RENEWABLES FIRST

Decoding the
Power Purchase Price

FY26

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Acknowledgment

We would like to acknowledge Herald Analytics for partnering with us in the collation of data and insights.

Disclaimer

All the information and analysis provided in this document are accurate and to the best of our knowledge and understanding. In case you identify any error, feel free to reach out to us at: info@renewablesfirst.org.

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Executive Summary

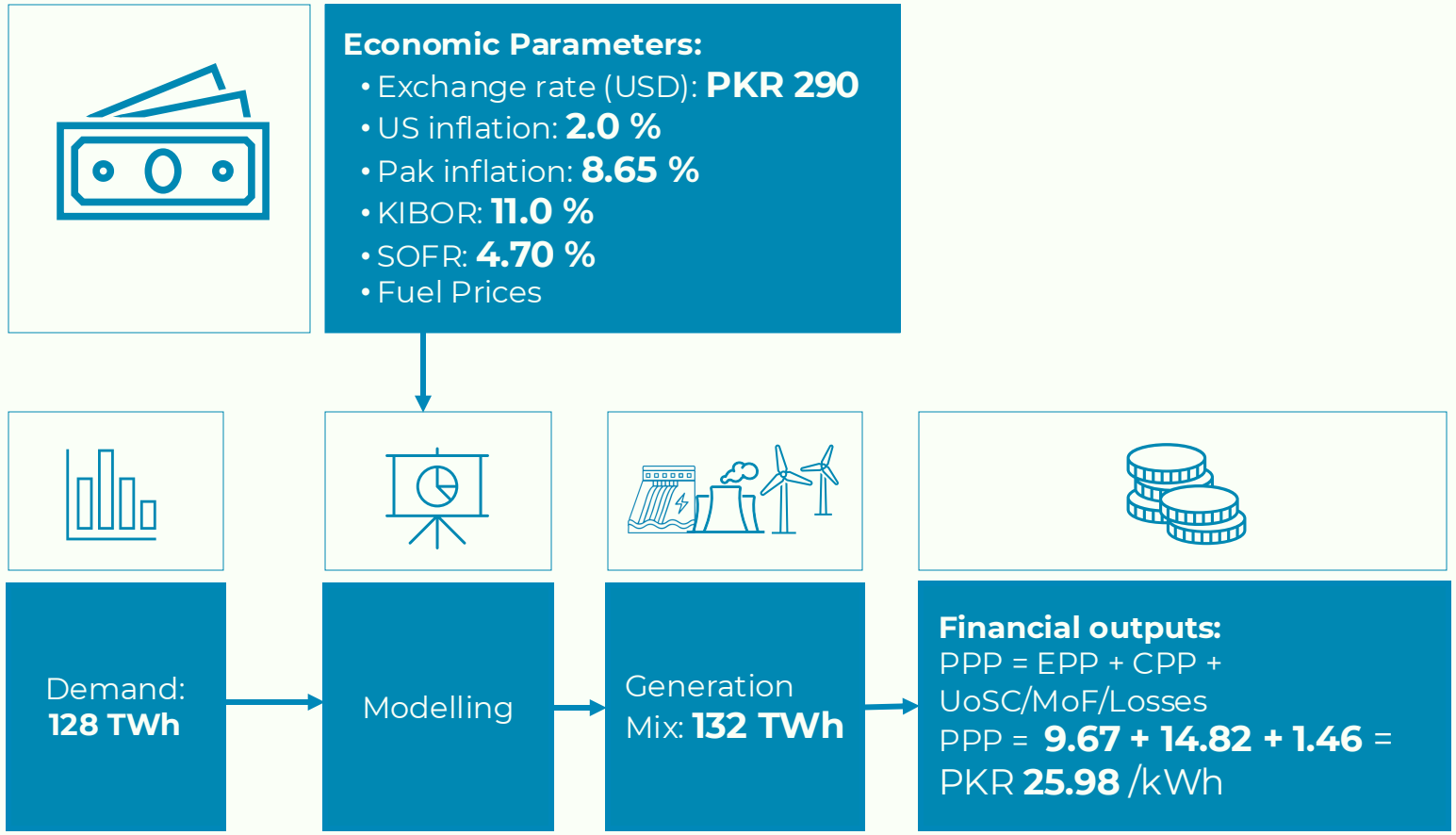
- NEPRA sets the Power Purchase Price (PPP) each year, which decides the electricity requirement, generation costs and most of the consumer tariff (about 90%). The process is based on demand forecasts, fuel prices, exchange rates, and system constraints.
- For FY26, CPPA-G shared seven scenarios (plus one by NEPRA) with different assumptions for hydrology, exchange rates (PKR 280–300/USD), and fuel prices. These showed that PPP could fall by PKR 0.30–2.30 per kWh compared to FY25's PKR 27 per kWh.
- NEPRA approved 2.8% demand growth, which translates annual demand to 128 TWh. But rooftop solar (already 6.1 GW vs IGCEP's 2034 forecast) may reduce grid demand.
- Hydel's share is projected at 27% (down from 32%), raising its cost per unit. The nuclear share increases with the addition of K2/K3's new line, while coal and gas use also rise, making the system more exposed to global fuel prices.
- The PPP for FY26 is PKR 25.98 per kWh (↓4% YoY) with a total cost of PKR 3.3 trillion. Capacity charges are PKR 16.32 per kWh (↓5.7%) and energy charges PKR 9.41 per kWh (↓2.9%).
- Decline in PPP is mainly due to contractual reforms (IPP terminations, take-and-pay conversions) and lower global fuel prices.
- Demand variation, low hydrology, flexibility costs like partial load adjustment charges(PLAC), and non-projected missed volumes (NPMV) could change PPP up to PKR 2 per kWh.

Note: FY26 covers the period from July 2025 to June 2026

PPP setting process

NEPRA's PPP framework and annual tariff setting process

PPP annual tariff setting process

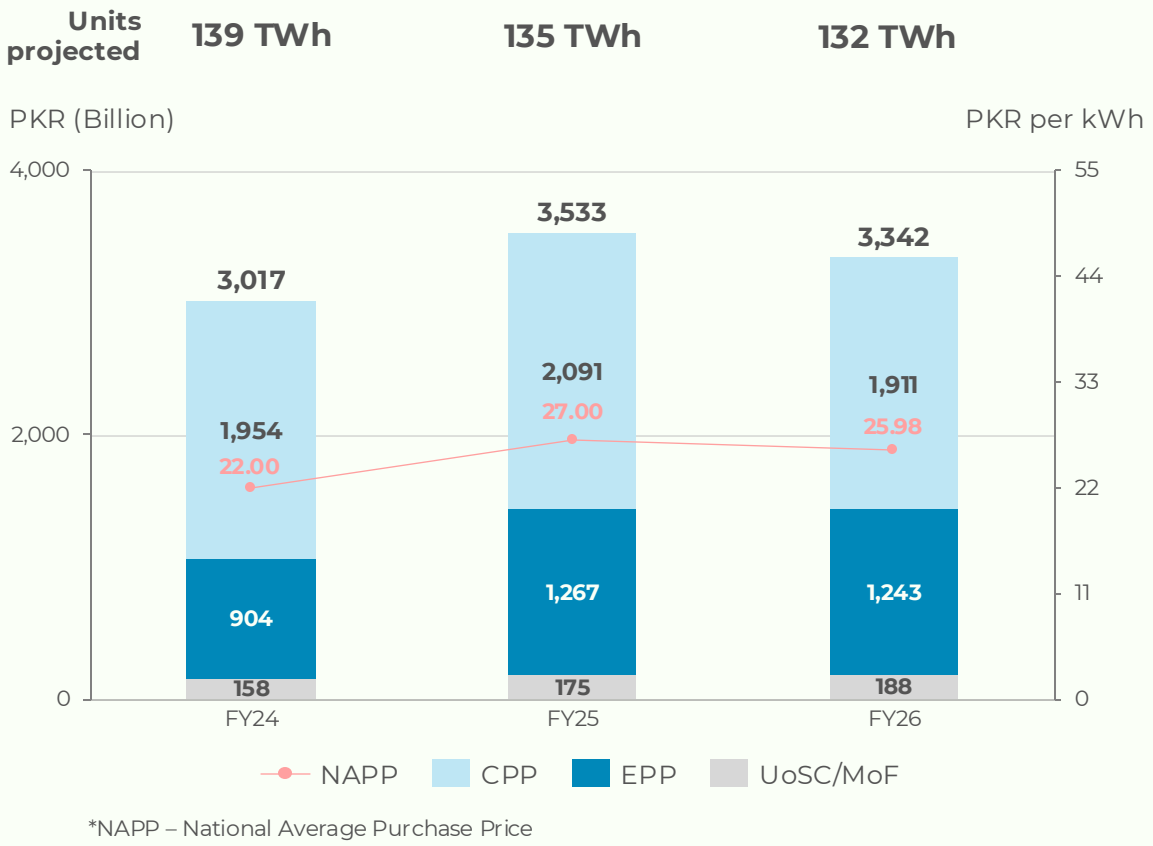


PPP is a pass-through cost mechanism designed to provide a stable and predictable tariff framework, serving as the reference for monthly fuel cost adjustments (FCA) and quarterly tariff adjustments (QTAs). It consists of:

- **Energy purchase price (EPP):** Covers fuel costs and variable O&M expenses, accounting for fuel price variations and maintenance costs.
- **Capacity purchase price (CPP):** Fixed charges paid to generation plants to ensure capacity availability, regardless of actual dispatch.
- **Use of system charges (UoSC) & market operator fee (MoF):** Costs for transmission network usage and system operation/market administration.

FY26 is projected to see a PKR 1.02 per kWh reduction in the PPP, with total PPP estimated at PKR 3.3 T against projected generation of 132 TWh.

PPP, NAPP, and projected generation, FY24 - FY26

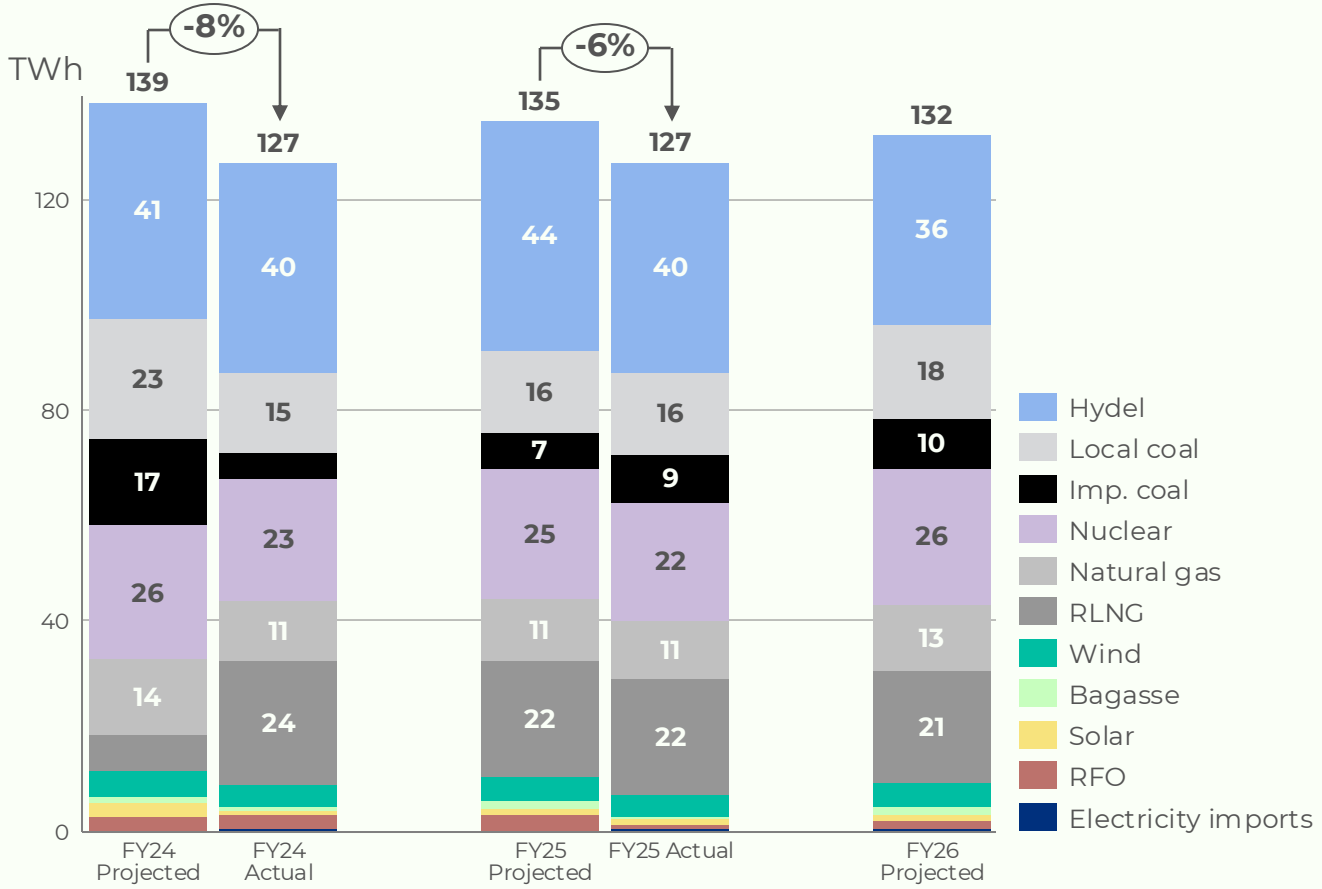


*NAPP – National Average Purchase Price

- Electricity generation projections declined by 5%, dropping from 139 TWh in FY24 to 132 TWh in FY26, driven by lower national electricity requirements, tariff-induced demand suppression, and increasing solar adoption reducing reliance on the grid.
- The PPP surged by 17% YoY, rising from PKR 3,017 billion (B) in FY24 to PKR 3,534 B in FY25, fuelled by higher fuel prices and currency depreciation. However, in FY26, it fell by 5% YoY to PKR 3,342 B, mainly reflecting the retirement and renegotiation of take-or-pay contracts along with partial stabilization in fuel prices.
- Projected PPP declined from PKR 27 per kWh in FY25 to PKR 25.98 per kWh in FY26 primarily due to a reduction in capacity charges, which helped alleviate overall cost pressure.
- For FY26, generation is projected at 132 TWh, i.e., slightly below FY25's projection. The current projection is based on a 2.8% demand growth rate over Jan–Dec 2024 actual generation, and factoring in the 11% increased demand from K-Electric.
- Capacity payments remain structurally high, keeping fixed costs elevated despite lower energy offtake, underscoring persistent overcapacity and inflexible take-or-pay contracts.

