rs in Billion	
1- Gross Receivable from DISCOs	1068	1,534
2- Funding Sources:		
D- GoP Equity Contribution	318	338
E- Outstanding Commercial Loans	439	583
F- Sub-total	757	921
3. Circular Debt Amount (1 - 2C) payable within supply chain	**311**	**613**
4- Actual Circular Debt Amount (1– 2A) towards suppliers & lenders	**750**	**1,196***

Source: Financial Statements of CPPA & PHPL

*June 2018, increasing every month

1.28. During meeting with PHPL officers with regard to status of loans it was informed that as per the decisions of the meeting held on May 21, 2009 under the chairmanship of the then Advisor to the Prime Minister on Finance and attended by the representatives of World Bank and Asian Development Bank it was inter-alia resolved that "*as soon as possible but before June 30, 2009 GoP will remove the bank borrowings (along with the mark-ups) that are on the books of power companies (PEPCO, GENCOs, CPPA, NTDCL, DISCOs, WAPDA) as a consequence of GoP's unpaid subsidies from year 2004 through 2009 amounting to Rs. 216 billion and these amounts will be placed in a holding company (wholly owned by the GoP) outside the power sector while the repayments would be managed through other means such as asset sale. It was also resolved that servicing of the liabilities will be reflected in the budget. In pursuance of the said resolution, PHPL was created in 2009.*"

1.29. However, from the review of the financial statements of PHPL, CPPA and DISCOs, we understand that the above decision was not implemented and debt servicing burden is still on the power sector instead of being transferred on the budget. This fact clearly indicates that actual level of circular debt is Rs 1.196 Trillion out of which Rs 613 Billion is outstanding towards IPPs and oil/ gas suppliers. (we understand that MOE recently in presentations made to Finance Minister have accepted the fact that circular debt includes loans)

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Chapter-2 Generation, Energy Price & Consumption Patterns

Capacity Mix

2.1 The present installed available capacity (August 8, 2018) of connected to NTDC Grid is in excess of 30GW[11] which is heavily skewed towards thermal energy with over 63% of electricity requirement being met through fossil fuels (coal, gas, RLNG and Oil). At present, no major indigenous coal based plants are operational in Pakistan however they are expected to come online soon.

Type of Plant	*Installed capacity (MW)*	*De-rated capacity (MW)*	*%age*
Thermal – Mostly Imported Fuel			
Refined Fuel Oil (RFO)	6,521	5,906	19%
Gas/RLNG	12,056	10,849	35%
Coal	2,810	2,638	9%
Sub-total	**21,387**	**19,393**	**63%**
Other Indigenous Sources			
Hydel	8,443	8,443	27%
Nuclear	1,345	1,246	4%
Wind	1,033	1,033	3%
Bagasse	201	191	1%
Solar	400	400	1%
Sub-total	**11,422**	**11,313**	**37%**
Grand Total	**32,810**	**30,707**	**100%**

Source Ministry of Energy (Power Division)

2.2 Out of Gas/RLNG based generation facilities of 12,056 MW (De-rated 10,849 MW), there are 1,431 MW (De-rated 1,174 MW) worth of generation facilities that are based on natural gas. Most of natural-gas-based generation facilities are government owned (GENCO's Guddu, Kotri and Quetta with cumulative gross capacity 1291 MW) that are far less efficient compared to IPPs. Cumulatively GENCOs are consuming about 400 mmcfd which if diverted to more efficient IPPs can reduce the power purchase cost for the consumers.

2.3 Besides above certain IPPs are using dedicated gas resources (i.e. not based on imported fuel) with a gross capacity of 1,624 MW (De-rated 1,518 MW). These mainly include power projects of Uch, Liberty, Foundation and Engro.

2.4 Pakistan's dependence on the fossil fuel is 63% however, if above discussed indigenous gas consumption is excluded than imported fuel dependence stands at 55%[12], based on Pakistan's existing energy mix, which is a threat to energy security. The imported fuel

[11] The information provided by MOE contained an error in calculation. The error related to sum of capacities for furnace oil (FO) based IPPs where capacity of KAPCO was missed in the totals. Above figures have been documented in this report after correction of the error in MOE figures.
[12] Based on MOE MOE information "List of Gas/RLNG Plants & Gas/RLNG Requirements"

dependence also results in sudden price jumps in consumer tariff that impacts consumer affordability levels and recoverability level of Distribution companies.

2.5 Within Hydel Segment constituting 8,443 MW, 79% relate to three major dams that is Tarbela, Mangla and Gazi Brotha. The hydel Segment also includes Neelum Jehlum 729 MW that is in testing phase.

2.6 It is evident from above that previous government remained focused on imported fossil fuels and added about 7,900 MW RLNG based capacity mainly in last 14 months (till August 2018), while same is expected to reach 10,000 MW in near future that will further increase reliance on imported fuels.

2.7 In this regard, it was noted that the previous government also stopped all renewable energy projects (small hydros, wind, solar and bagasse) approximately over 1600 MWs which had not signed Implementation Agreement (IA) or Energy Purchase Agreement (EPA) as per last Cabinet Committee on Energy ('CCE') meeting held on 12 December 2017.

Understanding Tariff Structures

2.8 The generation tariffs for power plants are mainly of two types under currently applicable regime. The 1st type of tariff constitutes of (a) Capacity Purchase Price (CPP) and (b) Energy Purchase Price (EPP), while the 2nd type of tariff does not have a CPP component and only EPP is applicable.

2.9 CPP component covers debt servicing, rate of return and other fixed costs of the power plant, while constituents of EPPs are dependent upon whom it is paid to, like in case of thermal it includes fuel cost and variable operational and maintenance (O&M) costs, while in case of Hydel it includes water use charges and variable O&M, however in case of wind or solar EPP includes all cost components that are paid based on energy supplied in kWh terms. The major distinction between two is that CPP is dependent upon availability of plant and not how much plant has produced while EPP is paid only if electricity is produced by the plant.

2.10 These two types of tariff are structured based on the types of risks parked with generation facilities and IPPs. For example, thermal and hydro are paid both CPP and EPP components while Wind and Solar Projects are paid only EPP component, but since CPP is not paid to wind and solar they are must run plants to ensure that these remain bankable. In case electricity is not procured or evacuated by a wind or solar plant, due to fault of GOP, GoP will have to pay against deemed energy that would been procured.

2.11 In nutshell, thermal and hydro projects are paid CPP depending upon their availability and not linked to the fact how much energy is produced by these plants, while EPP is paid once they produce electricity, since thermal plants are subject to merit order (government gets electricity to the extent required depending upon the cost of fuel and efficiency rates of plants) while hydro projects subject to resource risk (water availability). On other hand wind and solar are not paid CPP but these are "must run" which means if these plants produce electricity (depending upon availability of wind or sun light) government is bound to procure that electricity.

2.12 Thermal and hydro projects are paid CPP depending upon their availability and not linked to the fact how much energy is produced by these plants, while EPP is paid once they produce

electricity, since thermal plants are subject to merit order (government gets electricity to the extent required depending upon the cost of fuel and efficiency rates of plants) while hydro projects subject to resource risk (water availability). On other hand wind and solar are not paid CPP but these are "must run" which means if these plants produce electricity (depending upon wind or sun light) government is bound to procure that electricity.

2.13 Based on discussions held with various industry professionals it is important that Fuel Supply Agreements (FSA) of all the government run RLNG projects be reviewed, as it seems like that these FSAs for RLNG purchase are structured in a way that even if these plants do not qualify in merit order, and do not generate electricity, these plants still have to make payments to the RLNG suppliers. This could result in a new type of circular debt issue where CPPA under the Energy Purchase Agreement will not be subject payment of EPP component while the power plant/IPP will be required to make payments to the RLNG suppliers. This conclusion is subject to further review and vetting of the agreements for RLNG plants.

2.14 The tariff control period of generation projects varies depending upon the technology, however generally the tariff of any project is higher in the first 10-12 years because of the debt component however once debt is fully repaid there is significant reduction in tariff.

Energy Mix and Source-wise Cost – FY 2018

2.15 The electricity produced by the generation facilities connected to NTDC Grid was 120,400 GWh, during FY 2018, out of which 66% energy was supplied by Thermal segment, 27% by renewable energy and 7% by nuclear and other mix sources.

2.16 Total cost of energy was Rs 1.16 Trillion in which CPP component was Rs 36%, mainly contributed by thermal segment. while remaining was EPP component. The average (basket) price of electricity was Rs. 9.6/kWh, based on energy mix in FY 2018.

2.17 Table below summarize the impact of energy and cost mix of different sources on the basket price, based on the CPPA data for FY 2018.

SOURCE	ENERGY (GWH)	SHARE %AGE	CPP RS IN M	EPP RS IN M	TOTAL RS IN M	SHARE %AGE	CPP RS/ KWH	EPP RS/ KWH	TOTAL RS/ KWH
THERMAL	**78,957**	**66%**	**188,322**	**669,507**	**877,829**	**76%**	**2.4**	**8.5**	**11.1**
GENCOS	23,671	19.7%	57,970	219,491	277,461	24%	2.4	9.3	11.7
RFO	16,006	13.3%	50,332	166,646	216,978	19%	3.1	10.4	13.6
GAS	14,919	12.4%	36,759	85,221	121,980	11%	2.5	5.7	8.2
RLNG	15,361	12.8%	31,769	131,284	163,053	14%	2.1	8.5	10.6
HSD	908	0.8%	3,674	9,538	13,212	1%	4.0	10.5	14.5
COAL	8,092	6.7%	27,818	57,327	85,145	7%	3.4	7.1	10.5
NUCLEAR	**8,720**	**7%**	**67,351**	**9,135**	**76,486**	**7%**	**7.7**	**1.0**	**8.8**
RENWABLE	**32,058**	**27%**	**140,160**	**61,676**	**201,837**	**17%**	**4.4**	**1.9**	**6.3**
HYDEL	27,975	23%	136,238	2,871	139,109	12%	4.9	0.1	5.0
WIND	2,232	2%	793*	38,606	39,400	3%	0.4	17.3	17.7
SOLAR	700	1%	29*	12,969	12,998	1%	0.0	18.5	18.6
BAGASSE	1,151	1%	3,100	7,230	10,330	1%	2.7	6.3	9.0
MIX (SPP)	**666**	**1%**	**1,141**	**4,125**	**5,266**	**0%**	**1.7**	**6.2**	**7.9**
TOTAL	**120,400**	**100%**	**416,974**	**744,444**	**1,156,152**	**100%**	**3.5**	**6.2**	**9.6**

Source: Analysis has been conducted on CPPA Data for CPP, EPP and Energy for 2018

*This seems to be paid due to delay in interconnection of these plants

2.18 Based on above table, thermal segment contributed at an average price Rs. 11.1/kWh. Highest price within thermal segment was of HSD based generation facilities at Rs 14.5/ KWh, followed by RFO at Rs 13.6/ KWh, RLNG at Rs 10.6/ KWh, Coal at Rs 10.5/KWh and Gas at Rs 8.2/kWh. GENCOs with their mixed used were at Rs 11.7/kWh. It is to be noted that these sources are subject global commodity prices of fossil fuels (except for local coal plants once included in the basket).

