Empowering Hydrogen Integration through Education in Renewable Energy Systems

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Abstract

Awareness and developing a skilled workforce are essential for effective integration and long-term energy resilience. This paper presents the "Green Ambassadors" program at the Holon Institute of Technology (HIT), Israel—an innovative educational initiative designed to support the transition toward a hydrogen-based energy economy. The program integrates academic content on renewable hydrogen production and energy system balancing with experiential learning and community outreach. Engineering students collaborate with elementary school pupils through hands-on demonstrations that showcase renewable hydrogen generation, storage, and utilization within power systems. A mixed-methods evaluation—comprising surveys and interviews with students, faculty, and school participants—indicates a significant enhancement in understanding of hydrogen technologies and their integration into future energy systems. The findings underscore the program's impact on improving system-level comprehension of hydrogen's role in grid stability, balancing, and decarbonization. The study proposes the adoption of similar educational models to foster social acceptance, regulatory preparedness, and professional capabilities for large-scale hydrogen deployment in smart, renewable energy infrastructures.

Keywords

Environmental awareness, renewable energy, sustainability education, peer education, experiential learning, hydrogen energy.