Coal and nuclear gains ground in FY26 projected generation mix to offset the reduced hydel share

Energy source wise generation mix actual vs projected, FY24 – FY26

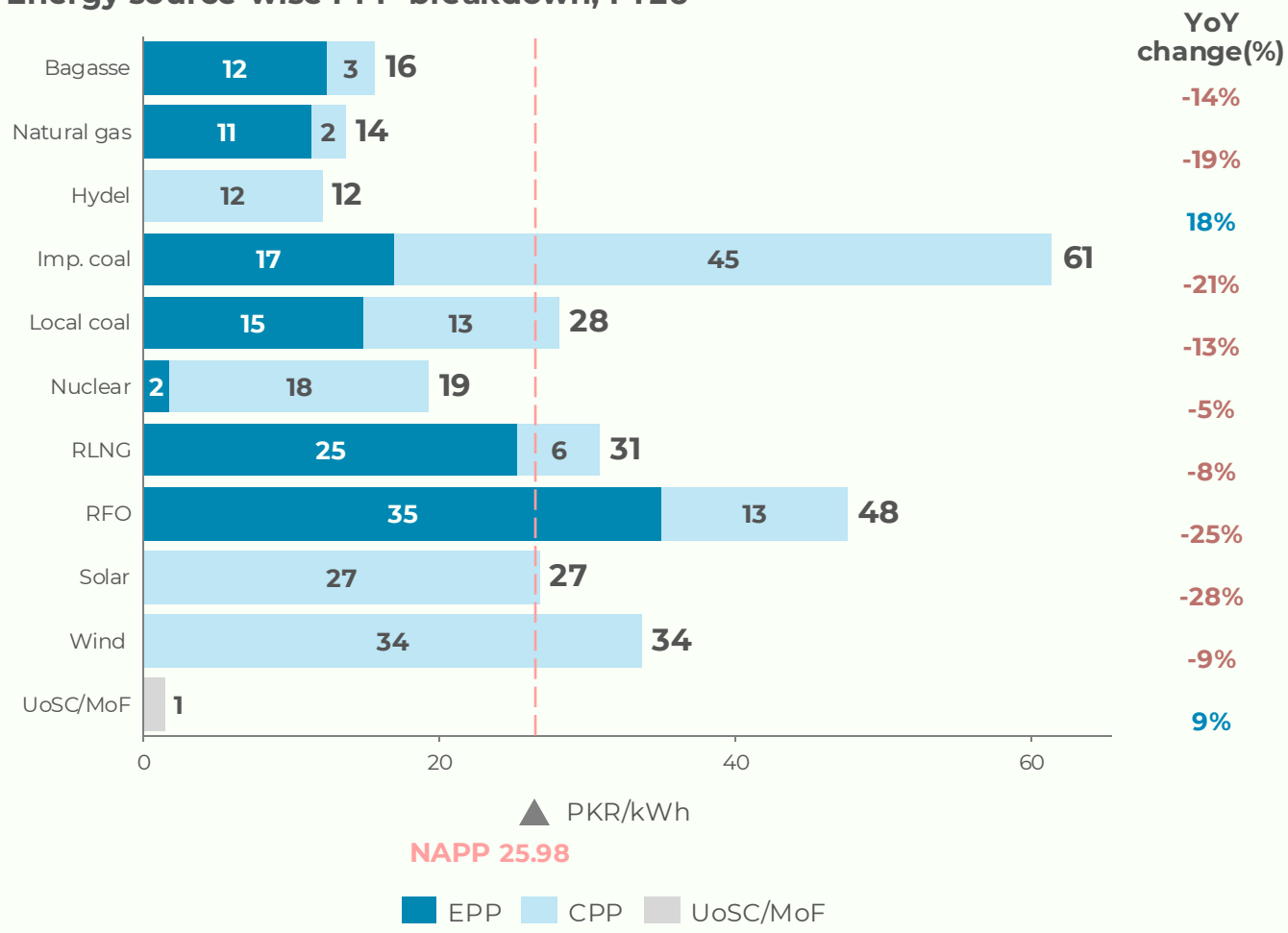


- In FY24 and FY25, electricity generation stood at 127 TWh, falling short of the projected 139 TWh and 135 TWh by 8% and 6% respectively, indicating overestimated projections that increased power procurement costs and added strain on system operations.
- Coal generation is projected to rise from 25 TWh in FY25 to 28 TWh in FY26, to compensate low hydrology forecast and reduce reliance on volatile imported RLNG prices.
- Despite a 12% shortfall in FY25 nuclear generation compared to projections, its share increased. This rise is largely attributable to the energization of the dedicated 500 kV transmission line from K2/K3 to the Port Qasim–Matiari corridor (capacity enhanced by 400MW).
- In FY26, the generation mix shifts toward local coal to reduce costs and forex exposure, particularly during high RLNG prices and low hydel output, while renewables lower share requires strategic planning.

Data Source: NEPRA & Renewables First calculations

The projected PPP decreased by 4% YoY, from PKR 27 per kWh in FY25 to PKR 25.98 per kWh in FY26

Energy source-wise PPP breakdown, FY26



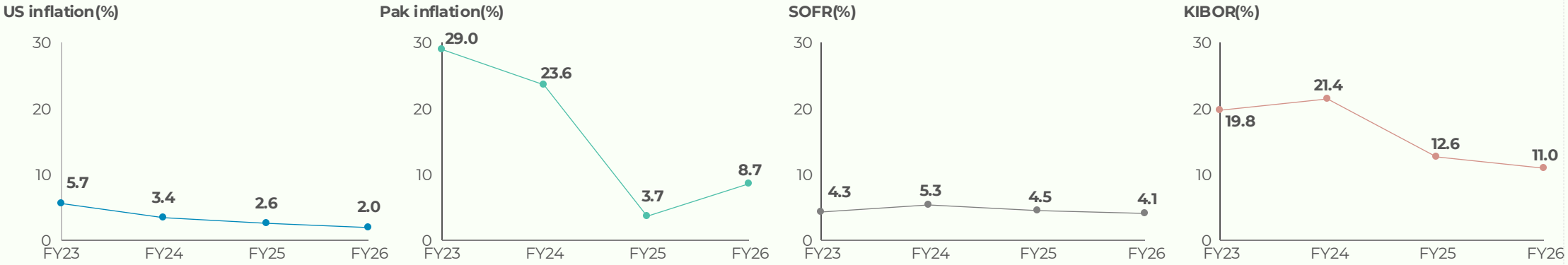
Data Source: NEPRA & Renewables First calculations

- In FY26, hydel PPP increased 18% YoY to PKR 12.05 per kWh from PKR 10.39 per kWh in FY25, driven by higher hydel capacity payments spread over fewer units. However, low inflows may further reduce hydel generation, escalate costs, strain fiscal resources, and heighten risks for tariffs.
- In FY26, the variable generation cost of RLNG is projected at PKR 25 per kWh, the highest in the mix. Price variations in RLNG due to international market volatility could raise overall system costs.
- Imported coal has high-capacity payments projected at PKR 45 per kWh, driven by lower plant utilization of 24%, with fuel costs at PKR 17 per kWh, indicating that financial risk is driven more by fixed obligations than energy costs, unlike RLNG and RFO.
- Solar per-unit cost fell 28% YoY, but the average price remains high compared to new solar prices (10–15 PKR/kWh), due to legacy EPAs signed when renewables were costlier. Adding solar capacity at new rates through auction could lower the solar basket price.

