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# Pakistan's Solar Policy Changes: An Assessment

***Zahra Niazi***

2025 [2]

*CASS Policy Brief*

**June 2025**



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*Pakistan's Solar Policy Changes: An Assessment*

*Zahra Niazi*[*]

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## Executive Summary

Pakistan's distributed solar energy generation has surged significantly in recent years, driven by favourable net metering incentives, increasing electricity tariffs, and falling costs of solar panels. As part of a policy shift, in March 2025, the authorities announced major amendments to Pakistan's net metering policy for consumers under upcoming contracts to address the rising fiscal burden in the power sector. Key changes include revising the settlement mechanism from net metering to net billing, reducing the compensation rate for exported electricity, introducing more stringent system size criteria, and limiting the contract validity for net metering consumers to five years. In response to public concern, the proposed changes were put on hold in late March, but reportedly, the government is now once again actively considering the implementation of these policy changes. Moreover, the federal government has introduced an 18 per cent sales tax on imported solar panels in the federal budget 2025-2026 to protect the domestic solar industry.

The objective of this policy brief is to present recommendations for balanced policy adjustments that ensure the long-term fiscal sustainability of the power sector while furthering the goal of achieving energy security and energy independence, which have been regarded as vital components of national security. It recommends adopting a gradual and stepwise approach to net metering reforms (possibly in conjunction with a tiered incentive framework), accelerating the long overdue reforms to address the challenges facing the power sector, and bringing the newly introduced 18 per cent tax on imported solar panels to a reasonable level.

## Introduction

In 2015, the National Electric Power Regulatory Authority (NEPRA) introduced Pakistan's Net Metering Policy, allowing grid-connected solar consumers with three-phase connections to offset their electricity usage and receive compensation at the off-peak retail tariff for exporting surplus electricity to the grid. Subsequent amendments included exempting systems under 25 kilowatt (kW) from licensing requirements, altering the buyback rate from the off-peak rate to the National Average Power Purchase

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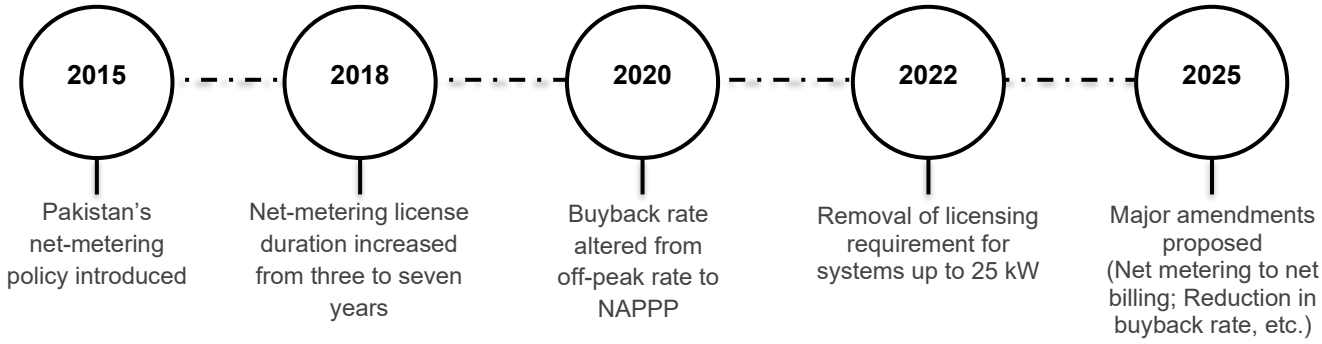
Price (NAPPP), and extending distributed generation license durations from three to seven years.[1] The favourable net metering provisions, along with the falling costs of solar cells and rising electricity prices, prompted a surge in the uptake of distributed solar energy systems throughout Pakistan. A Bloomberg report from August 2024 revealed that electricity bills in Pakistan exceeded the cost of rental rent for many households.[2] By December 2024, the country's net metered capacity had increased to 4,124 megawatts (MW) from just 321 MW in 2021, promoting energy independence and supporting the country's transition to renewable energy.[3]

