

Pakistan's Renewable Energy Auction Experience

2025



RENEWABLES FIRST

Authors

Ammar Qaseem | Renewables First

Ahtasam Ahmad | Renewables First

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A. Qaseem and A. Ahmad, "Pakistan's Renewable Energy Auction Experience,"
Renewables First, 2025.

Executive Summary

A total of 640 MW of wind and solar projects were procured by KE in 2024 as part of its plans to move towards 30% RE by 2030.

KE's successful RE auctions contrasted with the federal government's failed attempts, highlighting critical lessons for future auction designs.

KE's inclusive project design, moderate eligibility criteria, robust payment security, and prior record of payments all contributed to its success in auctions.

Future RE auctions must focus on smaller project sizes, better payment securities, and inclusivity to rebuild confidence.

- K-Electric (KE) recently conducted Renewable Energy (RE) auctions to advance its 30% renewable energy target **by 2030, awarding 640 MW of projects in three tranches**. Tranche 1 included 150 MW of solar projects in Balochistan, awarded at a tariff of 3.9 cents/kWh. Tranche 2 featured a 220 MW site-neutral hybrid project in Dhabeji, Sindh, awarded at 3.1 cents/kWh. Tranche 3 comprised 270 MW solar projects in Sindh at 3.4 cents/kWh.
- The government's attempt to procure 600 MW of solar technology under the fast-track framework failed to attract bids despite prior warnings about its flaws [1]. **The federal government fast-track framework passed by the IGCEP neglected the ARE Policy 2019**, eroding investor confidence and sidelining the much cheaper Category III projects. While the government conducted auctions without adhering to its own plans & policies, K-Electric's auctions were carried out under a coherent plan aimed at achieving 30% RE by 2030.
- KE divided its 640 MW procurement into smaller projects (e.g., 100 MW at Bela, 50 MW at Winder) to attract a broader range of developers. At the same time, the government proposed a single 600 MW project, limiting participation to large-scale players.
- KE's technical eligibility requirements (50–100 MW experience over 10 years) were more inclusive than the government's higher threshold (90 MW over 15 years).
- KE's financial criteria (e.g., net worth > USD 45 to 60 million (M), liquid assets > USD 25 M) were more moderate than the government's stringent requirements (net worth > USD 115 M), which excluded smaller yet capable firms.
- KE also ensured robust payment security through escrow accounts, minimizing developer risks. The government's reliance on CPPA-managed accounts provided weaker assurances, further tainted by its history of delays and non-payments.
- **Starting with smaller project sizes** is crucial for attracting investments
- **Cost of participation in auctions** must be reduced
- **Inclusivity** is essential to prevent the exclusion of too many potential developers
- **Better payment security mechanisms** must be implemented to garner investor confidence
- **Existing stakeholders** must be treated fairly to gain market trust

¹ "The Fast-Track Solar Paradox", <https://www.dawn.com/news/1731222>

Driven by rising costs of fossil fuels and increasing demand for cleaner energy, KE has charted a path towards 30% renewables in its generation mix by 2030

Round 1 encompasses 640 MW of RE procurement in Sindh & Balochistan in three tranches



Tranche 1: 150 MW

Type	Solar
Location	Balochistan (50 MW Winder, 100 MW Bela)
Deadline	July 31, 2024
Status	Bidding closed at PKR 11.2 per unit (3.9 cents) won by Master Group ¹



Tranche 2: 220 MW

Type	Hybrid (Solar+Wind)
Location	Sindh (Dhabeji) – Site Neutral
Deadline	Aug 31, 2024
Status	Bidding closed at PKR 8.9 per unit (3.1 cents) won by JCM



Tranche 3: 270 MW

Type	Solar
Location	Sindh (120 MW Deh Halkani, 150 MW Deh Metha Char)
Deadline	Sep 30, 2024
Status	Bidding closed at PKR 9.8 per unit (3.4 cents) won by KAPCO ²

KE is a vertically integrated power utility company based in Karachi, Pakistan. It generates, transmits, and distributes electricity to over 3.7 M customers in Karachi and its surrounding areas.

