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Titel des Beitrags: Current status of water electrolysis for energy storage, grid balancing and sector coupling via power-to-gas and power-to-liquids: A review
Abstract: Water electrolysis has the potential to become a key element in coupling the electricity, mobility, heating and chemical sector via Power-to-Liquids (PtL) or Power-to-Gas (PtG) in a future sustainable energy system. Based on an extensive market survey, discussions with manufacturers, project reports and literature, an overview of the current status of alkaline, PEM and solid oxide electrolysis on the way to large-scale flexible energy storage is presented. These main water electrolysis technologies were compared in terms of available capacity, nominal and part-load performance, flexibility (load range, load gradients, start-up time, stand-by losses) lifetime and investment costs. This review provides a basis of the parameters required and the necessary understanding of electrolysis fundamentals and technologies for a techno-economic analysis of water electrolysis-based concepts and an evaluation of PtG and PtL in energy system studies.

Stichworte: Alkaline electrolysis; PEM electrolysis; SOEC; Energy storage; Market survey; Investment costs; System performance
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