**Figure 1: Timeline (Key Amendments to NEPRA's Net Metering Regulations)**




**Source**: Author's Compilation

However, in recent months, concerns have increasingly emerged among policymakers that generous solar net metering incentives have created an imbalance, where the wealthier subset of consumers is subsidised at the expense of a larger population base, as over 80% of the net metering consumers belong to affluent areas of major cities.[4] As solar adoption accelerated, utilities saw a drop in daytime sales, which shifted fixed costs onto non-solar customers. Additionally, the higher penetration of distributed solar could put the country's grid infrastructure at risk of failure since the bulk of net metered surplus loads are concentrated in larger cities where rapidly expanding capacity may affect supply stability.[5]

Thus, as part of a policy shift, the Economic Coordination Committee, in March 2025, approved major amendments to net metering regulations for consumers under upcoming contracts, subject to the cabinet's approval. These included revising the settlement mechanism from net metering to net billing (where the imported and exported units are treated separately for billing purposes rather than one

1 Haneea Isaad and Syed Faizan Ali Shah, The Future of Net-Metered Solar Power in Pakistan, report (Islamabad: Institute for Energy Economics and Financial Analysis, 2024), https://ieefa.org/resources/future-net-metered-solar-power-pakistan.

2 News Desk, "Electricity bills surpass house rents: Bloomberg," Express Tribune, August 17, 2024, https://tribune.com.pk/story/2488704/electricity-bills-surpass-house-rents-bloomberg.

3 Press Information Department, "ECC Approves Amendments to Net-Metering Regulations to Address Growing Burden on Grid Consumers," press release, March 13, 2025, https://pid.gov.pk/site/press_detail/28297.

4 Saima Shabbir, "Pakistan's Energy Minister says Net Metering Billing System for Solar Power Unsustainable," Arab News, January 28, 2025, https://www.arabnews.com/node/2588122/pakistan.

5 "Revised Solar Policy," Dawn, March 15, 2025, https://www.dawn.com/news/1897985.

offsetting the other) and reducing the buyback rate from the NAPPP (PKR 27 per unit) to PKR 10 per unit (a nearly two-thirds reduction).[6] Additionally, the government also decided to introduce stricter system limits, allowing solar system capacity to be capped at the customer's sanctioned load (with only a 10 per cent margin allowed), down from the 50 per cent margin previously permitted,[7] while limiting the contract validity for net metering consumers to five years.[8] In response to public concern, the proposed policy changes were put on hold in late March 2025, but reportedly, the government is now once again actively considering the implementation of proposed policy changes.[9]

With the net-metering policy amendments already under consideration, the government has announced another major solar policy change. The federal government has introduced an 18 per cent sales tax on imported solar panels in the federal budget 2025-2026 to protect the domestic solar industry.[10] In 2022, the government eliminated the 17% sales tax on solar panels, a policy measure that significantly contributed to advancing the country's clean energy transition.

## Potential Risks and Implications of Solar Policy Changes

While the rationale for policy changes has merit in principle, these shifts ought to be approached with caution, considering the following factors.

**Off-Grid Migration Risks and Energy Inequality:** The drastic policy shifts could prompt many new and existing solar consumers to extend their off-grid hours through battery storage, potentially accelerating the decline in grid-based electricity consumption. Innovations in battery chemistries and their high-scale production, among other factors, have already led to a decline in lithium-ion battery costs worldwide while improving their performance.[11] For reference, in 2024, lithium-ion battery pack prices dropped by 20 per cent compared to 2023 worldwide and across Pakistan.[12] Sodium-based batteries, utilising a more abundant and less costly resource, are also emerging as a promising

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6 Ibid.

7 "Change in Solar Net Metering Policy put on Hold," Express Tribune, March 27, 2025, https://tribune.com.pk/story/2536675/change-in-solar-net-metering-policy-put-on-hold.

8 Mushtaq Ghumman, "Net Metering Consumers: Contract Term Limited to 5 Years," Business Recorder, March 25, 2025, https://www.brecorder.com/news/40354577.

8 Mushtaq Ghumman, "Net Metering Consumers: Contract Term Limited to 5 Years," Business Recorder, March 25, 2025, https://www.brecorder.com/news/40354577.

9 Zafar Bhutta, "Government Decides to Tighten Solar Net-Metering Rules," Express Tribune, June 5, 2025, https://tribune.com.pk/story/2549564/govt-decides-to-tighten-solar-net-metering-rules.

10 Rehan Ayub, "Budget 2025-26: Pakistan govt proposes 18% tax on imported solar panels," Business Recorder, June 10, 2025, https://www.brecorder.com/news/40367012/budget-2025-26-pakistan-govt-proposes-18-tax-on-imported-solar-panels.

11 Zahra Niazi, "Distributed Solar Energy Generation in Pakistan: Potential, Barriers and Policy Recommendations," Journal of Aerospace & Security Studies 3, (2024): 122-148.

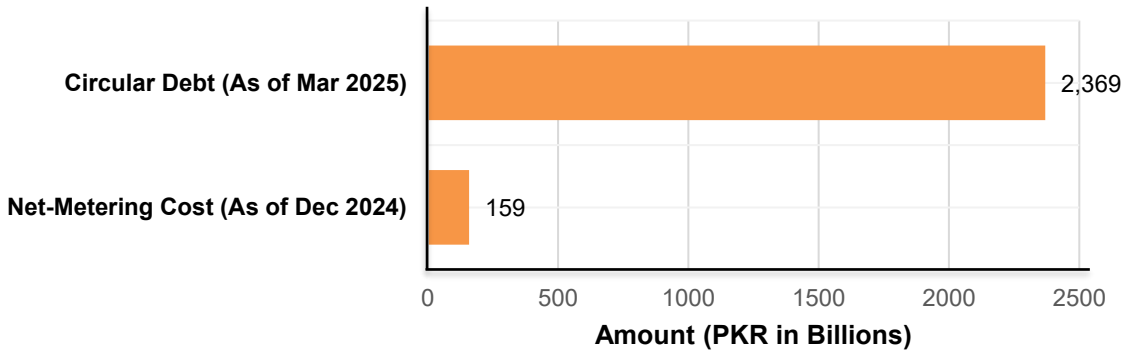
12 Correspondent, "Big Drop in Solar Battery Prices in Pakistan," Pakistan Observer, November 16, 2024, https://pakobserver.net/big-drop-in-solar-battery-prices-in-pakistan-check-rates-of-lithium-tubular-batteries/; Oktavia Catsaros, "Lithium-Ion Battery Pack Prices See Largest Drop Since 2017, Falling to $115 per Kilowatt-Hour: BloombergNEF," BloombergNEF, December 10, 2024, https://about.bnef.com/blog/lithium-ion-battery-pack-prices-see-largest-drop-since-2017-falling-to-115-per-kilowatt-hour-bloombergnef/.

alternative to traditional lithium-ion batteries, increasing the feasibility of transitioning to off-grid solutions.[13]

Moreover, the policy shifts could widen energy inequality, as wealthier households can more easily afford a rapid switch to off-grid solutions. At the same time, the 18% sales tax on imported solar panels is likely to place a heavier burden on the relatively less wealthy households that have only recently begun to seek greater energy independence through renewable energy solutions.

**Minor Savings Amid Major Inefficiencies:** At present, the fiscal impact of net metered solar remains relatively small when compared to the massive inefficiencies and structural losses that continue to burden Pakistan's power sector. As of December 2024, net metering consumers had shifted a cost of PKR 159 billion onto grid-connected consumers.[14] In contrast, Pakistan's circular debt had climbed to PKR 2,393.4 billion by June 30, 2024, according to NEPRA's *State of the Industry Report 2024*,[15] and increased to PKR 2,396 billion by the end of March 2025.[16] Although capacity payments have been the primary driver of this debt, other challenges, such as transmission and distribution (T&D) losses and poor recovery rates, also contribute significantly to the fiscal strain. In FY 2023-24 alone, T&D losses and the low recovery rate added PKR 276 billion and PKR 314.51 billion, respectively, to the circular debt.[17] Given this context, the immediate fiscal savings expected from the proposed amendments to net metering regulations are likely to remain limited, especially if consumers also respond by reducing their reliance on the grid.

**Figure 2: Net Metering vs Circular Debt**




**Source**: Author's Compilation

13 Niazi, "Distributed Solar Energy Generation in Pakistan: Potential, Barriers and Policy Recommendations."

14 Press Information Department, "ECC Approves Amendments to Net-Metering Regulations to Address Growing Burden on Grid Consumers."

