

# Pakistan Distributed Solar

## 4 No Regret Policy Actions

**BLUF:** Pakistan's distributed solar boom is providing cheaper power to thousands of households and businesses. But it's also threatening to destabilize the grid and deepen energy sector debt. Rather than discouraging distributed solar adoption through aggressive regulatory measures, Pakistan needs to develop a policy playbook to manage distributed resources in a way that safeguards grid stability, protects utility finances, and ensures fair outcomes for all power consumers.

### Why It Matters

Pakistan's rapid boom in distributed solar is reshaping its power system faster than policy can keep up. The scale of this adoption is staggering: while [roughly 4 GW of rooftop solar](#) is registered under net metering, [Pakistan imported](#) a record-breaking 16.6 GW of solar panels in 2024 and an additional 10 GW through June 2025. This massive distributed solar surge, which utilities have largely been unable to track, creates a critical blind spot for policymakers, threatening to destabilize the country's power sector and undermine its financial viability.

### The Problem

Globally, many power markets have struggled to develop a playbook for managing distributed renewable energy in ways that benefit customers, strengthen the grid, and equitably divide the cost and benefits to both adopters and non-adopters. To date, success has typically relied on controlled adoption of distributed resources (solar and increasingly storage), and allowing time for utilities and regulators to plan, integrate resources into distribution systems, and evolve compensation schemes that reflect the value of this generation to the system.

However, Pakistan does not have the luxury of time to manage its distributed solar boom. The vast majority of its new distributed solar capacity is being installed "off the radar," neglected by energy planning and straining utility financing. The immediate consequence is a [significant decrease in grid demand](#), which data shows was down 3% in 2024, despite 2.4% GDP growth the same year.

If left unmanaged, the surge in untracked rooftop systems (combined with an expected increase in battery storage) will push more customers to defect from the national grid, increase costs on those who remain on the grid, and deepen utility debt. A demand-erosion model

indicates that if behind-the-meter generation comprises 15% of total electricity demand by 2030, the price grid customers pay for a unit of power could rise by 31%.<sup>1</sup>

## Policy Recommendations

- **Develop Pro-Poor Distributed Energy Policies:**
  - **Context:** One of the primary concerns of Pakistan's [policymakers](#) is that the surge in distributed energy resources will lead to higher power prices for the poor. In June, Pakistan's Power Minister [stated](#) that if net-metering is allowed to continue as is, then, "200,000 to 300,000 people will benefit from it while placing an additional 15% burden on the entire nation."
  - **Recommendation:** Pakistan should implement targeted incentives and financing to accelerate distributed solar adoption in select win-win cases for low-income customers. For instance, the adoption of solar for water pumping in Balochistan has helped reduce costs for farmers and reduce losses for the utility. Targeted pro-poor distributed solar policies can ensure that not only the rich benefit from Pakistan's distributed energy revolution, and can address chronic utility pain-points.
- **Revise Tariffs:**
  - **Context:** Pakistan has undergone significant electricity tariff reform over the past several years in an effort to reduce power sector debt. The average price of electricity has [increased nearly 50%](#) from FY22 to FY25. One consequence of these reforms has been an increase in the financial incentive for users to adopt solar and batteries. As utility-generated electricity demand decreases, Pakistan needs to find new ways to pay for fixed utility infrastructure.
  - **Recommendation:** The distributed energy surge requires that Pakistan revisit all aspects of its tariff methodology with three goals in mind:
    - **Right-size financial returns for distributed solar users:** Gradually reduce the [buy-back rate](#) utilities pay for excess solar power so it reflects the real value of that power to the grid, still compensating adopters but keeping costs fair.
    - **Minimize cross-subsidies:** Adjust tariffs so customers without distributed solar aren't paying unfairly higher rates to cover those who generate their own power. Higher fixed or service charges could help share grid costs more evenly.
    - **Protect the financial viability of distribution utilities:** Introduce measures like revenue decoupling so utilities can stay financially stable even as more customers produce their own power. Pakistan should also focus on using tariffs, interconnection rules, and other measures to

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<sup>1</sup> This demand-erosion model was presented at a National Electric Power Regulatory Authority (NEPRA) hearing on November 11, 2025. The data breakdown can be found [here](#).

incentivize distributed energy development for customers and regions with the greatest benefit to utility finance and operations, such as historically high-loss areas.

- **Allow Virtual Power Plants access to the Competitive Trading Bilateral Contracts Market (CTBCM).**

- **Context:** Pakistan has [recently launched the first auctions](#) for its new wholesale power market, designed to enhance competition and efficiency.
- **Recommendation:** A top priority for the new market should be establishing rules to allow for distributed system aggregators to partake in future auctions. Starting on a pilot basis in the highest-density distributed solar zones, Pakistan can grant aggregators market access as virtual power plant operators in exchange for enhanced compliance (system size caps, grid codes, etc.) and control over distributed energy resources.

- **Reimagine the Distribution Utility Model**

- **Context:** Pakistan's distribution utilities have long struggled to deliver high-quality power and are a significant contributor to the country's circular debt challenges. For FY25, the power sector has projected that [PKR 505 billion \(USD \\$1.79 billion\) would be added to circular debt](#), well above the IMF target of PKR 200 billion (USD \$0.7 billion), mainly due to inefficiencies of power sector companies and under-recovery of electricity bills. Pakistan has [often raised the prospect](#) of privatizing additional distribution assets, but the solar surge is likely to make poorly performing utilities even less attractive to private investment.
- **Recommendation:** Pakistan should use the distributed solar boom as an opportunity to pilot new electricity distribution models that could be profitable and attract private sector interest. For instance, the [UK](#), [Netherlands](#), and [Australia](#) are utilizing different distribution system operator models to better manage high penetrations of distributed resources without destabilizing utility finances.

## Conclusion

Pakistan's solar boom doesn't have to come at the expense of its power sector. With the right policies, distributed energy can [strengthen](#) rather than weaken the grid. By revising tariffs, modernizing distribution models, enabling new market actors like virtual power plants, and investing in targeted win-win pro-poor solar programs and grid upgrades, Pakistan can utilize its solar surge to make its power system more equitable and financially viable.