Examination of assumptions

Variations in economic parameters assumptions could result in higher capacity payments

Economic parameters trend, FY23 – FY26



FY26 numbers are as per projections made in PPP

Economic parameters sensitivity's impact on PPP components

Parameter	Impact on EPP (PKR B)	Impact on CPP (PKR B)	Total Impact (PKR B)	Per unit impact (PKR)
1 Rupee Depreciation	+3.3	+4.9	**+8.2**	+0.06
1% Increase in SOFR	–	+22.9	**+22.9**	+0.18
1% Increase in KIBOR	–	+6.0	**+6.0**	+0.05

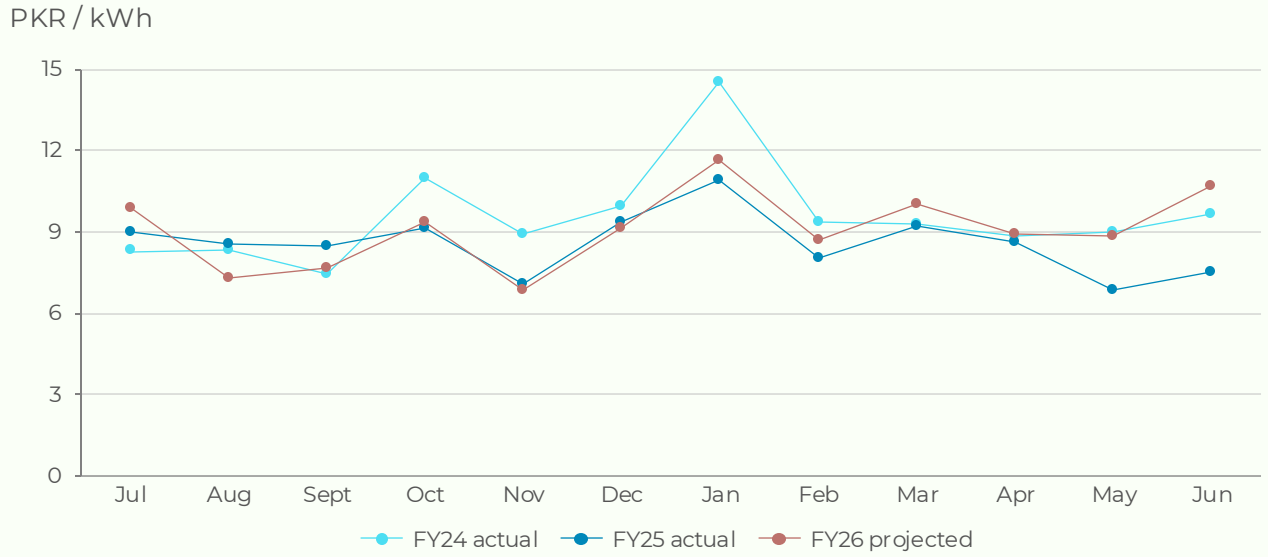
Impacts are based on a one percentage point change in the respective parameter

- Capacity payments account for 58% of the PPP for FY26, and are highly sensitive to economic variables. Minor shifts in these parameters affect the capacity charge. In FY25, such variations in economic factors led to negative quarterly adjustments.
- For FY26, NEPRA set Pakistan's inflation at 8.65%, higher than ADB's forecasts of 6.0% for 2025 and 5.8% for 2026. US inflation is assumed at 2.0%, whereas the US Federal Reserve projects inflation at 2.7% in 2025 and 2.2% in 2026, indicating a gap with the current assumption.

Data Source: NEPRA, ADB, US FED, & Renewables First calculations

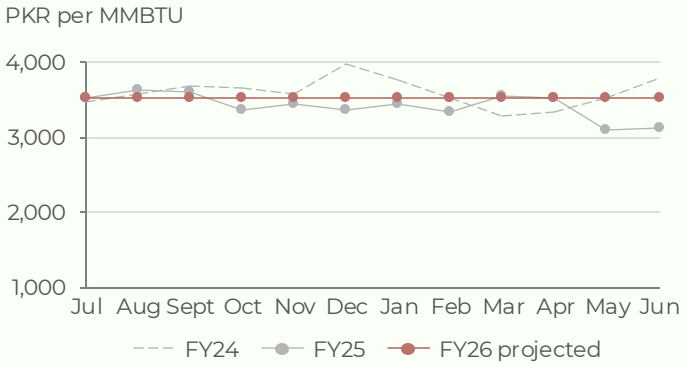
FY26 fuel prices are assumed constant, with small adjustments factored in

Month-wise fuel cost, FY24 – FY26

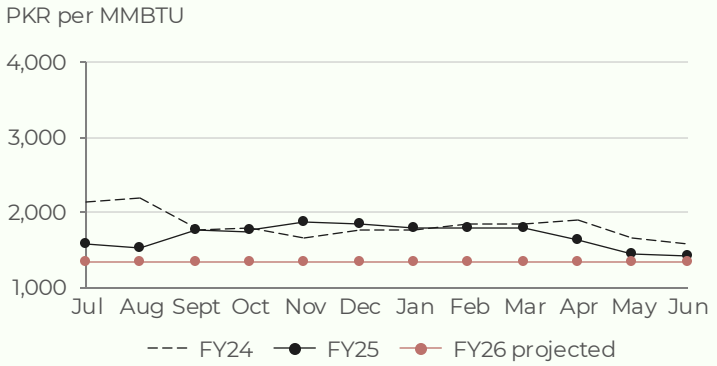


- Fuel costs account for 34% of the PPP while fuel-based sources constitute 48% of the projected generation mix. Any deviation in reference fuel prices directly impacts tariffs and is adjusted through monthly FCA.
- RLNG, which represents 16% of the generation mix, is indexed to Brent. The PPP assumes Brent at $72–74/bbl above market expectations. J.P. Morgan projects Brent in the low-to-mid $60s, while Goldman Sachs expects ~$56/bbl in 2026.