15 National Electric Power Regulatory Authority, State of the Industry Report 2024, report (Islamabad: National Electric Power Regulatory Authority, 2025), https://nepra.org.pk/publications/State%20of%20Industry%20Reports.php.

16 Monitoring Desk, "Power Sector Circular Debt Rises to Rs 2.396 Trillion," Profit, April 29, 2025, https://profit.pakistantoday.com.pk/2025/04/29/power-sector-circular-debt-rises-to-rs2-396-trillion/.

17 National Electric Power Regulatory Authority, State of the Industry Report 2024.

**Grid Modernisation Delays:** While solar energy adoption is rapidly increasing, instances of overgeneration (where solar output exceeds export capacity) are not widespread across the grid. Implementing large blanket caps on photovoltaic (PV) system sizes prematurely to preserve grid stability could reduce the perceived urgency for initiating broader grid modernisation efforts, which should begin now to ensure the effective long-term integration of distributed solar energy. A World Bank-funded study indicates that meaningful grid upgrades should be required after the share of solar and wind in the energy mix has reached 10 per cent.[18] Although currently little below 5 per cent, the share could rise to 10 per cent in a few years.[19]

**Missed Opportunity (Renewable Energy Targets):** Pakistan has pledged to reduce projected emissions by 50 per cent, aiming for 60 per cent of its electricity to come from renewables by 2030.[20] Hydropower is expected to play the primary role in achieving the target, but with its output becoming increasingly unreliable due to climate variability,[21] solar energy offers immense potential to bridge the gap. It is the only renewable energy source where individuals and businesses also bear the capital expenditure (CapEx), thereby reducing the financial burden on the government. However, the solar policy changes could discourage investment in the clean energy sector by undermining investor confidence. At the same time, rapid off-grid migration by solar prosumers or overly cautious limits without an urgent need could result in the underutilisation of the country's distributed solar energy capacity and the wastage of surplus generation, thus leading to a missed opportunity to fully leverage solar power in achieving the country's renewable energy targets.

## Policy Recommendations

The brief recommends a balanced approach to policy adjustments alongside complementary measures to address power sector inefficiencies.

**Gradual Net Metering Reforms:** A predictable and stepwise approach to net metering reforms is recommended (e.g., lowering the buy-back rate for new installations by a certain percentage periodically or implementing and gradually increasing the grid usage charges for solar customers) (See Annexture, action item 4 and 12). Such an approach would give the market time to adjust, mitigate the risks associated with abrupt reforms, and avoid the potential long-term fiscal burden posed by unadjusted net metering policies. International precedents of gradual and stepwise solar reform models already exist. Notably, in 2022, the Brazilian government introduced a new net metering regime for systems up to 5 MW, allowing the systems connected before 2023 to retain full net metering benefits until 2045 and new systems (from 2023 onwards) to be subject to gradually increasing grid usage

18 BR Research, "Tackling the Solar Storm," Business Recorder, May 27, 2024, https://www.brecorder.com/news/40305432.
19 Ibid.
20 BR Research, "Pakistan's renewable leap - hurdles and hopes," Business Recorder, February 4, 2025, https://www.brecorder.com/news/40346204.
21 Sana Nazli, Jiahong Liu, Haibin Wang, Shan-e-hyder Soomro, "Water Resources in Pakistan: A Comprehensive Overview and Management Challenges," Journal of Water and Climate Change 15, no. 10 (2024): 4919-4935.

charges.[22] Likewise, in California, NEM (Net Energy Metering) 1.0, introduced before July 2017, offered full retail rate compensation, USD 1 monthly fee, and free grid interconnection; NEM 2.0, effective from July 2017 to April 2023, added monthly charges of anywhere from USD 10 to USD 20, a one-time interconnection fee of USD 75, and a small by-passable fee for new connections; and NEM 3.0, implemented from April 2023, reduced export compensation rates (about 75 per cent less), raised by-passable charges, and increased monthly fee (between USD 48 and USD 64 per month for a 10 kilowatt (kW) system).[23] In Brazil, the transmission grid is federally regulated and ownership includes a mix of public and private entities,[24] whereas, in California, the gird is state-regulated, with a significant portion of it managed by investor-owned utilities.[25]

