

The Transition that (almost) bankrupted a Nation!

From WAPDA to Unbundled System-Six Decades of Power Sector Management in Pakistan

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Summary

The provision of electrical power is of critical importance in any country's economic growth and development. Since independence, Pakistan has experimented with two major systems of power provision- a vertically integrated system under WAPDA since 1959 with Production, Transmission and Distribution under a single organization, and an 'unbundled' system with private sector participation since early 1990s that separated these three functions, managed by over two dozen public sector entities and private sector concentrated in power production. WAPDA achieved significant national milestones but its operations were hampered by various factors that were not necessarily of its own making. The persistence of these problems led to unbundling of the WAPDA led system, ushering in private sector led IPP model and a plethora of public sector entities managing it. However, except for production, not a single target/aim that was set at the time of WAPDAs unbundling has been met. Even the production aspect has come at a hefty price to the exchequer and the consumer. The liabilities of the sector have assumed such proportions that it has put the entire fiscal operations of the federal government at stake, reflecting a poorly managed, inefficient and unproductive system. The cost-benefit analysis concludes that the previous system under WAPDA was better in terms of benefits accrued. The conclusion of this research effort is that the decision to unbundle WAPDA was poorly thought out and badly executed. In the Way Forward, it is proposed that the best strategy now is to decentralize the system to provincial level, with competition, a competitive trading market and optimizing upon relative comparative advantage at the core of the new strategy.

Executive Summary

Pakistan's power sector has undergone a profound transformation since independence, evolving from a centralized monopoly under the Water and Power Development Authority (WAPDA) to a fragmented structure with multiple entities. **Historically**, WAPDA – established in 1959 as a vertically integrated utility – spearheaded the country's electrification and large-scale water and power projects. In its early decades, WAPDA achieved notable successes: it rapidly expanded electricity access (electrifying thousands of villages), developed major hydropower reservoirs (such as Mangla and Tarbela dams) that provided cheap energy and irrigation water, as well as fostering domestic technical expertise and self-reliance in power infrastructure. These efforts contributed to economic growth by increasing per capita electricity consumption and supporting agricultural and industrial development.

However, chronic issues such as under-investment in Generation and Transmission, high Transmission and Distribution (T&D) losses, politically driven policies like rural electrification, and the non-provision of required funds for meeting development goals strained WAPDA's finances and capacity. The sector's overreliance on a single source (hydroelectricity) led to seasonal energy shortages, and the absence of sufficient funding for expansion resulted in frequent load-shedding. This created strong motivation for reforms.

International financial institutions and donors advocated for liberalization and private sector participation as a remedy, viewing WAPDA's monopoly as inefficient. The government, facing fiscal constraints and an energy crisis, grew receptive to these ideas. Thus, a series of policy initiatives from the mid-1980s onward paved the way for unbundling and privatization: private power generation was invited through the 1994 Power Policy (and subsequent policies in 1995, 1998, 2002), an independent regulator (NEPRA) was established in 1997, WAPDA's Power Wing was **unbundled** into separate generation companies (GENCOs), distribution companies (DISCOs), and a transmission company (NTDC), with the expectation that competition and private capital would resolve the sector's woes.

Despite these initiatives, the study finds that many of the original objectives of unbundling have not been achieved. The power sector's challenges, in fact, have worsened, with the post unbundling power system struggling with **persistent crises** that mirror or exceed those of the WAPDA era. Notably, efficiency gains remain elusive: while WAPDA's integrated system was criticized for T&D losses which, on average, stood around 24-25 percent till its demise, the unbundled system still suffers significant losses, averaging around 21 percent since its inception (often well above regulator's allowed 11 percent threshold), with the financial burden of these losses has ultimately shifted to the state and consumers. The hoped-for surge in private investment materialized mostly in power generation (through independent power producers, IPPs), but this came at a high cost to the system in the form of expensive capacity payments and fuel imports, etc., that

have led to some of the highest electricity tariffs in the region, straining consumers and industries. The generation mix moved decisively toward costly thermal fuels (oil, gas, and imported coal) after unbundling, as new private plants were predominantly fossil fuel-based; consequently, Pakistan's power tariffs rose steeply in the 2000s and 2010s, and the country became heavily reliant on fuel imports, exposing it to balance-of-payments pressures.

The expected improvements in service reliability and systemic inefficiencies remain elusive. Load-shedding has persisted, reaching crisis levels several times, inflicting substantial economic damage (with studies estimating annual GDP losses of around 2 percent due to power outages). Continued governance failures led to the emergence of Circular Debt (CD), a defining feature of the unbundled era, with inefficiencies and misaligned incentives across generation, distribution, and retail leading to accumulation payment arrears throughout the supply chain. By March 2025, CD exceeded Rs 2.3 trillion despite payments of Rs. 2.06 trillion on this account. The burden of these inefficiencies, ironically, falls squarely on the consumers and national treasury, which goes against what was eschewed at the time of WAPDA's unbundling. Besides CD, the magnitude of fiscal liabilities built up over the years have been such that they have put government finances in a very precarious position; capacity payments and power sector subsidies, for example, have gobbled up more than Rs. 17 trillion since FY 96-97. By contrast, the system under WAPDA had minimal liabilities since it generally financed its projects via its own revenue plus public sector development outlays, and there was no equivalent of today's cascading inter-corporate debt.

Additionally, the unbundled structure created institutional fragmentation: over two dozen public sector entities now operate in the power sector, often with overlapping roles and diluted accountability. The coordination challenges and 'turf wars' among these agencies (generation companies, multiple DISCOs, central power purchaser, regulator, etc.) have hampered coherent planning and exacerbated governance problems. In short, the reform that was meant to cure the sector's ills ended up with the sector sleepwalking into an abyss, as many of the problems and constraints faced under vertically integrated WAPDA not only remain unresolved but have, in some cases, become more acute under the unbundled system.

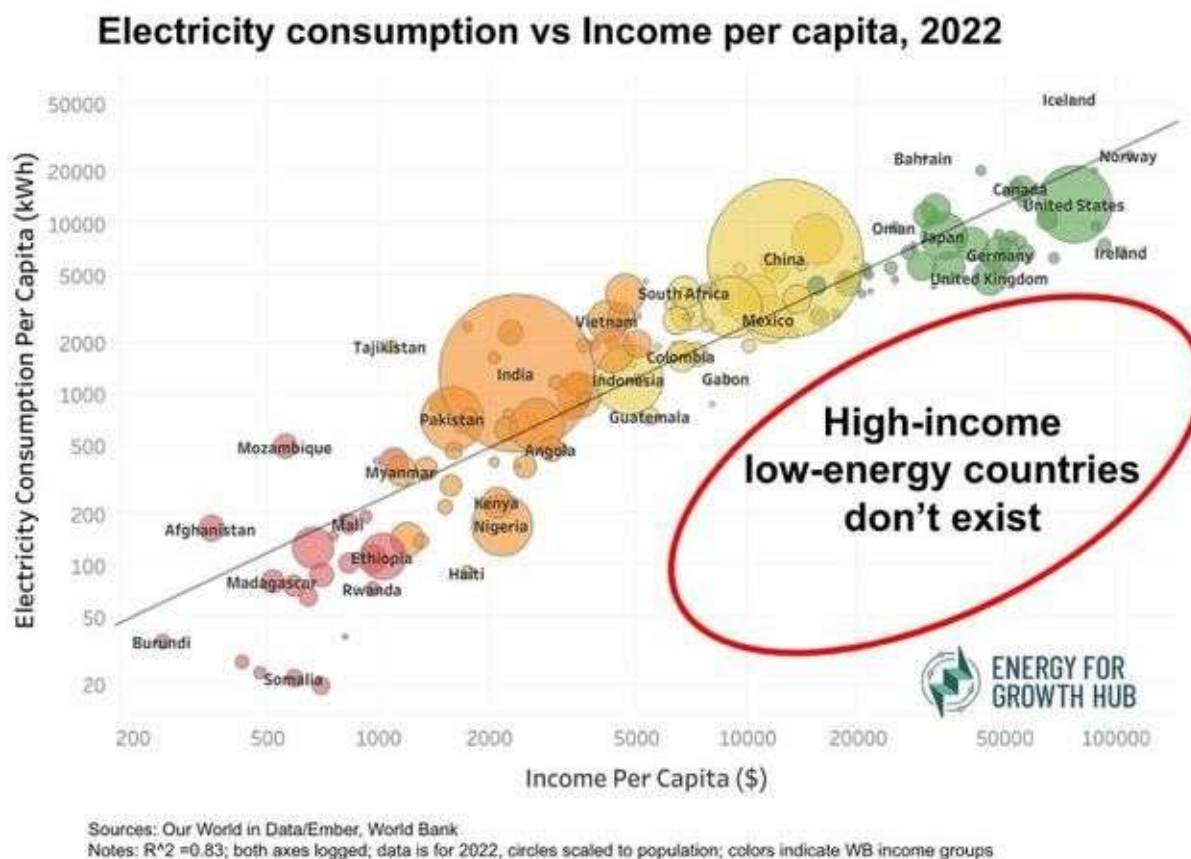
Given this sobering outcome, the paper argues that a bold rethinking is required to put the sector on a sustainable track. The analysis of historical data, comparative performance, and policy evolution reveals that merely unbundling a monopoly without addressing underlying governance and incentive issues has yielded limited benefits. Indeed, some positive aspects of the old WAPDA system – such as its ability to undertake integrated long-term planning, mobilize low-cost financing (often with significant grants and concessional loans), and reinvest surpluses into expansion – were lost or weakened. WAPDA's integrated structure had fostered a measure of self-reliance (for example, WAPDA in the 1980s was generating a substantial portion of its development funds internally and had attracted top international experts for projects like waterlogging and

salinity control), whereas the unbundled regime became heavily dependent on external financing and consulting, often dictated by donor agendas. The study's comparative assessment shows that the unbundled power sector's financial viability and technical performance have not met expectations; indicators such as per-capita electricity consumption growth, industrial usage of grid power, and overall capacity utilization have stagnated or declined in the post-unbundling period. By FY 23-24, Pakistan had an installed generation capacity of nearly 46 GW (including K-Electric), yet peak demand utilization was barely one-third of that – meaning two-thirds of capacity is paid for by consumers but goes unutilized due to demand shortfalls and systemic inefficiencies. This overcapacity, coupled with guaranteed capacity payments in contracts, has translated into enormous fixed costs that are passed on in tariffs. These outcomes underscore that the intended market liberalization and corporatization measures did not automatically yield a competitive, efficient market as envisaged. Instead, new problems like CD and exorbitant IPP contracts have combined with old issues like losses and poor service, resulting in a complex crisis.

In light of these findings, the paper provides policy recommendations and a forward-looking roadmap to guide the power sector out of its recurring crises. Central to the recommendations is the need to reform governance and market structure. The study advocates moving towards a truly competitive electricity market (the long-delayed Competitive Trading Bilateral Contract Market, CTBCM), where multiple buyers and sellers can trade power, replacing the current single-buyer model that concentrates power procurement in a central agency. This transition would encourage efficiency and innovation, but it also requires strong regulatory oversight and the political will to diminish bureaucratic control. The authors emphasize decentralizing decision-making: pricing and planning should incorporate provincial and local considerations, allowing regions to develop energy solutions suited to their resources (for example, enabling hydro-rich areas or solar-rich areas to benefit from their natural advantages with less interference from a centralized authority). Institutional streamlining is also recommended – the profusion of public sector entities must be consolidated or better coordinated, and the role of government should shift from micromanaging operations to setting policy and enforcing rules. The paper calls for restoring financial sustainability by renegotiating onerous contracts (especially with IPPs), eliminating distortive subsidies and surcharges over time, and aggressively tackling inefficiencies in distribution. Ultimately, the study concludes that without deep structural changes – including enhancing transparency, accountability, and competition – Pakistan's power sector will remain stuck in a cycle of crisis. The way forward entails difficult but necessary reforms to create a modern, resilient electricity supply that can support the country's growth while being affordable to consumers.

1 Introduction

Power consumption and economic growth correlated, with innumerable studies proving beyond doubt that prove beyond any doubt that as GDP grows, so does power consumption. Simply put, one is not possible without the other. The graph below amply demonstrates the positive correlation between power consumption and economic growth, with the largest economies consuming highest per capita power.



As the graph posits, there is no such thing as high income, low-energy consumption country. An implication is that the functioning of power sector within a country holds critical importance in terms of economic growth prospects of a nation. A well-functioning power sector which is able to meet the power demands of a country propels higher GDP growth as well as increased energy consumption.

Pakistan is no exception to this rule, and this criticality of power provision for economic growth and development was recognized from early days.¹ Since independence, Pakistan has gone through two major experiments in its quest to ensure provision of energy in the country- the creation of a vertically integrated Water and Power Development Authority

¹ In fact, there is research that suggests that higher consumption of electricity spurs higher economic growth rather than the other way around. See 'Energy and economic growth in Pakistan' (2004)

(WAPDA) in 1958, which was a single entity charged with looking after Production, Distribution and Transmission, with the arrangement lasting from its founding in 1959 to early 1990s, when it was 'unbundled' into entities that were to look separately after production, transmission and distribution, an arrangement that is still in effect.² The second experiment began with unbundling of WAPDA in early 1990s with the aim of increased private sector involvement in the Power sector.³

Till this day, there exists no study that has taken an extensive look at the workings of the sector in these two distinct eras (Pre-Unbundling vs. Post-Unbundling) while also making a comparison. Specifically, the political economy behind the workings of the power sector in these two periods and how several factors that affected its workings? Although Malik, Mahmood and Ahmed (2008) did make a comparison between these two eras, this research paper constitutes a more detailed, expansive analysis of a sector that has troubled the policy makers since long. Moreover, substantial amounts of stats from both eras were accumulated for narrating the story of these two eras and a brief comparison (cost-benefit analysis). Additionally, this paper aims to peer deeper into the reasons that led to WAPDAs unbundling, and whether the decision was warranted? Once this particular query is addressed, the post-unbundling part is then analyzed in detail, followed by a brief Cost-Benefit comparison, and finally, a Conclusion and Way Forward section.

2 A brief note on difficulties encountered and some clarifications

Research work that spans long-term horizons, especially any research related to public sector entities in Pakistan, tends to be a significant challenge in Pakistan's peculiar institutional setting. From access to data and related documents to logistics related issues, such research usually requires a Herculean resolve to be completed, specifically when the aim is to produce original, quality research output.⁴ Just to give the reader an idea of the difficulties and roadblocks encountered, the following para from the famous, all-powerful M. Ali Committee on Independent Power Producers (IPPs) and Power Sector (2021) presents a good illustration of this fact-

'Despite its best efforts, the Committee was not provided with the break-up of bulk power upfront tariff, including Return on Equity ("RoE") used under the 1994 policy,

² It is difficult to pinpoint an exact date when WAPDA was unbundled since it was the culmination of a long drawn-out process that began taking shape in mid-1970s.

³ Before WAPDAs founding, electricity related matters were dealt by respective provinces with no unified arrangement for coordination or decision-making.

⁴ Pakistan's research landscape is notorious for plagiarism and intellectual copy right violations. During the course of this research work, the authors also encountered numerous such cases, which were discarded for lack of quality and being mere rephrased versions of other papers

because of which it was constrained to undertake only a limited review of the IPPs set up under the 1994 Policy'.⁵

Earlier, in 2017, when the Senate of Pakistan sought details regarding payment of Rs. 32.451 billion as Capacity Payments to IPPs that remained idle, the Central Power Purchasing Authority (CPPA-G) and National Power Control Centre (NPCC) both refused to provide the required data.⁶

Similar issues were frequently encountered during the course of completion of this paper, briefly provided in the following lines.

- The figures of receivables mentioned by SBP, NEPRA and ADB, in terms of contributors to 'Circular Debt', do not match and there is a considerable difference between various sources. For example, SBP states that receivables from FATA in FY 07-08 and 08-09 were Rs. 9.43 and Rs. 10.24 billion respectively.⁷ But for the same years, ADB puts the numbers at Rs. 74.2 and Rs. 84.4 billion respectively, quoting Finance Division and CPPA-G as the source.⁸
- An example of data fudging is the data pertaining to SAIFI and SAIDI, two measures that reflect quality of electricity services being provided. In the NEPRA Annual Report 2014-15, the reported SAIFI and SAIDI for Tribal Electricity Supply Corporation (TESCO), an area where losses are one of the highest in the country and electricity breakdowns plus load shedding is frequent, are close to figures of Islamabad Electricity Supply Corporation (IESCO), which has persistently been the best performing distribution company (DISCO) over the years. This, to put mildly, is not possible! Additionally, the reported numbers for these variables for areas within Peshawar Electricity Supply Corporation (PESCO), bordering TESCO areas, in the same year also reflects serious data quality issues. There is a huge gulf in the reported numbers between the two, which given the ground realities, is not possible.⁹ From the same reported statistics, the significant difference between the average SAIFIs of FY 2012-13 and FY 2013-14 is hard to believe (217 and 124 respectively, which reflects decline in SAIFI by almost half). This contention is supported by the corresponding SAIDIs for these years, which shows a decline by only 10 percent.
- In terms of systemic interruption data (SAIDI), measured in minutes, there is a remarkable difference between data reported for Multan Electricity Supply Corporation (MEPCO) for the FY 2019-20 and FY 2020-21. The former is 31,921

⁵ #21, p.7, 'Report on the Power Sector: COMMITTEE FOR POWER SECTOR AUDIT, CIRCULAR DEBT RESOLUTION & FUTURE ROADMAP' (2021). This report is generally referred to as the M. Ali Committee Report

⁶ Report No. 10 of 2017, p.3 of Annexure, Senate of Pakistan

⁷ SBP Annual Report FY 2012-13, CH on Energy, Table 3.2, p.40

⁸ 'Sustainable energy sector reforms' (2013), ADB, Supplementary document 13 on Circular Debt and its repercussion, Table-1, p.4

⁹ NEPRA Annual Report 2014-15, Table 57, p.157

minutes (or 562 hours) while the latter is reported as only 40 minutes (less than an hour).¹⁰ Such a stupendous drop within a year is not possible, and clearly the reported data is fudged.

- Reported statistics in terms of quantified benefits of Mangla and Tarbela dams also present an anomaly. The figures presented in a 1986 report¹¹ and those presented in WAPDA Annual report 1991-92 differ significantly.¹² As per the estimations made in 1986, the total benefits from Mangla in the time period 1967-1980 stood at Rs 10 billion, 607 million. In contrast, the estimates in Annual Report 1991-92 put the total benefits at Rs. 22 billion, 806 million. Further, there is no explanatory note on what gave rise to such substantial difference in estimates?

The above mentioned anomalies/ data discrepancies were kept in perspective during the course of research work in order to avoid making interpretational mistakes and arrive at the most logical, unbiased conclusions and estimations.

It is opportune, also, to clarify that despite the expansive nature of this study, there are many details that remain uncovered. Pakistan's power sector constitutes a vast, complex technical setting, making it impossible to cover its every aspect in just a single paper. Every sub-sector (Generation, Distribution and Transmission) has its own peculiarities, history and technicalities that would need at least a separate paper of considerable length, if not a whole book. Despite this, it is hoped that the reader would find enough details to understand the historical context and development of this sector.

¹⁰ NEPRA Performance Evaluation Report-Distribution Companies, 2022-23, p.31

¹¹ WAPDA Projects in Brief (1986)

¹² WAPDA Annual Report 1991-92, p.18 and p.20

CHAPTER-I

WAPDA- The
promise that
morphed into a
problem

1- WAPDA- Genesis and Achievements

The antecedents of founding of WAPDA are rooted in circumstances at the time of birth of the country, the Indus Water Treaty (IWT) between India and Pakistan and the quest to achieve economies of scale through a natural monopoly on an already built expansive network of water.¹³ At the time of Pakistan's birth, there was little or no private sector presence in the country, especially in context of taking up largescale development and infrastructure projects. Therefore, by default, public sector assumed responsibility of economic management related matters. This included the provision of electricity and issues related to power development in the country.

The post-partition functions related to electricity that were being dealt with by provinces were later shifted to the WAPDA, created under an Act of Parliament (WAPDA Act-1958). The economics of power production, distribution and provision, as well the natural geography of the country favored a centralized, natural monopoly for large-scale development of the power sector.¹⁴ Further, the development of a power related nationwide infrastructure requires tremendous amounts of coordination and effort which was not possible through a disbursed governance and decision-making structure. Moreover, the financial basis of carrying out large projects like Tarbela and Mangla implied that there were huge amounts involved (mostly irrecoverable or sunk costs) and such projects could be of long-gestation. All these factors favored a centralized body of decision-making, backed by the federal government, which ultimately led to WAPDA's founding in 1959.

Another factor going in favor of a single, central body was the geographical realities and the concept of a natural monopoly. Pakistan had a rich riverine system since the start, with a huge network of canals all across the country built by the colonial administration. Water has remained the cheapest source of power production throughout history. All it needed was to build power producing infrastructure on water's natural flow and a networked delivery system for power provision. For various reasons, it could not be done by provinces, so it fell to the Center to take up the reins in this matter. But it needed a vertically integrated natural monopoly, one that is built upon a naturally bestowed resource (in this case, water) to pursue the twin goals of socio-economic development and power production (and provision). All these factors were the basis of founding of WAPDA.

¹³ Briefly put, Economies of Scale refers to the concept of reduction in average costs (fixed plus variable costs) as a firm increases its output.

¹⁴ There were other factors too that favored a centralized, federal level entity, one being the negotiation of external loans required for internal development, especially large-scale infrastructure. Given adverse financial circumstances in the early years of the country, there was little or no possibility of carrying out required development work through internal resources.

All of the above are well encapsulated by the WAPDA Year Book 1963-64 in the following words-

‘The Authority was established to provide for the unified and coordinated development of the water and power resources of West Pakistan’.

Besides the above mentioned domestic compulsions and aims, the signing of the Indus Water Treaty (IWT, 1960) between India and Pakistan also necessitated the establishment of a central authority like WAPDA. The IWT gave rise to the ‘Indus Basin Plan’ (IBP) that envisaged building of mega water storage structures (Tarbela and Mangla), link canals of 388 miles in length with aggregate capacity of 99,000 cusecs, five new barrages equaling 3.5 miles in length, and 2,500 tube wells across the country to control water logging and salinity and provide water for agriculture. All this was not possible in an environment with segregated decision-making; it needed a central coordinating authority. In this regard, given the paucity of technical and financial resources, there was no alternative but to turn to donors and foreign government’s to help in completion of the said objectives. Consequently, the government entered into an agreement with the U.N Special Fund for assistance worth 2.4 million dollars, under which UN was to provide funds, technical expertise, training and required equipment for completion of IBP. Thus began WAPDAs long journey in terms of developing and managing hydro related facilities that continues on till this day.

From time to time, WAPDAs functions and operations went through changes. The Constitutions of 1956 and 1962 and 1973 declared electricity to be a dual federal/provincial subject. Article 157 of the 1973 Constitution of Pakistan gives authority to the federal government and provinces to generate, transmit and distribute electricity throughout Pakistan. The Article reads;

Article 157 - Electricity. (1) The Federal Government may in any Province construct or cause to be constructed hydro-electric or thermal power installations or grid stations for the generation of electricity and lay or cause to be laid inter-Provincial lines.

(2) The Government of a Province may-

- (a) to the extent electricity is supplied to that Province from the national grid, require supply to be made in bulk for transmission and distribution within the Provinces;
- (b) levy tax on consumption of electricity within the Province;
- (c) construct power houses and grid stations and lay transmission lines for use within the Province; and
- (d) determine the tariff for distribution of electricity within the Province.

- (3) In case of any dispute between the Federal Government and a Provincial Government in respect of any matter under this Article, any of the said Governments may move the Council of Common Interest for resolution of the dispute.

In its functions and responsibilities, WAPDA was tasked to investigate, survey, plan and execute schemes for all or any of the following matters, namely:

- irrigation, water-supply and drainage; and recreational use of water resources;
- the generation, transmission and distribution of power; and the construction, maintenance and operation of power houses and grids;
- flood control;
- the prevention of water-logging and reclamation of water-logged and salted lands;
- inland navigation; and
- the prevention of any ill effects on public health resulting from the operations of the Authority'

There was recognition at the government end of the importance of developing power resources for the socio-economic development of the country, amply reflected in the development outlays. During the Second 5-Year Plan (1960-1965), for example, almost half (Rs. 2,260 million out of Rs. 4,508 million) was earmarked for the Water and Power sector, out of which the total allocation for the WAPDA projects was Rs 1758.52 million (approximately 78 percent).

By end of FY 1965-66, out of the total expenditure of Rs 1,795 million, it had managed to complete twelve major projects at a cost of Rs 1,295 million on thirty nine proposed schemes in the Water and Power Development Programs, while other major and minor projects were in the works. The following table presents selected major works of WAPDA (completed or in progress) and their estimated costs up till end FY 1962-63.

Table: Major WAPDA projects and their cost (Rs. million)	
Name of work	Cost
Mangla Dam	2,306
Resettlement	276
Tarbela Dam	3,347
Link Canals	1,740
Barrages	1,262
Remodeling	119

In its workings, WAPDA enjoyed considerable autonomy (theoretically at least), perhaps best described by the following statement-

'The Authority as a corporate body is entitled to acquire and draw on Authority's fund meeting its requirements of money in the course of its day-to-day business. The Authority funds consist of loans and grants from the Federal and Provincial Governments, foreign aid and funds raised through sale of debenture with the approval and backing of the Federal Government. WAPDA has also financed part of its power development programme through self-generated funds, that is, funds available from revenue surplus of the Electricity Operations Branch. With the disintegration of One Unit and consequent emergence of four provinces in Pakistan in 1969-70, the pattern of financing of development projects also underwent a change. Beginning from the financial year 1972-73, the funds for financing water projects have been provided by the respective Provincial Governments through their Annual Development Programme to WAPDA which acts as an executing agency for these provinces. The funds for power projects and such water projects as are of inter provincial nature and are planned on national basis continue to be provided by the Federal Government. For implementation of salinity control and reclamation projects, (SCARPS) as embodied in the revised 21-year Accelerated Programme, funds are provided by the Federal Government. The liability on account of payment of interest and loan in respect of power projects is that of WAPDA which operates and maintains completed power projects. As to water projects, these on completion and after initial test running, are transferred to the Irrigation and Power Department of the respective provincial governments along with their liabilities for operation and maintenance.¹⁵

Aside from grants (federal, provincial governments and donors), debentures, revenue from sale of electricity and later on, raising its own funds through WAPDA bonds, another source of income came from outsourcing fishing rights. In FY 1984-85, for example, Rs. 24.88 million were earned through outsourcing fishing rights in Mangla reservoir. Further, for its plans and estimations, it used to carry out extensive studies of various kind, both at the macro and micro level. One such micro level study, conducted regularly, was the 'Power Market Survey Report', prepared by the Power Market Survey Division of WAPDA's Planning Department. The data included in the report was based on actual field surveys i.e., a micro-economic study of present and prospective power demands for each consumer category (agriculture, industry, transport, communications, as well as the programs included in the Industrial Investment Schedules prepared by the provincial governments).

As described above, WAPDA was bestowed with a vast array of responsibilities that ranged from producing cheap electricity and its provision all over the country to building mega water storage reservoirs for agricultural and electricity production purposes. Additionally, land reclamation, soil surveys, etc., were also part of its responsibilities. What follows is a brief description of its achievements and benefits.

¹⁵ WAPDA Year Book 1975-76, p.4

About five years into its operations, in FY 1963-64, it estimated that due to its reclamation activities (reclaiming saline and water logged soil for growing crops), the net increase in farm income on average was Rs 64 per acre in the northern zone and Rs 58 per acre in the southern zone of the country, with a final benefit-cost ratio of 2.25:1, meaning for every single rupee spent, the estimated monetary benefits were equivalent to 2.25 rupees, reflected in the accompanying table.¹⁶

Table: Estimated benefits of WAPDA reclamation projects (Rs. millions)			
Item	North Zone	South Zone	Total
Gross value of crop production after reclamation	5,058	2,403	7,461
Gross value of crop production prior to reclamation	2,666	1,320	3,986
Gross value of incremental crop production	2,392	1,083	3,475
Annual cost of reclamation programme	291	103	394
Increased cost of production after reclamation	857	318	1,175
Total costs	1,148	421	1,569
Cost-Benefit Ratio	2.1:1	2.6:1	2.25:1

The responsibilities entrusted upon WAPDA meant that it had a sizeable yearly purchase quota for equipment and services, which was a positive spillover for the local economy. Although there is no technical study available in terms of estimating the multiplier effect of these purchases, there is little doubt that the large-scale purchases would have spurred the local economy. Moreover, these purchases gradually tilted towards having a minimal foreign component, thus saving precious foreign exchange. All this is reflected in the table below which shows purchases from 1963 to 1973, bifurcated by local and foreign components.¹⁷

Table: Imported and local purchases (in Rs. millions)							
Year	Local Orders	Foreign (cash)	Loan, credit and Barter	Total	Change	% local	% foreign
1961-62	9.10	23.91		33.01		28	72
1962-63	14.60	6.60	16.2	21.20	(1,200)	69	31
1963-64	35.8	20.6	16.2	73.6	5,300	49	28
1964-65	84.7	10.7	20.2	115.6	4,200	73	9
1965-66	33.3	16.8	19.6	69.7	(4,590)	48	24
1966-67	70.9	0.5	10	81.4	1,170	87	1

¹⁶ WAPDA Annual Report, 1963-64, p.57

¹⁷ Compiled from WAPDA Annual Report, 1972-73, p.224. Also notice the precipitous declines in total purchases in selected years that reflect breaks in WAPDA's efforts due to paucity of funds, an issue that kept plaguing its workings

1967-68	53.9	0.2	55.9	110	2,860	49	0
1968-69	173.1	0.1	16.8	190	8,000	91	0
1969-70	30.6	0.3	60.1	91	(9,900)	34	0
1970-71	78.8	0.6	49.6	129	3,800	61	0
1971-72	26.8	0.03	4.5	31.33	(9,767)	86	0
1972-73	120	0.1	47.5	167.6	13,627	72	0

Another of WAPDAs decision that was meant to benefit the country came in the form of employing local manpower, especially consultants, for its power projects rather than being dependent upon foreign consultants (which was the case in its initial years). This is evident from the following statement in its year book of FY 72-73-

‘The decision to appoint Pakistani consultants in the Power Sector was announced during the year for maximum utilisation of the available expertise. This was indication enough of the confidence reposed in national professional skills by the Government. Hitherto, foreign consultants had been appointed. In some cases, they came as a part of the package deal signed with the loan giving agencies. These foreign consultants either utilised the local talent or associated local consultants for detailed spade work. Although some useful service was rendered by the foreign consultants, the Pakistani counter-parts were usually relegated to the second position despite the fact that the bulk of work was done by them. Such an arrangement usually cost a great deal to the country's exchequer in general and to WAPDA in particular. Thus rightful place of our country's experienced and skilled personnel was restored. Some of the works were awarded to Pakistani consultants and contractors. Notable among such works were the studies undertaken in connection with 200MW Gas Turbine for Lyallpur and preparation of its PC-1 Proforma and of shifting of 12.25MW Gas Turbine from Kotri to Quetta’.¹⁸

Accordingly, of the total of 15,333 consultants and contractors employed by WAPDA in FY 1972-73, only three percent were foreigners.¹⁹

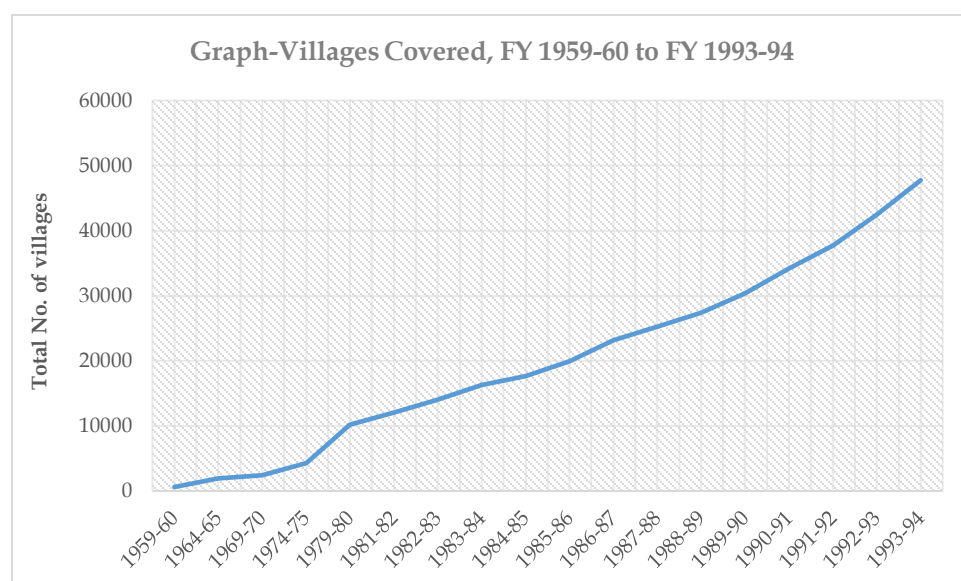
Critical savings of foreign exchange came in the form of WAPDAs increasing use (and priority given) of hydel power for electricity generation, thus obviating the need for expensive imported fuels. Throughout WAPDAs pre-unbundling history (and even afterwards), the emphasis of its management had been on utilizing the lowest cost input for energy production (i.e., hydel). For example, in FY 74-75, diesel (the costliest production source in pre-unbundling days) contributed only 0.16 percent in terms of sources used for electricity production, while total imported sources for electricity

¹⁸ WAPDA year book 1972-73, p.132

¹⁹ WAPDA Year Book 1972-73, p.60

production (fuel + KESC) contributed only 2.33 percent to the total electricity produced. The remaining 97 percent came from the cheapest sources, hydel and natural gas. In FY 75-76, the contribution from diesel fell to 0.015 percent and 0.20 from imports respectively. The savings resulting from the use of low-cost sources were considerable, aptly reflected by the example of savings that accrued due to fuel mix used for production in FY 84-85. The fuel expenses were Rs. 1,847.9 million in FY 83-84, bringing the average fuel cost on account of thermal generation to 35.35 paisa per KWH as against 40.85 paisa per KWH during 1984-85.²⁰ This implied cheaper electricity production or savings to the tune of Rs. 3,674 million in that fiscal year alone.²¹

In terms of low-cost electricity generation, and to gauge the potential size of savings (in line with the above shown calculation for a single year), two of its mega schemes (Mangla and Tarbela) have remained outstanding performers, contributing tremendously towards provision of cheap electricity (aside from storing water and making it available for agricultural purposes throughout the year) that in turn helped businesses, industry and overall economic performance. From FY 1967-68 to FY 1991-92, Mangla dam generated 97,296 MKWH at a cost of Rs. 0.30 per unit. From FY 1975-76 to FY 1991-92, Tarbela dam generated 108,615 MKWH at a cost of Rs. 0.30 per unit.²²



Aside from the efficiency perspective, WAPDA also contributed towards fulfilling the 'equity' criterion of national development in various capacities. This primarily came in the form of the provision of electricity to far

flung areas of the country, a herculean task given the various geographical, security, financial and political constraints. Beginning with six hundred and nine village electrifications in FY 1959-60, it had managed to electrify more than forty seven thousand villages by FY 1993-94 when unbundling came along. Although there is no study that has

²⁰ WAPDA Year Book 1984-85, p.85

²¹ Calculations are as follows- FY 84-85, 12,245 MKwh from hydel and 5,858 from thermal, meaning the cost from hydel @ 0.10 paisa= Rs. 1,224 million (0.10*12,245) while cost from thermal @ 0.40 paisa= Rs. 2,343 million (0.40*5,858). If the 12,245 were produced @ 0.40 paisa, it would have meant an expense of Rs. 4,898 million. (4,898-1,224)= Rs. 3,674 mil savings

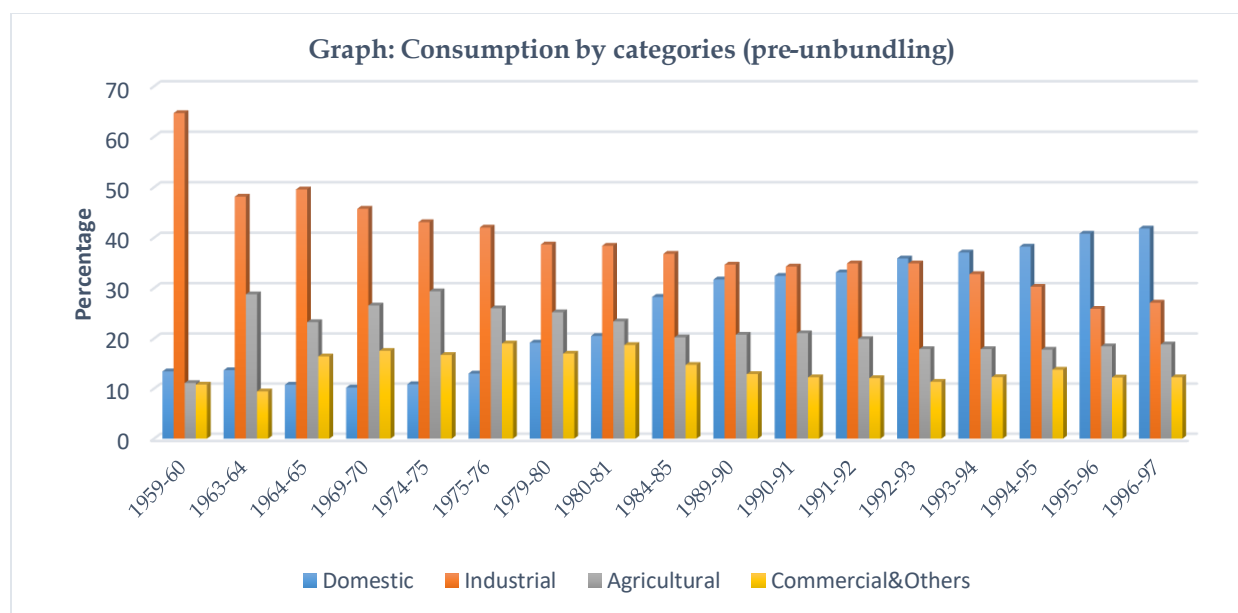
²² Data taken from various WAPDA Year Books

gauged the positive socio-economic spillovers of electricity provision to far flung areas of Pakistan, but given that there is ample evidence at global level of growth in per capita income as well as overall economic growth in lieu of electricity provision, one can be reasonably confident in stating that these areas realized significant socio-economic gains as electricity came to their areas.

The provision of electricity to nook and corner of the country helped increase the per capita consumption of electricity, not only an important indicator of enhanced welfare but also an important consideration in terms of financial viability (via increase in number of consumers, which in turn increases sales revenue) of an enterprise like WAPDA that is tasked with provision of an important service like electricity. By end fiscal 1982-83, WAPDA's efforts had resulted in per capita power consumption increasing nearly seventy four fold from 2 kWh in 1947 to approximately 225 kWh. Additionally, since 1959, number of consumers witnessed a seven-fold increase and revenues from sale of electricity had multiplied more than eighteen times.²³

Since early years of WAPDA's establishment, the consumer numbers in all categories (industrial, commercial, agriculture, domestic and others) had been on the increase. But the trend was particularly encouraging for the industrial, commercial and agricultural sector, thus contributing to socio-economic development through higher job creation, higher productivity, increase in output and increase in per capita income. Between FY 1959-60 and FY 1995-96, when IPP produced electricity entered the system, the industrial consumption remained 40 percent on average, reflecting higher use by industrial sector as well as WAPDA's contribution to industrial growth. Since then, unfortunately, the industrial consumption has gone down, to an average of 28 percent post-unbundling as the country is witnessing either stagnant industrial growth (with low electricity consumption) or de-industrialization. This is a critical point since industry has always remained one of the highest consumer of grid electricity around the globe, helping meet the service provider its financial requirements. The higher consumption of the industrial sector (pre-unbundling) is reflected in the graph below that shows consumption by categories.

²³ 'WAPDA-Then, Now, Tomorrow' (1980), p.62



Aside from the above, WAPDA also administered a vast array of welfare related initiatives within the organization, and its welfare initiatives (like hospitals and colleges) benefited the population at large. In FY 1980-81, for example, the Managing Committee of WAPDA Welfare Fund disbursed a sum of Rs. 1,165,800 to dependents/survivors of deceased WAPDA employees. Rs. 115,000 were disbursed among legal heirs of the 377 deceased WAPDA employees for meeting their funeral expenses, Rs. 126,400 was spent on grant of scholarships and for purchase of books. A sum of Rs. 47,000 was disbursed in 47 cases for meeting the expenses of marriage of daughters of WAPDA employees, while a sum of Rs. 51,300 was spent in 434 cases of deaths of dependents of WAPDA employees. Additionally, benefits of group life insurance scheme were enhanced in consonance with Pay Scales, ranging from Rs. 15,000 to 125,000. In terms of healthcare, the organization was running well-equipped hospitals at Lahore, Tarbela, Guddu, Mangla and Warsak, with Out-patients' hospitals started at Hyderabad, Peshawar and Islamabad.

WAPDA also showed itself to be receptive to newer ideas of governance and management. One such example is reflected in its decentralization experiment in the late 1970s. Its distribution setup was reorganized in 1976 to provide for increased participation of the provincial governments and consumer representatives in determining priorities and ensuring equitable distribution. These Boards were established at Lahore, Multan, Sargodha, Islamabad, Peshawar and Quetta. Each Board had a Chairman (who was the chief engineer of the region), two whole time Directors (finance and technical) and six part-time Directors-one a senior representative of the provincial government concerned, one representing the Chamber of Commerce & Industry, one representative each from agriculture and general consumers and one member each from the National and Provincial Assemblies. This reflected an urge to have wide, national-level representation and also a strategy to deal with local level issues through decentralization.

One of its strong points was its financial independence and its ability to generate its own revenue through various sources like bond issuance and grants. Over time, various financial indicators (like immediate cash at hand, total assets, etc.) showed a healthy growth despite several difficulties encountered, with the implication that WAPDA was less of a burden than other entities operating in the realm of public sector. This independence in fund/resource generation steadily evolved over time. In FY 1986-87, it was tasked with generating own development funds for its projects as Federal Govt. decided to significantly limit or do away with Annual Development Plan (ADP)s for water and power projects.²⁴ Consequently, it started raising its own funds through other means like sale of Bonds, aside from the traditional earnings through sale of electricity. First Issue of WAPDA Bearer Bonds were floated in 1988, against the target of Rs. 2 billion, fetching Rs. 3.102 billion from the public. The second issue floated in 1989 was also over-subscribed and fetched Rs. 5.631 billion against the target of Rs. 5 billion. The 3rd issue of WAPDA Bonds floated in 1990 was once again over-subscribed by about 75 percent as it fetched Rs. 6.844 billion against the target of Rs. 3.9 billion taking the total investment in these bonds to Rs. 15.577 billion. What all these bond issues and subscriptions reflected was the confidence of investors in WAPDA's financial standing.

Other than that, over the decades, WAPDA earned through cultivating fish in its reservoirs. In FY 1980-81, for example, it earned a record Rs.5 million from sale of fishing rights for Chashma, Mangla and Tarbela reservoirs to commercial parties. Thus, unlike most organizations in the public sector, it generated considerable amounts of funds to take care of its own affairs and projects, obviating the need for government funding in terms of running its day to day affairs.

The decision to concentrate upon domestic sources of production led to saving of precious foreign exchange which would have been expended on import of sources like furnace oil. Importantly, the low-cost electricity helped spur household and economy-wide consumption, leading to more revenue generation opportunities. And given that it received a large portion of foreign assistance in the form of grants (aside from loans on easy terms), the government was saved from heavy payments on account of foreign liabilities.

At its inception, WAPDA had little in terms of top-quality manpower that could take on work responsibilities in terms of projects like Mangla. However, over time, through technology transfer and knowledge infusion, it built up a quality human capital base through which it carried out its works. In case of Tarbela and Mangla dams, not even five

²⁴ The funding, however, seems to have continued later on. For example, in ADP of FY 1991-92, at 11.24, p.103 and p.104 of, there's a statement which suggests that despite taking the decision back in FY 86-87 to stop funding WAPDA, development funds kept flowing to WAPDA for power projects. This is explained by political imperatives, especially rural electrification, which is termed as a 'non-remunerative' activity for which WAPDA needed to be reimbursed or supported, therefore needing the continuation of Govt support (though reduced). Thus a separate budgetary grant was initiated under rural electrification, with Rs. 2.57 billion earmarked for rural electrification throughout the country

per cent of the work was done by Pakistani engineers. But for the designing of Kalabagh Dam, for example, eighty per cent of the work was carried out by Pakistani engineers, reflecting specialization and skill gaining through transfer of technology in the specialized field of big dam building. The skills garnered over time are still being used today.

The above stated offers a minor glimpse into contributions made by WAPDA in terms of socio-economic development of the country.

2- What led to WAPDA's Unbundling

In the fiscal year 1984-85, when the basic framework for unbundling WAPDA was initially agreed upon between International Financial Institutions (IFI) and Government of Pakistan (discussed later), things took a turn for the worst due to various reasons, leading to speed-up of the process of unbundling. Due to drought, there was record low water flow, leading to low hydel production, initiating a chain that would lead to worst load-shedding in country's history, and forcing even the then Chairman WAPDA to opine that something different will have to be done. In his words,

‘First, I will admit that the year 1984-85 witnessed the worst load-shedding in WAPDA history. Unfortunately, this is indicative of a rather difficult future, regarding the power supply situation, in view of ever growing consumer demands. The present extent of load shedding did not come about overnight. The increase in demand has been outstripping the growth in generation for some time. During the past 7 or 8 years, consumption of power has been increasing at the rate of over 11 percent, while the generation capabilities have increased by only 4 percent’.²⁵

This only served to hasten the process of bringing in the private sector in lieu of nationwide anger and mounting losses to the economy due to load-shedding. The commendable achievements of WAPDA aside, various issues like persistent load-shedding plagued its working and its performance. Part of these issues were driven by domestic and institutional policies, while others were of external nature. Ultimately, the persistence of these issues paved the grounds for unbundling. A brief description is presented in the following lines.

A major issue lay in the over-reliance on water as the major source of generating electricity. Although hydroelectricity was cheap, the over-reliance on it as main source of electricity production meant that in the years when water flow was below average or low, electricity production as well as crops would suffer. This is exactly what happened in FY 1974-75, for example, as noted by the WB in its report on Pakistan's power sector-

²⁵ WAPDA Annual Report, 1984-85

‘In FY1974-75, Pakistan suffered a series of setbacks. These included record low river flows reducing irrigation and hydroelectric power... In addition, because of damage to the stilling basins repairs to the Tarbela Dam have taken longer than expected and irrigation potential will probably not be available till late in FY1976. River flows during the 1974 summer crop season were the lowest in the past 90 years and fall and early winter canal supplies were only 40% to 50% of normal’.²⁶

Since electricity generation was excessively dependent upon water flows, this naturally meant that winter months were the most precarious in terms of electricity generation given that water flows are its minimum during these months. Load shedding in winter was common, which hampered business and economic activity, electrification efforts and higher electricity consumption in the country. In years with below normal rainfalls (like FY 64-65 and FY 74-75), the situation would get worse. In contrast, there were some years with above average rainfall (complemented by availability of water reservoirs like Mangla that could store excess water) when load shedding even in winters would be minimal or none. One such year was FY 1972-73, where, as per WAPDA,

‘For the first time there was no load shedding even in winter’.²⁷

However, these kinds of fortuitous circumstances were the exceptions rather than the norm, and load-shedding continued to plague the system, with its severity compounded several times in years when water flows were below average. This, aside from overall socio-economic repercussions, made life difficult for industries which was the largest consumer category of electricity consumption. Resultantly, a number of private industries resorted to ‘captive power’, having their own small plants, mainly for stand-by purposes, with an estimated total capacity of 230 MW by end FY 1976-77. This dependency upon hydro as major source of electricity production cost WAPDA in the long-run as persistent load-shedding, especially in winter months when water availability was low, led to resistance against its continuity as the sole provider of electricity and related aspects.

The political economy of being a public sector entity and its repercussions also affected WAPDA's operations. Although a state monopoly since the start, it did enjoy a substantial degree of autonomy in its work. However, from time to time, political demands upon it would lead to diversion of resources from planned works towards unplanned, financially unfeasible works. It specifically came under severe stress in the aftermath of the 1971 war when Zulfikar Ali Bhutto assumed power, leading to prioritizing politically directed schemes like village electrification as well as tube well electrification. The PPP government passed the ‘National Economic Reform Order (1972), which resulted in the immediate nationalization of a number of industrial plants, including the private

²⁶ WB Report No. P-1753-PAK (1976), p.1 and p.2

²⁷ WAPDA Year Book 1972-73, p.202

components of Karachi Electric, Multan Electric Power Company (MEPCO), and the National Refinery.

Nationalization was part of PPP economic strategy, but it proved to be an unwelcome development for WAPDA. Part of the reason was the animosity shown towards it by the then finance minister, Mr. Mubashar Hassan, and the then President, Mr Bhutto. By 1970, its autonomous status was gone and it was being run directly by the federal government through Ministry of Industries and Natural Resources. The persistent load shedding had been a cause of concern for all the segments as the shortage of electricity crossed 300 MW in 1972. Government's efforts aimed at resolving the issue revealed some startling facts, like idle and unutilized power plants across the country.²⁸ The situation became so dire that government had to promulgate 'Electricity Control Order 1972', leading to electricity rationing through discontinuing electricity supply to cinemas, public places and other selected avenues.

