1. **Project Title**: “The role of Energy Storage Systems in power regulation to ensure the safe operation of the power system”
2. **Motivation**: As a devoted graduate student specializing in energy engineering and management, it's imperative to tackle the utilization of renewable energy sources and ensure their seamless operation to attain climate neutrality in the power generation sector. To enhance power system stability and ensure seamless operations, Energy Storage Systems (ESS) must be used as a replacement for fossil fuel power plants in the task of providing power regulation. The growing production of renewable energy serves as a pivotal driver for achieving sustainability goals, highlighting the critical need for advancements in energy storage solutions. In this project, I aim to explore a diverse range of energy storage solutions, including various types of batteries, pumped hydro storage, compressed air energy storage, super capacitors, flywheels, hydrogen and ammonia as a hydrogen carrier, and discuss their role in matching renewable production and demand.
3. **Research Question:** What will be the significance of long-duration energy storage in an energy transition and what are the options for storing energy to support increased renewable energy generation?
4. **References:**
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