**Tiered Incentive Framework:** A further consideration could be a tiered incentive framework (aligned with a gradual reform model) to prevent over-subsidising large systems. In Vietnam, for instance, the feed-in tariff rates were lowered in 2019 based on system type, with a relatively lower rate of USD 7 per kWh (kilowatt-hour) announced for ground-mounted solar power projects and USD 7.7 per kWh for floating projects compared to USD 9 per kWh for rooftop projects.[26] Likewise, for the electricity exported to the national grid, Sri Lanka's tariff structure offers a relatively higher per-unit rate of USD 0.09 per kWh (kilowatt-hour) for systems below 500 kW compared to USD 0.08 per kWh for systems above 500 kW.[27] In Sri Lanka, the grid is managed almost entirely by state-owned utilities and regulated by the Public Utilities Commission (PUCSL).[28] In Vietnam as well, the grid is state-owned and centrally regulated by the Ministry of Industry and Trade (MOIT).[29]

**Address Power Sector Inefficiencies:** Gradual net metering reforms must be complemented by efforts to address the inefficiencies and structural losses in the power sector to ensure that the power sector's long-term fiscal burden can be meaningfully reduced. The government has rightly initiated the renegotiation of Power Purchase Agreements of the Independent Power Producers, to relieve the

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22 "Brazil's New Net Metering Policy Set to Boost Distributed Generation Sector," RECESSARY, January 11, 2022, https://www.reccessary.com/en/news/Brazils-new-net-metering-policy-set-to-boost-distributed-generation-sector.

23 "Solar Education: California Net Energy Metering 1.0 Vs. 2.0 Vs. 3.0," Burgeson's, Accessed May 26, 2025, https://www.burgesons.com/blog/solar-education-california; Zeeshan Hyder, "Everything you need to know about California net metering 2.0," Solar Reviews, Accessed May 30, 2025, https://www.solarreviews.com/blog/california-net-metering-nem-2.

24 International Energy Agency, Grids in Brazil: Mobilising Private Capital through a Robust Regulatory Framework, 2020, https://www.iea.org/reports/brazil-case-study/grids-in-brazil-mobilising-private-capital-through-a-robust-regulatory-framework.

25 Sarah Lozanova, "Understanding NEM 3.0 in California," Greenlancer, Accessed June 3, 2025, https://www.greenlancer.com/post/nem-3-0.

26 "Vietnam Government will Approve New FiTs for Solar Power Projects," Enerdata, September 29, 2019, https://www.enerdata.net/publications/daily-energy-news/vietnam-government-will-approve-new-fits-solar-power-projects.html.

27 Public Utilities Commission of Sri Lanka, "Rooftop Solar PV Connection Schemes," October 10, 2023, https://www.pucsl.gov.lk/rooftop-solar-pv-connection-schemes/.

28 Public Utilities Commission, Annual Report 2023, report (Colombo: PUCSL, 2024), https://www.pucsl.gov.lk/wp-content/uploads/2024/04/Draft-Annual-Report-2023.pdf.

29 International Trade Administration, "Vietnam - Power Generation, Transmission, and Distribution," Accessed June 4, 2026. https://www.trade.gov/country-commercial-guides/vietnam-power-generation-transmission-and-distribution.

burden of capacity payments (See Annexture, action item 1). The efforts must be expanded and accelerated in a transparent, lawful manner (to maintain investor confidence). Equally important is to expand the deployment of advanced metering infrastructure to reduce electricity theft and enhance billing accuracy, enforce legal action against habitual defaulters, introduce strict accountability mechanisms with distribution companies (DISCOs), and upgrade the grid infrastructure to cut the huge T&D losses and revenue shortfalls (See Annexture, action items 5-9). Moreover, accelerating the implementation of a competitive electricity market is imperative to transition the sector towards a financially sustainable and market-oriented model (See Annexture, action item 10).

