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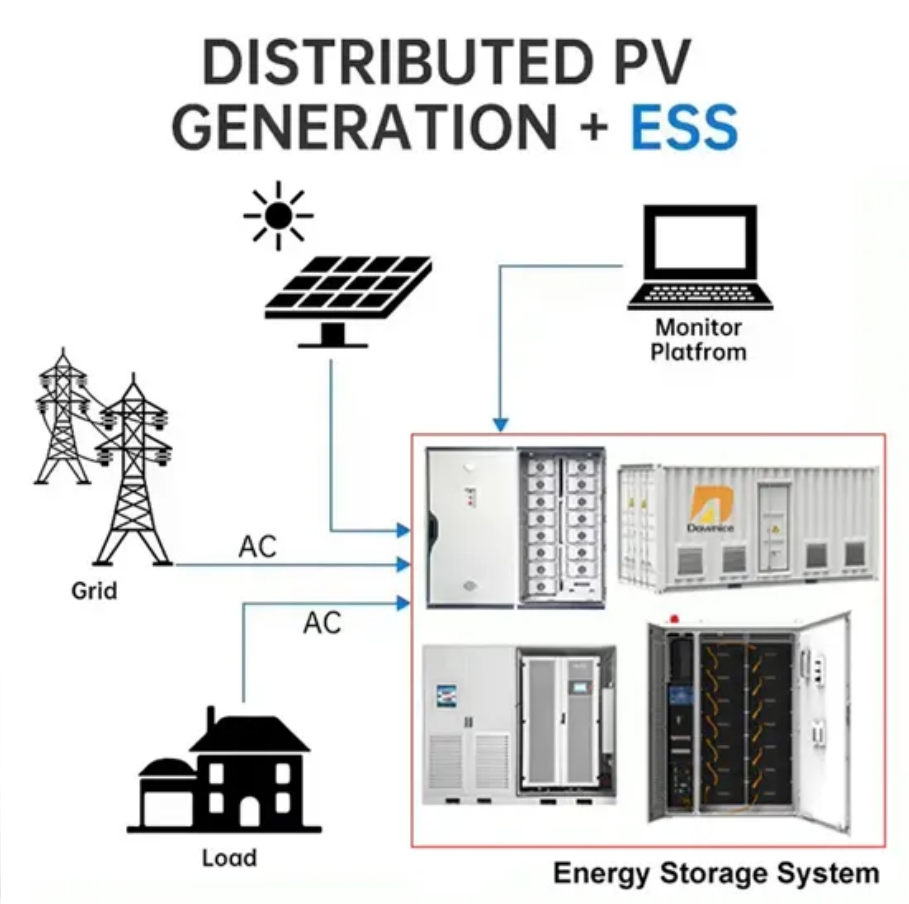
Solar and wind energy complementary system in Hamburg Germany



Overview

Solar and wind energy today have a significant role in providing carbon-free electricity to European systems, and their importance is expected to increase in the next decades while the entire continent aims.

Why is solar power important in Hamburg?

Solar power is a crucial driving factor in both Hamburg and all of Germany to reach these renewable energy transition goals. Along with wind power and the generation of energy from biomass, solar power is one of the most important sources of clean, environmentally friendly, renewable energy.

Where do wind energy resources complement solar energy?

For example, according to Nascimento et al. , wind resources complement solar energy by 40 %–50 % in the Brazilian Northeast along the coastline, reaching up to 60 % in Rio Grande do Norte state. Concerning other regions, the complementarity levels reach 40 % in the South, Southeast, and the remainder of the Northeast .

How does solar and wind contribute to the vesg?

The complementary effects of solar, wind and hydropower enhance the VESG even further, which in principle makes it possible to keep the energy storage demand well below the storage capacity of existing hydropower reservoirs (section “Virtual energy storage gain for PV solar, wind and hydropower over Europe”).

What is the vesg of wind and solar power?

By testing various shares of wind and solar power as complements to the existing hydropower system, we find that the share of 2:4:1 is close to a maximized VESG of 467 TWh, and these shares satisfy the energy production-consumption of 4494 TWh y −1.

Solar and wind energy complementary system in Hamburg Germany

The complementary nature of wind and solar energy in Europe's energy

As Europe races towards its ambitious climate targets, the complementary roles of wind and solar energy have become pivotal in the continent's energy transition. Germany, often at the ...

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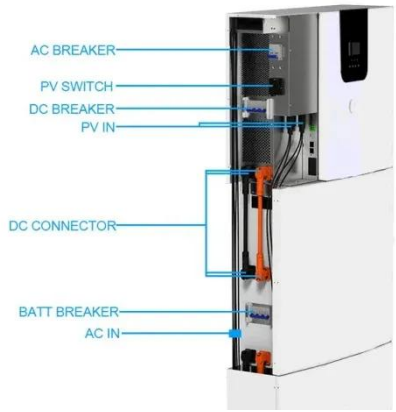
Germany is undergoing an energy



transition. By 2045, fossil fuels will be gradually replaced by clean energy. An alternative option is to use geothermal, solar and wind energy to ...

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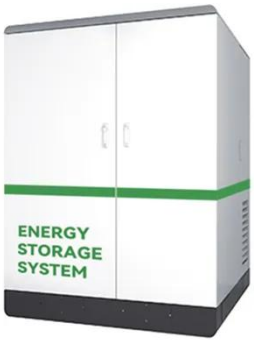

Complementary behavior of solar and wind energy based on ...

In fact, United Kingdom, Germany, and France have a stronger summer-winter difference in capacity factors of wind and solar than Spain and Italy. From the power system ...

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Spatiotemporal management of solar, wind and hydropower ...

The potential electricity production

matches the consumption by spatiotemporal management of suitable shares of solar and wind power complemented with the present ...

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