Power Sector Solutions Brief - 2

i. *Ensure NEPRA is an Independent Regulator Focus is on Public Interest, has Teeth, Owns Sector, Undertakes Proactive Policy Measures and is Unwilling to accept Status Quo*
   - Expiring PPAs extension only under "no electricity, no payment"
   - Amendment to upfront tariff policy (2005 extended in 2007 during Musharraf tenure) and new PPAs to be signed after competitive bidding providing price discovery
   - DISCO targets for bill recovery and T&D losses be based on actual
   - Accountability of performance of DISCO and NTDC management team based on defined parameters and targets
   - Net metering tariff be based on 4/5 year payback; limit solar capacity to sanctioned load; adjust excess units over two months, encourage battery storage and increasing vertical solar to change the duck curve peak
   - Increase sanctioned load charge for connectivity and availability
   - Given that 96% of total system cost is recovered on units consumed whereas capacity charges are fixed and account for about 70% of total revenue of DISCOs, irrespective of consumption
     - Charges billed to DISCOs by CPPA-G remain consistently over Rs. 4,000 per kW/month on sanctioned load
     - Only around 2-4% of the recovery structure is variable whereas 67% of power sector charges are fixed and 33 % variable.
     - NEPRA allowed 1000-2000kwh/month for non residential consumers and Rs 200-1000 for residential consumers to be raised in steps but already demand raised to reduce this
     - Fixed charges to be at 50% Maximum Demand Indicator by 2026 and raised to 75% of sanctioned load or actual MDI by 2028

ii. MOE take measures to
   - Change Demand by reducing peak hour tariff for residential consumers, EV TOU to non peak hours increasing peak hour tariff for commercial consumers
   - Merit order be strictly followed by CPPA-G and based on EPP + CPP. Avoid the sunk cost fallacy by pricing electricity at affair market price to avoid economic distortions
     - KE own generation be per national merit order, own generation pricing be lower than that of NTDC
   - Consumer focus
     - Bill averaging to facilitate protected consumer's cash flow

- Capacity Building for operation, planning and execution of projects
- NTDC/CPPA-G increase Utilization Factor to 75% by removal of System Constraints given that
  - During FY 23 Utilization Factor of de-rated thermal electric power generation capacity remained 34.68%.
  - PPA is based on 60%.
  - System constraints resulted in Rs. 20.203 bn loss, which was disallowed and contributed towards accumulation of circular debt.
  - Power plants had to be operated on RFO/HSD due to system constraints or shortage of RLNG/Gas. This cost Rs. 164 bn.
  - According to estimates, in financial year 2022–23, around 15 to 30 percentage was electricity pilferage valued at Rs 380 billion; estimated in FY 2023-24 is up to Rs 520 billion
  - Payment obligation on Account of Non-Project Missed Volume due to grid constraints, scheduled maintenance and other potential issues including RE projects was Rs. 10.517 bn.
  - If plants are operated below full load especially base load power plants at part load results in lower efficiency and higher generation costs in the monthly FPA. PLAC was Rs. 46.59 bn.
  - HVDC transmission line established to efficiently transport electric power mainly from the southern region to the central and northern load center with the average utilization at approximately 1,584 MW, 39.6% of its designed capacity of 4,000 MW and thus has impact on Circular Debt due take or pay liability.
  - The existing interconnection capacity between NTDC and KE, which relies heavily on supplies from the National Grid, is limited to about 1,100 MW.
    i. KE investment plan proposing the establishment of two 500 kV grid stations at KKI and Dhabeji and augmentation of the 500 kV NKI grid station be expedited
  - Under PPA(s), power dispersal arrangements must be completed within agreed timelines (ranging from sixty to one hundred twenty days before the Scheduled Commercial Operation).
    i. In majority cases, NTDC failed to complete these dispersal arrangements within time and budget
    ii. PPMC pursue strict time lines for removal of Network Constraints

