RENEWABLES FIRST

Pakistan's Power Market Insights

Jun 2025

Introduction

Our power market insights highlight important trends shaping Pakistan's power sector. This document focuses on long-term changes, such as the effects of fuel cost variations and shifts in the energy mix. The goal is to help businesses and consumers understand how the power sector is evolving.

Key highlights

In Jun 25, electricity generation increased by 2% year on year (YoY), rising from 13.5 TWh in Jun 24 to 13.7 TWh

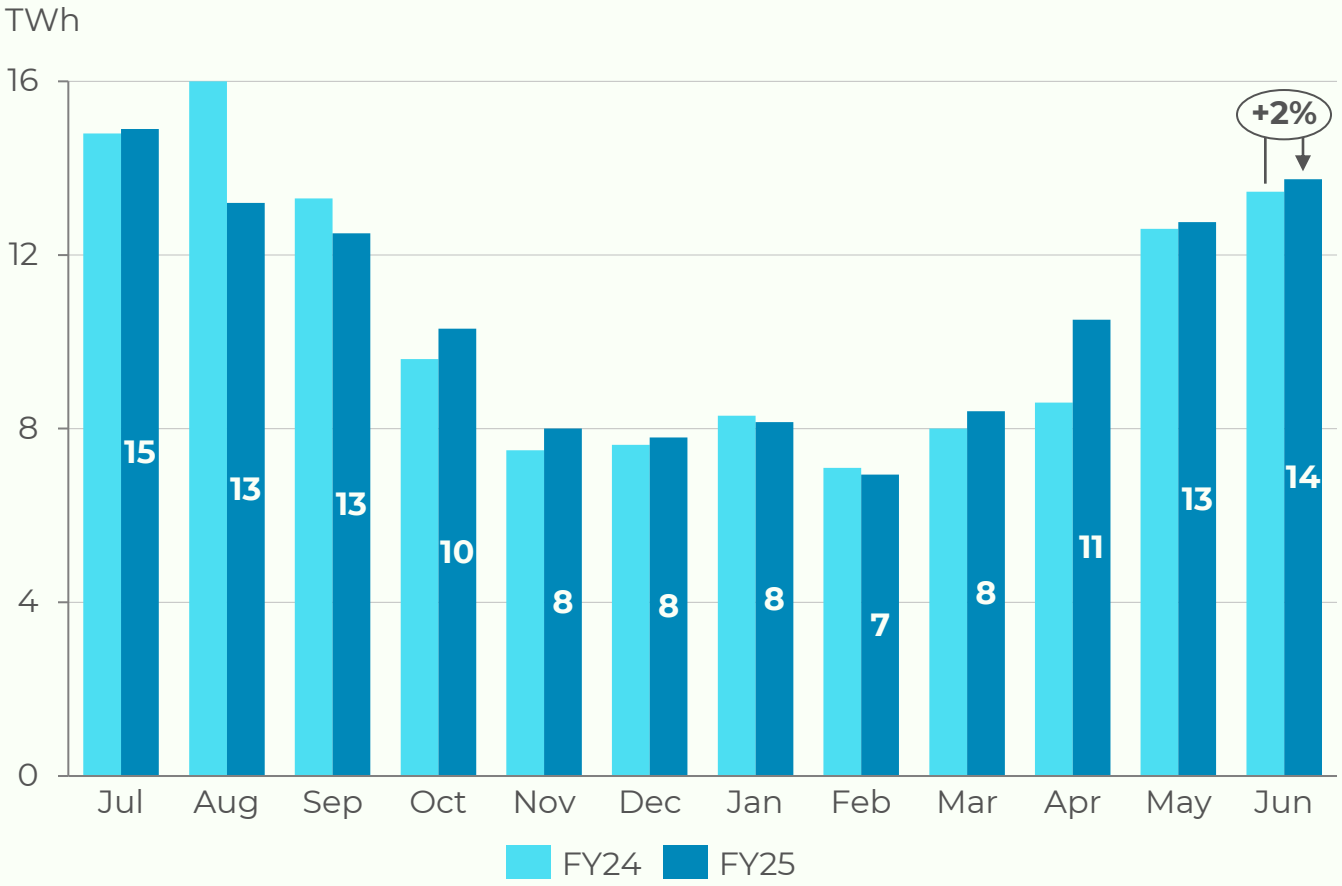
In Jun 25, hydel led the generation mix with 14% YoY increase driven by strong water inflows

Electricity generation in FY25 edged up by less than 1% YoY, totalling 127 TWh

#RFPowerMarketInsights

Jun 25 generation rose to 13.7 TWh, driven by captive power plants (CPPs) shifting back to the national grid

Month-wise electricity generation in FY24 vs FY25



Data Source: NEPRA & Renewables First calculations

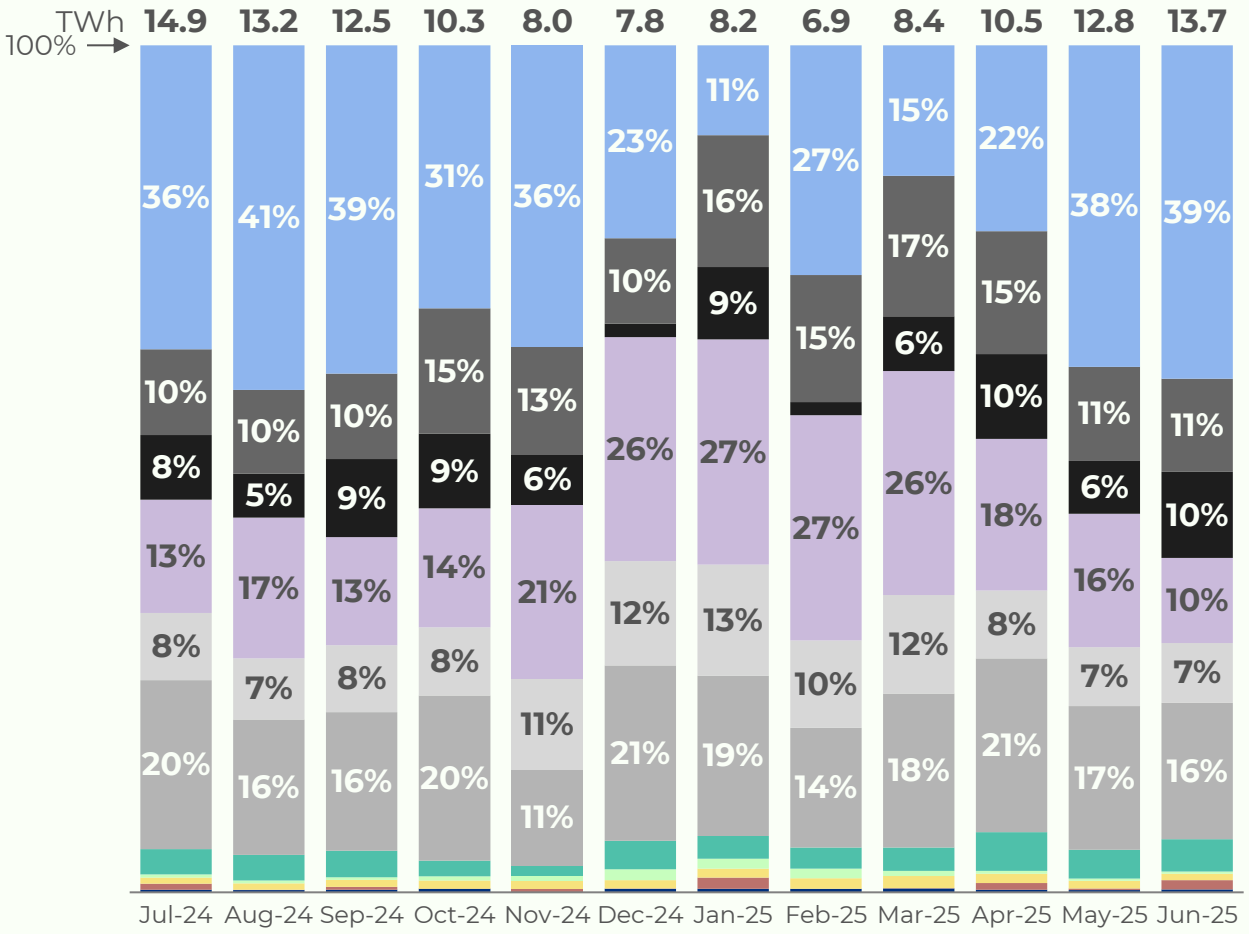
- Electricity generation increased to 13.7 TWh in Jun 25, driven by slightly warmer temperatures, with a national average of 32.45°C, i.e., 0.47°C above country's historical average temperature for Jun.
- Negative QTA and FCA adjustments in recent months led to lower tariffs, and together with favourable economic indicators, encouraged improved reliance on the national grid. The recently imposed gas levy further supported this shift by phasing out the cost advantage of CPPs self-generation over grid-based electricity.
- Under the federal government's 'Off the Grid (CPP) Levy Act 2025', the gas levy, currently set at PKR 791 per MMBTU, has increased the generation cost for CPPs from PKR 35 to PKR 42.32 per kWh, compared to the B3 industrial tariff of PKR 29 per kWh (off-peak). Further phased increases in the gas levy are planned, as outlined below:

5%: upon enactment **10%:** Jul 25
15%: Feb 26 **20%:** Aug 26

QTA: Quarterly tariff adjustments
FCA: Fuel cost adjustments
MMBTU: Million British thermal units

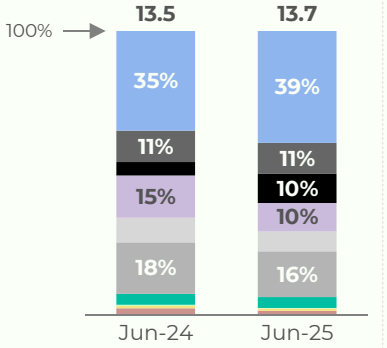
In Jun 25, hydel powered 39% of the grid, driven by strong inflows and strategic dam releases

Energy source-wise generation mix, FY25



- In Jun 25, hydel generation rose by 12% MoM from 4.8 TWh in May 25 to 5.4 TWh in Jun 25, driven by peak snowmelt runoff from northern river catchments and strategic dam releases to meet rising electricity demand and kharif season irrigation needs.
- Nuclear generation dropped by 31% MoM, falling from 2 TWh in May 25 to 1.4 TWh in Jun 25, due to refueling at K-2 and C-1 and an unplanned outage at C-4.
- Imported coal-based generation jumped 76% MoM, from 0.79 TWh in May 25 to 1.39 TWh in Jun 25, offsetting the nuclear shortfall and meeting June's higher electricity demand.

Energy source-wise generation mix, Jun 24 vs Jun 25



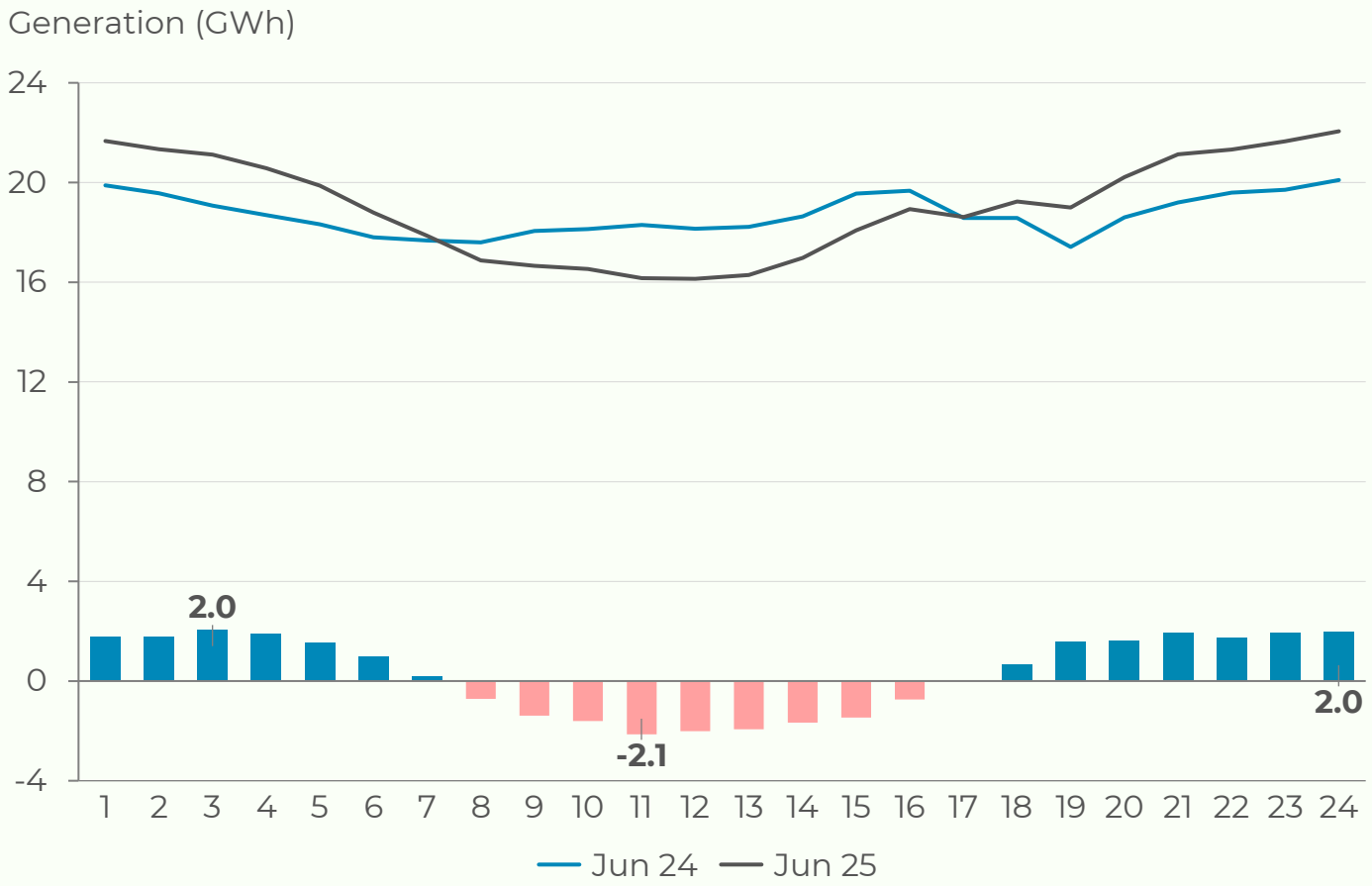
K-2: Karachi nuclear power plant unit-2
C-1: Chashma nuclear power plant unit-1
C-4: Chashma nuclear power plant unit-4

- Hydel
- Local coal
- Imported coal
- Nuclear
- Natural gas
- RLNG
- Wind
- Bagasse
- Solar
- RFO/HSD
- Electricity imports

Data Source: NEPRA & Renewables First calculations

In Jun 25, a 2.1 GWh variation in electricity generation was observed during daylight hours

