



Chapter

## Impacts of Energy Storage Systems on PV Prosumer Based on Household Load Profiles

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### ABSTRACT

The development of renewable energy generation in power grids has reduced greenhouse emissions due to fossil fuels. Renewable energy sources take part in electricity generation, which affects the economy, environment, national security, and human health. Photovoltaic generating units have increased dramatically worldwide. Even high-generation PV could not meet high demands in the dawn and dusk as it could not produce power regularly. A duck curve always forms with the demand dip in the midday period. This leads to the curtailment of PV power, which in turn affects the environmental and economic advantages of renewable sources. To ensure dependability and stability, most hybrid systems still need a traditional generator or a connection to the main grid. Energy Storage Systems (ESS) are useful in this regard because they encourage the use of renewable energy from the charge and discharge cycles of power with respect to all time horizons. In recent years, the PV consumer market with BESS (battery energy storage systems) and super capacitors has expanded greatly, which has filled the gap between household load and PV power profiles. This chapter highlights the available combinations of storage systems and methodologies for the enhancement of PV prosumer profitability.