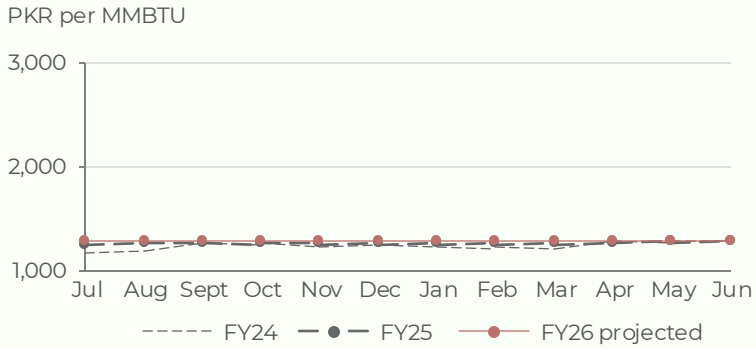
RLNG rates, FY24 – FY26



Imported coal rates, FY24 – FY26



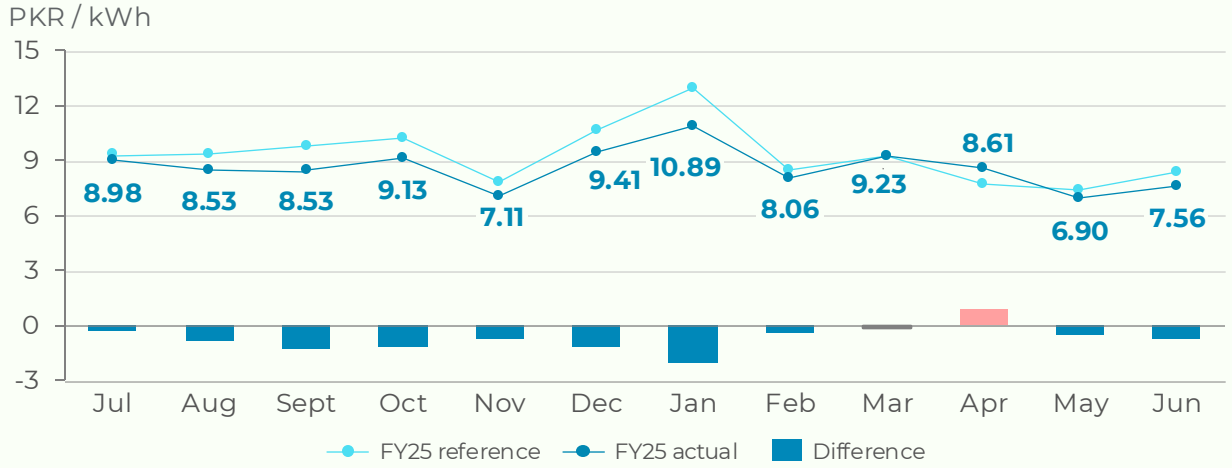
Local coal rates, FY24 – FY26



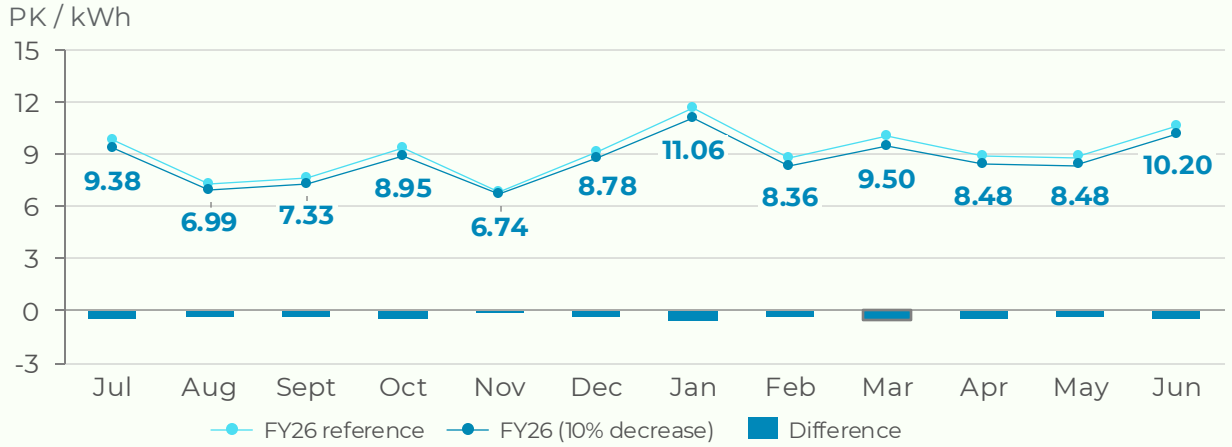
Data Source: NEPRA & Renewables First calculations

Lower global prices and higher estimates resulted in negative monthly fuel charge adjustments

Monthly Fuel Adjustment – FY25



Fuel prices projections vs 10% RLNG price Reduction - FY26

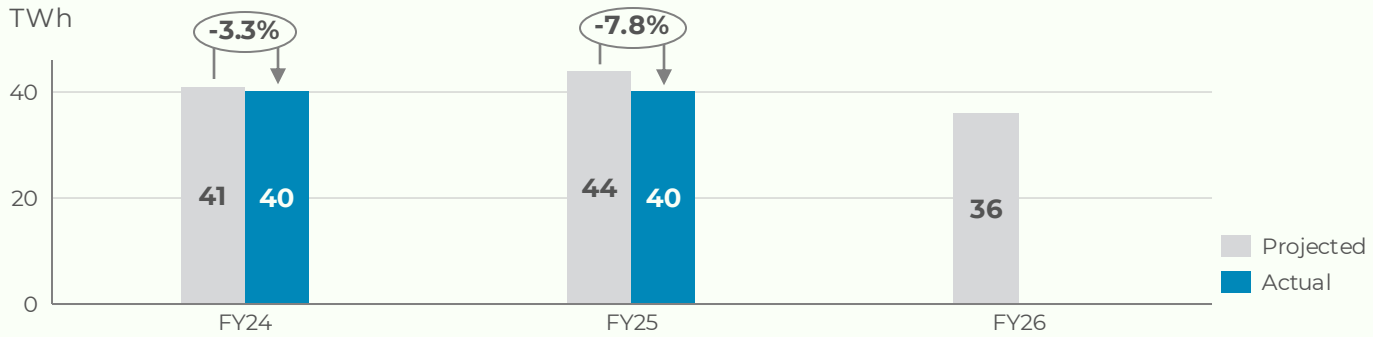


- In FY25, lower international prices combined with higher reference estimates resulted up to PKR 2 per kWh negative monthly FCA.
- OGRA in the RLNG price notification dated 15th August 2025, notified Brent on 67.7$ almost 10% less than the projected in PPP. A 10% reduction in brent price could give negative FCA up to PKR 0.6 per kWh.
- If global prices follow JP Morgan and Goldman Sachs forecasts, actual RLNG and imported fuel costs would be significantly lower than PPP assumptions, resulting in negative monthly fuel charge adjustments.
- FY26 has already started off with negative FCA, this is evident from CPPA-G submission to NEPRA for negative FCA of PKR 1.691 per kWh for July 2025.

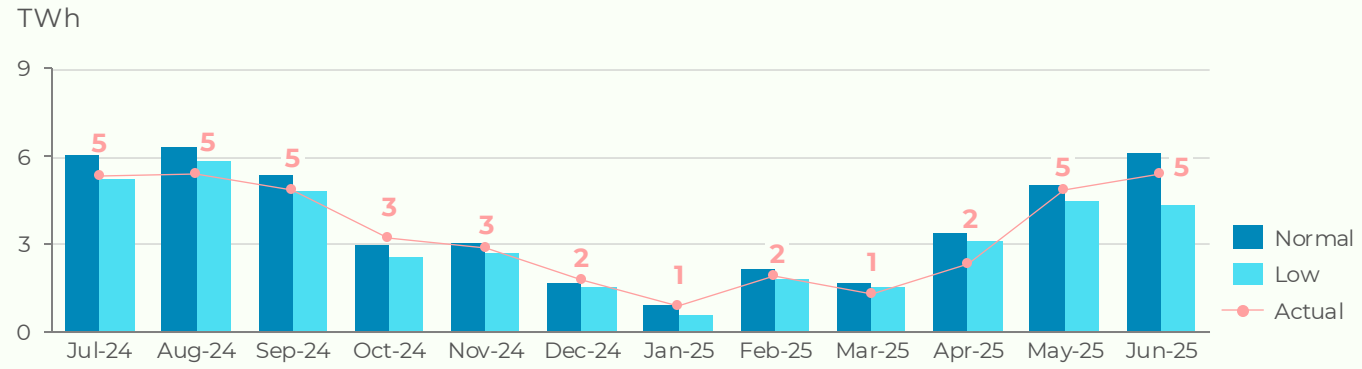
Data Source: NEPRA, OGRA & Renewables First calculations

