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Optimized Topology and Sizing Principles Operational Optimization Strategies for RES+BESS+Hydrogen-Based Microgrids

Introduction

In several power systems worldwide, periods of 100% renewable electricity generation have already been achieved, demonstrating the technical feasibility of near-zero-carbon power supply. However, the decarbonization of energy-intensive sectors such as industry, heating, and transportation remains a major unresolved challenge.

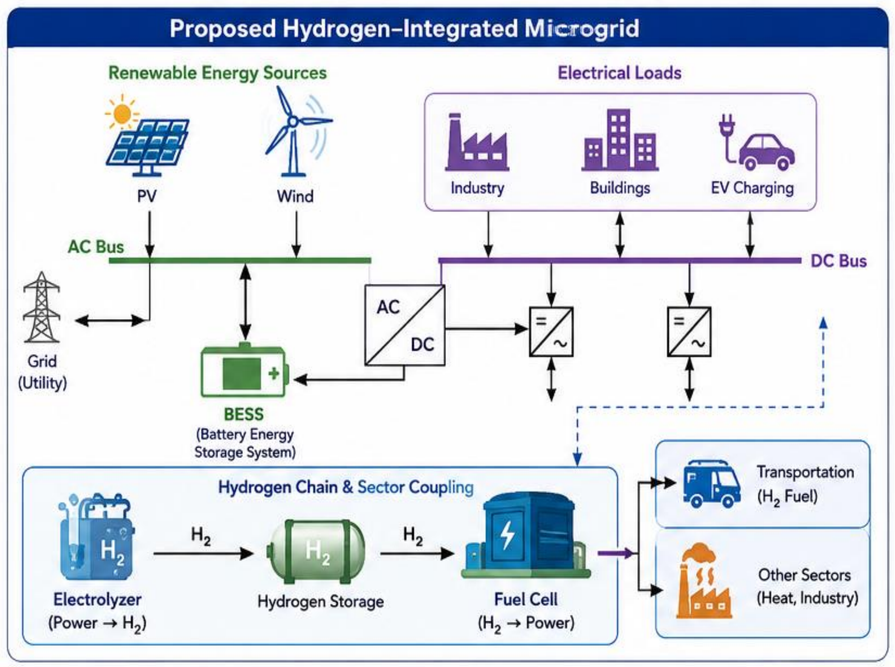
Method

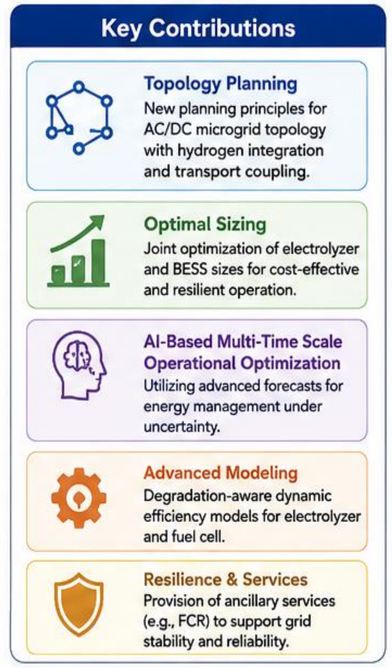
Hydrogen-integrated AC/DC microgrids have emerged as a key enabler of cross-sector energy coupling, allowing renewable electricity to be flexibly converted, stored, and delivered across multiple energy carriers

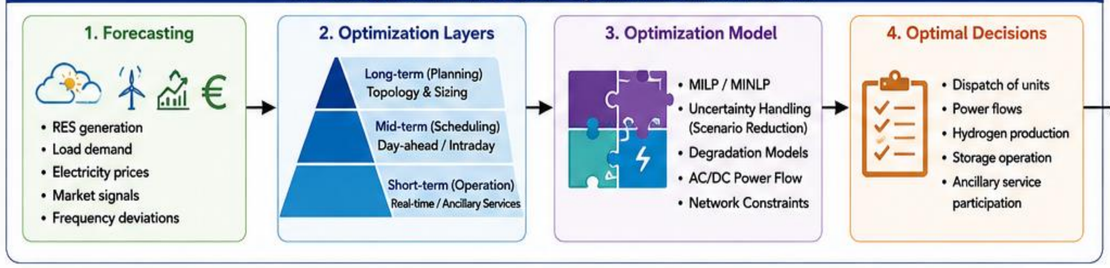
Results

- Systemic planning, network topology and coupling with transportation sector utilizing hydrogen-based fuels for resilient and efficient integration of hydrogen electrolysers in AC/DC microgrids.
- Optimized sizing of hydrogen electrolysers and battery energy storages (BESS)
- Multi-time scale AI-based operational optimisation advanced forecasts to maximize cost- and energy efficient and resilient operation of microgrid with RES+BESS+hydrogen electrolysers.













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Project partners

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Ideal4Green

Funded by

Funded by the European Union

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