

ENERGY STORAGE SYSTEMS

UNIT-I

INTRODUCTION

Applications of Energy Storage System

1. Grid Stability and Reliability:

Energy storage systems help balance supply and demand, smooth fluctuations from renewable energy sources and improve overall grid stability.

2. Integration of Renewable Energy:

By storing excess energy from source like solar, wind, storage systems enable greater utilization of these resources and reduce reliance on fossil fuels.

3. Time Shifting:

Energy storage allows users to store energy when its cheap and use when its more expensive, optimizing energy costs.

4. Backup Power:

In case of grid outages, energy storage systems can provide a backup power supply for homes, businesses, and critical infrastructure.

5. Electric Vehicle Charging:

Energy storage systems can be used to charge electric vehicles especially at public charging stations, by storing energy during off-peak hours and discharging it when needed.

6. Microgrids:

Energy storage is essential for the development and operation of microgrids, enabling localized energy generation and consumption, enhancing resilience, and reducing reliance on the main grid.

7. Industrial and Commercial Applications:

Energy storage can optimize energy consumption in industrial and commercial settings, reducing energy costs and improving efficiency.

8. Smart Grids:

Energy storage systems are component of smart grids, facilitating the integration of distributed generation, demand response, and other advanced grid technologies.

9. Transportation:

Battery storage is crucial for electric and hybrid vehicles, enable or ultra-low emissions transportation.

10.Power Accessories:

Advances in power converters, fast chargers, and wireless charger for energy storage systems are also actively being developed.