

Energy Crisis:-

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Refers to a significant shortage or disruption in energy supply &/or a substantial rise in energy prices, leading to broader economic, social, & political challenges.

It has not only been affecting the trade & industry, development & construction, education & administration gravely but has also seriously impeded the progress of whole national life.

Background / History:-

- ↳ In 1970's, when the government launched the massive Mangla & Tarbela dams, leading to short lived period of robust hydro-driven energy generation that ably responded to demand.
- ↳ following a period of economic expansion in the 1980's energy demand skyrocketed, outstripping supply & infrastructure. The government attempted to increase the production but was unable to meet the demand.
- ↳ The problem has worsened as PK population has grown & as urbanization has resulted in the growth of new companies & other corporate energy users.
- ↳ Energy Electricity shortfall reached a peak of 8,500 MW in June 2012 more than 40% of Demand.
- ↳ PK's National oil & gas company "OGDCL" predicts indigenous oil Reserves will be exhausted by 2025 & PK will run out of domestic sources of Natural gas by 2030.

Causes:-

1. Lack of Investment:-

one of the Primary Reasons for PK's energy Crisis is the insufficient investment in the energy sector.

→ The Country has not made substantial investments in building new power plant or upgrading existing infrastructure to meet the growing energy demand.

→ In 2007, Govt did not compensate the power companies for the subsidy that was being provided to consumers. Power companies in turn could not pay the oil & gas companies, reducing their liquidity to import the furnace oil that was needed to generate electricity.
2. Circular Debt:-

① This occurs when distribution companies (DISCOs) fail to pay power producers, who in turn cannot pay fuel suppliers. Leading to shortage of funds for fuel & maintenance.

→ In the current fiscal year, the electricity sector circular debt topped Rs 2.636 trillion, surpassing the govt's pledge to keep it within Rs 2.31 trill.

→ According to Ministry of Energy's power division's, The Circular Debt in 2024 January rose by Rs 84 billion to Rs 2.636 trillion up from Rs 2.551 trillion by the end of Dec 2023.
3. Expensive Hydrocarbons:-

→ Electricity depends on hydrocarbons.

→ In PK the Diesel generation capacity is more than 12000 units are installed but the generation cap is very less.

 - ↳ Gas TPPs are 7000 megawatt → & PK is consuming all of them.
 - ↳ Coal → 9000 megawatt → maximum used.
 - ↳ Diesel is less used.



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Pk's Expensive Source of Electricity is first Diesel - then Gas - then Coal.
These are not Locally Produced

- these are Imported -

Bcz they are Imported they are Bought in dollars so the value is Decreased.

for Example. In 2021 → 1 dollar = 178 PKR.
2024 1 = 280 PKR.

if 1 Billion Dollar energy^{was} Imported It costed PK around 178 Billion PKR

- ⇒ Pk's Heavy Reliance on Imported Hydrocarbons has significantly Contributed to its energy Crisis, Placing Immense financial strain on the Economy and Increasing the utility Bills.
- The ministry of petroleum & Natural Resources highlights the escalating cost associated with these energy sources, which are unsustainable for a Nation already grappling with economic challenges.

Financial Burden of Diesel, LNG & Coal:-

- ↳ Diesel is the most expensive Hydrocarbon, exerting substantial pressure on Consumers due to its widespread use in transportation & Backup Power Generation.
- ↳ LNG (Liquefied Natural Gas) is comparatively cheaper than Diesel. It remains a costly fuel for Power plants & Industries driving up electricity prices.
- ↳ Coal is more affordable than diesel & LNG, still expensive compared to Renewable energy & domestically produced Natural Gas.

Global Conflicts and supply chain Disruptions:-

- As Reported by International Energy Agency (IEA), The Russia-Ukraine war & Instability in the Middle east have disrupted global oil & gas supply chains, pushing European & Asian gas prices to high Records.
- These Geopolitical ~~transitions~~ tension with global commodity prices have significantly increased energy costs, placing heavy burden on energy importing countries like Pakistan.
- The State Bank of PK's FY2023 Report underscores the adverse effects of the disruptions on the Nations Macroeconomic stability.
- This Dependency on foreign energy sources compounded by global price volatility, has rendered energy costs unsustainable for Pakistan.

Impact of Currency Depreciation:-

- As the PK Rupee weakens against US dollar currently at an exchange of 277.50 Rupees to 1 US dollar.
- The cost of Hydrocarbons increases like oil & LNG.
- These Fuels purchased in Foreign Currency becomes more Expensive. Intensifying more Economic strain on the Country.
- This Devaluation has not only raised the cost of energy imports but also contributed to Inflation.
- The Combined effect of rising Energy prices & currency depreciation has worsened Pakistan's energy crisis, creating vicious cycle of financial for both the government & citizens.

