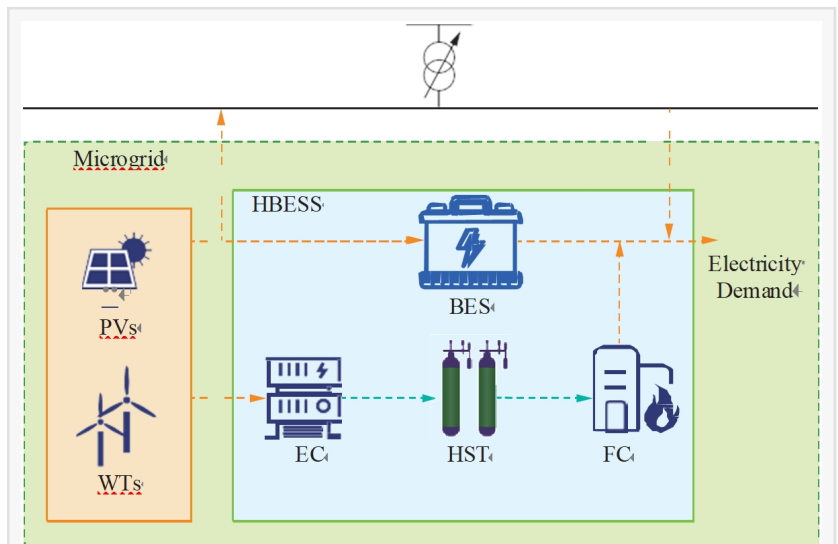


Latest issue in 2024 Hydrogen-Battery Energy Storage in Microgrid

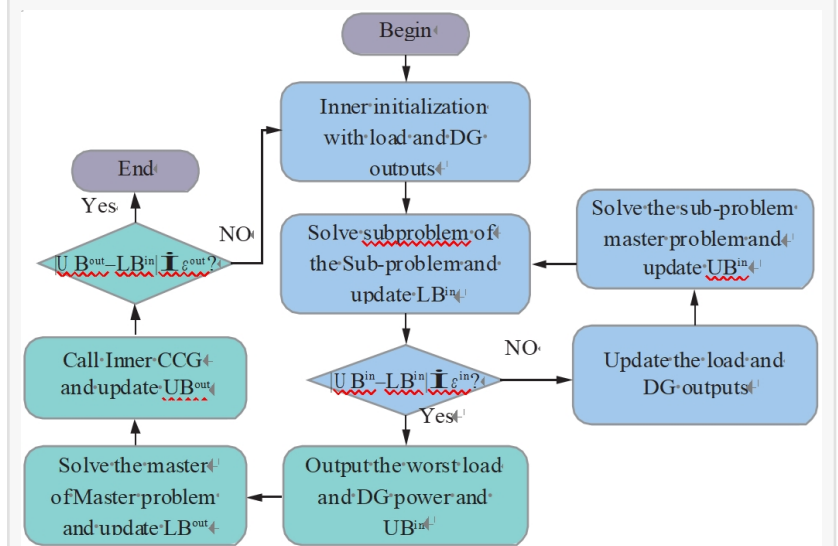
GA, UNITED STATES, December 18, 2024 /EINPresswire.com/ -- Optimal Hydrogen-Battery Energy Storage System Operation in Microgrid with Zerocarbon Emission.

What is the value of a hybrid hydrogen-battery energy storage system (HBESS) work in a microgrid? To answer this question, a team led by Professor Xu Zhao from The Hong Kong Polytechnic University proposes an adaptive robust optimization approach tailored for HBESS operating within a microgrid with SoC management to minimize the operating cost.

In the model, detailed in the journal Global Energy Interconnection, the day-ahead stage utilizes robust optimization to establish the hydrogen dispatch and battery storage state-of-charge (SoC) upper and lower bounds, while the intraday stage focuses on dispatching battery storage within the defined SoC interval, taking into account the uncertainty realization from a holistic daily perspective.



Structure of a HBESS integrated microgrid



Outer-inner-CCG algorithm framework

To hedge against the uncertainties, the adaptive robust optimization method is proposed to adapt the proposed HBES system integrate microgrid operation model with integer recourse variables and then solved by the proposed outer-inner-CCG algorithm. The outcomes of the simulations affirm the exceptional performance efficiency, and resilience of the adaptive robust operation model.

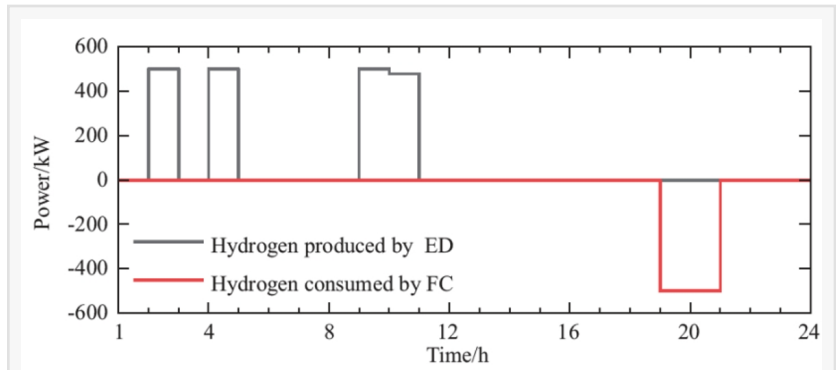
In sum, this study (doi: <https://doi.org/10.1016/j.gloei.2024.10.006>) proposes an adaptive robust HBESS integrated microgrid operation model with SoC management to minimize operating costs.

DOI
10.1016/j.gloei.2024.10.006

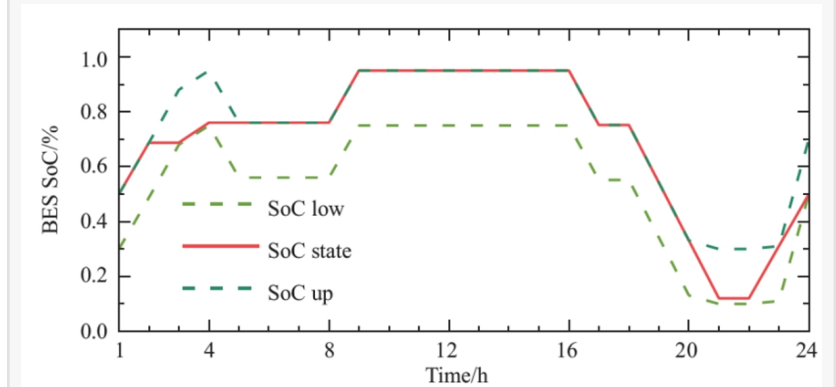
Original Source URL
<https://doi.org/10.1016/j.gloei.2024.10.006>

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HST optimization results



BES optimization results

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