In 1972, when Hayat Khan Sherpao assumed the charge of Ministry of Water and Power, the then Finance Minister, Mr Mubashar Hassan, wrote a letter to him about WAPDA, stating that

'For the last five months, all my efforts in this direction have been frustrated by the inefficient organization over which your Ministry will be presiding. I would only refer you to the minutes of the last meeting of the Economic Coordination Committee of the Cabinet (ECCC) in which power shortage was discussed.... Progress has to be watched very carefully and ruthlessly...'²⁹

Three months later, the then Civilian Marshal Law administrator (and later Prime Minister), Mr. Zulfikar Ali Bhutto, wrote letter to the same minister, contending that

'The affairs of WAPDA are in a total mess. The country is being robbed by WAPDA quite mercilessly. We have to set up a technical high-powered committee to go through the affairs of WAPDA with a thin comb. Every aspect has to be scrutinized to promote efficiency and full utilization of resources. With the changed conditions there must be as much decentralization as possible...'³⁰

Accusing WAPDA of having an urban bias and ignoring rural areas, where majority of the votes came from, it was directed to speed up 'rural electrification' of the country. This scheme, over time, took a political color as it was increasingly used for political purposes. Provincial governments, for example, would furnish a list of the identified areas to the federal government where they wanted electricity services to be available, without any cognizance of financial aspect of extending this service to selected areas. For example, the following towns were electrified based on identification by the provincial government of

²⁸ For example, the Shahdara power station at Lahore remained idle due to non-availability of natural gas. Other than that, six power plants in government and semi-government ownership lay idle, plus several in private sector. Source: 'The Mirage of Power: An inquiry into the Bhutto Years, 1971-77' p.29

²⁹ p.30, ibid

³⁰ p.30, ibid

Baluchistan in the fiscal years 74-75 and 75-76, supplied electricity that was to be produced through diesel, the most expensive input in electricity production at that time.

Table - Baluchistan villages selected for electricity provision, FY 1974-75 and 1975-76	
Dera Bugti	Leo Bund
Kohlu	Gaundawa
Kahan	Gwadar
Muslim Bagh	Turbat
Duki	Naukundi
Sanjawi	Kharan
Barkahn	Meshkahil
Makhtar	Wadh
Musa Khel	Nal
Qila Saifullah	Mashkay
Qamruddin Karez	Ormara
Lehri	Pasni
Panjgoor	
Maiwand	

Over time, it became amply clear that such politically motivated electricity provision did more harm than good. In the 1980-81 official report, WAPDA maintained that

‘The issue of village electrification which poses a pressing social problem has been thoroughly discussed at Wapda-arranged seminars at national level in which foreign experts also participated. The consensus that emerged from these deliberations was that some sort of cooperative efforts must come from the people and that they should also share the heavy cost of village electrification to some extent. The Punjab Government has in this respect taken initiative and have agreed that villages can get electricity provided the residents pay 33% of electrification cost. On national level, Wapda is also negotiating loans from several agencies for village electrification’.³¹

These schemes started becoming a burden upon WAPDAs finances as provision of electricity to a large number of such areas resulted in substantial Transmission and Distribution (T&D) losses, resulting in financial difficulties aside from causing paucity of

³¹ WAPDA Yearly Report 1980-81, p.104

funds needed for pursuing other development and maintenance work, like repair of transformers.

Another of the politically motivated programs was the 'grow more food' program, with directions to electrify maximum number of tube wells around the country, an apparent ploy to curry political favor with land holders (especially owners of large tracts of agricultural lands who had been an influential group in politics even in colonial times). This diversion of resources like transformers, insulators, etc., to tube well and rural electrification, coupled with issues arising in sourcing equipment in the aftermath of 1971 war, dealt a significant blow to WAPDA's development plans. There was no shortage of water in that fiscal year (1971-72), which could have met the electricity demand, but restrictions had to be imposed on connections to new industrial and commercial units since the needed equipment like transformers were not available for the said purpose (either diverted to tube well schemes or unavailable due to import restrictions).³² Major Capital Works also suffered-In FY 1972-73, a sum of 4.24 crore (Rs. 40 million) was requested against Capital works but only half were sanctioned.

The outcome of this was alarming. In FY 1974, estimates suggested that 25 percent of electricity output was consumed by some 64,000 tube-wells around the country, with a major portion not paying its due share. This inflicted heavy financial cost upon WAPDA, aptly reflected in the following words:

'In spite of the high subsidy (Tube Wells), this facility is highly misused and this category of consumers indulge in malpractices..... other agricultural consumers are mostly feudal lords who are reluctant to pay electricity bills of their tube wells and occasionally use force to coerce WAPDA staff, who are in many cases more than willing to join hands with the landlords.... Extreme case of non-payment in Baluchistan, where electricity bills have not been paid in many areas for ten years....with the result that arrears are mounting at the rate of Rs. 1.5 crore per month...whenever the tube well consumers (especially of Pishin) are disconnected, the law-enforcing agencies order the reconnection in "the interest of peace".³³

Politics was also a constant hindrance in coming up with a tariff that could help WAPDA fulfill generated funds for its investment needs, as lower than demanded tariffs approved by the federal government did not fetch the required amounts from sales of electricity. A World Bank (WB) report acknowledged this in the following words:

'In the power subsector, pricing policies have also improved but several problems remain. The Government is committed to maintain power tariff levels sufficient to allow WAPDA to cover 40% of its investment program from internal funds. To accomplish this target, tariffs increased by 13% in FY90 and by 8X this year. These increases, however, are linked to a relatively low investment

³² WAPDA year book 1972-73, p.229

³³ 'Energy loss reduction in WAPDA Power Distribution System', (1987), p.59

program, as evidenced by the continuing excess demand for power and load-shedding. In addition, the tariff structure needs to be improved as certain consumer categories continue to be highly subsidized, and the average tariff level is still below the Long-Run Marginal Cost (LRMC) of electricity. At present, and following the cost increases due to the higher cost of oil fired thermal generation, electricity tariffs should be increased to reflect the higher costs. Similarly, the subsidized gas price paid by WAPDA is translated into a lower electricity tariff. Paradoxically, the low power tariffs, combined with insufficient generation, excess demand at peak times, and load-shedding result in higher energy costs imposed on commercial and industrial enterprises as they have to resort to the extensive use of back-up diesel generators'.³⁴

If getting approval of requested tariff from the government remained a challenge, an even bigger challenge confronted WAPDA throughout its pre-unbundling operations in the form of lack of receivables (or unpaid dues) of the public sector, an issue that persisted even after unbundling. For example, in FY 1999-2000, WAPDAs receivables amounted to Rs. 34 billion (1 percent of GDP), with a major chunk owed by Public Sector Entities.³⁵

Political favoritism caused a decline in the standards of the organization was reflected in contracts for works and services, an area especially prone of political interference and corrupt practices. The Chairman's message in the WAPDA Annual Report (80-81) noted that

'For this WAPDA will have to be very strict in selecting the consultants and contractors. In the past WAPDA has paid heavily through compromising on these and abiding by the outmoded method of accepting the lowest tenders even when doubts were cast about the ability of the Contractors concerned'.³⁶

For an organization pursuing country-wide electricity provision as well as handling matters related to water and water provision for agriculture, it was imperative that funds be arranged in a timely manner for completion of projects. However, from the very start, WAPDA encountered great difficulties in getting the funds required for completion of projects it had identified, or even those projects that central or provincial governments identified. And it was not just the domestic finances which were the problem, but also the external sources. For example, in FY 1963-64, WAPDA experienced a shortfall of Rs. 204 million (of which foreign loan component was Rs. 170 million) because the foreign loan did not materialize. This delayed/hampered the work on projects such as Lyallpur Thermal Plant, Sukkur Thermal Station and Hyderabad Thermal Power Extension. The following para offers us a clear demonstration of this.

'From FY1965-66 through FY1969-70, when WAPDA's investments were still capable of keeping abreast of the demand development, sales increased annually

³⁴ 'Pakistan: Current Economic Situation and Prospect-Report No. 9283-PAK (1991), xi, p.38, #2.66

³⁵ IMF Country Report No. 01/24, January 2001, p.29

³⁶ WAPDA Year Book 1980-81, Chairman's Message

by about 15%-23% (except in 1966/67, a year of exceptionally low water). Since FY1971 growth rates have dropped to 2%-11%, per year, indicating not only the effects of political unrest and severe drought, but also the fact that for many years WAPDA and the Government have been unable to raise the funds required for an investment program in step with the potential power demand. This has resulted in blackouts, load shedding, high losses and an inability to connect new customers at the required rate'.³⁷

By mid-70s, given increasing pressures upon WAPDA in the face of growing demand and for meeting other aims directed by governments (like increased pace of rural electrification), WAPDA sought more funds to meet all the demands, from upgrading its system (like the poor health of T&D system) to coming up quickly with new generation plants to cater for increasing electricity demand. However, arranging for the required funds proved to be a huge problem. A WB loan report noted that

'The total WAPDA development program for the Project construction period, i.e., FY76-80, anticipates investment expenditures of almost US\$1.8 billion. Of this amount about US\$574 million equivalent is in foreign exchange and about US\$1.2 billion in local currency. In addition to the proposed loan, about US\$490 million of the foreign exchange cost of the program still has to be secured. Moreover, about US\$700 million in local currency will have to be found from domestic resources'.³⁸

The demands kept piling up, as well as the requirements for funds. The Sixth Five-Year Plan's (1983-1988) allocation for energy was 38 percent of total public-sector outlays, representing a 200-percent increase over the achievements of the previous Plan. The next 5-year plan, the Seventh Plan period (1988-1993) continued the trend of requiring ever-increasing outlay, with energy-sector investments accounting for nearly 50 percent of the public investment program from FY 1989 to FY 1990. However, the required amounts never materialized due to fiscal constraints, which forced government to look at private sector to take up the task of arranging funds through investment in the energy sector.

Not surprisingly, the Seventh Five-Year Plan mentioned private sector as an important player in the following words:

'The contribution of the private sector in power system development is expected to be over 2,000MW. This may include incentives such as designating areas for private sector power projects which have been identified, defining conditions of purchase of power by WAPDA and KESC, assigning a major portion of Lakhra coal fields for private power generation and designating selected dormant gas fields for private sector power development'.³⁹

³⁷ WB Report No. P-1753-PAK (1976), No. 22, p.6

³⁸ WB Report No. P-1753-PAK (1976), No. 22, p.6

³⁹ 'Infrastructure constraints on Energy Development: The case of Pakistan' (1991)

Cases of fund paucity were not limited to generation only, but affected almost all areas of WAPDAs working. For example, a 1980 report noted that the distribution system needed urgent renovation involving new 11 kV feeders, augmenting existing feeders and substations, and replacement of worn-out service lines (that were causing substantial line losses). But the aim was hampered by financial constraints affecting the required minimum outlay per annum of Rs. 100-150 million, which was be needed to execute the program in five years.⁴⁰

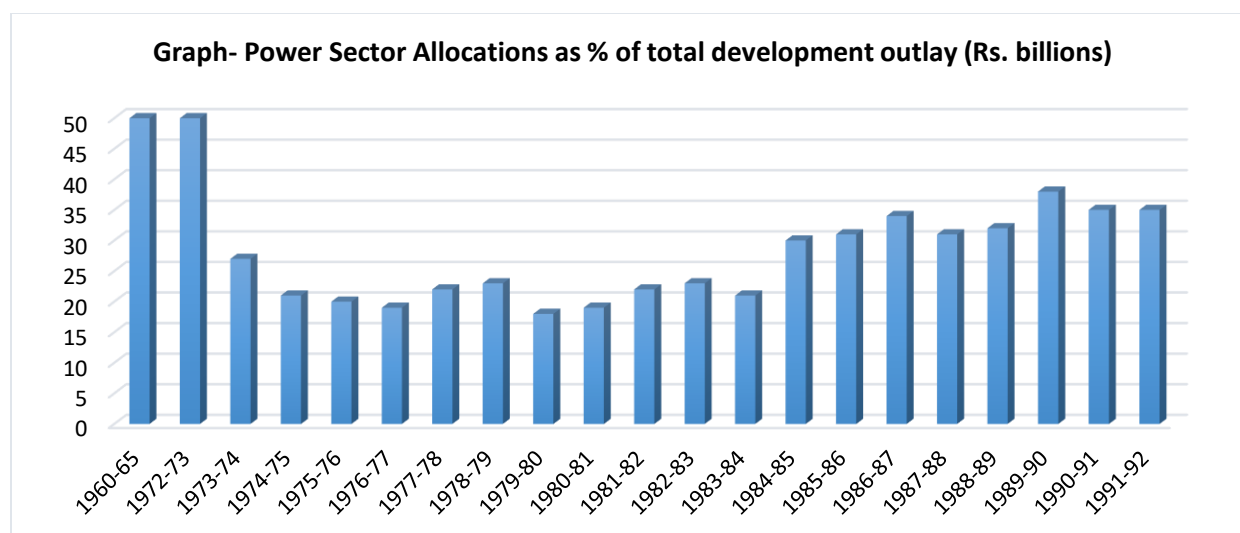
Delay in fund provision would often lead to escalated costs and bigger capital outlays, specifically for projects that were of longer gestation period (like mega dams). Many projects had to go through repeated price revision due to changing input prices over time, leading to tremendous difficulties for WAPDA and its schedule of work. A good reflection of WAPDAs development work being hampered by the paucity of funds is illustrated in the table below.

Table: WAPDA fund requirement vs Allocations: FY 77-78 (Rs millions)				
Department	Requirement		Allocated by Govt	
	Domestic	Foreign	Domestic	Foreign
Generation	881.46	306.07	550	299
Primary Transmission	1,053.89	373.61	803.10	408.80
Secondary Transmission	1,332.75	250	550	141.40
Distribution	1,252.30	-	630	-

Additionally, the issue encountered in getting the required development funds to match the 5-year Plans are reflected well in the following graph which show a declining trend of development funding over time.⁴¹

⁴⁰ WAPDA-Then, Now, Tomorrow (1980), p.62

⁴¹ Source: Annual Development Plans, Planning Commission, various years



The decline in development funding, as well as pressure to follow other political/administrative orders of the federal government meant that either WAPDA had to fund from its own sources or delay the projects. For example, in FY 83-84, WAPDA had to contend with a cut of Rs. 425 million from its available funds (self-finance) to meet the ADP financing gap created by increase in the allowances of staff in line with the increase announced for the federal and provincial governments, lesser ADP allocation, and increase in prices of POL and non-availability of natural gas forcing WAPDA to use higher priced HSD/Furnace Oil for generation of thermal power.⁴²

As discussed above, political considerations also created issues in terms of determination of optimal tariffs. No commercial or financial venture can survive without recouping costs through its sales at a price that covers at least its average cost. WAPDA was no exception, and needed a reasonable rate of return to meet its financial obligations. However, tariffs were often directed from above, with the intention of heavily subsidizing the household consumer, without taking into consideration operational requirements. A WAPDA Report in 1980 noted that-

‘There are also constraints on self-generation of funds arising from the fact that the electricity tariff is not commensurate with a realistic rate of return which should be 8 per cent per annum. Furthermore, there are problems of recovering large arrears of electricity revenues from several public and semi-public agencies, and the plugging of heavy leakage of revenue caused by electricity thefts....

Inadequate tariff increases permitted in the past have not been able to earn a reasonable rate of return and, thus, insignificant amounts were available for self-financing after meeting expenses. There has been an enormous increase in the cost of basic inputs as well as general establishment expenses which has absorbed nearly all increase in tariff. A recent exercise carried out to estimate the amount of self-financing showed that an annual increase of 10% in tariff would

⁴² Annual Development Plan 1983-84, p.55

generate a cash surplus of about Rs. 4,400 million and an annual tariff increase of 15% would meet the needs of self-financing".⁴³

As a result of heavily subsidized tariffs, which were pointed out by many as being insufficient to recoup Long-Run Marginal Cost (LMC, necessary for financial soundness of an entity engaging in service provision), WAPDA often found itself short of financials needed to pursue its development work. The Fifth and Sixth -Year Development Plans, for example, emphasized accelerated development of the power sector, advocating higher use of domestic energy resources. Similarly, a Long-Term Energy Strategy (LES) was drawn up that set targets for next two decades (i.e., up till 2010). However, none of these could be achieved due to limited availability of financial resources (domestic and foreign), with many targets remaining either completely unmet or falling way behind schedule.

Aside from the above, WAPDA employed a large labour force to construct and manage numerous projects, both in the water and power sectors. A majority of its labour force was, however, engaged for the maintenance and operation of its distribution of power operations all over the country. An even bigger management problem occurred in the form of unionization and political affiliations that would create problems for management, especially when it came to bargaining over wage and other benefit. By end 1980, there were sixty five trade unions in WAPDA, out of which nine were operating as Collective Bargaining Agents (CBA). One of these unions used to operate as C.B.A. on industry-wise/national basis and the remaining eight operated on local level. This was a pressing problem specifically in times of financial distress. And as Ghafoor's 1998 study (cited later) showed, the labor productivity was poor.

The human capital issues were also inherent to some degree in the management and technical cadre, reflected mainly in the technical, engineering and design issues that cropped up from time to time. For example, in 1975, tunnel 2 of Tarbela collapsed during first reservoir filling which led to expeditious repairs before the 1975 flood season. In the year 1975 and 1976 the stilling basins of tunnels 3 and 4 were damaged during operation resulting in remedial works. Other numerous such instances over the years spoke of deficiencies at the human capital level in WAPDA's technical cadre.

These management and overall human capital deficiencies not only affected its overall performance but also led to concerns about its abilities to handle multi-sectoral works. Despite the reasonably good performance it showed in terms of handling tasks assigned to it, especially mega projects like Mangla and Tarbela dam, there were many within the domestic governing circles and from within the donor community who did not see WAPDA's performance as being up to the mark. For example, a statement in the Federal Government's fourth five-year plan (1970-1975) contains the following-

'Serious doubts having been expressed about the ability of WAPDA to shoulder the responsibility of retail distribution of power, along with the construction of

⁴³ 'WAPDA- Then...Now...Tomorrow' (1978)

major power and irrigation facilities. Consideration, therefore, should be given to the bifurcation of the power wing from WAPDA.⁴⁴

This statement clearly indicates that the push (theoretical, at least) for bifurcating WAPDA had its genesis much earlier than 1980s when the process actually began. Due to the reasons cited above, there had been a gradual movement towards unbundling, which culminated in the theoretical blueprint in mid-80s, and complete unbundling from early 90s onwards.

Another major shortcoming that was to really affect WAPDA as well as the country's power related fortunes came in the form of failure to optimally tap the available natural resources.⁴⁵ This was arguably the major failure in terms of energy production in the country. Publications, both government and private, had persistently noted that there were ample domestic resources for power generation which needed to be tapped. In 1991, for example, energy expert Robert Looney stated that

'Pakistan possesses a variety of commercial and traditional energy resources for which there appears to be considerable scope for expansion. Much of the commercially viable hydroelectric potential has not as yet been tapped, and the use of coal for possible thermal power generation has only just begun to be explored. Considerable reserves of natural gas have already been proven, and prospects are good for the discovery of additional fields of oil, and especially, of gas. Pakistan has some 30,000 megawatts (MW) of hydropower potential of which only 2,897 MW have been developed. In FY 1988, thermal generation accounted for 57 percent of total power generation, but this is now expected to increase to 66 percent by FY 1993. Almost half of thermal generation is oil based due to the failure to expand the use of domestic coal and gas for thermal generation'.⁴⁶

In the same year (1991), a World Bank report on Pakistan painted a similar picture, reflected in the following statement:

'Despite Pakistan's good endowment with energy resources, its dependence on energy imports has increased, because of underutilization of domestic resources. This reflects low investment by both the public and the private sector and has resulted in higher utilization of imported oil as well as continued power shortages. Other issues affecting the sector are (1) inadequate pricing policies that led to excessive demand for some types of energy and financial difficulties for the companies and (2) political and institutional problems that have delayed

⁴⁴ 'Learning from Power Sector Reform-The case of Pakistan' (2019)

⁴⁵ Strictly speaking, this was not WAPDA's fault as utilization of available resources involve financial, technical as well as technological aspects within a country. In context of natural resources, these aspects fell in the domain of overall economic management and governance of which WAPDA was but a small part. However, since the failure to tap available domestic resources was a major factor that turned the tide against it, therefore it is being mentioned here

⁴⁶ 'Infrastructure constraints on Energy Development: The case of Pakistan' (1991), Overview

preparation and implementation of large investment programs... Pakistan's commercially exploitable energy resources consist of hydropower, natural gas, oil and coal. Despite the country's good endowment of energy resources, its dependence on energy imports (crude oil and oil products) has been increasing because of under-utilization of domestic resources..... Total recoverable reserves of coal are estimated at 1400 million tons, of which 175 million tons are proven. Despite the technical suitability of Pakistan's coal for the production of electricity and industrial steam, its share in the supply of commercial energy has remained stagnant at a very low level. This was mainly due to the pricing policy prior to 1985 when the price of fuel oil and natural gas was kept low.⁴⁷

We find a similar statement in WAPDA's Annual Report of FY 1991-92-

"Hydel capacity, once the mainstay of WAPDA's power generation system and the cheapest source of energy, has over the past years seriously suffered because of absence of new projects despite presence of huge hydel potential available in the country increasing reliance on expensive fuel operated thermal power plants. Besides, WAPDA's system has been facing power shortage which, in low hydel periods, causes load-shedding leading to inconvenience to the consumers, and direct and indirect national losses".⁴⁸

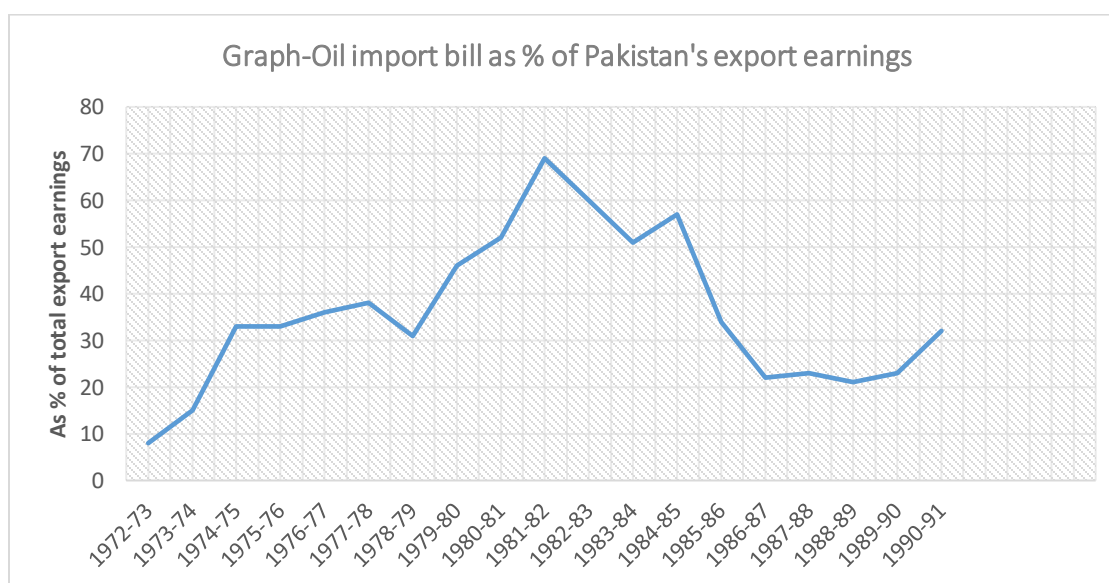
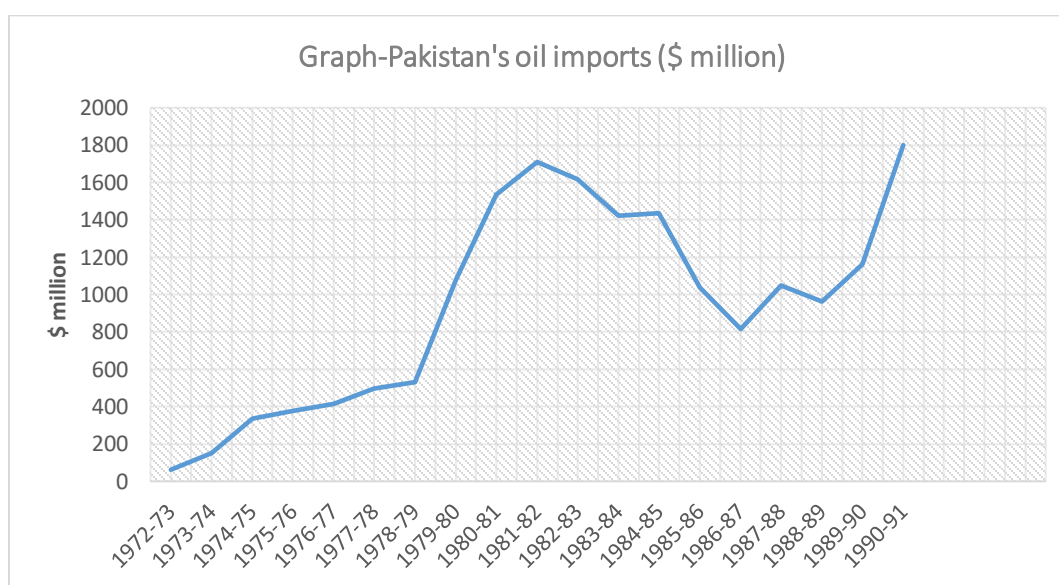
Over time, the increasing demand for energy and the gap between demand and supply of energy due to paucity of domestic energy inputs led to increasing imports which strained the country's foreign exchange. In 1981, 90 percent of demand for oil and petroleum products was met through imports, with total energy imports equivalent to 54 percent of total export earnings of the country. This, of course, constituted a precarious situation since oil prices tended to go through wild swings, as in the case of 1973 Arab-Israeli war when the prices skyrocketed. We find a similar situation in terms of imported coal: In FY 1972-73, Pakistan imported 31 thousand tons of coal; In FY 1986-87, the import quantum had significantly increased 919 thousand tons.

Net energy imports as a percentage of total export earnings had jumped significantly from 9.3 percent in 1970 to 35 percent in 1978. In terms of GDP, the net energy imports increased from 0.7 percent of GDP in 1970 to 2 percent of GDP. The increasing recourse to imports to meet energy demands, including electricity, is considered one of the primary reasons for external debt to GDP ratio observing an increase from 22.1 percent of GDP to 49.3 percent of GDP by mid-1980s. In FY 1985-86, the portion of electricity produced through imported oil constituted 14 percent of total electricity production in that fiscal year, clearly demonstrating the increasing reliance on imported fuel sources. In FY 1988-89 and FY 1989-90, the percentage of electricity generation from thermal sources increased to 42 and 46 percent respectively. In FY 1991-92, when it was finally decided to move towards unbundling, the share stood at 53 percent.

⁴⁷ 'Pakistan: Current Economic Situation and Prospect-Report No. 9283-PAK (1991), xi, p.iv, #2.53, #2.59

⁴⁸ WAPDA Annual Report, FY 1991-92, p.69

Throughout the 1970s and 1980s, due to the issues with low availability of water (especially in winter months and even summers with less rainfall), the dependence on imported sources of energy kept increasing as other domestic thermal sources, especially natural gas, and domestic oil production were not enough to meet the electricity demand. But as oil import bill kept increasing, so did the pressure on Pakistan's meagre foreign exchange earnings, till it was decided that the private sector should take the lead, saving the government its precious, much-needed foreign exchange. To illustrate, Pakistan's total oil import bill between FY 1972-73 and 1979-80 was \$3,448 million, averaging 30 percent of the country's total export earnings. However, the same figures for the decade between FY 1980-81 to FY 1990-91 stood at \$14,543 million and 40 percent respectively, a situation untenable for a country like Pakistan. These are illustrated in the graphs below.



This raises the question of why Pakistan could not make use of its indigenous resources? Indigenous coal serves as a good reflection of this failure to optimize upon domestically available inputs, with its use as a source of energy witnessing a significant decline over the years, from 60 percent in 1948 to hardly 4 percent in 1981. In FY 1975-76, coal contributed only 6 percent to the total energy production in the country despite substantial proven reserves. As per the Geological Survey of Pakistan, total coal reserves in Pakistan were estimated to 47 crore tons. However, the process of exploring them was slow, complemented by absence of good quality mining technology, and majority of coal being mined was of low quality, mostly used in brick kilns, Railways and Defense services. This led to import of coal, mainly for power production purposes, consuming Rs. 5 crore annually in import payments, further straining the dollar earnings of the country. As far as the reasons concerning low utilization of total coal reserves was concerned, aside from low quality mining technology, the Economic Survey (ES) noted shortage of investment and non-availability of Railway freight wagons for carriage of coal as other ones.⁴⁹ Interestingly, the ES mentions Lakhra coal reserves and Government's efforts to develop/convert the lignite coal to a level where it could be used for commercial and power production. This was to be done with the help of M/s Sanderson and Porter Inc., USA, who were to be prepare a feasibility study on Lakhra coal.⁵⁰

What were the reasons for Pakistan's failure to tap its coal (and other domestic) resources for power production? Excerpts from a World Bank report provides us the answer in the following statement-

'Although these prices were increased subsequently, development of coal deposits has not yet taken place. The main reasons for this delay include: i) the absence of a stable market for large-scale use (a large coal-fired thermal plant is now to be constructed but might end up using imported coal); ii) the inadequacy of laws governing coal exploration and development by the private sector; and iii) the failure of the public sector to develop publicly-held concessions'.⁵¹

Additionally, what also hampered its exploration and optimization was the discovery of natural gas reserves at Sui and its increasing, quick adoption in commercial, residential and industrial activities given its cheap, subsidized price. In 1961, natural gas as percentage of total energy consumption stood at 9.5 percent; in 1981, the percentage had gone up to 38 percent, with the majority of consumption coming from domestic use rather than electricity production. In incentivizing the uptake of natural gas, the mistake was made in terms of non-development of other resources within the country like coal. The subsidized consumption of natural gas would later lead to quicker depletion of natural

⁴⁹ Economic Survey, 1975-76, p.71 and p.72

⁵⁰ Ibid, p.72

⁵¹ 'Pakistan: Current Economic Situation and Prospect-Report No. 9283-PAK (1991), No. 2.59, p.36

gas reserve at Sui, plunging Pakistan into yet another foreign exchange difficulty as depletion in natural gas reserves had to be supplanted by imported sources like RLNG.

If non-utilization of domestic energy sources proved to a major issue, an equally vexing issue for WAPDA was the non-availability or frequent disruptions in supply of the available sources of electricity production, primarily owing to perverse incentives and policy failures. Price differentials between various categories of consumers and the subsidized nature of natural gas meant that it was in high demand, used not just in electricity sector but also in heavy demand in residential sectors and industrial sectors like cement and fertilizers. Yet, the frequent failure by the Government to grant raise in well-head prices of natural gas in context of increasing costs of production led to suppliers refusing to provide additional gas needed in lieu of increasing demand, leading to temporary suspensions of natural gas in major commercial and industrial hubs like Karachi (gas-shedding). In 1983, for example, issues surrounding natural well-head pricing lead to shortages in supply of natural gas, affecting power production and leading to discontinuation of supply of natural gas in major cities like Karachi. These perverse price incentives, in the end, created substantial gaps between demand and supply, which necessitated imports of energy (like furnace oil) for meeting domestic demand.

Aside from the internal critical perspective on WAPDA there was an external push in the works too. The theoretical grounds for its undoing came in the form of liberalization (or neoliberal) philosophy that gained momentum in the 1980s under Ronald Reagan in the US and Margaret Thatcher in the UK. Persistence of issues like load shedding had gradually built the momentum for voices calling for doing away with WAPDA led system since early 1970s. The process of bifurcation of WAPDA and the power sector into multiple entities, that had its genesis in the early 1980s, took an urgency after the beginning of the 1988 IMF led liberalization program. For example, the 'Private Power Cell' in WAPDA was created in 1988 to evaluate and negotiate private power projects. It later became the Private Power Infrastructure Board (PPIB) that came up with Power Policy 1994.⁵²

This assertion is corroborated by WBs senior researcher, Michael Gerrard, in the following words-

'In 1988 the government of Pakistan initiated a program to address macro-economic constraints and liberalize the economy. The program, among other actions, required rationalization of public expenditures. Budgetary allocations for revenue-earning public entities were reduced. Investment financing for these enterprises was, in the future, to be mobilized through internally generated funds and borrowings from the domestic and international capital markets. This pro-program had a profound impact on the energy sector, which historically had accounted for more than 33 percent of annual development allocations, since internally generated funds and projected borrowings fell short of the investments

⁵² 'Financing Hubb Power Project' (1997), p.44

needed to meet the forecast demand. In response, the government outlined a strategy for rationalizing the consumption of energy and increasing the role of the private sector in energy to fill the gap left by the reduction in public investments'.⁵³

The donor-led forays into Pakistan's energy sector have a long history, whether it be in the form of setting up a donor consortium for arranging Tarbela or Mangla dam loan, or for enforcing their will upon government in terms of their directions for power sector. In 1964, for example, Harza Engineering Co. International, prepared initial phase of the Master Plan that presented a programme of water and power development up to 1975. Regional plans for irrigation and agricultural development were subsequently developed by Hunting Technical Services and Sir M. McDonald and Partners for the Lower Indus Plains in 1966 and Tipton & Kalmbach Inc. for the Upper Indus Plains in 1967.

These kinds of consultancy services were usually (but not always) the result of loan agreements that were of 'tied' nature, which bind the receiver to use credit in a specific manner, usually to the benefit of the creditor country. An example comes in the form of a loan negotiated in 1970, whereby WAPDA was bound to work with a foreign firm under term of the loan;

'As early as 1970, when a \$23 million loan agreement was signed with the WB, included a requirement for consulting services to improve management and to supply the management of the Power Wing with information necessary for planning its operations, services and future investment needs. In recent discussions with the Bank, WAPDA and Government officials acknowledged that improvement in accounting and financial management was urgently required'.⁵⁴

BOX- World Bank as Administrator and financier of IBDF

The outsized role of donor agencies in Pakistan's power sector comes via Pakistan's requirement for financial capital and expertise during the early years given that Pakistan had none. Give Pakistan's energy requirements and future plans, especially after the Indus Water Treaty (IWT) with India, large scale projects could not be built without technical expertise and financial assistance from outside.

This gap was filled by donors, with WB being one of the leading ones. The Bank assisted in mobilizing funds and served as Administrator of both the Indus Basin Development Fund (IBDF) (1960-67) and the Tarbela Development Fund (TDF) (1968-present), managing the disbursement of over US\$2.3 billion equivalent.

Source: PROJECT COMPLETION REPORT PAKISTAN TARBELA DAM PROJECT (1986), WB

⁵³ 'Financing Hubb Power Project' (1997), p.43

⁵⁴ No. 27, p.8, WB Credit 213-PAK (1970)

In 1976, while deliberations upon a power sector loan for Pakistan were going on, the government had bound itself to WBs advice in case of decentralization of power related services to the provinces;

‘An understanding has therefore been reached that should the Government intend to initiate legislation or action designed to restructure the power sector, the Bank will be informed in sufficient time to allow an exchange of views with the Bank regarding the effect on WAPDAs power wing’⁵⁵

There are many other instances of questionable behavior and decision-making on part of donors (some discussed in later sections), like companies financed by ADB and WB loans not requiring domestic insurance services, which could have lessened the fiscal burden;

‘The companies have been exempted from the requirements of obtaining insurance only from the National Insurance Corporation (NIC) under NIC Act of 1976 if they are funded by multi-lateral lending agencies like World Bank, ADB etc. Now private power companies can get insurance as per requirements of lenders and utilities’.⁵⁶

As noted above, the drying up of much needed funding for pursuing development works, like the ADP had had gone through notable reductions as a financially poor central government found it difficult to sustain development plans for power sector. Within the development outlay for power projects, approximately half was based on foreign component, a substantial change from previous ADPs which used to have a smaller foreign component. But even more important was the fact that the era of soft loans and considerable grants had come to a close as donor countries like the US and UK started losing their geopolitical interests in the region, especially in lieu of Soviet withdrawal from Afghanistan. Instead of major foreign aid coming in the form of non-debt creating grants, the composition changed to major portion of foreign inflows being loans.

To illustrate, consider the following two examples- In FY 1963-64, WAPDAs foreign receipts comprised loan of Rs 36.83 million and a grant of Rs. 62.31 million, reflecting that grants were almost double the size of loans. By FY 1972-73, the total foreign funding (including the later supplementary financing agreement) came to \$946 million. Of this, 73 percent was in the form of grants while only 27 percent were loans, implying a lower debt pressure.⁵⁷

By mid-1980s, though, loans had become the dominant component of foreign inflows. During the Fifth Five-year Plan (1978-83), the percentage of grants in total foreign assistance dropped to 23 percent. The percentage remained the same during the Sixth

⁵⁵ WB Report No. P-1753-PAK (1976), No. 18, p.5 and p.6

⁵⁶ ‘Power Policy 1994’, p.6

⁵⁷ WAPDA Annual Report 1972-73, p. 2

Five-year Plan (1983-88), but dropped precipitously to 15 percent during Seventh Plan period (1988-1993). During the Eight five-year Plan, it dropped to mere 10 percent.⁵⁸

On its own, to check the widening gap between supply and demand, WAPDA responded by rapidly constructing a number of thermal power stations which included 250 MW Unit at Jamshoro, 3 units of 210 MWs each (total 630 MW) at Multan Power Station, 300 MW Unit based thermal potential Lakhra lignite and 4 gas turbines each of 100 MW at Kot Addu. Further, foreign and Pakistani parties in private sector were invited to participate in the development of Lakhra Coal Mines. In January 1985, a contract between WAPDA and Intercontinental Engineering Limited (Integ) of Canada was signed for the preparation of a pre-feasibility study for an imported coal fired power station near Karachi.

But by end fiscal FY 84-85, however, increasing recourse to thermal power meant an increasingly hefty payment bill, especially for imported sources of thermal production. The total cost of electricity production by thermal sources stood at Rs. 1,858 million in FY 83-84, which increased to Rs. 2,384 in FY 84-85. Of these, the imported fuel sources (Furnace Oil, HSD and coal) were 60 percent of the total cost in FY 83-84 (Rs. 1,101 million) and 50 percent in next fiscal (Rs 1,207 million in FY 84-85). In dollar terms, the import bill was \$78.64 million in the former fiscal, while it was \$75.43 in next fiscal.⁵⁹ As a percentage of export earnings, it was 2.2 percent of export earnings in both fiscals.⁶⁰ The increasing recourse to import of oil for use in electricity production, an expensive alternative, weighed heavily on our meagre reserves. In 1982, for example, 44 percent of Pakistan's energy needs were met by imported oil.⁶¹ During the first half of the eighties (1980-85), as energy demand outpaced energy supply persistently, there was ever more dependence upon imports for energy, resulting in these imports equaling 60 percent of export earnings (compared to an average of 28 percent of oil importing developing countries), a situation unsustainable for a cash strapped, low reserve country like Pakistan.⁶²

Briefly put, it became impossible for the public sector to foot the bill of power sector operations.

These issues gave rise to persistent load-shedding, leading to economic losses. Several studies, like that of Dr Hafiz A Pasha, were carried out to gauge the impact of these outages. These studies showed that load-shedding was affecting the industrial output and negatively affecting GDP, therefore a solution needed to be found.⁶³ He and his co-authors documented incidence of load shedding from 1980-81 onwards, reaching a peak

⁵⁸ Source: Pakistan Economic Survey, various editions. As per PIDE research on foreign aid, the average percentage of grants in foreign assistance in the 21st century has dropped to 2 percent or lower. See 'Foreign aid, donors and consultants: Analyzing Pakistan's foreign aid inflows and its outcomes' (2024), PIDE

⁵⁹ Calculations using numbers presented in Table-25, p.66, WAPDA Year Book 1984-85

⁶⁰ Economic Survey 1982-83 and 'The role of demand-side management in Pakistan's electric planning', *Ahmad Faruqi (1984)*

⁶¹ Pakistan Economic Survey 1984-85

⁶² 'An Energy Input-Output Table of Pakistan for 1979-80 and Some Applications' (1987)

⁶³ 'The economic cost of power outages in the industrial sector of Pakistan' (1989)

in 1984-85, the year of study. The bulk of load shedding tended to be concentrated in winter and the early summer months from December to June, reflected in the Table below-

Table- Load-shedding hours by months, 1979 to 1985						
	1979-80	1980-81	1981-82	1982-83	1983-84	1984-85
December	469		594	366		968
January	451	369	635	1000	600	1,623
February	429	278	766	434	400	700
March	200	190	496	537	850	1,800
April	305	100	480	193	850	1,300
May	220	100	344		268	1,300
June	134	186	329		475	1,500

An earlier study, undertaken by the Lahore Chamber of Commerce and Industry (LCCI), put the loss of output on average for industries in Punjab at 25.6 percent. The overall production losses for FY 1984-85 were estimated to the tune of Rs 6.8 billion in the province of Punjab, equivalent to about 14.7 percent of the value added in the industrial sector within the province.⁶⁴

All the above cited factors finally led to decision to unbundle WAPDA, ushering in the unbundled system in which IPPs were to play a major role.

3- Was WAPDAs Unbundling warranted?

With the above in mind, it is important to ask the all-important question- were the shortcomings so debilitating that it warranted wrapping up the WAPDA led system? Were the factors that led to WAPDAs undoing its own creation or were those external? What were its fundamentals, especially its financial position, at the time of its unbundling into various companies?⁶⁵

The question relating to circumstances has, in most part, been answered above. We can consider WAPDA very unlucky in this regard since many of the major issues it faced (lack of financing, failure to utilize domestically available resources like coal, politically motivated projects like rural electrification that burdened its financial resources, etc.) were not of its own making, but ultimately it had to take the blame and flak for the negative spillovers like persistent load-shedding. One suspects that if these issues had

⁶⁴ 'The social cost of unsupplied electricity', and 'Productivity Losses Due to Load shedding' (1986)

⁶⁵ Put another way, was there danger of insolvency?

been resolved in time, the push for the organization's unbundling would either have been muted or not risen at all.

The failure to utilize upon annual available water inflows is a good illustration of this point. Pakistan has historically been served by the largest contiguous irrigation network in the world, fed by Indus, Kabul, Chenab, Jehlum, Sutlej and Ravi rivers. However, Pakistan has failed miserably to take advantage of the water availability. Every year, unfortunately, millions of cubic feet of water flow unutilized into the Arabian Sea, bearing a significant cost to Pakistan's economy over time.⁶⁶ In November 2017, during a hearing in Senate of Pakistan, representatives from Indus River System Authority (IRSA) and Pakistan Council for Research in Water Resources (PCRWR) claimed that the value of Pakistan's yearly waste of fresh water is equivalent to \$21 billion. Further, between 1984 and 2017, Pakistan is estimated to have lost 1,570 billion cubic meters (BCM) of water, enough to add an estimated \$636 billion to Pakistan's GDP. Moreover, if this water had been utilized, it would have generated 430,000 MW of electricity. These estimates relate only to regular flows of water. If one were to account for flood water, the costs of wastage rises further. In the floods of 2010, 2011 and 2014, for example, 112 BCM of water valued at \$46 billion went to waste.⁶⁷

Further, a recent report put the annual losses due to lost/unutilized water at \$29 billion annually as 29 Million Acre Feet (MAF) of water was being lost to Arabian Sea.⁶⁸

Over the years, WAPDA had been persistently complaining of funds that could have helped it build storage reservoirs that could at least have utilized half of the water lost annually. However, as shown above, it never got the required amount. Otherwise, one could be confident in predicting that the issues encountered during WAPDA's time would not have been of such magnitude. Point being, again, that it was not WAPDA's fault.⁶⁹

Despite the challenges, by the time bifurcation was decided upon, i.e., mid-1980s, WAPDA had managed to increase the total distribution network in the country by 2,386 percent while the number of grid stations had increased by 678 percent. This is aside from

⁶⁶ It is critically important to clarify here that this statement is not advocating stopping water flow into the Arabian sea. Rather, it is in terms of failure to optimize on running water. Fresh water flowing into the Arabian sea is in fact necessary to stop salty water intrusion that renders land uncultivable as well as unlivable

⁶⁷ 'Some Bitter facts' (2017), Muhammad Zahid Raffat. One can argue in terms of methodology of calculation of the losses. However, the fact remains that a tremendous amount of water is wasted every year, and that the opportunity cost of the lost water (forgone irrigation and agricultural output, electricity produced, etc.) is substantial.

⁶⁸ 'Insufficient storage capacity causes 29 MAF water loss annually' (2023)

⁶⁹ Sadly, the saga of underutilization of resources continued unabated. In its 'Pakistan Infrastructure Development Report' (2007), SBP noted the alarming trend, estimating that Pakistan was utilizing only 14 percent of its hydro potential, 21 percent of its natural gas, 14 percent of its oil, and only 4.59 million tons of coal out of reserves of 678 million tons of coal (*Table-1, p.ix*)

the other major achievements, some of which were discussed above, despite the persistent political pressures and issues it had to face.

The picture of financial health that one gets over time also does not reflect the organization being in any dire straits. One such critical indicator is the Net Operating Profit, the amount of revenue remaining after subtracting a company's variable and fixed costs. Another critical indicator is the loan repayment burden (interest and principal amount) as a percentage of earnings. The following table presents these statistics of selected years.

Table- Select indicators of WAPDAs financial health (various FYs)		
Fiscal Year	Total debt servicing as % of electricity sales	Net Operating profit (Rs. million)
1962-63	-	22
1963-64	-	35
1978-79	-	836
1979-80	27	1,410
1980-81	23	1,870
1982-83	24	2,214
1983-84	24	1,977
1984-85	25	1,168
1989-90	21	6,788
1990-91	23	7,414
1991-92	20	8,057

What the table indicates is that after paying for all its operations related expenses, WAPDAs finances were in surplus. Moreover, the quantum of debt servicing was never large enough to put the organization at the brink of insolvency.

Figures from individual years also support this contention. The total cash available for immediate use in WAPDAs assets was equivalent to 2.5 percent and 2.1 percent of total assets for FY 74-75 and FY 75-76, respectively. The total interest paid on foreign loans was equivalent to 3.79 percent of revenue from electricity sales⁷⁰, while it was equivalent to 20.12 percent in terms of Central Govt. loan. In aggregate, it meant that total interest burden of central government and foreign loan in that year was equal to approximately 24 percent of revenue from electricity sales, indicating that despite higher T&D losses, the

⁷⁰ \$4.8 million approximately, or 0.28 percent of Pakistan's estimated export earnings of 1.7 billion dollars in that fiscal year

financial health remained viable. The overall interest payment burden in FY 75-76 remained at 31 percent of the total revenue earned from sale of electricity.

At the time when initial thoughts of unbundling WAPDA began, in the early 1980s, the following statistics painted a relatively healthy picture of the organization's finances. In FY 1980-81, total debt servicing amounted to Rs. 1,458 million (33.74 percent of profit from electricity sales), of which Rs. 985 million was in interest payments (22.79 percent of profit from electricity sales). It was Rs. 973 million or 27.13 percent of profit from electricity sales in previous fiscal, i.e, FY 1979-80). Net profit stood at Rs. 1,870 million, against corresponding figures of Rs. 1,410 million in 1979-80 and Rs.836 million in FY 1978-79. Long term debts were recorded as Rs.11,671 million, spread over a long time and at easy installments.⁷¹

Self-financing (through surplus funds generated from WAPDA power sales) in FY 1980-81 was Rs. 1,759 million, up from Rs. 131 million in FY 75-76 and Rs. 1,546 in FY 1979-80 (Rs. 1,726 million were raised in self-financing in FY 1984-85). On average, the self-financing ratio for the last three fiscal years was recorded as 55 percent as compared to 40 percent required by the loan-giving agencies.⁷² WAPDA's total cash (cash in hand, cash on imprest and cash in banks was equivalent to Rs. 315,375,227 (10.18 percent of total assets). The same fell to 2 percent in FY 82-83 and 1.3 percent in FY 83-84 , less than previous fiscals but still a reasonable percentage.

Finally, in the FY 1990-91 and 1991-92, the Net Operating profit stood at Rs. 7.4 million and Rs. 8.05 million respectively. The total interest payment on debt as percentage of total profit from electricity sales was 23 and 20 percent respectively. The long-term foreign debt in these years was 48.71 and 54.61 percent of total loans. The T&D losses, which had remained above 25 percent over the decades, had started to persistently come down, averaging 22 percent in these fiscal years.

Importantly, WAPDA was not dependent upon federal government in terms of contracting loans or pursuing its development work (federal government had stopped provision of ADP for power projects in FY 1986-87). There were no guaranteed loans against WAPDA in the later fiscal years.