- PPIB induct new generation capacity only after a through consideration of all relevant factors and comprehensive analysis of situation of economy, investment quantum and on basis of projected impact on consumer tariff.
    i. Shut down inefficient power generation by CPPA- G, KE including its IPPs, and GENCOs with EPP+CPP >Rs 45 per unit
    ii. Be reviewed, bought out earlier and policy framework developed for them to upgrade and operate in CTBM regime
        - Implement CTBM by Jan 1, 2025, facilitate development of competitive market over a period of time and reduce wheeling charges
    iii. Incorporate only committed projects which have achieved financial close; be revised post early retirement of expensive power plants; increase utilization factor and then critically assess need and timing of 24 new hydel power generation projects (7,460 MW) planned between 2024 and 2032
- In summary, new capacity add on be only upon utilization factor increase to 75%
- As of June 30, 2023 Pakistan's *installed* capacity stands at 45,885 MW (CPPA-G 42,362 MW), *dependable* generation capacity is 43,749 MW (CPPA-G 40,628 MW and (KE 3,121 MW)
    i. This capacity consists of 25,490 MW of thermal generation (GENCOs, IPPs, and SPPs), hydroelectric of 10,635 MW, wind power 1,838 MW, solar energy 530 MW, biomass (bagasse) generating 249 MW, and nuclear power adding 3,620 MW.
    ii. KE's own thermal generation capacity is 2,816 MW and falls short to meet current demand of its system.
    iii. KE procures electricity: 366 MW from thermal IPPs, 100 MW from solar potential, 139 MW from SPPs/CPPs, and approximately 1,100 MW sourced from the CPPA-G System to bridge the gap.
- Federal Secretary Power Rashid Langrial stated earlier this year country's *installed* capacity being 44,980MW of which effective operational capacity is of 22,879MW
    - Consists of hydel 7,315MW, RLNG 4,499MW, Coal 4,909MW, Nuclear 2,965MW, Gas 1,317MW, RFO 1,234MW, Wind 435MW, Solar 104MW and bagasse 99MW

        - Furthermore, out of 44,980 MW installed capacity, degraded capacity is 37,951MW, capacity discounted for high summer @ 40 degrees is 36,849 MW, capacity discounted for permissible and forced outages is 32,576 MW, capacity discounted for seasonal and daily variation, 28,736 MW, capacity discounted for exorbitant marginal cost (Energy Purchase Price) results in operational capacity is 23,718 MW
    - Our *generation capability* is 30,574 MW in CPPA-G with peak demand of 23,679MW (6,895 MW surplus); in KE System it is 3,409 MW and 3,654MW, respectively (deficit 245MW).
        - Globally, target for reserve margin, which is the amount of unused available capability of an electric power system (at peak load for a utility system) as a percentage of total capability, is ~20 percent, according to experts.
        - Gap between installed capacity and projected demand, like in the past, will continue due to changing growth indicators and RE induction, indicating need to better manage the moving target and execution cycle for power plants of 5-7years for thermal and 10+ years of nuclear and hydel
            - Lackluster economic growth of 0.29% in FY 2022-23 vs generation planning based on over 5% GDP growth on peak summer demand did not help.
            - Risk analysis may smoothen the curve to some extent but more important is how planning basis is timely rectified

iii. Contribution by MoMA, OGRA, MoF and MoIndustries

- LNG and coal port charges reduction will bring in 'one' time ~$100m fee benefit/adjustment against EPP/CPP
- Increasing minimum wages by Rs 20,000 (present unskilled, semi skilled, skilled and highly skilled wages of Rs 37,000, 38,280, 45,910 and 47,868, respectively) to ensure live able wages and thereby improving ability of 25m residential consumers to service their bills
    - Enabling 94% domestic consumer using 200- 500 units to service their bills
- Manage CAD to strengthen Rs vs USD
- "Free units" perk be part of total remuneration with actual payment against bill by consumer
- Charge average tariff from all with aim to deliver energy at a competitive and affordable price and shift consumption to nondomestic consumers

- As per State of Industry Report 2023

a. Total number of electricity consumers in the country reached 38,249,950 and consumed 121,852.01 GWh
b. Out of which 43.92 % was consumed by 33,115,996 domestic consumers
c. 7.3 % was consumed by 4,095,967 in commercial category, 25.51% was consumed by 397,685 industries,
d. And 7.91% was by 377,255 agriculture consumers
    i. PM on July 10, 2024 is quoted as saying that Rs 500bn has been lost over 8-10 years on account of tube wells in Baluchistan
    ii. And shifting of 1m tube wells to solar energy starting with 28,000 tube wells in Baluchistan at cost of Rs 55bn.
e. And 15.38% by other 263,047 consumers

