

How can a wind-solar power generation contribute to green hydrogen production?

To broaden the utilization/consumption of renewable energy, the water electrolysis driven by the wind-solar power generation is developed to achieve the green hydrogen production, the system configuration is shown in Fig. 1. This system mainly consists of the wind turbine, photovoltaic system, AEL and battery.

Can a photovoltaic system improve hydrogen production and efficiency?

Many investigations have been conducted to enhance the hydrogen production and efficiency of the green energy source system. The photovoltaic (PV) system is considered to be the most appropriate technology for solar-based hydrogen production combined with water electrolysis.

What is a wind-PV-es hydrogen production system?

**Results and Analysis 5.1. System Parameters** The researched wind-PV-ES hydrogen production system, consisting of an wind-PV electricity generation subsystem, batteries for energy saving, an alkaline electrolyzer, and other supporting devices, was designed to optimize day-ahead generation scheduling with a 24 h cycle.

Are green hydrogen production systems based on solar and wind sources possible?

In the present review, green hydrogen production systems based on solar, and wind sources are selected to investigate the trends and efforts for green hydrogen production systems because coupling water electrolyzers with solar and wind sources can be a promising solution in the near future for the utilization of surplus power from these sources.

How can solar and wind energy be used for hydrogen production?

This helps determine the optimal combination of solar panel capacity, electrolyzer size, and energy storage to enhance hydrogen production and overall efficiency. Additionally, intelligent energy management strategies can be developed using ML techniques to optimize solar and wind energy usage for hydrogen production.

Is a wind-solar hybrid hydrogen production system feasible?

Hamid et al (Shakibi et al., 2023). analyzed the feasibility of a system composed of wind turbines, solar collectors and electrolyzers, which shows that the wind-solar hybrid hydrogen production system possesses economic and environmental value in terms of annual power generation and carbon emission reduction.

Completed draft journal article covering wind-PV complementarity analysis, which: Wide range of metrics for wind-PV complementarity, based on hourly. generation profiles derived across ...

A typical wind photovoltaic hydrogen storage capacity configuration model was established with wind power, photovoltaics, energy storage, and hydrogen production equipment as the main ...

Combining electrolytic hydrogen production with wind-photovoltaic power can effectively smooth the fluctuation of power and enhance the schedulable wind-photovoltaic ...

5 ???&#0183; Thus, this system has several advantages either in producing electrical energy or as backup power with a hydrogen storage-fuel cells system. The simulation results show that 200 ...

The wind-photovoltaic-hydrogen multi-energy complementary system (WPHMECS) takes the full absorption of REPG as its core goal, taking into account the advantages of MECS coupling ...

This paper proposed an optimized day-ahead generation model involving hydrogen-load demand-side response, with an aim to make the operation of an integrated wind-photovoltaic-energy storage hydroge...

the potential of hydrogen as a storage option for wind power energy is promising and could help to reduce our dependency on fossil fuels and support the transition to a more sustainable energy ...