**ADVANCED ADIABATIC COMPRESSED AIR ENERGY STORAGE**

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**ABSTRACT**

A novel adiabatic compressed air energy storage and electricity generation using compressed air energy is proposed. It captures excess power prior to electricity generation so that electrical components can be downsized for demand instead of supply. Large scale penetration of renewable energies such as wind and solar into the electric grid is complicated by their intermittency. Energy storage systems can mitigate these fluctuations by storing off-peak energy for use at peak-demand times. Compressed air energy storage (CAES) is one of the most promising storage technologies due to the large amount of energy that can be stored at an economical cost. This paper shows the transformation of photovoltaic (PV) electricity production from an intermittent into a dispatchable source of electricity by coupling PV plants to compressed air energy storage (CAES) gas turbine power plants.