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

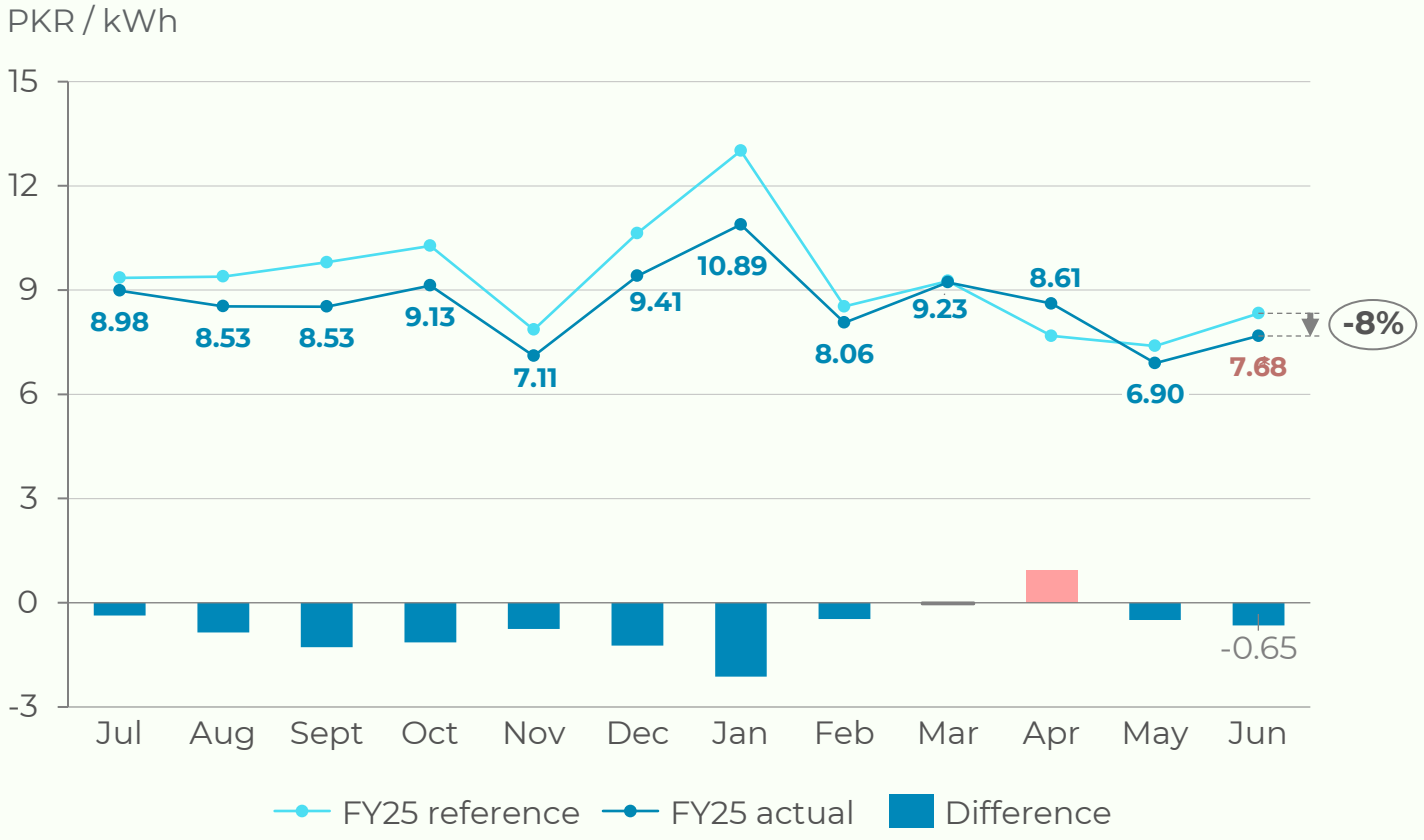


- Overall electricity generation increased in Jun 25 compared to Jun 24. Conversely, the hourly generation profiles revealed a sharp mid-day dip of 2.1 GWh, reflecting an increased solar uptake and shifting grid reliance during daylight hours.
- In Jun 25, peak electricity demand reached 24.7 GW, up 7.5% from last year's peak of 22.97 GW, while the minimum peak demand rose to 12.4 GW, a 24% increase from 10 GW in Jun 2024. This broader rise in demand suggests sustained economic activity.

Data Source: NEPRA & Renewables First calculations

Throughout FY25, fuel cost adjustments largely remained negative with a projected reduction of PKR 0.65 per kWh for Jun 25

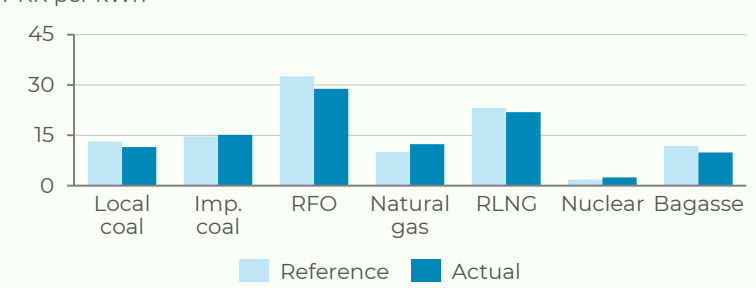
Fuel price adjustments in FY25



* Provisional number

- In Jun 25, the cost of natural gas-based generation stood at PKR 12.4 per kWh, reflecting a 24% increase from the reference cost PKR 10 per kWh. Meanwhile, nuclear generation cost stood at PKR 2.5 per kWh, 37% higher than the projected price.
- In Jun 25, reference generation was projected at PKR 8.33 per kWh, while actual generation stood at PKR 7.68 per kWh, reflecting an 8% decline. As a result, a negative fuel cost adjustment of approximately PKR 0.6541 per kWh is expected to provide PKR 8.7 billion relief to consumers.

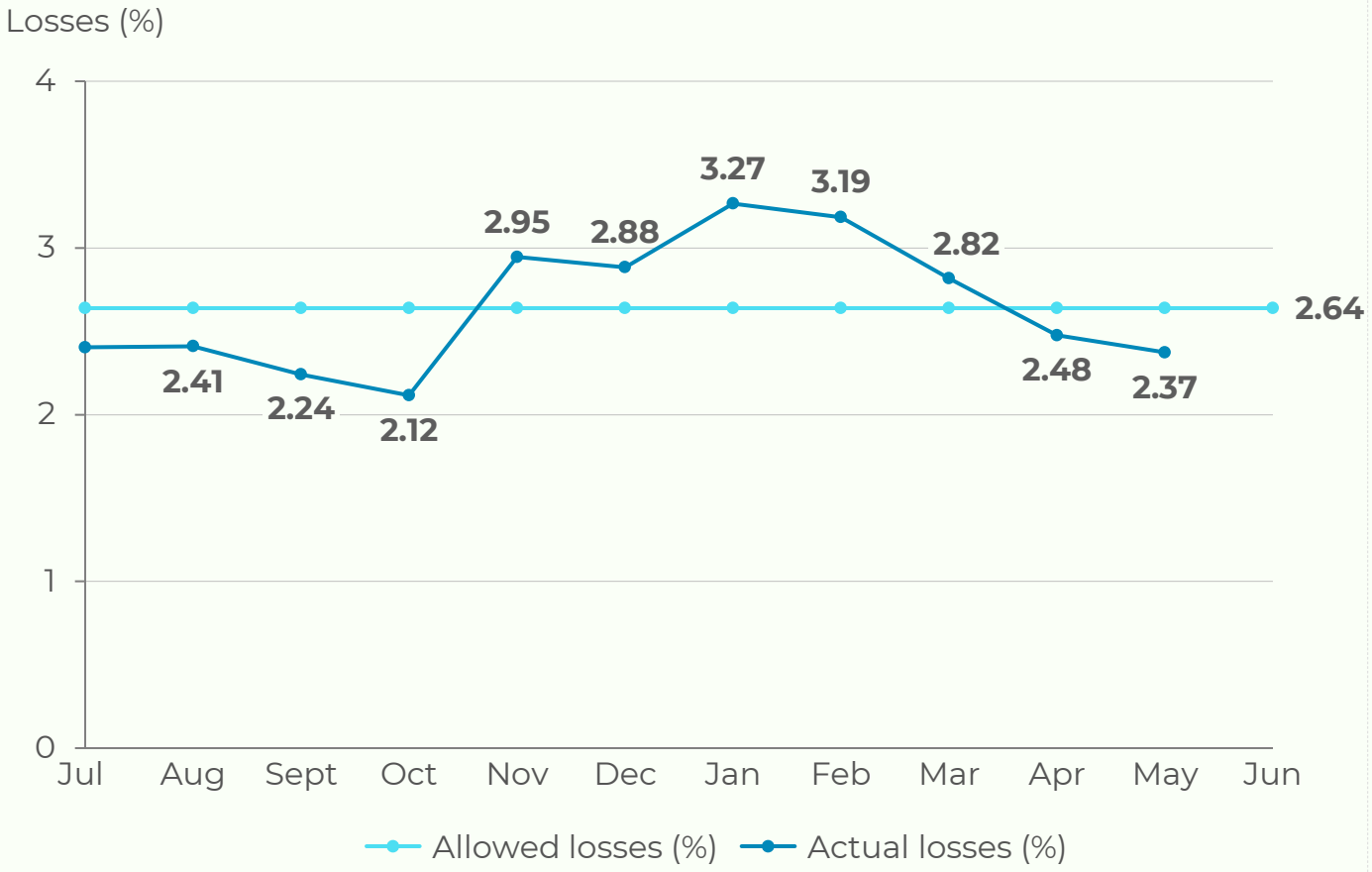
Per unit fuel cost comparison for Jun 25, actual vs reference



