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Title: Cost of grid-connected energy storage cabinet for middle eastern airports

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Why are airport energy systems so expensive compared to other microgrid designs?

Due to the high upfront investment costs of the hydrogen energy system, the airport energy system integrated with hydrogen production and storage facilities has high initial cumulative costs comparing with other microgrid designs.

Can airport energy system be a micro-grid?

The electrification of airport energy system as a micro-grid is a promising solution to achieve zero emission airport operation, however such electrification approach presents the engineering challenge of integrating new energy resources, such as hydrogen supply and solar energy as attractive options to decarbonize the present system.

What is hydrogen-solar-storage integrated microgrid system for airport electrification?

This paper innovatively introduces hydrogen-solar-storage integrated microgrid system for airport electrification. The energy system of airport outside the terminal is designed as a direct current (DC) microgrid system. The aircraft APU and EVs in the airport are integrated into the DC microgrid.

What is the most cost-effective airport energy system?

By comparing with scenario 1 (base case), the airport energy system with hydrogen integration (Scenario 5) is identified as the most cost-effective option, which can reduce the whole system costs by \$2.654 million/year (41.6%). The PV +BSS system (Scenario 3) can reduce the costs by \$1.453 million/year (22.78%).

In recent years, the Middle East and North Africa region has gradually become a solar energy development base that has attracted global attention. Morocco, Egypt, Saudi ...

Finally, sensitivity analysis of key system parameters such as solar irradiance, grid emission factor, electricity price, carbon tax, unit investment cost of hydrogen energy system ...

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The transformation of the energy structure in the Middle East is accelerating, and the demand for new energy storage is strong. Major countries attract investment in energy storage projects by ...

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