Transmission Inefficiencies & line loss:-

- ↳ PK's energy crisis is exacerbated by significant transmission inefficiencies.
- ↳ The (NTDC) (is responsible for transmitting electricity from power generators to the national grid) Faces critical challenges due to its outdated infrastructure.
- ↳ Acc: to Nepra & the world^{PK} energy sector Report, the transmission losses ranges B/w 18 to 20%.
- ↳ This means a substantial portion of electricity generated is lost during transmission. Resulting in inefficient energy distribution system.
- ↳ These losses not only reduces the effective supply of electricity but also increases costs, as additional energy must be generated to offset the loss.
- ↳ By upgrading transmission infrastructure & implementing the modern energy management systems these inefficiencies can be addressed.

Mismanagement of Distribution Companies (Disco):-

- ↳ These companies are plagued by challenges such as: electricity theft, line loss & exemption of influential individuals from paying bills.
- ↳ This mismanagement has led to unsatisfactory delivery & further burdens ~~the~~ already strained national tariff structure.
- ↳ As reported by Nepra, the national average power purchase price is approximately Rs 27/unit.
- ↳ After factoring in distribution margins, the average consumer tariff increases up to 35.5/unit.
- ↳ This rise is driven by several factors, like currency depreciation, high inflation, elevated interest rates, the addition of new power generation capacities & sluggish sale growth.

These Inefficiencies undermine the financial stability of the energy sector but also deepens the Burdens on Consumers, Highlighting the urgent need for Improved governance & Reforms within the DISCOs.

Role of IPPs

Independent power Producers are privately owned entities. That operate under Diverse Ownership structures such as Built ^{own} operate (BOO), Built own operate transfer (BOOT), and Build Lease transfer (BLT).

↳ IPPs are crucial in meeting the Country's energy demands, especially in addressing electricity shortages.

↳ As per NEPRA (National Electric Power Regulatory Authority) 100 IPPs currently operate in Pakistan.

↳ Among these 52% are government owned & 48% belongs to private entities. local owners like, DISCON Group, Anglo Pak group, Tareem group, Salman shahbaz group, Mansha group.

& Foreigned owned IPPs by chinese, UAE, France, US, Singapore Norway & other Countries.

Expensive

Flawed/Agreements with IPPs:-

↳ In 1994 when only 40% population of PK had access to electricity the Govt introduced Power Policy to Attract foreign Investors.

↳ This policy offered lucrative Incentives including High Returns on Investment (15-18%) & Minimum Equity Investment Requirements.

↳ The Policy prioritized thermal Power Plants adding 16 furnace oil & gas based IPPs with combined capacity of 4100 MW.

- ↳ These Policies expanded Capacities that led to excessive profits for IPPs amounting to Billion of Rupees. For Ex: Mian Mansha group & others
- Major IPPs have earned significant Returns over the years underlining flaws in the Agreements. Financial Burden & Capacity Payments
- In some Instances the Govt has Continued to make Capacity Payments to non-operational plants
- Some wind power plants in Pakistan were Commissioned evidently at Costs up to four times Higher than similar Projects in Bangladesh & Vietnam, raising Concerns about Transparency & Corruption.
- Moreover IPPs Relying on Imported Fuels, despite PK's domestic Coal Reserves, further Inflate electricity Costs.
- ↳ In 1994, 2005, 2011 → The IPPs were mainly Diesel Based some were LNG Based some were wind Based.
- ↳ 2015 → IPPs were mainly LNG & Coal Based some of them were wind & solar Based.
- ↳ Earlier Problem was Generation Capacity was less & demand was more Now (other way Round) Gen is more & demand is less
- ↳ In 2024 Gen Capacity was Nearly 43000 MW & the demand during Summer times was 26000 - 27000 MW so 16-17000 MW was unused.
- ↳ In Summers Winters 13000 MW which is 29000 MW Less than Installed Capacity.
- ↳ In the Agreement with the IPPs the government agrees or commits on purchasing atleast 75% of Total Generation Capacity from an IPP Annually.
- ↳ Fixed Costs are paid to IPPs Regardless of whether electricity is utilized or not - all a major strain on PK's energy sector.

- ↳ The Rupee's Decline Against the Dollar over the Past years has increased by Dollar Indexation, which is tied to these Capacity payments.
- ↳ Over the past 10 yrs the IPPs have Reviewed Capacity Payments of Rs. 8.344 trillion.
- ↳ It has been projected that the IPPs will Review Capacity Payments of Rs. 2.1 trillion in fiscal year 2024-25.

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Other Factors / Causes:-

- ↳ Line Losses: → in pk its about 20% as compared to 8 to 10% in other countries.
 - ↳ Bcz of poorly managed transmission system.

↳ Large scale theft of electricity

- ↳ Revealed by the growing difference B/w units generated or purchased & those paid for.

↳ Loss is more than Recovery.

↳ Wastage of energy by energy Industrial Sector: Consumes about 30% of Total electricity due to Less efficient system & other practices.

↳ Over use of Energy by Transport Sector: Consumes 28% of Total energy.

- ↳ due to old & poorly tuned engines.

Domestic wastage 45%

↳ due to Unnecessary use of light & air Conditioners & large scale illumination on different Occasions.



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~~Remedial Measures~~ General wastage Excessive use of Electricity in Govt offices, roads, Park Illumination have also contributed to worsening energy crunch.

Corruption & Lack of Political will on the concerned energy departments: