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Energy Crisis In Pakistan

Pakistan, a country poised at the crossroads of rapid industrial growth and burgeoning urbanization is grappling with a severe energy crisis that has stymied its developmental prospects and tested the resilience of its Economy. This crisis, characterized by chronic power shortages and frequent black-outs, has deep-seated implications for every facet of Pakistani life. This energy deficit has led to frequents power outages, hampering economic growth, disrupting daily life, and impeding technological progress. In this context there is a dire need of addressing these crisis at the earliest in order to overcome its negative implications on the national life of Pakistan.

How Energy Sector of Pakistan Operates:

i- Major Dependence on Hydrocarbons: (oil, gass, Coal)

a) 2022-2023

Hydrocarbons	Consumed	Local Production	Imported
Oil	588000 Barrel	83000 Barrel	500000 Barrel
Gass	1 billion cubic feet	36 %	64 %
~~Coal~~	7.53 Tonne mn		

6500 Mega Watt Electricity was consumed per day by coal where 2500 MW generated by local Coal while other from imported Coa

Hydrocarbon operators:
PSO, Shell, Attock Group of companies (all these import HC)
Local producer
- OGDCL (Oil and Gass Development company Limited)
- POL (Petroleum, Oil, and Lubricants)
- MOL (No abbreviation)

P.S (Pakistan is not a major producer of HC, as it imports more and produces less)

Hydrocarbon Suppliers:
→PSO
36% oil can be refined maximum and rest is considered as a waste material.
U.S = 91% China = 86%
S.A = 85%

Gas Suppliers
Sui-Southern (Sindh, Baluchistan)
Sui-Northern (Punjab, KPK, AJK, GB).

Transmission Bodies:
NTDC (National Transmission Dispatch Company)

Distributing Bodies: DESCO.
TESCO, LESCO, FESCO, HESCO, K-Electric.etc.

Decision Making Bodies:
NEPRA: (takes major decisions of Electricity)
OGRA: (takes major decisions of oil and gas)

Major Electricity producers:

WAPDA: (28- 30 %)
IPPs: (Independent Power Producers)

Civil Nuclear Projects: 2200MW by K2 and K3
C-1, 2, 3, 4 (Chasma Projects) each generate 340MW.
Role of Bank: Provide loans

2-Energy Profile of Pakistan:
"Pakistan's total installed power generation capacity is 43,775MW, of which 59% of Energy comes from thermal (fossil fuel), 25% from Hydro, 7% from Renewable (wind, solar, and biomass), and 9% from Nuclear."
(NEPRA 2022 Yearly Report)

3- Problems with the Energy Sector:
i- Load Shedding: (More Demand and less Producti
Shortfalls:- 2023 (above 7000MW), 2022 (10,000mw), June 2024 (6400MW), 2007 till end of 2016 (5000-8000
Load Shedding: 2023 (Urban = 4-5hrs, Rural = 10-12hrs
2022 (U = 8hrs R = 16-18hrs), 2006 → 2016 (U = 8hrs R = 18hrs.)

ii- Expensive Electricity (Pakistan the World 1st, and Asia's 3rd most expensive Electricity provider (P
Domestic Unit: (24 to 90 PKR
commercial Unit: (48 to 90 PKR

Slab	price in PKR
600 and above	72
300-600	66
100-300	44
1-100	28

power.

4-

Reasons for Energy Crisis:

i- Over-reliance on fossil fuels:

(a) High import dependency:

exposure to international market volatility.

(b) Underutilization of Domestic Resources.

Reasons (Technological constraints, investment deficencies, politicalo instability in source-rich area).

ii- Expensive Agreements with IPPs:

* 1994, 2005, 2011, and 2014.
* Local IPPs should be paid in dollars according to agreement.

(a) Increase in circular Debt:

Despite massive repetitive price shocks to consumers and country-wide drive against theft and billing defaults, the World bank has found power and gass circular debts increasing by an average of RS. 135 billion to RS. 5.5 trillion (about 5.1 pc of GDP) by end-january this yead and wants the government to do more.

iii- Subsidies and Tarrif issues:

*lead to financial imbalances.

Tarrifs are often set below the cost of generation and distribution, resulting in revenue shortfall for energy companies.