**Manage Grid Overload Locally and Accelerate Grid Modernisation:** In the immediate term, DISCOs should identify hotspot localities where solar feed-in is approaching the grid infrastructure's limit and temporarily impose localised constraints, such as a solar penetration cap per distribution transformer, until upgrades are made. This will help address the grid overload concerns due to over-generation in specific localities. However, the only long-term fix for widespread solar integration is to undertake large-scale grid modernisation efforts. In addition to installing modern metering technologies that enable detailed energy usage data collection and support real-time communication (See Annexture, action item 6), pilot projects for other innovative grid solutions, such as utility-level battery-based energy storage systems (BESS) and virtual power plants (VPPs), should be introduced and expanded. BESS use batteries to store electricity generated from various sources and release it when needed (See Annexture, action item 6). Likewise, VPPs are gaining traction worldwide; they help support the grid by connecting many smaller energy sources through a digital system and managing when to store, use, or send electricity, thus balancing supply and demand in real-time.[30]

**Reconsider the tax on imported solar panels**: It is recommended that the government reconsiders and revises the tax on solar panels to bring it to a more reasonable level in order to sustain the ongoing progress towards clean energy transition. At the same time, the policy could include targeted exemptions for specific groups, such as low- and middle-income households and small-scale farmers, to ensure that the transition to solar remains inclusive and equitable (See Annexture, action item 2). The government's stated rationale for the introduction of new taxes is to ensure the competitiveness of the local solar industry. This objective should be pursued more actively by supporting the industry through other measures such as capacity building and innovation support (See Annexture, action item 11).

Annexure I outlines the detailed action plan/matrix.

[30] Don McPhail, "What are Virtual Power Plants? The Ultimate Win-Win-Win," Uplight, January 23, 2023, https://uplight.com/blog/what-are-virtual-power-plants-the-ultimate-win-win-win/.

## Annexures

| Action Plan Matrix | | | |
|---|---|---|---|
| **Broad Area** | **Proposed Action** | **Timeframe** | **Responsible Entity** |
| **(1) Power Sector Governance** | Renegotiate IPP contracts, strengthen regulatory oversight, and restructure circular debt to reduce electricity costs, and improve transparency. Net metering reforms may have little impact on fiscal savings unless the structural problems in the power sector are addressed. | Short-medium term | **Lead:** Power Division **Supporting (Main):** Ministry of Finance, NEPRA, International financial institutions, etc. |
| **(2) Sales tax on imported solar panels - Reconsideration** | Revise the sales tax on imported solar panels to a lower, more affordable rate. Introduce targeted tax exemptions or reductions for specific groups, such as low- and middle-income households and small-scale farmers | Short-term | **Lead:** Ministry of Finance, Federal Board of Revenue (FBR) **Supporting (Main):** Planning Commission, Power Division |
| **(3) Grid Management/ Modernisation** | Identify solar hotspot zones and impose localised constraints on solar feed-in temporarily. Prioritise areas with the most stress and high losses for initial grid upgrades. | Short-term | **Lead:** DISCOs, NGCP **Supporting (Main):** Power Division, Energy Infrastructure Development and Management Company (EIDMC), Alternative Energy Development Board (AEDB), Provincial energy departments, NEPRA, etc. |
| **(4) Net Metering Reforms** | Set up a task force/working group to develop guidelines for gradual net metering reforms.<br>➢ Identify and shortlist international best practices for gradual reforms/tiered incentive structure.<br>➢ Perform a cost-benefit analysis of the shortlisted reform elements/Pilot the reform elements in targeted regions.<br>Announce a gradual net metering reform framework that outlines a phased timeline for changes in light of the potential long-term fiscal burden posed by unadjusted net metering policies. | Short-term | **Lead:** NEPRA **Supporting (Main):** Power Division, DISCOs, AEDB, Independent consultants, Solar industry representatives, etc. |
| **(5) Grid Management/ Modernisation** | Identify and mobilise international finance and technical partnerships for large-scale grid investments. | Short-medium term | **Lead:** Ministry of Finance, Economic Affairs Division **Supporting:** Power Division, Planning Commission, etc. |
| **(6) Grid Modernisation** | Develop and implement a formal partnership framework with international development partners and the private sector to fund and | Short-medium term | **Lead**: Power Division **Supporting (Main):** National Grid Company of Pakistan (NGCP), Private |

