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Sommario/riassunto	<p>The increasing share of renewable energy sources is drawing attention to a critical challenge. The availability of wind turbines and photovoltaic solar cells is limited and difficult to predict. They usually provide a fluctuating feed-in to the grid, so energy reserves, e.g., conventional thermal power plants or energy storage systems, are necessary to establish a balance between electricity supply and demand. Various solutions can be adopted to maintain the security of supply and improve the flexibility of the future power system, such as improving the efficiency of technical processes in areas such as thermal power plants, cement and metallurgy industries, the use of advanced thermochemical conversion technologies such as gasification, the expansion of high-voltage transmission infrastructure, the promoting of renewable energy sources, the employment of large-scale energy storage systems, and the use of highly flexible power generation units with carbon capture and utilisation, such as combined-cycle power plants. Given this background, this Special Issue contains fundamental scientific studies on the latest research progress in the development and optimisation of gasification processes, renewable energy source "solar energy", synthesis of new hybrid nanocomposites and nanofluids, carbon capture, and energy storage systems. Special Issue Editors Falah Alobaid Jochen Strohle</p>