2.19 Renewable segment contributed at Rs 6.3/kWh. The current generation mix includes wind and solar projects with older tariffs when these technologies were expensive with Wind at Rs 17.7/KWh and Solar at Rs. 18.6/kWh. However recent tariffs of these technologies have a price of around Rs 7/kWh for first year. Hydel currently stands at Rs 5/kWh, as debt period of these plants is complete however new hydel tariffs will have a tariff of around Rs 10.33 /kWh.

2.20 Following table has been prepared to understand the impact of new tariff based on projects under development and in pipeline, which indicate that wind and solar projects are becoming cheapest source of electricity compared to all other sources.

Source-wise Comparison Price of Electricity	*CPP (Rs./kWh)*	*EPP (Rs./kWh)*	*Total (Rs./kWh)*	*Basis*
Hydel Projects				
Old Hydel Projects	4.87	0.11	4.97	CPPA data FY 2018
New Hydro Projects	9.69	0.64	10.33	Note-1
Thermal				
Old RFO Projects	3.14	10.41	13.56	CPPA data FY 2018
Gas based Projects	2.46	5.71	8.18	CPPA data FY 2018
RLNG Projects	2.07	8.55	10.61	CPPA data FY 2018
Imported Coal	3.44	7.08	10.52	CPPA data FY 2018
Thar Coal	5.46	5.17	10.63	Note-2
RE Projects				
Old Solar Tariff	-	18.58	18.58	CPPA data FY 2018
Latest Solar Tariff	-	7.15	7.15	Note-3
Old Wind Tariff	-	17.65	17.65	CPPA data FY 2018
Latest Wind Tariff	-	6.77	6.77	Note-4
Bagasse Tariff	2.69	6.28	8.97	CPPA data FY 2018

Source: Various Sources

Note-1 Based on review of NEPRA's tariff determinations (April/May 2018) of Kohala and Azad Pattan Projects for 1st agreement year, once these projects become operational. The energy price is estimated based on the capacity factor of 52.9%. It is important to highlight that the said tariff will reduce to Rs. 4.5/kWh (subject to devaluation) after 12 years of debt servicing. Current conversion rate has been assumed at US$ 1 = Rs 120 to keep it comparable with CPPA data of FY 2018.

Note -2. The tariff shown is based on Thar Coal Upfront Tariff June 2016 with LIBOR, FX Adjustments only. The tariff has been calculated assuming PKR/USD rate of 105, and LIBOR Rate of 1.33%, to keep it comparable CPPA 2018 Data.

Note -3 Tariff is based on NEPRA Determination for Zorlu Solar Power Project dated January 2018, that is a 100% foreign funded project and capacity factor of 20%. ZSPL. Current conversion rate has been assumed at US$ 1 = Rs 120 to keep it comparable with CPPA data of FY 2018. Other 250 MW of Projects holding similar level of tariffs are currently awaiting issuance of Letter of Support from GoP.

Note -4 Based on Tariff Determination for 50MW Wind Power Project (of Shaheen foundation) funded through SBP Renewable Financing Facility, dated August 2018. Tariff is recalibrated at comparable CPPA 2018 Data Assumption of PKR/USD of 120. The tariff is based on the capacity factor of 40.6%.

2.21 The GENCO's are far less efficient compared to IPPs operating in Pakistan and continuity of these less efficient plants are burdening Pakistan's economy as these negatively impacting power purchase cost (compared to other options) that in turn is affecting paying

capacity of consumers and resulting in theft or non-recovery of bills and unnecessary increase towards circular debt.

2.22 The primary reason for high electricity cost in Pakistan is actually linked to delay in exploitation of hydro power potential in the country. Due to this delay a number of private sector oil-based IPPs were added to the system in 1994 and 2002. While these IPPs provided much-needed new power generation capacity at the time, the country's generation mix tilted heavily towards Fuel Oil/Furnace Oil (FO) that is currently hovering around at a Price of Rs 13.6 kWh and holds a 13% share in energy mix and 19% share in cost of electricity.

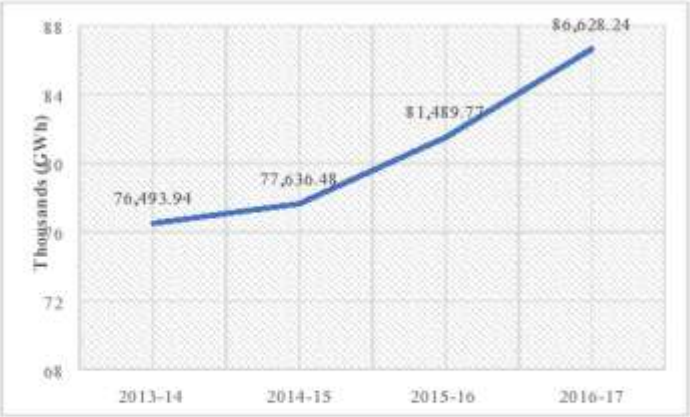
2.23 Above issue further aggravated due to the GOP's policy to divert gas to other sectors of the economy, such as domestic consumers, and to encourage use of compressed natural gas (CNG) for private vehicles further limited gas supply to the power sector, forcing thermal generators to depend on more expensive fuels. Gas shortages further pushed thermal generation towards more expensive fuels.

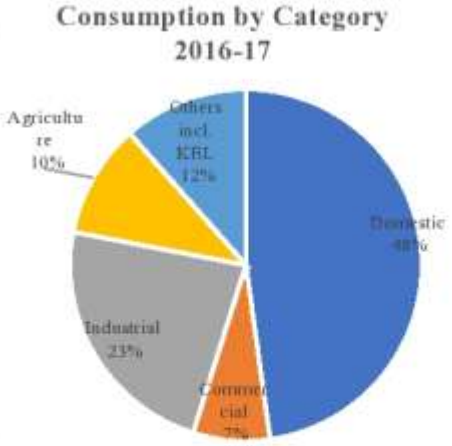
2.24 Over time, the price of imported FO/HSD increased substantially, inflating the cost of generation. This increase in cost was not passed on to consumers either by delaying the NEPRA tariff that impacted circular debt or subsidies.

2.25 In addition to vast un-exploited hydel resources in the country, global technological innovation has provided an opportunity to Pakistan to exploit indigenous resources such as Wind and Solar, which are available in abundance, and reduce the strangle of imported fuel that directly challenge our growth potential. Due to prioritization of energy security, the global shift to renewable energy has seen a considerable increase. For example, India has built up its renewable portfolio to 20% of installed capacity, compared to a meagre 4% in Pakistan. The current situation in Pakistan could seriously compromise the energy security of the state while placing ever increasing stress on the financial resources of the GoP.

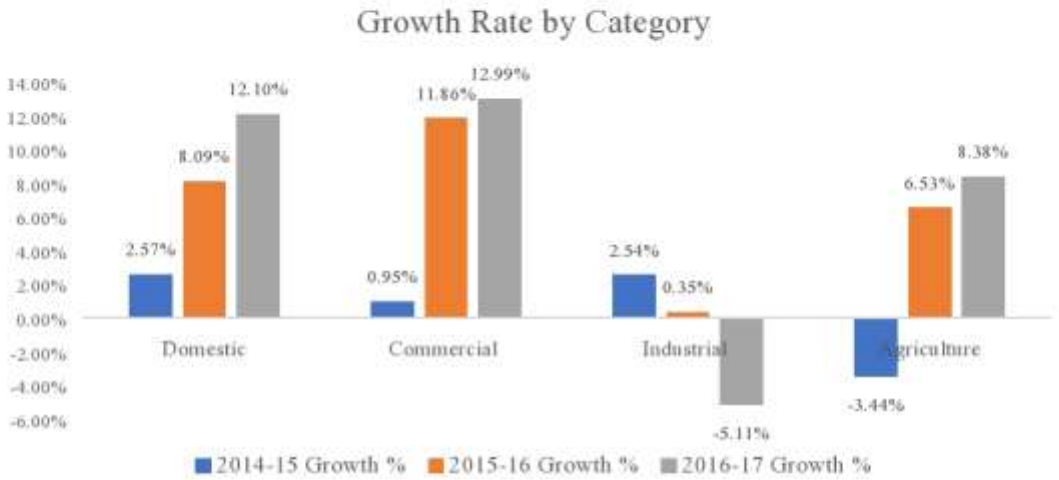
Energy Consumption

2.26 The Country has consistently seen an increase in Demand over the last 4 years. For the Year 2016-17, Demand in Pakistan rose 6.31% to 86.6GW with Domestic Consumers creating the largest Demand at 48%, followed by Industrial Consumers at 23%. Category-wise Demand and Historical Demand increase has been presented in below.