Target by 2030

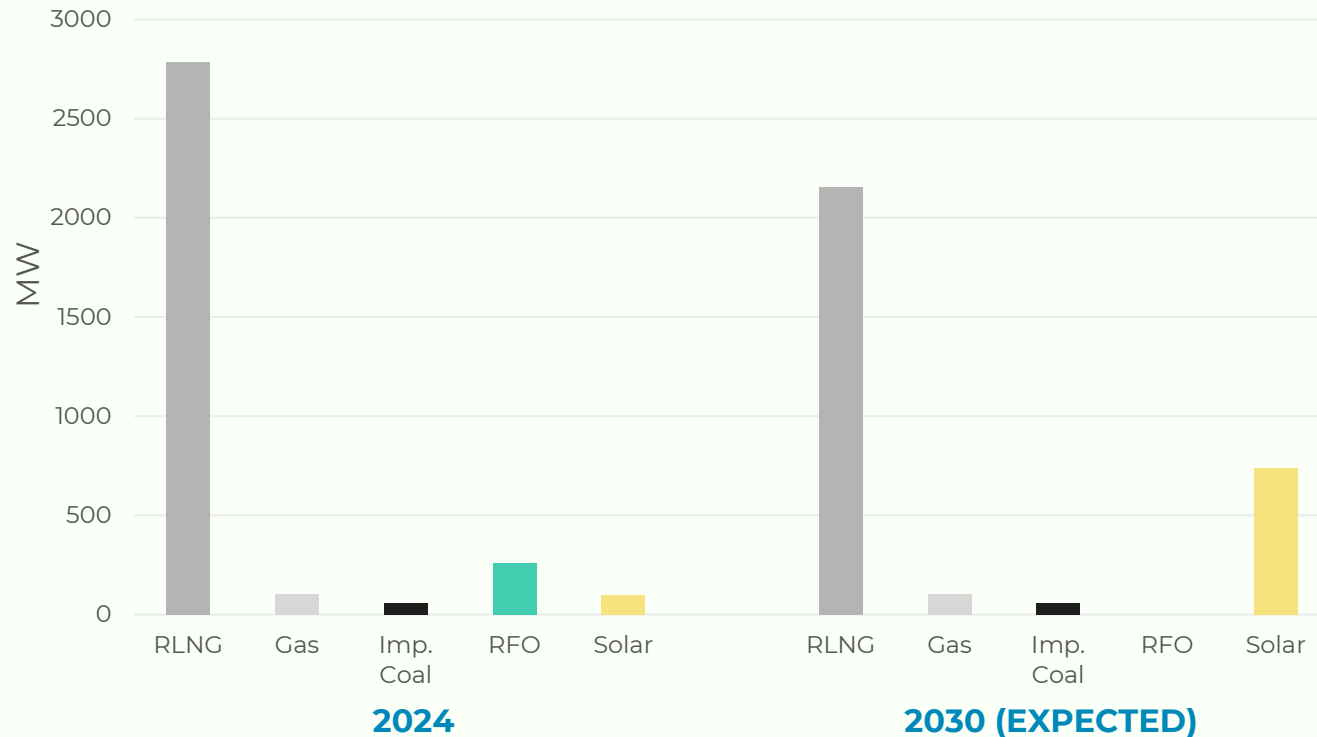
- Through multiple procurement rounds, 1,300 MW (30%) of renewable energy will be added to the generation mix.
- **Round 1** consists of 640 MW of RE added to the grid in three tranches: 150 MW, 220 MW, and 270 MW.

¹ Next closest bid by Atlas and JCM both at 4.2 cents per unit

² Next closest bid by JCM at 3.6 cents per unit

K-Electric's current capacity stands at 3310 MW, with a 97% share of fossil fuels and a mere 3% of RE

KE's Electricity Mix - Current and Projected



Retirements

- A total of 1102 MW capacity is expected to retire from the KE system in the next 10 years (892 MW by 2030).
- Retirements include BQPSI, GAEL, and Tapal.

New RE Additions

- As per the approved Power Acquisition Programme (PAP), KE will be procuring 673 MW of REs during the firm period (FY24-26), and out of these 673 MWs, 640 MW will be procured via competitive bidding, and the rest of the 33 MW will be procured under negotiated procurement.

¹ These figures have been taken from the IGCEP 2024 and do not include supply from the NTDC

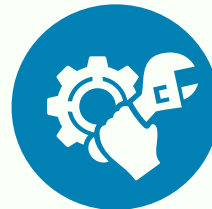
The design of auctions conducted by the Govt vs. KE differed in important aspects, including size, cost of participation, and payment security

Project size	Cost of participation	Inclusivity	Payment security mechanisms	Stakeholder treatment
<p>Smaller projects are preferred in renewable energy auctions as they reduce risks for investors. Focusing on more minor scales can enhance manageability, attract a broader range of participants, and foster a competitive investment environment.</p>	<p>High participation costs, such as application fees and bid bonds, can deter potential investors. Lower costs and simplified processes can improve participation rates, creating a more inclusive marketplace that encourages diverse investment.</p>	<p>An inclusive approach to RE auctions promotes community representation and welcomes underrepresented groups and smaller firms. This diversity enhances competition and innovation, leading to more equitable project outcomes.</p>	<p>Robust payment security mechanisms, such as escrow accounts, are crucial for investor confidence. Strong payment assurance systems mitigate concerns about delays and defaults, making investments more attractive and encouraging long-term commitments.</p>	<p>Fair treatment of stakeholders is vital for maintaining trust in the renewable energy market. Consistent, timely payments and transparent communication can foster a favorable investment climate and rebuild investor confidence.</p>