In essence, at the time when unbundling was being taken into account and during implementation stages, WAPDA was nowhere near default or in any dire financial situation so as to warrant its unbundling citing financial issues. The issues that were cited as grounds for WAPDA's undoing had little to do with its performance or internal dynamics; rather, it had to bear the brunt of shortcomings and mistakes of the decisions taken elsewhere (failure to provide required financial resources, failure to exploit domestic sources of power generation, etc.) of which it was not a part. This argument is

⁷¹ Critically, the assets constructed through these debts (like water reservoirs or thermal plants) were put to use immediately and optimally. There were instances of idle capacity over the years, but they were few and none of these instances resulted in debilitating capacity payments

⁷² WAPDA Yearly Report 1980-81, p.128

supported by several expert sources, like this statement of Looney and Winterforth (1993);

‘If Pakistan is suffering from serious shortages of energy it is largely due to insufficient development of domestic resources in the face of rapidly increasing demand. Ultimately the country's energy problems are related to low levels of investment which have been financed, nearly exclusively, by the federal government... The small public investment programme is both insufficient and unsustainable because of conflicting demands from other sectors’.⁷³

During the time that the whole unbundling process came to fruition (from providing a theoretical base in mid-80s to practical unbundling in the 1990s), a chorus of voices raised concern on the manner in which this process was being pursued. Many felt that WAPDA was deliberately undermined to make room for private sector despite higher costs. For example, engineer Amjad Ali Agha opined that

‘For the last 8–10 years very little was accomplished in increasing the electricity generation capacity and only 2000 MW was added in this period. As per demand forecast at least 8,000 to 10,000 MW should have been increased. One factor behind this was that the Government took a decision 10 years ago, that in future power plants would be established by the Private Sector, and WAPDA was not allowed to set up new plants, particularly in the thermal sector. This policy was flawed since Private Sector was asking for very high price which WAPDA could not afford to pay. For instance WAPDA was able to set up thermal plants at a price of about 700,000 to 800,000 dollars per MW, but the private sector was asking for over 1.2 Million dollar per MW. The failure to take no remedial action was a big setback. In order for the private sector to be more competitive, WAPDA should be allowed to simultaneously continue its generation program. Three years ago the Government agreed as a special dispensation for WAPDA to set up three thermal plants of total 1800 MW capacity, but WAPDA was stopped even after they had made all arrangements including financing’.⁷⁴

To boot, and perhaps even more damning, is the fact that the federal government kept using WAPDA as a platform to provide financial support to the new unbundled system, which ran in complete contravention to the aims of unbundling. Aziz and Ahmed (2012), for example, opine that

‘Addressing the sector’s financial constraints also requires that WAPDA’s financial position be protected. WAPDA provides cheap electricity, which the country desperately needs, and enabling WAPDA to invest more in hydropower projects would reduce the average cost of generation. However, the opposite outcome is often pursued. Payment to WAPDA is curtailed more than payments to independent power producers.

⁷³ ‘Public sector investment in energy- Budgetary constraints and tradeoffs in Pakistan’ (1993)

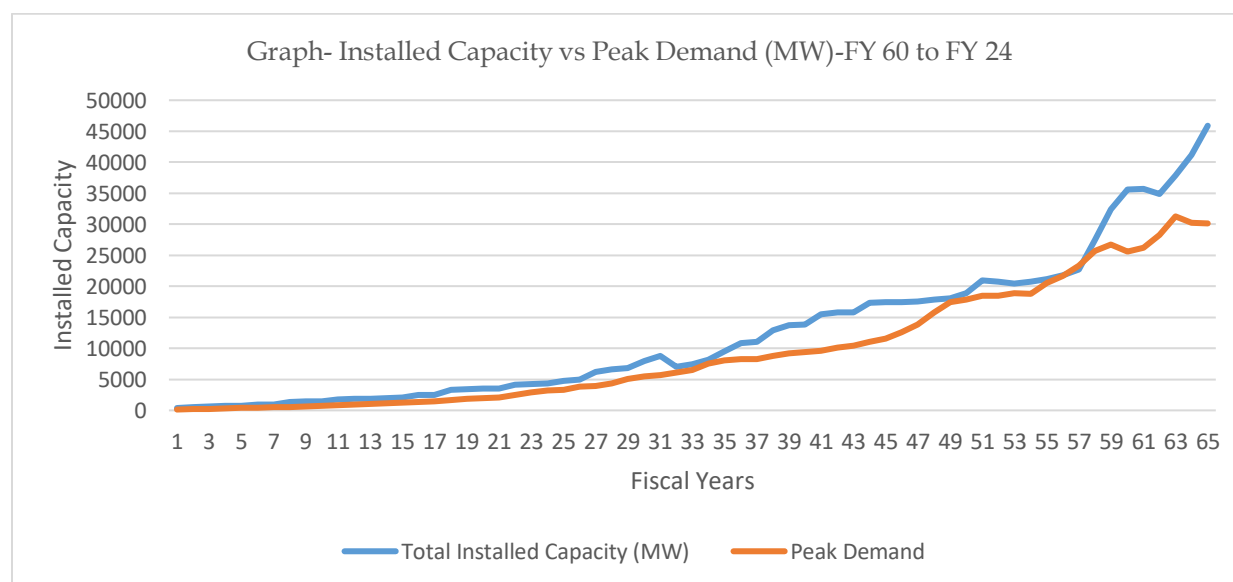
⁷⁴ ‘Genesis of Power Crisis and its Management in Pakistan’ (2008)

Its cash balance is used as a cushion when the government decides to inject funds into the sector, and WAPDA has at times been asked to write off its receivables. These actions are indefensible'.⁷⁵

Similarly, nothing was learned from the failure to utilize available water resources. In 2011, for example, about 89 percent of Pakistan's hydropower potential remained untapped by FY11.⁷⁶

The process of privatization itself became controversial and was carried out in a manner that reflected haste. Even the WB, an ardent supporter of unbundling, noted the issues in this process. It noted that a 'The De-regulation and Disinvestment Committee' (1990) was formed to recommend the sale of public entities in the financial and manufacturing sectors. But before the said forum could finalize its report with its recommendation, the government announced a series of liberalization and investment incentives for the private investors, including generous tax holidays and favorable returns on investment.⁷⁷

Last, but not the least, despite the outsized importance given to electricity generation/production, the real issue lay at the demand side inefficiencies, reflected in high Transmission and Distribution (T&D) losses and ignoring electrical appliance efficiency. As the following graph demonstrates, had the transmission inefficiencies been taken care of, installed capacity was enough to take care of peak demand (this fact remained true even after unbundling, as is clear in the graph)-



But as demonstrated above, WAPDA rarely got the funds it required for removing transmission inefficiencies or upgrading it. Instead, it was forced to extend the transmission lines even further due to political considerations. Similarly, in all the years

⁷⁵ 'Pakistan's power crisis: The way forward' (2012), p.7

⁷⁶ *SBP Annual Report 2010-11*, Ch on Energy, p.39

⁷⁷ No. 1.39 and 1.40, 'Pakistan: Current Economic Situation and Prospect-Report No. 9283-PAK' (1991)

of the system under WAPDA, it never occurred to Pakistan's policymakers that demand side management is as important as supply side management. In case of electricity use, this meant giving efficiency of electricity consuming appliances due consideration, something that would have reduced the load upon the grid considerably. The government, in the end, did realize it as it established the Energy Conservation Centre (ENERCON) to serve as the focal point for all conservation activities, with the WB agreeing a \$35 million credit.⁷⁸ However, it came too late; it was established in 1986, and by that time WAPDAs unbundling had been all but decided.

All the above point to poor appraisal of ground realities at the time of unbundling. However, the dice had already been rolled in favor of thermal power and private sector's inroads into this sector. By end fiscal 1991, i.e., FY 1990-91, the gap between electricity production from thermal and hydel sources had become significant (4,156 MW from thermal and 2,897 from Hydel). This was unsustainable on account of Government's own finances, especially the difficulties related to insignificant foreign exchange and in terms of availability of major domestic thermal sources like natural gas whose supply had been erratic and unreliable over the years.⁷⁹ Thus, WAPDA went from heavy reliance on one unreliable source (water) to another unreliable source (natural gas).

From the government point of view, however, there was no other option but to let private sector take the lead as it could finance neither the required investment in power sector nor afford losing precious foreign exchange on importing sources of power generation. In this aim, they found IFIs and donors in agreement with them, some eagerly pushing for introduction of Independent Power Producers (IPPs).⁸⁰

Thus, the WAPDA led system came to an end, ushering in the unbundled era.

⁷⁸ 'Energy Inefficiency in the Asia/Near East Region and its Environmental Implications' (1989) ', and 'Plans for the Power Sector in Thirteen Major Developing Countries' (1989)

⁷⁹ In FY 1990-91, 38 percent of total consumption of natural gas was for power generation, reflecting the heavy reliance on a source whose supply was prone to interruptions

⁸⁰ A noticeable, albeit astonishing, aspect of donor involvement in WAPDA led power system was the concentration upon financing power production, while providing little in terms of financial support for investment in the aspects of power system that needed it the most: Transmission and Distribution. This peculiar feature of donor and IFI involvement in power sector continued in the same vein after unbundling, as majority of the investment flew to power production

CHAPTER-II

The era of IPPs, Private
Energy and Public
Management - The road
to hell is paved with
good intentions

1- Chronological developments leading to WAPDA's unbundling

As discussed above, the unbundling of WAPDA did not come about all of a sudden, but was a culmination of several events over the decades. The unbundling itself was not a single event; rather, it was a sequence of events, starting with the theoretical foundations for bi-furcating a state monopoly into separate components (Production, Transmission and Distribution). The first such suggestion surfaced in the government's 5-Year Plan in the mid-70's, carried forward by the donors in the 1980s, and then the initiation of practical steps towards this goal in early 90s after due approval from the Government, and the practical bi-furcation into separate entities spread over a decade or more. The following lines present a brief overview of the important phases of this process, with details covered in Annexures.⁸¹

At the time of sixth five-year plan (1984-88), the government had all but decided that the transition from a single monopoly to a private sector led power sector as the need of the hour. As pointed out above, even WAPDA's own Chairman acknowledged that given the worst outages and persistent failure in overcoming load shedding, there was little option but to do something 'different'. And given the projected large annual increase in peak energy demand (estimated to grow by 8.2 percent per annum between 1989-99, and 6.8 percent per annum on average between 1999-2009), plus the growing limitations on the GOP to finance investments in power generation facilities while also meeting the IMF covenants (and commitments made to it), led the GOP in November 1985 to issue a paper titled "Private Sector Policy-1985", inviting private sector to participate in "Build-own-Operate" (BOO) power generation projects. The implementation of this policy initiative was intended to be carried out in conjunction with World Bank and USAID, both of whom assisted the GOP in the formulation of long-term (20-years) energy strategy including guidelines for the introduction of private sector investment in power sector.⁸² In the same year, the International Atomic Energy Agency (IAEA) reported that;

'To attract commercial loans and private sector investment, developing countries will have to adopt policies that will improve the investment climate and reduce political, foreign exchange, and commercial risk. In this regard, both Turkey and Pakistan have invited proposals for private sector construction and operation of power generating stations, the output of which would be sold to national power authorities at prices that would amortize debt financing and provide a return on equity. To assist in mobilizing private sector capital to developing countries, the World Bank has developed co-financing schemes and is working on others, including guarantees to mitigate risks due to a project's location in a developing country'.⁸³

⁸¹ The reason for avoiding a detailed description of the unbundling process is that these events, especially post-IPP Policy 1994, have been covered extensively in other publications. However, for the sake of accumulating the related information in a single place, details of major events are given in the Annexures

⁸² "WAPDA's Strategic Plan for the Privatization of the Pakistan Power Sector" (1992)

⁸³ 'Financing electric power in developing countries' (1985)

The reform policy sought to create a new sectoral framework in order to achieve the reform objectives that included:

- Attracting private sector investment without using sovereign guarantees.
- Improving sector efficiency through competition, accountability, managerial autonomy and profit incentives.
- Rationalizing electricity prices and social subsidies in order to eliminate inefficiencies, while maintaining socially important policies such as rural electrification and low-income “lifeline” rates.

As a result of the GOP’s ambitious policy for private sector investment in power sector, under both the Sixth (FY 1984-88) and Seventh (FY 1989-93) Five-year plans, a number of private sector projects were initiated. A one-page policy paper signed by the then President, General Zia ul Haq, in 1987 paved the way for private generation companies in the country. The Govt. with support of international partners established the Private Sector Energy Development Fund (PSEDF) in 1988 as an instrument for attracting private sector investment.⁸⁴ Simultaneously, the government created the ‘Private Power Cell (PPC)’ in WAPDA in 1988 to facilitate the entry of private sector in the power business (later renamed as Private Power Infrastructure Board (PPIB) in 1994). The pace of privatization was quickened as the projects moved towards implementations at much slower than anticipated pace. As a result, shortages in peak demand in 1989 reached 1,800 MW, about 30 percent of the demand.

HUBCO was the first of private sector’s mega investment, the feasibility of which was completed in 1988, having capacity of 1,292 MW. After completion of feasibility, HUBCO started negotiation with PPC /WAPDA for establishing a thermal power plant in 1989. The initiative was hailed a trailblazer by the international organizations. In 1991, HUBCO became Limited Liability Company for executing the project in Pakistan. In 1992, the plant signed an agreement with WAPDA to develop a 1,292 MW power plant. The Power Purchase Agreement (PPA) was signed on 3 August, 1992 for thirty years’ period, supported by WB which helped in arranging the finances. The original offer was 97 paisa/ KWh; but the power purchase agreement (PPA) was signed at 6.1 cents/ KWh, equivalent to 234 paisa. HUBCO also signed an agreement with Pakistan State Oil for providing refined furnace oil (RFO).

In the beginning, National Power PLC of the United Kingdom and Xenel Industries Limited of Saudi Arabia funded the project. Later, Energy Corp of the United States became its major shareholder. The WB got involved in arranging finances from the governments of France, Italy, Japan, United Kingdom and the United States as co-financiers in the Private Sector Energy Development Fund (PSEDF) of Pakistan. This fund along with the WB and the Import/Export Bank of Japan jointly developed an Expanded Co-Financing Operations Program to assist the international commercial debt funding by

⁸⁴ ‘Power Projects: History, Politics and Policy’

the provision of a partial guarantee. A significant portion of the offshore debt was also guaranteed by certain export credit agencies. A group of local banks led by the National Development Finance Corporation (NDFC) of Pakistan provided rupee debt.

Meanwhile, the Govt. notified the 'The De-regulation and Disinvestment Committee' in the FY 1990-91 for divestment of public sector entities. The Government subsequently formed a Privatization Commission for this purpose, with the Prime Minister of Pakistan directed the Chairman WAPDA to launch an initiative to privatize the existing power system as rapidly as possible. To assist in implementing this directive, the Chairman WAPDA retained an International Advisory Group (IAG), experienced in the electricity privatization around the world. The team, funded by USAID, was asked to develop a Strategic Plan that will ensure the long term goal of bringing electricity to all Pakistanis while introducing private ownership, managerial autonomy, and competition throughout the Sector.

In the FY 1990-91 budgetary proposals, in order to prop up rural industry and economy, it was decided by the government to give entrepreneurs licenses to set up their own electricity generation facilities, with WAPDA bound to buy electricity from these generation plants, an earlier step (along with HUBCO) towards decentralizing power production but also binding WAPDA with capacity buying from power sector.⁸⁵

The HUBCO project financing closed in 1994 and the construction started smoothly. Finally, in March 1997, the plant started selling power to WAPDA. NEPRA granted license to the power plant in August 2003. The 1,292 MW, \$1.6 billion Hub Power Project was hailed as a landmark in the field of infrastructure finance at the time of financial close in 1995. It started commercial operations (COD) on 31-March, 1997.⁸⁶ The famous Power Policy 1994, with unprecedented incentives for the private generation plants, was based on experience gained during the planning, negotiations and development of HUBCO. The project was named as "*deal of the decade*" by Euromoney Institutional Investor. The global financial market cited this project as the first major private sector venture executed in any perilous developing country environment.

To finalize the contours of privatization, a plan named "WAPDA's Strategic Plan for the Privatization of the Pakistan Power Sector" ("the Plan") was published. It laid the foundations for further government actions initiating privatization of WAPDA's assets (excluding hydropower) and introduction of private investments in the electricity sector. Prepared by the International Resources Group, Putnam, Hayes & Bartlett, Inc., on behalf of the USAID/Islamabad,⁸⁷ it was structured to meet the following three major goals of the Government;

⁸⁵ Annual Development Plan 1990-91, xi under 'Rural Industrial Policy', p.56

⁸⁶ 'Pakistan's energy sector: From crisis to crisis-breaking the chain' (2012)

⁸⁷ 'WAPDA's Strategic Plan for the Privatization of the Pakistan Power Sector' (1992)

- Enhance Capital formation in the Pakistan Power Sector (“PPS”), without recourse to GOP budgetary support and without Sovereign Guarantees;
- Improve the efficiency of PPS through competition, accountability, managerial autonomy, and profit incentives; and
- Rationalize prices and social subsidies, while maintaining certain socially desirable policies such as rural electrification and low income “lifeline” rates.

To replace the vertically integrated WAPDA utility, the plan envisaged the ultimate structure of the power sector to include;

- A number of private power generation companies operating under the free market competition (IPPs);
- A government-owned corporatized entity responsible for owning and operating large multi-purpose hydel facilities (WAPDA);
- A national transmission and despatch entity, privately-owned and regulated, responsible for the integrated operation of the power sector as a wholesale electricity (NTDC/CPPA-G);
- Market arrangements allowing final consumers, at least large industrial user, to purchase power directly from the generators or power merchants, with the transmission and distribution entities providing transportation and related services in a non-discriminatory manner (CTBCM, DISCOs)
- Private, regulated distribution companies, responsible for providing reliable and reasonably priced electric power services to ultimate customers, including socially desirable subsidized electric services such as rural electrification, and “lifeline” rates for financially disadvantaged customers. The GOP will provide these private companies’ subsidies to provide these otherwise non-economic services. The private companies will have an incentive to control costs (Privatized DISCOS, with separate Distribution and Supply functions)
- An autonomous National Regulatory Authority (“NRA”), consisting of five commissioners, a staff drawn from seasoned professionals familiar with electricity issues, and at least initially, external technical advisors funded by an international agency. The NRA will oversee a reorganized WAPDA, the transmission/central despatch entity, the distribution and generation companies - until the wholesale market becomes competitive (NEPRA as regulator)

The transformation of electricity sector in a privatized, competitive industry was deemed an ‘evolutionary’ process occurring over a number of years. The transformation was to begin immediately with the following initial steps;

- Reorganization and corporatization of WAPDA into a holding with its subsidiaries operating as discrete, autonomous profit centers (WAPDA to disintegrate in separate generation, transmission and distribution entities);
- Privatization of selected WAPDA entities (either its subsidiaries or separate assets) as they become commercially viable with initial sales (such as Jamshoro

and all or part of the Faisalabad Area Board) as soon as practical (privatize WAPDA's thermal plants and distribution companies);

- Active solicitation of offers to build new privately-owned thermal generating plants, selling power to WAPDA under contracts that can later be assigned to privatized distribution companies (IPPs in private sector);
- Design and establishment of *NRA* to oversee the evolution of privatized PPS and to regulate monopolistic services (NEPRA).

The 1992 Reform Plan was to be implemented in following four phases:

- ***Sector Policy Formulation:*** In first phase, it was proposed that policy formulation, improvements in WAPDA's power procurement program (through IPPs, as extensive as possible, to move towards a competitive power procurement process), and preparation for privatization of selected generation and distribution assets be undertaken by WAPDA in consultation with MoWP, and approved by the Council of Common Interests (CCI)
- ***Decentralization and Corporatization of Sector Operations:*** In second phase, WAPDA's Power Wing was to be reorganized into decentralized business centers and corporatized. Such corporatized entities, to the extent of whole or partial AEBs, were then to be privatized. This was the next step towards a market where power purchase and sales would occur among independent AEBs and power generators leading to a simple wholesale market. Retail rate reforms were to be designed and implemented by NRA (established in this phase) to eliminate cross-subsidies and to reflect the costs of providing electric services
- ***Refinement of Competitive Market Structures and Operations:*** In third phase, WAPDA's core role was to be limited to retaining the hydel facilities. To the extent of distribution entities, the corporatized distribution entities would be responsible for planning their individual systems. The regulatory authority set up in phase-II would continue to develop and exercise its authority, and the retail reforms begun in Phase-II were to be completed. The independent generation and distribution companies, some privately owned and some corporatized, were to be responsible for planning their individual systems and to buy and sell in the wholesale spot and contract markets. The transmission sector was to be carved out and vested as a separate entity, initially Government-owned, and responsible for management of the transmission system and the dispatch/market-making function. The energy needs and national energy policies would continue to be forecasted and formulated by the GOP
- ***Private and Fully Operational Competitive Sector Operations:*** In the last phase, the power sector would be structured and operated on the basis of a long-term competitive market model, i.e., unbundling of WAPDA and an electricity sector in which the scope for private ownership and competitive market processes should be as extensive as possible. It was understood that some details and features of the long-term model might be modified during the transition period in view of actual performance and market results

In 1993, in lieu of the strategic plan, the process of WAPDA's unbundling was kick-started. After consultations with Privatization Commission ("PC") and the Competition Commission of Pakistan ("CCoP"), the Ministry of Water and Power (MoWP) submitted a summary document entitled "Privatization of WAPDA and Amendments to the WAPDA Act" to the CCI (1993 MWP Summary). The MWP requested the CCI to:

- Approve proposed amendments to the WAPDA Act
- Approve the privatization plan for restructured WAPDA's Power Wing per the Privatization Commission recommendations
- Provide assurance to the NWFP Government regarding the methodology to be used to determine hydel profits

The Council of Common Interest (CCI) approved the 1993 summary for implementation by concerned quarters. This was followed by Parliament passing the WAPDA (Amendment) Act, 1994. The most significant amendment was made to Section 8(2) of the WAPDA Act, which authorized WAPDA to prepare a scheme or part thereof, to "privatize or otherwise restructure any operation of WAPDA except hydel generating power stations and the national transmission grid". After this amendment in 1994, WAPDA established a team consisting of WAPDA and CCP members to implement "the Corporatization / Commercialization of WAPDA and its Existing Asset Blocks", a process which remained delayed by a couple of years. In 1997, the CCP-WAPDA team hired consultancy services of a consortium consisting of financial, legal and technical experts, namely M/s. SyCip. Gorres. Velayo & Co. and Associates (SGV).⁸⁸

In the same year, a Task Force set up by the Prime Minister on October 30, 1993, forwarded its proposals for mobilization of resources and promoting private sector investment, as well as making recommendations for enhancing indigenous oil and gas production. This strategy, which was based on the successful experience of other regional utilities operating within similar socio-cultural environment and constraints, comprised of the following main elements:

- **Demand Side Management-** Launching of an aggressive Demand Side Management (DSM) Policy to control and regulate the growth of the unproductive component of demand, and discourage wasteful and expensive patterns of consumption
- **Energy Loss Reduction-** Improving performance of both WAPDA & KESC vis-a-vis energy loss reduction (T&D losses), which in 1993-94 stood at around 23.2 percent for WAPDA, and 33.6 percent in KESC

⁸⁸ March 7, 1997. The contract contained well-defined terms of reference, which evolved at various subsequent stages on account of directives of WAPDA and the GOP (the WAPDA-CCP Services). In addition, the Chairman WAPDA issued "General Order No.1" which authorized the incorporation of companies (future DISCOs) to take over the functions of the AEBs, including authorization for WAPDA members (Finance and Power) to deliver all assets, documents and papers as transaction documents.

- **Operational Improvements-** The Task Force set improvement targets vis-a-vis thermal plant availability, thermal efficiency, and upgradation of operational regimes, which collectively could increase the net available supply by about 460 MW, resulting in fuel cost savings to the tune of Rs 4.7 billion annually by 1998
- **Private Sector Participation in Power Generation-** Over the Eighth Plan period, an estimated amount of 102 billion (Rs. 86 billion in foreign and Rs 16 billion in local currency) was required in the private sector for financing IPPs. To attract this quantum of investment from private sector, major policy reforms and structural changes were cited as necessary to make the investment environment attractive for foreign and domestic investors

The Task Force recommended an attractive policy package for attracting overseas investment and to encourage a corporate debt securities market essential to raise local financing for power development projects. The main features of this package are presented at **Annexure-A**.

The recommendations of the Prime Minister's Task Force regarding attracting private sector investment became the basis for first power policy titled "*Policy Framework and Package of Incentives for Power Generation Projects in Pakistan*", issued in March 1994. The complex suite of documentation developed together with experience gained by Pakistan officials and institutions during its six years of the 1292 MW, \$1.6 billion Hub Power Project helped in implementation of the Private Power Policy-1994 (salient features of this policy are given at **Annexure-B**). It also marked the constitution of the Private Power and Infrastructure Board (the "PPIB") as one window operation for IPPs. The PPIB was responsible for coordinating with all agencies and Ministries for facilitating IPPs. It was also responsible for monitoring performance of private sector projects as per agreements, and safeguard interests of the consumers.

The 1994 Power Policy was quite attractive for private sector investment in power sector. Pakistan succeeded in attracting over \$5 billion in investment in private generation in record time. It earned high praise amongst international developers and financiers, and was highlighted as a model for private sector development in the power sector, described as "*the best energy policy in the whole world*" by the US Secretary of Energy following a trip to Karachi in September 1994. That same year, the Hub Power Project was named project finance "Deal of the Year" by Euromoney Institutional Investor. Under this policy, 19 independent private power projects (IPPs) of 3400 MW reached financial close in record time (four projects, totaling 300 MW were subsequently terminated). The plants established under this policy are detailed in **Annexure-C**.

By end-June 1995, PPIB had issued Letter of Support (LOS) to 32 energy projects totaling to 9931 MW capacity. Out of 32 LOS issued by PPIB, WAPDA signed Power Purchase Agreement (PPA) with 13 private power producers for the purchase of 3140 MW power in private sector, while KESC signed 5 power purchase agreements for capacity equaling 1,222 MW. In FY 1999-2000, WAPDA signed additional power purchase agreements with

18 power projects having a total capacity of 5,816 MW including KAPCO (1621 MW) and HUBCO (1292 MW).

The 1994 Policy was the start of private sector's increased participation in Pakistan's power sector. It was followed by several minor level policies like the 1995 Hydropower Policy and Alternative Energy Policy, aside from founding of several institutions (NEPRA, CPPA-G, GHCL, etc.). The 2015 Power Sector Policy, in lieu of CPEC investment, was the other major policy in this sector. The details of this journey are given at **Annexure-D**.

By end FY 2023-24, forty-six (46) multi-fuel based Independent Power Producers (IPPs) of 22,174 MW including hydropower, indigenous Thar coal, Gas/RLNG and Oil were operational. Moreover, fifty-four (54) Alternative and Renewable Energy (ARE) IPPs of 2,784 MW had also been commissioned. The cumulative capacity of afore-mentioned 100 IPPs reached **24,958 MW** which represents **61 percent of total capacity in the national grid**, attracting over **USD 33 billion** as FDI.

The installed capacity of IPPs is given below.⁸⁹

Table: IPPs commissioned since 1994		
Fuel/Technology	No. of IPPs	Installed Capacity (MW)
Hydel	04	1053
Wind	36	1845
Solar	10	680
Bagasse	08	259
Thar Coal	05	3300
Imported Coal	03	3960
RLNG	04	4896
Gas	14	3334
KAPCO: Multiple Fuels (Gas / HSFO / HSD / RLNG)	01	1638
RFO	15	3993
Total	100	24,958 MW

⁸⁹ MoE, Yearbook 2023-24.

A more detailed table, reflecting total capacity addition in the system under the IPP-mode, break-up of plants by fuel, capacity, relevant policy and current status of plants is provided at **Annexure-E**.⁹⁰

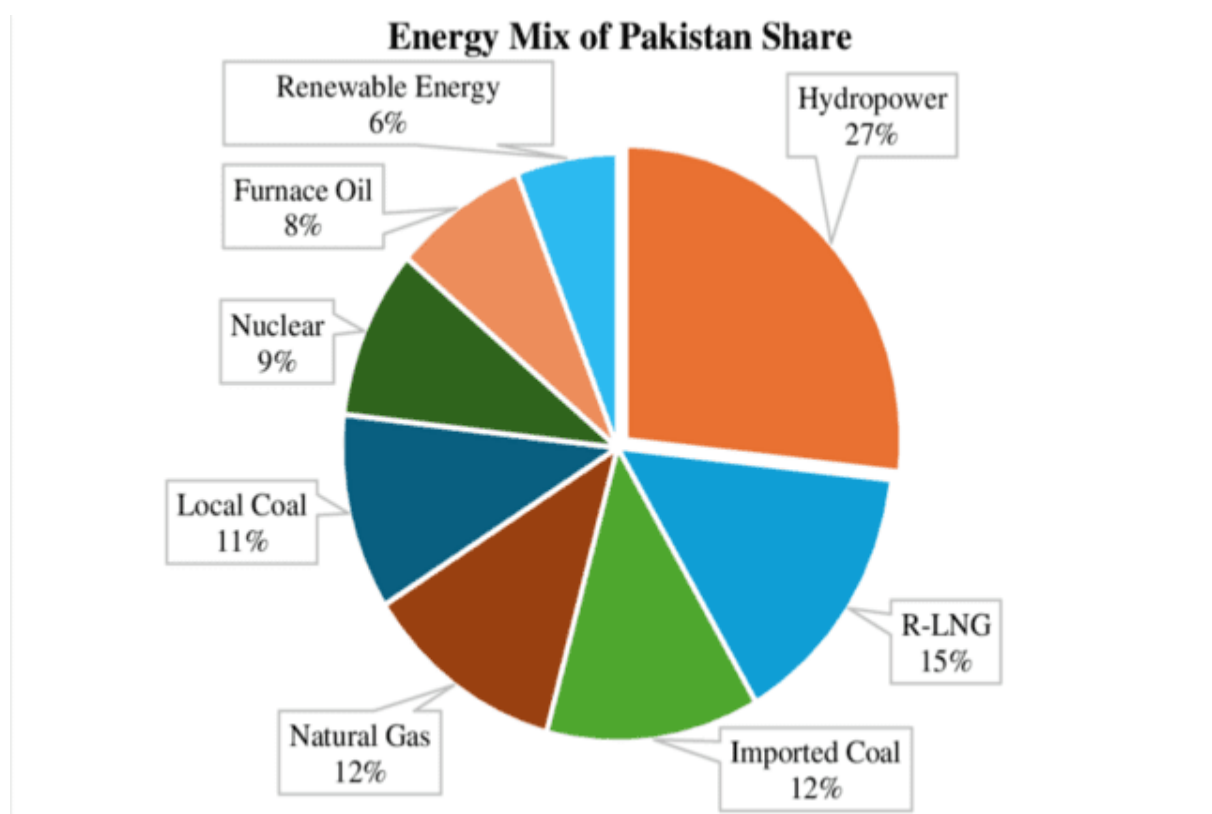
As depicted in the graph below, there was a gradual change in ownership of generation capacity. Post unbundling of early 90s, when WAPDA under the public sector was the owner of almost entire generation capacity, the infusion of IPPs started a gradual transition that saw public ownership reduced to 33 percent of total generation capacity by end fiscal 23-24. Almost all of the private sector's capacity is in the form of thermal power generation. This is depicted in the two following graphs-



⁹⁰ Data provided by PPIB

At the moment, the total capacity of the CPPA-G system, both public and private, exceeds 46,000 MW. Out of this total, almost 45 percent of the capacity FY 2023-24 was dependent upon imported fuel. Besides, net-meters for solar electricity systems installed on rooftops by various categories' consumers are also connected to the national grid. As of June 2024, over 156,372 distributed generation solar facilities with installed capacity exceeding 2,200 MW, including K-Electric Limited (KE), have been integrated with the grid through net-metering. The goals, as specified in the Indicative Generation Capacity Expansion Plan (IGCEP) 2022-31, are to add an additional 3,420 MW by 2031.⁹¹

An important feature of the new arrangement, which was to have outsized fiscal repercussions later on, was the obligation to buy capacity from private power producers. In other words, government bound itself to pay for a minimum level of production capacity, irrespective of the fact whether the capacity is utilized or not. Similarly, another characteristic that would later have far reaching implication (financial and otherwise) of the post-WAPDA era comes in the form of transition to production from other sources that were primarily dependent upon imported fuels. The generation mix of CPPA-G system for the year 2022-23 is depicted in the following graph, showing a marked contrast from pre-unbundling days when hydro power was the mainstay of electricity production;



⁹¹ NEPRA, 'State of Industry Report 2023-24'

Theoretically, a diverse mix of fuel for energy production is essential to ensure stable, reliable affordable and sustainable power supply. However, this resulted in significant difficulties, especially in lieu of foreign exchange payments.

We now move to the important query of the aftermath and the repercussions of the unbundled system, and whether it was able to meet the objectives stated at the time of unbundling the WAPDA led system of power generation.

2- Did unbundling deliver?

In answering this query, it will be important to keep in perspective the issues that had plagued the WAPDA led system (like persistent load shedding, gap between demand and supply, etc.) and the objectives for bringing in the private sector to replace the public sector which would then be free of the obligations that it had to incur over the years. Moreover, what follows is an aggregate picture of events and data that discounts multiple events (like change in government policy) for the sake of clarity as well as brevity.

We start with the power generation capacity that was as a persistent problem under WAPDA. On this count, the unbundling policy has been very successful as considerable investment in the form of FDI has poured into the power sector over the years. As mentioned above, the generation capacity now exceeds 46,000 MW, way above the maximum peak and average demand (recorded at 25,000 MW and 18,000 MW, respectively, in FY 23-24). Therefore, generation capacity is no more an issue. How much cumulative investment took place in this sector post-unbundling, however, is a matter of conjecture because

- a) the relevant government departments refuse to provide the required data, and
- b) different sources quote different numbers.

For example, as per a WB study, between 1990 and 1997, a total of \$131 billion were invested in the IPPs globally, of which 7 percent (\$9.17 billion) was invested in Pakistan.⁹² However, another source puts the number at \$5.3 billion.⁹³ But after 1997, when the PML-N took over for its second stint, the investment dropped significantly as there was crackdown against the IPPs. The second major wave of investment occurred under CPEC Phase-I, which puts the investment in power sector at \$34 billion.⁹⁴ Simply put, the exact figure is not known but what is known is that the investment, especially in power generation, was significant.

⁹² 'The impact of IPPs in developing countries- Out of crisis and into the future' (1998)

⁹³ 'Lessons from the independent private experience in Pakistan' (2005)

⁹⁴ CPEC data and Ministry of Planning and Reforms

Unfortunately, this is about the only achievement under unbundling, and that also if we only consider generation capacity exclusively of the whole eco system of generation!

This achievement tends to pale when one considers the price that the country and the system (specifically consumers) have had to pay, are paying and will pay in the future. This price came in various forms, like unaffordable electricity price that deprived customers of their income and made industry uncompetitive, huge payoffs to investors within record period of time based on dubious claims and corrupt accounting practices, and saddling the system with such outsized liabilities that it remains on the verge of collapse without tax-payer financed subsidies costing trillions of rupees.

For a start, almost immediately, the motives and objectives/aims were compromised when the first agreement with HUBCO was signed. The Government of Pakistan (GOP) provided guarantees for WAPDA obligations as power purchaser and PSO as fuel supplier. Per the Power Purchase Agreement (PPA), WAPDA would pay a monthly tariff in US\$ for both capacity and energy consumed. This violated a basic tenet of unbundling-taking the risk of liabilities (specifically financial liabilities) away from the public sector. We see similar questionable steps taken at administrative level too. The Private Power Cell (PPC), created at the behest of donors, was allocated separate funds from the development budget, which was against the aim of lessening the fiscal burden upon public exchequer. In FY 1990-91, for example, it utilized Rs. 74 million from development budget under the 'Public Sector Investment' head, which calls into question the financial acumen of Pakistan's planners.⁹⁵

BOX- The outsized returns of IPPs

The returns of IPPs have attracted scrutiny and criticism from the very start, especially the fixed returns at 17-18 percent. A major reason cited by the second PML-N government's (1997-1999) crackdown against IPPs was allegations of corruption in IPP agreements, specifically the fixed returns. The scale of those returns was brought into the limelight again during PTIs government. Its investigation report (known as the Mohammad Ali Report) made some startling revelations regarding IPP returns. The return on equity of a majority of the IPPs set up under the various power policies ranged from 40pc to 87pc in rupee terms. Against an initial investment of only Rs110bn, IPPs set up under the 1994 and 2002 power policies alone earned astonishing net profits of Rs618bn.

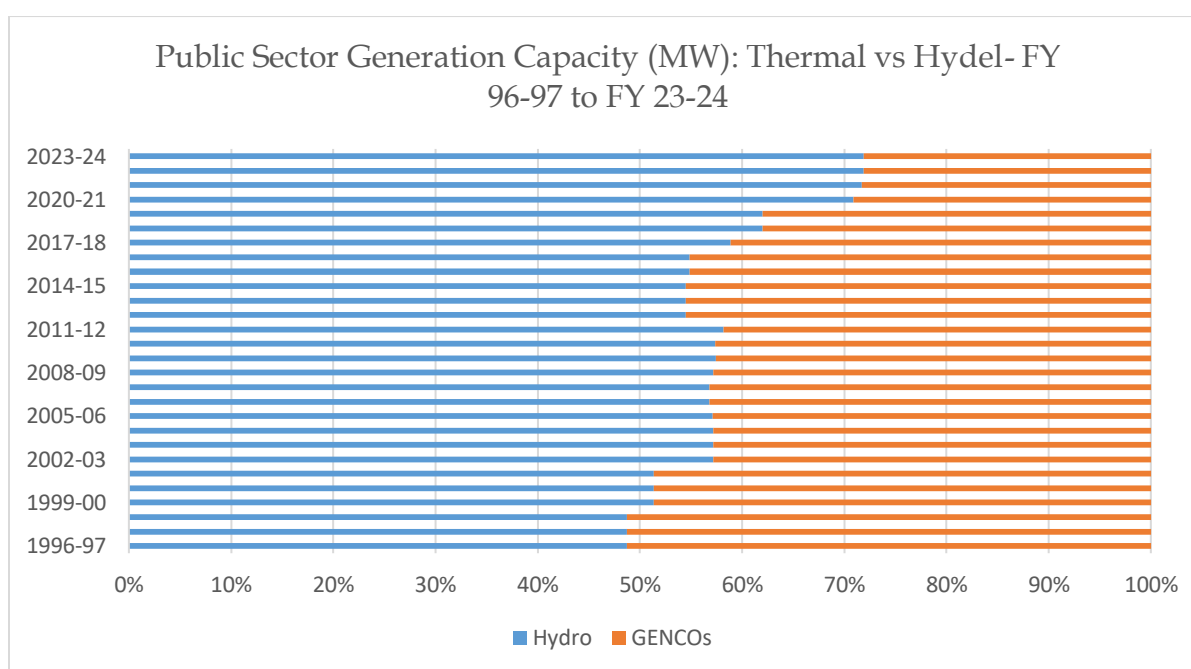
Recently, a Senate Standing Committee directed the regulator NEPRA to submit the last five years' balance sheets of IPPs to analyze their returns, after reports emerged that some of them were earning returns as high as 100 percent while producing little or no electricity.

Source: 'The eternal wait for Godot', Sakib Sherani, DAWN, 16th August 2025 and 'Senate Committee directs NEPRA to submit five-year power plant balance sheets for ROI scrutiny', PROFIT, 11th August 2025

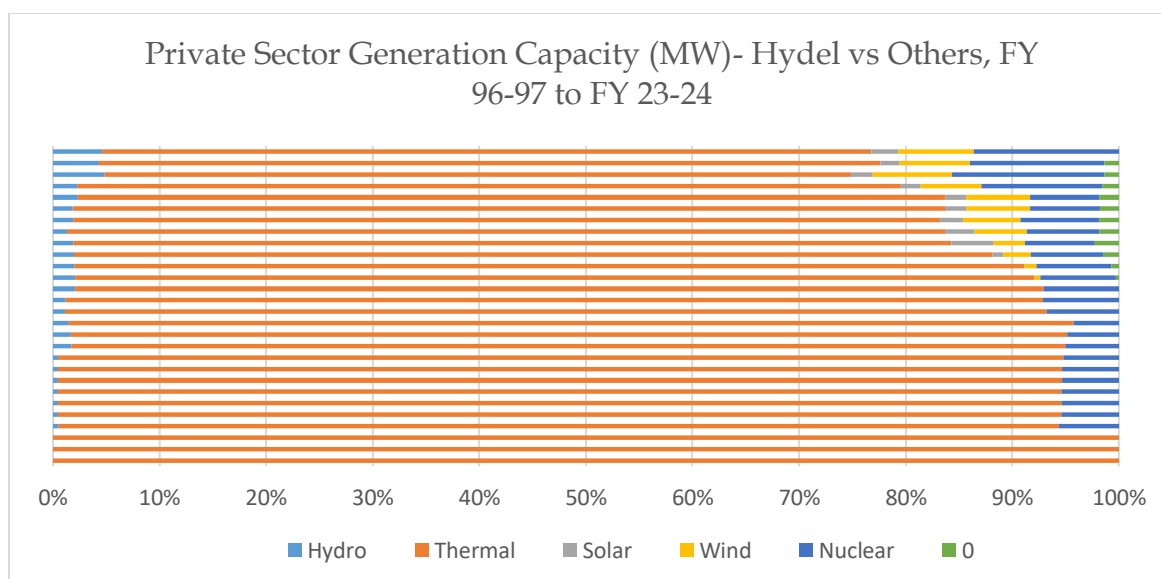
⁹⁵ Annual Development Plan 1991-92, p.332

An immediate problem that befell Pakistan's power consumers was the sizeable rise in the cost of electricity, mainly on account of imported fuels to power new IPPs. In FY 94-95, WAPDAs energy payments equaled Rs. 179 million. In FY 95-96, when IPP produced electricity entered the system, the payments shot up to Rs. 634 million, an astonishing rise by 254 percent within a year. For the next two fiscals, the payments stood at Rs. 35 billion and 54 billion respectively, reflecting a mind-boggling rise by 194,531 percent and 30,068 percent compared to FY 94-95 payment.⁹⁶

The formidable cost inflicted upon the consumers, the country and external account by higher quantities of imported fuel sources has continued since that time (discussed later in cost-benefit section). The rise in generation capacity from imported fuel has adversely impacted the financial health of the sector. Overall, the generation from the private sector thermal IPPs has shown an increasing trend since FY 1996-97, depicted in the following two graphs-



⁹⁶ IMF Staff Country Report (1999), Statistical Appendix, Table-23, p.25



One can clearly discern that within the public sector generation capacity (first graph), hydro is still the dominant component. Even the thermal production is mostly from nuclear power, which is cheapest of the available thermal sources. In contrast, hydro is hardly of consequence in private sector production capacity (at mere 3 percent in FY 23-24), is dominated by thermal capacity and dependent upon expensive imported fuels.

One of the most profound changes to occur with unbundling, which was to have detrimental repercussions for every segment of electricity use as well for the aggregate economy, was the setting of electricity tariffs (specifically, components of tariffs). We start with WAPDA and what constituted its electricity tariffs, which is stated in its 1958 WAPDA Act as follows-

"be so fixed as would provide for meeting the operating costs, interest charges and depreciation of assets, the redemption at due time of loans other than those covered by depreciation, the payment of any taxes and a reasonable return on investment".

The final tariff, though, was decided by the Federal Government. Uniform tariffs were introduced throughout WAPDA area in July 1969. From July 1971 to November 1981, WAPDA tariffs saw increase on 11 occasions, but these were minimal. In order to avoid increase in tariffs whenever input costs (like price of fuels) increased, a 'Fuel Surcharge' Clause was added in WAPDA tariffs in July 1978, but was not applicable on domestic consumers and was averaged out over a period of previous 12 months on account of fuel consumed by WAPDA. The Budget for FY 1990-91, by which time bifurcation of WAPDA had been decided, proposed Rs. 2.5 billion revenue under the 'WAPDA Fuel Adjustment Surcharge' head, in 'Non-tax Measures', to cover higher fuel costs as well as lower fiscal deficits.

Suffice to say, the tariff setting was used in a manner that ensured least inflationary impact (especially upon domestic consumers). The trajectory of rise in electricity tariffs remained pretty flat till unbundling (depicted in the graph following discussion on tariff determination post-unbundling).

Post-unbundling, with the advent of IPPs, final tariff became the sum of two separate components- Energy Purchase Price (EPP, variable component) and Capacity Purchase Price (CPP, fixed component). The CPP comprises:

- (i) Project Debt payments (inclusive of interest and principal),
- (ii) Return on Equity which was agreed at 18 percent IRR over the project life in 1994 Policy,
- (iii) Fixed element of the Operating and Maintenance Cost, (iv) Insurance Cost for the plant, and
- (iv) Foreign Exchange Risk Insurance Cost (FERI) which is the cost of hedging the loans against foreign exchange risk.

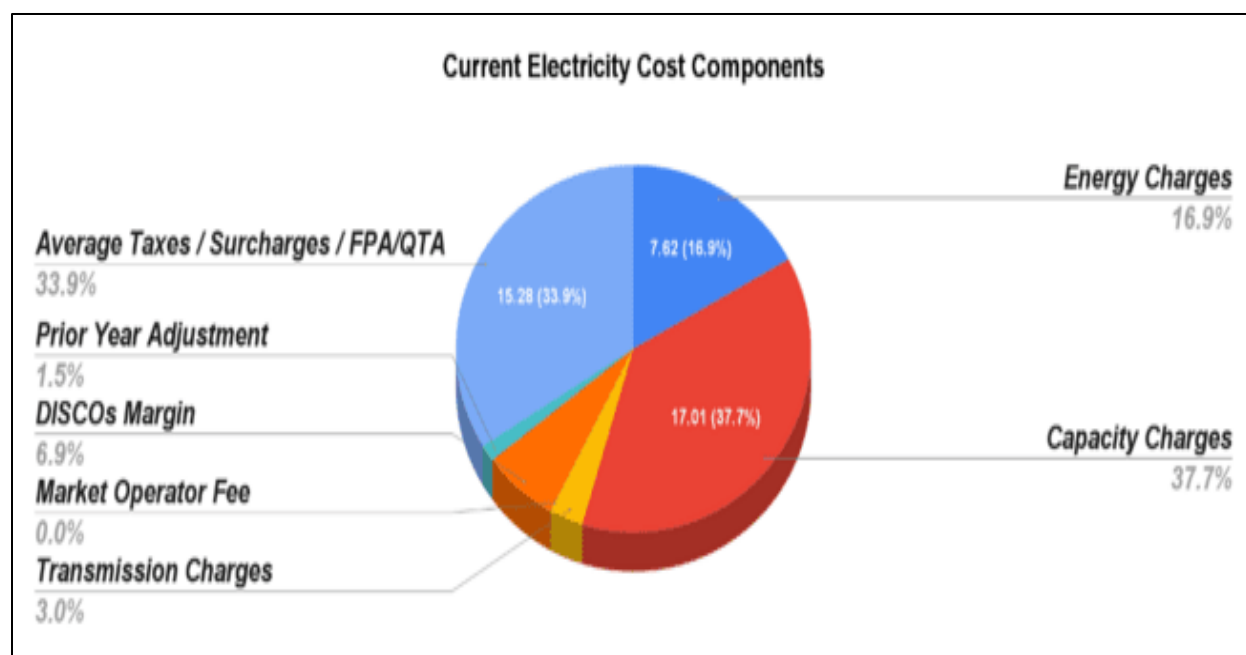
This was not all. Additional costs included 'adjustments' like PYA and various supplementary charges that are not part of the basic electricity cost; instead, they include various fees, surcharges, duties and taxes imposed by the government, which ultimately increase the overall cost of electricity for consumers.