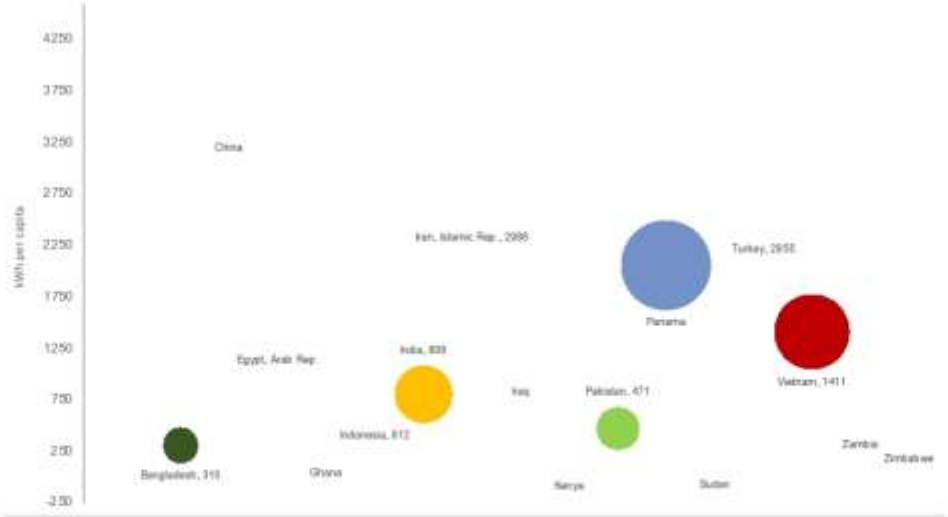




2.27 Analysis of Demand Growth that has occurred over the past 4 years provides greater insight into factors driving demand growth in Pakistan and why the Committee feels that projected Demand may be ***suppressed*** (i.e. is higher) by certain elements.



2.28 Domestic & Commercial Demand has experienced double digit growth due to lower load shedding (increased supply), and higher Consumption in the economy creating demand for Energy (higher appliance infiltration). This increase is further augmented due to increased commercial activity. Agriculture consumption also experienced a large increase due to installation of tube-wells. This overall increase was in line with increased GDP Growth of the Pakistani economy. Worryingly, Demand from the industrial sector experienced negative growth due to over-reliance on industrial Captive Power Plants – that is Industrial Generators - for the reason of uncertain supply from the Grid. This pattern is worrisome for the following factors; it artificially reduces Energy Demand in the economy whereas actual demand is high but is temporarily being met with off-grid Energy; Captive Plants are expensive that have knock-on effects on prices of goods in the economy increasing cost inflationary pressures and reducing competitiveness of local products in the global market; the moment supply from Grid becomes certain, industrial consumers will shift back to buying Energy from the Grid as it is cheaper causing an unexpected large increase in Energy Demand in the future. On other hand it is also important to highlight that per capita energy consumption of Pakistan (as provided hereunder) is one of the lowest in world and electricity demand is expected to grow at fast pace if the supply is available.



Chapter-3 Projected Demand Supply Gap of Electricity

Demand and Supply Analysis

3.1 The Power Division, in its presentation to the Senate Committee depicted the following forecast of demand and supply of the electricity, with Supply crossing 60GW by 2025, based on this data electricity shortfall will reduced to minimal 440 MW (at demand grown assumption of 7%) in FY 2019 and will further reduce to 229 MW in next year. Electricity shortfall will completely disappear from FY 2021.

All figures are in MWs

Year	*Installed Capacity*	*Additions*	*Capability*	*Demand Growth (4%)*	*(Deficit)/ Surplus*	*Demand Growth (7%)*	*(Deficit)/ Surplus*
2018-19	33,299	NP*	26,124	26,348	(224)	26,564	**(440)**
2019-20	36,064	2,765	28,194	27,420	774	28,423	**(229)**
2020-21	40,696	4,632	30,843	28,601	2,242	30,413	**430**
2021-22	44,476	3,780	33,647	29,822	3,825	32,542	**1,105**
2022-23	46,161	1,685	35,321	31,095	4,226	34,820	**501**
2023-24	51,260	5,099	40,283	32,429	7,853	37,297	**2,986**
2024-25	60,088	8,828	46,644	32,816	12,828	39,865	**6,779**

Source All figures are provided by Ministry of Energy (Power Division), except additions that have been calculated based on MOE numbers
*NP means NOT PROVIDED

Capacity Additions

3.2 During the discussion on above forecast it was pointed out that a total of 26,789 MW capacity is proposed to be added in the generation mix from July 2019 to June 2025. Based on this Committee requested a detailed year-wise breakup of proposed capacity additions. The breakup of capacity additions provided by MOE, are summarized hereunder that does not match with additions in the installed capacities provided above as shown in the shaded columns:

3.3

All figures are in MWs

Years	*Hydro*	*Wind*	*Thar Coal*	*Imp. LNG*	*Imp. Coal*	*Solar*	*Nuclear*	*Import*	*Revised*	*Original*	*Diff.*
2018-19	41	200	660	830	660	600	-	-	**2,991**	NP*	-
2019-20	201	-	-	420	823	600	-	-	**2,044**	2,765	-721
2020-21	177	1,224	1,980	-	-	-	1,100	-	**4,481**	4,632	-151
2021-22	1,001	-	2,970	-	1,620	-	1,100	1,000	**7,691**	3,780	3,911
2022-23	920	-	-	-	1,320	-	-	-	**2,240**	1,685	555
2023-24	4,325	-	-	-	-	-	-	-	**4,325**	5,099	-774
2024-25	2,203	-	-	-	-	-	-	-	**2,203**	8,828	-6,625
Total	**11,388**	**1,572**	**5,610**	**1,250**	**4,423**	**1,200**	**2,200**	**1,000**	**28,643**	32,145	-3,502

Source Ministry of Energy (Power Division)
*NP means NOT PROVIDED

3.4 Based on capacity additions data provided by MOE it was noted that due to delay in CODs of the Projects in pipeline, the electricity shortfall will continue till FY 2021 that is for next three years. Further review of the capacity additions indicates addition of 1,200 MW during July 2018 to June 2020 and addition of 1,224 MW of wind projects in FY 2021, however

these projects will be delayed because of the decision made by previous Cabinet Committee on Energy ('CCE') in their meeting dated 12 December 2017. Accordingly, the projected electricity deficit in MOE analysis may further aggregate.

Halt on Renewable Energy Projects by Previous Government

3.5 The previous government stopped all renewable energy projects (small hydel, wind, solar and bagasse) approximately over 1600 MWs, under development, which had not signed Implementation Agreement (IA) or Energy Purchase Agreement (EPA) as per the above referred decision of CCE.

3.6 Furthermore, the above referred decision also states that all projects based on wind, solar, small hydel and bagasse energy "will be awarded through competitive bidding." Some experts suggested that existing projects cannot be included in a classic transparent competitive bidding process since most of the existing projects have their own LOIs, generation license, land lease and technical studies. The usual way to carry out a competitive bidding process is that the government provides the land and the technical studies, grid connectivity and requests bids based on the said documentation and a base price established by NEPRA.

3.7 In this context Committee held meetings with AEDB and industry experts who informed that it will take a year to prepare the documentation and another one year to undertake the tendering process and finalize the successful bidders, followed by the financial close process of 6-12 months and then the construction period of 10 months in solar power projects and 18 months in wind projects, which means cumulative 3-4 years are required to restart inducting further renewable energy in the system. Resultantly this will delay induction of 1600 MWs of renewable energy holding tariffs and ready to start construction within 6 months to one year. It will also increase the investor fatigue, as these investors have already spent 2-3 years in developing these much-needed projects.

3.8 The haphazard approach in launching competitive bidding will result in loss to the country and demotivate existing investors. A recent case in this regard is the competitive bidding process undertaken by Pakhtunkhwa Energy Development Organization (PEDO) of the Province of Khyber Pakhtunkhwa for 6 Hydro Power Projects cumulatively 518 MWs. The competitive bidding process was launched in October 2016 and only recently, after seventeen (17) months of processing, five (05) out of (06) projects were rejected by NEPRA under the said competitive bidding for reasons related to higher tariff bids received and improper documentation and processing by PEDO. Such unfruitful iterations of competitive bidding would lower investor confidence in Pakistan and is therefore an exercise detrimental to the power sector unless structured in a proper fashion that requires time and until then existing project pipeline with impressively low tariffs should be allowed to reduce the loss and level of circular debt in Pakistan.

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Chapter-4 Electricity Losses Transmission & Distribution

4.1. Energy losses occur in the process of supplying electricity to consumers due to technical and commercial (theft) reasons. The technical losses are due to energy dissipated in the conductors, transformers and other equipment used for transmission, transformation, sub-transmission and distribution of power. Pilferage by hooking, bypassing meters, defective meters, errors in meter reading and in estimating un-metered supply of energy are the main sources of the non-technical losses, when these losses are added to technical losses, it gives Transmission & Distribution (T&D) loss. Whereas commercial losses are separate and are attributable to non-recovery of the billed amount, which is reflected in collection efficiency. T&D losses together with commercial loss give us Aggregate Technical & Commercial (AT&C) losses.

4.2. In purely commercial sense, NTDC / DISCOs are in the business of transportation of electricity where price of commodity (electricity) being transported is 6-7 times more expensive then the gross margin on sale of one unit of electricity. For example, if we assume sale price for sale of electricity unit is around Rs. 11 while DISCO's gross margin for transportation is say around Rs 1.5/ unit, accordingly loss of one unit of electricity eliminates the margin on 7.33 units of electricity transported. Due to this reason NEPRA sets target T&D loss for NTDC / DISCOs and financial impact of targeted/ allowed T&D Loss is included in the Distribution Margin of these entities to safeguard their viability. However, in reality the actual T&D Losses of these entities are higher than the targets, the difference shrinks the cashflows available for meeting operational expenditure or payment of electricity price, resultantly T&D Loss contributes towards circular debt. To address this, both aspects are important: (1) reduce T&D Losses and (2) maintain electricity price.

4.3. Technical Losses[13] (that are component of T&D Loss) emerges in the process of supply of electricity to consumers. During the process of supply some power is consumed in stepping up or stepping down of the voltage levels, and some is lost along the lines and cables that carry the energy losses occurring at various stages of power transformation and loading of the transmission system at 500 kV, 220kV,132kV are known as transmission losses. In Pakistan losses occurring at 66,000 volts (66kV) 33,000 volts (33kV) are also parked as transmission losses of Distribution Companies. The losses at the 11kV, 6.6kV and lower voltage levels are termed distribution losses. Technical losses generally vary with the square of the load current being distributed. As a result, losses will increase as more capacity is used. Losses are also proportional to the length of the line. The technical losses comprise both variable and fixed components. The fixed component of technical losses depends largely on the system configuration, pattern of loading of transmission and distribution lines, magnitude and types of loads, characteristics of equipment etc. The variable component is due to weak and inadequate sub-transmission and distribution lines, inadequate sizing of conductors used, lengthy transmission and distribution lines and inadequate reactive compensation in the system. On other hand the non-technical losses are a component of distribution system losses that are not related to the physical characteristics and functions of the electrical system.