K-Electric conducted three auctions under a single stage two envelope process



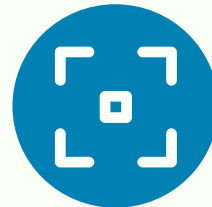
Auction Demand: 270 MW
Auction Type: Single-stage, two-envelope process with pre-qualification
Location: Site-specific (Tranche 1 & 3), site-neutral (Tranche 2)



Technical Criteria
 Experience in developing, commissioning, and operating renewable or thermal utility-scale IPP projects of at least 50 MW cumulative capacity over the last 10 years, with at least one project of 30 MW. Must have operated a power project of at least 50 MW connected to a high-voltage grid for three years.



Eligibility Criteria
 Private or publicly listed entities, or consortium/joint ventures with max five members.
 Minimum 51% shareholding required by applicant during the lock-in period.



Auction Rounds: Single
Project Size: 120 MW & 150 MW
Application Cost: PKR 50,000
Bid Bond: USD 1000 per MW
Performance Guarantee: USD 5000 per MW



Financial Criteria
 Average Net Worth over the last 3 years > USD 45 M.
 Average annual turnover > USD 45 M in the previous three years. Average net profits > USD 4 M over the last three years. Liquid assets > USD 25 M. For multiple projects, financial criteria amounts double.



A request for proposal (RFP) was issued only to Prequalified Applicants. The project was awarded on a Build-Own-Operate-Transfer (BOOT) basis and transferred back to the Government of Sindh (GoS) at the end of the term.
80% Indexation allowed by NEPRA.
No Benchmark Tariff Provided.

Despite two attempts and three deadline extensions, the federal government failed to secure a single bid¹



Project Size: 600 MW
Auction Type: Single-stage, two-envelope process
Location: site-specific



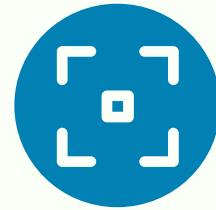
Technical Criteria

Prior experience in power projects with a cumulative generating capacity of at least 15% (90MW) of the project capacity in the last 15 years. Only projects equal to 30 MW or above will be considered.



Eligibility Criteria

Private or publicly listed entities or Consortium/Joint ventures can apply.
 In consortium/ joint venture, the lead applicant should have a minimum 25% shareholding.



Auction Rounds: single

Project Size: 600 MW
Application Cost: USD 2700 (registration + rfp)
Bid Bond: USD 10,000 per MW
Performance Guarantee: USD 20,000 per MW
Processing and Additional Fee: USD 1300 per MW



Financial Criteria

Net Worth > USD 115 M



Project to be awarded on a BOOT basis transferred back to the Government of Pakistan (GoP) at the end of the term

80% Indexation² allowed by NEPRA
Benchmark Tariff: 3.4 cents/kWh (First Round)

¹ For the 600 MW Muzaffargarh Project: First RFP was floated in Feb 2023, deadline was extended till Sep 2023; Second RFP was floated in Oct 2023 and second extended deadline was Jan, 2024

² Indexation was initially provided at 70% and subsequently increased to 80%

A comparison between auctions conducted by K-Electric vs. the Government shows significant differences

01

02

03

04

Project sizes

Technical eligibility

Financial eligibility

Payment security

KE

100 MW Bela
 50 MW Winder
 120 MW Deh Halkani
 150 MW Deh
 220 MW Metha Ghar
 Dhabeji
 Site Neutral

Prior experience of developing/operating 50 to 100 MW of cumulative capacity in the past 10 years¹

Over the last three years:

- Average Net Worth¹ over last three years > USD 45 to 60 M
- Average annual turnover > USD 45 M over the last three years.
- Average net profits > USD 4 M over the last three years.
- Liquid assets > USD 25 M

Developers receive undisputed payments through an escrow account, with provisions for alternate arrangements if needed, minimizing risks of non-payment or delays.

KE's smaller projects are boosting participation. Globally, smaller projects have shown that similar project sizes offer an attractive opportunity for investors in Pakistan's inexperienced renewable energy market by lowering risks and boosting success, with Latin America achieving up to 59% price reductions on sub-40 MW projects and Japan's reduced size limits tripling bids in 2019 without raising costs.

