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IOT BASED ENERGY GENERATION USING PELTIER MODULE

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AP/IT IV IT STUDENTS

ABSTRACT

- *In the modern technologies, the production of power is focussing on the renewable energy resources as the non-renewable energy resources are getting depleted.*
- *There are some technologies which implement the recycling of waste energy.*
- *As the heat spreads and starts flowing so does the free charge carriers from the hot side to the cold side.*
- *The end voltages are proportional to the temperature difference and generating voltage.*
- *The heat energy is produced from its sources is wasted, which include the hot combustion gases, hot products obtain in the industrial process and heat transfer from hot equipment surfaces .*
- *It includes all kind of human activities, natural system and all organisms .*
- *This converts boost the input voltage produced, there by sufficient for charging the batteries.*
- *The battery charged can be used for operating the appliances.*

Keywords

- *Generation scheduling, power fluctuation, quantization index (QI), wind-energy storage hybrid system, wind power forecasting.*

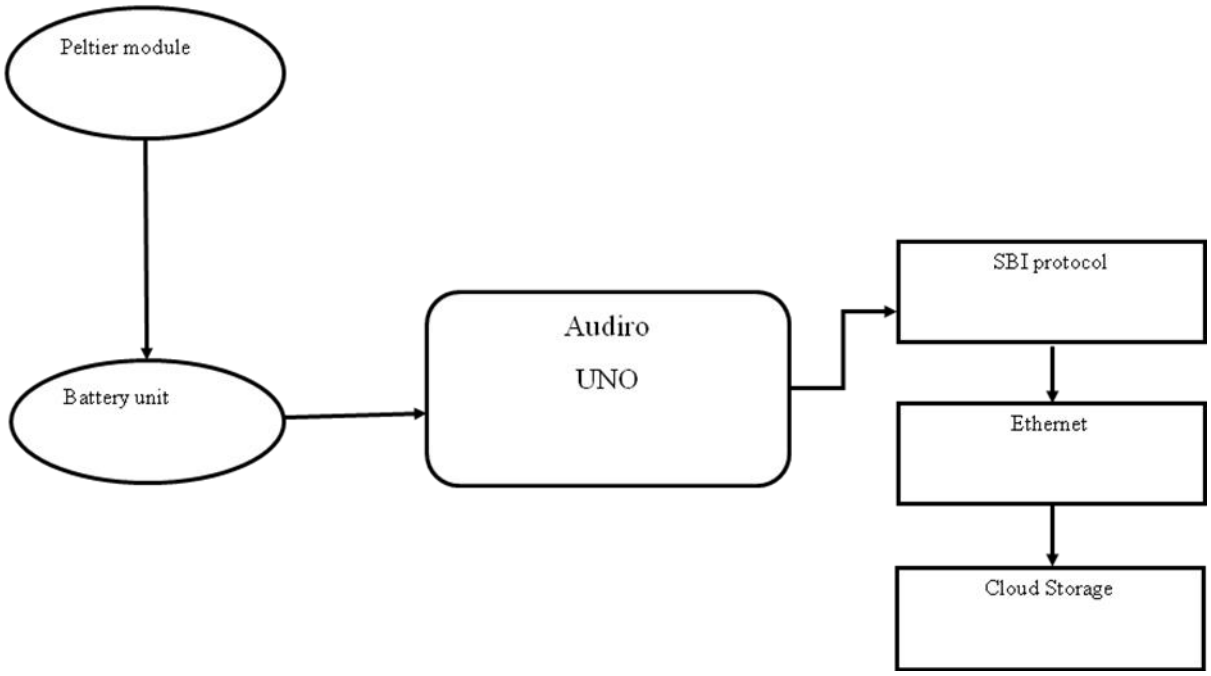
I.INTRODUCTION

As wind generation technologies become mature, wind energy is a valuable alternative to conventional energy sources. However, the penetration of wind power in grid system is constrained by its fluctuation feature of the power output. There is a growing research interest in using energy storage to increase the portion of renewable resources in electricity markets [1]–[6]. However, the application of energy storage system (ESS) to reduce the schedule deviation of the wind farm requires detail investigation due to high investment and operational cost.

The existing system is to consume the maximum solar energy through solar panel. A Solar Tracker is a device onto which solar panels are built-in which tracks the motion of the sun ensuring that maximum amount of sunlight strikes the panels all over the day. Solar tracking allows more energy to be produced because the solar array is able to remain aligned to the sun. The components used for its construction are servo motor, Arduino and LDR.

