TUS
Ollscoil Teicneolaíochta na Sionainne:
Lár Tíre, An tIarthar Láir
Technological University of the Shannon:
Midlands Midwest

Department of Mechanical & Automobile Engineering

Reasearch: Green Energy *Autonomy*

Aim of the project

The aim of this project is to create an alternative way to produce green energy at home. This system should be autonomous and be able to run without much intervention. The system should be fully operational and be able to generate power without being disrupted based on the region or weather forecast.

Objectives

- Research available renewable energy systems
- Examine existing systems and perform case studies
- Explore different methods for energy storage
- Design a suitable system for a residential home
- Highlight my findings/data

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Case Study : Phi Sea House

The Phi Sea House is a 100% self-sustaining 24-hour solar powered multi-house residence based in Thailand. It was founded in 2015 and was the 1st self sustaining multi-housing estate in the world. They used hydrogen to store excess power as a brilliant alterative to batteries. The project boasts 86 kW of photovoltaic capacity, producing an average of 326.8 kWh of electricity per day, exceeding the community's monthly energy demand of 6,000 kWh.

Case Study : Solhyd Panel

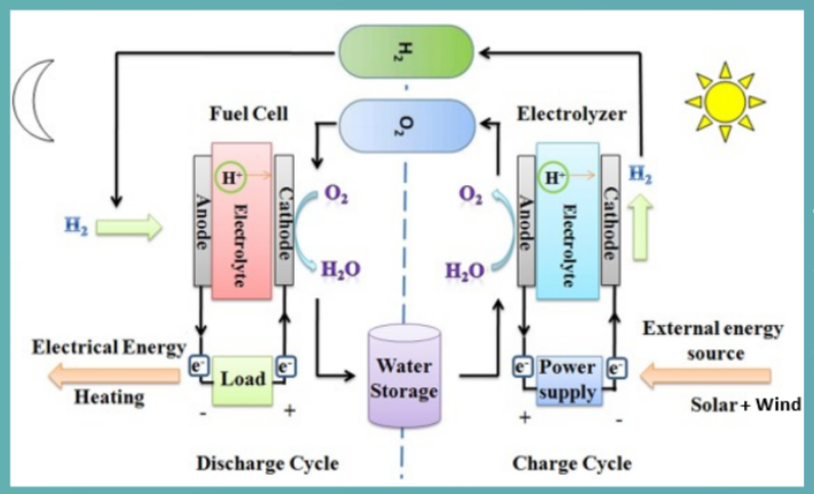
The Solhyd panel was created by a solar-hydrogen company based in Belgium since 2011. The company's goal is to produce hydrogen from sunlight and water vapor in the air, providing a sustainable and renewable energy solution for various applications. Solhyd's innovative technology combines a solar panel with a hygroscopic material that absorbs water vapor from the air. This concept completely eliminates the use of a battery for energy storage .

Conclusion

In conclusion, while Solhyd and the Phi Suea House project present innovative solutions for renewable energy and hydrogen production, focusing on developing self-powered residential house systems offers unique advantages that make it a more versatile and adaptable approach to sustainability. Furthermore, focusing on just one renewable source limits the energy harvested.

Final Design

After extensive research the following system design was the most appropriate.



Calculations

The following calculations are for a 3-4 bedroom house in Ireland with an average consumption of 11.5kwh per day. To meet those requirements this will be the system needed:
3 x 400W solar Panel
(4-5hr sun time, >4kwh)
2kw Wind Turbine
(5-6hr wind time, >8Kwh)
Fuel Cell (1kwh-2kwh)

References

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