GOVT

Single Project of 600 MW

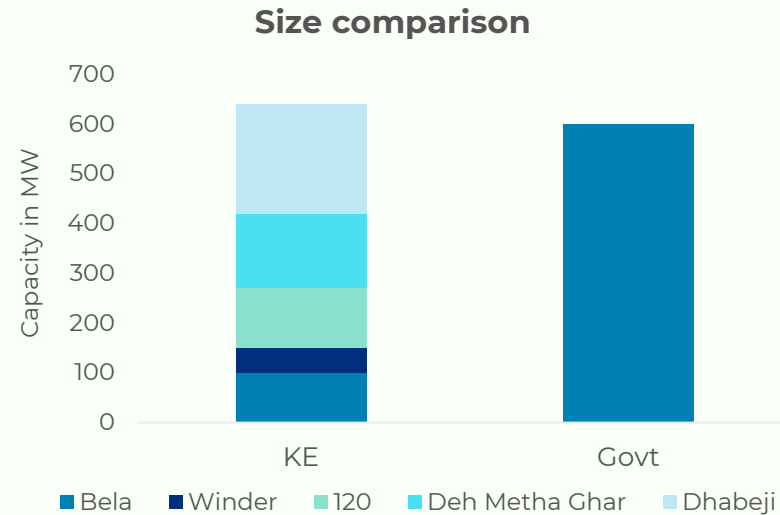
Prior experience of developing/operating 90 MW of cumulative capacity in the past 15 years

Net Worth > USD 115 M

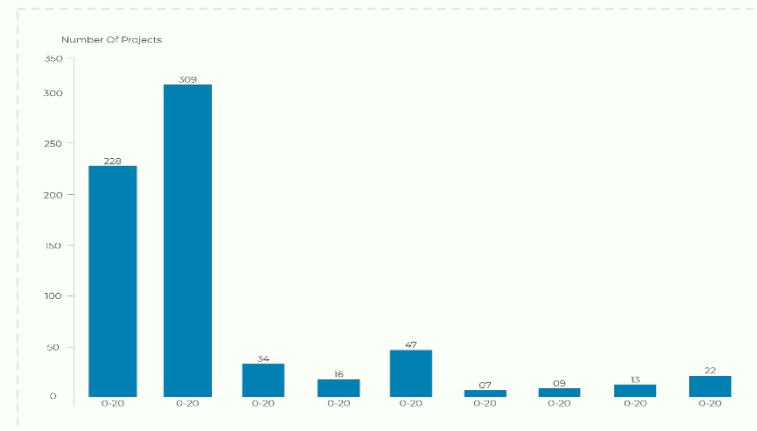
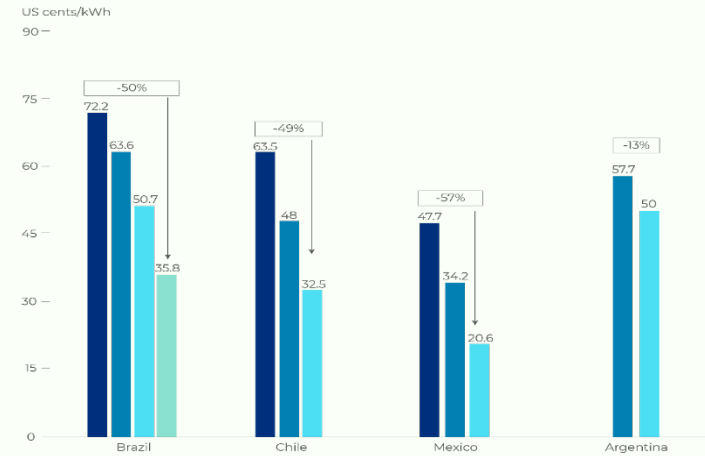
Bank debit from a dedicated solar account maintained by CPPA

¹ Criteria varies for solar and hybrid project requirements

Large project size (600 MW) of federal auctions was a significant factor in deterring investments, as global experiences have also shown



KE procured more capacity (640MW) than the federal government intended (600MW) in smaller chunks and multiple sites. This allowed multiple players to participate, fostering competition and reducing the cost of procured electricity.