[13] *(PDF) Analysis and Reduction of T&D Losses in India.* Available from: https://www.researchgate.net/publication/315117791_Analysis_and_Reduction_of_TD_Losses_in_India

Electricity Transmission - NTDC

4.4. NTDC is responsible for transmission of electricity at 220 kV and 500kV of voltage levels. During last five years till June 30, 2017 the transmission losses of NTDC were at declining trend, in FY 2013 transmission loss[14] of NTDC was 3.05% that reached 2.31% in FY 2016. However, based on presentations of MOE (Power Division) it was informed that during FY 2018 NTDC transmission loss has increased to 2.6%. Based on the review of historical trends, NTDC tariff petitions and review petition to NEPRA, Committee is of the view that transmission losses of NTDC will not have any significant contribution towards circular debt as long as the progress on network strengthening continues.

4.5. Based on the review of State of Industry Report of NEPRA it is highlighted that transformation capacity of NTDC at 500 kV level was 18,624 MVA and at 220kV was 25,660 MVA at June, 2017. To meet the electricity shortfall and connect upcoming powerplants with national grid it was planned to increase the 500kV network to 21,150 MVA by June, 2018 and subsequently add 11,700 MVA over next four years. Similarly, at 220 kV level NTDC plans to add more than 21,000 MVA. The adequacy of transmission system is mainly dependent on the 220 kV level transformation capacity as it is the interconnection voltage level between NTDC and DISCOs and will have positive impact on distribution segment. It has been claimed that by May and June 2018, the transmission system will be sufficient at the margin to meet demand at the peak time.

4.6. On NTDC, it is important that existing plans for strengthening transmission network are reviewed and implemented to connect upcoming powerplants with national grid and meet the electricity shortfall of the country and also balance the load on DISCOs networks.

Electricity Transmission & Distribution - DISCOs

4.7. The end tail of electricity network is handled by Distribution Companies who are owners of network of 132kV and below voltage, in this report only government owned entities involved in distribution segment have been analyzed as they are mainly related to the issue of circular debt.

4.8. Generally, level of service delivery of any distribution company can be analyzed by understanding adequacy of power transformers (mostly 132/11 kV transformers), 11 kV feeders and finally the distribution transformers. These factors are discussed hereunder based on the review of State of Industry Report of NEPRA:

- The total power transformers (132 kV, 66 kV and 33 kV voltage levels) in all DISCOs totaled 1,743 in June 2016 that increased to 1,828 by June 2017. Because of this reason on an overall country basis overloading of power transformers (above 80%) reduced to 36.8% in FY 2016- 17 from 45.15% in FY 2015-16, but it is still very high pointing to potential problems in distribution networks of related DISCOs. On DISCO to DISCO comparison, FESCO and QESCO have more than their 50% power transformers overloaded above 80%, followed by HESCO, PESCO and SEPCO having more than 40% of their transformers overloaded. From the point of improvement SEPCO installed

[14] Based on NEPRA's State of Industry Report 2017

only two new transformers during FY 2017 and its overloading position worsened from 28.45% of overload transformers in 2016 to 44.92% overloading in 2017.

- Country wide 11 kV feeders of all DISCOs increased from 8,099 to 8,454 however transformers with more than 80% overloading increased from 28.14% to 29%. On DISCO level, PESCO and TESCO have the highest percentage (more than 50%) of overloaded feeders, followed by QESCO, SEPCO, MEPCO and LESCO (more than 30%).

- Distribution Transformers of all the DISCOs increased from 653,141 in FY 2016 to 681,805 in FY 2017 and overloaded (by more than 80%) distribution transformers reduced from 15.31% to 12.54% in respective years. DISCOs with highest percentage of overloaded distribution transformers in FY 2017 include LESCO at 30.13%, followed by PESCO at 29.18% and SEPCO at 20.69%.

4.9. It is to be noted that although PESCO, SEPCO, TESCO and QESCO have generally been accepted as poor performers, but facts indicate that better performers like LESCO and MEPCO also require investment in infrastructure as more than 30% of 11 kV feeders were overloaded by more than 80% during FY 2017 while LESCO also has the worst record of overloading of distribution transformers. Similarly, FESCO has very serious issues to tackle with the overloading of its power transformers. These issues indicate a dire need of steps required for investment in infrastructure not only to reduce technical losses but also to make it capable to sustain distribution of power for upcoming power projects.

Transmission & Distribution (T&D) losses - DISCOs

4.10. One of the contributors of circular debt is the high transmission and distribution losses in DISCOs viz-a-viz the Authority's allowed targets. The contribution of T&D Loss in the overall level of actual Circular Debt amounts to Rs. 187 Billion, based on the presentations given by officials of MOE during Committee hearings. The loss has been built-up over last five years as tabulated hereunder:

YEARS	UNITS	2013-14	2014-15	2015-16	2016-17	2017-18
UNITS SOLD	GWH	71,055	72,642	76,623	81,558	91,902
ALLOWED T&D LOSSES	%age	15.3%	14.2%	15.3%	15.3%	16.3%
ACTUAL T&D LOSSES	%age	18.7%	18.7%	17.9%	17.9%	18.3%
EXCESS LOSSES OF DISCOS	%age	3.3%	4.5%	2.6%	2.6%	2.0%
IMPACT OF EXCESS LOSS	Rs M	39,332	52,562	31,865	33,961	29,389
CUMULATIVE LOSS IMPACT	**Rs M**	**39,332**	**91,894**	**123,759**	**157,720**	**187,109**

Source: MOE Presentations

4.11. Above historical analysis indicate that actual T&D Losses of DISCOs could not be reduced below 17.9% in last five years, in fact in FY 2018 the actual T&D Losses has increased to 18.3%. The decrease in the difference between target and actual T&D loss and resultant financial loss during FY 2018 is only due to the reason that NEPRA has increased its target which means that cost of increase in inefficiencies has been passed to the consumer in FY 2018 by increasing the electricity price.

4.12. To understand the major contributors of this loss, NEPRA's latest State of Industry Report has been reviewed that captures results of FY 2017 in comparison to FY 2016 and has been reproduced hereunder:

DISCO	*2016-17 Units In GWH*			*Losses (%)*		
	Purchased	Sold	Lost	2015-16	2016-17	Inc./Dec
PESCO	12,511	8432	4,079	33.8	32.6	(1.2)
TESCO	1,450	1,227	223	19.0	15.4	(3.6)
IESCO	10,583	9,627	955	9.1	9.0	(0.1)
GEPCO	9,779	8778	1001	10.6	10.2	(0.4)
LESCO	20,622	17,783	2,839	13.9	13.8	(0.1)
FESCO	12,858	11,499	1,359	10.2	10.6	0.4
MEPCO	15,951	13253	2,698	16.5	16.9	0.4
HESCO	5,360	3,712	1,648	26.5	30.8	4.3
SEPCO	4,489	2788	1,701	37.9	37.9	0.0
QESCO	5,789	4,453	1,336	23.9	23.1	(0.8)
	99,391	**81,551**	**17,839**	**17.9**	**17.9**	**0.0**

Source: NEPRA State of Industry Report 2017

4.13. Based on above it may be noted that as a whole, DISCOs did not show any improvement in transmission and distribution losses, as their overall losses have been recorded as 17.95% for both the years, which in fact has increased to 18.3% in FY 2018 (as per MOE). The losses in HESCO increased by 4.29% in the FY 2016-17 over those of the FY 2015-16. SEPCO also showed slight increase in its losses. Losses of MEPCO also increased by 0.46%; however it is a matter of concern that one of the good performing DISCOs i.e. FESCO could not reduce or even maintain its losses at the FY 2015-16 level of 10.24%, as its losses in the FY 2016-17 increased to 10.57%.

4.14. Based on benchmarks set in developed countries acceptable T&D loss level is around 10% (as against 18.3% in Pakistan) and if this fact is kept in view all the DISCOs except IESCO, GEPCO and FESCO are above the benchmark ignoring the fact that the cost of the loss is borne by consumers or Government of Pakistan. It is also important to note that in absolute terms highest number electricity units are lost by PESCO 4,079 GWH, followed by LESCO 2,839 GWH and MEPCO 2,698 GWH and others.

4.15. As per tariff determinations and state of industry report of NEPRA, huge investment funds have been allowed to DISCOs every year for critical projects however DISCOs' performance does not reflect any improvement which has resultant impact either on circular debt or cost is passed to the consumer.

4.16. It is noted that the DISCOs have obvious lack of managerial capacity and skills, mindset to not go for such projects which may bring drastic improvements in the system; for instance, installing meters at all levels to trace flow of electricity top to down in the system, automatic metering and centralized monitoring. In nutshell desire to lower losses, if any, does not seem to have materialized over last five years may be to conceal inefficiencies under this head. DISCOs seem content with their performance levels, and that approach at this cross-road where the Federal Government has inducted a large generation capacity to the system may drag the whole sector down if immediate steps to correct this position are not taken.

4.17. Consumer end tariffs are highly sensitive to the losses in the transmission and distribution systems. With every percentage increase in allowed losses the tariff increases exponentially

(as the cost of production goes up) and to the extent these are not allowed as part of tariff result in circular debt.

4.18. Safe and reliable transmission and distribution of electricity has become a major problem in Pakistan. The major part of these losses also relate to theft in these DISCOs. No progress has been made to minimize power theft or to overcome technical constraints that provide opportunities to for power theft.

4.19. To understand the impact of energy theft, Committee has analyzed numbers reported in NEPRA's state of Industry Report 2017 under which technical loss studies data has been compiled (these studies were conducted by DISCOs during FY 2011-12 to the FY 2014-15 through independent consultants in respect of their transmission and distribution systems which included their 132 kV network). The following table provides the results of T&D losses reported by DISCOs, on the basis of transmission and distribution network loss studies conducted by Third Party Consultants. These losses have been compared with Actual T&D Losses of the DISCOs to estimate the element of theft in electricity distribution network of Pakistan based on the estimated electricity supply of 99,391 GWh during 2017[15].