- Bangladesh has 16.2 m lifeline consumers and analysis shows that 26.45m ie 69.15% consumers in Pakistan pay below cost whereas 15.5 million "protected consumers" using up to 50 and 100 units per month pay Rs. 3.95 and Rs. 7.74 (lifeline) respectively and Rs 10.06 using up to 200 units per month.
    i. 5.95 million "unprotected category" pay Rs 16.48 per unit for the first 100 units and another 5 million consumers fall pay Rs 22.95 for the next 101-200 units and Rs. 27.14 for 201-300 slab
    ii. For those surpassing 200-unit limit, consumers must wait 6 months before reverting to the protected category.
    iii. The consumers of the next five household categories from 301 units and above pay Rs 32.03 - 42.72 per unit

- Thus delivery of electricity at average tariff plus T&D losses is doable
    - Our average per-unit power purchase price of Discos due Capacity charges works out as Rs17.66 per unit whereas energy charges are Rs 9.69 per unit- totaling Rs 27.35 per unit for 2024-25 for national average power purchase price of around *Rs 27* per unit
        - After adding losses and distribution margins, the average tariff goes up to *Rs 35.50* per unit against Rs27.78 for last year (Rs 8.15 per unit)
        - And 18pc general sales tax (Rs 6.5 per unit), the average base tariff for next year jumps to *Rs 42* per unit excluding other taxes, duties and surcharges.
            - This figure does not include any adjustments related to monthly fuel and quarterly tariff adjustments.
        - Real applicable average tariff for DISCOs would stand between *Rs 65 and 72* per unit after inclusion of surcharges,

taxes, duties and levies besides monthly and quarterly adjustments.

- Thus reduction possibility is in this *Rs 37-44 per unit* add due to indirect Taxation on Energy Sector which be
  i. Converted to single tax at import & E&P custody transfer
  ii. DISCOs be granted minimum tax exemption
  iii. Consider removal of Tax exemption on profit to 106 IPPs of Rs 30.23bn FY 24 and Rs 1.25tr since 1990
  iv. Improve optics and narrative of reason of indirect tax collection through electricity bills and consolidate amount
     - Exempt from Sales Tax or allow adjustment of "WHT/Sales Tax" in individual tax returns which will increase # of filers
  v. PDL intent was of managing fluctuations in import value but has now become a revenue generation tool with Rs 1.28tr in FY 25 vs Rs 960bn in FY 24 vs FY24 budget of Rs 869bn, of which
     - Rs28bn is expected to be collected from levy on crude oil,
     - Newly introduced levy on gas is projected to generate Rs400 million, despite not being included in the original budget for 2023-24, but Rs220m was still collected under this head,
     - Miscellaneous receipts from oil and gas companies are anticipated to generate Rs1.52tr in 2024-25
     - The Gas Infrastructure Development Cess (GIDC) collection target remains at Rs2.5bn for 2024-25.
     - For the Natural Gas Development Surcharge (GDS), which represents the difference between the prescribed and sale price of gas allocated to provinces, the government projects Rs25.61bn for the next fiscal year.
     - The government also plans to collect Rs3.53bn through the petroleum levy on Liquefied Petroleum Gas (LPG) in FY25,
     - The budget for FY25 includes Rs25bn to be retained as a discount on local crude oil prices, consistent with the revised estimate for the current year but up from the original budget of Rs20bn.
     - Additionally, the budget proposes a decrease in the royalty on crude oil and an increase in the royalty on natural gas for provinces. The royalty on crude oil is set at Rs58.65bn, while the royalty on natural gas is budgeted at Rs103.751bn for FY25.
  vi. Final option is effectively utilization of subsidy by paying directly to recipient
     - Out of PSDP
     - Budget of Provinces
     - Subsidy given to USC (Rs 60bn) and BISP (Rs 598.71bn FY25 vs Rs 471 billion FY24)

vii. Recent measures have highlighted ability to reallocate subsidies
   - The average national tariff would have further increased due to prime minister announced Rs10.69 per unit cut to industry having a negative revenue impact of Rs 200bn over 3months This amount would have stand transferred to domestic, commercial, bulk power consumers, etc but for funds made available from PSDP as announced by FM.
   - Punjab Government has announced Rs 14/unit cut in power tariff for 201 to 500 units (Rs 45 bn subsidy for 2 months)
   - Federal Government has announced Rs 50 bn subsidy for 1QFY25 to 25m (94%) NTDC and KE domestic protected and non protected consumers using up to 200 units- Rs 4-7 per unit relief. To be paid out of PSDP as well?
   - Industry be charged tariff based on (CPP+EPP based on LNG Price of SNGPL)
     a. Industry incentive be linked to export performance
     b. Recipient or family undergo skill development program