Data Source: NEPRA & Renewables First calculations

Improved generation from northern hydel plants helped reduce transmission and transformation (T&T) losses

T&T losses in 11M-FY25



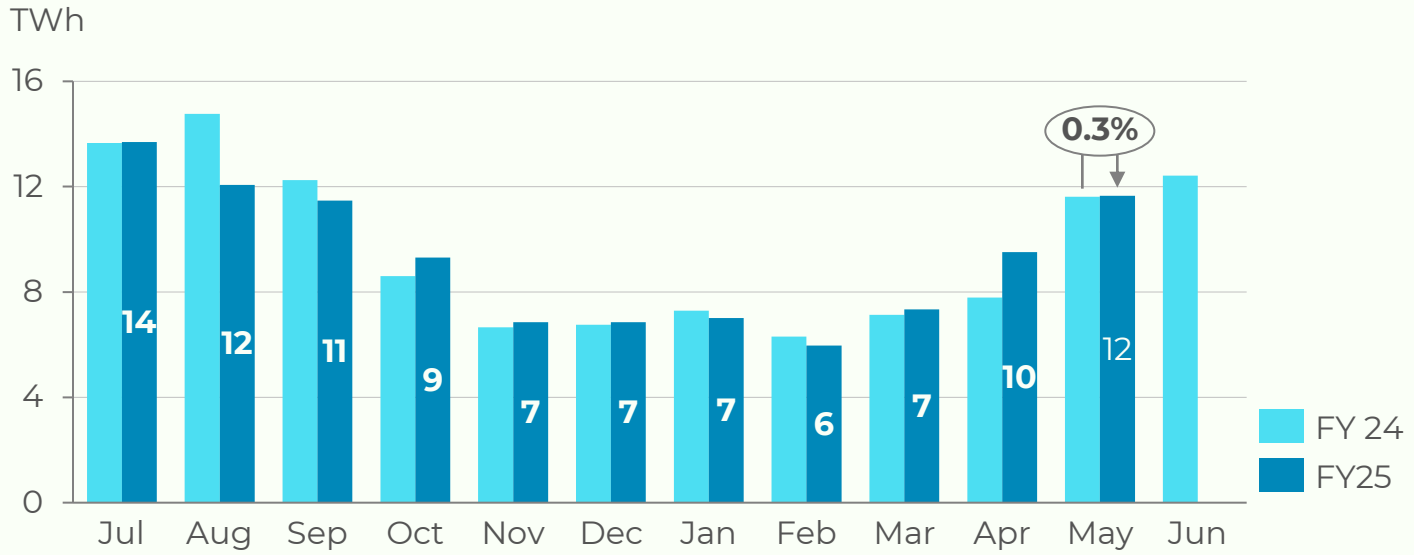
- During winter, reduced hydel generation in the north increases reliance on southern thermal plants to meet northern load centres demand, leading to higher transmission losses. However, improved hydel generation in May led to a drop in T&T losses to 2.37%, falling below the allowed threshold of 2.64%.
- The 2.37% losses in Jun 25, resulted in a loss of 355.19 GWh in May 25, with an estimated financial impact of PKR 0.59 B. Cumulatively, T&T losses during the first 11 months (11M) of FY25 amounted to PKR 13.86 B.

Note: For Jun 25, NEPRA has yet to report the T&T losses

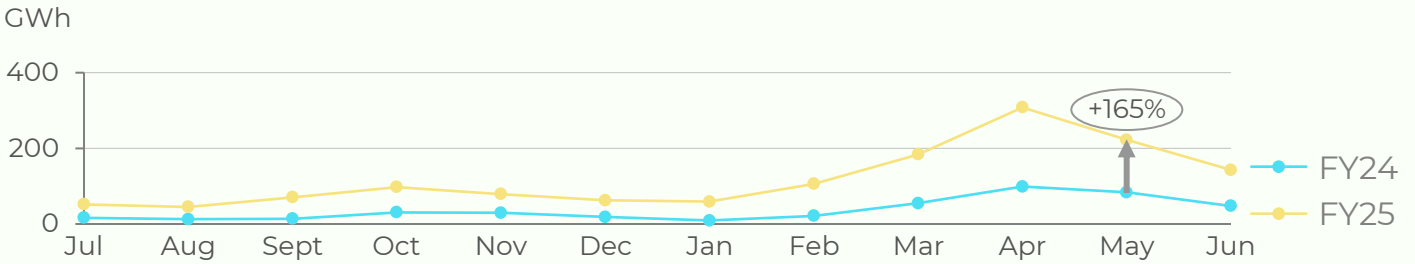
Data Source: NEPRA & Renewables First calculations

DISCO's electricity procurement saw a slight dip of 1% YoY in the first 11M of FY25

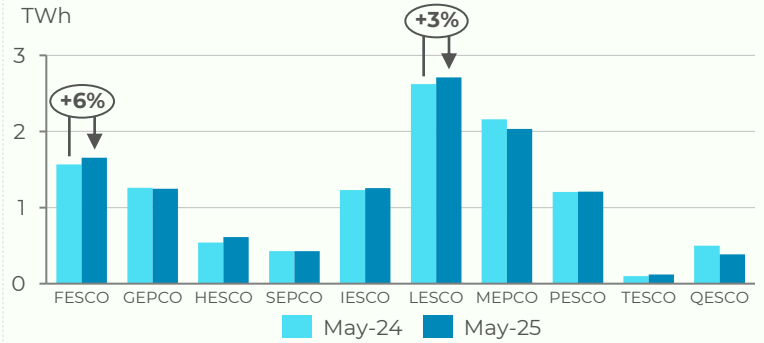
DISCO-wise units procured, FY24 vs FY25



Comparison of DISCOs' net-metering units procured, FY24 vs FY25



DISCO-wise units procured, May 24 vs May 25



- In the first 11 months of FY25, DISCOs procured 102 TWh, a 1% YoY drop from 103 TWh in FY24, while net-metering procurement surged 165% YoY, rising from 390 GWh to 1,286 GWh, signaling increased rooftop solar adoption.
- In May 25, LESCO and FESCO showed increased grid consumption, driven by possible economic activity alongside rising renewable energy adoption in urban and industrial zones.

Note: NEPRA has yet to report the procurement by DISCOs for Jun 25.

