

## ENERGY HARVESTING FROM HUMAN MOTION USING FOOTSTEP

Mr. Vijay Bhan Dinkar, Dept. of Mechanical Engineering  
Rabindranath Tagore University, Bhopal

### ABSTRACT

Presently multi day's vitality and power square measure the one in all the essential wants with regard to the present innovative world. During this venture we have a tendency to square measure manufacturing wattage as non-traditional technique by strolling on the strides. Non-traditional vitality framework is very basic as of currently to making countries like Asian nation, China then forth. Non-traditional vitality utilizing strides desires no fuel info capability to form the yield. During this venture the transformation of mechanical vitality into electrical vitality is finished by utilizing basic drive systems, for instance, rack and pinion get along and chain drive part.

### KEYWORDS

Energy Harvesting; Wearable Devices; Human Motion; Electric Generator; Biomechanical Energy

### INTRODUCTION

In this project the weight which acts on the foot step is used to generate electrical energy [1]. When a person walks over the foot step, a force acts on the step. One can simply be amazed by knowing how much energy a person can have just by walking on the floor with normal speed.

That energy may be used and converted into electrical energy. The Mechanical energy (weight) is converted into electrical energy using drive mechanism, in this case rack and pinion.

This project includes number of simple setup and component that is installed under the walking or standing platform. When person walk or stand on this platform their body weight compresses the setup of system which tends to rotates a dynamo and current produced is stored in dry battery And while the power producing platform is over crowded with moving population, energy is produced is high. More movement of people will generate more energy.

### LITERATURE REVIEW

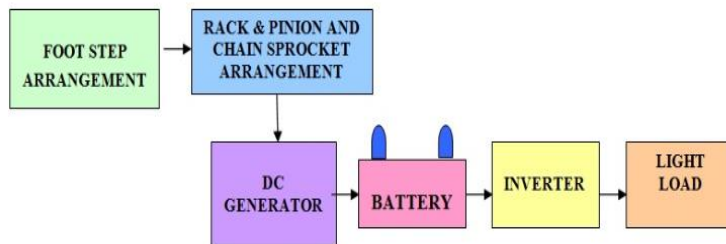
---

#### **Basic principle of ENERGY HARVESTING FROM HUMAN MOTION USING FOOTSTEP**

The pushing power is converted into electrical energy by proper driving arrangement. The rack & pinion, spring arrangement is fixed at the inclined step. The spring is used to return the inclined step in the same position by releasing the load. The pinion shaft is connected to the supporter by end bearings as shown in fig. The larger sprocket also coupled with the pinion shaft, so that it is running the same speed of the pinion. The larger sprocket is coupled to the

small cycle sprocket with the help of chain (cycle). This larger sprocket is used to transfer the rotation force to the smaller sprocket. The smaller sprocket is running the same direction of the forward and reverse direction of rotational movement of the larger sprocket. This action looks like a cycle pedalling action.

### Block diagram



### METHODOLOGY

---

**Introduction** -In this project the weight which acts on the foot step is used to generate electrical energy [1].

The Mechanical energy (weight) is converted into electrical energy using drive mechanism, in this case rack and pinion. Generated energy can be stored in batteries. Then the output of the battery is used to lighten the lamps in the room or any such application. In this project we are converting Mechanical energy into Electrical energy. We are trying to utilize the wasted energy in a useful way [2]. By using Rack and Pinion arrangement we are converting to and fro motion of the steps into rotational motion.

**Value engineering:** - Our project is all about saving human energy and converting it to electrical energy. So reforming this energy back to usable form is the major solution. This project is used to generate voltage using footstep force. This system uses voltmeter for measuring output, led light, weight measurement system and a battery for better demonstration of the system.

Human locomotion in over load crowded subway station, railway stations, bus stand, airport, temple or rock concerts thus can be converted to electrical energy with the use of this promising technology.

**Legal terminology :** -In the United States, value engineering is specifically mandated for federal agencies by section 4306 of the national defence authorization act for fiscal year 1996, which amended the office of federal procurement policy act. "Each executive agency shall establish and maintain cost-effective value engineering procedures and processes".

### CALCULATION OF FOOT STEP POWER GENERATION MECHANISM

---

**CALCULATION**

CONSTANT LOAD	NUMBER OF TIME LOAD APPLIED AND REMOVED	In parallel		In series	
		voltage	Ampere	voltage	ampere
40	1	12	2	24	1
40	2	24	4	48	2
40	3	36	6	72	3
40	4	48	8	96	4
40	5	60	10	120	5
40	6	72	12	144	6

**Number of teeth in gear: - 17 teeth**

**Diameter of the gear: - 75 mm**

**Length of the chain 750 mm**

**Dynomo: 12v**

**REFERENCES** [1][2]–[6]

- [1] T. M. Bertilsson, M. Leach, I. Scoones, and B. Wynne, "Science and Citizens, Globalization and the Challenge of Engagement," *Can. J. Sociol. / Cah. Can. Sociol.*, 2006.
- [2] R. van Est, "The Broad Challenge of Public Engagement in Science," *Sci. Eng. Ethics*, vol. 17, no. 4, pp. 639–648, 2011.
- [3] D. Qaurooni, A. Ghazinejad, I. Kouper, and H. Ekbia, "Citizens for Science and Science for Citizens," 2016, pp. 1822–1826.
- [4] R. van Est, "The Broad Challenge of Public Engagement in Science," *Sci. Eng. Ethics*, vol. 17, no. 4, pp. 639–648, 2011.
- [5] S. B. Nolen, G. Tierney, A. Goodell, N. Lee, and R. D. Abbott, "Designing for engagement in environmental science: Becoming 'environmental citizens,'" in *Proceedings of International Conference of the Learning Sciences, ICLS* ,

2014, vol. 2, no. January, pp. 962–966.

- [6] M. Mayo, *Global Citizens - Social Movements and the Challenge of Globalization*. 2005.

[WWW.WIKIPEDIA.COM](http://WWW.WIKIPEDIA.COM)

[WWW.SLIDESHARE.COM](http://WWW.SLIDESHARE.COM)