

# **Boosting and energy storage integrated power station**





## Overview

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How can pumped-storage power (PSP) stations contribute to a low-carbon economy?

Facilitate the development of PSP station systems and a low-carbon economy. Optimizing peak-shaving and valley-filling (PS-VF) operation of a pumped-storage power (PSP) station has far-reaching influences on the synergies of hydropower output, power benefit, and carbon dioxide (CO<sub>2</sub>) emission reduction.

What is pumped-storage power (PSP) station operation?

Pumped-storage power (PSP) station operation, known for its critical role in power grid system management, including load peak-shaving, load valley filling, frequency modulation, phase modulation, and emergency backup, holds great importance , , .

Can a PSP station implement PS-VF operation for enhancing power grid absorbability?

Multi-objective optimization algorithms can be used to tackle the PS-VF operation of PSP station systems for counterbalancing various operation purposes. Lastly, this study only considers the PSP station to implement PS-VF operation for enhancing power grid absorbability to renewable energy.

How can a PSP station reduce residual load volatility?

The goal of optimal PSP station operation is to reduce the residual load volatility by first absorbing other renewable energy inputs. This study collected 245,280 power load datasets (=7 factors \* 365 days \* 96 time steps) of the Hunan province grid in 2022.



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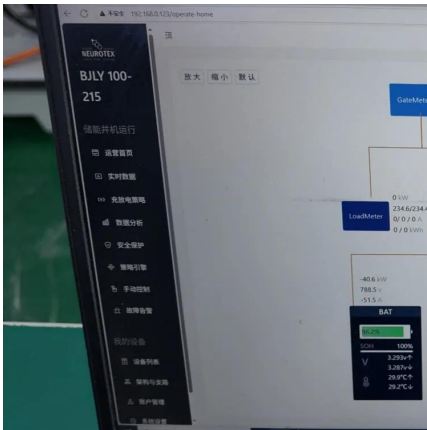
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