To illustrate further, for the FY 2023-24, the reference uniform national average tariff (Rs. 45.06/kwh) for electricity along with its components (and their respective shares) included in the consumer bill are given below.⁹⁷

- Energy Charges (Fuel + Variable O&M): **Rs. 7.62/kwh**
- Capacity Charges (Fixed O&M + ROE + ROEDC + IDC + Insurance + Debt Servicing Surcharge etc.): **Rs. 17.01/kwh**
- Transmission Charges (O&M + Depreciation + ROE + Interest + Other Income + Prior Year Adjustment): **Rs. 1.37/kwh**
- Market Operator Fee (O&M + Other Income + Prior Year Adjustment): **Rs. 0.01/kwh**
- DISCOs Margin (O&M + Other Income + Depreciation + Interest + Prior Year Adjustment): **Rs. 3.10/kwh**
- Prior Year Adjustment (Under/ over recovery due to delay in notification/over under sales etc.): **Rs. 0.67/kwh**
- Average Taxes / Surcharges / FPA/ QTA: **Rs. 15.28/kwh**

The charges in the final tariff are graphically represented as under-

⁹⁷ Taken from NEPRA State of the Industry Report, 2024

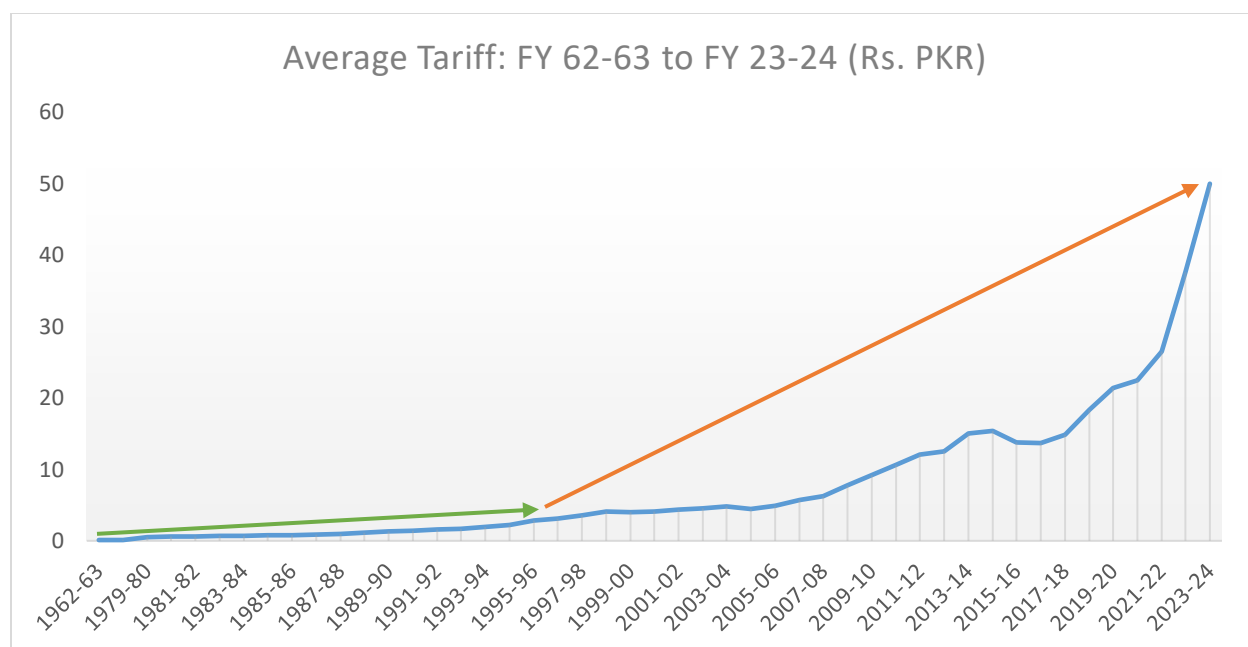


The final tariff is further classified in forty-five different slabs for all category consumers. Lifeline consumers who consume up to 100 units pay least fee, while commercial consumers pay highest bills. For other domestic consumers, the bills increase with increasing consumption.

In short, new forms of costs were introduced that burdened all categories of consumers, and having substantial negative economic repercussions. Also, by introducing dollar indexation, the risk to tariff inflation increased manifold. Between that between 1994 and 1998, 31 percent of increase in tariff was due to rupee devaluation against the dollar,⁹⁸ while electricity tariff rose 87 percent.

The end result was a steep rise in trajectory of electricity tariffs since unbundling, clearly reflected in the graph (from FY 62 to FY 94, under WAPDA, the trajectory remained almost flat).

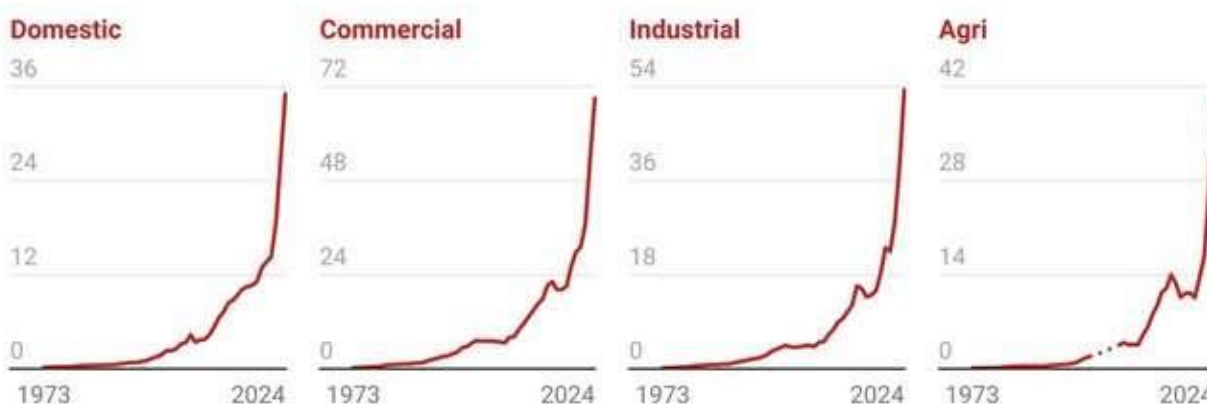
⁹⁸ 'IPPs: The real Issue' (1998), Anjum Siddiqui, *Pakistan Development Review (PDR)*



We see something similar if the above is bifurcated by four major categories, reflected in the graph below, which shows electricity tariffs after FY 1972-73.⁹⁹

Pakistan Electricity Tariffs - 50+ year journey

Rs/unit



Excludes taxes, surcharges and duties that have typically ranged around 25% of the pre-tax tariff of late

Chart: Zuhair Abbasi • Source: IGCEP 2025 • Created with Datawrapper

One can clearly see the steeply rising trajectory of electricity tariffs after the 'unbundling'.

Aside from the extractive nature of tariffs, other such practices to cover up mismanagement and failure to financially manage the system have crept into the system

⁹⁹ Graph shared by Zuhair Abbasi, Business Recorder correspondent, in a tweet on 30th August 2025.

post-unbundling. Fake billing to cover up costs and show improved performance on account of distribution losses is one such practice that has been frequently marked out by not only the regulator (NEPRA) but also by other public and private sector institutions.¹⁰⁰ It was recently reported that the consumers of electricity had been charged for 900 million fictitious units of electricity, costing them a hefty Rs. 244 billion.¹⁰¹ Back in 2023, when consumer complaints regarding wrong/inflated billing skyrocketed, NEPRA carried out inquiry into billing of two specific months (July and August 2023), concluding that distribution companies (DISCOs) have been taking recourse to all kinds of tactics to increase revenue from consumers, like billing for days that constitute more than a month, or inflated readings against defective meters.¹⁰² In the report's 'Findings', NEPRA had the following to say-

'It is very unfortunate that distribution companies are deliberately carrying out such malpractices in order to hide their inefficiencies due to which thousands of consumers suffered with higher electricity bills. Overall, it can be said that most of the DISCOs have failed to charge the electricity bills in accordance with the relevant clauses of CSM i.e. 4.3, 6.1.1, 6.1.3 & 6.2 and terms & conditions of tariff approved by the Authority. The DISCOs have also failed to carry out the mechanism of percentage checking as provided in CSM. Moreover, detection bills have been charged in violation of clause 9.1 and 9.2 of CSM'.¹⁰³

Further verification of this extractive practice, an apt reflection of the inefficiencies that were supposed to be taken care under the unbundled system, comes in the form of the details of fake billing over a decade by PESCO, one of the major loss-making DISCO (the amounts were billed to customers who had no meters installed). These are presented in the following table-

PESCO Over-Billing Summary (Rs. millions)¹⁰⁴			
Year	No. of Disconnected Consumers	Units charged to Disconnected Consumers	Amount charged
2011-12	5,694	1,635,570	18,869,675
2012-13	8,837	2,671,182	34,324,629
2013-14	7,662	5,407,943	81,530,837
2014-15	11,390	3,464,601	59,914,474
2015-16	13,104	6,133,744	107,684,860
2016-17	14,377	4,191,390	69,890,255
2017-18	16,374	5,072,205	82,021,633
2018-19	15,814	3,666,504	61,060,472

¹⁰⁰ It is not that the issue of fake or inflated bills never cropped up during WAPDAs time. However, such instances were infrequent, and the quantum as a total of bill collections tended to be negligible

¹⁰¹ 'Audit reveals Rs. 244 billion overbilling fraud by eight power distribution companies'

¹⁰² INQUIRY REPORT IN THE MATTER OF EXCESSIVE BILLING BY DISCOs JULY & AUGUST - 2023

¹⁰³ Ibid, p.12

¹⁰⁴ PESCO Audit Report, 2020-21

2019-20	27,841	4,817,654	80,149,370
		37,060,793	595,446,205

In nine fiscal years, customers of PESCO had to pay in excess of Rs. 595 million for which there existed no basis. Suffice to say, over-billing and fake billing are two persistent characteristics that DISCOs have exhibited over time. PESCO is but a small reflection of this malaise that runs into trillions of rupees over time, extracted unethically from electricity consumers all over the country.

Then there are efficiency related issues which were supposed to have been solved by unbundling. However, they still linger persistently. One such vexing issue is that of cross-subsidy¹⁰⁵, which means one group of users has to bear additional burden of another group of users for electricity use (who end up with less burden), has still lingered on despite unbundling. Since WAPDAs time, it is the industrial consumers that have had to bear additional burden of electricity usage and services as domestic consumers have been heavily subsidized. One of the aims of unbundling was to get rid of this kind of inefficiency. However, it continued unabated, hurting Pakistan's industry as industrial consumption has gradually gone down, having negative socio-economic repercussions. All Pakistan Textile Mills Association (APTMA), one of the largest industrial association of Pakistan, has regularly raised this issue. As per their latest calculation, using category-wise data, they claimed a cross-subsidy of Rs. 140 billion in FY 24-25, implying a disproportionate burden of Rs 140 billion on industry on behalf of consumers of other categories (domestic, specifically). The Federal government, however, disputes this claim, putting the estimate at Rs. 74 billion, which by no means is insignificant.¹⁰⁶

But it is not just the persistence of cross-subsidies that is the issue- in fact, the overall public/taxpayer subsidies to the power sector, without which the power sector would have collapsed post-unbundling, constitutes a major drain upon the national exchequer, and consequently, upon the taxpayer. In FY 2012-13, energy subsidies constituted 95 percent of the total subsidies provided by the federal government. In the previous fiscal (FY 2011-12), it was 512 billion or 90 percent of total subsidies.¹⁰⁷

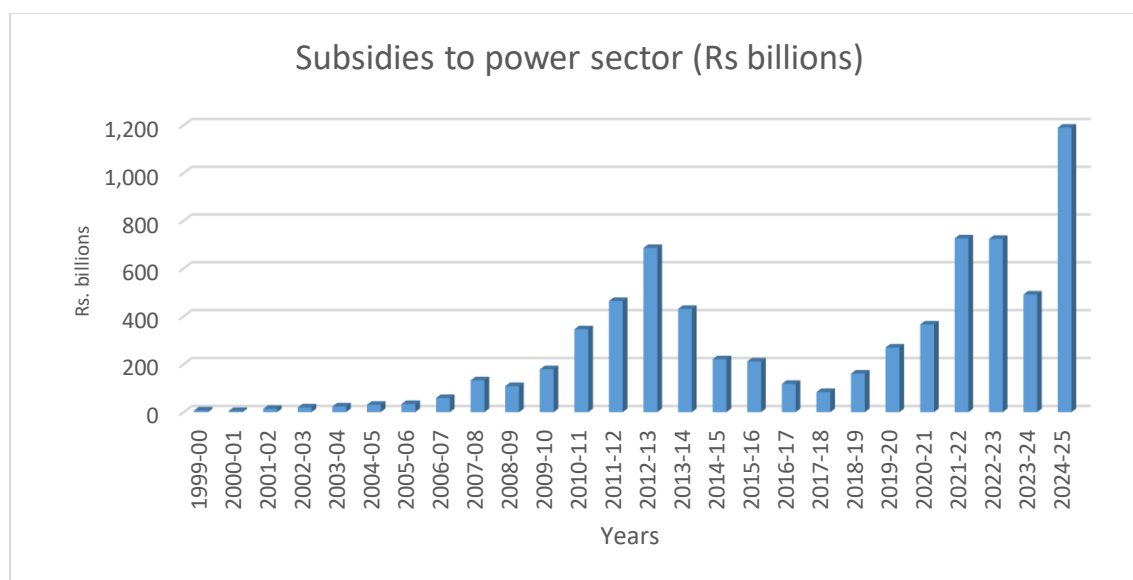
Post unbundling, when the public sector was supposed to be free of the obligations of power sector, especially financial obligations, it found itself even more indulgent in its affairs and survival, continually doling out taxpayer financed subsidies to keep the sector afloat. Available data suggests that a cumulative amount of **Rs 7 trillion, 105 billion in**

¹⁰⁵ Cross-subsidy is the difference between the tariff identified by the regulator NEPRA (covering costs related to generation, transmission, distribution and associated margins) and the one approved by the Government. This difference in final tariff ends up as two sets of tariffs (rather than a uniform tariff): NEPRA determined and a subsidized rate determined by the Government, which ends up in one particular segment subsidizing another

¹⁰⁶ 'Industrial Power Tariff' (2025)

¹⁰⁷ Federal budget documents

subsidies has been provided to power sector by the federal government between FY 99-00 and FY 23-24 (reflected in the graph below), just to keep it from defaulting or collapsing altogether.¹⁰⁸ Put another way, taxpayers had to pay this amount when they were supposed to be free of such obligations. This totally goes against the *raison d'être* of the unbundling exercise.



The cost is not merely reflected in subsidies but also in various forms of ‘exemptions’ that have been granted to the power sector since the 1994 Power Policy, a trend that was repeated in later policies and continues till this day. For example, as explained in the Annexure to 1994 Policy, exemptions were provided to investors from corporate income tax, custom duties, sales tax, and other surcharges on imported equipment (constituting ‘indirect subsidy’). Although the year-wise breakup is not available, a report in 2024 claimed that since their inception, IPPs have availed tax exemptions to the tune of Rs. 1.2 trillion.¹⁰⁹ Back in 2015, former finance minister Hafiz A. Pasha revealed that the lifetime income tax exemption were unprecedented and no other industry enjoyed such special treatment. Citing FBR, he stated that the annual revenue foregone was Rs 51.5 billion. Cumulatively, between FY 09-10 and FY 14-15, the exemption cost the exchequer Rs 200 billion.¹¹⁰ Additionally, as the State Bank also noted, the private power producers also enjoyed the following subsidies- fuel subsidy, interest subsidy, environmental subsidy and cross-subsidy.¹¹¹

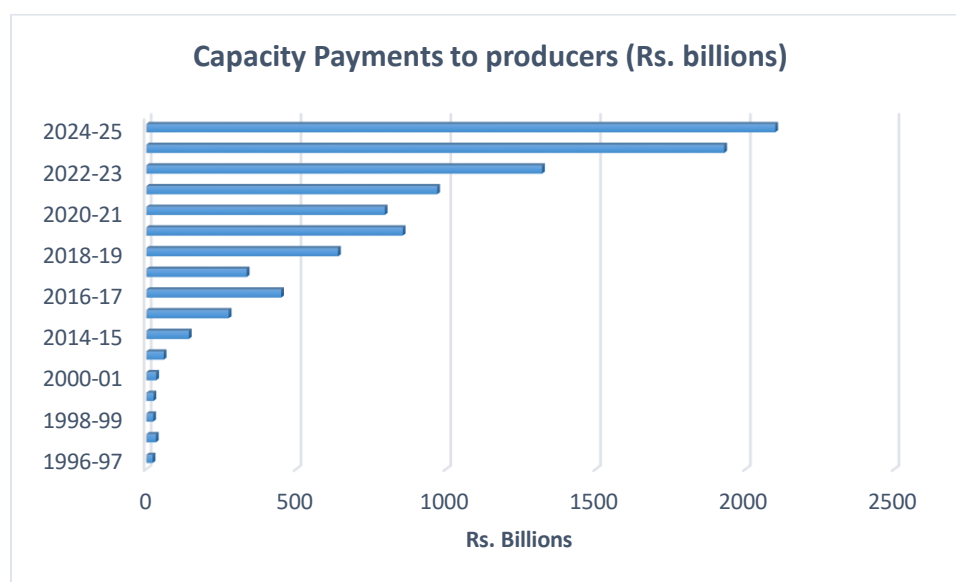
¹⁰⁸ Subsidy figures mainly taken from Finance Division and SBP documents over the years. These constitute Inter-Tariff Disco Differential, Adjustment of additional surcharge against GST, Payments for ex-FATA, payment for Tube Wells in Baluchistan, Interest on TFCs, other subsidies, subsidies to KESC and PEPCO

¹⁰⁹ ‘Independent power producers enjoyed tax breaks of Rs. 1.2tr since 1990’

¹¹⁰ The case of IPPs’ (2015)

¹¹¹ ‘The Pakistan Infrastructure Development Report’ (2007), p.25

Topping off the absurdity and inefficiency of this extractive system is the vexing issue of ‘capacity payments’, an attribute that came with the introduction of IPPs. Briefly put, power producers charge for setting up power capacity, which forms part of final tariffs. No capacity payments existed during WAPDAs time, but started as soon as privately produced electricity entered the system. The first capacity payment, a hefty Rs. 21 billion, was made by WAPDA in FY 1996-97 to procure electricity from IPPs. Since then, our estimates suggest that an amount of approximately Rs. 10 trillion, 440 billion has been paid to producers till now, as depicted in the following graph-



The problem is that most of the payments took place without any audit of production and for capacity that was never utilized!¹¹² Year after year, report after report, it was emphasized that these payments are being made without any proof to back up the claims of producers, and constituted the biggest burden upon the power sector. Back in 2007, the SBP report on infrastructure noted the inefficiency of both the public and private sector production plants, with private sector plants exhibiting more scale inefficiency than the public sector plants.¹¹³ Recently, a Senate Standing Committee, while pondering over the failure of the regulator NEPRA, revealed that IPPs had misreported data, extracting an additional Rs. 39 billion/- from government in capacity payments and NEPRA had failed to check this malpractice.¹¹⁴

The efficiency and utilization levels, worryingly, seem to have fallen lower over time, reflected in the M. Ali report and NEPRA reports over several years. On 20th July 2024, caretaker minister Mr. Gohar Ejaz tweeted a list of IPPs being paid Rs. 150 billion per

¹¹² The M. Ali Report covers this aspect well, as well as various NEPRA reports

¹¹³ The Pakistan Infrastructure Development Report (2007), *SBP*, p.20

¹¹⁴ ‘Overcharged and Underpowered’, Dr S. Ahmed, 18th November 2024, *the NEWS*

month, with half of them running at 10 percent capacity.¹¹⁵ As per NEPRA's quarterly adjustment notifications FY 24 for capacity payments, the power plant-wise analysis revealed that capacity payments for plants having less than 25 percent plant factor contributes 29 percent to the total capacity charges, while those with plant factor of 25-50 percent contributed to 25 percent payment respectively. Therefore, due to IPP "Take or Pay" agreements capacity charges are being paid to those power plants which do not operate even on 50 percent of their actual capacity.

Aside from the matter of payments made on dubious grounds, it has affected demand for electricity too, which needed to grow substantially to cover for the costs of installed capacity. The SBP Annual Report 2017-18 noted that capacity payments are the reason that electricity tariffs remained high despite a sharp decline in fuel costs and overall significant decline in international commodity prices, critically affecting demand. Between FY 17-18 and FY 18-19, for example, the requirement was for demand to grow by at least 30 percent to cover the costs like capacity costs. However, demand only grew by 12 percent, meaning that the remaining 18 percent had to be extracted from consumers despite no consumption of electricity.¹¹⁶

Meanwhile, as consumers suffered, IPPs made unprecedented, staggering profits. As former Finance Minister, Dr Hafiz A Pasha noted back in 2015, their return on equity is substantially higher than the average of all companies.¹¹⁷ On top of that, the extremely liberal 1994 Power Policy gave lifetime exemption to all IPP projects, making the post-tax rate of return of IPPs higher and over twice the national average. Such massive profits have repercussions on national scale, specifically in terms of wealth and income inequalities. Saqib Sherani, former government Advisor on Finance, recently wrote that

‘The scale of the wealth transfer is staggering. As a crude indication, around 33 IPPs received contractual capacity payments of Rs8.3 trillion between 2014 and 2024, according to disclosure by the Power Division. According to the 2020 GoP inquiry report, the return on equity of a majority of the IPPs set up under the various power policies ranged from 40pc to 87pc in rupee terms. Against an initial investment of Rs110bn, IPPs set up under the 1994 and 2002 power policies alone earned net profits of Rs618bn. Investment payback periods of projects reviewed by the committee ranged from one to six years’.¹¹⁸

It is also pertinent to recall that, as discussed above, one of the issues that forced the government to look towards unbundling the organization was the increasing burden upon the external account in lieu of higher payments for imported fuel sources for

¹¹⁵ https://x.com/Gohar_Ejaz1/status/1814597980629966990

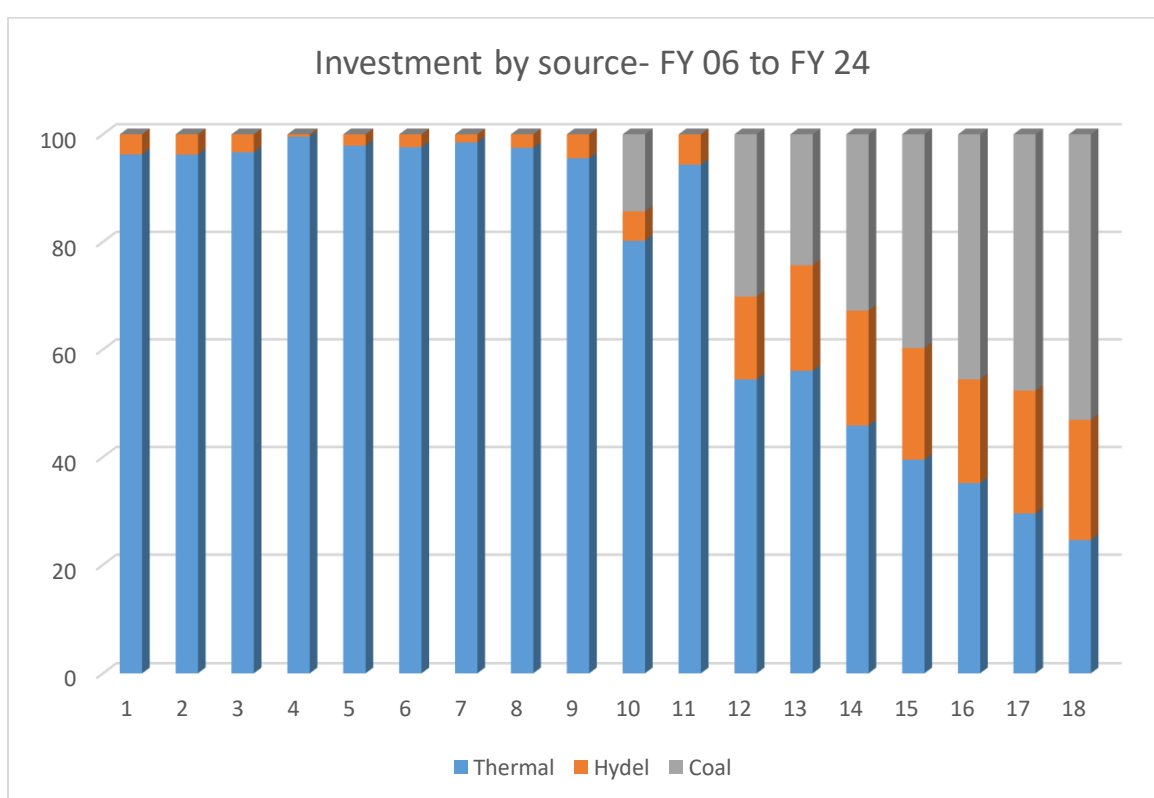
¹¹⁶ SBP Annual Report 2018-19, Special Section 'Why are power tariffs in Pakistan consistently high'

¹¹⁷ 'The case of IPPs' (2015)

¹¹⁸ 'The eternal wait for Godot', Sakib Sherani, *DAWN*, 16th August 2025

electricity production. The underlying assumption was that once unbundling takes effect, the external account would then be free of the pressing burden of dollar payments, resulting in massive foreign exchange savings. However, like majority of the assumptions underlying the move to unbundle the sector, this assumption also remained unfulfilled as precious foreign exchange has been expended from the external account to import various fuels.¹¹⁹

Not only did the substitution towards imported fuel cost Pakistan billions of dollars in imports, they also introduced increased levels of pollution through burning fuels like furnace oil and coal, leading to worsening air quality and increasing cases of medical complications for residents of various parts of the country.¹²⁰ This is evident from the following graph that shows the power sector investment by source-



The provision of imported fuel, in turn, has largely been dependent upon Government guarantees, a financial burden that has ballooned over the years, with the end customers being the ones who have borne the cost. As expected, government has found it difficult to fulfill its financial commitments. In April 2011, for example, Pakistan State Oil (PSO) could not honor its payments to suppliers as receivables reached unsustainable levels, leading to choking of imported supplies of HSD and furnace oil. The resulting fuel

¹¹⁹ Dollar repatriation due to dollar indexation of returns is another avenue of foreign exchange loss post-unbundling

¹²⁰ 'Independent Power (or pollution) producers? Electricity reforms and IPPs in Pakistan' (2015)

shortfall for power generation companies led to some of the worst load shedding episodes throughout Pakistan, inflicting huge economic losses. Capacity utilization in GENCOs subsequently declined to 23 percent in May 2011.¹²¹

Consequent to 1994 Power Policy, for example, foreign exchange reserves of the country were used for the import of machinery for IPPs, costing over \$3 billion. This precipitated a foreign exchange crisis in 1996-97.¹²² This continued, taxing the meagre foreign exchange reserves of the country. In FY96 and FY97, for example, the contracts with the IPPs pushed up the power generating machinery imports and thereby the current account deficit.¹²³ In years when both economic growth and electricity demand picked up, there was a significant jump in machinery imports. In FY 06-07 and 07-08, for example, the import of electricity generating machinery consumed almost \$2 billion dollars in imports.¹²⁴

The aim of independent regulator (NRA, later to become NEPRA) has also remained unfulfilled as the regulator has been subjected to persistent political and administrative interferences by successive governments, especially in its appointments.¹²⁵

There were many other economy-wide repercussions, the discussion of which is beyond the scope of this paper. One of them was the increasing quantum of Non-Performing Loans (NPLs) in the banking sector. For example, between Dec-08 to Dec-12, NPLs increased from Rs. 1.3 billion to Rs. 17.5 billion attributable to power generation and telecom sectors. As of Dec-12, the major share in NPLs (47 percent) pertained to power generation followed by 27 percent with telecom sector, 13 percent with power transmission.¹²⁶

Finally, the introduction of IPPs and the related issues (payments, mode and manner of negotiation, design of contracts, audit, etc.) have all been mired in huge controversies, with frequent allegations of rampant corrupt practices and dubious payments. In 2003, for example, a report revealed that one of World Bank's (WB) leading officials in setting up IPP deals (especially the HUBCO IPP) was also designing its invoices for payments from WAPDA and had bought a stake in that IPP, which he later sold to Malaysian investors. Moreover, the same report alleges connivance of WAPDA officials in staggeringly high payments to IPPs by deliberately keeping its thermal plants in disrepair (so that electricity can be brought from IPPs, at three times higher cost).¹²⁷

¹²¹ SBP Annual Report 2011, Chapter on Energy, p.36

¹²² 'The case of IPPs' (2015)

¹²³ SBP Annual Report 2007-08, Ch.7, p.119 and p.122

¹²⁴ SBP Annual Report 2007-08, Ch.7, Table 7.25, p.152

¹²⁵ At the moment, NEPRA comes under the Cabinet Division of the Federal government

¹²⁶ 'Infrastructure Finance Review, 2008-12' (2013), SBP, p.4, Table-A on p.9 and Table-C on p.11

¹²⁷ 'IPP payments and WAPDA losses'

The Rental Power Projects (RPP) under the PPP government (2008-2013) came under severe scrutiny, as even the Supreme Court took cognizance of the matter. In FY 2013-14, when Rs. 480 billion were paid to IPPs in one-go under the PML-N government, it immediately raised suspicions and controversy as Auditor General questioned the basis of such a huge payment, pointing out the lack of proof against the payment (the matter, till this day, remains mired in controversy).¹²⁸

Similarly, in 2012, the Supreme Court of Pakistan outlawed all Rental Power Projects (RPPs) citing corruption, violation of competitive bidding practices (as required under PPRA rules) and wasting billions of rupees (2012 SCMR 773). The same year, Nine IPPs, with a combined power generation capacity of 1,800MW, notified the government that they are invoking sovereign guarantees for the recovery of their dues amounting to Rs. 31 billion. Few years later, in 2016, Transparency International (TI) sent a letter to the then Chief Justice, alleging massive irregularities and corruption in IPPs (with details).¹²⁹

By the beginning of the 21st century, even the donors that were instrumental in initiating the IPP era in Pakistan were acknowledging the shortcomings and failures of the 1994 Policy.¹³⁰ World Bank, for example, published a detailed report in 2001 over the shortcomings of Pakistan's private power policy push. Within two decades of the first IPP experiment and Power Policy 1994, it was apparent that Pakistan's unbundling experiment had morphed into a mega disaster of epic proportions. Financial Times, a leading international journal on economics and finance, dubbed unbundling and IPPs 'failed privatization'.¹³¹

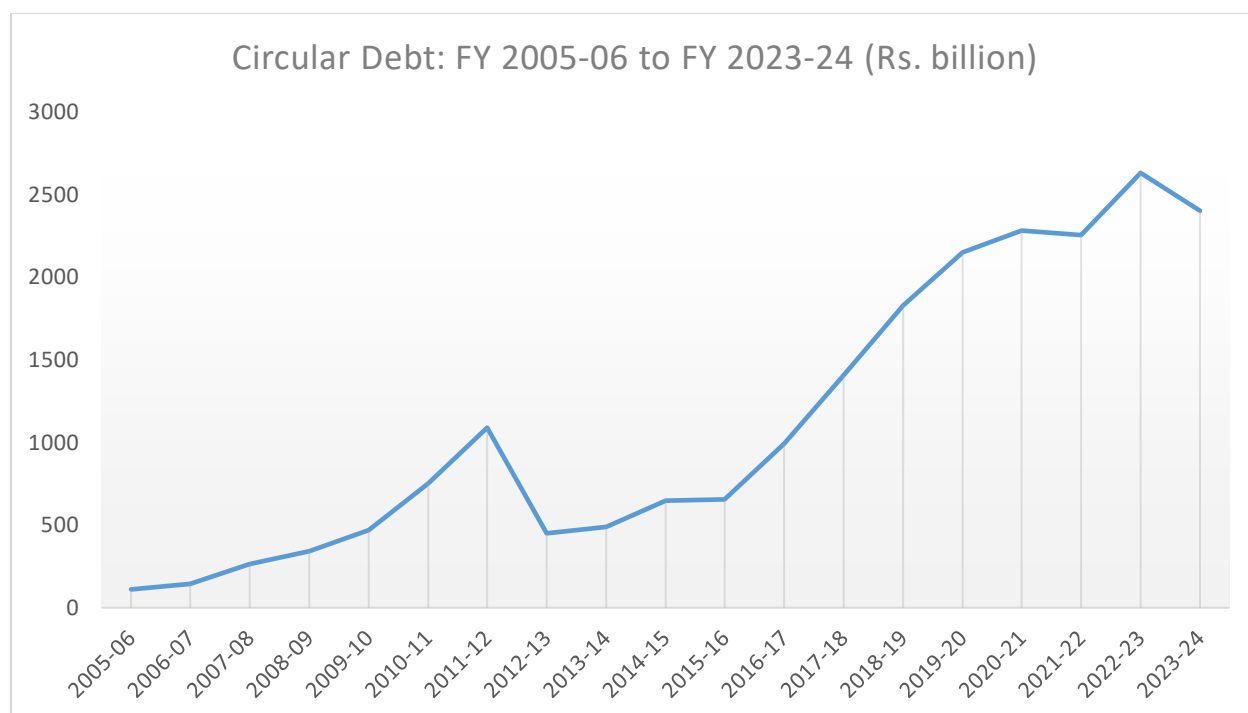
Finally, the system-wide inefficiency of the post-unbundling power sector is amply reflected in the phenomenon of Circular Debt (CD), basically a shortage of required finances to run the system and a good indication of governance failure. By March 2025, it stood at a massive Rs. 2.3 trillion, despite payment of Rs. 2.03 trillion since FY 06-07 from national exchequer to clear this obligation. Its growth over time is depicted in the graph below-

¹²⁸ As the payment of Rs. 480 billion was being approved by the government, the Auditor General, Buland Akhtar Rana, objected to it. Next day, he was transferred from his post. For reference, see the following: 'Controversial payment to IPPs: PAC report rejected', 17th February 2017, *Business Recorder*, and 'Senate's recommendations on 'illegitimate' payments to IPPs: PD asked to share implementation status', Mushtaq Ghumman, 10th September 2024, *Business Recorder*

¹²⁹ Letter dated 18th June 2016, addressed to Chief Justice Anwar Zaheer Jamali, alleging illegal benefits to IPPs of over Rs. 200 billion per year

¹³⁰ 'Implementation completion report in the amount of \$150 million to the Islamic republic of Pakistan for a private sector energy development project' (2001)

¹³¹ 'Pakistan's real power problem: a failed privatization' (2012)



3- What went wrong?

For a transition that was supposed to take care of all the issues plaguing the power sector, and with such expansive help from IFIs (through their human capital expertise as well as finance), why did it fail to deliver? As shown above, the system is now saddled with liabilities that were not even present under WAPDA (like Circular Debt). For the purpose of understanding the loopholes that rendered this transition of little positive significance, and for course correction in terms of future policy-making, it is thus imperative to query the basis of the failure.

One of the main issue that has come to characterize the present unbundled system is the excess generation capacity that carries a huge burden of capacity payments. This, in turn, came about because almost every source (government, donors and others) believed that demand would grow at a significant pace, mimicking the high demand growth of the late 1970s and 1980s.

All of them, however, turned out to be false! For example, as per the Power Policy of 1994,

‘The system is characterized by a high degree of suppressed demand. Conservative projections for annual average increase in the demand are nearly 8% per annum for the next 25 years, which means that **approximately 54,000 MW of additional generation capacity will be needed up to year 2018**’.¹³²

¹³² ‘Power Policy 1994’

Similar faulty demand projections were made at other places, like WAPDAs Annual report of 1991-92, whereby it was assumed, based on last five-year data that electricity demand would grow from 6,532 MW to 13,395 MW in FY 99-00 (or 105 percent increase).¹³³ Additionally, WAPDA Annual Report 1997-98 projected electricity demand to reach 49,640 MW in FY 2017-18.¹³⁴

These projections, however, proved to be too optimistic, clearly reflected in the table below that shows the difference between official estimates of peak demand and the real peak demand that occurred over the years.¹³⁵

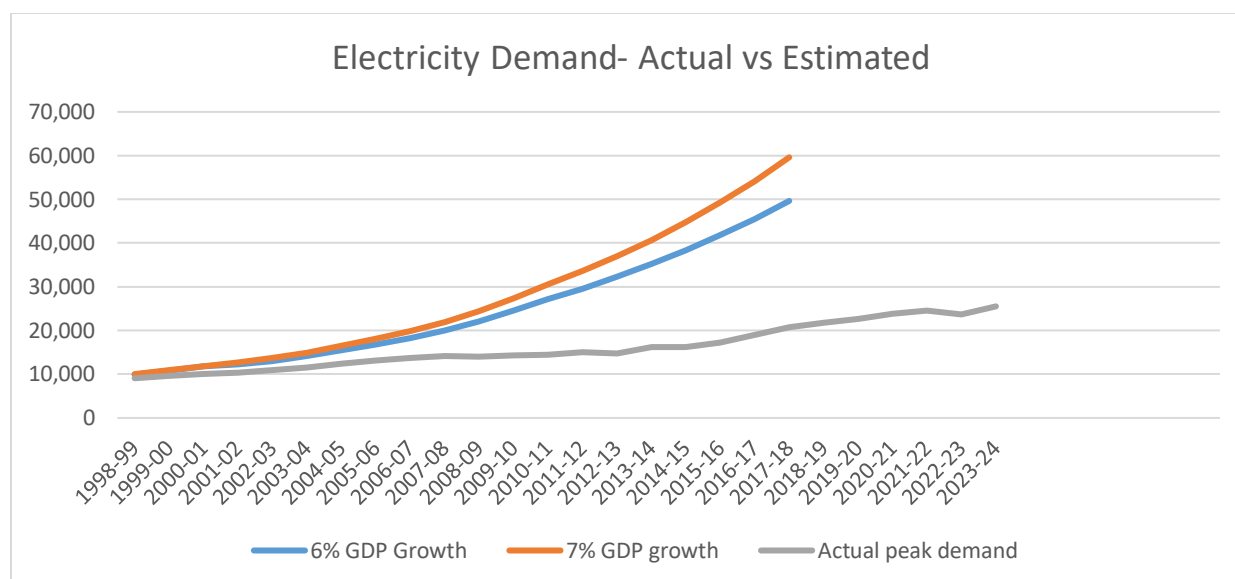
Maximum Estimated peak demand (MW)- WAPDA			
Year	Demand (6% GDP, 8-9% sales growth)	Demand (7% GDP, 9-10% sales growth)	Peak Demand
1998-99	9,927	10,019	9,074
1999-00	10,749	10,949	9,556
2000-01	11,763	11,785	10,033
2001-02	12,227	12,686	10,358
2002-03	13,043	13,658	11,000
2003-04	14,141	14,943	11,527
2004-05	15,413	16,438	12,385
2005-06	16,801	18,082	13,066
2006-07	18,313	19,890	13,645
2007-08	19,961	21,879	14,151
2008-09	22,106	24,452	14,055
2009-10	24,487	27,335	14,309
2010-11	27,155	30,591	14,468
2011-12	29,599	33,650	15,062
2012-13	32,263	37,015	14,756
2013-14	35,166	40,716	16,170
2014-15	38,331	44,788	16,233
2015-16	41,781	49,267	17,261
2016-17	45,541	54,193	19,020
2017-18	49,640	59,613	20,795

Just to get an idea of the staggering gap between the estimates and real peak demand, the difference between both of these for the FY 17-18 stood at 38,818 MW. The following graph further depicts the difference between estimates at various growth rates and the real peak demand.

¹³³ WAPDA Annual Report, FY 1991-92, p.71

¹³⁴ WAPDA Annual Report, FY 1997-98, Table 3.1, p.58

¹³⁵ Peak demand statistics, taken from *Power Statistics*, NTDC



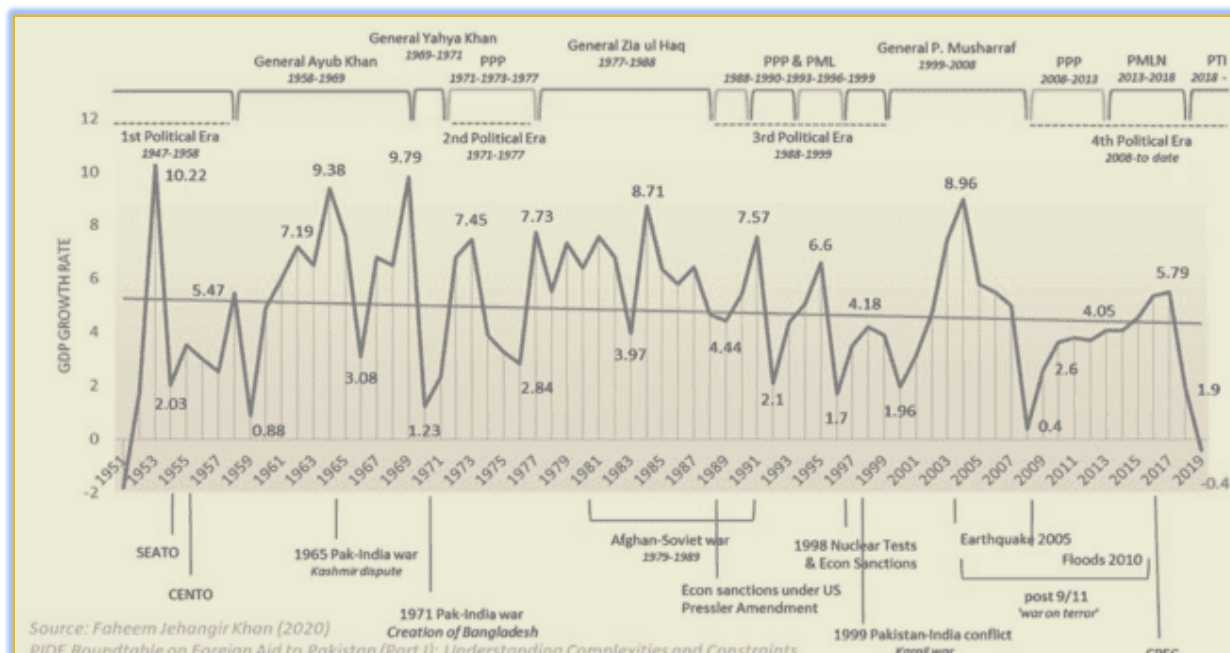
If the earlier WAPDA demand forecasts were way off the mark, no lessons were learned from these poor quality projections. In fact, in 2008, NTDC projected even greater demand figures that proved to be completely at odds with reality. Take, for example, their 'low' demand forecast for 2025 at 73,041 MW. In 2025, the peak demand has hardly crossed 25,000 MW.¹³⁶

Demand Forecasts made by NTDC (in MW)						
Peak Demand	2007	2010	2015	2020	2025	2030
Low	18,883	24,339	35,271	51,296	73,041	98,557
Normal	18,883	24,474	36,217	54,359	80,566	113,695
High	18,883	24,562	37,075	58,120	92,762	145,304

It is natural to ask, in context of above, why were the estimates so off the mark? Specifically, what were the basis of such faulty demand estimations? A detailed discussion of the probable reasons is beyond the scope of this research paper, therefore a brief account is presented here.

¹³⁶ 'NTDC. OFFICE OF G.M. PLANNING POWERNTDC / PEPCO WAPDA HOUSE LAHORE' (2008), reproduced in 'DATA COLLECTION SURVEY ON ENERGY SECTOR REFORM IN THE ISLAMIC REPUBLIC OF PAKISTAN' (2014) by JICA

The linear estimates of growth in demand seemed to have been based merely on nominal numbers (like aggregate growth in electricity demand over a few years plus calculated income elasticities of electricity demand). However, there appears to have been no analysis of underlying endogenous and exogenous events that propelled increase in demand for electricity. Importantly, there were no alternative estimates that allowed for the possibility of changes in these events/policies, and how they would impact demand. For example, even a cursory look at Pakistan's GDP growth trajectory (shown in the graph below¹³⁷) would have informed the estimators that making linear estimates based on non-linear growth trajectory is unwise and risky.



It is also doubtful that those entrusted with estimating the future demand ever took into account the falling GDP growth rates in late 1980s and throughout the 1990s (acknowledged as Pakistan's 'lost decade' in the economics community), and the fact that domestic policies heavily subsidized electricity rates, especially the ones for domestic consumers (at the expense of industrial and commercial consumers, a policy that continues till this day).¹³⁸ It should have occurred to the estimators that once private sector comes in with its imported fuel plants and when public subsidies are gradually phased out, electricity will not be as cheap as had been earlier. Going by the simple demand and supply theory, any rise in prices of a product would negatively affect its demand, which is exactly what happened in the aftermath of unbundling. To boot, the yearly growth of consumers on main grid under WAPDA, from FY 59-60 to FY 93-94,

¹³⁷ Taken from PIDE RAPID Growth Strategy (2022). Notice that the average growth trend line depicts a downward trend over time

¹³⁸ Domestic consumers, for example, were exempted from 'fuel surcharge' introduced as part of final tariff in July 1978

remained at 16 percent. Post unbundling, up till end FY 23-24, the growth has averaged only 5 percent.¹³⁹

The fact of the matter was that even back in 1990s, there were clear indications that the projected growth in electricity demand was wrong as the real growth in demand had hit snags due to various reasons (low per capita income growth, rising electricity prices, real income of consumers being either decreasing or constant, etc.). As soon as the generous flow of aid from donors and foreign governments tapered off post-Soviet withdrawal from Afghanistan, there were indications that economic growth as well as per capital income growth would also taper off. In FY 1989-90, for example, the total electricity demand grew by a mere 4.4 percent.¹⁴⁰ In FY 1994-95, the growth of demand declined to only 2.3 percent. Next fiscal (i.e., FY 1995-96), it hit the lowest level of 0.4 percent growth.¹⁴¹ However, a year later, WAPDA was to come up with its demand forecasts based on the same old projections of GDP and GNP growth at 6 to 7 percent per annum in the future despite all the evidence pointing in the other direction.

Remittances is another factor in the questionable demand estimates and its basis. There is almost unanimity in the contention that the rise in electricity demand coincided with a rise of remittances since the 1970s. For example, Haq (1992) stated that

‘It may be noted that the net factor income at current factor cost from monies sent by the Pakistanis working abroad has increased from \$115.9 million to \$1.7276 billion, indicating that a portion of the money received from Pakistanis abroad has been used to purchase domestic electric appliances such as refrigerators, freezers, radios, television sets and so on’.¹⁴²

As a percentage of GDP, remittances kept rising, reaching a peak (as percentage of GDP) in mid-1980s (a time when western aid was also in maximum flow due to Soviet-Afghan War). Yet, from there on, they started to decline, a trend that continued at an increasing pace throughout the 1990s (before picking up again as Pakistan became ally in War on Terror in 2002). This is clearly visible in the graph below, which depicts remittances as a percentage of GDP.¹⁴³

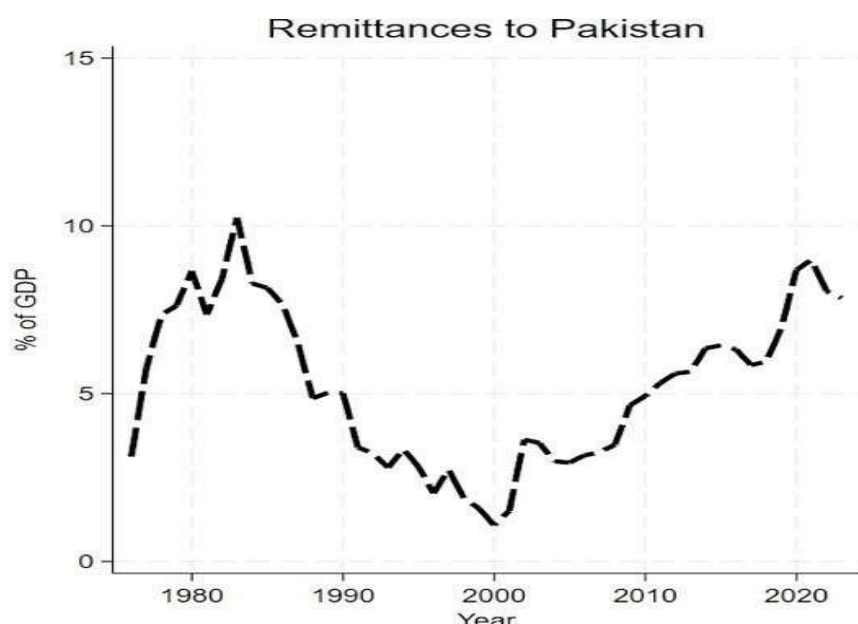
¹³⁹ This is not to say that gradual rise in electricity rates was the only culprit in decline of electricity demand or the slow pace of rise in new consumers. Part of the reason may be attributed to distribution companies (DISCOs) being more selective in giving out new connections compared to previous system under WAPDA. Although this aspect requires more research, majority of the analysts of the power sector agree that higher prices were the main driver of lower demand and lower growth in consumer base

¹⁴⁰ Annual Development Plan 1990-91, p.150

¹⁴¹ ‘The Political Economy of Energy Development in Pakistan’ (1998)

¹⁴² ‘Energy planning in Pakistan: Problems and Prospects’ (1982), Abu M. Izhar Ul Haq (former Chief of Energy section at Planning Commission)

¹⁴³ ‘Remittances: A lifeline with Dutch Disease’ (2025)



Yet, nowhere in demand estimates do we find any mention of how this declining trend may affect the demand for electricity in the coming years. Put another way, there was little or no acknowledgement of the effects of this exogenous shock to demand.

Apart from the estimates being based on questionable grounds and lacking any viable analysis of exogenous and endogenous factors, there were other glaring facts, numbers and factors that raise question on the timing and methodology of the whole unbundling exercise. These were raised even before unbundling practically took shape, at that time and in its immediate aftermath. Some of these are as follows.

