

Feasibility study report on photovoltaic energy storage on the user side

How can residential solar PV systems be enhanced?

Residential solar PV systems could be enhanced by employing a number of different energy storage technologies, such as electrical energy storage (EES), chemical energy storage, and thermal energy storage (TES).

Can energy storage systems be integrated with solar PV in detached houses?

In order to evaluate the financial feasibility of integrating energy storage systems with solar PV system in detached houses, economic indicators able to compare the costs of the different storage scenarios with one another are needed.

What factors affect the financial feasibility of energy storage systems?

Furthermore, another factor that affects the capacity and subsequently the financial feasibility of energy storage systems is the size and location of the modelled solar PV system.

Why is energy storage important in distributed photovoltaics?

Due to the adjustable and flexible characteristics of the energy storage system, its application in distributed photovoltaics can effectively solve the problems of voltage overruns and the timing difference between photovoltaic output and user power demand.

Can a solar PV system be economically feasible in 2021?

However, if the results are compared to the higher electricity prices of 2021, solar PV systems with a renewable fraction up to 50 % would be economically feasible by selling excess electricity to the grid. With 2021 electricity market prices, also a battery storage would be economically beneficial up to a renewable fraction of about 20 %.

Is LIB storage a good alternative to a stand-alone solar PV system?

While the costs of all energy storage systems remain too high to be considered financially attractive without further support mechanisms, LIB storage is clearly the best storage alternative in all scenarios with a LCC 1000-7500 EUR higher and a LCOE 0.005-0.04 EUR/kWh higher than the costs of a 13.5 kW stand-alone solar PV system.

The National Renewable Energy Laboratory (NREL) provided technical assistance for this project. The purpose of this report is to assess the site for a possible photovoltaic (PV) system ...

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