

Energy Generation using Hybrid System of Horizontal Axis Wind Turbine and Solar Panel

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Abstract: This paper discusses about the construction of a Horizontal axis wind turbine that will be combined with a solar panel to create direct current (DC) electricity that will be used to charge a battery. This system will meet the house's basic electrical needs. A variety of designs were examined in terms of wind turbine was selected based on literature. The major goals of this project are to decrease pollution and preserve the environment by reducing the use of fossil fuels, increasing windmill power output, and developing hybrid machines to create more electricity with zero emissions. In the pursuit of sustainable and renewable energy sources, the integration of multiple technologies has emerged as a promising solution. One such innovative approach is the hybrid system of vertical axis wind turbines (VAWT) and solar energy generation. Harnessing the power of wind and sunlight, this hybrid system offers a synergistic and efficient approach to energy production. By combining these two renewable sources, we can achieve a more reliable and consistent energy supply while minimizing the environmental impact

Keywords: Renewable Energy, Generator, Inverter Circuit, Horizontal Axis Wind Turbine, Wind Energy, Solar Panel

REFERENCES

- [1] S. Jain, and V. Agarwal, "An Integrated Hybrid Power Supply for Distributed Generation Applications Fed by Nonconventional Energy Sources," IEEE Transactions on Energy Conversion, vol. 23, June 2008.
- [2] A. O. Ciuca, I. B. Istrate, and M. Scripcariu, "Hybrid Power-Application for Tourism in Isolated Areas," World Academy of Science, Engineering and Technology 53 2009, pp. 264-269.
- [3] Ahmed, N.A., Miyatake, M., and Al-Othman, A.K. "Power Fluctuations Suppression Of Stand-Alone Hybrid Generation Combining Solar Photovoltaic/Wind Turbine And Fuel Cell Systems, Energy Conversion.
- [4] Deshmukh, M.K., Deshmukh, S.S. "Modeling Of hybrid Renewable Energy Systems", Renewable and Sustainable Energy Reviews, Vol. 12, No. 1, pp. 235-249
- [5] Yang, H.X., Jurnett, B., and Lu, L. "Weather data And probability analysis Of hybrid photovoltaic-wind power generation systems In Hong Kong", Renewable Energy, Vol. 28, No. 11, pp. 1813-24, 2003.
- [6] Yang, H.X., Lu, L., and Zhou, W. "A Novel Optimization Sizing Model For Hybrid Solar Wind Power Generation System.", Solar Energy, Vol. 81, No. 1, pp. 76-84, 2007.
- [7] Mazzeo D, Matera N, (2021) A literature review and statistical analysis of photovoltaic-wind hybrid renewable system research by considering the most relevant 550 articles: An upgradable matrix literature database. J Clean Prod 295. <https://doi.org/10.1016/j.jclepro.2021.126070>
- [8] Wadi M, Shobole A, Tur MR, et al. (2018) Smart hybrid wind-solar street lighting system fuzzy based approach: Case study Istanbul-Turkey. In: Proceedings— 2018 6th International Istanbul Smart Grids and Cities Congress and Fair, ICSG 2018. <https://doi.org/10.1109/SGCF.2018.8408945>
- [9] Ricci R, Vitali D, Montelpare S (2015) An innovative wind- solar hybrid streetlight: Development and early testing of a prototype. Int J Low-Carbon Technol 10: 420– 429. <https://doi.org/10.1093/ijlct/ctu016>