DISCO	*Transmission Losses as per Study (%)*	*Distribution Losses as per Study (%)*	*Total*	*Actual T&D Loss*	*Electricity Purchased FY 2017*	*Element of Theft and Law & Order (GWH)*
PESCO	3.64	17.31	20.95	32.6	12,511	1,458
TESCO	Data Not Available with NEPRA				1,451	
IESCO	1.71	6.94	8.65	9	10,583	37
GEPCO	2.06	8.52	10.58	10.2	9,779	0
LESCO	2.1	9.66	11.76	13.8	20,622	421
FESCO	2.55	8.39	10.94	10.6	12,858	0
MEPCO	3.5	11.3	14.8	16.9	15,951	335
HESCO	3.42	15.04	18.46	30.8	5,360	661
SEPCO	4.53	14.8	19.33	37.9	4,489	834
QESCO	7.9	13.36	21.26	23.1	5,789	107
		Total			99,391	3,852
		Electricity Theft %age				**3.9%**

Source: Analysis is based on NEPRA State of Industry Report 2017

4.20. Based on the above analysis it was noted that Electricity theft in the system is about 3.9% and estimated cost of theft in 2018 is Rs 53.4 Billion based on energy supply of 120,400.5 GWh[16] and unit price of Rs 11.37/kWh[17].

4.21. The federal government has been lax in passing appropriate legislation to curb electricity thefts, promote energy conservation, increase commercial transparency, strengthen regulatory entities, and promote an open and competitive energy market. The government also appoints the Board of Directors (BOD) of the DISCOs; political and bureaucratic influences continue to limit the BOD's independence and technical and management competency. At the corporate level, the Board's authority and efficacy in monitoring and enforcing the performance of DISCO management is limited or nonexistent.

[15] As per state of industry report 2017
[16] Provided by CPPA for FY 2018
[17] Provided by MOE based on basket price of July to April 2018

4.22. It is strongly recommended that high powered committee or an institution can be mandated to oversee strengthening of transmission and distribution networks of the DISCOs, monitoring of performance benchmarks and getting independent studies done for DISCOs. World renowned experts in the area can be engaged or retained by the Committee/ entity for this purpose. Detailed mandate of the committee/ entity may be drafted. Following concepts can be considered for inclusion that are based on global best practices however are subject to further technical debate:

- Utilization of Capacity – increase in the cross-sectional area of lines and cables for a given load to reduce losses after considering the trade-off between cost of losses and cost of capital expenditure.

- Higher Voltages - move to higher voltages to reduce utilization and therefore losses in the networks.

- Shorter and more direct lines – explore possibilities to reducing losses by reconfiguring the network, for example by providing more direct lines to where demand is currently situated.

- Demand management – explore methods to reduce peaks in demand to ensure reduction in losses. An additional demand of 1 GW in peak times will result in a greater increase in losses than 1 GW in off-peak periods. For this purpose, discussions can be held with factories in industrial hubs and discussions with regulator on peak and off-peak rates and its implementation.

- Balancing 3 phase loads – monitoring that DISCO's are balancing 3 phase loads periodically throughout the network.

- Explore new technologies and discussions and develop consensus amongst stakeholders for new loss reduction technologies for example controlling quality of transformer core material - the level of fixed losses in a transformer is largely dependent on the quantity and quality of the raw material in the core. Therefore, higher quality materials will lead to lower losses. A new development in the United States is the amorphous core distribution transformer with very low fixed losses but higher costs than conventional units.

- Eliminating multiple transformation levels - eliminating 33 kV transformation levels and moving to 66kV voltage levels can reduce losses. Also switching off transformers in periods of low demand can also lead to lower losses.

- Smart Grid- Smart grids are transmission network that utilize information and communication technologies to make the transmission infrastructure more efficient and resilient. It enables developers and operators to carry out real time monitoring and controlling the systems. This helps in reducing AT&C losses, peak load management, outage management, power quality management and also channeling power from renewable energy resources.

- Exploring innovative financing solutions using instruments of Public Private Partnerships and facilitating / supporting DISCOs in follow-up to obtain requisite approvals.

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Chapter-5 Recovery from Private Sector by DISCOs

5.1. DISCOs are responsible for sale of electricity to the customers at the price approved by NEPRA, however GoP provides different subsidies to consumers in residential, industrial and agricultural categories which reduce the effective tariff charged to these consumers, due to this reason the liquidity position of the DISCOs is affected by delays and non-receipt of funds from both private and public sector.

5.2. The cumulative receivables as on June 30, 2017 were Rs 669.8 Billion[18] that has increased by Rs. 154.5 B during FY 2018, and has reached Rs 824.3 Billion[19] as of June 30, 2018 that has directly impacted circular debt level during 2018.

5.3. Various reasons that are contributing towards this sharp increase in DISCO's receivables from private sector have been discussed hereunder:

Running & Permanent Disconnected Defaulters:

5.4. There are more than 5.3 Million non-paying electricity connections in Pakistan who are getting electricity and are either willful defaulters or are unable to pay. Cumulative outstanding balance of these defaulters stands at Rs 404.8 Billion (i.e. about 49%) of Rs 824.3 Billion receivables as at June 30, 2018. As per DISCOs the main reason for non-accessibility for disconnecting these connections is the non-cooperation from provincial authorities and law and order situation of the related areas.

5.5. Besides above there are more than 1.3 million electricity connections that have been permanently disconnected with payables of Rs. 95 Billion to DISCOs that is about 12% of Rs 824.3 Billion receivables as at June 30, 2018.

5.6. Comparing 2018 figures of running and permanent defaulters with FY 2016, indicate that the default amount has grown at an average rate of Rs 50 Billion per annum in last two years.

[18] As per state of industry report NEPRA para 4.5 under chapter for 'Performance of Distribution Sector'. The amounts exclude receivable from K-Electric
[19] As per information provided by MOE (Power Division) through email dated August 8, 2018, does not include KE.

AGING	XWDISCOS DEFAULTERS DETAIL					
	Permanent Defaulters			Running Defaulters		
	2016		2018	2016		2018
	Consumers	Rs in M	Rs in M	Consumers	Rs in M	Rs in M
UP TO 2 MONTHS	59,312	1,194	826	3,486,666	32,555	22,179
2-3 MONTHS	8,892	302	212	146,124	2,582	1,723
3-6 MONTHS	35,938	845	1,260	161,463	5,054	4,327
6-12 MONTHS	67,447	2,391	3,120	152,694	7,118	8,398
1-3 YEAR	218,828	8,741	10,004	339,169	42,101	21,890
ABOVE 3 YEARS	877,095	45,464	79,930	1,007,963	253,562	346,324
TOTAL	**1,267,512**	**58,937**	**95,352**	**5,294,079**	**342,972**	**404,841**

Source: MOE Data

5.7. Review of further breakdown of these default amounts indicate that major concertation of these defaults is in QESCO (40%), followed by PESCO (19%), SEPCO (17%) and HESCO (11%).

	RUNNING DEFAULTERS		PERMANENT DISCONNECTION		TOTAL	
DISCO	Rs in Million	%age Share	Rs in Million	%age Share	Rs in Million	**%age Share**
LESCO	7,835	2%	10,735	11%	**18,570**	**4%**
GEPCO	1,550	0%	543	1%	**2,093**	**0%**
FESCO	1,233	0%	694	1%	**1,927**	**0%**
IESCO	1,231	0%	281	0%	**1,512**	**0%**
MEPCO	2,610	1%	5,942	6%	**8,552**	**2%**
PESCO	53,000	13%	40,767	43%	**93,767**	**19%**
HESCO	35,640	9%	18,670	20%	**54,310**	**11%**
SEPCO	71,248	18%	13,409	14%	**84,657**	**17%**
QESCO	196,056	48%	1,789	2%	**197,845**	**40%**
TESCO	34,438	9%	2,521	3%	**36,959**	**7%**
TOTAL	404,841	100%	95,351	100%	**500,193**	**100%**

Source: MOE Data

5.8. Brief Case studies of these DISCOs are provided hereunder:

Quetta Electric Supply Company (QESCO) – Agri Tube Well Subsidy Issue

5.9. QESCO has been unable to collect Rs. 197.8 billion from its electricity consumers. The main reason for this huge pile-up of receivables is non-payment of bills by the Agri-consumers who are utilizing above 75% of the electricity being supplied by QESCO. A brief overview[20] of the issue is given hereunder:

i. Initially Agriculture tube well connections were subsidized as per below mentioned formula w.e.f 2001 to June 2010 without capping number of tube well connections.

- Rs. 4,000 per tube well / month was to be paid by Agri consumer;
- The remaining amount was to be shared by QESCO, Govt. of Baluchistan (GoB) and Federal Govt. (GoP) in a ratio of 30%:30%:40% respectively.

[20] The issue of Agri Subsidy has been summarized based on the information provided by QESCO

ii. Later, number of tube wells were capped at 15,660 on 30th June 2006

iii. Agri subsidy ceased w.e.f July 2010 to Nov: 2012 & again restored by ECC GoP w.e.f 1st December 2012 to 30th November 2014 as per below mentioned formula without any clarification of receivable/dues of intervening period w.e.f July 2010 to Nov: 2012 and the decision is still pending.

- The amount per tube well / month was capped at Rs.50,000 out of which Rs. 6,000 per tube well / month was to be paid by Agri consumer; and
- The remaining amount of Rs. 44,000 was to be shared by GoP & GoB as per ratio 40%:60% respectively.

iv. Agri subsidy decision was once again revised by ECC GoP by capping the number of Agri-Tube well connections at 28,088 w.e.f 1st January 2015 to 31st December 2016 & then extended for another period of 1 year w.e.f 1st January 2017 to 31st December 2017 as per below mentioned formula and terms & conditions:

1. Federal Govt: and Govt: of Baluchistan will provide subsidy to Agriculture consumer up to Rs. 65,000/month in 40:60 ratio respectively.
2. The Agri consumer will pay Rs. 10,000/month.
3. In case the bill exceeds Rs. 75,000/month, any amount over & above would be paid by the Agri consumer.

v. Agri-Consumers are reluctant to pay their share of electricity bills out of their share because of dispute (Withdrawal of subsidy July 2010-Novmeber 2012).

vi. As of June 2018, there are 28,088 Agri-Consumers who owe Rs. 188.5 billion while GOB and GOP owed 43.9 billion with regard to Argi-tube well subsidy issue to QESCO. Besides this Rs 55.3 Billion for 27 months (July 2010 to November 2012 because of non-clarity in ECC decision) is not yet been notified as to who is responsible for this amount.

vii. These circumstances have forced QESCO to reduce the power supply hours so as to minimize financial burden on the national exchequer.

viii. To cope with this issue, Ministry of Energy has planned conversion of existing legal tube-well connection to solar energy. In first phase of the plan, 10,000 tube-wells have been solarized with a cost of Rs. 49.52 billion and then extend this program for another 20,000 tube wells. This means that government plans to plug in about Rs 150 Billion for solarization of 30,000 tube wells

5.10. As of June 2018, 28,088 Agri-Consumers owed Rs. 188.5 billion while GOB and GOP owed 43.9 billion for AgrI tube well subsidy head to QESCO. The subsidy Agri tube well subsidy program started in 2001 has become one of major contributor to circular debt and Government is now considering solarization of 30,000 Tube wells as a direct subsidy to the farmers.

