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Pakistan's Rooftop Solar Boom Challenges National Grid Amid Energy Crisis

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— Categories: Economics

Pakistan is experiencing a dramatic rise in rooftop solar power as millions of households seek relief from soaring electricity bills and prolonged power outages. This surge in solar adoption is putting unexpected pressure on the already debt-laden national electricity grid, exposing the government's failure to effectively manage the country's power sector crisis.

Once a rare sight, solar panels are now common not only in wealthy neighborhoods but also in middle- and lower-income areas across cities like Karachi and Sialkot. Residents like Fareeda Saleem have turned to solar after enduring daily blackouts. Despite the significant

upfront cost of Rs180,000, which she covered by selling personal valuables and borrowing money, Saleem now enjoys uninterrupted electricity during Pakistan's sweltering summer. For many like her, solar power represents a rare and essential relief from unreliable grid electricity.

According to Ember, a global energy think tank, solar energy's share in Pakistan's electricity mix jumped from less than 2 percent in 2020 to over 10 percent by 2024. Even more striking, solar accounted for 24 percent of power production in the first five months of 2025, overtaking traditional energy sources such as gas, coal, nuclear, and hydropower. This rapid growth puts Pakistan on track to meet its goal of 60 percent renewable energy by 2030, an achievement driven largely by consumer frustration rather than government initiatives.

Dave Jones, chief analyst at Ember, calls Pakistan "a leader in rooftop solar," attributing the boom to widespread dissatisfaction with a power system plagued by inefficiency and steep price hikes. Electricity tariffs have risen sharply, peaking at a 155 percent increase, due to global fuel cost surges and demands from the International Monetary Fund (IMF) to cut government subsidies. For many Pakistani families, electricity bills now rival or even exceed rent payments, making solar power a necessary alternative.

Energy expert Muhammad Basit Ghauri of Renewables First notes that the solar surge is "a response to a crisis" rather than a policy-driven outcome. Affordable solar technology imported primarily from China has made the switch financially feasible for many.

The government, burdened with roughly $8 billion in power sector debt, now faces unintended consequences as consumers disconnect from the national grid. Pakistan relies heavily on costly imported gas and long-term contracts with independent power producers (IPPs), many Chinese-owned, which require fixed payments regardless of demand. A government report warns that the rise in solar users imposes a "disproportionate financial burden" on those remaining on the grid, driving tariffs higher and threatening energy sector sustainability.

In reaction, the government recently introduced a 10 percent tax on imported solar equipment and proposed reducing the rates paid to consumers who sell excess solar energy back to the grid. These measures come as National Grid electricity sales fell 2.8 percent year-on-year in June, continuing a troubling trend.

Business owners like Karachi’s Arsalan Arif and Sialkot’s Hammad Noor underscore solar’s practical benefits. Arif, who once spent a third of his income on power bills, now enjoys reliable electricity supporting his catering business. Noor’s solar investment paid off within 18 months, saving him approximately 1 million rupees monthly, although recent taxes have increased his costs.

Pakistan’s solar revolution underscores a clear truth: citizens are taking control of their energy needs out of necessity amid government inaction. Until the authorities address structural problems, ballooning debt, inefficient contracts, and subsidy dependence, the national grid’s future remains precarious, while the solar sector continues to grow as a beacon of energy independence.