Hydrology projections remain uncertain creating challenges for system reliability and driving up generation cost

Actual vs projected hydel generation, FY24 – FY26



Monthly hydel generation profiles, low vs normal vs actual generation FY25



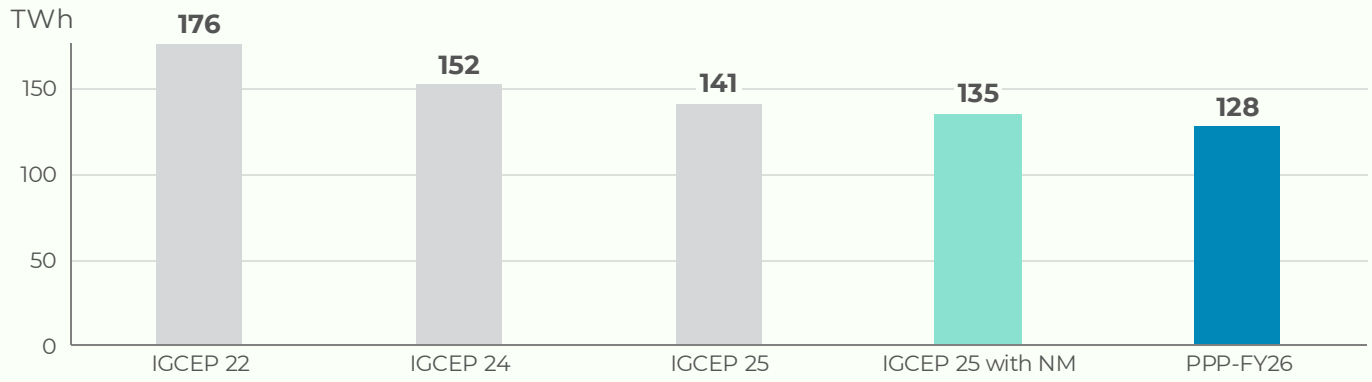
Parameter	Impact on EPP (PKR B)	Impact on CPP (PKR B)	Total impact (PKR B)	Per unit impact PKR
1% Reduction in Hydrology	+6.4	-0.5	+5.8	+0.05

- The gap between projected and actual hydropower generation widened from 3.3% in FY24 to 7.8% in FY25, highlighting the need to refine forecasting models by integrating real-time water flow data, climate patterns, and reservoir management insights.
- FY25 actual generation aligned with low hydrology forecast, instead of normal hydrology approved by NEPRA. This reflects sustained water inflow challenges and hydropower's climate vulnerability.
- For FY26, NEPRA approved low hydrology forecast in which CPPA took a conservative estimate 18% less than the FY25 projections
- FY26 early trends show that projections remain optimistic under the low hydrology scenario, along with the exclusion of Neelum-Jhelum due to technical constraints.
- 1% drop in projected inflows would trigger reliance on costly RLNG and imported coal, raising power costs by PKR 0.05 per kWh.

Data Source: NEPRA, OGRA & Renewables First calculations

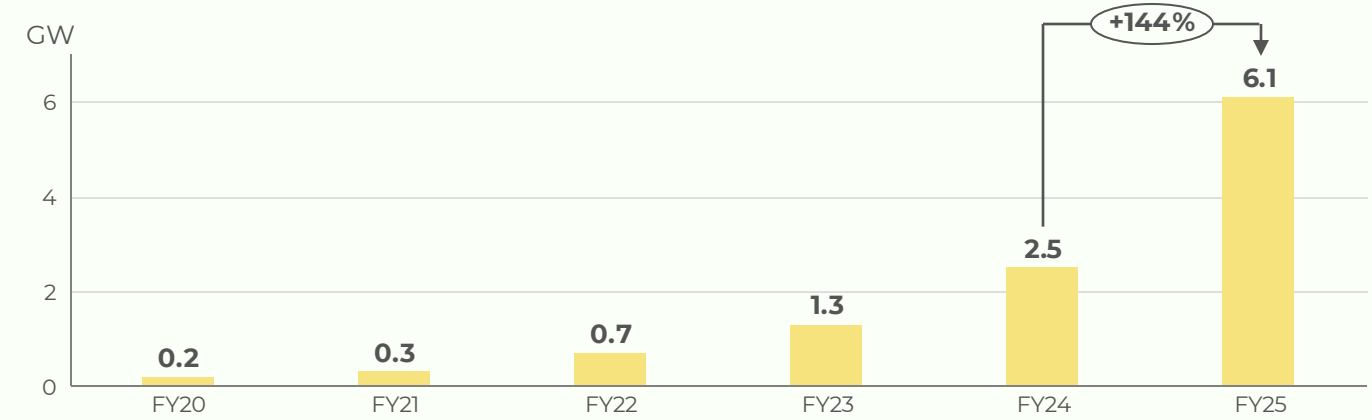
Net-metering capacity surges beyond IGCEP FY34 target, hits 6.1 GW by FY25

Demand projections of FY26



[1]

Cumulative Net-metering capacity (excluding KE)



[1] *PPP-FY26 excludes KE's own generation (only considers CPPA-G allocation)*
[2] *For further details on the growth of solar in Pakistan, see our study "The Great Solar Rush in Pakistan"*

- Despite concerns over declining generation trends, NEPRA approved a 2.8% growth projection (Jan-Dec 2024 base) in power demand, citing a 28% YoY surge in April post-tariff cut. CPPA-G has linked this to improved economic indicators and the shift of captive users to the grid.
- CPPA-G continues to apply fixed growth over the previous year's actuals, a repetitive approach that overlooks the structural shift in consumption trends. This approach ignores non-linear growth in distributed solar PV.[2] In FY25 alone, net metering capacity increased by 144% YoY, already surpassing IGCEP forecasts.
- Earlier IGCEPs projected net metering to reach 4.3 GW by 2031 and 2.9 GW by 2034. Yet, by the end of FY25, installed capacity had already exceeded these long-term estimates.
- Future net metering additions must be explicitly forecasted and incorporated into demand projections to ensure accurate and forward-looking system planning.

Data Source: NEPRA & Renewables First calculations

PPP is highly sensitive to demand fluctuations, with a 5% decline potentially raising costs by PKR 1.1 per kWh

Impact of ± 5% Demand variation on Power Purchase Price

- The projected demand in PPP is achievable if captive consumers return to the grid and the economy sustains growth. However, in the event of political instability or further migration of captive consumers to off-grid or hybrid solar PV, grid demand may deviate from projections.
- PPP is sensitive to demand variations. **±5% variation** in demand can move the projected PPP by up to Rs 1.1/kWh, reinforcing the critical role of accurate demand forecasting in ensuring reliable tariff projections.