Latin America

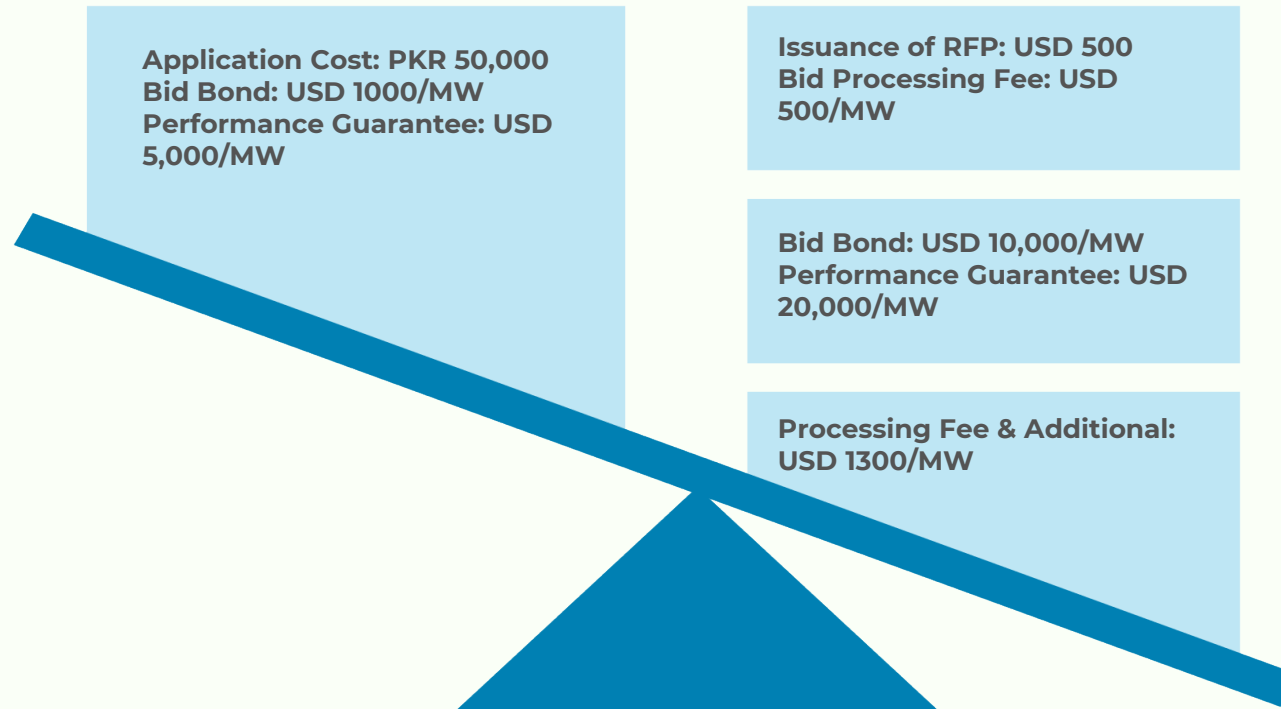
As indicated in the upper figure, most of the projects in Latin America were smaller than 40 MW, yet prices continued to decline. Between 2015 and 2018, Brazil saw a 50% price reduction; from 2015 to 2017, Chile saw a 59% reduction, and Mexico saw a 57% reduction in cost. Between RenovAr 1 and RenovAr 2.5, Argentina saw a 22% price reduction.

Japan

In Japan, size limits did not decrease market interest but led to higher participation. In the fourth round of 2019 RE auctions, size limits were reduced from 2 MW to 500 kW. This resulted in a threefold increase in the number of bids, but it did not prevent prices from falling compared to previous rounds.

The cost of participation in federal fast-track auctions posed excessive financial requirements, deterring bidders and hindering its competitiveness

KE's auctions offered a far more investor-friendly structure with minimal costs, lower bid bonds, and reduced guarantees; making the process accessible and attractive for bidders while encouraging competition.



The charges for the 600 MW Muzaffargarh solar project were excessively high. Significant upfront fees, bid bonds, and guarantees created a heavy financial burden before project execution.

These costs, combined with additional fees at key milestones, likely deterred bidders and undermined the project's attractiveness in a competitive market. The charges for the 600 MW Muzaffargarh solar project were excessively high, with significant upfront fees, bid bonds, and guarantees to create a heavy financial burden before the project execution. These costs and additional fees at key milestones likely deterred bidders and undermined the project's attractiveness in a competitive market.

The failure of the government's 600 MW auctions holds valuable lessons for future auctions in Pakistan

Start with Smaller Project Sizes

1

Large project sizes, such as the 600 MW Muzaffargarh plant, are too risky for Pakistan's developing market. Smaller projects are more attractive from an investor's point of view and align well with Pakistan's market dynamics.

Reduce Cost of Participation

2

The federal government's auction costs, including application fees, bid bonds, and performance guarantees, were prohibitively high, creating barriers for smaller developers. As KE's auction experience has shown, lower costs and simpler processes are more successful in attracting investors.

Ensure Inclusivity

3

The government's stringent criteria, such as a net worth exceeding USD 115 M and operating experience of 90 MW, excluded many potential participants. Inclusive criteria enhance participation and foster a competitive environment that attracts diverse developers and investments.