| | | | |
|---|---|---|---|
| | undertake pilot projects for innovative grid solutions, such as BESS and VPPs.<br>Pilot at least two BESS and one VPP by Q4 2026. | | sector, International donors (Asian Development Bank - ADB, World Bank), EIDMC, AEDB, etc. |
| **(7) Grid Modernisation** | Fast-track Advanced Metering Infrastructure (AMI) deployment through new public-private partnerships while expanding existing donor-funded projects like those supported by ADB.<br>Achieve 50% DISCO coverage of AMI by end-2025. | Short-term | **Lead:** Power Division<br>**Supporting (Main):** NGCP, Private sector, International donors (ADB, World Bank), AEDB, etc. |
| **(8) Power Sector Governance** | Mandate all DISCO support units to fast-track their anti-power theft operations within a mandated turnaround time. | Short-term | **Lead:** DISCOs<br>**Supporting (Main):** Law enforcement agencies, Power Division, Federal Investigation Agency (FIA), etc. |
| **(9) Grid Modernisation** | Roll out full-scale grid modernisation nationwide. | Medium-long term | **Lead:** NGCP<br>**Supporting (Main):** Power Division, EIDMC, DISCOs, Provincial energy departments, NEPRA, etc. |
| **(10) Power Market Reform** | Fast-track rollout of competitive power market (CTBCM). | Medium-long term | **Lead:** Independent System and Market Operator of Pakistan (ISMO)<br>**Supporting (Main):** Central Power Purchasing Agency-Guaranteed (CPPA-G), Power Division, NEPRA, Large power consumers and private generators |
| **(11) Solar Industry Support** | Introduce and implement a framework to support local solar industry through capacity building and innovation support. | Short-medium term | **Lead:** Ministry of Industries and Production<br>**Supporting (Main):** AEDB, Universities, Ministry of Science and Technology, Power Division, etc. |
| **(12) Net Metering Reforms** | Update the cost-benefit analysis to reflect technology cost changes, grid savings, and fiscal burden.<br>Adjust the net metering reform model if necessary. | Medium-long term | **Lead:** NEPRA<br>**Supporting (Main):** Power Division, DISCOs, AEDB, Independent consultants, Solar industry representatives, etc. |

***Source:*** Author's own.
***Short-term:*** up to 1-2 years; **Medium-term:** 3-5 years; **Long-term:** 6-10 years. ***Note:*** The Power Division, in coordination with NEPRA, should oversee and monitor the overall progress of these reforms.

| Glossary | |
|---|---|
| **AEDB** | Alternative Energy Development Board |
| **ADB** | Asian Development Bank |
| **AMI** | Advanced Metering Infrastructure |
| **BESS** | Battery Energy Storage System |
| **CPPA-G** | Central Power Purchasing Agency-Guaranteed |
| **CTBCM** | Competitive Trading Bilateral Contracts Market |
| **DISCOs** | Distribution Companies |
| **EIDMC** | Energy Infrastructure Development and Management Company |
| **FBR** | Federal Board of Revenue |
| **FIA** | Federal Investigation Agency |
| **ISMO** | Independent System and Market Operator |
| **IPPs** | Independent Power Producers |
| **NEM** | Net Energy Metering |
| **NEPRA** | National Electric Power Regulatory Authority |
| **NGCP** | National Grid Company of Pakistan Limited |
| **PPA** | Power Purchase Agreement |
| **VPPs** | Virtual Power Plants |

| Definitions of Key Terms | |
|---|---|
| **Advanced Metering Infrastructure** | Advanced metering infrastructure is an integrated, fixed-network system that enables two-way communication between utilities and customers. |
| **Battery Energy Storage System** | Battery storage, or battery energy storage systems, are devices that enable renewable energy, like solar and wind, to be stored and then released when the power is needed most. |
| **Buyback Rate** | the buyback rate is the price paid by the electricity distribution company to a customer for the excess electricity they generate and send back to the grid. |
| **Distributed Energy Generation** | Distributed generation of energy refers to the generation of electricity at or near consumption points. |
| **Independent Power Producers** | Independent Power Producers are private companies that generate power/electricity before selling it to the national grid. |
| **Net Billing** | Net billing is a system where prosumers are paid in cash for excess electricity exported to the grid at a predetermined rate and are billed separately for the electricity they consume. |
| **Net Metering** | Net metering allows solar prosumers to receive energy credits for excess solar electricity exported to the grid, which are used to offset future electricity bills. |
| **Virtual Power Plants** | A virtual power plant is a collection of small-scale energy resources that, aggregated together and coordinated with grid operations. |

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