5.11. With regard to solarization of tube wells it is noted that maintenance of solar panels and solar system by an uneducated farmer, who have received this system without incurring any cost seems to be waste of resources. A study should be conducted to setup a state-of-the-art

solar power park of 500 MWp in Baluchistan under IPP mode (by any entity with global experience in this business) can provide electricity free or at discounted rates for 25 years to these 30,000 tube wells. For this purpose, Government can follow a competitive bidding process for a 500 MWp power plant in Baluchistan under IPP mode. The generation price of electricity from power plant will cost Rs 6/kWh compared to Rs 9.5/kWh in FY 2018. This will cost about Rs 6.5 B per annum to GoP (at current solar tariff rate) for provision of free electricity to Agri tube wells. On other hand GoP can generate about Rs 40 Billion by making free/discounted electricity conditional upon paying (say) 20% of their existing dues and return on this amount plus amount owed as subsidy by GoP and GoB can significantly reduce or hedge this subsidy cost. There can also be other methods that can be explored for covering this annual cost. The method will allow access to these sites to the QESCO officials for installing smart meters and for future control on electricity flow to these connections.

Peshawar Electric Supply Company (PESCO) – Law & Order Situation

5.12. PESCO is ranked number 2 in terms of outstanding receivables from running and permanent connections amounting to Rs. 93.8 billion. 86% of these receivables i-e Rs. 80.3 billion are overdue for above 3 years and additional Rs. 5.6 billion are overdue for above 1 year.

5.13. PESCO is divided into eight (08) Circles covering about 1,204,621 Hectares of land in total. PESCO covered area is distributed in **Bannu** circle, **Hazara-1** circle, **Hazara-2** circle, **Khyber** circle, **Mardan** circle, **Peshawar** circle, **Swabi** circle and **Swat** circle and has about 946 11 KVA feeders.

5.14. Out of above 946 feeders about 380 11 KVA feeders have 50% or more AT&C losses and out of these 380 feeders, about 360 of the 11 KVA feeders have recovery ratio of 70% and less. Table below provide a summary[21] of loss-making feeders in PESCO:

Circles	*Number of high AT&C feeders*	*Number of feeders with low recovery rates*
Peshawar Circle	87	82
Khyber Circle	75	69
Mardan Circle	17	15
Hazara Circle-I	4	4
Hazara Circle-II	34	33
Swat Circle	21	21
Bannu Circle	138	132
Swabi Circle	4	4

Source: Summary and analysis of data shared by PESCO

5.15. The apparent reasons based on discussions with PESCO management is law and order situation in the province and non-existing support from provincial governments in collecting these receivables form the private consumers. In order to overcome this issue, law & order situation must improve complimented by the professional management of the DISCO.

5.16. About 38% of the PESCO Feeders have recovery rates of 70% or less. It was also noted that in most of the instances T&D Losses is also high in the areas with low recovery rates. Majority of loss-making feeders in PESCO region fall in domestic (residential) category.

[21] The summary has been developed based on the management presentation by PESCO

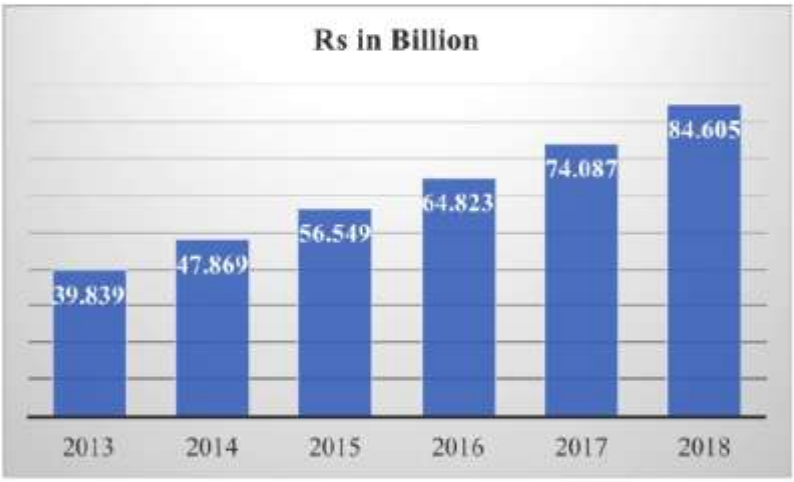
5.17. The matter of recovery from private sector in PESCO has become a serious concern affecting circular debt issue and its resolution is possible only with the support of provincial government and local governments. It is recommended that smart metering combined with Aerial Bundle Cables can be installed in these high loss-making areas with the support of rangers / Pak army and provincial/ local governments in parallel to political solution to be worked out in consultation with the tribal elders of the related areas to resolve this issue.

Sukkur Electric Supply Company (SEPCO) – Noncooperation by Provincial Govts

5.18. SEPCO has also been unable to collect Rs. 84.6 billion from private consumers contributing to the total receivables of Rs. 88 billion of SEPCO. Out of the 84.6 B an amount of Rs. 74 billion is overdue for above 3 years.

5.19. In past SEPCO was facing issues of recovery not only from private customers but also from provincial governments, however certain adjustments were made with the Government of Sindh in FY 2017 because of which provincial government receivables have reduced to minimum.

5.20. SEPCO's receivables from private sector are increasing at the rate of Rs 8-10 Billion per annum and has reached Rs. 84.6 Billion that mainly represent non-payments from domestic consumers.



Source: SEPCO Presentation

5.21. In this regard it is also highlighted that SEPCO is also facing very high T&D losses in the areas with low recovery rates due to illegal hooks and running of post-disconnection electricity connections. It was informed that based on SPECO's survey about 400,000 illegal connections are operating in SEPCO jurisdiction.

5.22. Management of SEPCO attributes reasons of the poor performance in T&D losses and recovery rates to poor socio-economic condition in the area that evolved after super floods in August 2010 combined with shortage of line staff, worst law & order situation and non-cooperation of provincial governments and police departments. SEPCO has even requested deployment of Pak rangers to resolve recovery and illegal connections.

5.23. To elaborate level of non-cooperation by police department following numbers have been submitted to the Committee by SEPCO:

Financial Year	*FIR Lodged (NO)*	*FIR Registered (No)*	*Balance Pending (No)*	*Number of Stealers*
2016	3,424	22	3,402	33,857
2017	4,176	45	4,131	41,662
2018 (July to May)	4,305	12	4,293	35,948
Total	**11,905**	**79**	**11,826**	**111,467**

Source: SEPCO Presentation

5.24. Because of above conditions SEPCO cannot enforce disconnection of electricity on defaulters, even at certain locations where disconnection is enforced, defaulters' resort to direct hooks that increase theft and T&D losses.

5.25. Based on consultation with SEPCO management, a recovery plan based on following parameters can be evolved with provincial governments:

- Listing of difficult / hard areas and areas with concentration of defaulters.
- Two step publicity approach: Phase-1 focusing on warning messages and Phase-II sharing of defaulter's names and locations on media
- Recovery under Land Revenue Act 1967
- Provincial Level Recovery Task Force directly supervised by high grade officers in provincial governments should be assigned to recover amounts due from defaulters in hard areas, in consultation with provincial governments.
- Stage wise incentive schemes to be designed for recovery of arrears, considering following parameters
  - Line staff can be incentivized to collect arrears with 2 months to six months
  - Local governments and tehsildars can be given incentives for recovery where default period is above six months and less than one year
  - Matters can be handed over to Recovery Task Force where recovery period is above 1 year

5.26. Issues faced by HESCO are almost similar to SEPCO and further detailed review of HESCO has not been performed.

Tribal Electric Supply Company (TESCO)

5.27. TESCO has faced severe law & order crises over the past two decades and ranks 5th in the list of DISCOs (primarily due to a meager number of consumers in its area) that are unable to collect dues from the private consumers. GOP has split out Tribal Electricity Supply Company Limited (TESCO) from the original company PESCO to determine its billing and subsidy requirements. TESCO is now an autonomous DISCO and manages its operations independently in that area.

5.28. Currently GOP policy is following the policy of providing free electricity to the residential consumers of FATA and hence, although there are tariffs determined and notified for all consumer categories, Federal Government budgets a subsidy to cover the cost of the residential consumers.

5.29. TESCO's receivables from private consumers stood at Rs. 37 billion[22] as at 30th June 2018, which mainly seems to relate to commercial and agriculture consumers. The situation is expected to improve in future as law & order situation is improving in the area.

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[22] Based on receivable statement of June 30, 2018 from MOE.

Chapter-6 Government Receivables & Subsidies

6.1. The DISCO's receivables from different governments stood at Rs 244.3 Billion including impact of different subsidies, as provided hereunder:

- Receivable from AJK Government – Rs 99.3 Billion
- QESCO Receivable of about Rs 44.4 from Federal Government and Government of Baluchistan with regard to Agri Tube well Subsidy
- PESCO's receivable of Rs 18.6 Billion from Government of KPK on account of stay on tariff (Sept 2008 to Sept 2010)
- Other subsidies receivable of about Rs 53 Billion mainly relating to Tariff Differential Subsidy (TDS) and Industrial Support Package (ISP)
- Receivables of Rs 29 Billion for sale of electricity to different government departments.

Receivable from AJK Government – Rs 99.3 B

6.2. AJ&K receives bulk power supply from three distribution companies: IESCO, PESCO and GEPCO, out of total Rs. 99.3 billion receivables from AJ & K Rs. 67.321 billion are owed to IESCO, Rs. 11.66 billion to GEPCO and Rs 20.3 Billion to PESCO.