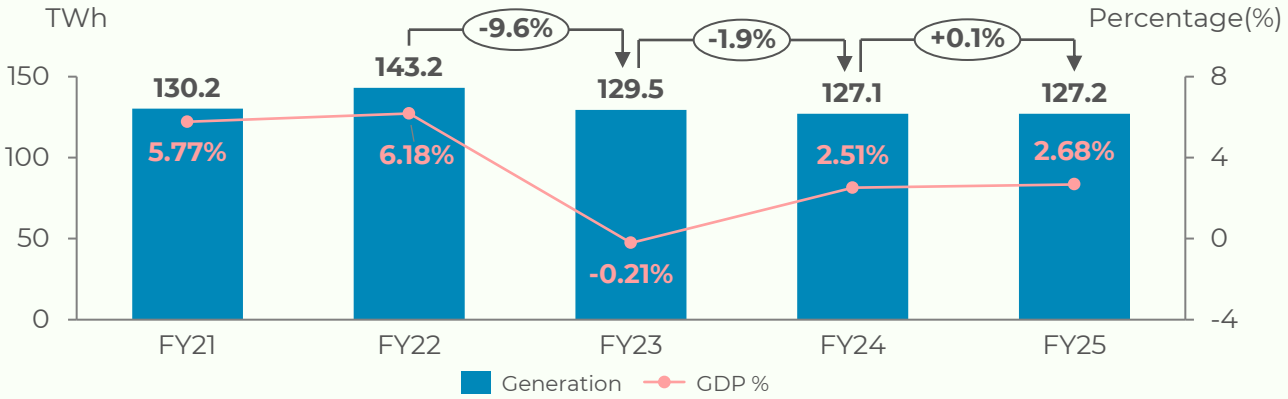
Data Source: NEPRA & Renewables First calculations

Power Sector Overview - FY25

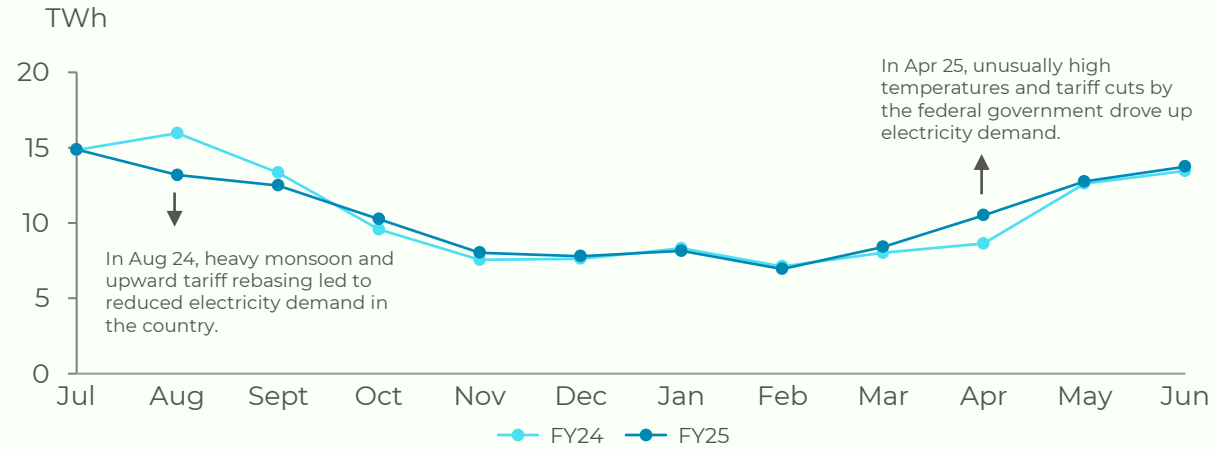
Trends in electricity generation
Generation mix and renewables share
Impact of fuel prices on power generation costs
Electricity tariff trends across consumer segments

FY25 saw a marginal 0.1% YoY increase in electricity generation to 127.2 TWh, breaking a two-year downtrend

Electricity generation and GDP growth, FY21 - FY25



Month-wise electricity generation comparison, FY24 vs FY25



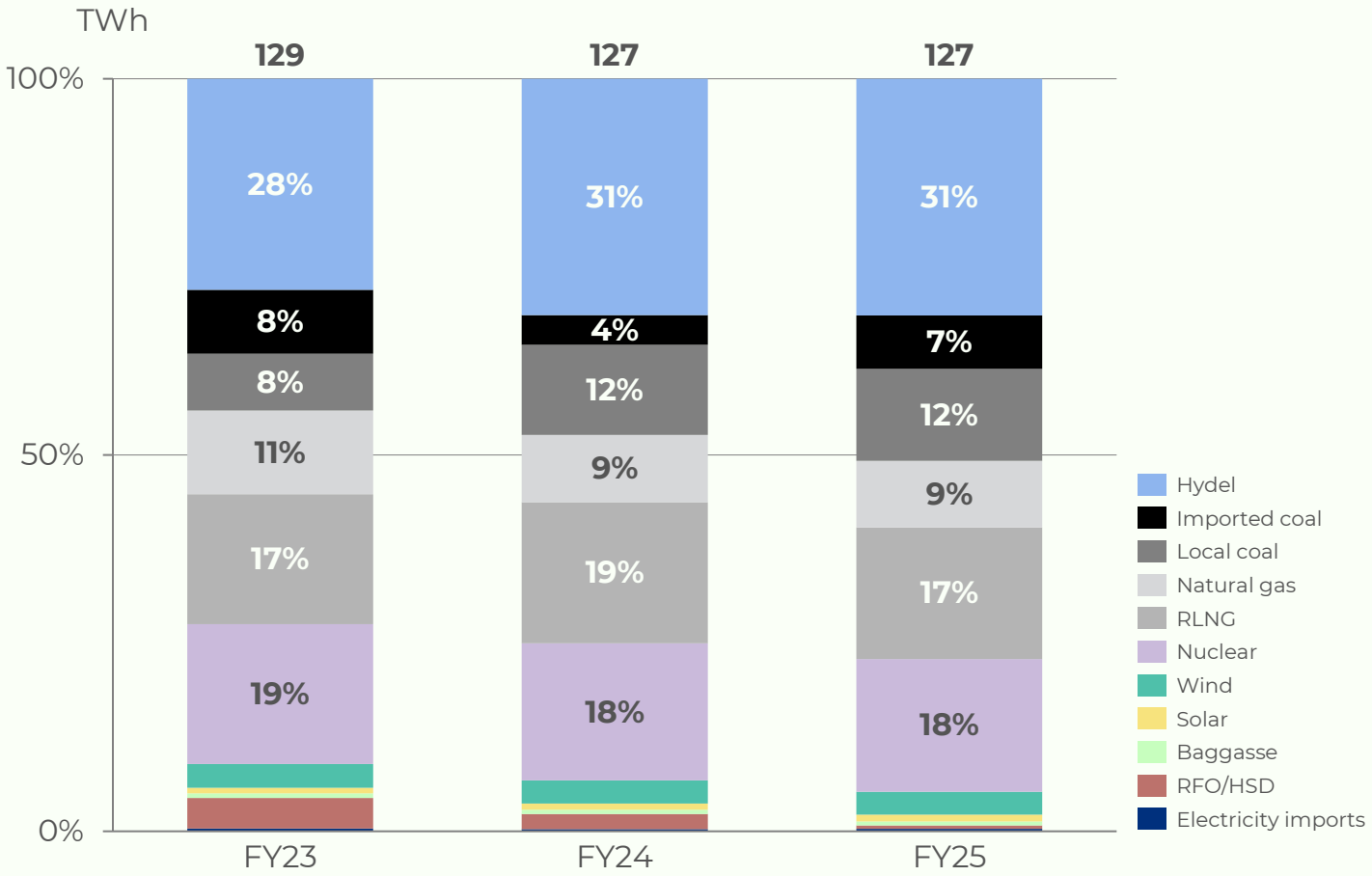
- Electricity generation in FY25 totaled 127.1 TWh, nearly unchanged from FY24 despite rapid growth in net metering, off-grid solar adoption, and captive power generation, indicating sustained growth.
- Improved GDP growth from stronger economic conditions, along with an imposed gas levy on captive power, prompted industries to increase reliance on grid, supporting overall demand despite the solar boom.
- A 3% YoY decline in H1-FY25 was offset by a 4% rebound in H2-FY25, reflecting seasonal shifts and gradual industrial recovery.
- Compared to FY24, electricity generation in FY25 declined in Aug 24 due to heavy monsoon conditions and the impact of a PKR 5 per kWh upward tariff rebasing, which temporarily suppressed demand. In contrast, Apr 25 saw a spike in grid generation, driven by an early-season heatwave, increased cooling needs, and a significant tariff reduction of PKR 7.41 per kWh announced by the federal government for Apr–Jun 2025.