Provide Better Security Mechanisms

4

KE boosted investor confidence by ensuring payments through secure escrow accounts with provisions for alternatives if needed. In contrast, the government's reliance on a solar account under CPPA lacked third-party oversight, raising concerns about payment security.

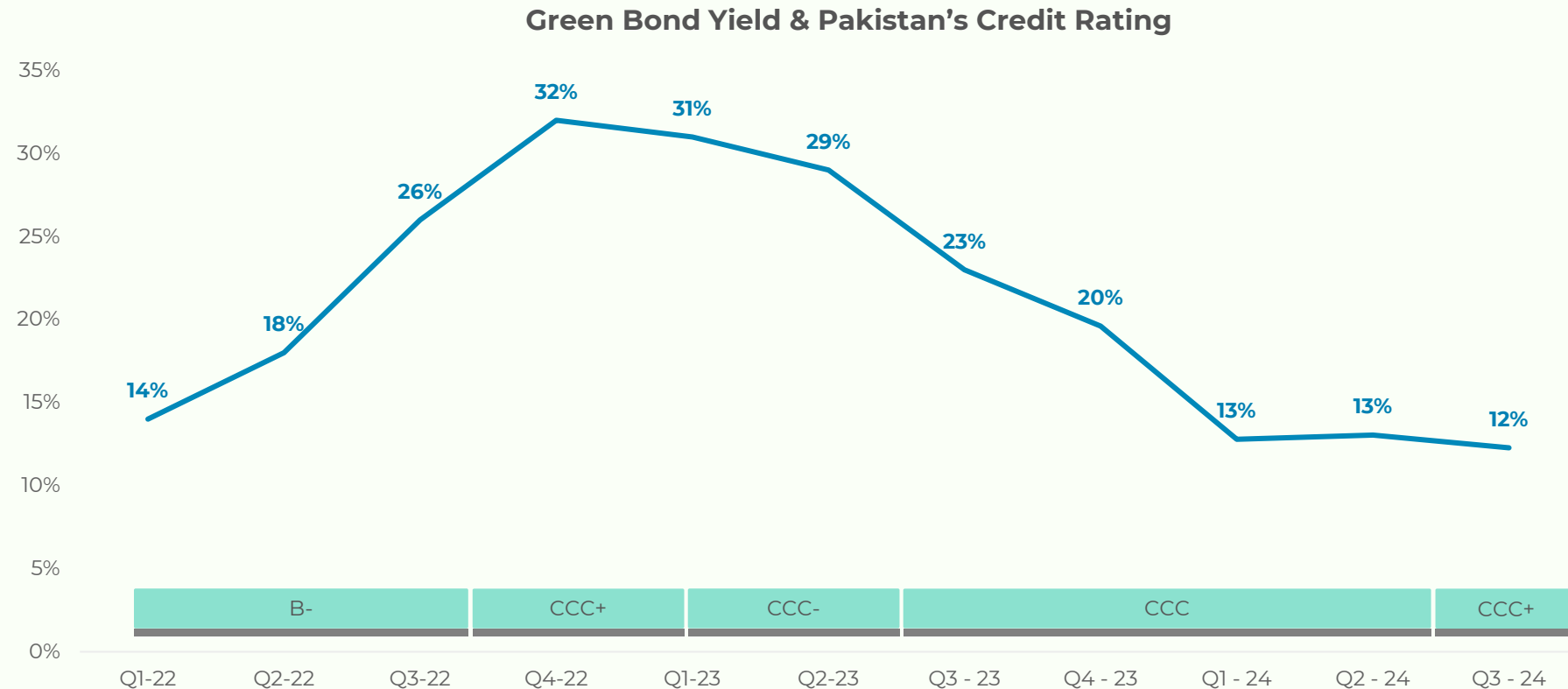
Ensure Fair Treatment of Existing Stakeholders

5

KE's consistent record of timely payments fostered investor trust, unlike the government's history of payment delays and curtailments, which deterred investors. In the future, the government must ensure fair treatment of developers by addressing payment delays, curtailments, and financial and political instability to rebuild investor confidence.