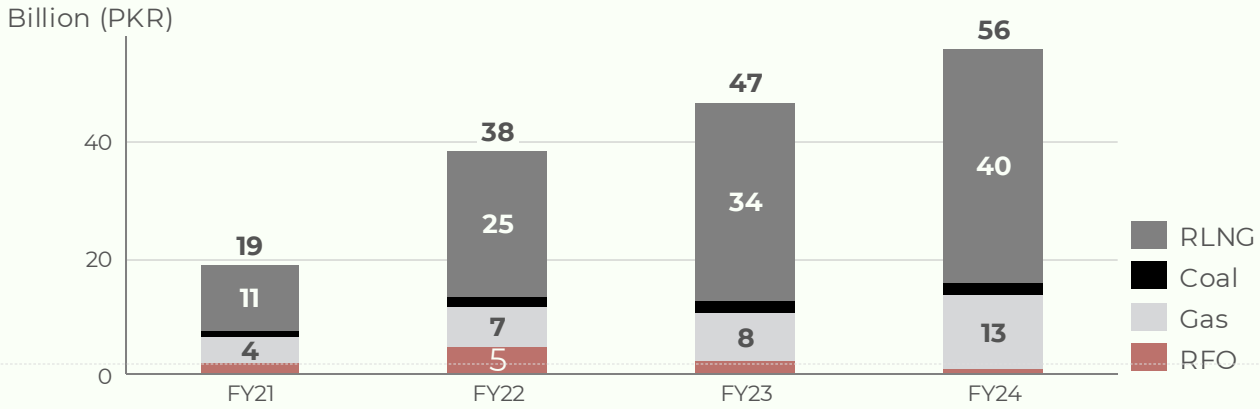
Data Source: NEPRA & Renewables First calculations

Unaccounted parameters

Flexibility gaps in the grid result in higher costs through partial load adjustment charges (PLAC)

Avg. monthly hourly generation profiles, Jun 24 vs Jun 25

PLAC trend, FY21 – FY 24

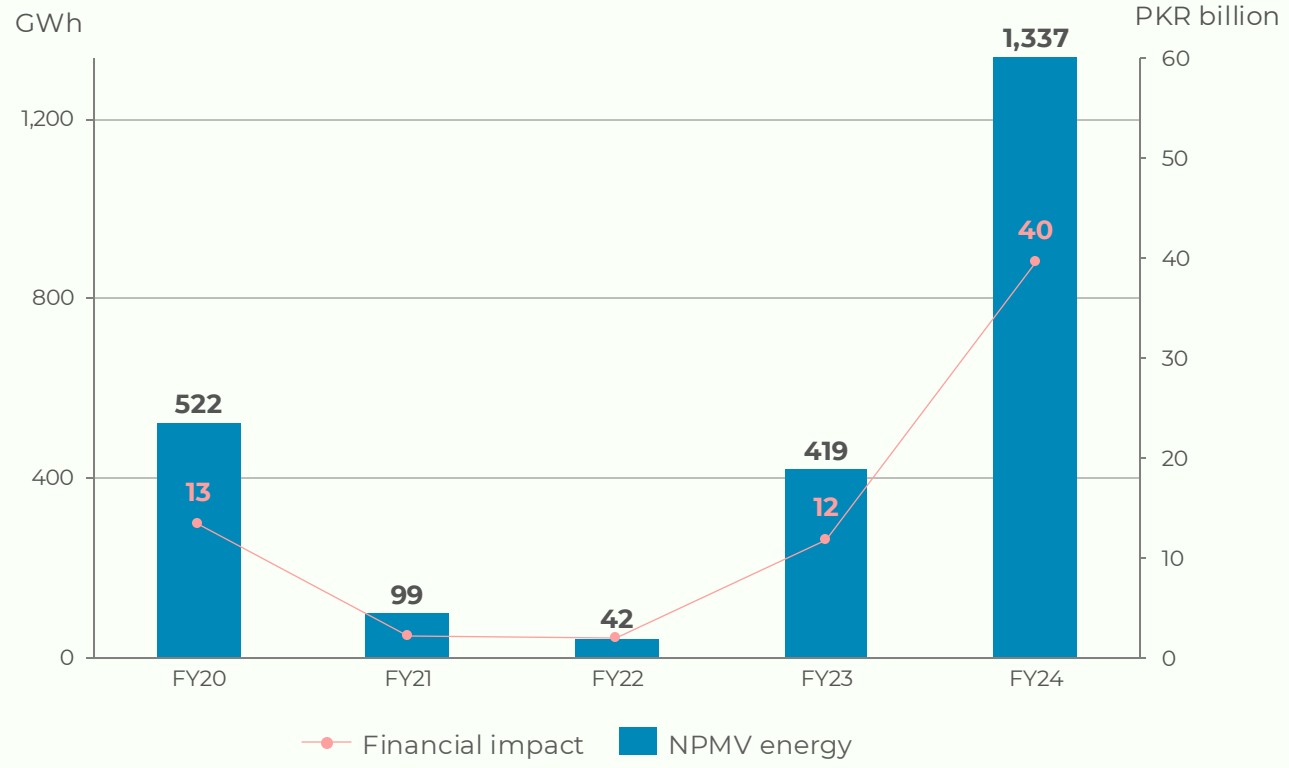


- The solar rush has reshaped the grid load profile, which now exhibits a pronounced "duck curve" with midday dips and steep evening ramps, increasing the need for fast and flexible generation
- Conventional thermal plants are forced into partial-load operations, triggering significant Partial Load Adjustment Charges (PLAC). These costs have grown rapidly, from Rs 19 billion in FY21 to Rs 56 billion in FY24, marking a nearly threefold increase.
- If FY24's PLAC level repeats, PPP could rise by ~Rs 0.44/kWh.
- Despite their growing magnitude, PLAC costs remain largely unaddressed in the PPP framework, even though they represent the hidden cost of inflexible generation in a solar-dominated grid.
- To ensure more accurate tariff projections and system planning, PLAC must be explicitly accounted for in PPP methodology, alongside a greater emphasis on flexibility investments and ramping solutions.

Data Source: NEPRA & Renewables First calculations

Exclusion of non-projected missed volumes (NPMV) of renewables in FY26 PPP understates potential costs

