

SolarInvert Energy Solutions

Energy storage requirements for St George photovoltaic power station





Overview

What are the energy storage requirements in photovoltaic power plants?

Energy storage requirements in photovoltaic power plants are reviewed. Li-ion and flywheel technologies are suitable for fulfilling the current grid codes. Supercapacitors will be preferred for providing future services. Li-ion and flow batteries can also provide market oriented services.

Should energy storage be integrated with large scale PV power plants?

As a solution, the integration of energy storage within large scale PV power plants can help to comply with these challenging grid code requirements 1. Accordingly, ES technologies can be expected to be essential for the interconnection of new large scale PV power plants.

Which energy storage options should be used in future grid codes?

While flow batteries could be an alternative option, Lithium-Ion or flywheel energy storage could also be used, specially in those particular cases where very high power is required (e.g. very large photovoltaic power plants). Black start is also one of the candidates to be required in the future grid codes.

Are energy storage services economically feasible for PV power plants?

Nonetheless, it was also estimated that in 2020 these services could be economically feasible for PV power plants. In contrast, in , the energy storage value of each of these services (firming and time-shift) were studied for a 2.5 MW PV power plant with 4 MW and 3.4 MWh energy storage. In this case, the PV plant is part of a microgrid.

How much energy does a PV plant need?

To sum up, from PV power plants under-frequency regulation viewpoint, the energy storage should require between 1.5% to 10% of the rated power of the PV plant. In terms of energy, it is required, at least, to provide full power during 9–30 min (see Table 5).



Can flywheel energy storage be used in large scale PV power plants?

Nevertheless, flywheel energy storage are rarely found in current large scale PV power plants projects. Inertia emulation, fast frequency response and power oscillation damping requirements are strong candidates to be included in the future grid codes.



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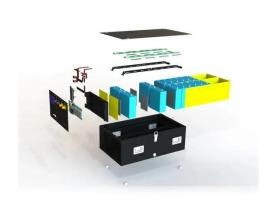


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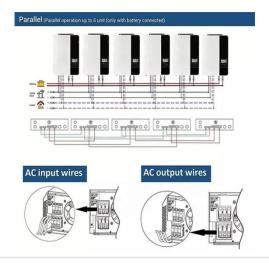
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