Elwan (1992) also felt that the timing of privatization and the underlying circumstances were less than favorable for that kind of move. Specifically, he pointed out that the foreign exchange reserves at end FY 1991 stood at a paltry \$415 million, too small to provide required confidence to the private sector to assume risks. Similar was the case with FDI, which stood at a meagre \$120 million in FY 1989-90, significantly lower than what would have been required for sustained privatization.¹⁴⁴ Fraser (2005) made a similar contention, stating that WBs own estimates suggested profit repatriation to the tune of \$800 million per year that with an investment of \$5 billion, an amount that Pakistan would find very difficult to contend given the poor export performance and overall dollar earnings.¹⁴⁵

Around the time of 1994 Power Policy, as the agreements were being signed, former finance minister, Mr Sartaj Aziz (late) wrote a series of articles questioning the need for so many agreements, as well their terms. In one of his articles, he questioned

¹⁴⁴ 'Privatization, Deregulation and Macroeconomic Policies: The Case of Pakistan' (1992)

¹⁴⁵ 'Lessons from the independent private experience in Pakistan' (2005)

‘Why are so many agreements, MOIs, MOUs and LOS being issued at such frightening speed for power generation up to 13,000 MW, which is four times the capacity recommended by the government’s own task force on energy?’¹⁴⁶

In 1998, few years after unbundling, Dr Ashfaq Hassan Khan, former advisor on Finance to Government of Pakistan, and his co-author raised concerns over the liabilities being accrued, the paradox of investment concentration in power sector only and economic risks in the following words-

‘Why could Pakistan not succeed in attracting sufficiently large FDI despite liberalizing its payments and exchange regime as well as inward FDI regime? The present study attempts to find out the answer. Rather, a relatively large inflow of FDI into the power sector since 1995 has created some adverse effects, most important of which was the large increase in imports of capital goods for construction of power plants, and the ongoing conflict between the government and foreign independent power producers (IPPs) on the power rate the government needs to pay to IPPs under the purchase contract. Another negative effect of FDI concentration on the power sector was that as the remittances by IPPs began to increase, it severely constrained the balance of payments, given that foreign exchange earnings through exports of goods and services remain low.....One of the central criticisms concerning the new power policy has been the issuance of far too many letters of support for private power projects and the resultant recurring annual foreign exchange cost to cover fixed and variable foreign currency expenses. Such a recurring nature of foreign exchange cost will have serious implications for the country’s balance of payments. The key cash outflows in terms of foreign exchange are debt repayments, dividend payments, and fuel payments. Pakistan is likely to experience a recurring foreign currency liability of \$900 million to close to \$1.0 billion per annum over the next 14 years. If 1292 MW of Hub Power Company is also taken into account, then the recurring foreign currency liability increases to \$1.3-1.4 billion per annum. These estimated balance of payments implications are very close to the ones estimated by Citibank (1996), ABN AMRO Bank (1996) and Naqvi (1996). The amount is significant in view of the country’s present level of foreign exchange reserves of \$1.2-1.3 billion’.¹⁴⁷

By the beginning of the 21st Century, the fiscal burden of the 1994 agreements was openly being spoken about. In its summary of fiscal operation (2001), the finance division had the following to state;

‘The consequences of the large exceptional financing, being notably FCDs and foreign investments in the energy sector, with guaranteed off take and guaranteed price for electricity sales, on the long-term balance of payments situation were apparently not

¹⁴⁶ ‘The perils of high cost imported energy’ (1994)

¹⁴⁷ ‘Foreign Direct Investment in Pakistan: Policy Issues and Operational Implication’ (1999)

carefully considered either by the Government or the World Bank and IMF.... Notwithstanding this, investment income payments (including interest payments) had risen from US\$ 1.3 billion in 1991-92 to US\$ 2.5 billion in 1997-98'.¹⁴⁸

By end fiscal 2010, the liabilities and problems of the power sector in lieu of unbundling had assumed such a massive proportion that even the government acknowledged severe macroeconomic imbalances and risks due to this sector's poor performance and mismanagement-

'Fiscal consolidation crucially hinges upon improvement in the power sector. Pakistan has to rationalize the generation mix for provision of cost effective energy supplies. The government has to eliminate power tariff differential either through financial improvement, cost efficiency and complete pass-through to attract more investment in the sector. The fiscal cost of the power sector may jeopardize the macroeconomic stability in the country; devastate prudent debt management and result in unbearable consequences for economic growth. The power sector has become a thorny issue of economic management and to leap forward we need to resolve this issue as early as possible'.¹⁴⁹

Finally, in taking stock of the Power policies in Pakistan, Dr Afia Malik, a leading scholar on the power sector, had the following to say-

'The 1994 Power Policy resulted in projects which did not meet the "least cost" generation test because of small size, unsuitable location, excessive reliance on oil and steam turbines technology instead of more efficient combined-cycle plants. The same mistake was repeated in the Power Policy 2002. The policy encouraged the exploitation of indigenous resources but attracted plants with the same expensive fuel mix. Similarly, in 2013 and later in 2015, despite severe criticism on the earlier policies, the new policies came up with more or less the same set of incentives for the generators'.¹⁵⁰

The institutional, managerial and intellectual weaknesses within the governing set-up of Pakistan that gave rise to these negative spillovers after unbundling have a heavy imprint on the foreign donor agencies, who were also instrumental in affecting the unbundling of WAPDA. Dr Nadeem Ul Haq, one of Pakistan's leading economist who has also held top level posts in policy making, has been one of the most vociferous opponents of the influence of donors on Pakistan's policy making.¹⁵¹ In a recent co-authored write-up, he opined that Pakistan's entire power sector has been shaped and engineered by external actors (donors), with the domestic policy makers acting merely as silent spectators and

¹⁴⁸ Fiscal Summary (2001), p.24

¹⁴⁹ 'Fiscal Policy Statement, 2009-10' (2010), p.16, Finance Division

¹⁵⁰ 'Power Projects: History, Policy and Politics' (2022), p.11

¹⁵¹ Dr Haque has held the posts of Deputy Chairman Planning Commission, Vice Chancellor Pakistan Institute of Development Economics (PIDE) and other high-level posts in multilateral institutions like the IMF

followers of their advice. The Structural Adjustment Program (SAP) of late 80s/early 1990s came with the push to disintegrate WAPDA (as argued above), the Pakistan Electric Power Company (PEPCO) was created on ADBs advice, NEPRA was created on advice of USAID and WB despite the fact that the regulatory architecture advised by them was alien to Pakistan's ground realities, billions of dollars have been funneled into generation and setting up of new plants who have been collecting vast amounts of capacity payments, millions of dollars have been loaned to distribution and transmission without any improvement. Recently, when the government tried to renegotiate the onerous ToP contracts, these donor agencies were unanimous in opposing any such renegotiation of contracts.¹⁵²

Another instance of their influence (and advice) proving counterintuitive to the country and its consumers is the LNG contracts. The advice to revert to LNG and setting up infrastructure was advised by the USAID, WB, ADB and IFC. And just like the 1994 Power Policy, when IFC arranged funds for setting up IPPs, it was IFC and ADB who provided required finances to set up infrastructure, like \$160 million to set up LNG terminal at Port Qasim.¹⁵³

We similarly observe a very active role throughout the unbundling process. To further facilitate loans for power projects, World Bank facilitated the 'ECO Guarantee program' for loans in 1990 and 1992.¹⁵⁴ The Private Sector Energy Development Fund (PSEDF), set up to facilitate the 1994 Power Policy, serves as another example, established with the help of WB, USAID and other funding agencies to provide up to 40 percent loan finance for setting up power projects at a fixed interest rate of 14 percent per annum.¹⁵⁵

The end result is that Pakistan is now left with another surplus- LNG that is more than the required consumption with in the country, but contracts that need Pakistan to off-take LNG anyways. This has caused \$378 million in losses just on this account, accruing to domestic Exploration and Production (E&P) sector that has been forced to curtail domestic gas production. Not just that, but as a result of gross mismanagement, the FY 24-25 saw domestic hydrocarbon production drop to a 20-year low, resulting in an estimated foreign exchange loss of \$1.2 billion in this fiscal year alone.¹⁵⁶ It would also be pertinent to mention that the two major contracts for LNG supply were signed by the Pakistani government on a 'take-or-pay' basis, creating yet another foreign exchange liability upon itself whose total cost could be as low as \$26 billion or as high as \$40 billion.¹⁵⁷

¹⁵² 'Outsourced Power: how aid agencies engineered Pakistan's energy bureaucracy' (2025)

¹⁵³ 'Outsourced Power: how aid agencies engineered Pakistan's energy bureaucracy' (2025)

¹⁵⁴ 'Financing Hubb Power Project' (1997), p.44

¹⁵⁵ 'POLICY FRAMEWORK AND PACKAGE OF INCENTIVES FOR PRIVATE SECTOR POWER GENERATION PROJECTS IN PAKISTAN' (1994), No. 3 under 'Financing Arrangements'

¹⁵⁶ 'Hydrocarbon production output in FY 25 hits 20-year low'

¹⁵⁷ '\$50bn blunder?'

Another notable feature of gross mismanagement and poor acumen comes in the form of exclusive thrust of investment (foreign and domestic) on generation compared to Transmission or Distribution, mainly because the incentives for generation were so lopsided that it took out any risk-taking on part of investor. The share of private investment in the power generation was estimated to be \$6,536 million up to 2005 and US\$ 12,847 million are in the pipeline for 50 new projects (including wind and solar energy projects) were also under construction at that time.¹⁵⁸ But the other two, Distribution and Transmission, failed to attract any meaningful investment during that time. Distribution companies, for example, had to invest US\$ 200 million per year to improve their distribution network but that quantum of investment never took place.¹⁵⁹ Between 2008 and 2013, of the outstanding amount owed by various sectors to local commercial banks and DFIs, sixty percent belonged to the power sector, increasing from Rs. 95.3 billion in FY 2008 to Rs. 176.2 billion in FY 11-12, all against Power Generation. In the same period, the outstanding amount against Transmission went down from Rs. 33.5 billion to Rs. 21.5 billion, almost all by the public sector rather than private investors. There was no amount outstanding against Distribution, though, again reflecting investor appetite for riskless investment in generation. In the same time period, the cumulative number of projects in power generation increased from 99 to 178, while those in Transmission declined from 28 to 20. There was none in power Distribution! Cumulative Disbursements to Power Generation over the period 2008-12 saw a rise of more than 150 percent.¹⁶⁰

Further, since the inception of the IPP policy, two leading donors (WB and ADB) have financed around 165 power sector projects worth \$15 billion (in loans), mostly concentrated in power generation.¹⁶¹ A good example of donors concentrating upon generation rather than the two traditional areas of concern (transmission and distribution) comes from World Bank's support for NTDC's investment program. In 2004, the government requested that the bank finance some power projects, including a 220 kV grid station at Kassowal for NTDC. ESAs, which the bank required for this grid station, needed to be revised and redrafted many times. In parallel, NTDC obtained funds from local banks for a 500 kV grid station at Sahiwal. By the end of 2008, the 500 kV Sahiwal grid station had been commissioned; by contrast, NTDC had not even initiated tendering for Kassowal project. While one could claim that such rigor applies to all World Bank projects, that a much larger project was completed in the time it took to complete one

¹⁵⁸ The Pakistan Infrastructure Development Report (2007), p.16, *SBP*

¹⁵⁹ The Pakistan Infrastructure Development Report (2007), p.17, *SBP*

¹⁶⁰ 'Infrastructure Finance Review, 2008-12' (2013), *SBP*, p.4, Table-A on p.9 and Table-C on p.11

¹⁶¹ 'The shady economics of international aid' (2025)

donor's procedures for just the appraisal of a project also points to a need for some realism in those procedures.¹⁶²

Last, but not the least, is the poor negotiation skills of Pakistani bureaucracy and leadership in negotiating and managing power generation agreements that have come to saddle Pakistan's financial resources (internal and external) with outsized liabilities. Two aspects/instances (fixed returns and coal fired plants) aptly demonstrate this. An important facet of IPP agreements is the one relating to *fixed returns*, a staggering rate of 17-18 percent have raised many objections over time.¹⁶³ The typical defense from the government's side is based upon Pakistan's high risk profile which, in turn, needs a higher rate of return to convince investors to invest in Pakistan. Yet this argument is dubious, if not outright fallacious, on several counts. A country's risk profile, for example, is amply reflected in the rates at which it can raise finances in the international capital markets (like bond market). At the time when CPEC power projects were being negotiated, with a fixed return of 17-18 percent, Pakistan was raising Eurobonds in international debt markets at 8 percent! How this yawning gap of 10 percent came to be has never been explained by government officials.

Similarly, another astonishing yet unexplained instance occurred in the form of setting up coal fired power plants under CPEC, which not only increased pollution but also increased the machinery import bill. This happened at a time when China itself was discarding coal power. In January 2017, for example, China's National Energy Commission issued a directive that advised cancellation of 103 coal powered energy projects that were planned or were under construction.¹⁶⁴ At the same time, we were encouraging setting up coal-based plants. Illogical decisions like establishment of Sahiwal coal power plant at a place that was hundreds of kilometers away from the port from where its imported coal was to arrive, and without a dedicated railway freight line, amply demonstrate the weak skills at play. But, politics prevailed over common sense, as is usually the case in Pakistan.

From what has been described above, it is quite clear that unbundling was done in a manner that clearly reflects a lack of proper demand and supply analysis, failure to consider multitude of relevant variables that shape power sector's outcomes, and poorly negotiated agreements in a manner that raises genuine queries. With a poor analytical base, it was all but guaranteed that Pakistan's power sector would run into further trouble. Only the policy makers could not fathom this (or deliberately chose to ignore it).

¹⁶² Pakistan's power crisis: The way forward' (2012), p.9

¹⁶³ The IPP agreements have never been made public. They remain a secret till this day

¹⁶⁴ 'CPEC and Potential Opportunities for Industrial Transformation in Pakistan', *SBP Annual Report 2017-18, Special Section 1*, footnote#4

CHAPTER-III

The costs and the
benefits- Comparing
the two systems

Now that the two systems under which Pakistan's electricity sector has been managed have been described in detail, this section undertakes a brief cost-benefit analysis. Few considerations, though, are in the offing. They are as follows-

- a) Although maximum effort has been made to arrive at a quantified comparison, in some cases we had to rely upon qualitative comparisons (backed by documented evidence) due to the paucity of data and related information.
- b) Existing claims from various quarters were scrutinized and the exaggerated ones were discarded. For example, a report on Tarbela dam claimed that by 2024, at the 50-year anniversary of commencement of operations at the Tarbela dam, it had released 406 million acre-feet (MAF) of stored water for agriculture and produced 590,361 million units of cheap electricity, whose financial and economic benefits of came to \$406 billion (if 1 MAF of water is valued at \$1 billion, against a total cost of \$4,512 million till date).¹⁶⁵ The calculation seems exaggerated since Pakistan's economy is estimate to be hardly \$425 billion, and that estimation is also not without controversy. Also, no rationale or basis of calculation is provided for the claim of economic and financial benefits of 1 MAF of water equaling \$1 billion.

Several comparative studies have been done over time in terms of costs and benefits of the two systems, wither analyzing the two periods distinctly or in comparison to each other. However, we do feel that despite some very good work done in terms of analyzing the performance of WAPDA and the post-unbundling power system, there are certain areas which needed a deeper exposition in order to gain a proper insight vis a vis comparison of the pre-unbundling and post-unbundling scenario, specifically the context, and then arrive at a conclusion regarding the performance of the two systems. For example, Ghafoor (1998) opined that the 'full cost' incurred in terms of electricity supply was not reflected in WAPDA's financial statements given grants, low interest loans and government subsidies that it received. Yet, the same were available to all the entities in post-unbundling scenario which puts them at par in terms of comparison.¹⁶⁶

A brief review of the studies is given below-

Malik, Mehmood and Ahmad (2007) compared the two systems, and opined that despite the strategic restructuring plan for fourteen years, there was weak implementation and no noticeable improvement in the issues plaguing the power sector. In fact, they contended that the technical, economic and financial viability of the sector had deteriorated. They advocate making use of indigenous resources and having emphasis on governance improvement. Pasha, Gellerson and Ghaus (1988), USAID (1988) and Ali

¹⁶⁵ 'Iconic Tarbela Dam turns 50 this year', *Business Recorder*, 13th September 2024 and 'Tarbela Dam's economic benefits stand at \$411 billion', *WAPDA*, 18th February 2025

¹⁶⁶ This includes both the public and the private sector, which has benefited immensely from the largesse of International Financial Institutions (IFIs) in terms of easy access to loans, guarantees given by Govt. of Pakistan and generous fixed returns in their agreements, the last two elements not available to WAPDA in the pre-unbundling period

(1990) estimated the economic and financial losses due to persistent load-shedding under WAPDA despite impressive growth in available generation capacity over the decades. Pasha's study concluded nine percent loss in industrial output, Ali put the loss equivalent to \$1 billion per annum, while the USAID study put the loss at nearly two percent of GDP. Ghafoor and Weiss (1988) analyzed the financial performance of WAPDA and KESC, concluding that had factors like subsidies and low-cost loans been factored in, WAPDA's good financial performance would have looked much less impressive than it appeared. This help, they concluded, was what enabled WAPDA to set tariffs below the long-run marginal costs of the industry, and were also low in comparison to tariffs in the regional context.

Ghafoor (1998) compared performance of WAPDA and KESC in terms of Total Factor Productivity (TFP) and average labor productivity. He found that although the labor productivity was low in both of them compared to what it was in the region, the TFP of WAPDA was much better than KESC. Additionally, he probed the economies of scale of both the thermal and hydel plants, and found that hydel and steam based power plants had higher economies of scale compared to combined cycle and gas turbines.

Munir and Naqvi (2018) investigated the privatization of 1990s, including that of the power sector, and concluded that privatization failed not only with respect to their stated aims, leading to a decline in national productive capabilities, but also had adverse distributional consequences, shifting the rewards to the buyers while the risks and costs remained with the public sector. They further contended that the suboptimal outcomes of the privatizations went largely unchallenged aided by a prevalent neoliberal view amongst the country's economic policy makers and intelligentsia.¹⁶⁷ Their study, however, did not peer deeply into the available evidence and numbers for a large-scale, deeper cost-benefit analysis, and some of their arguments and numbers are not in consonance with historic facts.¹⁶⁸

The power sector is facing a host of challenges in the generation, transmission, distribution and supply segments which need to be addressed through a comprehensive strategy focusing on the efficient management of primary fuel supplies, the integration of affordable, clean, and green electricity sources, and the promotion of competition to bolster energy independence and enhance efficiency across all segments of the sector.

¹⁶⁷ 'Privatization in the land of believers: the political economy of privatization in Pakistan' (2018), London School of Economics (LSE)

¹⁶⁸ For example, on p.10 of their study, they state that 'Since the cost of production and demand were low, so inevitably were the subsidies in absolute terms'. The statement that demand was low is false; in fact, demand had been galloping ahead of supply since long. Mubashar Hassan, finance minister in Bhutto's cabinet, mentioned a demand-supply gap of 300 MW in 1972 in his book 'Mirage of Power', a situation that persisted even in the 1980s. in FY 1984-85, WAPDA's Chairman admitted that it was the worst year in WAPDA's history in terms of load shedding and the supply between demand and history (source: WAPDA Year Book 1984-85). Also, their contention that neoliberal inspired 'sea change that came about in Pakistan the late 1980s and early 1990s' is also debatable since, as we have shown in this paper, the voices advocating WAPDA's bifurcation rose in early 1970s, within Govt's own quarters

Briefly put, the studies done so far upon the comparative costs and benefits has touched upon only selective aspects of the debate, or are shorn of extensive analysis of both systems and detailed data for this purpose. This study aims to fill this gap.

Before proceeding ahead with a brief cost-benefit analysis, it would be helpful to keep in mind why unbundling was initiated in the first place? The following were some of the major goals of WAPDA unbundling-

- Attracting private sector investment without using sovereign guarantees.
- Improving sector efficiency through competition, accountability, managerial autonomy and profit incentives.
- Rationalizing electricity prices and social subsidies in order to eliminate inefficiencies, while maintaining socially important policies such as rural electrification and low-income “lifeline” rates.
- Enhance Capital Formation within the sector outside the GOP budget and without Sovereign Guarantees;
- Improve the efficiency of the sector through competition, accountability, managerial autonomy, and profit incentives; and
- Rationalize prices and social subsidies, while maintaining certain socially desirable policies, such as rural electrification and low income “lifeline” rates.

With these in mind, we now proceed with the analysis.

Contribution to Economic Growth and Capital Formation We start with the benefits that accrued to the economy and economic activity in the pre-unbundling, WAPDA era. Quantification of benefits in this regard is not easy given lack of data (or quality of data), policy spillovers (fiscal multipliers of PSDP, for example) and indirect benefits (like subsidies). For example, Gellerson (1982) estimated that the rural area electrification did have positive Economic Internal Rate of Return (EIRR), but he did not arrive at a quantified estimate of benefits.¹⁶⁹ Similarly, the authors of the WB report on Tarbela Dam acknowledged that;

‘Unfortunately, the method of relating Tarbela's impact to the easily identified water releases from, and power generated at, Tarbela is not necessarily as straightforward as it might appear, particularly in the case of agricultural impact, because of physical externalities and the integration of Tarbela operations with those of other Indus Basin water storage and diversion operations..... The same difficulty affects also the gauging of impact sustainability, as it is possible that the above-mentioned benefits are not consistent with groundwater aquifer equilibrium’.¹⁷⁰

Their estimates suggested an Economic Rate of Return (ERR) around 13 percent. Moreover, between 1976 and 1983, the average quantity of water released annually for irrigation was 9.01 MAF, resulting in gross value of agricultural production of Rs 1.732

¹⁶⁹ ‘The Economics of Rural Electrification Projects: Theory and Case Study of Pakistan’ (1982)

¹⁷⁰ PROJECT COMPLETION REPORT PAKISTAN TARBELA DAM PROJECT (1986), WB, #21, p.6

billion per annum. In the same time, the average quantity of power generated annually was valued at Rs 6.9 billion at border prices).¹⁷¹

What follows is a brief attempt at estimating some of the benefits, quantified and otherwise.

Two major avenues of affecting economic growth came via contribution to agriculture and industrial growth. Agriculture holds a critical importance in Pakistan's economy. Although its contribution has dropped to around 22 percent of GDP at the present, it was much higher in the decades of 1960s to 1990s. Major portion of Pakistan's labor force is directly or indirectly related to this sector, and FAO estimates that around 70 percent of Pakistan's exports are directly or indirectly dependent upon agriculture. Since the main context of WAPDAs inception was the Indus Water Treaty (IWT) and its resulting requirements, WAPDA built an impressive array of water related infrastructure that not only produced cheap electricity but also stored much needed water, which enabled not only the availability of water throughout the year, but also led to substantial increase in cultivable area and more intensive cultivation, all of these helping Pakistan overcome its debilitating food shortages that were rampant in the early years of Pakistan's founding.

Table- Major WAPDA completed projects (1959-1993)					
Project Name	Year of completion	Work nature	Cost (Rs. million)	Acres of Irrigation (in thousands)	Provision of drinking water (millions of gallons)
Chablat Kas Lift Irrigation	1961	Non-IBS	0.4	1,400	
Rawal Dam	1962	Non-IBS	21		20
Guddu Barrage	1962	Non-IBS	475	2,900,000	
Tanda Dam	1965	Non-IBS	67	3,200	
Hub Dam	1983	Non-IBS	1023	22,000	104
Khanpur Dam	1984	Non-IBS	1,385	36,470	131
Tarbela Dam	1975	IBS	18,500		
Mangla Dam	1967	IBS	15,587		
Link Canals (8)	1965-1970	IBS			
Re-modelled Link Canals (3)	1965-1970	IBS			
Barrages/Syphon	1964-1971	IBS			

The completion of above mentioned projects brought huge tracts of land under cultivation, increasing food production and thus averting food shortages. An important aspect of these programs was WAPDAs 50 SCARPS programs from 1960 to 1990, rehabilitating 15 million waterlogged and saline acres at a total cost of Rs. 19 billion. The importance of this can be gauged by a WB report issued at the beginning of Indus Basin

¹⁷¹ PROJECT COMPLETION REPORT PAKISTAN TARBELA DAM PROJECT (1986), WB, #20, p.5

Settlement Plan (IBS), in 1960, that termed waterlogging and salinity as a 'serious menace in Pakistan'. Opining that increase in irrigation had raised the water table across many parts of the country, resulting in several millions of acres being water logged, millions of acres becoming severely saline and unfit for cultivation because there was no or little drainage, and that there was danger of further tens or thousands of additional acres becoming uncultivable. Therefore, this land needed reclamation and protection so that it could be sued for cultivation.¹⁷²

The end result of all this effort was the tremendous gains in not only the cropped area by 7.77 million hectares, but also the intensity of cultivation from hardly 2 to almost 6 by FY 92-93, as shown in the following table.¹⁷³

Table- Total, cultivated, sown and cropped area (millions of hectares)				
FY	Total Area	Cultivated Area	Area sown more than once	Total cropped area
1959-60	79.61	16.51	1.61	14.67
1992-93	79.61	21.4	5.99	22.44

How much did WAPDA contribute to Pakistan's agricultural and economic growth? Opinions differ on this matter, with no reliable quantified estimate of benefits.¹⁷⁴ A relatively recent estimate comes from Jinnah and Khan (2016), who estimated effects of various factors on agricultural GDP (AGDP) between 1970 and 2009.¹⁷⁵ They concluded that

'Total cropped area, irrigation water, improved seed distribution and import of pesticides have significant effects on the growth of AGDP. The long-run relationship between the Agricultural GDP and the total cropped area (million hectares) was positive for the Pakistani economy. The short run elasticity of the total cropped area with respect to AGDP was 0.47 and long run elasticity was 2.13. Thus, 1% increase in the total cropped area on average could enhance AGDP by 0.47% in the short run and 2.13% in the long run. Irrigation water has very critical position in farm production; 1% increase in availability of water on average boosted the AGDP by 0.93% in the long run while it fostered AGDP by 0.64% in the short run'.

Of the factors mentioned above, expansion of cropped area and availability of irrigation water are arguably the most important in terms of agriculture because these, in turn, create the demand for seeds and pesticide. For the sake of argument, though, we will assume that their contribution was half to the increase in agricultural GDP between FY 58-59 and FY 92-93. That would imply an increase of Rs. 167 billion to AGDP till

¹⁷² 'Indus Water Settlement Plan' (1960), Report No. T.O. 241, #5, p.1

¹⁷³ Agricultural stats taken from Pakistan Bureau of Statistics (PBS)

¹⁷⁴ WAPDA does provide quantified estimates of benefits from Mangla and Tarbela dams. However, as pointed out in the section above regarding difficulties encountered during research, the estimates lack explanation of methodology and are only centered on Mangla and Tarbela

¹⁷⁵ 'Evaluation of key factors responsible for agricultural growth and development in Pakistan' (2016)

unbundling of WAPDA, which in today's money is equivalent to Rs, 2,905 billion (approximately Rs. 3 trillion).¹⁷⁶

If one were to merely keep the rehabilitated 15 million acres (or 7 million hectares into perspective) in context and its total cost (Rs. 19 billion), then simply going by the cost-benefit ratios calculated earlier (presented in the WAPDA section above), the total accrued benefits till unbundling stand at Rs. 40 billion, at least. This amount was equivalent to 3.26 percent of GDP at that time (Rs. 1,225 billion approximately, or \$49 billion), which is a good reflection of the advantages accrued due to reclaiming land and ensuing cultivation.¹⁷⁷

Wheat sowed, produced and yield (1958-1993)			
FY	Sowed (000' hectares)	Production (000' tonnes)	Yield Per Hectare (kg)
1959-60	4,829	3,907	809
1992-93	8,034	16,156	1,947

Critically important in this regard was the significant increase in wheat production, the major staple diet. As opined by Ahmad and

Chaudhry (1987), who analyzed wheat production between 1949 and 1987,

‘What are the sources for such large additional production? A review of past production trends shows that so far, the most important source of incremental production has been expansion in acreage’.¹⁷⁸

Production on the expanded cultivable land, of course, could not have come about without the availability of water all year around. Also critically important to note in the table above is the figure of ‘area sown more than once’, which rose to almost 6 compared to hardly 2 at the time of WAPDAs founding. In terms of total cropped area, there was an increase by 7.77 million hectares (about 17.5 million acres), while production of wheat increased by 314 percent between 1958 and 1993, helping stave off the specter of food crisis.

Were it not for increase in acreage cropped, all the produced food staples would have needed to be imported, costing Pakistan a fortune in terms of foreign exchange that has always been Pakistan economy's Achilles heel. Therefore, an important aspect of advantages accrued due to water availability as well as land reclamation via WAPDAs operations was the accrued savings in foreign exchange due to home-grown crops.

How much were the estimated savings in foreign exchange? Between FY 59-60 and FY 92-93, wheat cultivation area increased by an estimated 3.79 million hectares, easily falling within the reclaimed land for cultivation under SCARPS (approximately 6.5

¹⁷⁶ The monetary shares of agriculture in GDP stood at Rs. 12 billion in FY 58-59 and Rs. 345 billion in FY 92-93

¹⁷⁷ The point here is that there was a positive contribution! Otherwise, it is unrealistic to think that the cost to benefit ratio remained the same throughout 1960s (when the estimates were made) to the time of unbundling

¹⁷⁸ ‘Profitability of Pakistan's Agriculture’ (1987)

million hectares).¹⁷⁹ Taking into account the 35 kg per year increase in yield per hectare between FY 58-59 and FY 92-93, it implies that between the mentioned years, the increase in wheat production was equivalent to 133 million kg's (35*3.79). Converting this amount to bushels for comparative purposes, it comes to 4,429,246 bushels. If the international per bushel price for the period under consideration is taken into account (average increase by \$2.10), that implies savings of approximately \$10 billion.¹⁸⁰ If adjusted for inflation since 1959 in dollar terms, thereby applying an adjustment by 5 times, it implies savings of approximately \$50 billion in FY 92-93 terms.¹⁸¹

Table- GDP Sectoral Share		
FY	Agriculture	Industry
1958-59	40	14
1969-70	38	24
1979-80	30	22
1989-90	26	24

At the same time, within these decades, WAPDAs operations (especially those related to its Power Wing) were also critical in helping a profound transformation from agriculture to industry reflected in the accompanying table which shows respective sectoral share of GDP over time.

Historically, the role of industrialization in a country's economic development is well-established, and WAPDAs role in this critical sectoral transformation is evident from the high share of industry (40 percent on average) in total electricity consumption till unbundling. Not only did it help industry grow by making a critical input available at cheap cost, but also helped WAPDA realize significant revenue from a source that helped cover its fixed and variable cost.¹⁸² In contrast, post-unbundling, the average has stopped to 27 percent (and dropping further), as the stupendous rise in electricity tariffs made it unfeasible for many industries to continue, result in either a shift from main grid or closing shop altogether, leading to de-industrialization (as being witnessed in the last many years).

Another under-appreciated advantage of WAPDAs operations, which benefited the economy via the consumption side, came through consumer savings due to low-cost electricity production. As discussed above in the WAPDA section, the pre-unbundling priority was to produce electricity from the lowest-cost input (i.e., hydro and natural gas) and avoid the expensive, imported alternatives, thereby not only perpetuating savings for domestic consumers but also in the form of saving precious foreign exchange. A snapshot of how much savings accrued to consumers due to production from hydroelectricity is given the following table, which estimates the expenses in case the electricity produced from hydro were to be produced from other, more expensive options.¹⁸³

¹⁷⁹ In FY 59-60, the cultivated area of wheat was approximately 4 million hectares while in FY 92-93 it stood at 7.79 million hectares. Source: PBS and Planning Commission Annual Plans

¹⁸⁰ Source- International wheat prices per bushel, *Macro Trends*.

¹⁸¹ Inflation adjusted value of dollar taken from

<https://www.in2013dollars.com/us/inflation/1959?endYear=1993&amount=1000000>

¹⁸² The receivables, or defaulters, were almost always from the consumer and the agricultural sector

¹⁸³ One immediate objection to this calculation would be that it was not possible to have hydro sources around the year, especially in winter months. This is true, but one has to consider that the main issue was not having enough

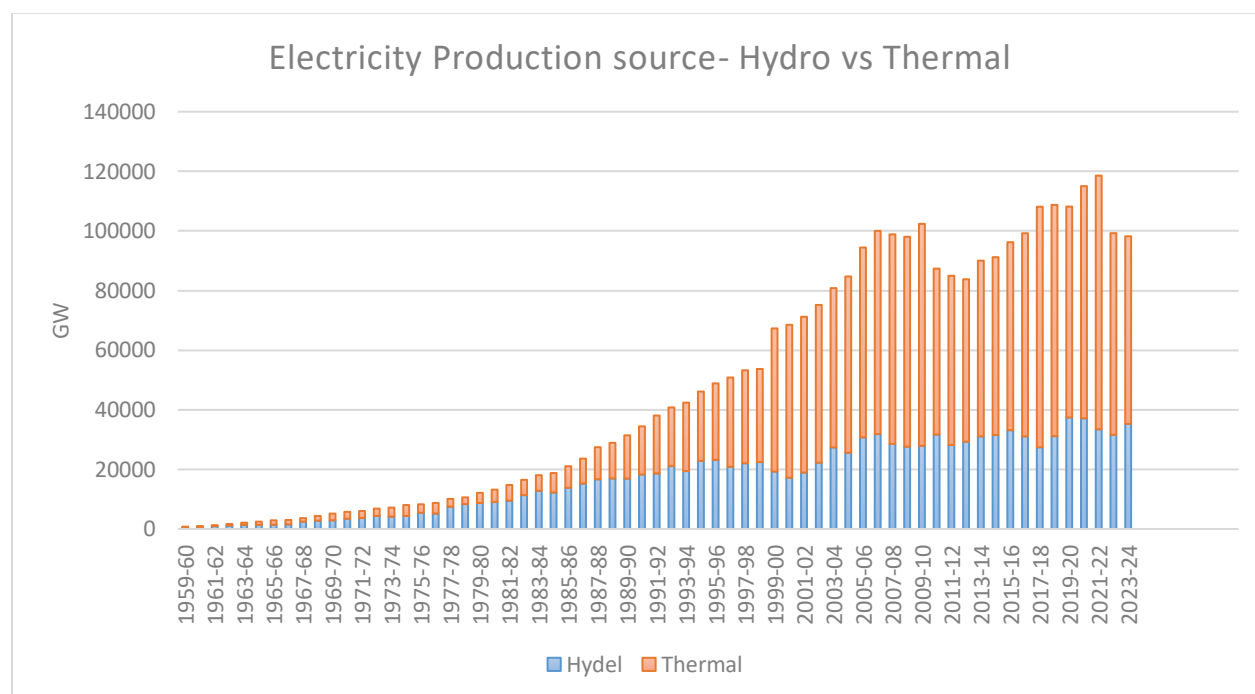
Production by source (in GW), and their cost difference(in paisa)								
Year	Hydro	Per unit cost (paisa)	Total cost (Rs million)	Thermal	Per unit cost (paisa)	Total cost (Rs million)	Total cost if thermal units produced at Hydro cost (Rs million)	Difference (Rs. million)
1970-71	3,449	0.09	310	2,291	0.7	1,604	206	1,398
1978-79	8,353	0.1	835	2,256	0.36	812	226	587
1981-82	9,526	0.3	2,858	5,242	1.16	6,081	1,573	4,508
1991-92	18,647	0.4	7,459	19,419	0.8	15,535	7,768	7,768
1992-93	21,111	0.7	14,778	19,680	1.2	23,616	13,776	9,840
1993-94	19,436	0.8	15,549	22,960	1.36	31,226	18,368	12,858
1999-00	19,288	0.27	5,208	48,021	1.8	86,438	12,966	73,472
2000-01	17,196	0.33	5,675	51,308	3.59	184,196	16,932	167,264
2001-02	18,941	0.36	6,819	52,257	3.59	187,603	18,813	168,790
2002-03	22,253	0.94	20,918	52,920	4.15	219,618	49,745	169,873
2003-04	27,372	0.97	26,551	53,450	3.8	203,110	51,847	151,264
2004-05	25,588	0.80	20,470	59,147	4.29	253,741	47,318	206,423
2005-06	30,751	0.86	26,446	63,700	5.33	339,521	54,782	284,739
2006-07	31,846	0.84	26,751	68,189	6.17	420,726	57,279	363,447
2007-08	28,536	0.87	24,826	70,336	6.17	433,973	61,192	372,781
2008-09	27,636	1.52	42,007	70,405	6.17	434,399	107,016	327,383
2009-10	27,927	1.08	30,161	74,456	6.17	459,394	80,412	378,981
2023-24	35,268	6.22	219,367	62,947	26	1,636,622	391,530	1,245,092

Before the IPP electricity entered the system, electricity produced under WAPDA (using mostly hydro power) saved the consumer an estimated Rs. 37 billion in just six fiscal years (for which data was available), implying a saving of Rs. 4.5 trillion in today's inflation adjusted money terms. Post-unbundling, as the IPP produced electricity through expensive fuels entered the system, consumers could have saved approximately Rs. 4 trillion (in 12 fiscal years for which data was available) if the same electricity had been produced using hydro sources. However, the entrance of IPPs have meant production

storage structures for water for producing maximum electricity throughout the year. In other words, theoretically it was possible to have highest amount of electricity produced through hydro sources throughout the year.

Besides, the estimation in table merely sends across the message that production through hydro was the cheapest and resulted in substantial savings over the years. Also, WAPDA did use thermal sources, but only when water availability was slow and these were mostly combined cycle plants that used domestic natural gas.

from expensive, imported fuels (as depicted in the graph below), which has been a significant factor in the steep rise in electricity tariffs.¹⁸⁴



Aside from the above, its operations had resulted in significant afforestation around the country, which has its own quantified and environmental benefits. Till FY 92, for example, a total of 297,416 acres of land had been afforested through Mangla and Tarbela dams.¹⁸⁵ Moreover, provision of water for agriculture brought millions of rupees in revenue for the provincial governments in the form of menial charge for water (*Abiana*).

WAPDA achieved all this while maintaining Net Operating Profit, having minimum liabilities that were mostly covered from its own financial resources, and did not require any significant public sector support for its survival. The accrued benefits easily outweighed the costs, like those of two mega dams, Tarbela and Mangla, which hardly cost a maximum of Rs. 32 billion for completion, but whose advantages are still accruing to the economy since the 1960s. All the while, it fulfilled the equity criterion too by managing to expand the grid to far flung areas of the country.

In contrast, if one goes by the criterion stated above, the post-unbundling IPP era appears as a far cry compared to WAPDA's contributions. First of all, the issues related to agriculture (and thus agricultural contribution to GDP) are not in its functions. Second, unlike WAPDA that gained both industrial, commercial and household consumers, the IPP led system has seen losses on all these counts, thus belittling its contributions to WAPDA and becoming persistently dependent upon public handouts without which it

¹⁸⁴ It is to be noted that WAPDA still produces the bulk of hydroelectricity

¹⁸⁵ WAPDA Year Book 1991-92

would not survive (discussed in the following sections). The industrial consumption of electricity has averaged 27 percent since IPP era, the pace of growth in consumers has averaged a dismal 5 percent (compared to 17 percent in WAPDA era), and given one of the highest electricity tariffs in the region and the globe, millions of consumers have shifted to alternate supply sources (specifically solar), thus putting the grid's financial security in a perilous condition.

In short, the IPP system's contribution to economic growth is nowhere near WAPDA led system. On this count, **the system under WAPDA comes out as way superior to IPP system.**

Debt, fiscal strain and accrued liabilities What does the comparison tell us in terms of accrued debt and liabilities in both systems? As mentioned before, it was not possible for Pakistan to carry out huge infrastructure works like major dams, for which it had to turn to donors for financial capital and technical assistance. Resultantly, WAPDAs major projects like Mangla and Tarbela Dam plus cost of their resettlement, Link Canals, Barrages, SCARPS were built with substantial foreign financing under the Indus Basin Development Fund (IBDF) Agreement of 1964.

By 1972-73, the total foreign funding (including the later supplementary financing agreement) came to \$946 million. However, of this amount, 73 percent was in the form of grants while only 27 percent were loans (of long repayment periods), implying a lower debt pressure.¹⁸⁶ This was pretty much the state of affairs by the time WAPDAs unbundling was decided, i.e., by FY 1992-93. The long-term foreign debt in these years was 48.71 and 54.61 percent of total WAPDA loans, which, as described in the WAPDA section above, was mainly being met by WAPDAs own resources rather than being a burden upon the federal government or foreign reserves. WAPDAs foreign loans over the years, as percentage of its total loans, are given in the following table-

Table- Foreign loans as % of total WAPDA loans	
Year	percentage
1963-64	35
1971-72	30
1972-73	27
1974-75	23
1975-76	34
1979-80	9
1980-81	8
1990-91	48
1991-92	55

Moreover, in all these years, there was little in terms of guaranteed loans that would burden Pakistan's domestic or external financial resources (mainly because they were to

¹⁸⁶ WAPDA Annual Report 1972-73, p. 2

paid through WAPDAs financial resources). The following table, for example, gives the amount of guaranteed loans in FY 1972-73-

Table- Guaranteed Loans (1972-73)	
Project name	(Rs. Lakhs)
Tubewell Electrification (DLF. 25)	36.11
W. P. High Tension Grid (DLF-29)	54.38
ST. and D. System (DLF-79)	99.57
Quetta Thermal Station (DLF-177)	53.35
S.A.R. and Replacement (Itl. Cr)	61.62
Additional Mobile (Itl. Cr)	63.48
Mangla Unit IV (Itl. Cr	1.73
Kotri Power Station (French Cr)	33.48
NGPS (Multan) (German Cr)	96.58
Electrification for SCARPS (Yugoslav Credit)	18.19
Two Additional Gas Turbine (Railmounted sets (Itl. Cr.)	14.9
	533.39

Additionally, there was little or nothing in terms of dollar repatriation of investment in the power sector. The only 'repatriation' was the normal payments on loans (principal and interest) and there is nothing to suggest that electricity related operations burdened the foreign reserves of Pakistan.

On the domestic financial resource front, as stated before, WAPDAs Net Operating Profit remained positive throughout, which meant that it did not need any significant support from the federal government for its operations. In FY 1990-91 and 1991-92, for example, the Net Operating Profit, stood at Rs. 7.4 million and Rs. 8.05 million respectively. Even when the federal government announced discontinuation of development outlays for WAPDA, its bonds sold well enough to fill that gap. The total interest payment on debt as percentage of total profit from electricity sales was 23 and 20 percent, respectively, which did not denote a significant amount.

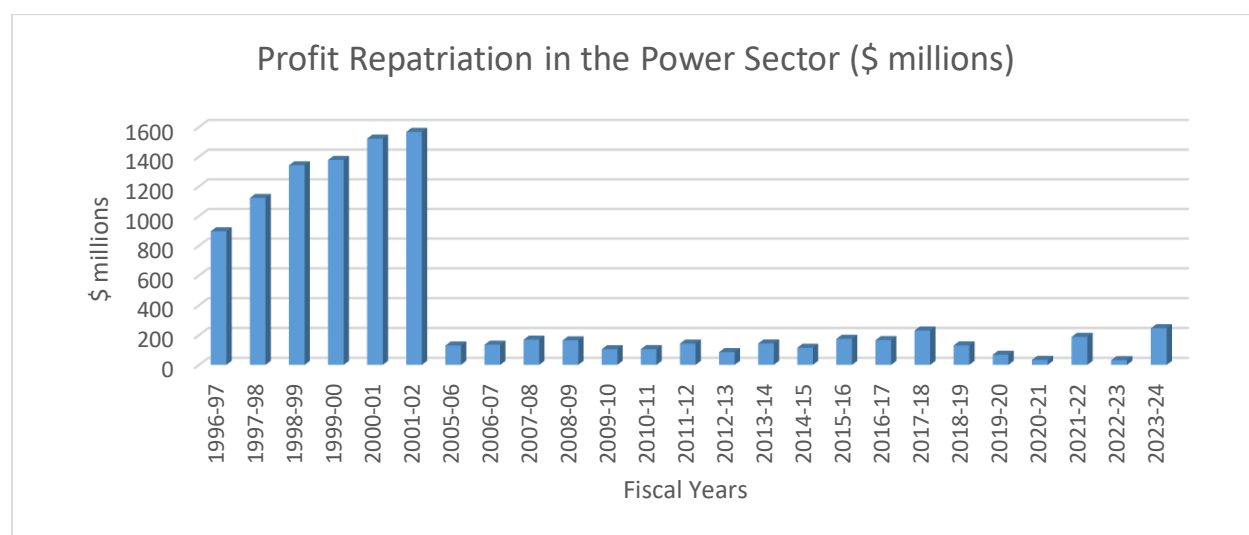
We now come to the aftermath of unbundling. In terms of external burden, Pakistan has experienced significant external debt and payment burden post-IPP. For a start, the careful reliance upon domestic energy sources for electricity production was replaced by reliance upon imported fuel, a policy that still continues. This was complemented by import of power machinery. The exact quantum of imported fuel that was used for electricity production is not known, but various reports suggest that the amount is significant when viewed in context of our external payment difficulties. Some of these are as follows-

- a) Machinery for IPPs costing over \$3 billion precipitated a foreign exchange crisis in 1996-97.¹⁸⁷

¹⁸⁷ 'The case of IPPs' (2015)

- b) In FY96 and FY97 the contracts with the IPPs pushed up the power generating machinery imports and thereby the current account deficit.¹⁸⁸ In FY 06-07 and 07-08, the import of electricity generating machinery consumed almost \$2 billion dollars in imports.¹⁸⁹
- c) A leading source of energy imports is LNG, which accounted for \$ 745.9 million in our import bill from July to April FY 22-23. Over 60 percent of this was used in power plants with long-term agreements and capacity payments. Likewise, Pakistan spent \$1.2 billion on coal imports between July and December 2022, with half of this amount used in power plants.¹⁹⁰
- d) Renowned investigative reporter, Sanaullah Khan, while appearing in a program, revealed that for the IPPs established after 2015, a total of \$20 billion of LNG and imported coal have been imported.¹⁹¹

The other major impact in terms of external payments comes in the form of profit repatriation for the investments in power sector, which was never an issue under WAPDA. Since FY 96-97, the total profit repatriation has been \$10 billion, 393 million, by no means a meagre amount.¹⁹²



Turning to domestic fiscal resources, as explained in the post-WAPDA (unbundling) section, the power sector has had such a severe negative fiscal impact upon government's financial resources that it almost bankrupted the treasury. Two measures, Capacity Payments (which did not exist in WAPDA's time) and fiscal subsidies (which were

¹⁸⁸ *SBP Annual Report 2007-08*, Ch.7, p.119 and p.122

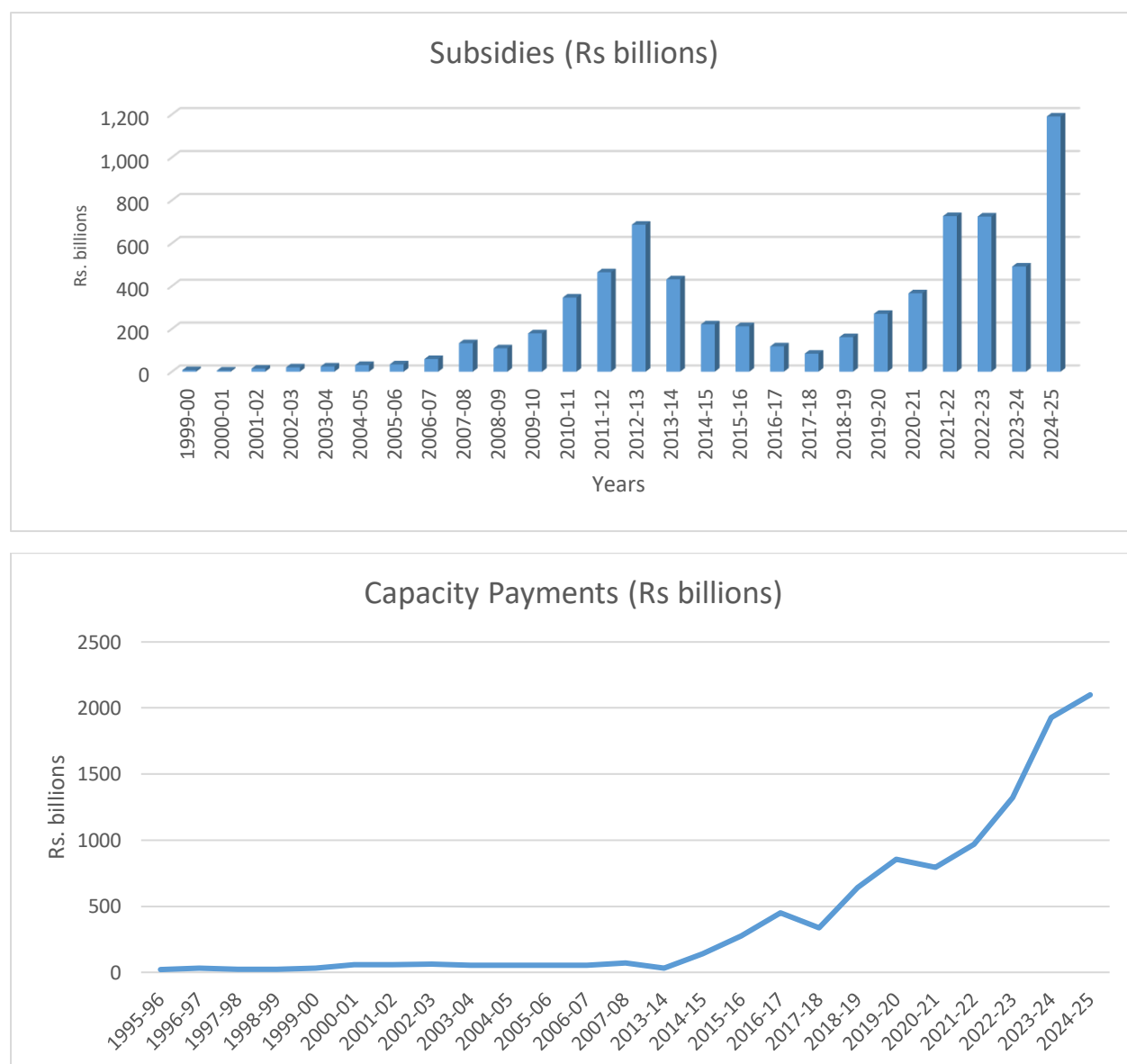
¹⁸⁹ *SBP Annual Report 2007-08*, Ch.7, Table 7.25, p.152

¹⁹⁰ Source: Afia Malik

¹⁹¹ Appearance on DAWN TV on 29th July 2024

¹⁹² Source. *SBP*. The data for three fiscal years (02-03, 03-04 and 04-05) was not available. It also critical to keep in mind that profit repatriation would have been much higher were it not for State Banks' stringent regulations on taking out dollars, something the foreign investors frequently complain about

meagre under WAPDA) clearly illustrate this outsized burden, **totaling a mammoth Rs. 17 trillion, 545 billion** since FY 1995-96. Both of these are illustrated in the following graphs-

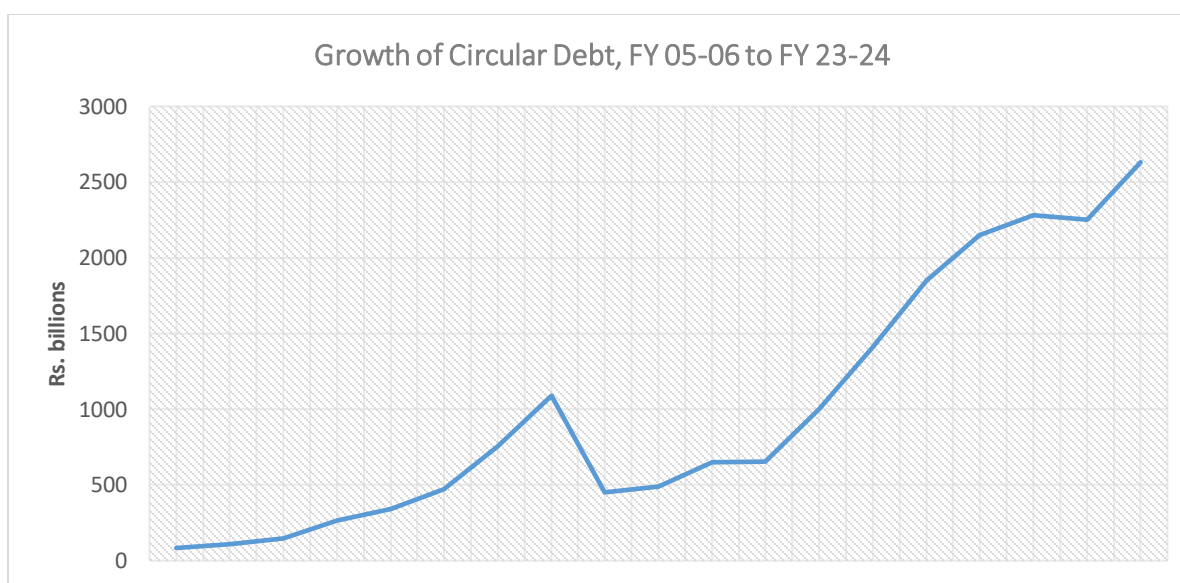


The mammoth expense of Rs. 17 trillion, 545 billion financed by taxpayer money, carries with itself an *opportunity cost*. Here, if we take SBP set interbank rate as the benchmark for opportunity cost of this expense, then the total comes to **Rs. 2 trillion, 458 billion**.