The key element Pettier module has the ability to convert thermal energy into electrical energy. They are made of two unique semiconductors, one being p-type and another being n-type and they are static in nature. The working operation is based on See beck effect . The principle of see beck effect is convert ion of heat energy into electrical energy.

II.BLOCK DIAGRAM



ARDUINO UNO

• *An Arduino is actually a microcontroller board.*
• *Its open source hardware feature.*
• *It has 14 digital input/output pin.*

PELTIER MODULE& DC-DC BOOSTER

• *A sandwiched shape device which can convert heat energy into electrical energy.*

• *The DC-DC booster converter will step up the input voltages.*

BATTERY UNIT &INVERTER

• *In electricity, a battery is a device consisting of one or more electrochemical cells that convert stored chemical energy into electrical energy.*
• *A power inverter, or inverter, is an electronic device or circuitry that changes direct current (DC) to alternating current.*

ETHERNET MODULE

- *The Arduino Ethernet Shield R3 (assembled) allows an Arduino board to connect to the internet.*
- *It is based on the Wiz net W5100 Ethernet chip (datasheet). The Wiz net W5100 provides a network (IP) stack capable of both TCP and UDP.*

SPI PROTOCOL

- *The Serial Peripheral Interface (SPI) bus is a synchronous communication interface specification used for short distance communication, primarily in embedded system.*
- *It is a two way communication between two device.*
- *That provide full duplex communication at very high speed.*

CLOUD

- *Cloud computing metaphor: the group of networked elements providing services need not be individually addressed or managed by users; instead, the entire provider-managed suite of hardware and software can be thought of as an amorphous cloud.*
- *It is used for storage purpose.*

III.CONCLUSION

- *Combining energy storage unit into wind farm is an effective way to improve the dependability of integrated wind power. However, the size of energy storage unit is a crucial restriction for the system design and operation due to its high cost. To solve this problem, this paper addresses the ESS sizing and time interval adjustment based on the wind power output fluctuation feature analysis and probabilistic wind power forecasting. The data that have "best performance" in power output fluctuation are selected to confirm the size of energy storage unit, with the scheduling time interval of 15 min. In the operational stage, the interval is prolonged to 30 min during the day of "best performance," which possesses least fluctuation.*

REFERENCES

[1] T. Tanabe, T. Sato, and R. Tanikawa, "Generation scheduling for wind power generation by storage battery system and meteorological forecast," in *Proc. IEEE Power Energy Soc. Gen. Meeting—Convers. Del. Elect. Energy Century*, 2008, pp. 1–7.

[2] W. Li, G. Jo´os, and C. Abbey, "Wind power impact on system frequency deviation and ESS based power filtering algorithm solution," in *Proc. IEEE Power Syst. Conf. Expo.*, 2006, pp. 2077–2084.

[3] S. Dutta and T. Overbye, "Optimal storage coordination for minimal wind generation schedule deviation," in *Proc. IEEE North Amer. Power Symp.*, 2010, pp. 1–7.

[4] J. Shi, Y. Liu, Y. Yang, and W. Lee, "Short-term wind power prediction based on wavelet transform-support vector machine and statistic characteristics analysis," in *Proc. IEEE Ind. Comm. Power Syst. Tech. Conf.*, 2012, pp. 1136–1141.

[5] J. Shi, W. Lee, and X. Liu, "Generation scheduling optimization of wind-energy storage system based on wind power output fluctuation features," in *Proc. IEEE Ind. Comm. Power Syst. Tech. Conf.*, 2017,

[6] H. Abdi and L. J. Williams, "Principal Component Analysis," Wiley Interdisciplinary Rev.: Comput. Statist., vol. 2, no. 4, pp. 433–459, 2010.

[7] S. K. Bhatia, "Adaptive K-Means Clustering," in Proc. AAAI 7th Int. Fl. Arti. Intell. Res. Soc. Conf. Menlo Park, CA, USA, 2004, pp. 695–699.

[8] Y. Xie, X. Chen, and J. Zhao, "Adaptive and Online Fault Detection Using RPCA Algorithm in Wireless Sensor Network Nodes," in Proc. IEEE 2nd Int. Conf. on Int. Syst. Des. and Eng. Appl. (ISDEA). Sanya, Hainan, China, 2012, pp. 1371–1374.

[9] J. Martínez-Carranza, F. Soto-Eguibar, and H. Moya-Cessa, "Alternative Analysis to Perturbation Theory in Quantum Mechanics," The Eur. Physical J. D, vol. 66, no. 1, pp. 1–6, 2012.

[10] P. Jiang, "A New Method for Node Fault Detection in Wireless Sensor Networks," Sensors, vol. 9, no. 2, pp. 1282–1294, 2009.