**ADDENDUM:
GOVERNMENT'S WEAK
INVESTMENT CASE**

High yields on Pakistan's green bonds have priced out many bankable RE projects

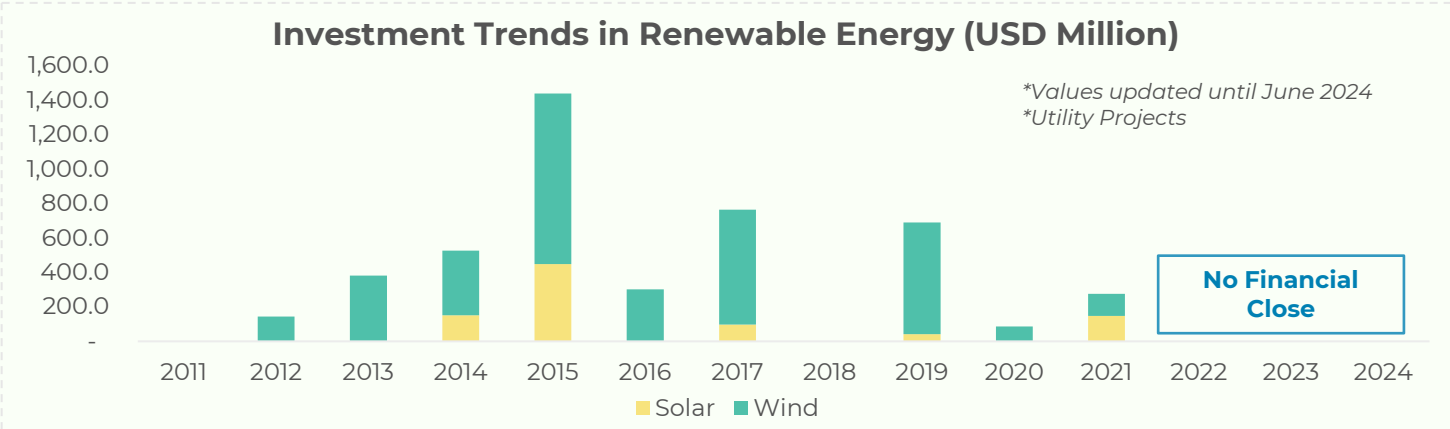


The risk-return equation of government-backed RE projects is currently unattractive for investors due to elevated interest rates and high risks.

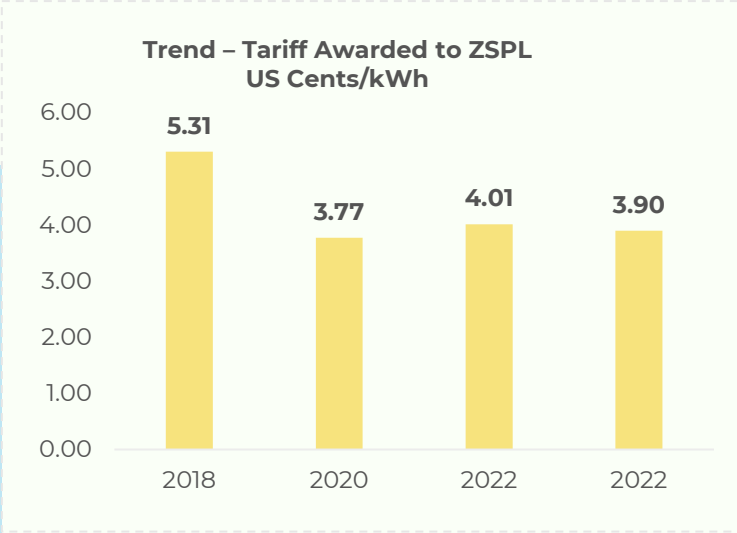
Multiple risks attributed to Pakistan and its power sector have added to investor's reluctance to participate in auctions

Risk name	Description of risk
Political	<ul style="list-style-type: none"> Changes in expected revenues/return due to political or social instability.
Regulatory	<ul style="list-style-type: none"> Fear of changes in law/regulation.
Sovereign	<ul style="list-style-type: none"> Risk of public debt becoming unsustainable and the government not being able to pay its debt obligations in time and form.
Currency	<ul style="list-style-type: none"> Volatility in foreign exchange rates.
Transfer	<ul style="list-style-type: none"> Inability – or complicated processes – to convert local currency to hard currency, or to repatriate hard currency.
Off-taker	<ul style="list-style-type: none"> Delays in the payment of power purchased by off-taker.
Land	<ul style="list-style-type: none"> Complications arising from overlapping planning permits, fragmented ownership or unregistered land.
Permitting	<ul style="list-style-type: none"> Long lead times.
Transmission network and evacuation	<ul style="list-style-type: none"> Insufficient exchange of electricity and system services across provinces. Lack of infrastructure available to evacuate power.
Volume	<ul style="list-style-type: none"> Curtailment of power.
Technology	<ul style="list-style-type: none"> Underperformance of technology.

Anecdotal evidence also indicates the presence of many risks and their detrimental impact



Over the past 14 years, RE investments totaled **USD 4.6 billion (B)**, peaking at **USD 1.4 B** in 2015. However, policy shifts toward imported fuel and regulatory uncertainty have stalled or canceled projects worth **USD 911 M**.

