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Non-Confidential Description - PSU No. 4446

"Self-Balancing Photovoltaic (PV) Energy Storage System"

Keywords:

Energy sustainability, solar power, photovoltaic arrays, battery storage

Inventors:

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Background

Current power electronics used in today's PV/solar farms, particularly if they employ storage solutions, are quite complex and expensive. Energy storage in systems is desirable as it permits accommodation for generation intermittencies and ancillary services to the grid, such as frequency regulation and demand response. As the intermittent renewable resources such as solar and wind power increase market penetration, balancing instantaneous electricity supply and demand will become more critical for the traditional power grid. However, such power electronics for energy storage solutions can cost up to 10-15% of the total cost of the solar farm.

Invention Description

This new hardware/software package provides a self-balancing solution for integrating battery storage into photovoltaic arrays, through the use of a hybrid PV/storage cell design and system. Regulation by software control will maximize the solar power generation.

Advantages

- Up to 30% lowered costs for the power electronic components.
- Maximizes energy conversion efficiency of the overall PV generation system.
- Self-balancing capability.
- Reduced transmission losses in grid systems

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