Pakistan has the highest-subsidies on energy products in South-Asia, about 0.9 pc of GDP

Effect on [illegible] power

Due to absence of cost-reflective tarrifs, together with operational and ~~technological~~ technical inefficiencies within the state-owned Discos, revenue collection does not fully cover the cost of electricity supply, which leads to accumulating circular debts.

iv- Inefficient Infrastructure:

(a) Outdated Transmission System

33% total loss in distribution and transmission system, 17% in transmission.

Majority of transmission line got expired either before 2000 or 2010-

Highest line loss in Asia 17%, CHINA (3%), India (9%), Bangladesh (9%).

v- Governance Issue: 16% loss distribution.

(a) Lack of Policy on Electricity Theft:

"Inefficiencies in the discos include outdaing metering practices, low collection rates, high technical losses, and rampant theft. While the pace of accumulation has slowed since FY23, the power sector circular debt has continued to grow." (Pakistan Development update, The World Bank)

In SA, Pakistan is top on Electricity Theft.

(b) Kanda System

(c) No concept of Electricity Bills.

vi - Enviromental and Geopolitical Challenges:

(a) Water Scarcity

Effect on the reliability of Hydroelectric power.

As per IMF, Pakistan's per capita annual water avaliabity which was 1500 cubic meters in 2009, is expected to fall ~~by~~ to 274 million acre till 2025.

(b) Geopolitical Tensions:

Russia- ~~Uka~~ Ukraine war

vii- Underutilization of Renewable Energy Resources.

Wind, Solar, ~~Biola~~ Biomass.

viii- Overpopulation and Over Usage.

5-Implication of Energy Crisis: 1-Economic Impacts

(a) Industry, a major and worst hit:

* Higher production cost of industrial products.
* Decline in exports.

Bangladesh (47 Billion Dollars)

Pakistan (17 Billion Dollars)

(b) Increased cost of doing Business:

Need for backup power solutions like generators which rely on expensive diesel or fuel.

ii- Setback for Agriculture:

More than 30% of Agriculture is based on tubewells and digwells.

power-shortages can lead to reduced crop yields and price hike.

iii- Increasing balance of Payments:

decrease in exports and increase in imports.

2020 (Neyo...

But, it solved 40% ...

As IPPs installed in 2011 and negotiated till in 2028.

Resultantly, increasing pressure on dollar reserves. For improvement, Government has to acquire loans.

iv- Implications on domestic life:

40% of the Earning of Lower middle class is consumed by electricity bills.

Disturbs domestic routine budget

This uncertainty of necessities of life gives birth to numerous psychological problems among its masses.

Unannounced load shedding → frustration

V - Implications On Commercial Market:

per unit cost of electricity has increased almost three times in last few years.

→ (1-)

VI - Implications on Nationalism: (Nation Integration)

Energy Crisis Leading to the polarisation in society which, in broader terms, has aired provincialism, which is a big threat national integration.

The producers of oil, gas, and coal are not being awarded according to the percentage of concerning production. Ignorance on the part of the government has incited these producers to adopt some illegal ways to claims their due share. KPK Example.

A senior official of Sui Northern Gas Pipe line records that:

But, it solved [illegible]

As IPPs installed in 2011 and 14 [illegible]

negotiated till in 1928.

"Half of the total volume of the gass being produced in KPK is being stolen by the people of areas close to gas fields. They have their own networks to steal gas, claiming it a matter of their right as the gas being extracted from their areas." (Dawn, 2019, 2/12)

VII - Implication on Tourism:

The crisis has tranished the image of country in comity of Nations.

foreigners are reluctant to visit its beautiful scenery.

Media presentation of local negativities

Tourists tag Pakistan as country of crisis, it in effect, ~~de~~ makes GDP suffers.

VIII Implication on Environment:

Reliance on fossil fuel (environmentally unsustainable)

Generator Emissions. (emission of Greenhouse gasses)

IX ~~Implications on~~ Public Discontent and Unrest:

Erosion of trust on Government's ability to manage. it can lead to dissatisfaction and erode trust in public institutions and political leadership.

Chronic power shortages can often spark protests, particularly in Urban areas.

2020 (Negotiation) → No more capacity payments & IPPs local IPPs would be paid in PKR.

But, it solved 40% problem.