Note: Generation numbers do not include K-Electric numbers

Data Source: NEPRA & Renewables First calculations

Generation from imported coal nearly doubled in FY25, increasing from 5 TWh in FY24 to 9.1 TWh

Energy source-wise generation mix, FY23 – FY25



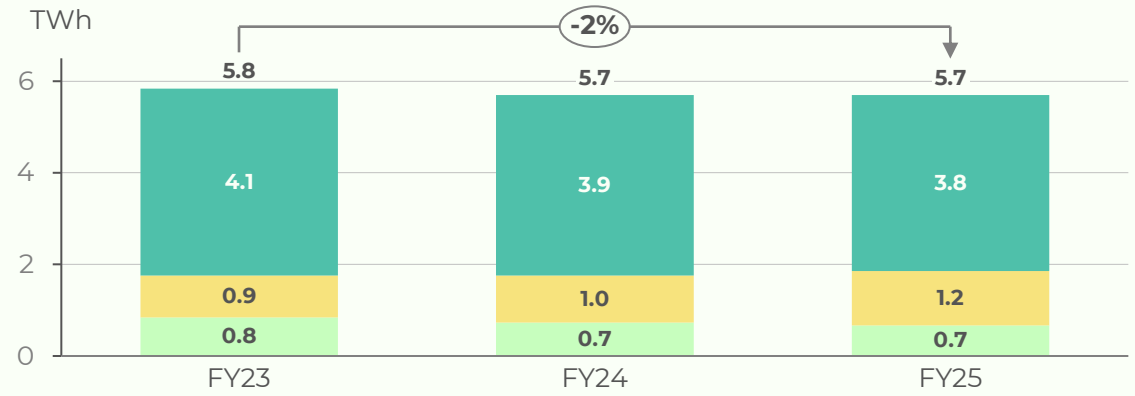
Data Source: NEPRA & Renewables First calculations

- In FY25, 81% YoY increase in generation from imported coal was driven by IPPs' renegotiations, favorable imported coal prices, and a shift away from costlier fuels. The increased generation also helped to cover shortfalls from other fuel sources.
- RFO generation declined steeply by 78% YoY to 0.6 TWh, reflecting the continued phase-out of oil-fired plants.
- Nuclear and RLNG generation saw a slight decline, with nuclear output falling from 23.2 TWh in FY24 to 22.5 TWh in FY25, and RLNG dropping from 24.4 TWh to 22.2 TWh over the same period, largely due to forced outages and lower dispatch priority, respectively.
- Overall, hydel generation rose by 10% from FY23 to FY25, but YoY growth remained subdued at just 0.2% in FY25 due to low seasonal water inflows despite capacity addition (Suki Kinari 884 MW added in FY25).

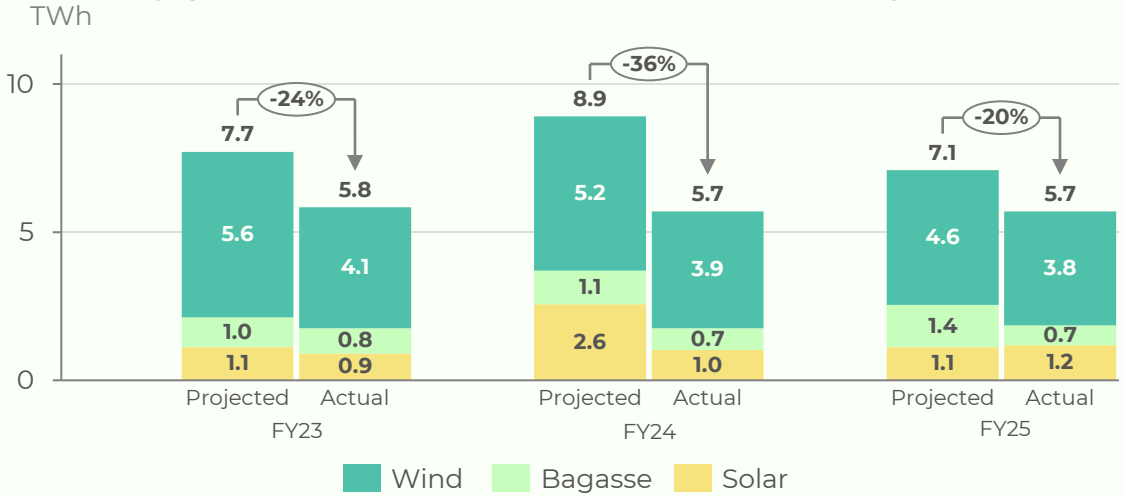
Note: generation numbers are taken from FCA and does not include K-Electric numbers

In FY25, solar generation rose by 15% YoY, bagasse declined by 8%, while wind almost remained flat

Electricity generation from renewables, FY23 – FY25



Electricity generation from renewables, actual vs projected FY23 – FY25



Data Source: NEPRA & Renewables First calculations

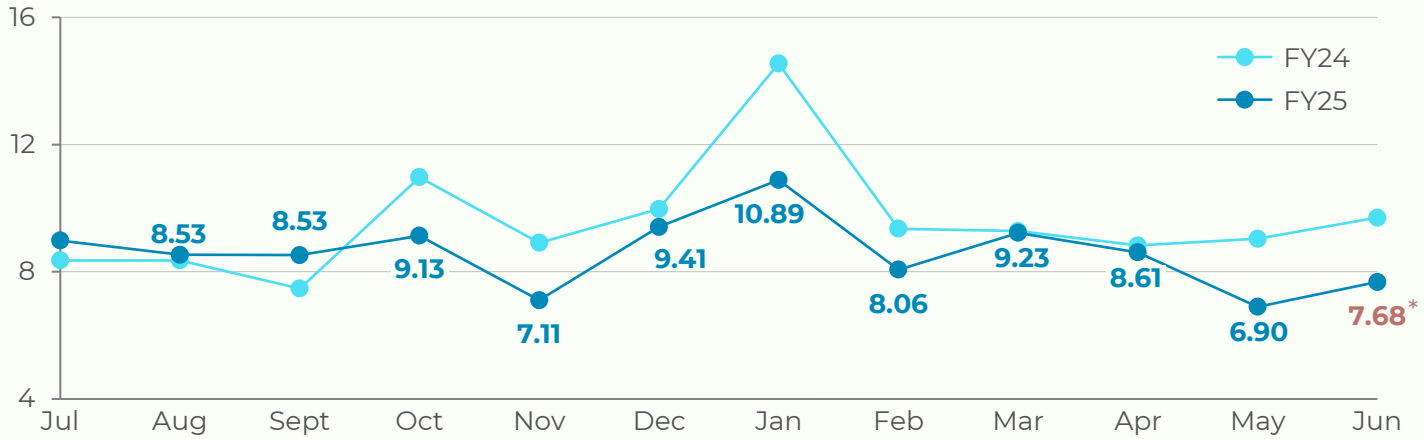
- Wind generation declined 6% from 4.1 TWh in FY23 to 3.8 TWh in FY25 despite stable capacity (1.8 GW), suggesting persistent curtailment, and transmission constraints that have led to underutilization of wind assets.
- In FY25, solar generation reached 1.2 TWh, marking a 15% YoY increase from 1.0 TWh in FY24. The growth was driven by the addition of three new solar plants: HNDS (50 MW), Meridian Energy (50 MW), and Helios (50 MW), all commissioned in Feb 24, contributing fully throughout FY25.
- Bagasse-based generation fell from 0.85 TWh in FY23 to 0.67 TWh in FY25, marking a 21% decline over three years. This drop is driven by reduced bagasse availability due to lower sugarcane crushing, increasing demand from the paper industry, and limited seasonal dispatch priority.
- Over the past three years, renewable generation has consistently fallen behind reference projections, highlighting persistent challenges in meeting expected output. This underperformance is primarily due to the intermittent nature of renewable energy sources (RES), grid limitations, and underutilization of capacity across wind, solar, and bagasse plants.

