



# Vpp battery Cabo Verde

What is a VPP (virtual power plant)?

At its core, a virtual power plant is a system that integrates and manages distributed energy resources (DERs) as if they were a single, unified power plant.

Does Cape Verde have a wave energy potential?

In the case of Cape Verde, there is one study evaluating the wave energy potential which highlights the resource available, particularly for the northern islands, such as S#227;o Vicente. Unfortunately, the study identifies the wave resource to match that of the wind.

What is a centralized power station (VPP)?

Unlike traditional centralized power stations, VPPs coordinate an array of decentralized assets such as solar panels, wind turbines, battery storage, and even industrial energy systems to contribute to the grid in a balanced manner. The agnostic nature of VPPs is a defining feature.

What is the Cape Verde reference system (CVRs)?

The recently published Cape Verde Reference System (CVRS) has been used as the baseline for the present study. It details the topology and components of the networks of both Santiago and S#227;o Vicente islands, including load and renewable profiles.

## 2.1. Energy mix, challenges, and future plans

What is a VPP & how does it work?

While the term has become a buzzword in energy and sustainability discussions, the understanding of what a VPP truly entails remains limited. This emerging technology stands out as one of the most promising pathways for optimizing energy use, achieving decarbonization, and enhancing energy reliability through the pooling of renewable resources.

How can Cape Verde meet its goal of 50% renewables?

Cape Verde can meet its goal of 50% renewables today by integrating energy storage. A 100% Renewable System is achieved from 2026, with a 20-year cost from 68 to 107 MEUR. Current paradigm doubles emissions in 20 years and costs range from 71 to 107 MEUR. The optimal configuration achieves 90% renewable shares with a cost from 50 to 75 MEUR.

The Cabo Verde Ministry Of Industry, Commerce And Energy has begun a search for developers for battery energy storage systems (BESS) on the islands of S#227;o Vicente and Boa Vista.

The archipelago of Cape Verde is a developing state in West Africa with extreme external energy dependency on refined oil imports despite their available solar and wind resources. Aligned with the global energy transition, the local government established goals in 2011 aiming at 50 and 100% RES.



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The European Union and the European Investment Bank (EIB) have announced a EUR300 million investment to strengthen Cabo Verde's digital infrastructure, ports and renewable energy sectors. The energy sector will receive EUR159 million to design and build an electricity production, grid and storage system.

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Also known as Dynamic Load Management (DLM) programs or Battery Storage Rewards Programs, VPPs offer a unique opportunity for solar plus battery owners to contribute to a more sustainable and reliable power grid while earning additional income.

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An article entitled " Virtual Power Plant (VPP): What are they and their benefits? " by Solar Choice (29 July 2021) defined a VPP as "an interconnected and distributed network of a wide array of energy sources, predominantly solar and battery systems (This can include other energy sources such as gas generators and electric hot water ...

Participation in a VPP involves integrating a business's energy-producing or energy-storing assets into a larger network managed by a VPP operator. For companies, this means an opportunity to monetize surplus energy, access more favorable energy pricing, and contribute to sustainability goals.

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Integrating distributed energy resources (DERs) behind the meter--such as photovoltaic panels, wind turbines, battery storage systems, combined heat and power (CHP) units, and controllable loads like heat pumps--offers a solution that can leverage the increasingly decentralized energy ecosystem to meet supply and demand challenges.

ESN Premium speaks with representatives of Lunar Energy and Nomad Power Systems, respectively targeting the tricky VPP and mobile power markets with energy storage-backed solutions. A couple of recent bankruptcies highlighted the challenges faced by battery storage providers that target distributed or niche segments of an otherwise booming market.

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