6.3. Under the Mangla Raising Agreement signed in 2003 between Government of AJ&K and Government of Pakistan, AJ&K Government is responsible to pay for the electricity supplied by DISCOs at subsidized rate of Rs. 2.59/kWh, this electricity supply at agreed rate continued till 2007. In the same agreement GoP Pakistan also agreed to pay Rs 0.15/KWh to GoAJK for water use charges for Mangla Hydel Project.

6.4. However, in 2007 NEPRA determined tariffs of DISCOs under which GoAJK Tariff was also determined and subsequently notified by the GoP. GoAJK did not agreed to the notified tariff, as AJK does not fall under purview of NEPRA and there was specific method provided in the agreement for revision in the tariff. Due to these reasons a gap emerged between the notified tariff and agreed tariff with GoAJK which have resulted in huge receivables from GoAJK.

6.5. On other hand, since issue of Net Hydel Profits has been resolved with provincial governments where same has been agreed at Rs 1.1/kWh, the GoAJK require to raise its Water Use Charges at par with what has been agreed with provinces.

6.6. In July 2017, Federal Government established a committee that has considered the tariff differential issue with GoAJK and Water Use Charges paid to GoAJK. The Committee recommended raising of water use charges for GoAJK to Rs 1.1/kWh from existing Rs 0.15/KWh (in line with NHP agreed with provinces) and on other recommended supply of electricity to AHK directly from CPPA rather than from DISCOs, as is done for K-Electric, based on tariff rates determined by NEPRA. Based on the committee recommendations the existing tariff differential subsidy by GoP as provided to consumers of Pakistan will also be extended to AJK, while Government Subsidy for AJK tariff differential will be eliminated. The recommendations were forwarded to ECC for approval and needs to be reviewed by the new government so that matter can be amicably resolved and implemented through execution of an agreement for amending the original Mangla Raising Agreement.

QESCO Receivable from Government of Baluchistan – Rs 44.4 B

6.7. The issue relates to Agri tube well subsidy and has been discussed in detail in previous chapter under the QESCO case study.

PESCO's receivable of Rs 18.6 Billion because of stay on Tariff

6.8. In 2008 the KPK Government[23] filed a petition against tariff increase. Despite the fact that it later withdrew the case, PESCO was not able to recover Rs 18.6 billion from KPK consumers for period starting from September 5, 2008 to September 15, 2010 (accrued while the court's stay order was in effect). HESCO faced a similar situation, when Sindh Government filed suit against HESCO in Sindh High Court and managed to block HESCO from receiving payments from Sindh Government for an extended period (the figures of HESCO are not available).

Delays in Subsidies TDS & ISP

6.9. The tariff differential subsidy is a government's policy of applying uniform tariff across all the DISCOs. NEPRA determines the electricity tariffs based on the revenue requirement of each DISCO to meet all costs and to earn a suitable profit. NEPRA determined tariffs varies for each category of consumer and across various DISCOs. The government under the uniform tariff policy notify a lesser tariff that is same across all DISCOs with the government assuming payment of the difference. This is known as the Tariff Differential Subsidy (TDS).

6.10. The last government announced a subsidy[24] of Rs 3/kWh for the Industrial Sector for enhancing the export base of the country. However, there were questions on the viability of the ISP subsidy for which a committee was constituted by ECC keeping in view the proposals of power division that the payment of ISP claims from cross subsidizing against negative fuel price adjustments could not continue after December 2017 and owing to financial difficulties, the support package is not sustainable after December 2017 till improvement in the financial health of the sector. The findings of the committee and viability of the ISP subsidy need to be revisited by new government.

6.11. As of June 30, 2018, a subsidy amount of about Rs 53 billion was due form GoP, which are considered to be quite material keeping in view the overall size of TDS and ISP. As per MOE presentation an amount of Rs 33.4 Billion out of total subsidy due is outstanding under ISP and has a material impact towards circular debt.

Receivables of Rs 29 Billion from Governmental Organizations

6.12. Delay in payments against electricity supplied to provincial and governmental departments schools, hospitals, police stations, water sewerage facilities and offices also contribute towards circular debt. Usually these departments delay the payment of electricity bills because of the shortage of funds or try to justify non-payment on the ground if non-reconciliation of electricity bills.

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[23] Pakistan Power Sector Circular Debt Report by USAID October 2012
[24] https://fp.brecorder.com/2018/05/20180529375521/

Chapter-7 Impact of Taxation on Circular Debt

Deficit Funding Scenario on DISCO Books

7.1 Before proceeding into detailed discussions on taxation issues, a holistic picture of funds flow of the DISCOs needs to be considered. The table provided hereunder provides details of receipts and payments of DISCOs for FY 2017 as shared with Committee by CPPA. Certain rows of the table are highlighted for readers attention.

Funds Flow Statement FY 2016-17
Rs in Million

Months	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Total
RECEIPTS													
DISCOs - Remittance	59,804	69,254	66,018	62,658	47,342	43,016	41,594	41,399	46,408	45,705	62,183	67,675	**653,056**
DISCOs - Retention	14,330	14,076	16,081	16,611	15,648	15,428	15,200	14,006	16,256	14,471	16,219	23,474	**191,800**
Loan arranges by GoP through PHPL	-	-	-	-	-	-	-	-	30,000	-	-	41,000	**71,000**
GOP Investment to settle circular debt	-	-	-	-	-	-	-	-	-	-	-	-	**0**
KESC - GOP Subsidy/Cash	-	-	-	-	8,089	6,303	-	2,238	6,974	-	3,483	3,903	**30,990**
FATA - GOP Subsidy/Receipts	-	-	-	2,348	1,442	677	1,544	-	780	713	789	1,607	**9,900**
GoP Subsidy - Tariff Differential	3,000	4,325	5,431	5,663	6,672	13,500	-	26,172	-	4,929	10,000	11,190	**91,083**
Agri. T/well Subsidy	-	-	-	-	1,680	-	-	-	-	-	-	-	**1,680**
DSS,LPS & TRS Receipts from DISCOs	4,003	1,435	5,320	5,136	5,521	4,039	5,038	3,709	3,781	3,734	3,991	5,954	**51,661**
Misc. Income/Receipts/Punkab Govt.	3,221	547	38	827	186	516	1,110	1,142	213	123	1,061	849	**9,833**
Total Receipts	**84,358**	**89,837**	**92,888**	**93,243**	**86,580**	**83,479**	**64,486**	**88,667**	**104,412**	**69,675**	**97,726**	**155,652**	**1,111,003**
Net Recipts (after retention)	70,028	75,761	76,807	76,632	70,932	68,051	49,286	74,661	88,156	55,204	81,507	132,178	919,203
PAYMENTS													
GENCOs	20,448	22,561	15,041	20,241	16,067	12,583	12,879	14,394	15,575	10,369	21,452	30,782	**212,392**
IPPs	41,823	44,675	42,579	44,828	41,384	41,856	29,291	46,166	66,093	29,769	50,253	81,743	**560,460**
Captive Power Purchases by DISCOs	-	-	-	-	68	211	-	277	757	681	-	348	**2,342**
WAPDA HYDEL	6,056	10,799	9,850	10,006	9,766	6,900	8,300	7,000	4,032	6,500	5,600	6,000	**90,809**
NITDC/CPPA	2,660	3,726	1,862	1,891	2,166	903	2,471	1,583	2,033	2,151	3,219	1,805	**26,470**
Sub-Total	**70,987**	**81,761**	**69,332**	**76,966**	**69,451**	**62,453**	**52,941**	**69,420**	**88,490**	**49,470**	**80,524**	**120,678**	**892,473**
DISCOs - Distribution Margin & Others	10,153	9,123	8,378	8,358	9,200	8,994	8,500	9,478	10,677	9,951	9,659	14,103	**116,574**
DISCOs - Taxes	4,176	4,954	7,704	8,254	6,448	6,434	6,700	4,528	5,579	4,520	6,560	9,371	**75,228**
Mark-up on TFCs	574	3,542	-	552	3,733	1,563	546	3,464	3,298	791	699	7,114	**25,876**
Total Payments	**85,890**	**99,380**	**85,414**	**94,130**	**88,832**	**79,444**	**68,687**	**86,890**	**108,044**	**64,732**	**97,442**	**151,266**	**1,110,151**

Source: CPPA Data

7.2 Review of the funds flow FY 2017 of DISCOs indicate two possible GoP's strategy either (1) to partially fund TDS amounting RS 91 Billion from taxes of Rs 75 Billion, OR (2) to deficit finance on the DISCO's books by raising debt of Rs 71 Billion for funding circular debt and taking it out through levying taxes of Rs 75 Billion on these DISCOs. Please note that tax amount of Rs 75 billion levied in FY 2017 does not include taxes of about Rs 10 Billion levied on IPPs and other taxes and duties levied on oil and gas sector that are then passed to DISCOs and also contribute towards circular debt.

7.3 However, without further commenting on possible strategy of past government, financial position of the Power sector remained under pressure leading to non-availability of required cash flow to meet the energy requirements/ generation in FY 2017.

7.4 The situation gets further complicated by the field formation officers of FBR, including practice of attachment of bank accounts of Government owned power sector entities on disputed issues leading to litigation in various cases.

Tax Issues of Power Sector & Settlement

7.5 Due to circulation of funds (injecting as loan / subsidy in power sector and taking out as taxes) results in refund claims of DISCOs that usually never paid by FBR. These refund related issues usually related following discrepancies;

A Sales Tax

- Levy of Sales Tax on subsidy granted by GOP to DISCOs;
- Disallowance of input tax credit against transmission and line losses;
- Payment of sales tax on accrual basis rather than on collection basis that because of low recovery rates of DISCOs become a double financial hit;
- Demand to charge Sales Tax on supply to AJ&K and Domestic Consumers of FATA on zero rate;
- Chargeability of Sales Tax on Capacity Purchase Price in case of CPPA G.

B Income Tax

- Levy of Minimum Tax (Turnover Tax) on DISCOs,
- Transmission of electricity not considered as supply of electricity by tax authorities rather considered as service requiring deduction of withholding tax by CPPA-G on payments to NTDCL.