Note: generation numbers are taken from FCA and do not include K-Electric numbers

FY25 largely saw negative fuel cost adjustments throughout the year, driven by lower imported fuel prices

Per unit fuel cost component, FY24 vs FY25

PKR / kWh

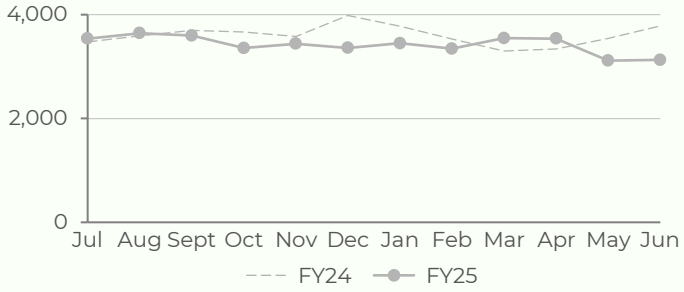


- RLNG and coal made up 36% share in the generation mix in FY25; the reduced RLNG and coal prices led to an overall reduced fuel cost component of electricity generation in FY25.
- This decrease in fuel costs contributed to stabilizing the cost of electricity generation, with almost negative fuel cost adjustments throughout the year.

* Provisional number

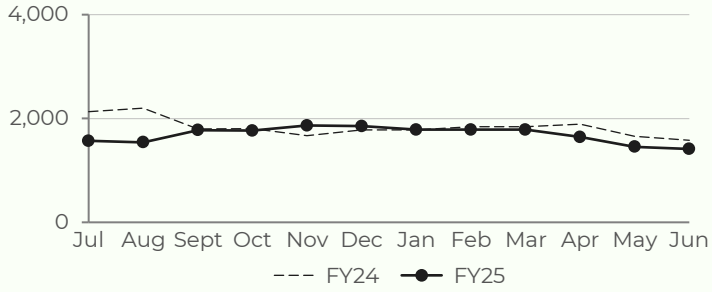
RLNG rates, FY24 vs FY25

PKR per MMBTU



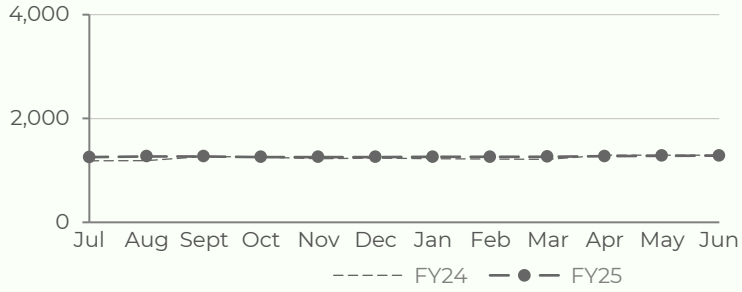
Imported coal rates, FY24 vs FY25

PKR per MMBTU



Local coal rates, FY24 vs FY25

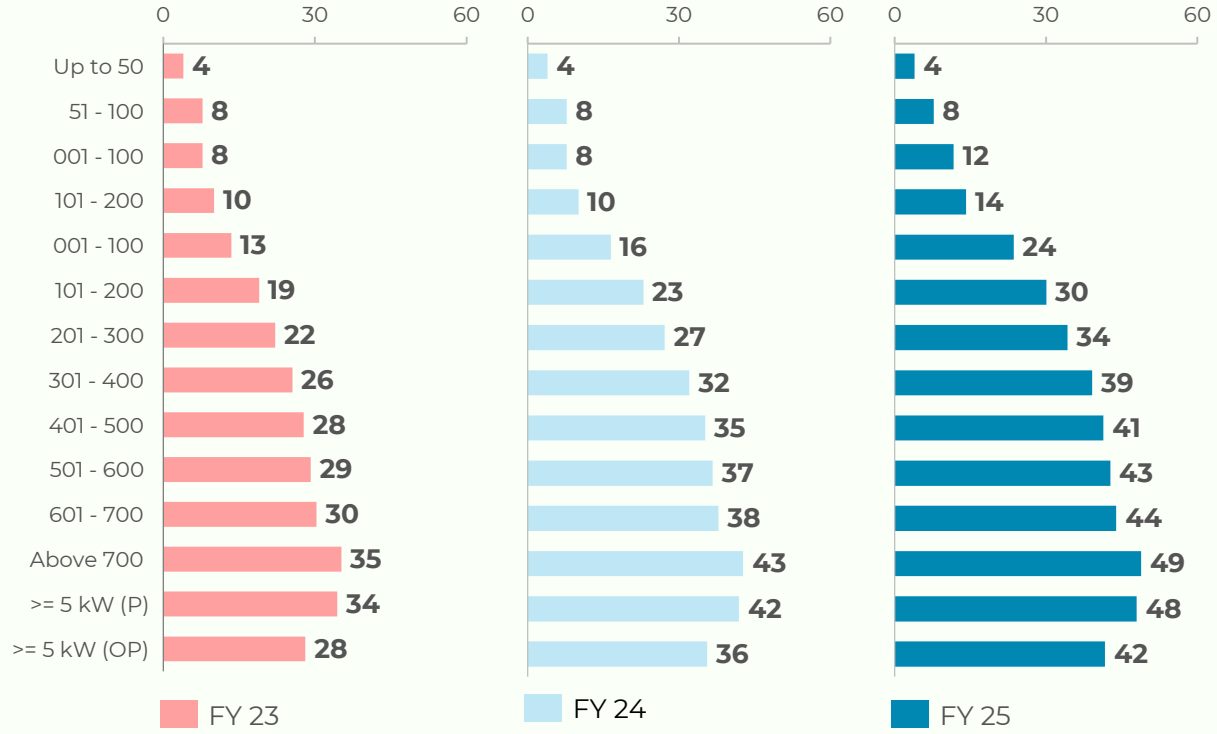
PKR per MMBTU



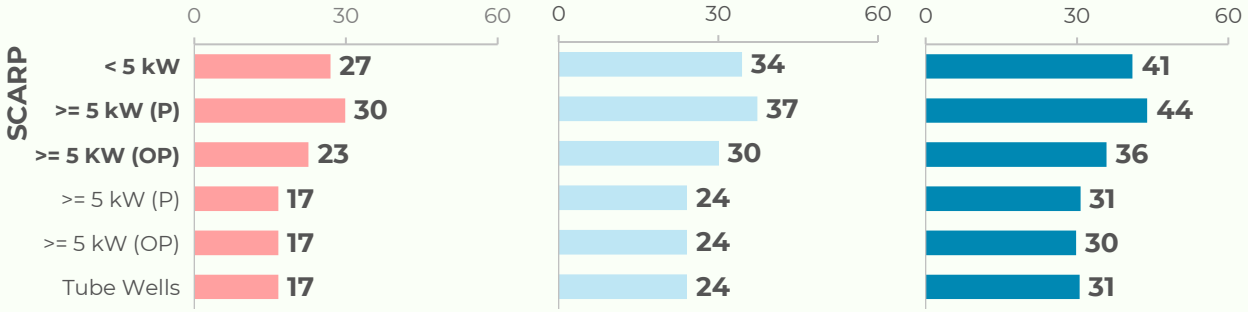
Data Source: NEPRA & Renewables First calculations

