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A new approach aims to reconnect commercial and industrial (C& I) energy users to the grid, supplying daytime power from solar and batteries through grid infrastructure funded by PV installers, with diesel as a backup when needed.

As renewables represent a larger share in a region"s energy mix, managing the grid can become a challenge. With the right approach, though, solar and batteries can actually serve to support resilient electricity networks. That is the premise of a project led by US-based think tank the Rocky Mountain Institute (RMI).

With utilities in many sub-Saharan African nations crippled by debt and unable to fund vital infrastructure upgrades, conventional wisdom has it that cheap, on-site solar energy will sound the death knell for the big, centralized, often state-owned model of electricity generation and distribution.

The RMI and Lagos, Nigeria-based C&I solar installer Daystar Power, however, have formulated an approach they say can enable solar and electric companies to work together to deploy more PV while upgrading electricity networks.

The soaring cost of diesel in Nigeria, where the project is being piloted, will enable utilities to charge a sufficient premium to fund repayment of the solar company for those grid upgrades while still offering savings - and much more reliable supply - to customers. Solar energy will be generated and consumed by C&I clients on site, with the grid stepping in as supplier outside of solar generating hours, backed up by battery storage and diesel.

pv magazine spoke to Daystar Power and a representative of one of the three utilities that are on board to ask if the proposed "win-win-win" approach could offer hope for struggling electric companies.

On the question of how much new diesel generation capacity is envisaged under the scheme, the press release issued by Daystar and the RMI talked of "transitioning from diesel-fired generators to utility-enabled solar systems with backup battery storage," with only a brief mention at the end that backup diesel generators would continue to be used.

The full, 157-page study prepared by the RMI - and funded by the US Trade and Development Agency (USTDA), which promotes US business interests abroad - spells out just how much diesel capacity will be required to ensure sufficient electricity supply during non-solar-generation hours.

The first 20 companies targeted by the program would receive 14 MW of diesel generator capacity, with all but one of them deploying new equipment, perhaps from US-based Caterpillar and Cummins. That compares with 27.2 MW new solar and 20.2 MWh of lead-acid battery systems.

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"In Nigeria - I won"t speak for [all of] Africa - we are very reliant on diesel," said Victor Ezenwoko, Daystar country head for Nigeria and Ghana. "The size of the generator needs to be big enough to step in if everything else fails. That doesn"t necessarily mean you"re always going to use it, versus solar which is going to be used every day as much as possible. For example, some businesses [under the new system] might use the generator six hours, or even two hours per day instead of 24 hours at the moment."

With Daystar acquired by oil major Shell in 2022, it"s easy to be cynical about diesel"s role in the proposed hybrid generation systems - especially since Shell refines its offshore crude oil into diesel in Nigeria, while trying to sell its onshore operations to local buyers, in a deal that could reach an estimated $2.4 billion.

Omosede Imohe, lead for distributed energy resources at Abuja Electricity Distribution Co. (AEDC), backed up Ezenwoko"s point by stating that the ratio of solar to battery storage to diesel envisaged is typical for fossil fuel-dependent Nigeria.