BREVET DE TECHNICIEN SUPERIEUR
ÉLECTROTECHNIQUE / ÉLECTRONIQUE

SESSION 2003

ANGLAIS

(Groupe 18)

Dictionnaire bilingue autorisé
Convertisseurs Euro et Calculatrices interdits

Session 2003		Code LVE 9	
B.T.S ÉLECTROTECHNIQUE / ÉLECTRONIQUE			
Épreuve ANGLAIS			
Durée 2 heures	Coefficients : Électrotechnique : 1 Électronique : 2	Nombre total de pages 3	N° de page/total 1/3

TRAVAIL À FAIRE

I) COMPTE RENDU EN FRANÇAIS (12 points)

Mettez en évidence les informations les plus importantes contenues dans le document (180 mots maximum).

II) TRADUCTION (8 points)

Traduire en français le passage en caractères gras page 3 :

de "There is a lot of...." (ligne 1) jusqu'à "kitchen appliances." (ligne 8)

UNUSED ENERGY...

There is a lot of unused energy flowing around in our local environment that we might be able to tap into - speeding traffic, vibrating machinery, stray radio waves.

Shad Roundy, a researcher at the University of California in Berkeley is pinning hopes on converting the myriad vibrations that surround us every day into electricity. Roundy has found that most high energy vibrations have frequencies in the range from 75 to 150 hertz. This has led him to focus on devices that produce these vibrations in abundance: car engines, industrial machinery and air-conditioning vents, kitchen appliances.

To harvest the power, Roundy uses two thin strips of lead zirconate titanate (PZT)[1] stuck together to form what he calls a "bimorph" less than half a millimetre thick. PZT is a piezoelectric material: stretching or compressing it creates a voltage across the surface. When he tested his bimorph on a car engine, the vibrations set up a voltage that he used to push small currents around a circuit. Output was only about 80 microwatts - not much, but certainly enough to power a small sensor for monitoring oil pressure or engine temperature. The sensor could send its readings as radio signals to the vehicle's engine control system.

However, you don't have to use high-tech components to scavenge power. For example, Gary Henderson, an engineer in New-York, wants states across the US to dig up their roads and install his pumps at regular intervals. The roadways themselves would then provide electricity as cars drive along them.

Each pump consists of a metal plate that sits on a liquid-filled bladder. When a car drives across it, the vehicle pushes the plate down by a centimetre or two. This forces the liquid out of the bladder through a one-way valve and into a turbine. Each pump is capable of generating about 80 watts of electricity each time a car runs over it, and this power is stored in rechargeable batteries or capacitors. This output may not seem a lot, but Henderson calculates that if ten per cent of California's drivers drove over two of these pumps per mile, it would generate 3 gigawatts of power.

[1] PZT : titanate de zirconate de plomb

The New Scientist, 3 August 2002 by James Hrynyshyn JUICE ON THE LOOSE p.38

364 words