As IPPs installed in 2011 and 14 can't be negotiated till in 2028.

x- Implication on Public life:

(a) Disruptions in Educational activities.

Digital Divide (over-reliance on modern tools, digital divide, especially for students in under-privileged areas)

(b) Urban-Rural Divide

(c) Social Disproportionate impact on the poor:

5- Solutions / Way Forward:-

The whole nation can materialize the quotation "there is always a silver lining in the dark cloud," to cope with the energy crisis.

i- Fostering Active and cooperative Regional Presence in South Asia:

Should indulge in peace deals with India, and then show an inclination to exchange the energy materials.

China's 'road&belt' initiative should be utilized

Should revise its relations with the United states regarding 'Peace Pipeline' and

It will lead to get fosil fuels from Iran, Afghan and Even Central Asian States.

ii Renegotiation of IPPs Agreements:

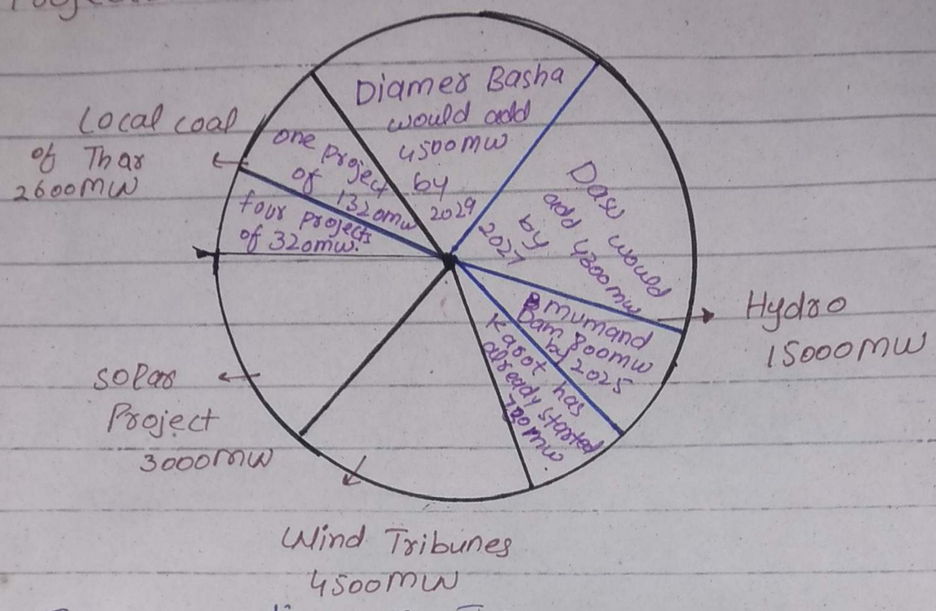
Agreements with 1986, 1991, 2002, and 2005 should have been negotiated long ago, but due to criminal negligence, it got delayed.

2020 (Negotiation) → No more capacity payments to IPPs
→ Local IPPs would be paid in PKR.

But, it solved 40% problem.

As IPPs installed in 2011 and 14 can't be negotiated till in 2028.

iii Installation of Local and Cheaper Electricity Projects:



Energy policy 2030.

Zero percent reliance on imported HC.

iv - Revamp/Updated Transmission Lines:

Need for changing the outdated transmission line

line loss and electricity theft will be reduced.

v - Utilizing Former Energy Policies as a Blue print for Resolving Crisis:-

Reflecting on former energy policies.

By analyzing and adapting successful elements from past policies.

Electric Power Policies	Year	Oil and Gass Policies
Attracting IPPs	1994	Enhancing indigenous oil and gas production
Hydropower	1995	
	1997	Private sector investment and areas sharing arrangment for the offshore
Competitive Bidding	1998	
	2001	Incentives for exploration and production companies
Incentives for renewable	2006	Enhance end-use efficiency in various energy consumption sectors
	2007	Policies, producers, tax and pricing regimes in respect of oil and gas
	2009	Competitive incentives to investors and proactive management
Energy conservation and IPPs	2010	
	2011	Exploration and production of tight gas in Pak.
		Implementation of LNG Projects
	2012	Low BTU Gas Pricing and its use for power generation
		Socially, economically, and environmentally sustainable exploration
Energy conservation	2013	
Hydro, clean, and cheap	2015	
	2016	LPG cost regulation for domestic consumers
Renewable Energy; Competitive Bidding only, Local manufacturing	2019	
	2020	

VI Privatization of Electricity System:
attracting more investors.
state should pay the role of regulators.