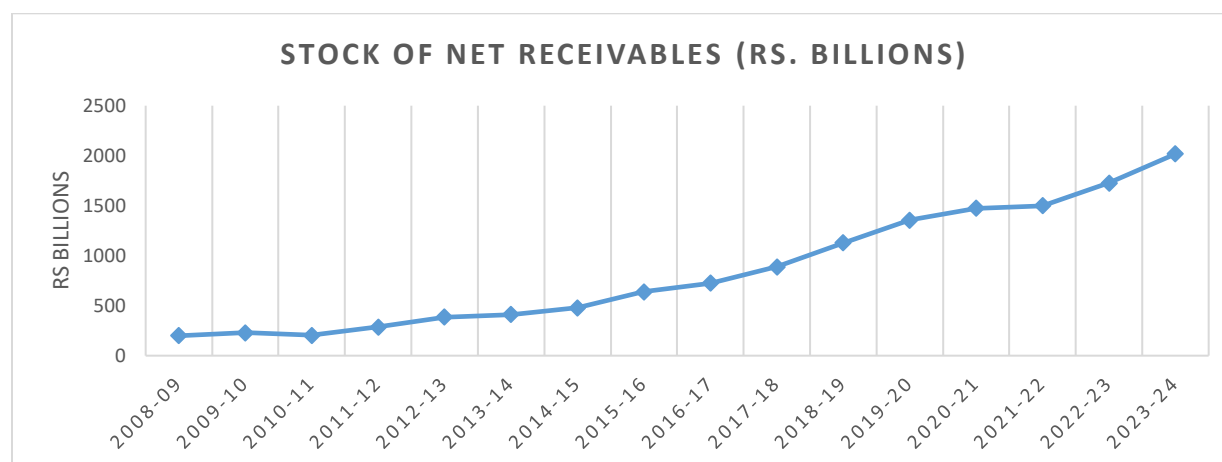
There extractive nature of these tax-payer financed payments is another aspect of this, like the adverse 'take-or-pay' commitments (non-existent under WAPDA) that obligate customers to pay even though they may not use electricity at all. In FY 2023-24, consumers ended up paying approximately Rs. 2 trillion on account of these capacity payments, for electricity that was never produced nor consumed. Further, to gauge the exploitative and

crass nature of this system, almost Rs. 760 billion of these payments went to government owned IPPs (Nuclear and Thermal).

Perhaps there is no better reflection of the poor governance of this system than the phenomenon of 'Circular Debt' (CD) which at its heart is a governance failure issue. Since FY 2005-06, CD has devoured more than Rs. 2 trillion from the national exchequer (meaning from the electricity consumers) and despite this, its stock still stands at Rs. 2.3 trillion at the present.¹⁹³

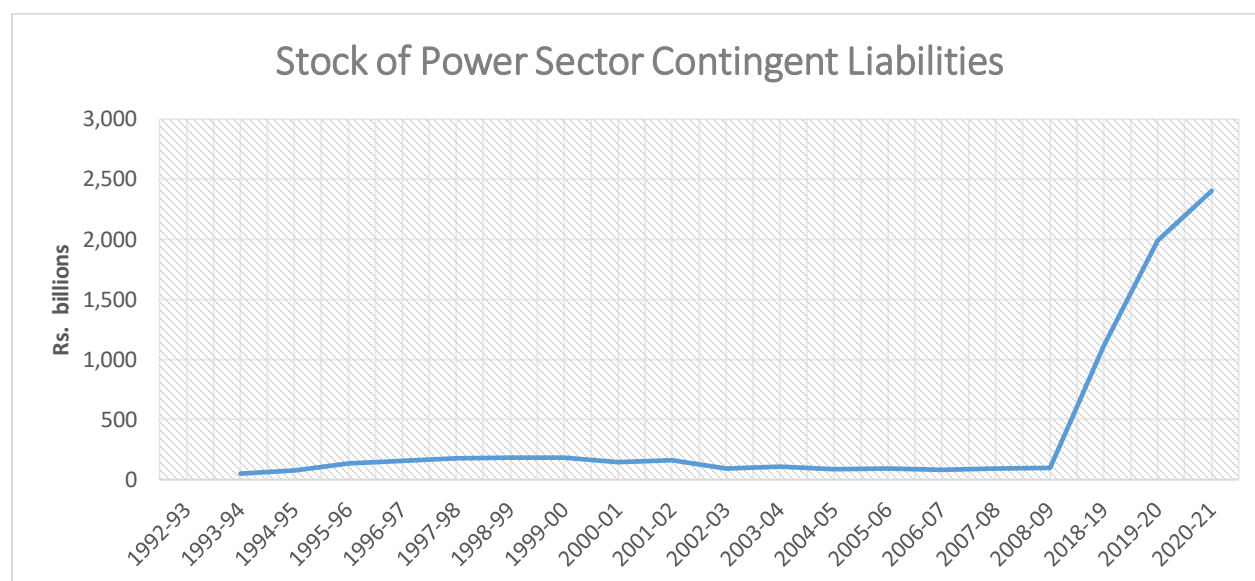


Another major liability that plagues the system is the sizeable amount of electricity receivables ('net receivables'), which had crossed Rs. 2 trillion/- as of end FY 23-24, a stark indictment of the inefficiency of the system that was unbundled with the aim of ameliorating these very kinds of inefficiencies. The uncollected amounts, in turn, feed into CD, keeping its stock high. The growth of net receivables of DISCOs is presented in the following graph-



¹⁹³ Source: Finance Division, Govt. of Pakistan

The above does not include the ‘contingent liabilities’ (unfunded, non-budgeted liabilities) like pension of the twenty four entities that are now working under the MoE. These liabilities started accruing soon after the unbundling and IPP 1994 Policy, reaching a staggering 37 percent of total federal government liabilities in FY 1998-99 (coming down gradually only after government forced IPPs into renegotiating their terms). But they’ve continued their upward trajectory since FY 08-09, as reflected in the graph below, now in trillions of rupees.



The billions in liabilities accruing per year due to Part-Load Adjustment Cost (PLAC) and Non-Project Missed Volume (NPMV), etc., are besides the liabilities mentioned above, not to mention the foreign exchange liabilities whose data is not available.

The fiscal burden upon the national exchequer is demonstrated well by the fiscal burden that the publically operated DISCOs impose, collectively bleeding Rs. 2.3 trillion in the last decade alone due to poor recovery, theft, inefficiency and mismanagement.

It is not just the government guaranteed liabilities that are a burden upon the foreign exchange reserves, but also the private loans since they carry a SBP convertibility guarantee, meaning that any additional payments arising out of depreciation of rupee against dollar will have to be paid through the gross forex reserves in the banking system. for example, in FY 2002-03, in terms of the ‘Outstanding Stock of Private Loan and Credits’, the Outstanding Stock of power sector loans was \$499 million (at 3-12 percent interest).¹⁹⁴

Again, the sheer amount of all these serve to act as a huge drag upon fiscal resources, and demonstrates that **WAPDA was the better system in this regard.**

¹⁹⁴ SBP Annual Report 2002-03, CH on Domestic and External Debt, p.136, Table 8.9

Aside from the above, in the unbundling era, a self-financing WAPDA gave way to a totally dependent system under MoE, whereby more than two dozen power entities are entirely dependent upon government handouts and wages (running in trillions of rupees) to keep the system afloat, which would otherwise collapse. And not to forget the tax exemptions, which has cost the national kitty a whopping Rs. 1.3 trillion since the inception of IPPs.

Therefore, when it comes to 'Debt, Fiscal Strain and Accrued Liabilities', **WAPDA was by far the superior system** with its own financing arrangements, low fiscal strain upon the government treasury and low external payment pressures.

The economic costs of load-shedding The consistent provision of power for business and economic activities is a must given the close correlation between economic growth and electricity consumption. Failure on this count, however, results in lower than anticipated economic growth (and its spillovers, like lack of business and employment expansion). So how do WAPDA and the unbundled system compare on this count?

In short, both systems have been failures on this count, inflicting substantial losses on economic activity. Persistent load shedding under WAPDA was a norm. This can be ascertained by the fact that in order to lessen their losses and access relatively reliable electricity, the private sector (especially industry) had to turn to off-grid solutions in the form of 'Captive power', which constituted 200 MW capacity in FY 1970-71, 230 MW in FY 1975-76 and same in FY 76-77.¹⁹⁵ Further evidence comes from various sources cited above, like the former Finance Minister Mr Mubashar Hassan's testimony (cited in WAPDA section).

Regarding quantum of total losses, estimates differ, though not by much. A study in 1990 put the annual loss of value added due to load shedding at an estimated \$500 million.¹⁹⁶ Two studies in terms of economic costs by Dr Hafeez Pasha and Dr. Aisha Ghaus compared the total economic and financial costs that load shedding inflicted upon the industrial sector in the pre-unbundling and post-unbundling era, by taking into account the years when load shedding was at its peak (FY 1984-85 and FY 2008-09).¹⁹⁷ They estimated that the total costs to the economy in FY 1984-85 were equivalent to 1.8 percent of GDP, while in FY 2008-09, the losses exceeded 2 percent of GDP. The following is taken from their studies.

¹⁹⁵ Annual Development Plan, 1977-78

¹⁹⁶ 'Foreign Economic Trends and their Implications for the US' (1990), *Department of Commerce, US*

¹⁹⁷ 'The economic cost of power outages in the industrial sector of Pakistan' (1989) and 'Economic cost of power outages' (2009)

**COMPARISON OF 2009 ESTIMATES WITH
EARLIER RESULTS (1984-85 STUDY)**

	1984-85	2008
Average Hours of Loadshedding (Annual)	175	1379
% of Sample Making Adjustment through Self Generation	12	75
Extent of recovery of Output (%)	44	60
Impact on Value Added (%)	8	9
Impact on Production	2.6	7.0

Source: Pasha (1989) and (2009)

NATIONAL COSTS OF LOADSHEDDING

Cost to the Industrial Sector	Rs 157 Billion
Cost to the Other Sectors of Industrial Loss of Value Added	Rs 53 Billion
Total Cost of Industrial Load Shedding to the Economy	Rs 210 Billion
Cost As % of GDP	2
Loss of Employment in the Economy	400,000
Loss of Exports	Rs 75 Billion equivalent to over \$ 1 billion

Source: Hafeez Pasha, Aisha Ghaus (2009)

**TOTAL COSTS OF LOADSHEDDING TO THE INDUSTRIAL SECTOR in
2008-09**

For Firms with Self-Generation	
Additional Cost of Power Self-Generation	Rs 32 Billion
Value Added Loss	Rs 42 Billion
Total Costs	Rs 74 Billion
For Firms Without Self-Generation	
Additional Costs of Adjustments	Rs 6 Billion
Value Added Loss	Rs 77 Billion
Total Costs	83 Billion
Overall Costs to the Industrial Sector	Rs 157 Billion
Cost as % of Industrial Value Added	9
% Loss of Production	7
Loss of Industrial Employment	300,000 workers
Source: Pasha and Ghaus (2009)	

Fiscal Year	Total hours of load shedding
2018-19	887
2019-20	894
2020-21	1,132
2021-22	1,226
2022-23	1,226

A statement by Finance Division in 2013 corroborated the estimates, stating that the power crisis in Pakistan was shaving off 2 percentage points of annual GDP growth.¹⁹⁸ A more

recent estimate by the WB put the annual losses to businesses due to load-shedding at Rs. 570 billion.¹⁹⁹ One would assume that the losses continue, as reflected by the severity and persistence of load shedding under the present system, as shown in the table.²⁰⁰

The system's regulator, NEPRA, acknowledged the failure of DISCOs in terms of bringing in efficiency to this system by curtailing the hours of load shedding, causing considerable loss to the country overall.²⁰¹

In short, as opined above, **businesses and economic activity suffered under both systems**. Although the estimates from various sources suggest that the economy-wide losses inflicted upon the system, as a percentage of GDP, are relatively higher under the unbundled system than the system under WAPDA, but the difference is not that significant.

¹⁹⁸ 'Pakistan's energy crisis: causes, consequences and possible remedies' (2014)

¹⁹⁹ 'A chronicle of mismanagement and financial woes' (2024), Zafar Bhutta, *Express Tribune*, 17th July 2024

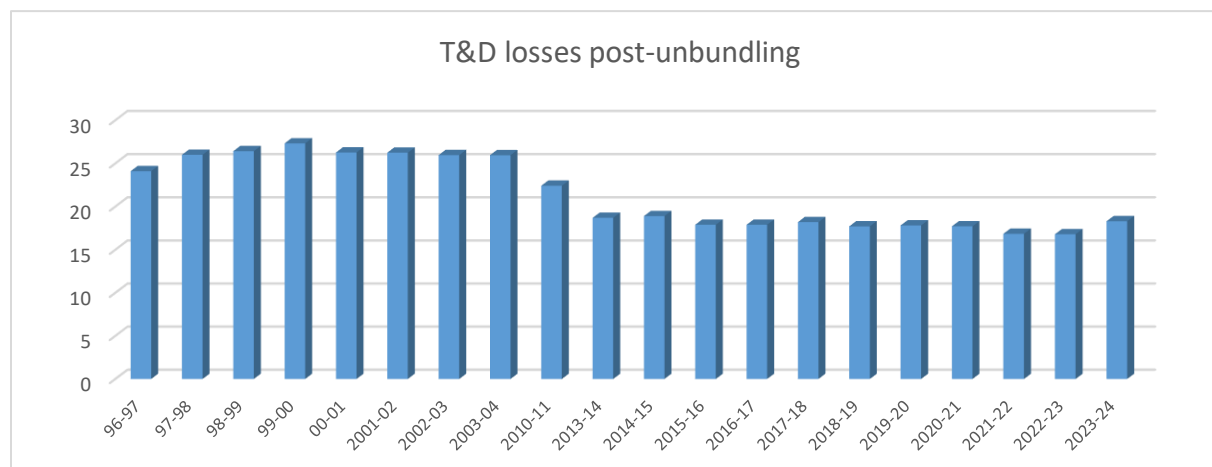
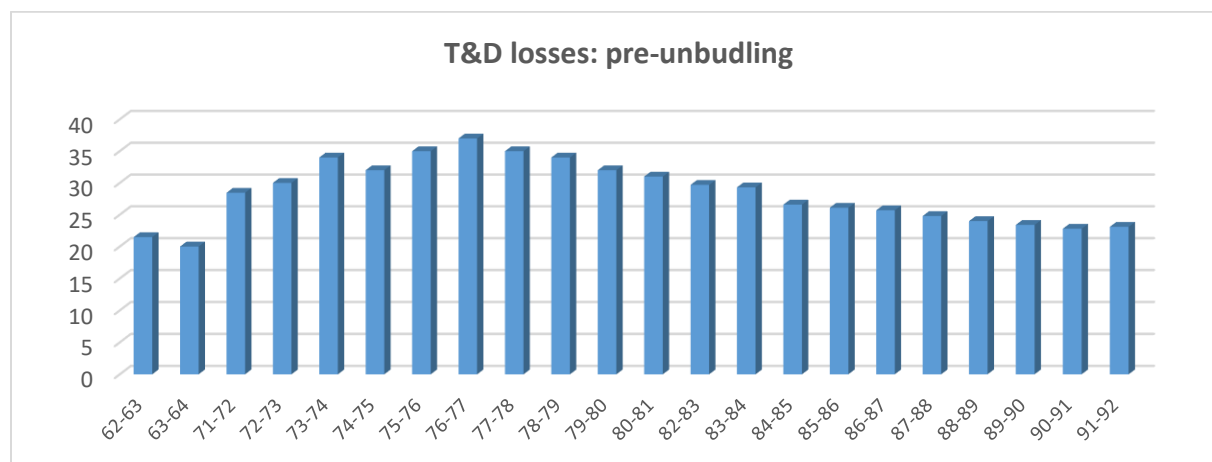
²⁰⁰ Calculated from SAIFI and SAIDI data, NEPRA Yearly Reports, various editions

²⁰¹ NEPRA Performance Evaluation Report-Distribution Companies, 2022-23, p.31

It is also important to distinguish between the reasons for load-shedding under the two systems. While load shedding under WAPDA had its roots mainly in reliance on water which was unavailable in winter months, followed by political imperatives and some level of inefficiency, the post-WAPDA system has inefficiencies at its heart in terms of the persistent load shedding. Unlike the WAPDA system, the availability of a critical input (water) has never been an issue under the unbundled system since producers have had several options to choose from. Yet load-shedding, a good proxy for systemic inefficiency, has existed.

It also needs to be kept in mind that unlike WAPDA, the present power system has no contribution towards development and sustainability of agriculture in the country (and thus towards food security). Despite unbundling, WAPDA is still managing to produce cheap electricity as well as continuing on with its other responsibilities related to water management.

Systemic Efficiency In terms of systemic efficiency, T&D losses provide a fair, aggregate reflection of the efficiency of the Transmission component of the energy chain. One of the major criticisms of WAPDA was its high T&D losses, which was cited as one of the main reasons for unbundling. For comparative purposes, the following two graphs present the pre-unbundling and post-unbundling experience.



The graphs above depict the post and pre-unbundling T&D losses. Before unbundling, the losses averaged 28 percent. Later, the losses dropped to 21 percent on average. Although it seems that the unbundled system is the clear winner in this case, we have to take into consideration other factors, especially the monetary amount which is the variable of interest here, specifically in context of it being a burden upon the exchequer. In that case, it would be difficult to grant a favorable view to the unbundled system since WAPDA's T&D losses were not as big a burden upon its finances or on Government, courtesy of WAPDA being an organization with ability to generate funds for itself, an ability that is absent in the present system. The heavy burden of T&D losses under the unbundled system ultimately gets shifted upon the government finances, which then extorts this money out of common people via different methods (as in case of plethora of taxes in electricity bills, discussed below).

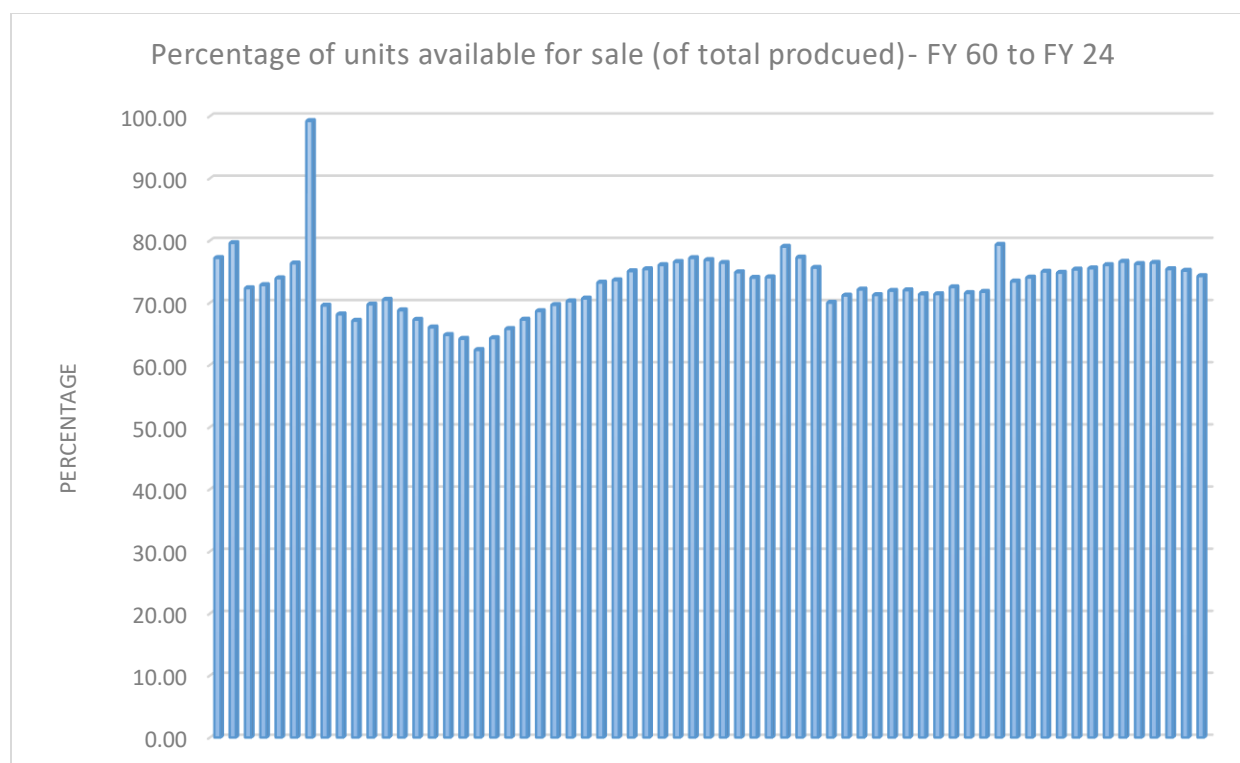
Moreover, Malik (2012) is of the view that if we look at the components of T&D losses, then the present system is more inefficient compared to the previous system. According to her,

‘In the T&D losses, distribution losses are almost 68 percent while the rest of them are transmission losses. And in the 68 percent of the distribution losses significant portion is that of electricity theft. In the period (1985-86 to 1994-95) units of electricity supplied which were also billed grew at the rate of 9.8 percent, while in the period (1994-95 to 2006-07) units billed grew at the rate of 5.4 percent. In the period (2007-08 to 2009-10) units billed increased at the rate of less than 2 percent. Thus, indicating the poor efficiency to curtail the power theft. Since high system losses and poor collection of bills from the customers was one of the major reasons behind the initiation of the reform process in Pakistan, its high magnitude shows how little the efforts (including various technical measures) adopted in the past have been effective to bring down these losses’.²⁰²

Additionally, as explained above, various extractive practices like fake billing/over-billing have become the norm.

Similarly, in terms of systemic efficiency related to production and transmission, one can analyze the pre-unbundling and post-unbundling number of units sold as percentage of units produced. Pre-unbundling (FY 59-60 to 92-93), the average stood at 72 percent. Post-unbundling, the percentage stands at 74 percent. So there is no substantial difference in efficiency in this regard, implying that the envisioned efficiency gains that formed one of the basic tenets of unbundling WAPDA has failed to materialize.

²⁰² ‘Power crisis in Pakistan: A crisis in governance?’



The following words of the regulator, NEPRA, is not only a testament to the inefficiency of the unbundled system, but also corroborates the extractive, unjustified nature of its operations;

‘It is important to understand that SAIFI and SAIDI only contains the unplanned power supply interruptions or we can say faults that are occurring at 132kV and down to 440/220v. Therefore, these two indicators can be improved by carrying out corrective and preventive maintenance on regular basis. For this purpose, colossal amounts are being allowed to these DISCOs every year under O&M head in their tariff determinations. However, the performance of DISCOs in this regard against the allowed funds seems not up to the mark’.²⁰³

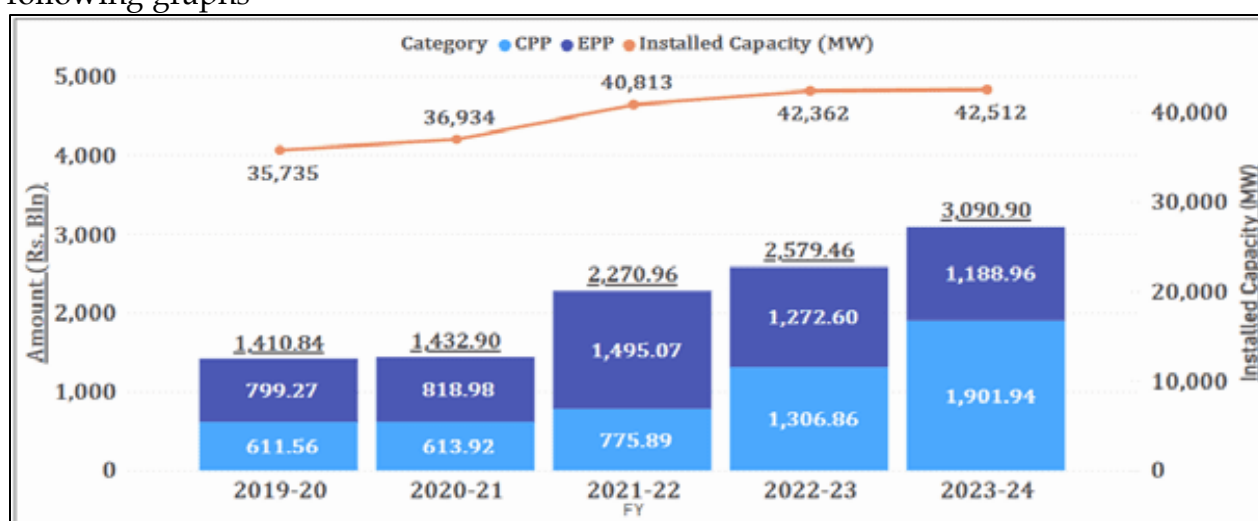
Therefore, one can argue that both systems fare poorly in terms of Transmission efficiency, while in terms of Distribution efficiency, the WAPDA system performed relatively better compared to the unbundled system. When it comes to efficiency in terms of units sold as percentage of total units produced, there is no noticeable difference between both systems.

Optimizing upon existing capacity and capacity cost coverage The installed capacity for electricity production has two major cost components- ‘fixed cost’ and ‘variable cost’. To cover both of these, and to keep the system financially viable, the consumption level has to be such that income from that consumption covers these costs. In the case of unbundled system, however, we find a persistent lack of such optimization given that consumption

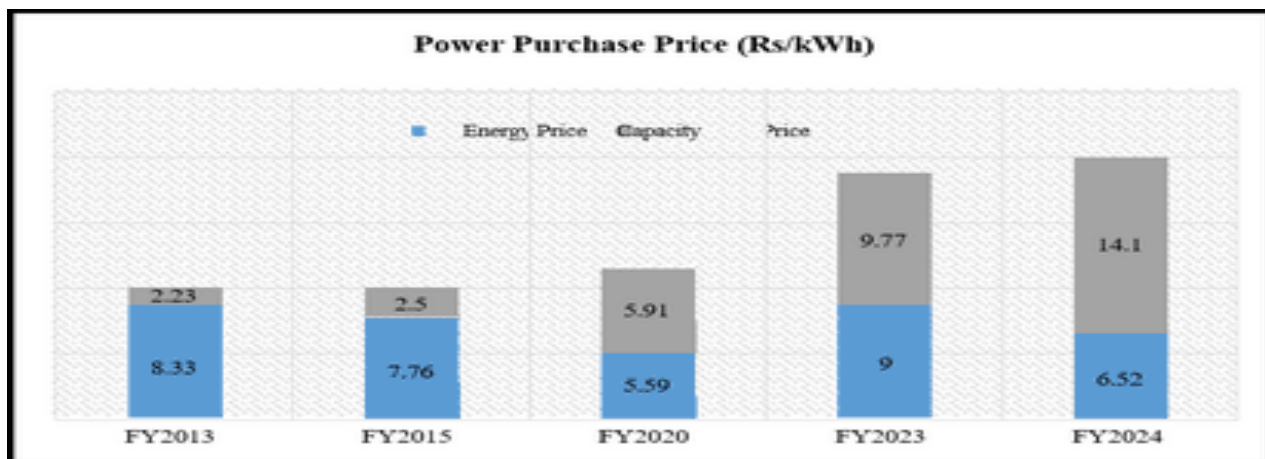
²⁰³ ‘NEPRA Performance Evaluation Report-Distribution Companies, 2022-23’ (2023), p.31

levels have either risen slowly, have stagnated, or fallen (as in the last couple of years). This means that a large portion of installed capacity with its fixed and variable charges remains unutilized, resulting in a massive transfer of payment burden upon consumers. This assertion is abundantly supported by looking at the bifurcated components constituting the electricity tariff. The *capacity costs* of public and private sector generation companies has formed the largest single component of consumer-end tariffs since some time (in FY 2022-23, for example, they were 37.7 percent of the final tariff). To top it off, on average, almost half of the capacity in the grid goes underutilized or unutilized.

By the end of the FY 2023-24, Pakistan's installed electric power generation capacity reached had reached 45,888 MW (including KE), while the average annual utilization during the same period was only 15,546.86 MW (33.88 percent).²⁰⁴ As a result, electricity consumers ended up paying for 30,341.145 MW (66.12 percent) of unutilized capacity, which includes cost of intermittency in case of RE power plants. The distribution between capacity and energy charges, reflecting capacity utilization failure, is given in the following graphs-



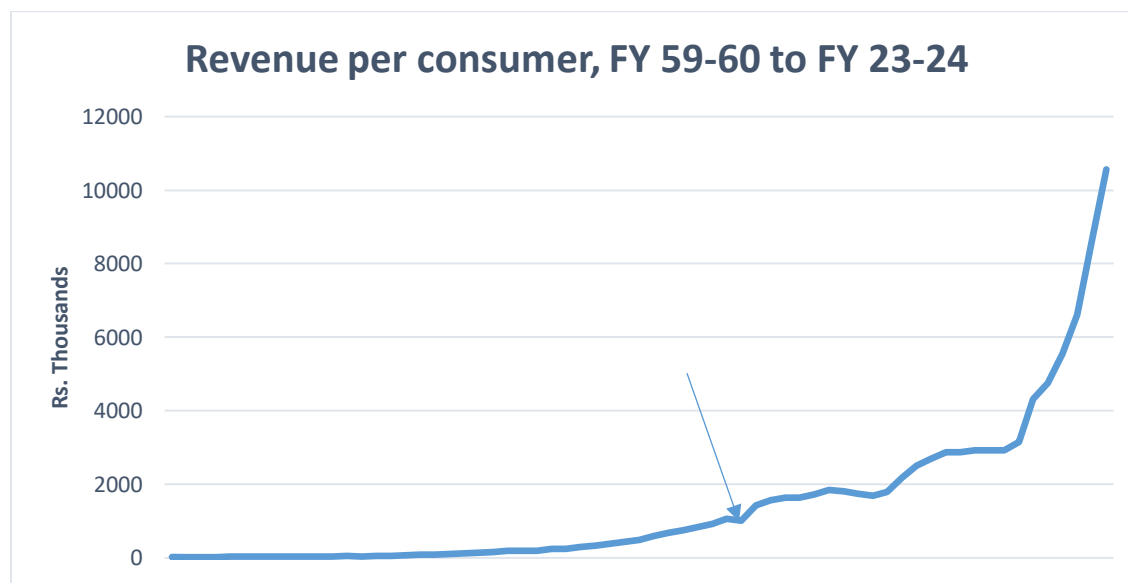
²⁰⁴ It is now above 46,000 MW



Source: CPPA-G, NEPRA

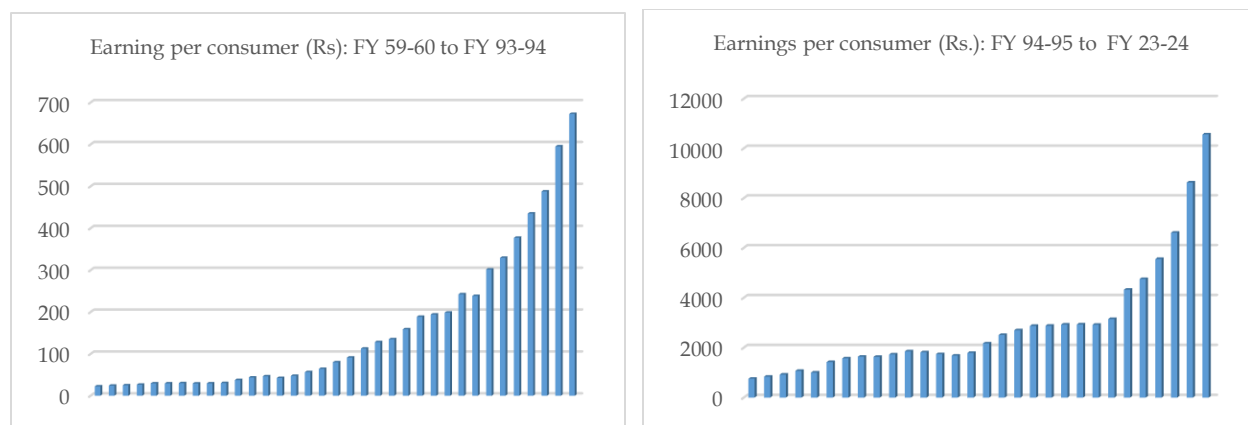
As described above, the burden of failure to cover total costs of production resultantly shifts to the consumer, clearly reflected in the following three graphs that detail

- total revenue per consumer over since WAPDAs inception
- revenue per consumer till unbundling
- revenue per consumer post-unbundling



Clearly, the earnings per consumer have risen substantially since IPP electricity made its way to the national grid (marked by arrow in the graph), not on account of collection efficiency or superior management skills, but on account of extractive practices (taxes, charges, etc.) to cover the non-optimized costs of electricity production.

This assertion is further supported by bifurcation of the above graph by two systems- WAPDA and unbundled system, shown in the two graphs below.



Between FY 59-60 and FY 93-94, the earnings per consumer averaged Rs. 176 in these thirty six years. In contrast, post-WAPDA, the average stands at Rs. 2,972 in thirty years, clearly reflecting the risings costs for the system and customers due to poor management in terms of capacity utilization.

WAPDA comes out the clear winner in this case, as the case of capacity underutilization was unheard of during that time. In fact, it was the opposite; peak demand used to top supply of electricity frequently. Under the WAPDA Act 1958, the process of Tariff determination is set out in the WAPDA Act in the following words.

"The rates at which the Authority shall sell power, shall be so fixed as to provide for meeting the operating costs, interest charges and depreciation of assets, the redemption at due time of loans other than those covered by depreciation, the payment of any taxes and a reasonable return on investment".

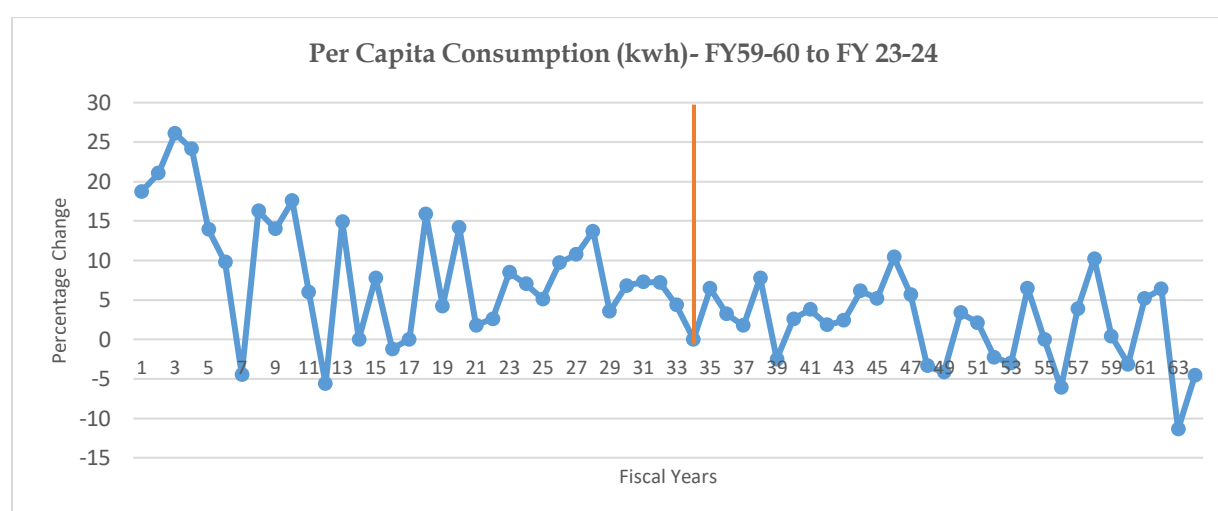
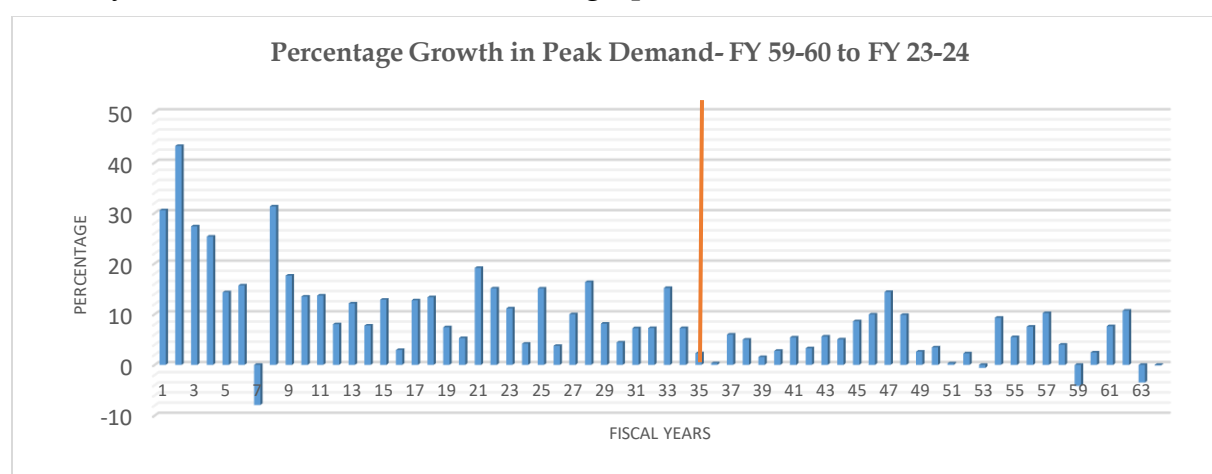
Despite high demand, and despite liabilities, tariffs and the resulting payments for consumers remained comparatively affordable. Over the course of this system's existence, before unbundling, all the plethora of charges, taxes and fees were never part of tariff determination! In fact, it was mostly limited to operating costs and costs of foreign loans. This is supported by studies like that of Ghafoor and Weiss (1988) who concluded that WAPDAs tariffs were below its long-run marginal costs due to generous help from the federal government and low-cost loans plus grants that enabled WAPDA to set tariffs below the long-run marginal costs of the industry, and were also low in comparison to tariffs in the regional context.²⁰⁵

Aggregate welfare and financial viability of the system As discussed at the start of this paper, the close (and widely accepted) link between electricity consumption and economic growth. Complementing this is the policy consideration of aggregate welfare enhancement, with per capita consumption of electricity being one of the main markers

²⁰⁵ Economic theory of industrial organization posits that for any industry to survive, everything else remaining constant (no subsidies, for example), the industry would need to operate in a manner as to recover its marginal cost of production in the long-run.

of welfare. Moreover, it is also an indirect indicator of financial viability of the system since higher electricity consumption is a good proxy for electricity sales, and given the nature of large-scale investment requirements in this sector that give rise to long-run fixed and variable costs, it is imperative that demand for electricity and consumption per capita keep rising so as to cover these costs.²⁰⁶

In terms of these two criterion, what does the data tell us? Between FY 59-60 and FY 92-93, 'peak demand' grew by an average of 13.44 percent, while the average per capita consumption (kWh) grew by 9 percent. In contrast, post-unbundling since FY 93-94, peak demand grew by an average of 4.66 percent while average per capita consumption (kwh) grew by hardly 1.75 percent.²⁰⁷ Clearly, the system under WAPDA outperforms the unbundled system in terms of average consumption growth and systemic financial viability. The two stats are shown in the graphs below-

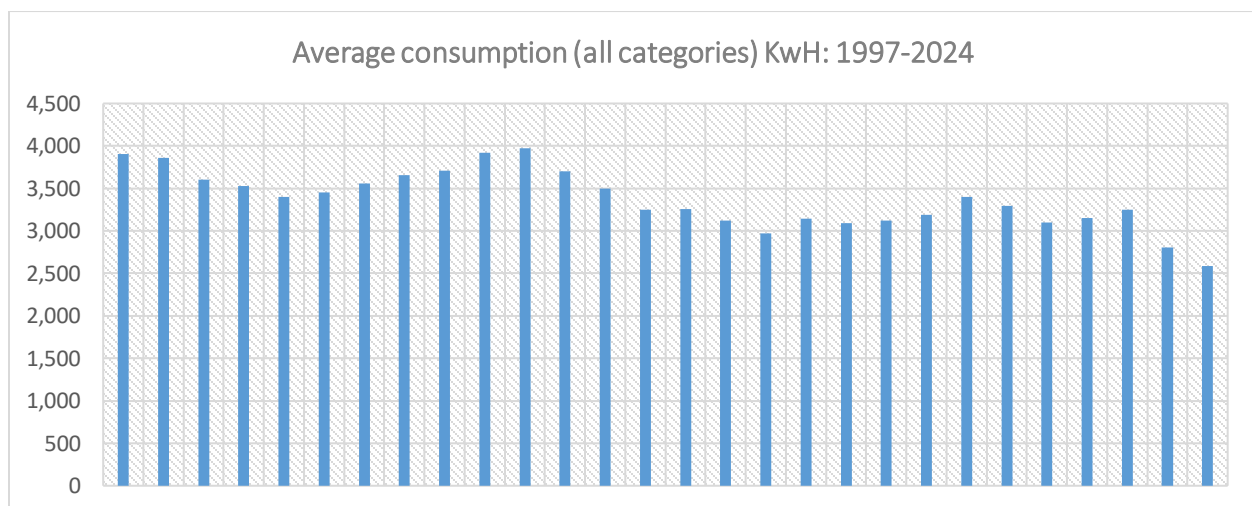
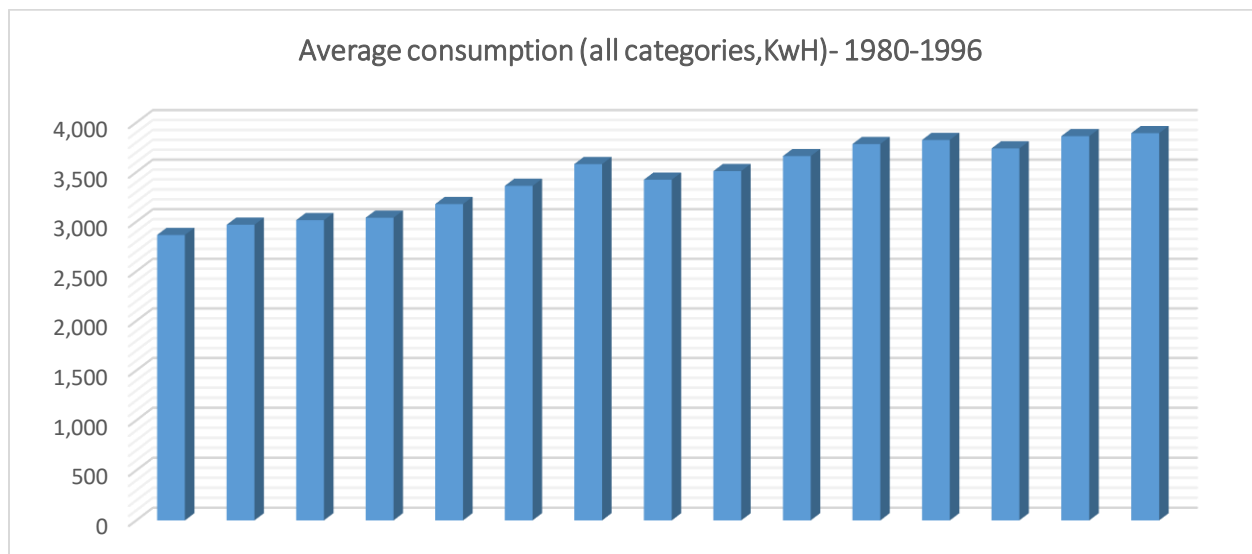


²⁰⁶ Otherwise, system would find it difficult to operate without being extractive, as we see in the case of post-WAPDA system, which cannot survive without taxpayer subsidies, that in turn invite predatory/extractive practices by the government for extracting money from consumers through various means

²⁰⁷ Computation based on NTDC stats

It is critically important to note that the trend of solarization since 2015, perpetuated by high electricity tariffs, has put the financial viability of the main grid at an even greater risk. According to available data, an estimated 17 GW of solar panels had been imported in 2024, double the amount in 2023.²⁰⁸ This, alternatively, constitutes the forgone consumers who could have consumed this quantity from the national grid, helping financially sustain it as well as lessening the tremendous fiscal burden upon the government. Unfortunately, the opposite is happening.

