ISSN 2394-3777 (Print)

ISSN 2394-3785 (Online)
Available
online at www.ijartet.com

International Journal of Advanced Research Trends in Engineering and Technology (IJARTET)
Vol. 5, Special Issue 7, March 2018

EFFICIENT ENERGY CONVERSION USING RECYCLING OF WASTE PRODUCTS

Ms.Sujitha.S.k[1],Ruba.M[2],Saranya.R[3],Umamahesh.S[4],mouniga.N[5]
1.Assistant professor,2,3,4,5.UG scholars
Bharathiyar institute of engineering for women,
Deviyakurichi, attur(t.k), salem(d.t)

ABSTRACT--Most of the energies are utilized by the industries due to depletion of fossil fuels and increasing the price to exploit the maximum presented energy from the waste heat source. This energy can be set in to positive use as a heat source for vapour absorption system to serves as cooling system. The objective is to utilize the thermal and fiscal advantages of using single effect lithium bromide water absorption by means of waste heat. The main objective is to convert the heat energy to power by recycling of wastes. The waste product can be burned and the produced heat will be sent to the Peltier module to convert power. This power will be stored into battery and it can be used for many applications. It will be very useful for many industries and organizations. The PIC can be used to control the battery and it is of very low cost and high quality parameters.

Key words -Peltier module, PIC, Lithium bromide

By 2050,the vast amount of earth population (i.e., 70%) will move to urban areas, thus, forming vast cities [1]. Such cities require a smart sustainable infrastructure to manage citizens' needs and offers fundamental and moral advanced services [2]. The adoption of Future Internet technologies enhanced by the use of the Internet Protocol(IP) on numerous wireless sensors enables the Internet of Things paradigm.Numerous sensors have the opportunity to be part of Wireless Sensor Networks(WSNs). When WSNs are applied in a city,they are responsible for collecting and processing ambient information and, thus, to upgrade legacy city infrastructure to the so-called Smart Cities (SCs). A definition of the concept of SC is provided in [6]: "A Smart City is a city well performing in a forward-looking way in the following fundamental components (i.e., Smart Economy, Smart Mobility, Smart Environment, Smart People, Smart Living,and Smart Governance), built on the 'smart' combination of endowments and activities of self-decisive, independent and aware citizens". This definition incorporates the fundamental component of a smart environment which is mainly adopted for systems dealing with environmental pollution. The concept of smart environments depicts the ambient intelligence found in a SC through the adoption of smart devices and wireless networks. This way, intelligent applications could be delivered on top of such infrastructures.

ISSN 2394-3777 (Print)

ISSN 2394-3785 (Online)
Available
online at www.ijartet.com

International Journal of Advanced Research Trends in Engineering and Technology (IJARTET)
Vol. 5, Special Issue 7, March 2018

WSNs are capable of reforming activities in a SC in every aspect of daily life [3]. In this paper, we focus on a specific application domain, waste management.The efficient management of waste has a significant impact on the quality of life of citizens. The reason is that waste disposal has a clear connection with negative impacts in the environment and thus on citizens' health.

In this paper, we take advantage of our study of the waste management problem in the city of St. Petersburg, Russia. St. Petersburg is a city of 5 million citizens covering a total are of1,439 square kilometers, a density of 3,391 citizens per square kilometer. On average, solid waste produced in the city is 1.7million tonnes per year. The daily amount of municipal solid waste generated is 0.93 kilograms per citizen. On a daily basis,the municipality of St.Petersburg uses 476 waste collection trucks with a capacity of 5 tons per truck. The fuel consumed in one year is, on average, 1.8 million liters. The average costs spent for fuel in one year for waste collection is more than 1million US dollars. Finally, the traffic congestion caused by the fleet of waste collection trucks at rush hours is significant due to the narrow roads and small backyards, causing indirect problems in citizens'activities. Obviously, it is critical to efficiently manage the waste disposed in every location of a SC not only focusing on the collection activities but also on its transport and recycling.