National average residential tariffs, FY23 – FY25

PKR per kWh



National average agriculture tariffs, FY23 – FY25



In FY25, increased residential and agricultural tariffs drove both segments toward more competitive energy solutions

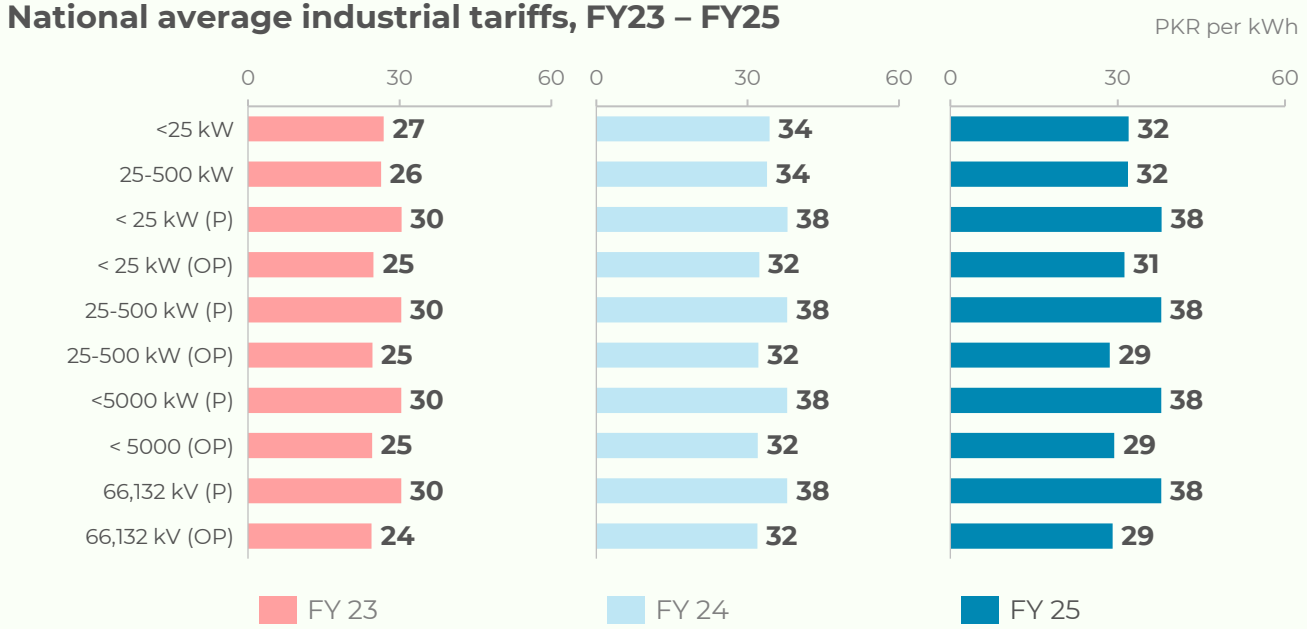
- Electricity tariffs for residential consumers, particularly those consuming 201 to 700 units, rose sharply over the past two years, disproportionately impacting Pakistan's urban middle class. This price-sensitive segment is increasingly turning to solar adoption and energy conservation measures to manage rising electricity bills. Time of use (TOU) consumers also faced significant hikes, with peak rates rising by 40% and off-peak rates by 48%, further incentivizing the shift toward solar solutions.

- The steep rise in agricultural electricity tariffs from 28% to 81% between FY23 and FY25 is sharply increasing irrigation costs for farmers using electric tube wells. These increasing tariffs are pushing agricultural consumers toward solar-powered tube wells as a more sustainable and cost-effective alternative.

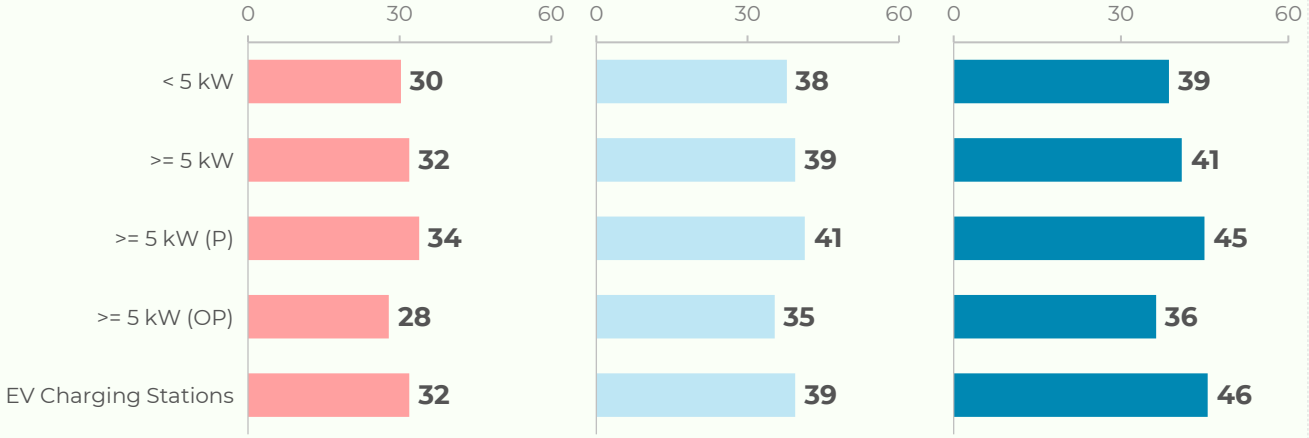
P: Peak
OP: Off Peak
SCARP: Salinity control and reclamation

Data Source: NEPRA & Renewables First calculations

National average industrial tariffs, FY23 – FY25



National average commercial tariffs, FY23 – FY25



Lower industrial tariffs in FY25 helped reduce production costs, while higher commercial tariffs raised business expenses

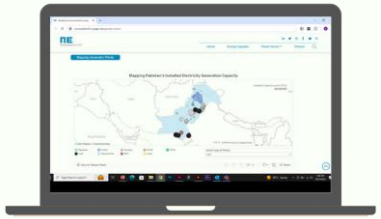
- After a 28% hike from FY23 to FY24 due to Jul 23 tariff rebasing, industrial tariffs reversed course in FY25 with a 7% reduction part of targeted measures (FY25 tariff rebasing) to boost exports, cut production costs, and restore business confidence, drawing industries back to the grid.

- Tariffs for commercial users rose by 22% from FY23 to FY25, increasing the cost burden on small and medium-sized businesses.
- Electric vehicle (EV) charging tariffs increased sharply by 30% from FY23 to FY25, potentially slowing commercial-scale EV adoption unless mitigated through targeted incentives or time-based pricing strategies.

Data Source: NEPRA & Renewables First calculations

For more power sector-related insights, visit:

Pakistan Energy and Climate Insights Dashboard



www.peci.renewablesfirst.org

PECI, an initiative of Renewables First, is an innovative platform that consolidates fragmented energy data from various agencies, supporting informed decision-making across Pakistan's energy sector. By centralizing critical energy and climate data, PECI improves accessibility and clarifies environmental impacts and emissions for stakeholders. RF's collaboration with Herald Analytics led to the development of the PECI Dashboard, which drives insights and offers robust analytics for energy data.

Pakistan Electricity Review 2025

https://uploads.renewablesfirst.org/Pakistan_Electricity_Review_2025_80753f62aa.pdf

The Pakistan Electricity Review 2025 report aims to improve technical accessibility and awareness of critical aspects of power generation, transmission, and consumption. It presents a comprehensive analysis of key trends and challenges that shaped Pakistan’s power sector during the fiscal year 2024 (FY24). The report utilizes publicly available data for the power sector, with NEPRA’s state of industry report (SIR) serving as primary data source.

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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