7.6 Further, in view of the fact that 10 DISCOs have separate registrations with Sales Tax Department and out of these 10 DISCOs some claims refunds and others with pay tax liability through separate returns. Therefore, it may be appropriate to modify sales tax rules to allow consolidated sales tax returns and discharge netted off liability for all the Distribution Companies at CPPA level. This will help reduce cash flow issues for the power sector.

7.7 In recent past a series of meetings were held between Ministry of Energy (Power Division) and Federal Board of Revenue to discuss various Tax issues and a summary has been moved by Ministry of Energy to ECC for approval on April 2018, however these proposals and recommendations did not include consideration of consolidated tax approach for DISCOs.

7.8 The proceedings of above referred meetings and related proposals from DISCOs, responses of FBR and recommendations of MoE (Power Division) are summarized[25] in the table hereunder. It is pertinent to highlight that DISCOs at their own level litigated the tax issues in Appellant Tribunals and got relief.

[25] SUMMARY FOR ECC OF THE CABINET No. 5(22-PF)/2013-Tax dated 11th April 2018 from Ministry of Energy - TAX ISSUES OF POWER SECTOR AND SETTLEMENT

DISCOs' Proposals	***FBR Response***	***Power Division Recommendations***
Levy of sales tax on subsidy granted by GOP to DISCOs *Power sector subsidy provided by the Federal or Provincial government is not liable to Sales Tax being not part of invoice;* ***Or*** *DISCOs may be allowed either to recover sales tax on tariff differential subsidy from the consumers or the Finance Division may provide sales tax on tariff differential subsidy to DISCOs.*	*Federal Board of Revenue recognizes that sales tax on tariff differential amount is not being recovered from the consumers and the burden cannot be imposed solely on DISCOs. It is, therefore, proposed that DISCOs may be allowed either to recover sales tax on tariff differential subsidy from the consumers or the Federal Government also pays sales tax on tariff differential subsidy to DISCOs.*	*ECC of the Cabinet may decide DISCOs may be allowed either to recover sales tax on tariff differential subsidy from the consumers or the Federal Government also pays sales tax on tariff differential subsidy to DISCOs.*
Disallowance of input tax credit against transmission and line losses: *Input tax adjustment may be allowed by a further 50% of differential between actual line losses and those determined by NEPRA.* ***Or*** *Input tax adjustment may be allowed 100% of differential between actual line losses and those determined by NEPRA.*	*Federal Board of Revenue, therefore, proposes that input tax adjustment may be allowed by a further 50% of differential between actual line losses and those determined by NEPRA.*	*Ministry of Energy (Power Division) agreed with the Federal Board of Revenue proposal.*
Payment of sales tax on collection basis rather than on accrual basis: *Sales Tax to be levied and collected during a tax period, shall be on cash collection basis and not on accrual basis, by amending rule 14 of chapter 3 of Special Procedure Rules, 2007.*	*Federal Board of Revenue is of the point of view that the entire sales tax regime is based on payment of sales tax on accrual basis. Creating an exception would invite similar demands from other utility companies like K-Electric and Gas Distribution Companies etc.* *Federal Board of Revenue, therefore, does not support the proposal.*	*In pursuance of SRO 560(1)2006 dated 05 June 2006 DISCOs are forced to pay Sales Tax on behalf of those consumers who are not even paying electricity bills. Resultantly, an amount of GST receivable of DISCO accumulates to Rs.84 billion till December 2016. Cabinet in its meeting held on 12 October 2011 accepted the stance of DISCOs. However, the matter is still pending on the part of FBR.* *ECC of the Cabinet may allow payment of sales tax on collection basis rather than on accrual basis.*

Demand to charge Sales Tax on supply to AJ&K consumers on fixed rate and Domestic Consumers of FATA. *Electricity supplies to and from AJ&K may also be zero rated as approved by CCE in case of the domestic consumers of FATA (which be clarified to be inclusive of supplies to TESCO),and to be adjusted in the consolidated account.*	*FBR agrees with the proposal that supplies of electricity to AJ&K may be zero-rated on the reciprocal basis. However, the agreement reached between the two Governments was not provided legal coverage under the Sales Tax Act, 1990.* *However, FBR supports grant of zero-rating on supply of electricity to domestic consumers as domestic consumers of FATA are not paying any electricity bills. However, the proposal for grant of zero-rating on supply of electricity to industrial consumers of FATA is not supported as most of the production of FATA based industries ends up in settled areas and also for the reasons that industrial sector of FATA is paying electricity bills on its own.*	*The Division agrees with Federal Board of Revenue*
Chargeability of Sales Tax on Capacity Purchase Price in case of Central Power Purchasing Agency, Guarantee Ltd. *CPPA is also allowed not to charge sales tax on capacity charges as per Rule 13(3) of the Chapter III of Sales Tax Special Procedures Rules, 2007, like IPPs, HUBCO, KAPCO or WAPDA.*	*FBR does not support the proposal of not charging sales tax on capacity purchase price of the electricity supplied by CPPA (G) to DISCOs. Exemption provided to IPPs from taxation of Capacity Purchase Price is in pursuance of sovereign agreements signed with the IPPs by the Government of Pakistan. No such exclusions had even been provided to NTDC.* *Federal Board of Revenue, therefore, does not support the proposal.*	*As per Rule 13(3) of the Chapter III of Sales Tax Special Procedures Rules, 2007, the value of supply for IPP, HUPCO, KAPCO or WAPDA Hydroelectric Power has been restricted to only Energy Purchase price. Meaning thereby, no sales tax shall be charged on Capacity Purchase Price. CPPAG is also not charging sales tax on Capacity charges on its subsequent supply. Currently, tax Department is alleging that above referred rule is not applicable on CPPAG. It is pertinent to note here that in case CPPAG proceeded to charge sales tax on total value of supply including Capacity charges, it will further increase the refunds of DISCOs.*
Extension in period for exclusion of purchase price of electricity through SRO 17KIV208, dated 21st February, 2008: *Extension be granted in period for exclusion of PPE (Purchase Price of Electricity) through SRO 171(1)/2008 dated 21 February 2008, up to date of privatization of the corporatized entities of WAPDA and CPPA by appropriate notification by FBR or to exempt turnover of EX-WDISCOs and CPPA (G) by insertion in clause (11A) of Part IV of the Second Schedule to the ITO, 2001.*	*The proposal is not supported as dispensation allowing exclusion of purchase price through the said SRO was available up to tax year 2013. The demand is contrary to the provisions of section 113 of the Income Tax Ordinance, 2001. However, FBR is of the view that rate of tax under section 113 may be reduced to 0.5% in case of DISCOs.* *This can, however, be done through an Act of Parliament.*	*The Division agrees with the point of view of Federal Board of Revenue*

7.9 Keeping in view, the financial condition of the Power Sector, the GOP should do enabling acts for implementation of the proposals agreed between DISCOs, FBR and Power Division while residual issues may be discussed further at special committee level and be resolved at earliest.

Estimated amount of Tax Refund Impacting Circular Debt

7.10 Based on review of financial statements of some of Distribution Companies following tax refunds were identified based on which it is estimated that an amount of about Rs 95 – 100 Billion is refundable from Tax authorities by DISCOs in Pakistan.

DISCO / TAX REFUNDS	AMOUNT
IESCO GST recovery affected for Zero rate Supply to AJ&K	4,800,611,712
LESCO's Estimated Tax Refunds due from Governments	1,383,626,448
QESCO GST receivable from government	16,458,224,122
PESCO's Receivable from Tax authorities on account of GST	42,762,048,785
FESCO's GST refund claim	7,754,000,000
Rough estimate of Tax refunds of other 5 DISCOs	40,000,000,000
Estimate Tax Refunds from DISCOs	**113,158,511,067**

Source: Financial Statements and Presentations of DISCOs

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Chapter-8 Delay in Tariff Notifications

8.1 NEPRA, in the FY 2015-16, determined a multi-year tariff for IESCO, LESCO and FESCO for five Years. The same were intimated to the Federal Government for its notification in the official gazette.

8.2 The three DISCOs, being aggrieved from the aforesaid determination, filed a Motion for Leave for Review (MLR) which was accordingly disposed off in 2016. The MLR decision was also intimated to the Federal Government for its notification in the official gazette.

8.3 Subsequently, a reconsideration request u/s 31(4) of the then applicable Regulation of Generation, Transmission and Distribution of Electric Power Act, 1997 was filed by the Federal Government, which was also decided by the Authority on mid 2016 and the decision was intimated to the Federal Government.

8.4 Subsequently the three DISCOs filed a writ petition in Islamabad High Court (IHC) against the aforementioned decisions of the NEPRA. Pursuant to the directions of the Honorable IHC, vide judgment dated June 22, 2017, the tariff of LESCO was re-determined by the Authority on September 18, 2017 and was intimated to the Federal Government for notification in the official gazette.

8.5 Since the tariff so intimated to the Federal Government was not notified and a considerable period lapsed; as a result thereof certain substantial legitimate costs could not be passed on to the consumers. Therefore, the Authority in exercise of its Suo moto powers, vide its decision dated October 23, 2017 allowed the impact of periodical adjustments on account of Power Purchase Price (PPP) including impact of T&D losses on FCA and Prior Year Adjustment (PYA) pertaining to the FY 2016-17 in the consumer end tariff of these DISCOs and the same was also intimated to the Federal Government for notification in the official gazette. The Federal Government in March 2018 notified the MYT of these DISCOs determined for the FY 2015-16 to 2019-20 along-with periodical adjustments on account of PPP pertaining to the FY 2016-17 with immediate effect.

8.6 In accordance with the above referred notified tariff, DISCOs filed a request for adjustments for variation in PPP for variation in Tariff components for the past periods (that is from July 2016- to December 2017), on account of different heads. Subsequently these DISCOs also requested to allow the variation in PPP and PYA for the FY 2017-18.

8.7 NEPRA on August 31, 2018 issued tariff determinations for these three major DISCOs LESCO, IESCO and FESCO that mainly focus on outstanding adjustments in the tariff components of last 2-3 years. Because of above delays following costs could not be passed to the consumers and has now been passed as Prior Year Adjustments in FY 2019.

DISCO	*Amount (Rs in Million)*
FESCO	37,017
IESCO	18,476
LESCO	52,775
Total	**108,268**

Source: Tariff Determinations DISCOs