

Rethinking the solar energy story

Fragile power grid is forcing solar firms to think smarter

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The solar power sector has reached a critical inflection point.

After several years of steady growth in grid-connected solar projects, expansion has slowed because the national electricity grid cannot absorb much more variable renewable energy.

This reality was formally acknowledged in October last year, when Electricity Regulatory Authority (ERA) announced a temporary suspension on the permitting and licensing of new grid-connected solar and wind projects.

The decision marked a pause in the country's renewable energy expansion. Signed on October 22 by ERA Chief Executive Officer Ziria Tibalwa Waako, the notice invoked the law that empowers the regulator to safeguard grid reliability and security.

The suspension reportedly affects about \$230m in planned investments, including proposed solar plants ranging from 20 megawatts in districts such as Gomba, Nebbi, Moroto and Luuka to large-scale developments of 150 megawatts in Amuru and 100 megawatts in Nakaseke.

Though temporary pending a comprehensive grid stability assessment, the halt signals a shift in how Uganda must approach renewable growth.

At the heart of ERA's decision is concern that the grid has reached its safe absorption limit for intermittent sources like solar and wind.

Earlier estimates suggested the grid could absorb about 250 megawatts of variable renewable energy. More recent studies have lowered that to roughly 200 megawatts due to engineering constraints.

By August 2025, Uganda had already surpassed this threshold, with about 239 megawatts licensed or permitted, including operational, near-completion and feasibility-stage projects. In effect, the grid is oversubscribed.

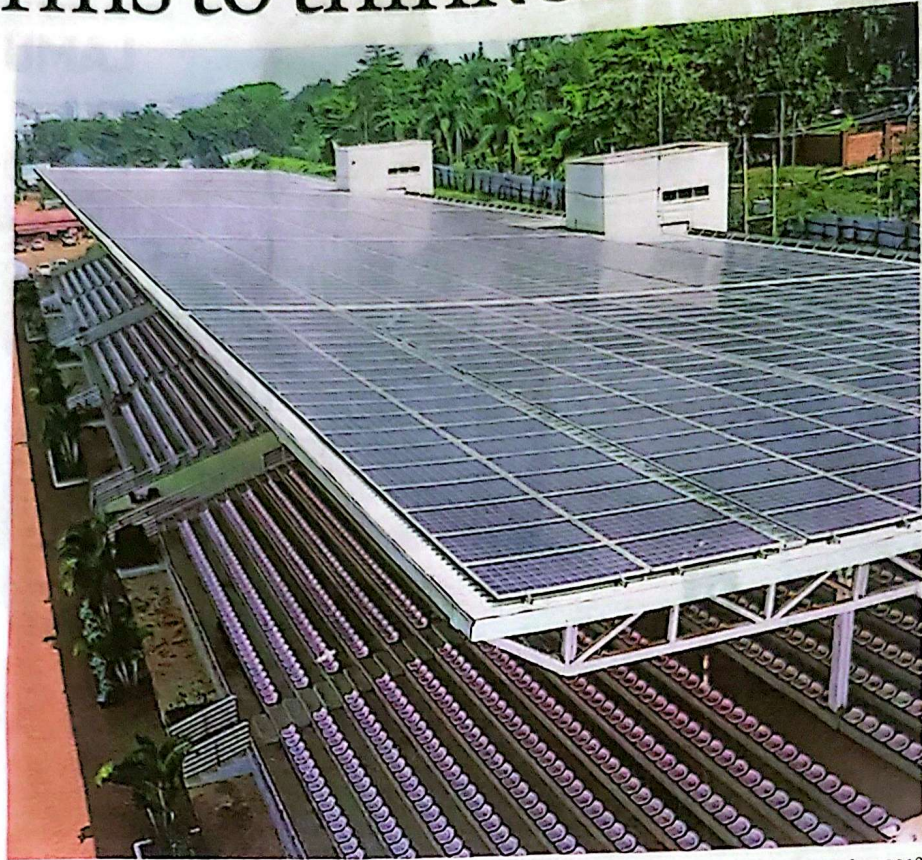
Sudden changes in sunlight or wind speed can trigger voltage fluctuations and frequency imbalances. Without adequate balancing mechanisms, such as flexible generation or storage, these fluctuations heighten the risk of outages and instability.

Aisha Naiga Wamala, Managing Partner at ABMAK Associates, notes that generation capacity has expanded faster than transmission and distribution infrastructure.

"Electricity generation capacity has grown faster than the supporting network, creating a situation where the grid risks overload if additional variable energy is added without reinforcement," she says.

Variable renewable energy depends heavily on weather conditions, and without a flexible grid that variability can translate into interruptions affecting consumers.

This thinking is reflected in national budgeting priorities. The 2026/27 National Budget Framework Paper proposes Shs1.172 trillion for sustaina-



ble energy development. Funding will support the 380 MW Kiba Hydropower Plant, a 10 MW floating solar installation at Isimba, 500 MW of utility-scale solar in Elgon and Acholi, and site studies for the Buyende Nuclear Power Plant.

Resources are also earmarked for high-voltage transmission lines, the Kampala Metropolitan System Improvement Project, and industrial electrification to help achieve the National Development Plan IV target of 70 percent electricity access.

Such upgrades are costly and time-consuming, making ERA's cautious approach a stabilising measure before further expansion.

The impact of grid constraints is visible at plant level.

At the 20-megawatt Kabulasoke Solar Power Plant operated by Xsabo Power, integration limits shape daily operations.

Grid-connected solar power plants feed clean energy into the national electricity system, reflecting the country's renewable energy ambitions alongside the growing need for stronger transmission and storage infrastructure. PHOTO / FILE

Commissioned in December 2018 and launched in January 2019, Kabulasoke feeds directly into the national grid.

On clear days it can generate close to its full 20-megawatt capacity. Yet output depends on irradiance and ambient conditions. During a December site visit, cloud cover reduced generation to between six and eight megawatts despite full functionality.

Engineers explained that panels require a balance between sunlight intensity and temperature. Extremely hot or cloudy conditions can limit performance.

Kabulasoke averages five to six effective sun hours daily, producing about 120 megawatt-hours, rising to roughly 136 megawatt-hours on favourable days. Generation peaks at midday and tapers off toward evening.

Like other grid-connected plants, Kabulasoke operates under dispatch orders

A mismatch

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