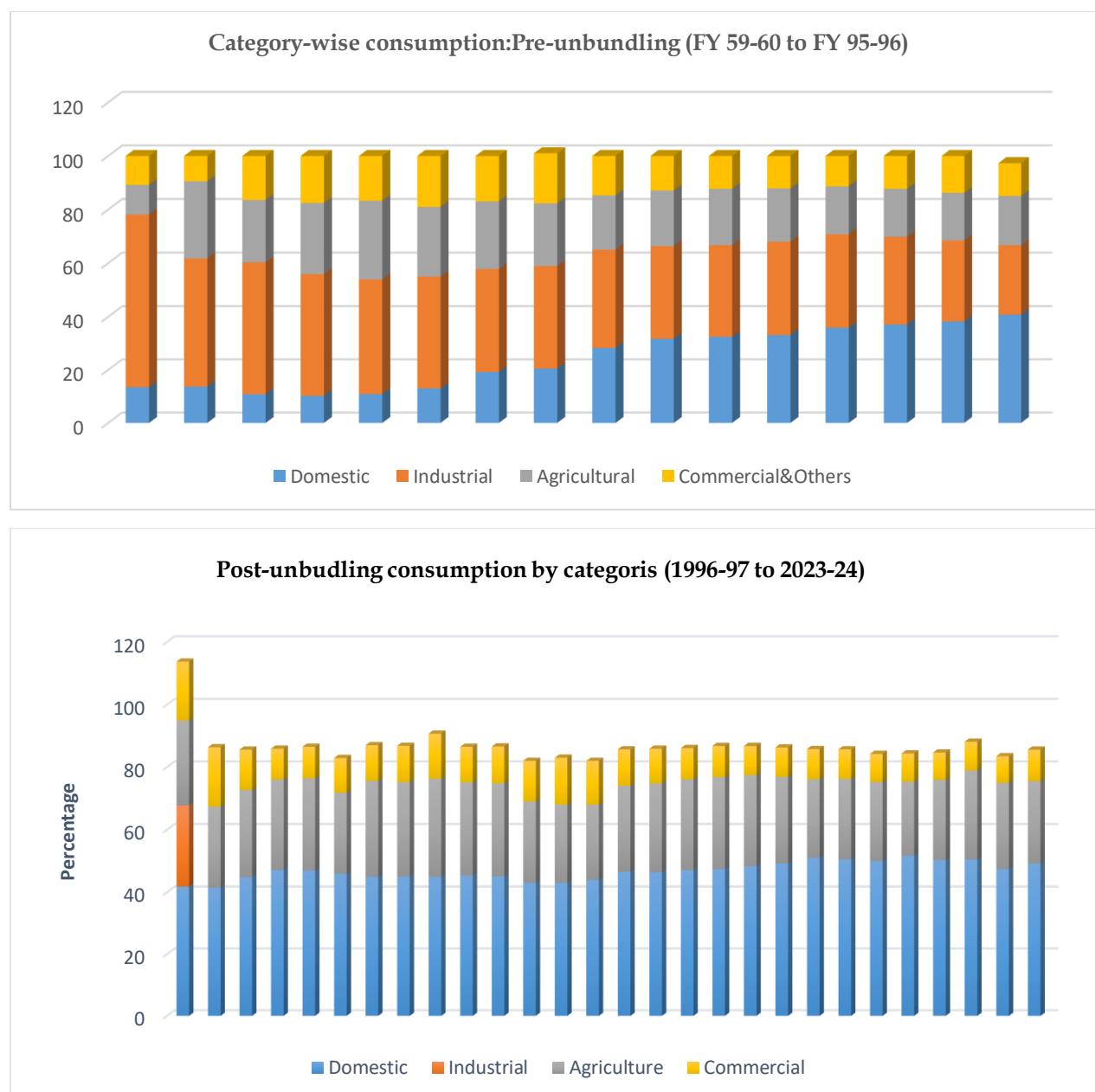
A comparative graph given below shows that initially the per capita consumptions was on the increase, but over the years it has either stalled or decreased post-unbundling whereby we observe a downward trend in terms of average consumption per capita;



Additionally, another marker of the electricity sector's financial health is the average consumption of the used by industrial sector of the economy. Worryingly, as pointed out

²⁰⁸ 'From crisis to clean energy, Pakistan emerges as top solar market in 2024'

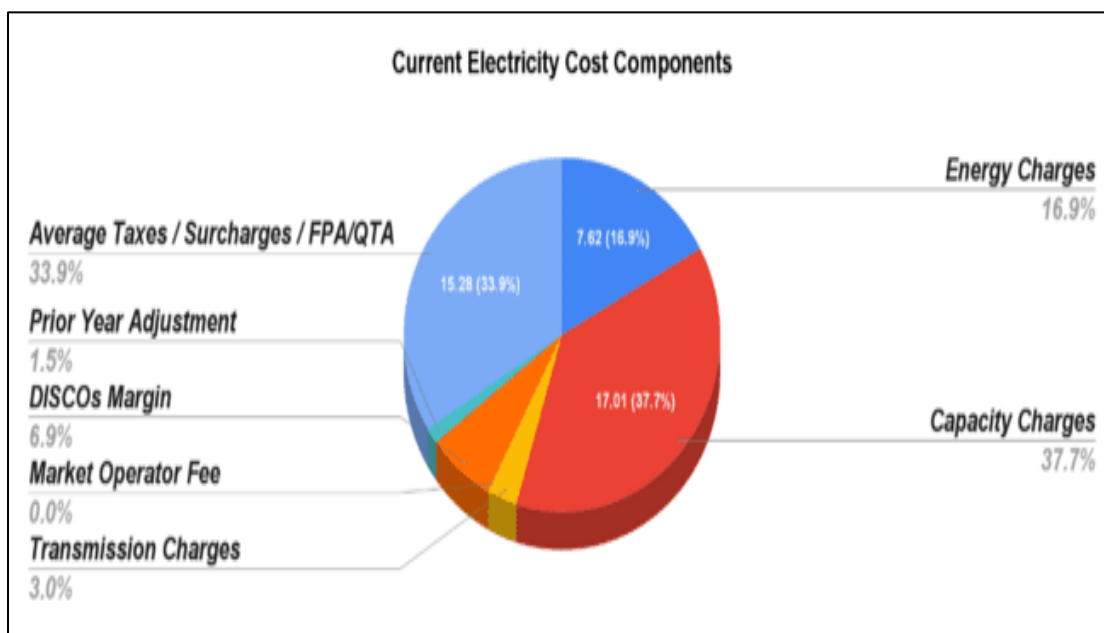
above, data shows that industrial sector consumption of the grid electricity has either stalled over the years, or decreased over time. Graphs below for both eras shows this;



Briefly put, the unbundled system has seen per capita consumption not only stagnate but also the worrying loss of consumers who are now increasingly shifting to rooftop solar, putting the already fragile financial health of the sector at an even greater risk. Moreover, the industrial consumption is going down. Thus, this system does comparatively poorly compared to state of affairs under WAPDA.

Extractive nature of earnings This follows the above, whereby it was shown that the earnings per consumer have jumped considerably post-unbundling due to extractive practices rather than any efficiency in collection or marked improved in management

practices. Faulty or fake billing, as described above, represents one of these kinds of practices. The soaring cost of electricity, compounded by a web of **taxes, surcharges, fees, and duties that is costing the consumer Rs. 15.28 per unit (FY 23-24 estimates)**, which is 33.9 percent of total electricity tariff, second largest after the capacity charges (37.7 percent). To illustrate, share of various components in the average electricity tariff for the year 2023-24 is illustrated as under:



Source: NEPRA

In comparison, WAPDAs tariffs rarely contained any such extractive taxes. A fuel surcharge, for example, was approved in tariff determination in 1978, but rarely applied to its full. The tariff, more often than not, was exclusively based on energy and operational charges, with little element of extraction.

Tariffs represent only one form of extractive practice rampant under this system. To illustrate, it was recently revealed that the regulator, NEPRA, allowed a coal power producer to extract its Rs. 215 million loss on account of suppliers' default from consumers. Put another way, the loss accrued due to a foreign suppliers' default upon its obligation to the coal power plant, for which the consumers are now being penalized unjustifiably.²⁰⁹

On this criterion, system under WAPDA fared far better.

Overall, in conclusion, WAPDA led system fares much better than the unbundled system in the cost-benefit analysis.

²⁰⁹ 'Power users paying dearly for regulatory failures'

BOX- What kinds of Taxes are being charged in Electricity bills?

Details of duties and taxes imposed on electricity bills as per the Ministry of Energy (power division) includes:

- Electricity Duty: A provincial levy ranging from 1% to 1.5% of variable charges, applicable to all consumers.
- General Sales Tax (GST): Levied under the Sale Tax Act 1990, imposing a 17% tax rate on the entire electricity bill for all consumers.
- PTV License Fee: An additional charge of Rs35/for domestic consumers and Rs60/for commercial consumers, is directly added to the electricity bills.
- Financing Cost Surcharge: Imposed at a rate of Rs0.43 per kWh, affecting all consumer categories except lifeline domestic consumers.
- Fuel Price Adjustment (FPA): A variable component reflecting the discrepancy between actual and reference fuel charges. Positive variations lead to extra charges on consumers' electricity bills, while negative variations result in a benefit to consumers.
- Extra Tax: Industrial and commercial consumers, not registered in the active taxpayer list of the Federal Board of Revenue (FBR), are subject to a tax rate of 5% to 17%, depending on different bill amount slabs.
- Further Tax: This additional tax of 3% is levied on all consumers without a Sales Tax Return Number (STRN), excluding domestic, agricultural, bulk consumers, and street light connections.
- Income Tax: Charged at varying rates based on applicable tariffs and the amount of the electricity bill.
- Sales Tax: Commercial consumers are taxed at a rate of 5% on bills up to Rs20,000/and 7.5% on bills exceeding Rs20,000/-.

Source: 'Tax nightmare of Pakistan's electricity bills-9 taxes, duties', Mettis Global News, 29th August 2023

CHAPTER-IV

Conclusion and the Way Forward

In 1961, a team of experts visited Pakistan in lieu of WAPDAs founding to prepare a plan for future development of the organization so that it could contribute towards developing agriculture and water resources of the country, helping perpetuate socio-economic development. The primary motives of the team are explained in the following para;

“A team of experts headed by Dr Jerome B. Wiesner, Special Assistant for Science and Technology to President John F. Kennedy, and Dr Roger Revelle, Science Adviser to the United States Secretary of the Interior, visited Pakistan in October, 1961, to get first-hand information on the problem. On their return to the United States these experts prepared a comprehensive draft report on the problem of waterlogging and salinity. This was received by the Government of Pakistan in September, 1962. In this draft report the panel of U.S. scientists supported the Wapda reclamation programme and recommended that simultaneously greater emphasis should be placed on the agricultural aspect of the problem. It also recommended that the reclamation should proceed at the rate of about one million acres per year thus spreading the programme over a period of 20 to 25 years as against 10 years suggested in the Wapda plan. Dr Roger Revelle, who edited the report, visited Pakistan twice in 1962, in December and March, to discuss the draft with Wapda and the Government officials before its finalization”.²¹⁰

Over the next three decades, till unbundling, the organization achieved significant milestones in terms of both power and water, explained in detail in the WAPDA section above. Its works like Mangla and Tarbela dam still benefit the economy of Pakistan, long after their establishment and commencement of operations. However, the commendable work was complemented by persistent problems that plagued its performance. Ironically, majority of these issues were not of WAPDAs making. Ultimately, the weight of the various shortcomings became unbearable and it was decided to unbundle/bifurcate it.

After unbundling, such level of high-quality scientific work was overtaken by financial swindlers and mediocre management in the form of IFIs and bureaucratic setups that displayed little zest for developing an efficient sector. A system once run by a natural monopoly taking advantage of economies of scale morphed into a highly extractive, expanded and inefficient leviathan that has severely taxed the fiscal resources of the federation aside from creating unparalleled difficulties for the denizens of this country. It is extremely difficult, for example, to justify the working of more than two dozen public sector entities in the electricity sector along, with output in the shape of a record Circular Debt to the tune of Rs. 2.4 trillion, delivering electricity at one of the highest costs in the region (and the world), and continuous legacy of losses that have to be borne by the consumer in the end.

²¹⁰ WAPDA Year Book, 1963-64, p. 57

A cursory reading of the comparison made above, and the context of both the systems, would make it amply clear that the objectives of unbundling largely remained unmet. The systemic inefficiencies that had made WAPDAs work difficult now bedevil the present system, and in some cases to a greater extent (like CD and Capacity payments, which were not there in pre-unbundling system).

In essence, the ‘unbundling’ of the power sector failed to ameliorate the issues that had plagued the workings of WAPDA till its bifurcation. To put it mildly, unbundling of WAPDA was a failure of epic proportions, one that caused Pakistan’s taxpayers a tremendous fortune. Pakistan’s experience with power sector reform – transitioning from a unified WAPDA system to an unbundled, multi-entity structure – has largely been a journey from one crisis to another. The evidence examined in this study demonstrates that the unbundling of WAPDA, initiated with high hopes in the 1990s, failed to remedy many of the fundamental problems it was meant to solve.

We now turn to the million dollar question- what is the Way Forward? A probable framework, along with analysis of various options, is discussed below.

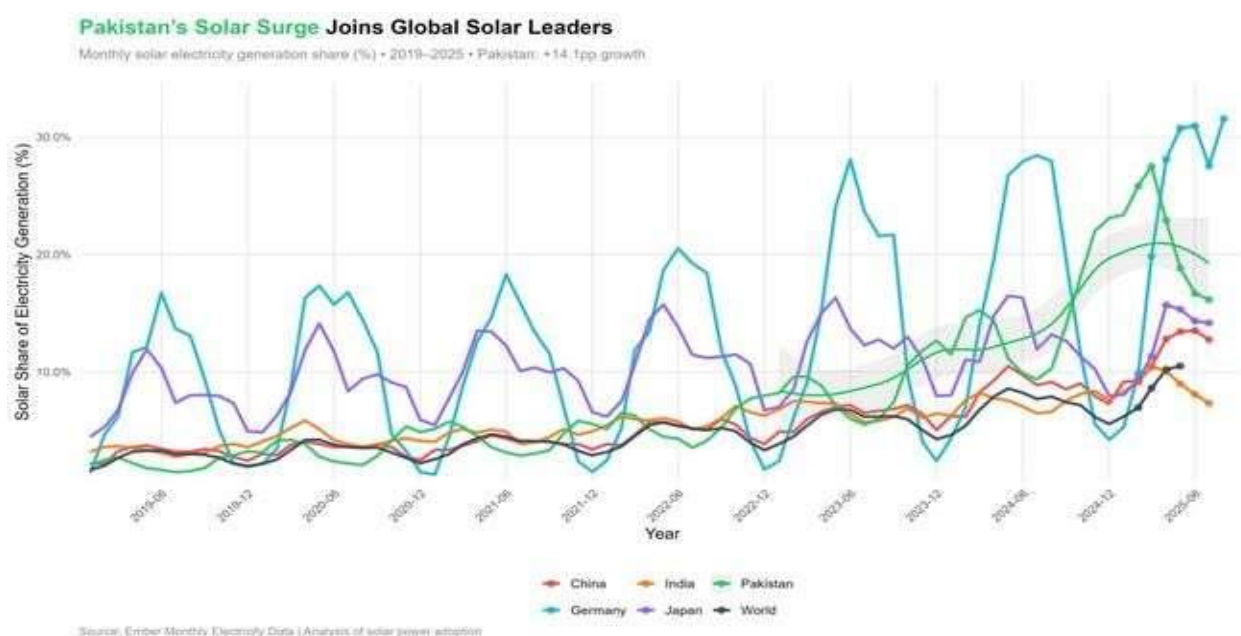
The first option, and the least desirable of the three options, is to continue with the system at the present and try tinkering with it in order to improve it. Suffice to say, the chances of a corrupt, inefficient, compromised and bureaucratic heavy system getting reformed is very slim, of not completely zero. As explained above, there are too many actors and interests who benefit from the inefficiency of the current state of affairs, especially the bureaucracy that has come to dominate the decision making in this sector. Any reform effort will have to have their perks and privileges cut considerably and replaced with experts of this sector (like engineers), a prospect they will fight tooth and nail as has happened several times before. Similarly there are many private sector players who have been significant beneficiaries of this system (like IPPs). They would also be loath to see any reform in the system that could see their goodies trimmed significantly. The easy way for them, for example, is to take recourse to courts where disputes in the power sector linger on for decades.

The second option is to revert back to the vertically integrated WAPDA led system. Given that the organization had performed relatively well before being unbundled, there is a certain school of thought that considers this possibility worthy of being pursued. However, it is argued that this possibility should also be discarded owing to several reasons. To begin with, WAPDAs own performance has deteriorated markedly over time. Its failures and shortcomings like the Neelum-Jhelum hydropower project has inflicted a terrible fiscal toll upon the consumers and the national kitty. This is also a reflection of decline in the quality of its human capital over time. The top quality human capital that once constituted WAPDA has either retired or has moved to other places. Trying to rebuild from the scratch, taking on the hefty liabilities of the present system and running an efficient system to handle the arduous tasks is beyond the capabilities of present-day WAPDA. Merely moving from on inefficient system to another dos not make any sense.

There is, though, a third option, one that is probably the best amongst the three options and the one advocated by this research effort. This option favors decentralization of the power sector to provinces, with their own generation, transmission and distribution arrangements, in tandem with the market-oriented initiatives like **Competitive Trading Bilateral Contract Market (CTBCM)**. This option comes with many advantages- end of cross-subsidization, proportionate risk sharing, every locality paying for its own rather than other, incentive for provinces to upgrade the system and specialize as per its advantage (like the northern territories specializing in hydro electricity production), end of federal government's monopoly upon power sector, and the chance to trade in a competitive market bringing efficiencies in terms of market transactions, etc.

Aside from three options discussed above, there is something phenomenal unfolding before our eyes since the last couple of years, something that is set to upend the workings of the traditional grid, power infrastructure and the whole power sector setup. That phenomenon is the solar energy revolution!

The phenomenal uptick in the use of solar energy and its effects can be gauged by the generation and use numbers. In August 2025, for example, 13.7 billion units of electricity were produced, which is considered an improvement since it was 7.5 percent more than the electricity produced in the same month of previous year. However, it still fell short of the production number in 2019, indicating a trend of falling electricity use from the main grid. Daytime peak numbers have been falling over time- of the 46,000 plus MW capacity, the average consumption remained 18,000 MW while the peak barely reached 23,000 MW (in Summer 2025). Given the rate of solarization, which is considered by many as the fastest in the world (see the graph below), this trend will likely fall further, endangering the financial solvency of the whole grid which has a sizeable fixed cost component in terms of its operations and liabilities.

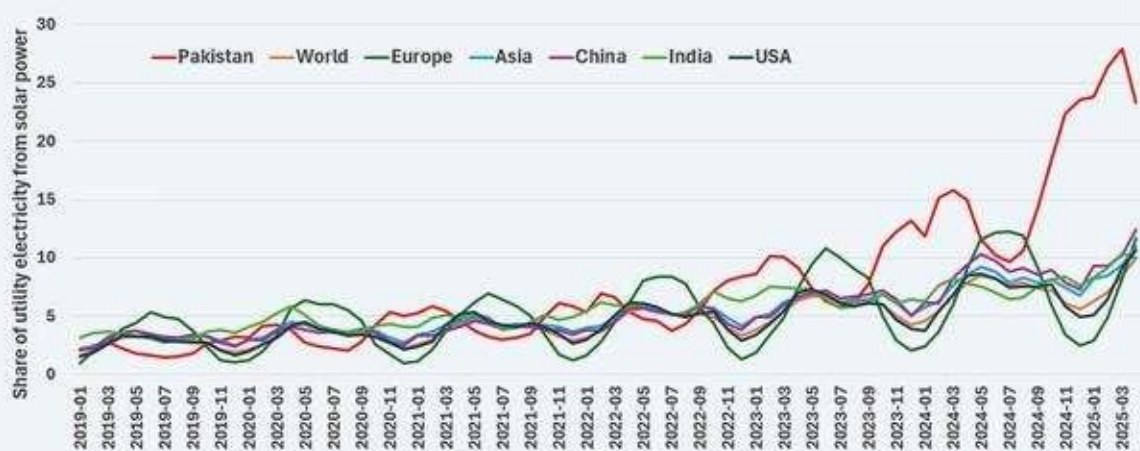


For the first time in the history of Pakistan, consumers all over the country have a real off-grid option. To gauge the quantum of change, solar systems now provide one fourth of the energy to the national grid, one the highest in the world.²¹¹

Widening lead:

Pakistan has sourced 25% of its utility electricity from solar this year, far above most other countries & regions

Solar power's share of electricity generation by select country & region



Source: Ember; 2025 data for January through April

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While it gives the consumers a relief in the form of having an alternative to the notoriously unreliable and poor quality grid, it has put the government in an even more precarious position as loss of consumption via national grid increases the financial liabilities aside from increasing the burden of running finances of system. And it is not just the falling consumption from the grid that should worry the government; the record import of solar cells (mainly from China) creates the same foreign exchange loss problem that has been bedeviling this sector since long. Despite being one of the biggest markets for Solar Panels, there is no local production. Therefore, aside from loss of foreign exchange (Pakistan economy's Achilles heel), the solar revolution in Pakistan basically represents a shift of jobs (services) from one sector to another without any major investment in terms of production in the country, something that can create new, longer term jobs.

These facts related to development of off-grid solar capability, which is predicted to pick up further pace, and its repercussions, will have to be kept in mind while pursuing any of the options stated above.

²¹¹ It is to be noted that these numbers usually do not include the solarization trends in rural areas, which most estimates suggest to be faster than urban areas. For example, the Housing Census 2023 revealed that rural grid access has declined from 82 percent to 77 percent mainly due to households turning to solar electricity

Other than the above, the following are also recommended in terms of Way Forward for the Power sector;

- Least or minimum inclusion of bureaucracy in Power sector's affairs and in power sector decision making. Bureaucracy and politics were a major issue in WAPDAs performance, and these are even bigger issues now. There is little or no need for more than two dozen public sector entities in the power sector. It's merely a waste of time and resources.
- Competitive bidding- for all future private investments should be on competitive basis with no 'take-or-pay' clause. Rather, it should be 'take-and-pay'.
- Implement the CTBCM immediately, a necessary steps pending since 2015.
- Proactive, rather than reactive policymaking, which has usually been the case with Pakistan's policy making overall.
- No payments to IPPs without forensic audit, and no issuance of licenses till required forensic audit abilities are in place.
- Concentration now should be upon the grid and distribution companies because these two are the real issues in terms of the power sector, from where the grid losses originate. There has been enough investment in generation, and there is plenty of it (more than 46,000 MW) given the average consumption that has fallen precipitously over the years.
- Avoid offering major incentives to IPPs. The incentives offered for such plants are unprecedented in the world. The capacity payments that include multiple factors like IRR, debt-equity, protection from taxes, and risk-protection are unprecedented for any comparable risk investments anywhere in Pakistan, too. The investments have become a favorite for all investors who otherwise would avoid to enter other sectors in the economy. Normally, the repayment period for equity investments in other sectors is longer than it is in the IPPs case. The average payback period for IPPs have not been more than 3 years. No other investment can compare with this remarkable recovery of costs and profits in such a short span of time. This needs to change.
- Dollar-indexation of capacity payments should be avoided, which added undue burden to the CPP/EPP has cost for the consumers. Multiple indexation, for instances with CPI and US bonds/ consumer inflation, fluctuations in the exchange rate coupled with price rises in international markets for imported fuel has exacerbated the situation for consumers of electricity. The power purchase price from the IPPs has historically proven to be extremely costly for consumers (compared to purchase price under WAPDA), aside from being a drain upon foreign exchange of the country.
- The basis of computing electricity demand needs to improve substantially. The recorded and computed demand had a wide difference over the years. Since the policies are framed on the basis of computed demand, it is observed that the actual demand remained far below the computed demand. The difference between the computed and recorded demands has been widening over the years. This

difference has actually caused damage to the power sector as capacity was added through power policies based on false premises used for computation of future demands. Therefore, the government or international agencies suggestion that Pakistan needed unbridled rush to add further capacity were traps that the sector currently finds itself in.

- A comprehensive analysis of jobs, the need and contribution of more than two dozen public sector entities in power sector needs to be carried out immediately. There is little in terms of coordination, cooperation and priority-alignment among the public sector entities are missing. Every entity (observed during this study) is enmeshed in a turf war to carve out its piece of cake under the Ministry of Energy. Majority of these entities (including MoE) are a parking place for bureaucrats and military personnel (retired and serving) rather than experts of the field. These need to be culled as they are merely a burden upon exchequer.
- The accountability mechanism for the public sector entities is either non-existent or very weak. The BoDs of the public sector companies are chosen by the Govt. and in most cases one individual hold the portfolios of the Boards of multiple entities. The boards are never held to account for the failure of the companies. Rather the cost is either borne by govt. in the shape of subsidies to the sector or piles up on the govt. accounts books to be financed with costly commercial debts.
- Make either a negotiated settlement with IPPs to bring down power generation cost to sustainable levels or undertake **forensic audits** of IPPs for identification of further issues. The **forensic audit** may cover;
 - Over-invoicing in project cost, fuel usage, misreported financial statements
 - Heat rate of fuel based IPPS
 - Kickbacks in commission of fuel supplies
 - Changes in CPPA-G payment obligations to IPPs on the basis of misreporting / regulatory breaches.

BIBLIOGRAPHY

Aftab, Safia (2014). Pakistan's energy crisis: causes, consequences and possible remedies. *Norwegian Peacebuilding Resource Centre*

Agha, Amjad Ali (2008) Genesis of Power Crisis in Pakistan and its Management *Pakistan Engineering Congress Paper No. 262*

Ahmed, Ayaz Malik, Afia Mahmood, Mir Annice (2008). Power Sector Reforms in Pakistan: A Critical Review. *Journal of Economic Literature*

Ahmad, Bashir and Chaudhry, Ali Muhamamd (1987). Profitability of Pakistan's Agriculture. *The Pakistan Development Review Vol. XXVI, No. 4 (Winter 1987)*

Ahmad, Mansoor and Ali, Mansoor M. (1998) The Political Economy of Energy Development in Pakistan. *Pakistan Journal of Applied Economics, Vol.14*

Ahmed, Ali (2025). From crisis to clean energy, Pakistan emerges as top solar market in 2024. *Business Recorder, 14th April 2025*

Ahmed, Saeed (2025). The shady economics of international aid. *Upriver Press*

Alahdad, Z. (2012). Pakistan's energy sector: From crisis to crisis-breaking the chain. *Pakistan Institute of Development Economics (PIDE Monograph No. 6)*

Albouey, Yves and Bousba, Reda (1998). The impact of IPPs in developing countries- Out of crisis and into the future. *World Bank*

Audit reveals Rs. 244 billion overbilling fraud by eight power distribution companies. *PROFIT, 22nd July 2025*

Aziz, Rashid and Ahmed, Munawwar Baseer (2012). 'Pakistan's power crisis: The way forward'.

Aziz, Sartaj (1994). Pakistan's power crisis: The way forward. 28th November 1994, *The Nation*

Bacon, Robert (2019). Learning from Power Sector Reform-The case of Pakistan. *Policy Research Working Paper No. 8842*

Beg, Daud (1987). Energy loss reduction in WAPDA Power Distribution System.

DATA COLLECTION SURVEY ON ENERGY SECTOR REFORM IN THE ISLAMIC REPUBLIC OF PAKISTAN' (2014). *Japanese International Cooperation Agency (JICA)*

Energy Inefficiency in the Asia/Near East Region and its Environmental Implications (1989). *U.S. Agency for International Development, RCG/Hagler, Bailly, Inc.*

Financing electric power in developing countries (1985). *IAEA Bulletin, Winter 1985*

Fiscal Policy Statement, 2009-10. *Finance Division, Govt. of Pakistan*

Fraser, Julia M (2015). Lessons from the independent private experience in Pakistan. *World Bank*

Gerrad, Michael (1997). Financing Hubb Power Project. *World Bank*

Gellerson, Mark W. (1982). The Economics of Rural Electrification Projects: Theory and Case Study of Pakistan. *The Pakistan Development Review, Vol. XXI, No.3 (Autumn 1982)*

Ghumman, Mushtaq (2025). Industrial Power Tariff. *Business Recorder, 16th July 2025*

Guisinger, Stephen and Irfan, Muhammad (1980). 'Pakistan's informal sector'. *Journal of Development Studies*

Haque, Abu M. Izhar Ul (1982). 'Energy planning in Pakistan: Problems and Prospects'. *Natural Resource Forum*

Haque, Nadeem Ul. Sattar, Shahid and Ali, Absar (2025). Outsourced Power: how aid agencies engineered Pakistan's energy bureaucracy. *Business Recorder, July 16 and July 17, 2025*

Havinga, Ivo C. Pintz, Peter (1987). An Energy Input-Output Table of Pakistan for 1979-80 and Some Applications Pakistan. *Development Review, Winter 1987*

Ibrahim, Elwan (1992). Privatization, Deregulation and Macroeconomic Policies: The Case of Pakistan. Chapter in *Structural Adjustment and Macroeconomic Policy Issues*, International Monetary Fund (IMF)

Implementation completion report in the amount of \$150 million to the Islamic republic of Pakistan for a private sector energy development project (2001). *Report No. 22157, World Bank*

Industrial Power Tariff (2025). *Business Recorder, 16th July 2025*

INQUIRY REPORT IN THE MATTER OF EXCESSIVE BILLING BY DISCOs JULY & AUGUST - 2023, *NEPRA*

Insufficient storage capacity causes 29 MAF water loss annually (2023). *The Nation, January 2023*

Indus Water Settlement Plan (1960). Report No. T.O. 241, *World Bank*

IPP payments and WAPDA losses. *DAWN, 21st July 2003*

- Jinnah, Benazir H and Khan, Nusrat B. Evaluation of key factors responsible for agricultural growth and development in Pakistan. *African Journal of Agricultural Economics and Rural Development* Vol. 4 (6), pp. 404-410,
- Khan, Ashfaq H and Kim, Yun-Huan (1999). Foreign Direct Investment in Pakistan: Policy Issues and Operational Implication.
- Khan, Mubara Zeb (2024). Independent power producers enjoyed tax breaks of Rs. 1.2tr since 1990. *DAWN*, 20th August 2024
- Ketoff, A., Satahye, J and Meyers, J. Plans for the Power Sector in Thirteen Major Developing Countries (1989). *Lawrence Berkeley National Laboratory*
- Kiani, Khaleeq. Power users paying dearly for regulatory failures. *DAWN*, 6th October 2025
- Looney, Robert (1991). Infrastructure constraints on Energy Development: The case of Pakistan. *The Journal of Energy and Development* Vol. 16, No. 2
- Malik, Afia (2012). Power Crisis in Pakistan: A Crisis in Governance? *PIDE Working Paper Series*
- Malik, Afia (2022). Power Projects: History, Policy and Politics. *PIDE*
- Pasha, Hafiz A (2015). The case of IPPs. *Institute for Policy Reforms (IPR)*
- PESCO Audit Report, 2020-21, *Auditor General of Pakistan*
- Pintz, P. Havinga, Ivo C and Quraishi, M.M (1987). An Energy Input-Output Table of Pakistan for 1979-80 and Some Applications. *Pakistan Development Review*, Vol. XXVI, No.4, Winter 1987
- Pirzada, Ahsan. J (2025). Remittances: A lifeline with Dutch Disease. *PRIME Institute*
- Power Statistics- NTDC, *Ministry of Energy, Govt. of Pakistan*, various editions
- Productivity Losses Due to Load shedding (1986). *Lahore Chamber of Commerce and Industry*
- PROJECT COMPLETION REPORT PAKISTAN TARBELA DAM PROJECT (1986), WB
- Qudrat, Hassan Ullah (2015). Independent Power (or pollution) producers? Electricity reforms and IPPs in Pakistan. *ENERGY* 83, p.240-251
- Report And Recommendation Of The President To The Executive Directors On A Proposed Loan To The Islamic Republic Of Pakistan For The Second Wapda Power Project. *World Bank* (Jan 29, 1976- No.P-1753-PAK)

R. Andersson and L. Taylor (1986). The social cost of unsupplied electricity. *Energy Economics*, Vol 8, No 3, July 1986, pp 139-146

Riffat, M. Zahid (2017). Some Bitter facts. *The Nation*

Report on the Power Sector: COMMITTEE FOR POWER SECTOR AUDIT, CIRCULAR DEBT RESOLUTION & FUTURE ROADMAP' (2021). *Government of Pakistan*

Saqib, Muhammad (2025). Hydrocarbon production output in FY 25 hits 20-year low. *Business Recorder*, 16th August 2025

Saleem, Farrukh (2025). \$50bn blunder?. *The News*, 17th August 2025

Siddiqui, Rehana (2004). Energy and economic growth in Pakistan. *The Pakistan Development Review* 43 : 2 (Summer 2004) pp. 175–200

The Pakistan Infrastructure Development Report (2007). *State Bank of Pakistan*

Vanham, Peter (2012). Pakistan's real power problem: a failed privatization. *Financial Times*, 22nd June 2012

WAPDA Annual Reports, *Govt. of Pakistan* (various editions)

WAPDA's Strategic Plan for the Privatization of the Pakistan Power Sector (1992). *International Resource Group, Putnam, Hayes, & Bartlett Inc.* prepared for USAID

Pakistan Economic Survey, *Govt. of Pakistan* (various editions)

ANNEXURE-A: Recommendations for attracting investment in Power Sector

- Standardized Implementation, Fuel Supply and Power Purchase Agreements.
- Introduction of an internationally competitive bulk tariff of 6.5 cents per kWh for 10 years. A premium of 0.25 c/kWh for projects above 100 MW commissioned by 1997.
- Allowing private investors, the option of own arrangements for import and transportation of fuel/oil for their power plants.
- Permission to power generation companies to issue Corporate Bonds, both bearer and registered.
- Permission to issue shares at discounted prices to enable venture capitalists to be provided higher rates of return proportional to the risk, without the current stipulated 10% discount limit.
- Exemption from Iqra Surcharge, Flood Relief Surcharge, and Import License Fees. The total impact of existing and proposed front-end exemptions will decrease local currency financing requirements by 35-40 percent.
- Permission to foreign banks to underwrite the issue of share and bonds of IPPs.
- Change in Companies Ordinance to permit registration anywhere in Pakistan to allow them to avail reduction in Stamp Duty and Registration Fees for registration of debt documents allowed by the Federal Government.
- Same tax facilities for private sector instruments as those available to NBFIs.
- Classification of NBFIs as financial institutions.
- Recommendation by GOP to State Bank for modification of Prudential Regulations to allow 80:20 debt equity ratio.
- Removal/reform of Section 13 of 1947 Foreign Exchange Regulation Act to enable nonresidents to purchase securities issued by Pakistanis without State Bank permissions.
- Abolition of 5% limit on investment of equity in associated undertakings.
- Government approval for an independent rating agency so that individual investors can make informed decisions.
- For local engineering and manufacturing companies, the present SRO 555(1)/90 to be made applicable to private power plants.
- Orders received by local engineering & manufacturing companies from private sector projects to be treated as export for refinance under State Bank Finance Scheme for Exports.
- One Window Operation through the establishment of a Private Power Board.

ANNEXURE-B: 1994 Policy salient features

- The power generated by IPPs would be purchased by WAPDA / KESC under long term contracts (between 15 – 30 years). Thus, WAPDA / KESC became “single buyers”.
- The IPPs could propose the site and technology, depending upon availability of fuel, cooling water, infrastructure, environmental impacts, and economics of the tariff.
- The GOP offered a Bulk Power Tariff of US Cents 6.5/kWh as an average for the first ten years, and a levelized tariff of US Cents 5.9/kWh over the project life as a final parameter for acceptance of the tariff.
- The actual tariffs comprised two components i.e. Capacity Price and Energy Price. The Capacity Price was to be paid on a monthly basis and covered the debt servicing, fixed operation and maintenance cost, insurance expenses and return on equity. The Energy Price was based on actual energy sold and included an element of fuel price as a "pass-through" item.
- The Build-Own-Operate projects were to raise funds without any direct sovereign guarantee of repayment, with minimum equity investment of 20% of the total capital cost.
- The Private Sector Energy Development Fund (PSEDF) set up with assistance of the World Bank, USAID and other multi-lateral lending agencies, would provide up to 40% of the capital costs of the project.
- Model Implementation Agreement, Power Purchase Agreement and Fuel Supply Agreement were prepared to avoid protracted negotiations between the GOP and the sponsors. The long term Power Purchase Agreements (typically for 15-30 years) were guaranteed by the GOP for performance obligations by the WAPDA/KESC. The Govt., under the terms of the Fuel Supply Agreement, also guaranteed the performance of the fuel supplier.
- The Govt. provided (a) protection against specific force majeure risk; (b) protection against changes in certain taxes and duties; and (c) assurance of the convertibility of rupees and remittance of foreign exchange to cover necessary expenses of the projects.

ANNEXURE-C: Power Plants and Capacity added under 1994 Policy

Fuel / Tech.	IPP	Capacity (MW)	PPA/EPAs (Years)	COD
RFO	Lalpir Power Limited. Mahmood Kot, Muzaffargarh	362	03-11-94 (30 years)	06-11-97
	Saba Power Company Ltd. Sheikhupura, Sargodha Road	134	26-12-94 (30 years)	31-12-99
	Gul Ahmed Energy Ltd. Korangi Town, Karachi	136	7-6-95 (22 years)	03-11-97
	Tapal Energy Ltd. WEST KARACHI	126	26-9-95 (22 years)	20-6-97
	Japan Power Generation (Pvt) Ltd. Off Raiwind Rd, near Jia Bagga	120	21-MAR-95 (30 years)	14-3-00
	Southern Electric Power Company Ltd Raiwind, Lahore	117	17-11-94 (30 years)	12-7-99
	Pak Gen. Power Mahmood Kot, Muzaffargarh	365	05-9-95 (30 years)	01-2-98
	Kohinoor Energy Ltd. Raiwand- Manga Road	131	08-11-94 (30 years)	20-6-97
Gas / RLNG	Rousch (Pakistan) Power Limited	450	25-2-95 (30 years)	11-12-99
	Davis Energen (Pvt) Ltd.	10.50	18-01-95 (30 years)	13-7-13
	Habibullah Coastal Power (Pvt) Co.	140	25-3-96 (30 years)	11-9-99
	Altern Energy Limited	31	18-9-95 (30 years)	06-6-01 (Ph-I) 20-9-08 (Ph-II)
	Fauji Kabirwala Power Company Ltd.	157	12-1-95 (30 years)	21-10-99
	Liberty (Daharki) Project	235	26-11-95 (25 years)	10-9-01
	Uch Power Ltd.	586	23-11-95 (30 years)	18-10-00
Total	15	3100.50		

ANNEXURE-D: Developments after 1994 Policy implementation

1995- Hydropower (Generation) Policy

The “Policy framework and Package of Incentives for Private Sector Hydel Power Generation Projects in Pakistan-May, 1995” was developed to attract private investment in the sector. Through this separate policy (separate from 1994 thermal power policy), the Govt. incentivized the private sector to develop hydel plants on locations of choice to provide cheap and clean energy to consumers. As per the policy²¹²;

- Investors are free to propose hydel power plants on tributaries and canal systems at any location and opt for any type of equipment.
- The policy covered all feasible plants having capacities up to 300 MW either of run-of-the-river type or with a nominal poundage for absorption of daily fluctuations. Hydropower plants of capacities above 300MW which do not disturb downstream users water rights do not undermine the, optimum development potential of a site, would be considered on a case-to-case basis irrespective of the location;
- The feasibility studies undertaken in the public entities like WAPDA/SHYDO others, were available to the private entrepreneurs against a fee.
- The private investors may carry out their own feasibility studies, complying with the criteria for the selection of consultants as laid down by the World Bank or Asian Development Bank. The feasibility studies of schemes to be undertaken would however ensure that:
- Private sector projects will raise funds for the projects without any direct sovereign guarantee of repayment.
- The minimum requirement for equity investment is 20% of the total capital cost of the project.
- A Private Sector Energy Development Fund (PSEDF) may provide up to 30% of the Capital Costs of the project, with a variable interest rate and a maturity period of up to 23 years including a grace period of up to 8 years.
- Article 161(2) of the Constitution of Pakistan, relating to net profits from hydropower generation, is not applicable to any hydropower projects built in the private sector.
- A nominal price for use of water was proposed for the Provincial Govts. in the Bulk Power Tariff at the rate of US Cents 0.233/Kwh (Rs 0.07/Kwh).
- The private power generation companies were exempt from corporate income tax on incomes earned from sale of electricity.

²¹² “Policy framework and Package of Incentives for Private Sector Hydel Power Generation Projects in Pakistan-May, 1995”

- The companies were allowed to import all types of plant and equipment for generation, transmission and distribution without payment of sales tax, Iqra, Flood Relief and other Surcharges as well as import license Fee.
- The companies were allowed to register anywhere in Pakistan to avail reduction in stamp tax and registration fee for registration of loan documents.
- Repatriation of equity along with dividends was allowed freely.
- Exemption from income tax in Pakistan for foreign lenders to such companies was allowed.
- Foreign companies/investors were free to set up projects without local partners.
- Private power companies were free to get insurance from any source as per requirements of lenders and utilities.
- Power generation was declared an industry and the companies were eligible for all other concessions available to industrial projects.
- Private parties could raise local and foreign finance in accordance with regulations applicable to industry in general.
- Orders received by local engineering and manufacturing companies from private power companies was treated as an export for refinance under the State Bank Finance Scheme for Exports.
- Import of construction equipment by private power companies for hydropower plants e.g. TBM's, Earth Moving Machinery and all other construction equipment was exempted from levies, except custom duty of 2%.
- Model Implementation (Concessions) Agreement and Power Purchase Agreement were prepared to avoid lengthy negotiations.
- Being BOOT projects, ownership of the project will be transferred to the Government free of charge after 25 years of its operation.
- The Government had to provide to private IPPs;
 - protection against specific force majeure risk,
 - protection against changes in certain taxes and duties,
 - ensure the convertibility of Rupee and remit ability of foreign exchange to cover necessary expenses of the projects.

i. Policy Achievements

Under this policy, one power plant for 25 years' term was established.

June 1996 – Divestment of WAPDA Shares in Kot Addu

WAPDA constructed the 1638 MW Kot Addu Power Plant in five phases from 1985 to 1996 in District Muzaffargarh, Punjab, at a distance of 16 K.M. from Taunsa Barrage. After unbundling process, the Kot Addu Power Company Limited (the "Company") was incorporated in April 1996 as a public limited company under the Companies Ordinance, 1984 to own, operate and maintain the Power Plant.

On June 27, 1996, after international competitive bidding conducted by Privatization, commission, WAPDA divested 36% of its shareholding in the Company to the strategic investor. In February 2005, the Privatization Commission (on behalf of WAPDA) sold another 18% of WAPDA shareholding in the Company to the General Public and the Company became listed Pakistan Stock Exchange. In August 2013, the strategic investor sold its entire shareholding in the Company to local corporate entities and individuals²¹³.

1997- NEPRA Act

In 1997, NEPRA was established as a statutory regulatory body regulator after the promulgation of the *“Regulation of Generation, Transmission and Distribution of Electric Power Act, 1997 (NEPRA Act)”*, to regulate private and public entities/companies/authorities engaged in the energy sector.

1997- CCI Decision for “Privatization of Utilities and other State-owned Entities”

In 1997, the Privatization Commission submitted a further summary to CCI entitled *“Privatization of Utilities and other State-owned Entities”*. The CCI granted post-facto approval (the 1997 CCI Approval) to the work completed to date by the Privatization Commission and decided that sale proceeds from the privatization should be entirely used to repay national debt rather than being utilized for budgetary support. The 1997 CCI approval provided official impetus for initiating the second phase of the Reform Plan, i.e., Decentralization and Corporatization of power sector entities.

1997- WAPDA Hires Consultants for Corporatization/Commercialization of its Assets Blocks

As stated earlier (Section 4.9 above), WAPDA created a WAPAD-CCP team in 1994 to implement *“the Corporatization / Commercialization of WAPDA and its Existing Asset Blocks”* (WAPDA-CCP). In 1997, the team hired consultancy services of a of a foreign firm, namely M/s. SyCip. Gorres. Velayo & Co. and Associates (SGV). The SGV Work Program and Methodology envisaged the restructuring and corporatization of the AEBs into eight government-owned DISCOs. The consultants recommended that:

- The AEBs/DISCOs should have greater influence over the formulation of power distribution expansion programs for their respective areas.
- The AEBs should have full control over electric power lines, equipment and facilities that are integral to their power distribution functions
- Clearer delineation of responsibilities between distribution and transmission companies should be agreed upon.

Regarding restructuring of WAPDA’s entities and functions, the following transaction arrangements were proposed:

- Preparation of legal documentation, i.e.:
 - (1) Memorandum and Articles of Association;

²¹³kapco.com.pk

- (2) Business Transfer Agreement²¹⁴;
- (3) Operation and Development Agreement²¹⁵;
- (4) Licenses for all the companies to be incorporated.
- Legal documents specific to the type of company, i.e., for DISCOs:
 - (1) Electricity Supply Agreement and Novation Agreement;
 - (2) Memorandum of Agreement; and
 - (3) Various correspondences.
- With respect to financial aspects:
 - (1) Opening balance sheets for the newly incorporated companies; and
 - (2) feasibility studies including financial projections, particularly for the model DISCO, GENCO and NTDC.
- With respect to technical/engineering valuation:
 - (1) Listing and classification of assets to be transferred to the model companies; and
 - (2) Valuation methodology to be used and training of WAPDA staff on same.

1998- The Action Plan-1998 & Prime Minister Secretariat's Executive Instructions

After the SGV Consultants report, in 1998 the MoWP sought approval from the Economic Coordination Committee (ECC) for a list of actions to be taken in support of sector restructuring, referred to as the "1998 Action Plan". Upon ECC approval of the Action Plan, the PM Secretariat issued Executive Instructions with directions that 1993 CCI-approved summary for WAPDA Restructuring shall be implemented, and the PEPCO should implement the process²¹⁶. The Executive Instructions specified the following parameters and guidelines for functioning and operations of the newly incorporated power companies:

- Facilitation of WAPDA restructuring; the Chairman WAPDA role would eventually only focus on "Water Wing".
- Share capital of the newly incorporated companies would be in the name of the President of Pakistan and would be voted by PEPCO.
- PEPCO would nominate members for the Boards of the newly incorporated companies.

²¹⁴ The Business Transfer Agreements were executed between WAPDA and each of the relevant corporatized entity (DISCO/GENCO/NTDC) and stipulates the methodology for transfer of business and assets of WAPDA to that particular corporatized entity in lieu of purchase price.

²¹⁵ The Operation and Development Agreements were executed between WAPDA and each of the relevant corporatized entity (DISCO/GENCO/NTDC). The intent of the O&D Agreement was that, following the transfer of the business functions and assets from WAPDA to each of the corporatized entity, the entity would require an operator to supply manpower and to provide development assistance to maintain reliable, quality power supply at affordable prices. It was agreed in the O&D Agreement that WAPDA would take on this responsibility, and provide the services detailed therein to the entity through seconded WAPDA personnel.

²¹⁶ A government-owned company, namely Pakistan Electric Power Company (Pvt.) Limited (PEPCO), which was incorporated to provide stewardship functions for the transition of power functions of WAPDA's Power Wing into 12 companies (generation, transmission and distribution) and to prepare them for privatization. PEPCO was intended to be a "transitional entity" to steward the reform in the sector.

- The Boards of Directors of the newly incorporated companies would independently exercise their powers and perform their functions, including appointing and determining the terms and conditions of their employees.
- The market structure design would be premised on principles of competition, whilst ensuring quality and affordable power to consumers;
- PEPCO would ensure that the restructuring and reform of WAPDA's Power Wing went according to the plan.

1998- Implementation of Action Plan and Federal Government Executive Instructions

Per the "Action Plan-1998" and PM's Executive Instructions, the terms of reference of WAPDA-CCP Services were realigned and linked to two major dimensions of the reform process (1) restructuring WAPDA's Power Wing; and (2) transitioning of WAPDA manpower. A number of interdependent activities from various government levels (not only WAPDA but also other agencies and entities) made part of the reform actions. WAPDA-CCP team proposed the adoption of a single buyer arrangement, with a mandate for continued and dynamic reform measures that would result in more sophisticated pricing models.

In addition to the incorporation of PEPCO in 1998, actions taken under the Reform Plan included:

- Corporatization of WAPDA's Power Wing into eight DISCOs, three GENCOs and NTDC: The respective AEBs were corporatized in 1998 as limited liability companies under the Companies Ordinance, 1984, with their own management and Board of Directors.
- Execution of legal documents, namely:
 - (1) Business Transfer Agreement;
 - (2) Operation and Development Agreement;
 - (3) Electricity Supply Agreement (ESA);
 - (4) Novation of ESA; and
 - (5) Memorandum of Agreement.
- Generation, Transmission & Distribution licenses issued to all government-owned GENCOs, NTDC and DISCOs respectively by NEPRA as a pre-requisite for carrying out their separate businesses.
- Generation, Transmission and Distribution tariffs were to be determined by NEPRA.
- Preparation of the opening balance sheet for each DISCO. The government-owned DISCOs operate as separate corporations, which maintain their own income statements and independent financial statements and accounts.

1998- Power (Generation) Policy

The government announced another energy policy in 1998, a combination of Thermal Power Policy-1994 and 1995 Hydro power Policy. The policy opted for open bids, denominated in Pakistani currency. The bidders required to quote the tariffs/price in two parts, "Capacity Purchase price" and "Energy Purchase Price". This policy exempted

certain taxes and duties and restored the protection against natural disaster. IPPs could raise finance in both local currencies and foreign currencies (GOP, 1998). Hydel power projects would be implemented on Build-Own-Operate-Transfer (BOOT) basis and after the concession period (15-30 years) these projects would be transferred to the government. The thermal projects would be implemented on a Build-Own-Operate (BOO) basis. The government was the sole guarantor of these agreements.

2002- Power (Generation) Policy

The government introduced a new power generation policy to attract the power sector in the generation business. The policy opened both hydro and thermal generation for IPPs (both public and private sector). Under this policy all public sector generation entities are also eligible for Capacity Payments. Salient features of the policy were²¹⁷;

- Concessions of policy were made available to all generators; public, private-public, and private;
- Proposals on sites or without feasibility studies were welcomed;
- Thrust on development of power projects based on indigenous resources and fuel especially coal and renewable;
- Tariffs (for solicited bids) through international competitive bidding;
- Two part tariffs comprising of CPP and EPP;
- To promote indigenization, local engineering industry to develop power projects with cumulative capacity of at least 2000 MW by year 2015.

ii. Policy Achievements

Under the policy-2002, a total 17 IPPs with 4787 MW capacity were established. Out of the total, 6 were based RFO, 7 on Gas/RLNG, and 4 were based on Multiple Fuel Based (HSD, HSFO, RLNG, Gas). One of these with 225 MW capacity, Atlas Power Ltd. Sheikhpura, is currently non-operational²¹⁸. Details of IPPs are as under;

Fuel	IPP	Capacity (MW)	PPA/EPA (25 Years)	COD
RFO	Attock Gen Ltd. Morgah, Rawalpindi	165	01-9-07	17-3-09
	Habco-Narowal Power. Narowal, Punjab	220	20-11-08	22-4-11
	Liberty Power Tech. Faisalabad, near M-3 Industrial Estate	200	01-7-08	13-1-11
	Nishat Power Ltd. Near Lahore	200	13-11-07	09-6-10
	Nishat Chunian Ltd. Near Lahore	200	13-11-07	21-7-10
	Atlas Power	225	06-9-07	18-12-09
Sub-total	6	1210		
Fuel/Tech.	IPP	Capacity (MW)	PPA/EPA	COD

²¹⁷ Policy for Power Generation Projects, 2002.