We model the waste management as a set of services on top of an IOT infrastructure in a SC. These services cover the following parts of a waste management scheme: (i) waste collection planning and implementation (e.g., routing solutions for collection trucks,dynamic adaptation of routes);(ii) transport of waste to specific locations (e.g., routing according to the type of waste); (iii) recycling and preparation for re-use. In this paper, we focus on the first type of services i.e., efficient planning of waste collection activities. We also focus on dynamic models on contemporary waste collection with the proliferation of Radio Frequency Identification(RFID), sensors and actuators [4]. Several devices have been adopted for enabling the efficient implementation of the dynamic waste collection e.g., RFID tags, sensors and actuators. With the term dynamic, we denote the ability of a system to change, in real time, the parameters and the plans that affect the collection of waste during the collection activity.Such functionalities could be incorporated into an intelligent transportation framework that results in real time directions provided to the collection trucks.

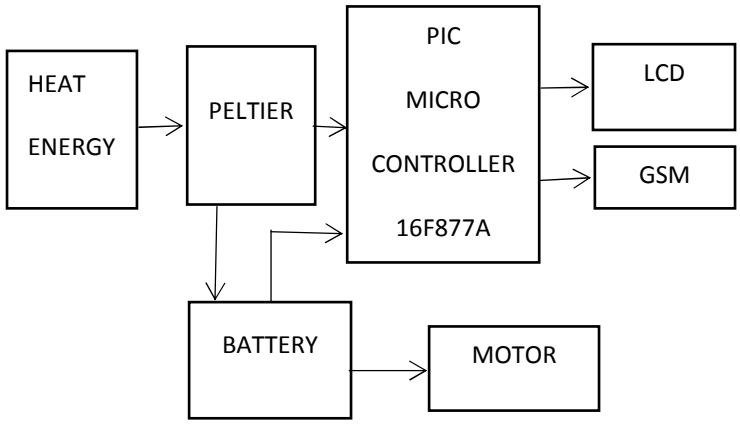

Fig. Block diagram

Intelligent transportation contributes to dynamic waste collection since it uses smart vehicle infrastructure, which is incorpora ted in this survey [5].Specifically,we present a comprehensive survey on the adoption of Information and Communication Technologies (ICT) in waste management models

ISSN 2394-3777 (Print)
ISSN 2394-3785 (Online)
Available online at www.ijartet.com

International Journal of Advanced Research Trends in Engineering and Technology (IJARTET)
Vol. 5, Special Issue 7, March 2018

focusing on the modern ICT tools and technologies. We survey a substantial body of knowledge, thirty-two case studies. Among them, only six models involve an IOT-enabled technology. We argue that waste management solutions should be adopted as the back-end middleware to support further inference and reasoning on top of the data coming from sensors. We also discuss a taxonomy of the studied models and,thus, we are able to compare the strengths and weaknesses of each one.The rest of the paper is structured as follows. Section 2 discusses the intelligent waste management and proposesa taxonomy adopted to compare waste management models.Section 3 reports on the survey of relevant models and the comparative assessment.Section 4 concludes the paper and discusses future work.

PELTIER MODULE

A typical thermoelectric (TE) module is composedoftwo ceramic substratessandwiching many pairs, or "couples" of Bismuth Telluride dice. The (pairs of) dice are connected electrically in series, and thermally in parallel, between the ceramics.One of these ceramics will be the "hot-side" and the other, the "cold-side."

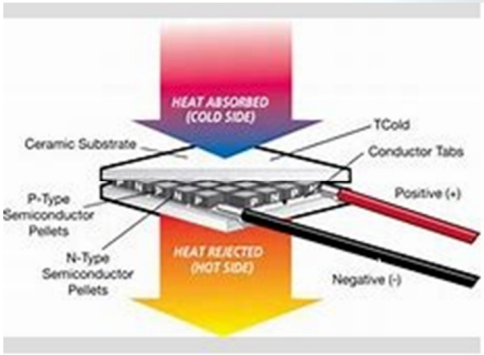

Fig. Internal blocks of peltier module

Aluminaceramicsubstrates are commonlyused for making TE modules. They are ridged, thermally conductive andexcellent electrical insulators. In addition to providing a sturdy foundation, the ceramics insulate the electrical elements within the module from a heat-sink on the hot-side of the module, and the object being cooled on the cold-side. Most modules have and even number of P-type and N-type dice and one of each, sharing an electrical interconnection, is known as, "a couple."