VII Building Research centers at regional level:
Aim should be conducting research on the issues of energy production and management.

Researches should be encouraged.

VIII - Construction of more dams:
already constructed ones are not maintained properly.
avoid floods

IX - ~~Sep~~ Establishing a Pedicated Bureau to combat corruption
should be a check and balance on the energy sector
separate Bureau should be established only to deal with the corrupt officers of particular sector.
Heavy fines on power theft.

X - Curbing Excessive Energy consumption in Elite circles and offices.
end of luxurious lifestyle among Elites.

XI - Equal Distribution of Resources among Provinces:
National Finance should be designed in such a way that none of the province reservations.

XII - Exploration of Energy policies of other countries: -
Kazakhstan:

Diagrams. flow Charts, Maps.

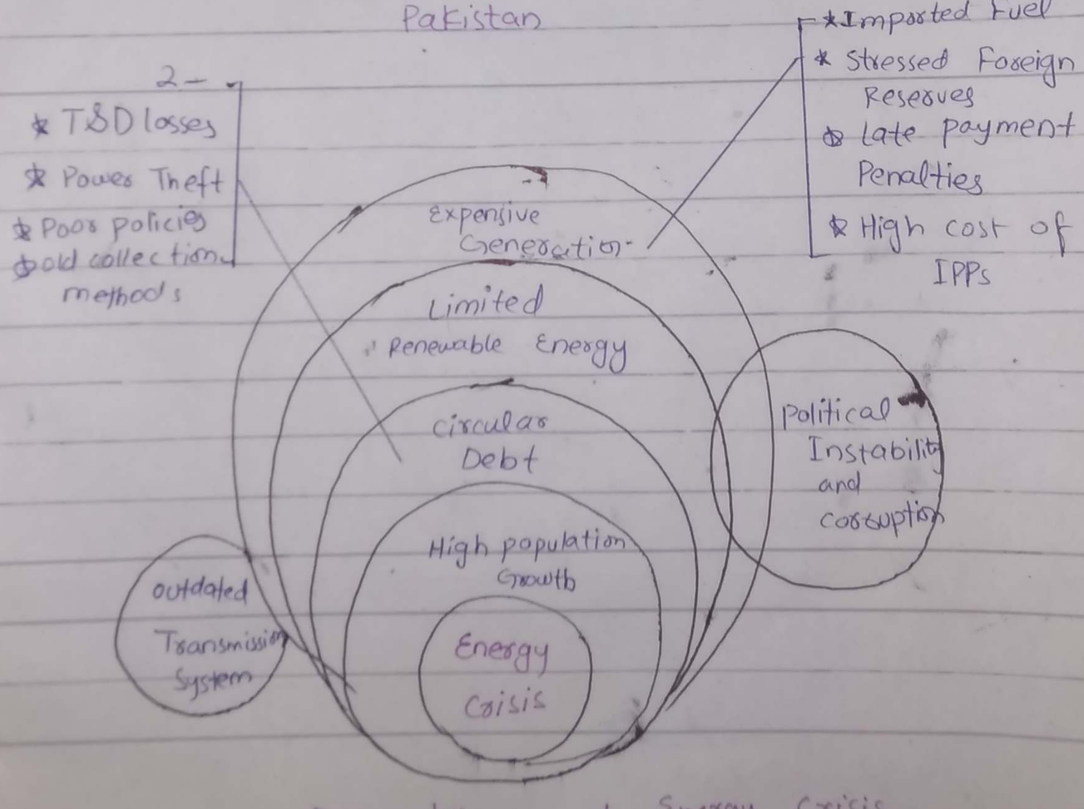
1-

Sector	Consumption (GWh)	Share %
Household	39,200	46.6
Commercial	6,576	7.8
Industry	23,687	28.2
Agriculture	6,906	8.2
Others	7,664	9.1
Total:	84,034	

Sectoral Share in Electricity consumption (July-March FY 2023)

source: Hydrocarbon Development Institute of Pakistan

2-



Reason | causes of Energy Crisis