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THE POWER GENERATING SHOES

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Abstract: - This project is to design a charger that able to implement into shoe in order to generate electricity to charge gadget during walking. For this project I was mainly focus on design a shoes charger for cell phone. The purpose of developing this project is to solve the problems of time consume for waiting cell phone fully charge. Besides this project design also can convert our wasted energy during walking into a usable electrical energy. The method of generating electrical voltage for charging an electronic gadget from the piezoelectric sensor that is fixed to the sole of the footwear is illustrated in this project.

INRODUCTION

Piezoelectricity in everyday life

Materials always have had a large influence on society. This was obvious in the Stone Age, Bronze Age, and Iron Age. We have named these eras by the most advanced material in that period, since these materials determine and limit the state of technology at the time. Also in modern society, the influence of materials is still present. However, nowadays the materials as such are not as visible anymore as they used to be. They are more and more embedded in complex devices and high tech systems that make whole economies exist and function in an efficient way.

Piezoelectric materials are among these „invisible‟ materials that are widespread around us, although they are unknown to the public at large. Mobile phones, automotive electronics, medical technology, and industrial systems are only a few areas where piezoelectric components are indispensable. Echoes to capture the image of an unborn baby in a womb make use of piezoelectricity. Even in a parking sensor at the back of our car, piezoelectric material is present.

ENERGY DEMAND IN PRESENT SCENARIO

World energy consumption refers to the total energy used by all of human civilization. Typically measured per year, it involves all energy harnessed from every energy source applied towards humanity's endeavors across every single industrial and technological sector, across every country. Being the power source metric of civilization, World Energy Consumption has deep implications for humanity's social-economic-political sphere.

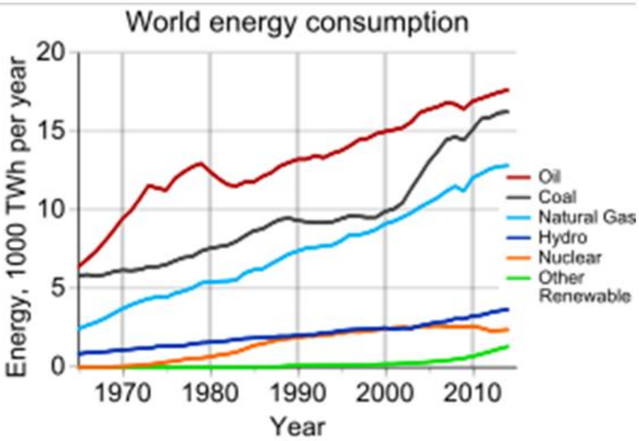
Institutions such as the International Energy Agency (IEA), the U.S. Energy Information Administration (EIA), and the European Environment Agency record and publish energy data periodically. Improved data and understanding of World Energy Consumption may reveal systemic trends and patterns, which could help frame current energy issues and encourage movement towards collectively useful solutions.

In 2012, the IEA estimated that the world energy consumption was 155,505 terawatt-hour (TWh), or 5.598 × 1020 joules. This works out to 17.7 TW, or a bit less than the estimated 20 TW produced by radioactive decay on earth. From 2000–2012 coal was the source of energy with the largest growth. The use of oil and natural gas also had considerable growth, followed by hydro power and renewable energy. Renewable energy grew at a rate faster than any other time in history during this period, which can possibly be explained by an increase in international investment in renewable energy. The demand for nuclear energy decreased, possibly due to the accidents at Chernobyl and Three Mile Island.

In 2011, expenditures on energy totaled over 6 trillion USD, or about 10% of the world gross domestic product (GDP). Europe spends close to one quarter of the world energy expenditures, Americans close to 20%, and Japan 6%.

World total final consumption of 104,426 TWh (or 8,979 Mtoe) by fuels in 2012 (IEA, 2014)

- Oil (40.7%)
- Coal/Peat/Shale (10.1%)
- Natural Gas (15.2%)
- Biofuels and waste (12.4%)
- Electricity (18.1%)
- Others (Renew.) (3.5%)



HOW OUR WORK IS DIFFERENT FROM OTHERS

Our work is different because it is work like a small power plant which is keep our self always without any problem. However, the energy produced by these materials is in many cases far too small to directly power an electrical device. Therefore, much of the research into power harvesting has focused on methods of accumulating the energy until a sufficient amount is present, allowing the intended electronics to be powered.

In a recent study by Sodano et al. the ability to take the energy generated through the vibration of a piezoelectric material was shown to be capable of recharging a discharged nickel metal hydride battery. In the present study, three types of piezoelectric devices will be investigated and experimentally tested to determine each of their abilities to transform ambient vibration into electrical energy and their capability to recharge a discharged battery.

The three types of piezoelectric devices tested are; the commonly used monolithic piezoceramic material lead-zirconate-titanate (PZT), the bimorph Quick Pack (QP) actuator and Macro Fiber Composite (MFC). The experimental results estimate the efficiency of the three devices tested and identify the feasibility of their use in real world applications.

Various different capacity batteries are recharged using each device, to determine the charge time and maximum capacity battery that can be charged. The results presented in this paper show the potential of piezoelectric materials for use in power harvesting applications, provide a means of choosing the piezoelectric device to be used and estimating the amount of time required for it to recharge a specific capacity battery.