LITHIUM BATTERY

An expert notes "If a battery cell charged too quickly, it can cause a short circuit, leading to explosions and fires" Because of these risks, testing standards are more stringent than those for acid-electrolyte batteries, requiring both a broader range of test specific tests.research areas for lithium-iron batteries include life extension,energy density,safety,cost reduction and charging speed among others

Fig. Lithium battery

ISSN 2394-3777 (Print)

ISSN 2394-3785 (Online)
Available
online at www.ijartet.com

International Journal of Advanced Research Trends in Engineering and Technology (IJARTET)
Vol. 5, Special Issue 7, March 2018

Lithiumbatteries consists of sulfide and lithium metal as the electrodes. However, this rechargeable lithium battery could never be made practical. Titanium disulfide was a poor choice, since it has to be synthesized under completely sealed conditions, also being quite expensive ~$1000 per kilogram for titanium disulfide raw material in 1. When exposed to air, titanium disulfide recharged.

LCD DISPLAY

A LCD used comprises of and great possibilities for most frequent usage in practice. It is based on the PIC16F877Amicrocontroller and display messages in two lines with 16 characters each. It displays all the alphabets. Greenletters,punctuationmarks, mathematical symbols etc.

GSM MODEM:

A GSM modem is a device which can be either a mobile phone or a modem device which can be used to make a computer or any other processor communicate over a network. A GSM modem requires a SIM card to be operated and operates over a network range subscribed by the network operator. It can be connected to a computer through serial, USB or Bluetooth connection.A GSM modem can also be a standard GSM mobile phone with the appropriate cable and software driver to connect to a serial port or USB port on your computer. GSM modem is usually preferable to a GSM mobile phone. The GSM modem has wide range of applications in transaction terminals, supply chain management, security applications, weather stations and GPRS mode.

WORKING OF GSM:

A GSM modem duly interfaced to the MC through the level shifter IC Max232. The SIM card mounted GSM modem upon receiving digit command by SMS from any cell phone send that data to the MC through serial communication. While the program is executed, the GSM modem receives command STOP to develop an output at the MC, the contact point of which are used to disable the ignition switch. The command so sent by the user is based on an intimation received by him through the GSM modem 'ALERT' a programmed message only if the input is driven low. The complete operation is displayed over 16×2 LCD display.

- Improved spectrum efficiency.
- International roaming.
- Compatibility with integrated services digital network (ISDN).
- Support for new services.
- SIM phonebook management.
- Fixed dialing number (FDN).
- Real time clock with alarm management.
- High-quality speech.
- Uses encryption to make phone calls more secure.
- Short message service (SMS).

The security strategies standardized for the GSM system make it the most secure telecommunications standard currently accessible. Although the confidentiality of a call and security of the GSM subscriber is just ensured radio channel.

ISSN 2394-3777 (Print)

ISSN 2394-3785 (Online)
Available
online at www.ijartet.com

International Journal of Advanced Research Trends in Engineering and Technology (IJARTET)
Vol. 5, Special Issue 7, March 2018

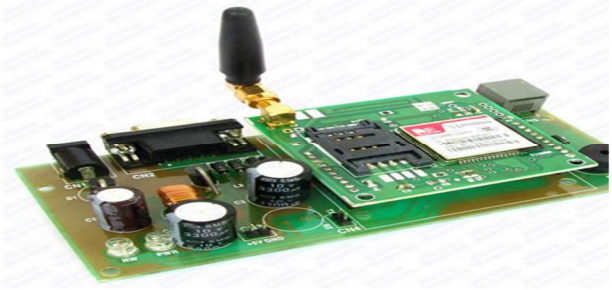

Fig. GSM Modem

1.ExperimentalAnalysisofThermoelectricWasteHeat System Retrofitted to Two Stroke PetrolEngine

Author:Seralathan, Dipin, Thangavel

Year:May 2007

2. Study of Vapour Absorption System UsingWaste Heat in Sugar Industry

Author: K.Balaji, R.Senthil kumar

Year : Aug 2011

CONCLUSION

The survey's focus is more energy-efficient GSM as an enabler of various applications including waste management. Specifically,it aims to present a large set of models dealing with the efficient waste management.We present efforts for the intelligent transportation within the context of GSM and smart cities for waste collection.To convert the heat energy to power by recycling of wastes. The waste product can be burned and the produced heat will be sent to the Peltier module to convert power. This power will be stored into battery and it can be used for many applications. It will be very useful for many industries and organizations. The PIC can be used to control the battery and it is of very low cost and high quality parameters.

REFERENCES