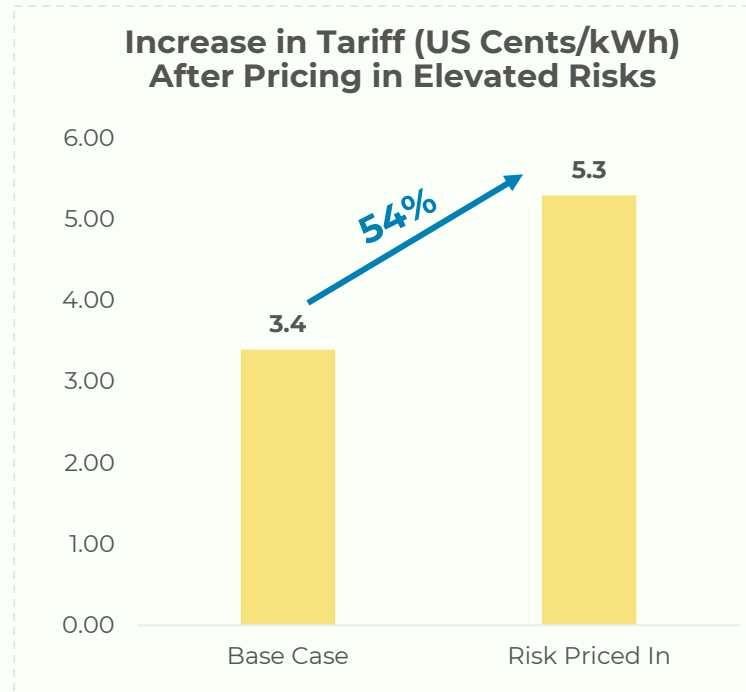


The Case of Zorlu Solar Pakistan Limited (ZSPL)

- ZSPL aims to develop a 100 MW solar PV project but faces significant financing challenges due to Pakistan's **macroeconomic environment**.
- The country's credit rating is at its **lowest in 15 years** (S&P and Moody's), deterring lenders and increasing financing costs through heightened spread margins and country risk.
- Specific **power sector issues**, including circular debt, delayed payments, and EPA renegotiations, complicate foreign financing efforts.
- The Asian Development Bank (ADB) has provided concept approval and anticipates credit approval but notes that financing is difficult to obtain, with credit margins **exceeding the authority-approved 4.25%**.
- ADB's willingness to finance relies on **ZSPL's corporate guarantee**; reopening the tariff would require restarting the assessment process and prolonging timelines.

Pricing in these risks presents a clearer picture of investor's benchmark expectation

Fixed – Tariff Assumptions		
Capacity (MW)		120
Capacity Factor		22%
Generation (MWh)		231,264
EPC Cost	USD' M/ MW	0.42
Degradation	% of EPC Cost	3%
PDC	% of EPC Cost	2
Land	USD' M	2.75
Insurance during construction	% of EPC Cost	0.40%
O&M	USD/MW	9,000
Insurance	% of EPC Cost	0.4%
Construction Period	Months	10
Project Tenor	Year	25
Debt	Year	15
Debt – Foreign		75%
Debt - Local		0%
Equity		25%



Our analysis compared two scenarios for a 120MW solar project: a baseline case using standard market returns (**14% equity return, SOFR + 4.25% debt**) against a risk-adjusted scenario reflecting Pakistan's current market conditions.

The second scenario drew from the Climate Policy Initiative's study on renewable energy investments in developing economies. This study examined markets with similar credit ratings and power sector challenges as Pakistan, including Egypt, South Africa, Bangladesh, and Tunisia. Based on this benchmarking, we adjusted the equity return to 30%.

Further, we increased the debt spread to **SOFR + 7.25% to match the return yield of WAPDA's Green Bond (12%)**.

The modeling results highlight a significant disparity: prevailing market conditions necessitate higher generation tariffs than government auction benchmarks. Yet KE has emerged as a notable exception, securing a **3.4 cent** bid for its 120MW Solar project in Deh Halkani. This achievement can be attributed to KE's unblemished two-decade **track record of IPP payments** and efficient project development processes that minimize delays. The utility's financial credibility is further strengthened by its **Master Collection Accounts system**, which earmarks long-term debt repayment funds, ensuring consistent obligations fulfillment. Additionally, the company remains attractive to investors because it needs to **expand its capacity to meet demand**, unlike the oversupplied national grid.

Thank You



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10 & 11, 3rd Floor, Executive
Complex, G-8 Markaz,
Islamabad Capital Territory