

## ***46ESS-50: Energy storage and retrieval for power generation***

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*Renewable energy sources aim to be a potential solution to reduce carbon dioxide and other global warming emissions. Unfortunately, generated electricity from renewable sources rarely provides immediate response to electrical demands, as the sources of generation do not deliver a regular supply easily adjustable to consumption needs. This has led to the emergence of storage as a crucial element in the management of energy, allowing energy to be released into the grid during peak hours and meet electrical demands. Large-scale compressed air energy storage (CAES) for power generation can be used as a solution to these issues. At present, the combination of high-expansion ratio turbines with advanced gas turbine technology is an important breakthrough in energy storage technology. The flexibility of the use of compressed air energy storage with air injection (CAES-AI) concept and supercharging with inlet chilling (CAES-IC) provides unique load management of energy. In this paper, the state-of-art of gas turbines used for energy storage is reviewed along with a comprehensive analysis of possible efficiency improvements and technical limitations of this technology.*