²¹⁸ PPIB data.

			(25/30 Years)	
Gas/RLNG	Engro Power Ltd. Qadairpur, District Ghotki, Sindh	227	26-9-07 (25 years)	27-3-10
	Saif Power Ltd. Sahiwal, Punjab	229	30-4-07 (30 Years)	27-4-10
	Halmore Power. Bhikki, District Sheikhpura, Punjab	225	28-4-07 (30 Years)	16-6-11
	Orient Power Co. Limited. Balloki, District Kasur, Punjab	229	08-11-06 (30 Years)	24-5-10
	Foundation Power Co. Limited (Fauji Daharki Power). Daharki, District Ghotki, Sindh	185	29-8-07 (25 Years)	16-5-11
	Sapphire Electric Co. Ltd. Muridke, District Sheikhpura, Punjab	225	19-2-07 (30 Years)	05-9-10
	Uch-II Power Project. Dera Murad Jamali, Balochistan	404	19-1-11 (25 Years)	04-4-14
Sub-total	7	1724		
Fuel/Tech.	IPP	Capacity (MW)	PPA/EPA (30 Years)	COD
Hydro	Patrind Hydropower Project. River Kunhar, Muzaffarbad, AJ&K	147	08-3-12	08-11-17
	Gulpur Hydropower Project. Poonch River, Gulpur, AJ&K	102	30-9-15	10-3-20
	Karot Hydropower Project. Jehlum River, Distt. Rawalpindi Punjab	720	30-8-16	29-6-22
	Suki Kinari Hydropower Project. River Kunhar, Mansehra, KP	884	03-20-14	14-9-24
Sub-total	4	1853		
G. Total	17	4787		

2002- National Transmission & Despatch Company License & CPPA Under NTDC

As discussed above, the Strategic Plan-1992 and later the Action Plan-1994, envisioned the creation NTDC as a national transmission company. The NTDC was The National Transmission & Despatch Company (NTDC) of Pakistan was incorporated on November 6, 1998. It began commercial operations on December 24, 1998. NEPRA granted Transmission license to NTDC on 31 December 2002. In accordance with its Transmission License, NTDC also established the Central Power Procurement Agency (CPPA) in 2004. Under Article 8 of the Transmission License the NTDC/CPPA was to procure electric power on behalf of the DISCOs and to prepare the organizations and the sector for transition towards a competitive wholesale/bilateral market (envisaged no late than 1 July 2012). In addition to this CPPA also discharged the functions of billing, settlement and payment to generation companies (GENCO, IPPs, WAPDA Hydel).

2006- National Power Policy for Co-Generation (Alternative Resources of Energy-2006)

In 2006, the government announced another policy for development of alternative and renewable energy projects. The policy supported power plants based on small hydro-power, solar, wind energy and biofuel technologies (Amer & Daim, 2011). The machinery used for these projects was exempted from duties and taxes to attract the investment. Pakistan is an agricultural country and its agriculture contributes 42.3% to employment and 19.5% to GDP (GOP 2016, pp.19). Sugarcane is one of the major crops and almost 83 sugar mills bio-waste has the potential of 3000 MW of energy generation (PPIB. 2008. p.9). The policy offered co-generation energy projects on bagasse as main fuel (a by-product of sugar-cane crushing mills from November to February) and coal from March onward (both imported and local) as main fuel.

This policy provided a 30 years' levelized tariff to the 60 MW capacity plants and above having thermal efficiency of 28% (PPIB.2008. P.10). The previous incentives of 2002 energy policy were also the part of this policy to attract the investors.

iii. Policy Achievements

Under the policy a total of 2525.47MW of capacity was added to the grid through 10 x solar-based IPPs of 680 MW and 35x wind based IPPs of 1845.47 MW. Details are tabulated below;

Fuel/ Tech.	IPP	Capacity (MW)	EPA/PPA (25 years)	COD
Solar PV	Best Green Energy Pakistan Ltd, QA. Solar Power Park near Bahawalpur	100	26-1-15	31-7-16
	Appolo Solar Development Pakistan Ltd, QA. Solar Power Park near Bahawalpur	100	26-6-15	31-5-16
	Crest Energy Pakistan Ltd, QA. Solar Power Park near Bahawalpur	100	26-6-15	31-5-16
	Quaid-e-Azam Solar Power (Pvt.) Limited, Bahawalpur, Punjab	100	8-7-15	31-7-16
	AJ Power (Pvt.) Limited. Khushab, Punjab	12	8-9-16	15-7-15
	Harappa Solar (Pvt.) Ltd. Sahiwal, Punjab	18	30-4-16	13-12-17
	Atlas Solar Limited (Zhenfa Pakistan New Energy Company (Pvt.) Ltd). Layyah, Punjab	100	29-1-21	14-10-17
	Meridian Energy Limited. Sukkur, Sindh	50	18-2-21	14-4-22
	Helios Power Limited. Sukkur, Sindh	50	18-2-21	19-1-24
	HNDS Energy Limited. Sukkur, Sindh	50	18-2-21	1-2-24
Sub-Total	10	680		
Fuel/ Tech.	IPPs	Capacity (MW)	PPAs (20 Years)	COD
	FFC Energy Limited, Jhimpir	49.5	05-4-11	16-5-13
	Zorlu Enerji Pakistan Ltd. Jhimpir	56.4	12-1-12	26-7-13

Wind	Three Gorges First Wind Farm Pakistan (Pvt.) Ltd. Jhimpir	49.5	04-1-13	25-11-14
	Foundation Wind Energy II (Pvt.) Ltd. Gharo	50	20-12-12	10-12-14
	Foundation Wind Energy -I Ltd. Gharo	50	20-12-12	11-4-15
	Sapphire Wind Power Company Ltd. Jhimpir	52.8	20-12-14	22-11-15
	Metro Power Company Ltd. Jhimpir	50	26-2-14	16-9-16
	Yunus Energy Limited. Jhimpir	50	26-3-14	16-9-16
	Master Wind Energy Pvt. Limited. Jhimpir	52.8	16-1-15	14-10-16
	Act Wind (Pvt.) Ltd. (Tapal Wind Energy Pvt. Limited). Jhimpir	30	19-2-15	7-10-16
	Gul Ahmed Wind Power Ltd. Jhimpir	50	30-12-14	18-10-16
	Tenega Generasi Limited. Gharo	49.5	29-12-14	11-10-16
	Hydro China Dawood Power Pvt. Limited. Gharo	49.5	25-9-14	5-4-17
	Sachal Energy Development Pvt. Limited. Jhimpir	49.5	27-2-14	18-4-17
	UEP Wind Power Pvt. Limited. Jhimpir	99	20-9-14	16-6-17
	Jhampir Power (Pvt.) Limited. Jhimpir	49.735	28-7-16	16-3-18
	Hawa Energy Pvt. Limited, Jhimpir	49.735	28-7-16	15-3-18
	Artistic Energy (Pvt.) Ltd. (Hartford Alternative Energy Pvt. Ltd). Jhimpir	49.3	14-11-16	16-3-18
	Three Gorges Second Wind Farm Pakistan Ltd. Jhimpir	49.5	15-12-16	30-6-18
	Three Gorges Third Wind Farm Pakistan (Pvt.) Ltd. Jhimpir	49.5	15-12-16	9-7-18
	Tricon Boston Consulting Corporation Pvt. Ltd -A: Jhimpir	49.735	13-4-17	16-8-18
	Tricon Boston Consulting Corporation Pvt. Ltd - B: Jhimpir	49.735	13-4-17	14-9-18
	Tricon Boston Consulting Corporation Pvt. Ltd - C. Jhimpir	49.735	13-4-17	11-9-18
	Zephyr Power Pvt. Limited. Gharo	50	13-4-17	27-3-19
	Lakeside Energy Pvt. Ltd. Jhimpir	50	11-11-19	14-4-22
	Artistic Wind Power Pvt. Ltd. Jhimpir	50	11-11-19	16-2-22
	Liberty Wind Power 1 Pvt. Ltd. Jhimpir	50	11-11-19	9-4-22
	Indus Wind Energy Ltd. Jhimpir	50	11-11-19	25-3-22
	Master Green Energy Ltd. Jamshoro	50	8-8-19	20-8-21
	ACT2 Wind Pvt. Ltd. Jhimpir	50	11-11-19	27-2-22

	Liberty Wind Power 2 Pvt. Ltd. Jhimpir	50	11-11-19	27-5-22
	Metro Wind Power Ltd. Jhimpir	60	11-11-19	6-6-22
	Nasda Green Energy Pvt. Ltd. Jhimpir	50	11-11-19	2-5-22
	DIN Energy Ltd. Jhimpir	50	11-11-19	27-3-22
	Gul Ahmed Electric Ltd. Jhimpir	50	11-11-19	7-4-22
	Tricom Wind Power Pvt. Ltd	50	11-11-19	1-9-22
Sub-Total	36	1845.47		
G. Total	46	2525.47		

2009- Creation Central Power Purchase Agency –Guaranteed(CPPA-G) as Independent Market Operator

In 2009, the Govt. decided to create an independent company to perform the market functions. The Govt. main objectives were to;

- Introduce a new cash flow management system consistent with sector restructuring;
- Improve fiscal discipline, i.e., DISCOs' ability to honor debts;
- Introduce measures to improve the power supply-demand balance, while ensuring a reasonable quality of service;
- Paving the way toward the next phase of market reform, i.e., competitive trading bilateral contract power market and retail market.

Accordingly, CPPA-G was incorporated in 2009 to take over market functions. However, it remained part of NTDC. On 27 July 2013, the CCI approved the National Power Policy-2013. This policy also called for reforms of CPPA, that still remained a part of NTDC. The Govt. developed two-phased approach to implement the reform of CPPA of NTDC.

The NEPRA Market Operator (Registration, Standards and Procedures) Rules, 2015 (Market Rules) mentions two phases for reforms of market operator; In Phase-I, legal documents necessary for operationalization of CPPA-G as an independent legal entity as Market operator would be completed. In the second phase, all other legal documents essential for complete transition to and development of fully competitive wholesale power market would be done.

In addition to its function as a market operator, CPPA-G also acts as the sole agent of DISCOs and purchaser of capacity and energy from the Generation Companies, and to settle the energy and capacity taken by the Distribution Companies.

2013- Frame Work for Power Co-Generation 2013 (Bagasse / Biomass): Addendum to the Renewable Energy Policy 2006.

The period between 2008-2013 saw the energy crisis worsening and the gap between demand and supply reaching to 5,500 MW. On 6 March 2013, the Economic Coordination Committee of the Cabinet (ECC) approved the 'Framework for Power Cogeneration 2013 Bagasse and Biomass' as an addendum to the Renewable Energy Policy 2006. The ECC also approved the following: -

- The scope of the Renewable Energy Policy 2006 shall include Bagasse / biomass / Waste-to-Energy, Bioenergy.
- The Renewable Energy Policy 2006 to be extended and continued for an additional five years w.e.f 06 March 2013.

Concession of the 2013 Co-generation Policy are as under;

- The Power Producer may establish the project as part of an existing sugar mill or as a separate entity.
- AEDB shall act as the coordinating agency for high-pressure (minimum 60 bar) bagasse / biomass-based projects.
- Upfront tariff for bagasse / biomass-based cogeneration projects to be determined by NEPRA.
- Tariff shall be on a per unit basis for energy delivered to the grid
- The Power Producer shall have the option to opt for Upfront tariff.
- The Power Purchaser shall evacuate all the energy offered, failing which such plants shall be deemed to have dispatched and sold the energy to the Power Purchaser. The CPPA shall bill the payment against such un-evacuated energy to the DISCO concerned.
- All financial and fiscal incentives available to renewable energy projects as per clause 8.6 of Renewable Energy Policy of 2006 (which are deemed to form part hereof) shall be applicable to all the power projects implemented under this addendum. For this purpose, power generation units of sugar mills shall be considered a separate entity.
- This framework shall be applicable to all bagasse / biomass based projects commissioned after January 2013.
- Wheeling shall be an option for Power Producers as allowed in the Renewable Energy Policy of 2006.

2.26.1 Policy Achievements

After this policy framework-2013, a total of 259 MW capacity on Bagasse was added to the system as detailed below;

Fuel	Plant	Capacity (MW)	PPA/EPA (30 Years)	COD
	JDW Sugar Mills Ltd (Unit-II) Rahim Yar Khan.	26.35	20-3-14	12-6-14
	JDW Sugar Mills Ltd (Unit-III), Ghotki.	26.35	20-3-14	03-10-14

Bagasse	Chiniot Power Limited Chiniot.	62.4	22-7-14	28-11-15
	RYK Mills Limited. Rahim Yar Khan.	30	10-10-14	24-3-15
	Hamza Sugar Mills Ltd. Rahim Yar Khan.	15	11-8-15	10-3-17
	The Thal Industries (Corp.) Limited (Layyah), Layyah.	41	18-4-16	01-12-17
	Almoiz Industries (Pvt.) Ltd. Mianwali	36	10-5-17	04-1-19
	Chanar Energy Limited. Faisalabad,	22	24-4-17	15-2-19
Total	8	259.10		

2015 - Power (Generation) Policy

In 2015, the Government of Pakistan through PPIB issued a comprehensive policy covering investments in thermal, hydro, renewable etc. resources for electricity generation. The scope of the power policy was²¹⁹;

- Private sector power projects.
- Public sector power projects, where required by the Project Sponsor.
- Public-Private Partnership (PPP) power projects.
- Power projects developed by public sector and subsequently divested.

iv. Hydropower Projects

The policy covered;

- Raw Site projects (with no feasibility study and engineering design yet) to be developed in private sector;
- Projects (with completed feasibility and engineering designs by private/public sector), may be developed in private sector;
- Projects under Public Private Partnership (PPP) arrangement;
- In case of electricity purchaser is a Federal entity, Private, Public or PPP mode projects awarded by Provinces, AJK or Gilgit-Baltistan, tariffs will be determined by NEPRA and GOP Guarantee is required;
- Only the run-of-river hydropower projects will be offered under this policy;
- Tariff will be determined as per NEPRA's or Provincial Regulator's Mechanism for Tariff Determination or any such procedure notified

²¹⁹ Power Generation Policy-2015, Private Power & Infrastructure Board, Ministry of Water & Power, April 2015.

by NEPRA or Provincial Regulator from time to time.

- The projects shall be implemented on BOOT basis or any other mode with 30 years' concession period for private sector.
- Water Use Charges (WUC) will be paid @ Rs. 0.425/kWh by the private sector hydropower projects to the province / AJK / GB.

v. Thermal Power Projects

- **The solicited projects**, may be processed and awarded through International Competitive Bidding (ICB) based on upfront tariff. For this purpose, following modes may be adopted:
- **Projects Awarded/Recommended by Provincial/AJK/GB Governments:** Projects designated and awarded by Provinces/AJK/GB in accordance with their applicable laws and recommend to PPIB for their further processing, PPIB may process the project further under this Policy
- **Public Private Partnership:** The concessions available to private power projects will also be available to PPP mode projects.
- **Public Sector Power Projects:** The incentives available to private power projects will also be available to Federal Govt., Provincial Govt. or Local Authority, which subsequently, divest such power projects.

vi. Bank Guarantee/Bid Bond, Letter of Intent, & Letter of Support:

- **Bank Guarantee**

PPIB will accept Bank Guarantee in US Dollars. However, the Bank Guarantee may be payable in equivalent Pak Rupees at the prevailing exchange rates at the date of encashment.

- **Bond**

For ICB projects and solicited proposals, the bidders will be required to submit bid bond in the form of Bank Guarantee @ USD 1000/MW in favor of PPIB along with the bids;

- **Letter of Intent (LOI)**

Upon fulfilment of requirements of the Policy and approval of PPIB Board, the PPIB will issue LOI to sponsors against submission of Bank Guarantee by the Sponsors @ US\$ 1000/MW in favor of PPIB.

- **Letter of Support (LOS)**

Once the tariff is approved/determined by NEPRA, PPIB will issue LOS

to sponsors against submission of Bank Guarantee by the Sponsors @ US\$ 5000/MW in favor of PPIB.

- **Interconnection agreement:**

The power tariff will be based on the point of delivery indicated by the Power Purchaser. The delivery point will either be the outgoing bus bar of the power plant (a central hub, a solid conductor or a group of conductors, that distributes power from incoming feeders to outgoing feeders) or a specific location on the grid of the power purchaser, depending upon one of the following options:

- **Tariff Structure**

- The Tariff will be offered in two parts: (1) Energy Purchase Price (EPP) and (2) Capacity Purchase Price (CPP).
- The CPP will be expressed in Rs. /kW/hour or Rs./kW/month which is payable provided the plant is made available for despatch by the company as per PPA.
- The tariff will be denominated in Pakistan Rupee.
- Specified adjustments for exchange rate variations of US Dollar, Pound Sterling, Euro and Japanese Yen shall be allowed. The adjustment related to debt servicing shall be allowed for the aforesaid currencies.
- The sum of EPP and non-debt related CPP will remain constant or increase over time.
- For project life, quarterly adjustments / indexations for local inflation, foreign inflation, exchange rate variations and interest rate variations will be made on 1st July, 1st October, 1st January and 1st April each year based on latest available data by the Federal Bureau of Statistics (FBS), US CPI issued by US Bureau of Labor Statistics and revised TT&OD selling rate of foreign currencies (US Dollar, British Pound Sterling, Euro and Japanese Yen) issued by the National Bank of Pakistan.

- **Financing of the Project**

The minimum equity shall be 20% and the maximum equity shall be 30%. However, if equity is more than 30% of the capital cost, equity in excess of 30% shall be treated as debt.

- **Security guarantees**

The GOP would inter alia:

- Guarantee the payment obligations of the Power Purchaser if it is a Federal entity;
- Guarantee the payment obligations of provincial/AJK/GB governments under the GOP IA;
- Provide protection against specified force majeure events as contained in the standard;
- Provide protection to the power projects against changes in the taxes and duties regime;
- Ensure convertibility of Pakistan Rupees into US Dollars and the remitability of foreign exchange to cover necessary payments related to the projects;
- The Company is entitled for delayed payment interest at the rate of 3-months KIBOR plus 200 basis points to be specified in the PPA;
- **Fiscal incentives**
 - An attractive Return on Equity / IRR shall be allowed in the tariff by NEPRA. Preference will be given to projects based on cheaper, renewable, cleaner and indigenous sources of energy.
 - The exemption from Income Tax under Clause 132 of Part-1 of the Second Schedule to the Income Tax Ordinance, 2001 shall be available to the new IPPs and PPP projects, and for any expansion of projects by IPPs that are already in operation.
 - Sponsors of the power project will be allowed to import plant and equipment not manufactured locally at a concessionary rate of 5% custom duty. The EOB will notify in advance list of locally manufactured goods in relation to power generation projects.
 - Companies will also be including turnover rate tax, completely exempted from the payment of income tax, and withholding tax on imports.
 - Repatriation of equity along with dividends is freely allowed, subject to prescribed rules and regulations.
 - Parties may raise local and foreign finance in accordance with regulations applicable to industry in general.
 - Non- Muslims and Non-residents shall be exempted from payment of Zakat on dividends paid by the company.

- **Financial regime**

- Permission for power generation companies to issue corporate registered bonds.
- Permission to issue shares at discounted prices to enable venture capitalists to be provided higher rates of return proportionate to the risk.
- Permission for foreign banks to underwrite the issue of shares and bonds by the private power companies to the extent allowed under the laws of Pakistan.
- Non-residents are allowed to purchase securities issued by Pakistani companies without the State Bank of Pakistan's permissions and subject to the prescribed rules and regulations.
- 100% foreign ownership of companies is permissible.

- **Applicability of the Policy**

This Policy was applicable to new power projects. Notwithstanding, the projects having valid LOI as of 15th February 2015 under Policy 2002 and/or Guidelines 2010, they had the option to opt for this Policy within one month of its coming into effect.

- **Savings**

This Policy will not be applicable to renewable energy power projects implemented under the Renewable Energy Policy 2006.

vii. Policy Achievements

The 2015 policy attracted the highest capacity addition to the national grid totaling **12,156 MWs**. The reasons for this additions were two folds; the policy allowed all kinds of fuels for generation purposes, and CPEC projects were launched to improve the country's energy infrastructure. Under the policy, following IPPs were established;

Fuel	IPPs	Capacity (MW)	PPAs/EPAs (30 Years)	COD
Imported Coal	Sahiwal Power Project, Qadirabad	1320	11-7-15	28-10-17
	Port Qasim Power Project, Karachi	1320	18-Apr-15	25-4-18
	HUB Power Project, Hub, Balochistan	1320	25-Jan-17	17-8-19
Sub-Total	3	3960		
Thar Coal	Engro Power Project	660	04-5-15	10-7-19
	Lucky Electric Thar Coal Project	660	07-3-18	21-3-22
	HUBCO Thar Coal Power Project	330	27-7-17	01-10-22

	Shanghai Thar Coal Project	1320	27-8-19	05-2-23
	Thal-Nova Thar Coal Power Project	330	21-7-17	17-2-23
Sub-Total	5	3300		
RLNG	Bhikki Power Project, District Sheikhpura	1180	22-7-16	20-5-18
	Balloki Power Project, Baloki District Kasur	1223	29-10-16	29-7-18
	Haveli Bahadur Shah Power Project, Haveli Bahadur Shah, District Jhang,	1230	29-10-16	09-5-18
	PTPL Power Project, Near Trimmu Barrage, Jhang,	1263	22-6-20	23-6-23
Sub-Total	4	4896		
Grand Total	12	12,156		

April 2015 - Power Transmission Policy

In April 2015, the Govt. issued the “Policy Framework for Private Sector Transmission Line Projects-2015”. The policy sought to solicit proposals from the private sector for investment in both AC and DC Extra High Voltage (EHV) Power Transmission Lines, Substations, and Converter Stations. The projects might comprise of one or more Transmission Line sections along with the associated Grid/Converter Stations. The salient features of the packages are;

- **Choice of Projects and Objectives**

- The TL projects on BOOT basis for concession period of 25 years, following which they will be transferred to NTDCL.
- International Competitive Bidding (ICB), based on levelized tariff, will be carried out.
- The projects may also be awarded on the basis of Upfront Tariff announced by NEPRA;
- NTDCL will carry out interconnection studies including load-flow, short-circuit and transient stability studies for the projects.
- The exact route/corridor for various transmission lines packages and locations of Grid/Converter Stations would be determined by the GOP or NTDCL.
- The O&M of Transmission Line and GS/CS will be performed according to International standards/norms.
- Land acquisition and acquisition of the legal right of way will primarily be the responsibility of NTDCL. This will be provided on long-term lease to the ITC.

- **Financing Guarantees**

- These projects will involve limited recourse financing.

- The minimum requirement for equity investment is 20% of the capital cost of the project.
- Permission for power transmission companies to issue corporate registered bonds;
- **Fiscal Incentives**
 - Profits and gains derived by the ITC from Transmission Line projects shall be exempt from corporate income tax for a period of 10 years.
 - Payment of minimum tax on turnover and payment of alternate corporate tax, respectively shall not be applicable for a period of ten years from the date of establishment of the ITC or commencement of business date.
 - The ITC is allowed to import plant and equipment upon payment of reduced Customs Duty of 5%.
 - Provisions of Section 148 of Customs Act shall not be applicable to Transmission Line projects' import of plant and machinery and specialized vehicles for a period of 10 years.
 - Sales Tax on import of machinery, equipment and other capital goods shall be charged at the rate of 5% and shall be non-adjustable/non-refundable.
 - The ITC is allowed to register anywhere in Pakistan to avail reduction in stamp duty and registration fee.
 - The ITC is free to get insurance from any source as per requirement of lenders and utilities.
 - The ITC is eligible for all other concessions which are available to industrial projects.
 - The sponsors may raise local and foreign finance in accordance with the regulations applicable to industry in general.
 - Repatriation of equity along with dividends is freely allowed, subject to the prescribed rules and regulations.
 - Non-Muslims and non-resident shareholders shall be exempt from the payment of Zakat on dividends paid by the ITC.
- **Security Package**

For independent transmission projects, the Government will:

 - Provide protection against political force majeure risk;
 - Provide protection against changes in certain taxes and duties;
 - Compensation in case the GOP/NTDCL defaults in its obligations towards the ITC.
- **Transmission Service Charge**
 - The Transmission Service Charge (TSC) will be designed to recover all

O&M Costs, Debt Serving and RoE including redemption of equity of the investors.

- The ITC (Independent Transmission Company) will charge the power purchaser a TSC based on annual revenue requirements.
- All TSC payments made to the ITC will be in Pak Rupees; while a single TSC will be calculated in Rs./kWh.
- The bidders/sponsors may split the above cost components into Pak Rupee and foreign currency costs.
- The TSC shall be paid in Pak Rupees and will be indexed for inflation and exchange rate variations on the allowed components of the TSC according to the date and parameters as defined in the bidding documents.

viii. Achievements of the Policy

Under the policy, the Pak Matiari-Lahore Transmission Company Pvt Ltd. (PMLTC), a wholly-owned subsidiary of China Electric Power Equipment & Technology Co. Ltd (CET), commissioned the +660kV HVDC Matiari-Lahore transmission line (878 Km) project through private sector investment. This new transmission line was initiated with private sector under the Policy Framework for Private Sector Transmission Line Projects, 2015 (the TL Policy 2015). The project achieved the Commercial Operation Date (COD) on 1st September, 2021 and now the project is operating on full swing

4- Post-Reform Power Sector Eco System

The Electricity Market Players

After unbundling of WAPDA, a multitude of private and public sector organizations, companies and statutory authorities have cropped up. Mainly, the Ministry of Energy established in 2017 administers such entities as discussed in brief below.²²⁰

Ministry of Energy (MoE), Power Division

Ministry of Energy (Power Division) was established in August, 2017 after splitting the Ministry of Water and Power. The Water Division was merged with the newly created Ministry of Water Resources, and the Power Division was moved under the newly created Ministry of Energy. Ministry of Energy consists of two Divisions, namely Power Division and Petroleum Division

Ministry of Energy (Power Division) has been mainly dealing with the subject of electricity, which include generation, transmission, and distribution, and policy matters pertaining to these three functions. Right now, there are 23 public sector companies and

²²⁰ Ministry of Energy (Power Division), Year Book 2023-24.

02 statutory bodies working under the Power Division. The power polices, power finance, operational matters pertaining to the above three functions, and administrative matters of 24 Entities/ organizations are being dealt respectively by the Power Finance, Corporate Affairs & DISCOs, Transmission, Tariff & Subsidy, and Development Wings within the Power Division. Main functions of the Ministry include;

- Power Policy Development
- Power Sector Development
- Financing of Power Sector
- Tariffs & Subsidies to Power Sector
- Corporate Affairs of Public Companies including DISCOs
- Transmission Sector

A brief description of the 25 attached departments, public sector companies and statutory organizations attached with Power Division, and other independent /autonomous actors in the electricity sector is as under;

Attached Departments of MoE, Power Division

i. National Power Parks Management Company Ltd. (NPPMCL)

National Power Parks Management Company Ltd. (NPPMCL) was incorporated in 2015 under the Companies Ordinance, 1984 and is a wholly owned Company of the Government of Pakistan (GOP). The Company owns and operates two R-LNG based Combined Cycle Power Plants (CCPP), namely 1230 MW Haveli Bahadur Shah (HBS) and 1223 MW Balloki. Both plants were established under the Power Generation Policy, 2015. The configuration of each of the Power Plant is 02x Gas Turbines (General Electric, France), 02 x HRSGs and 01 x Steam Turbine. These plants and generators are the most efficient plants in Pakistan. Guaranteed Net thermal efficiencies of these plants were 62.185% for Haveli Bahadur Shah Plant, and 61.7% for Balloki (2023-24).

ii. Power Planning & Monitoring Company (PPMC, previously PEPCO)

The PPMC coordinates and monitors key indicators like line losses, recoveries and theft control as designated agency of MoE (Power Division). With data DISCOs, PPMC prepares reports on the performance of DISCOs, collectively as well as individually. PPMC also provides support to the government in developing policies and strategic plans.

iii. Private Power and Infrastructure Board (PPIB, previously Private Power Cell in WAPDA/MoWP)

PPIB Facilitates private sector investment in power generation, particularly through Independent Power Producers (IPPs) mode, and manages project approvals. It is a 'One Window' facilitator for the investors in power generation/transmission line.

PPIB is also processing public sector power generation projects on IPP-mode with same incentives, concessions and facilitation as being provided to the private sector IPPs. During the period 2018-19, the PPIB projects included;

iv. Central Power Purchasing Agency - Guarantee Limited (CPPA-G)

The CPPA-G become as an independent market operator in April 2015. NEPRA granted market operator license to CPPA-G in 2022, and extended its certificate of registration as power purchaser. The main job of CPPA-G includes billing & settlements and power procurement from all generators on behalf of DISCOs. However, since 2018, the CPPA-G is also obligated to establish legal section, develop market, and work as tax collector on behalf of government, provide PIU and IT services. The CPPA also acts as a market operator, managing billing, settlement and payments.

v. National Transmission and Despatch Company (NTDC)

The NTDC was incorporated under the Companies Ordinance 1984 (now Companies Act 2017) on 6th November 1998 to plan, design, build, operate and maintain extra-high-voltage electric power transmission system. After having Certificate for Commencement of Business, NTDC started its commercial operations from March 01, 1999. The paid-up/share Capital of the Company is Rs. 52.7 Billion (5.27 Billion ordinary shares of Rs. 10 each). GoP owns 88% shares whereas employee owns 12% (2018-19)²²¹. NEPRA granted Transmission License vide No. T.L/01/2002 on 31-12-2002 to NTDC for exclusive transmission business for a term of thirty years. The transmission voltage under the license is 220 kV and above. The Company is responsible for evacuation of Power from the Hydroelectric Power Plants (mainly in the North), the Thermal Units of Public (GENCOs) and Private Sectors (IPPs) (mainly in the South) to the Power Distribution Companies through primary (EHV) Network.

The NTDC manages the operation and maintenance (O&M) of the transmission network comprising 19 Nos. 500 kV and 50 Nos. 220 kV grid stations besides 21,490 km of 500 kV and 220 kV transmission lines network spread across the country.

As per license and responsibilities, the NTDC is;

- **Transmission Network Operator (TNO)**
 - Operation and maintenance of existing 500 & 220 kV network
 - Planning, design and construction of new 500 and 220 kV System
 - Strengthening and upgrading of existing transmission network.
- **System Operator (SO) & Despatch- NPCC managed (stands transferred to ISMO)**

²²¹ Ministry of Energy Yearbook (2018-2019).

- Arranging non-discriminatory, non-preferential economic despatch
- Ensuring safe, secure and reliable supply
- **Wire Business**
 - Transmission Planning
 - Transmission Design & Engineering
 - Transmission Project Development and Execution
 - Operation and Maintenance of Transmission Assets

vi. National Energy Efficiency & Conservation Authority (NEECA)

The National Energy Efficiency and Conservation Act 2016 was passed by the Parliament in July 2016. Under Act-2016, the restructuring of the National Energy Efficiency and Conservation Authority was undertaken (9 August 2019). Per provisions of the Act, NEECA activities include;

- Energy Efficient Public Buildings and Green Procurement Program
- Energy Conservation Building Codes
- Energy Audits of Industries, Buildings & Brick Kilns
- Awareness Sessions
- Miscellaneous

vii. DISCOs (Distribution Companies)

DISCOs are responsible for efficient and equitable electricity distribution within their respective territories. They handle billing, revenue collection, consumer complaints, and ensure reliable service. They manage the operation and maintenance of distribution infrastructure, including feeders, transformers, and meters. They balance load demand and maintain supply reliability while minimizing outages. Operating within regulatory frameworks set by NEPRA, DISCOs implement policies related to tariffs, subsidies, and reforms. Infrastructure modernization, such as the adoption of smart grids and automated systems, also forms part of their operational scope. Additionally, they are tasked with reducing AT&C losses through operational efficiency and anti-theft measures. DISCO efficiency directly impacts the energy sector's sustainability, consumer satisfaction, and national economic growth.

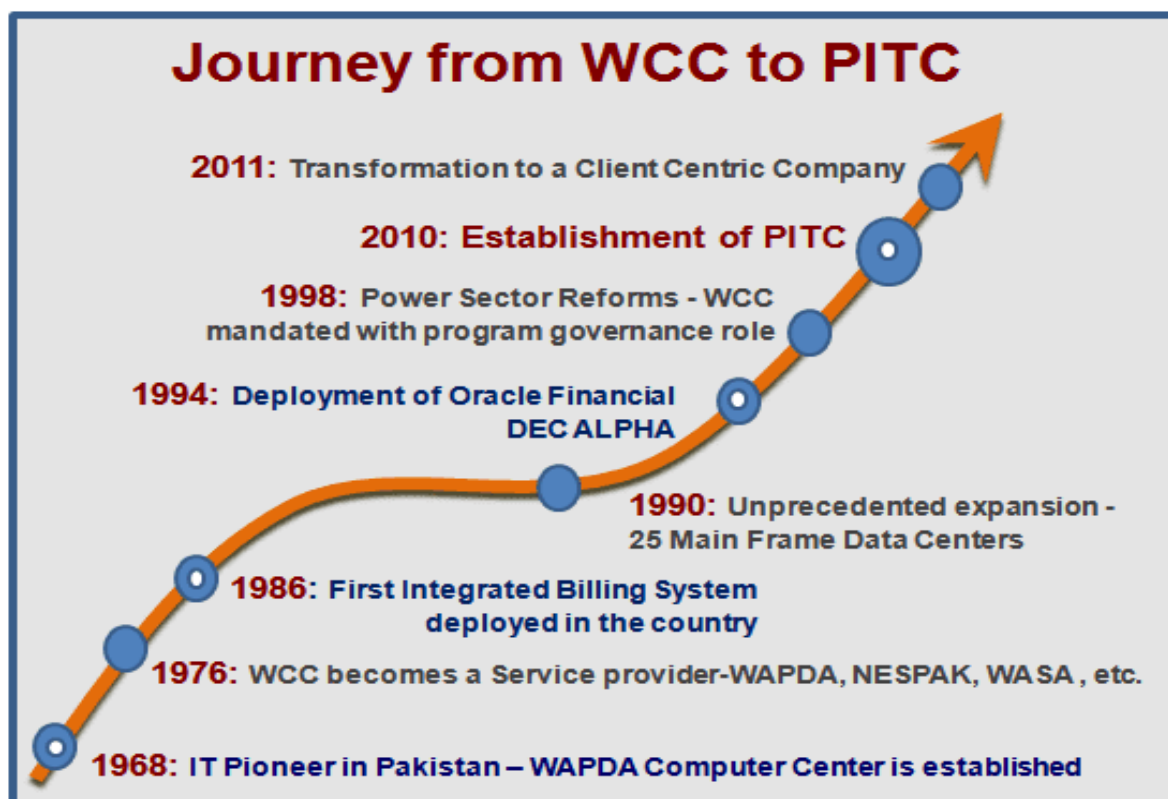
There are eleven DISCOs across the country. They are;

- Peshawar Electric Supply Company, (PESCO), Peshawar.
- Islamabad Electric Supply Company, (IESCO), Islamabad.
- Gujranwala Electric Power Company, (GEPCO), Gujranwala.
- Lahore Electric Supply Company, (LESCO), Lahore.
- Faisalabad Electric Supply Company, (FESCO), Faisalabad.

- Multan Electric Power Company, (MEPCO), Multan.
- Sukkur Electric Power Company, (SEPCO), Sukkur.
- Hyderabad Electric Supply Company, (HESCO), Hyderabad.
- Quetta Electric Supply Company, (QESCO), Quetta.
- Tribal Area Electric Supply Company, (TESCO), Peshawar.
- Hazara Electric Supply Company (HAZECO), Peshawar.

viii. Power Information Technology Company (PITC)

Power Information Technology Company Private Limited (PITC) is a commercial state-owned enterprise registered with SECP under section 42 of companies Act 2017. Its mandate is to provide IT services and technology solutions to all DISCOs and power sector entities to improve their efficiency, effectiveness and profitability and additional services. The IT services are provisioned through primary and disaster recovery sites (data centers) which are established at WAPDA House, and Aiwan-e-Iqbal, Lahore, respectively. The IT services are offered to DISCOS is Software as a Service (SaaS) model and DISCOs are charged on /consumer /month basis. The DISCOs pass on these costs to the consumers through quarterly tariff adjustment. Additionally, PITC provides technical consultancy, and other ICT support to various subsidiaries of PPMC and WAPDA.



ix. GENCOs Holding Company Limited (GHCL)

GENCO Holding Company Limited (the Company) is a public limited company incorporated on 9th February, 2012. The main objects of the Company are to improve performance of the public sector Thermal Generation Companies, which were created and incorporated after WAPDA's unbundling in 1999. The consolidated control of GENCOs was given under GHCL for better corporate management, improved financial control, and business planning. The offices of General Manager Thermal Operations and General Manager Design & Development (Thermal), which were initially established by WAPDA for operational management and development of new thermal power plants, were placed under the PEPCO after the unbundling of WAPDA, were transferred to GHCL on 10 April 2012.

Currently, the GENCOs managed by GHCL include;

- **Jamshoro Power Company Ltd. (GENCO-I)**
Commissioned between 1989 and 1991, the Jamshoro Power Station (GENCO-I) is a thermal power plant fueled by natural gas and fuel oil. It is operated by the Jamshoro Power Company. The Company manages and operates;
 - 144 MW Gas Turbine Power Station Kotri
 - Coal Power Project, Jamshoro (Not yet installed)
 - 2 x 660 MW Coal Fired Power Project Jamshoro Lot-I (Unit #1 plus Common Facilities)
 - 2 x 660 MW Coal Fired Power Project Jamshoro Lot-II (Unit #2 plus remaining Common Facilities)
- **Central Power Generation Company Ltd. (GENCO-II)-Guddu**
Guddu Thermal Power Station (GENCO-II) is the biggest Thermal Power Generation Complex of Pakistan in public sector, having total installed capacity of 2402 MW and licensed capacity of 1762 MW. The power station is situated on the right bank of River Indus near Guddu Barrage. GENCO-II is located in the Centre of NTDC transmission network, hence the Generating Units are connected with 132 kV, 220 kV and 500 kV grids. The plants use indigenous Gas from Mari & Kandh Kot.
- **Northern Power Generation Company Ltd. (GENCO-III)**
NPGCL consists of three Power Complexes;
 - Thermal Power Station (TPS) Muzaffargarh;
 - Gas Turbine Power Station (GTPS) Faisalabad (Generation License of GTPS Faisalabad is expired since 30.06.2022); and
 - 425 MW CCPP Nandipur.

During FY 2023-24, no substantial generation of electricity could be made from NPGCL Plants due to less demand from NPCC (system Operator). However, machines remained available for generation in Standby mode²²².

- **Lakhra Power Generation Company Ltd. (GENCO-IV)- Jamshoro**

The 150 MW Power Plant, the sole Power Plant of Lakhra Power Generation Company, was closed on the decision of Cabinet Committee on Energy (CCoE) dated 10.09.2020. the CCoE had decided close some of the Public Sector Power Plants including Lakhra Power Plant of LPGCL GENCO-IV. The Plant was already shutdown after a fire incident on 20th July 2017, but LPGCL Board was retaining the plant.

Further, MoE (PD) vide decision dated. 07.02.2023, directed that custody of LPGCL Lakhra may be handed over to JPCL Jamshoro as both are situated in District, Jamshoro. MoE instructed vide letter dated 07.05.2024 & GHCL dated 10.05.2024, directed LPGCL to handover the plant to JCPL Jamshoro, and retain staff till the final Disposal of Power Plant.

x. Power Holding Private Limited (PHPL)

Power Holding Limited(PHL) is a special purpose vehicle with specific mandate of holding debt of power sector and is a channel for servicing this debt. The company was initially incorporated as Private Limited Company. However subsequent to issuance of Pakistan Energy Sukuk-I by PHPL, status of company has been converted from Private Limited to Public Limited with effect from 01-04-2019. The company is wholly owned by the Government of Pakistan and is under the administrative control of Ministry of Energy (Power Division).

During 2023-24, PHL paid principal amount of Rs. 82.00 billion to Oil & Gas Development Company from budgetary allocation to reduce its debt from Rs. 765.253 billion to 683.253 billion. Additionally, during FY 2023-24, a mark-up amount of Rs. 153.073 billion has been repaid to the lenders in respect of PHL Debt. The amount was raised through the FCs @ Rs. 3.23 per unit imposed by the Government of Pakistan on consumers²²³.

Other Power Sector Organizations/Authorities

xi. Alternative Energy Development Board (AEDB) (Stands Merged with PPIB since 2023)

The AEDB was created through the AEDB-2010 (Act XIV of 2010). It was meant to promote and facilitate the development and deployment of alternative and renewable energy technologies in the country. The development of renewable energy based power generation projects was pursued on IPP-mode in private sector. AEDB initiated the formulation of the new draft ARE Policy 2019, targeting a share

²²² Ministry of Energy, Yearbook 2023-24.

²²³ Ministry of Energy, Yearbook 2023-24.

of 30% RE in power mix by 2030. The status of RE power projects as of 30th June, 2019 is given below²²⁴:

- Twenty-Four (24) wind power projects of 1233.37 MW cumulative capacity were operational and providing electricity to the grid.
- Six (06) solar projects of 430 MW cumulative capacity were operational.
- Eight (08) sugar mill based bagasse co-generation projects of 259.1 MW capacity were operational. One project of 74.4 MW capacity was under construction

AEDB promoted the net metering concept and facilitated the concerned stakeholders in implementation Net Metering systems under NEPRA's regulations.

The Alternative Energy Development Board (AEDB) was merged with the Private Power and Infrastructure Board (PPIB) on June 10, 2023. According to the PPIB, upon promulgation of the Private Power and Infrastructure Board (Amendment) Act, 2023 notified through the Gazette of Pakistan (Extraordinary, Part-1, as an Act No XXVI of 2023 of June 10, 2023), the AEDB has been merged with the PPIB. The AEDB-2010 (Act XIV of 2010) stands repealed/ dissolved, henceforth.

xii. Water and Power Development Authority (WAPDA)

The WAPDA develops water and hydropower resources, and manages large-scale projects for irrigation, flood control, and hydroelectric generation.

xiii. Independent Power Producers (IPPs)

IPPs are the private/public sector entities that generate electricity under long-term agreements with the government. The number of private IPPS in Pakistan are around one hundred (100) with capacity in excess of 22000 MW cumulatively. These IPPs have been commissioned and contracted under various policies since 1994 on gas, coal, RLNG, RFO, hydel, solar and wind etc. The terms of most of IPPs include both Capacity Purchase Price and Energy Purchase price. The model used for purchase of electricity in most cases is Take-or-Pay, while new plants are being installed on the Take-and-Pay basis.

xiv. KE (K-Electric)

A private company that manages generation, transmission, and distribution of electricity exclusively in Karachi and surrounding areas.

xv. Pakistan Atomic Energy Commission (PAEC)

The PAEC develops and manages nuclear power plants, focusing on providing sustainable and clean energy.

²²⁴ Ministry of Energy (Power Division), Year Book 2018-19.

xvi. Independent System and Market Operator (ISMO)

The Cabinet Committee on Energy gave its principal approval for the formation of the Independent System and Market Operator (ISMO) on 8 October 2024. The ISMO will be an independent multi-player market for electricity generation and procurement in Pakistan. It has taken over the system operation functions of National Power Control Centre (“NPCC”) under NTDC, and the market operations functions of the CPPA-G. ISMO will maintain a balance between electricity supply and demand, dispatching power from plants through the 500/220/132kV transmission network. It will also perform functions like generation planning and economic dispatch, transmission operation and control, and load management during emergencies.

ISMO will gradually end the government’s role as the sole buyer of electricity in the country, transforming the market into a multi-player independent market (CTBCM). Through this entity, an efficient and transparent competitive electricity market will be established in Pakistan. This system will allow consumers to purchase electricity from suppliers other than the distribution companies.

xvii. Pak Lahore-Matiari Transmission Company (PMLTC)

Lahore Transmission Company Pvt Ltd. (PMLTC) is a wholly-owned subsidiary of China Electric Power Equipment & Technology Co. Ltd (CET). The company commissioned the +660kV HVDC Matiari-Lahore transmission line (878 Km) project through private sector investment. This new transmission line was initiated with private sector under the Policy Framework for Private Sector Transmission Line Projects, 2015 (the TL Policy 2015), The project achieved the Commercial Operation Date (COD) on 1st September, 2021 and now the project is operating on full swing, was commissioned.

The Matiari-Lahore transmission line runs from south to north Pakistan, complete with three repeater stations, two converter stations at Matiari and Lahore, two 40 km electrode lines, and two grounding electrode stations. It starts at Matiari, Sindh and runs to the Nankana Sahib District near Lahore, Punjab. The line is capable of transmitting up to 4 GW (4,000 megawatts) of electricity. Constructed under the China-Pakistan Economic Corridor (CPEC), the transmission project is the first HVDC line and the first private sector transmission project developed in Pakistan. The \$1.6 billion project was developed on BOOT basis for a 25-year concession period term by the SGCC through a special purpose company named the Pak Matiari-Lahore Transmission Line Company.

xviii. Net-Metering

Government has taken several supportive steps for deployment of net metering systems. As of May, 2024, the total capacity of net-metering based installations has

reached up to 2187 MW which translates into 4.8% of the total utility scale grid connected power generation capacity of Pakistan.

xix. The Regulatory Regime - NEPRA

NEPRA is a quasi-judicial organization to regulate the power sector of Pakistan. It was established under Section 3 of the Regulation of Generation, Transmission and Distribution of Electric Power Act, 1997 (NEPRA Act No. XL 1997) to exclusively regulate the provision of electric power services in Pakistan. The said Act has undergone amendments over time, but the main amendments were introduced in the Regulation of Generation, Transmission and Distribution of Electric Power (Amendment) Act, 2018 [Act No. XII of 2018] (The Act), which has overhauled the role and responsibilities of NEPRA.

Initially, NEPRA was established as an autonomous organization with no administrative control from the GOP. However, for better interaction with Federal and Provincial Governments, it was made an attached department to the Ministry of Water and Power. Later, it was allied with GOP through the Ministry of Law and Justice. Since 2000, NEPRA has been under the Cabinet Division (Malik, 2024).

The powers and functions of the Authority as delineated in the Regulation of Generation, Transmission and Distribution of Electric Power (Amendment) Act, 2018 [Act No. XII of 2018] are:

- Grant of licenses under this Act:
- Specify procedures and standards for investment programs by generation companies and persons licensed or registered under the Act.
- Specify and enforce performance standards for generation companies and persons licensed or registered under the Act.
- Specify accounting standards and establish a uniform system of account by generation companies and persons licensed or registered under the Act.
- Review its order, decisions or determinations.
- Settle disputes between licensees in accordance with the specified procedure.
- Issue guidelines and standard operating procedures.
- Promote the development of a market, including trading, in accordance with the national electricity policy and the national electricity plan.
- Determine tariff, rates, charges and other terms and conditions for supply of electric power services by the generation, transmission and distribution companies and recommend to the Federal Government for notification.
- Review organizational affairs of generation companies and persons licensed or registered under this Act to avoid any adverse effect on the operation of electric power services and for continuous and efficient supply of such services.
- Encourage uniform industry standards and code of conduct for generation companies and persons licensed or registered under this Act.

- Tender advice to public sector projects.
- Submit reports to the Federal Government in respect of activities of generation companies and persons licensed or registered under this Act.
- Perform any other function which is incidental or consequential to any of the aforesaid functions.

ANNEXURE-E: IPPs by Installed Capacity, Fuel Type, Power Policy and current status

Fuel Types	Units/IPP	Installed Capacity (MWh)	Term of Agreement (Years)	Power Policy / IPPs	Status
RFO Based IPPs	15	3993	30 (7) 25 (6) 22 (2)	Pre-1994 (2) 1994 (8) 2002 (5)	9-Non-Operational 6-Operational
Gas/RLNG	14	3332.50	30 (11) 25 (3)	1994 (7) 2002 (7)	11-Non-Operational 3-Operational
Multiple Fuel (Gas, HSD, HSFO, RLNG)	1	1638	-	Pre-1994 converted to IPP after Privatization	PPA Expired
Hydro IPPs	5	1937	25 (1) 30(4)	1995(1) 2002(4)	Operational
Imported Coal	3	3960	30	2015	Operational
Thar Coal	5	3300	30	2015	Operational
RLNG	4	4896	30	2015	Operational
Bagasse	8	259	30	2013 Framework (2002 Policy extension)	Operational
Solar PV	10	680	25	2006 ARE	Operational
Wind	36	1845.47	20	2006 ARE	Operational
Grand Total	101	25841	42 (30 years) 20 (25 years) 2 (22 years) 36 (20 years)	3 (Pre 1994) 15 (1994) 1(Policy 1995) 16 (Policy 2002) 46 (2006 ARE) 8(2013 Framework) 12 (2015 Policy)	20-Non Operational 1-PPA expired 80-operational