Energy lost vs financial impact , FY20 – FY24



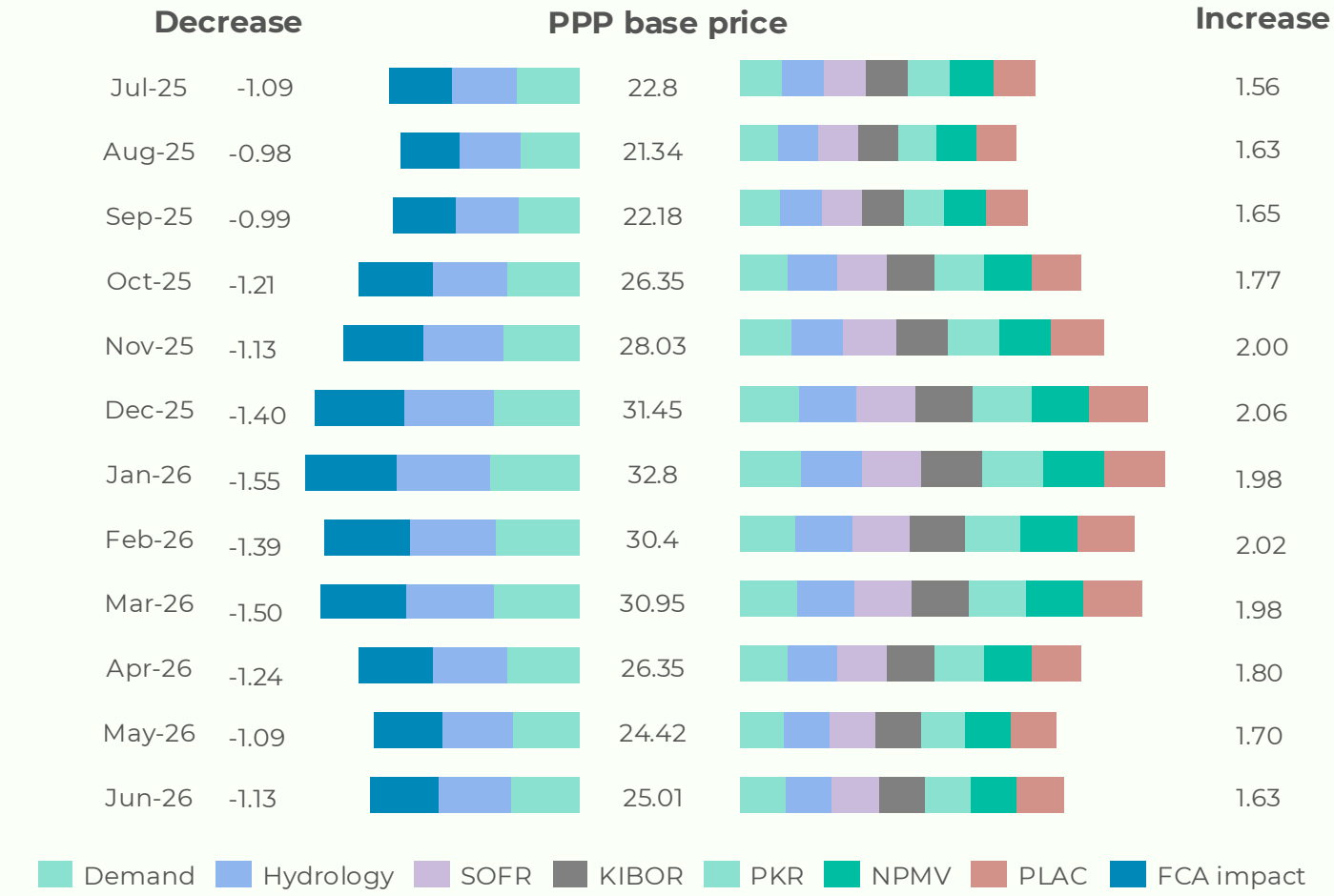
- Non-Project Missed Volume (NPMV) cost is growing on annual basis. In FY24 alone, 1,337 GWh of wind energy was curtailed, resulting in an NPMV-related loss of Rs 40 billion.
- To meet this shortfall, the system relied on replacement generation, adding a further Rs 22.73 billion in costs.
- If the same level of curtailment as in FY24 occurs, replacement generation would increase PPP by ~Rs 0.18/kWh, a cost that is currently not explicitly captured in PPP projections.
- The absence of NPMV in formal planning creates distortions in tariff calculations and masks the financial burden of system inflexibility.
- As renewables penetration increases, the likelihood of curtailment and replacement energy costs will only grow. Future planning must prioritize grid flexibility solutions to minimize curtailment risks going forward and include such cost in the Power Purchase Price Planning.

Data Source: NEPRA & Renewables First calculations

Conclusion

Demand, fuel costs, and economic parameters could drive electricity prices up by PKR 2 per unit for FY26

PPP sensitivity analysis



- PPP is highly sensitive to demand, hydrology, fuel costs, and economic parameters. Each factor can shift tariffs up or down by PKR 0.1–1.1 per kWh.
- Graph shows individual impacts for each month, how much demand, hydrology, economic parameters (PKR, SOFR, KIBOR), and unaccounted costs (NPMV, PLAC) could raise or lower PPP.
- Demand fluctuations have the largest effect on PPP. 5% drop in demand could add up to PKR 1.1 per kWh in the PPP putting an upward pressure on quarterly adjustment charges for consumers.
- Unaccounted costs such as NPMV and PLAC introduce additional financial pressures that are not explicitly captured in PPP projections, leading to an understatement of the true cost.
- These factors combined could shift PPP within a band of PKR -1 to +2 per kWh in the upcoming fiscal year.

Data Source: NEPRA, OGRA & Renewables First calculations

The tariff outlook for FY26 is expected to reflect cost pressures driven by changing consumption patterns

For FY26, electricity demand growth has been projected at 2.8%, aligned with the country's anticipated GDP growth of 3.6% as per International Monetary Fund (IMF) estimates. However, grid-based electricity sales have already declined for two consecutive years, largely due to the rising adoption of distributed solar, both behind-the-meter and net-metered systems. With further solar installations expected in FY26, grid sales are likely to continue their downward trend, potentially falling short of projections.

Overestimated demand drives unnecessary procurement and increases financial burden on consumers. Lower-than-projected generation results in underutilization of committed capacity, causing fixed payments to be spread over fewer units. This drives up per-unit cost and puts upward pressure on quarterly adjustment charges for consumers.

Due to low hydrology projections, hydel's share in the generation mix is expected to decline from 32% in FY25 to 27% in FY26, raising the per-unit cost of hydel electricity from PKR 10.4 to PKR 12 per kWh. This upward shift will significantly impact the overall PPP price, given hydel's dominant role in the generation mix. Meanwhile, the share of coal (both local and imported) is projected to rise from 17% in FY25 to 21% in FY26, aiming to reduce reliance on the volatile RLNG market and its associated supply chain risks.

The government is seeking to renegotiate long-term RLNG contracts. Shifting of captive users to the grid has reduced RLNG demand and created surplus supply. If contracts are revised, it would enable a shift away from expensive RLNG toward relatively cheaper fuels such as coal and domestic gas, helping lower overall generation costs and easing pressure on the PPP.

The absence of NPMV and PLAC in formal planning creates distortions in tariff calculations and masks the financial burden of system inflexibility. To ensure more accurate tariff projections and system planning, inflexibility cost must be explicitly accounted for in PPP methodology, alongside a greater emphasis on flexibility investments and ramping solutions.

Abbreviations

ADB	Asian Development Bank
BBL	Barrel
BTM	Behind the Meter
CCPA-G	Central Power Purchasing Agency (Guarantee) Limited
CPP	Capacity Purchase Price
DISCO	Distribution Company
EPA	Energy Purchase Agreement
EPP	Energy Purchase Price
FCA	Fuel Cost Adjustment
FY	Fiscal Year
GDP	Gross Domestic Product
GW	Gigawatt
IGCEP	Indicative Generation Capacity Expansion Plan
IMF	International Monetary Fund
kV	Kilovolt
kWh	Kilowatt-hour
KIBOR	Karachi Interbank Offered Rate
OGRA	Oil and Gas Regulatory Authority
MoF	Market Operator Fees
MW	Megawatt
NAPP	National Average Purchase Price
NEPRA	National Electric Power Regulatory Authority
NPMV	Non-projected Missed Volumes
PLAC	Partial Load Adjustment Charges
PPP	Power Purchase Price
QTA	Quarterly Tariff Adjustment
RFO	Residual Fuel Oil
RLNG	Regasified Liquefied Natural Gas
SOFR	Secured Overnight Financing Rate
TWh	Terawatt-hour
UoSC	Use of System Charges
YoY	Year-on-Year

Renewables First (RF) is a think tank for energy and environment. Our work addresses critical energy and natural resource issues with the aim to make energy and climate transitions fair and inclusive.

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