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Multi-energy infrastructure for production and storage of green hydrogen

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The centralized energy production on part of the renewable energy sources is intermittent and fluctuant in the function of metrological conditions and its installation in the electrical network can enhance the perturbations and installations. The hydrogen produces a solution that produces a more gentle solution that increases the energy storage and offers a better integration of the electricity and photovoltaics into the electrical network. The hydrogen produces a permanent energy source to decarbonize the industry, transport, gas sources and electricity. This combination does not damage the water and its usage to allow gas emissions to work. The hydrogen product is part of the removable electrical system in the water process, which uses a way to renew the energy: it allows the storage of the gas production sous vide, as a solution to the intermittence. The hydrogen can be injected into the electrical outlet via combustible piles, or injected into the electric outlet for domestic or industrial uses. This project aims to develop a durable infrastructure for production and storage of hydrogen produced by the PV solar system and used piles of combustible PEMFC. The proposed system architecture is designed to function as a new algorithm for gestion of energy (EMS) to optimize the exploitation of different components. The prototype/démonstrater of the production chain and storage of solar panels with maximum power of 1 MW will use an electrolyzer in the proton evaporation membrane (PEM), a storage tank of 350 bar of hydrogen pressure and a pile It combines a proton exchange membrane (PEMFC) to convert the hydrogen into electricity. The results of the simulation are based on the energy generation generated by the photovoltaic panne that produces an environ of 250 kilogrammes/hour of hydrogen produced by a renewing of 59%..

Biography

Prof, Dr. Eng. CHERIF Adnene is a senior Professor at the Faculty of Sciences of Tunis, University of Tunis Manar, specializing in Electric and Energy Engineering. He has been teaching 1991, electronics, Renewable energy, automatic control, and signal information processing for the Master's degree in Electronics and Computer Science. He is also the Director of a research laboratory "Analysis of electrical and energy systems" . He is the author and co-author of more than 100 publications in specialized impacted and indexed journals and more than 150 communications at international conferences. He participated in and leads international research and development cooperation projects R&D with the European Union (H2020 Europe) and the Maghreb region in the field of energy production, renewable energies and smart grids.

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