

“GENERATION OF ELECTRICITY FROM EXHAUST FAN”

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ABSTRACT

From home, offices, to industries there is great demand for a variety of exhaust fans. Exhaust fans are available at various specification such as RPM, watts, current, speed etc.

Most industrial units vary huge and high speed exhaust fan are required which runs continuously. Such exhaust fans consume a large amount of electric current and energy, An attempt is made in our project to utilize the exhaust fan air flow (exhaust wind) to rotate the blades of a turbine which is coupled to an electric generator. It is like a wind energy generator.

When the exhaust fan turned ON, the exhaust high speed air flow (exhaust wind) turns the blades of the turbine, which ultimately rotates the generator. The generator converts mechanical power into electric energy. This project may be applicable to small scale energy generation. The electrical energy may be stored in rechargeable batteries, a super capacitor or any other mode of storage mechanism.

The stored energy can be used for inverters etc. For greater efficiency of this system exhaust air flow can be focused directly through the pipes at the turbine blade..

INTRODUCTION

The rapid depletion of natural resources and fossil fuels have led to the development of alternative sources of energy. The conventional sources of energy are non-renewable, cause pollution, not sufficient to meet the growing energy demand. Due to these reasons, it is imperative that we must start exploring and developing methods to utilize the nonconventional energy sources to reduce too much of dependence on conventional sources. One of the most arresting form of non-conventional energy is wind energy. But due to some of its limitations, the wind energy cannot be utilized fully to produce electricity. This limitation can be surmounted with idea of using the wind from exhaust fan of big industries as a source of power.

The aim is to build a system that uses Exhaust Fan to generate electricity in rural areas. The system controls all settings. Air blowers usually use medium power to move air forward. Inside the centrifugal fan there is a wheel with small blades in the circle and a case that directs the air flow in the center of the wheel and exits the edge. The design of the blade will affect the way the wind blows and the efficiency of the wind turbine. This project uses Exhaust Fan set, turbine and DC

Generator. It is a renewable energy program that can reduce energy demand by creating waste energy. This system allows countries with low wind speeds, especially in urban areas, to use wind energy from fixed and predictable wind sources

PROBLEM IDENTIFICATION

Solar trackers have both horizontal as well as vertical axis tracking. A controller is used for multiple sensors to follow the movement of the sun. After the battery is fully charged through the charge controller, it needs to be disconnected to avoid overcharge. For the need of electricity in rainy season, more battery will have to be add.

AIM & OBJECTIVE

The main aim of the project is to prove that the wind from an exhaust air system can be utilized into useful forms of energy.

Moreover, the utilization of this man- made wind energy by the energy recovery wind turbine generator is aimed to give no negative effect on the performance of the exhaust air system

PROBLEM FORMULATION

LED has two legs one positive and one negative .The positive end is connected to the pillars of LED cube which acts as anode. The negative one is connected to the layer. Hence, to switch on a particular LED we have to give current to the corresponding pillar and ground the layer. LEDs offer a huge variety of benefits but at the same time they cannot be viewed as the optimum solution for every lighting-related application. Here, in no particular order, we list some of the main advantages of LEDs, together with some of the challenges faced by these devices.

COMPONENTS

- **Dynamo Generator** - Dynamo Generator 12V, DC, 0.9Amper Generator is a machine that converts mechanical energy into electrical energy. It works based on principle of faraday law of electromagnetic induction. The faradays law states that whenever a conductor is placed in a varying magnetic field, EMF is induced and this induced EMF is equal to the rate of change of flux linkages. This EMF can be generated when there is either relative space or relative time variation between the conductor and magnetic field.

- **Arduino Nano** - Arduino nano the classic Nano is the oldest member of the Arduino Nano family boards. It is similar to the Arduino Duemilanove but made for the use of a breadboard and has no dedicated power jack. Successors of the classic Nano are for example the Nano 33 IoT featuring a WiFi module or the Nano 33 BLE Sense featuring Bluetooth Low Energy and several environment sensors. The ATmega328 CPU runs with 16 MHz and features 32 KB of Flash Memory (of which 2 KB used by bootloader).

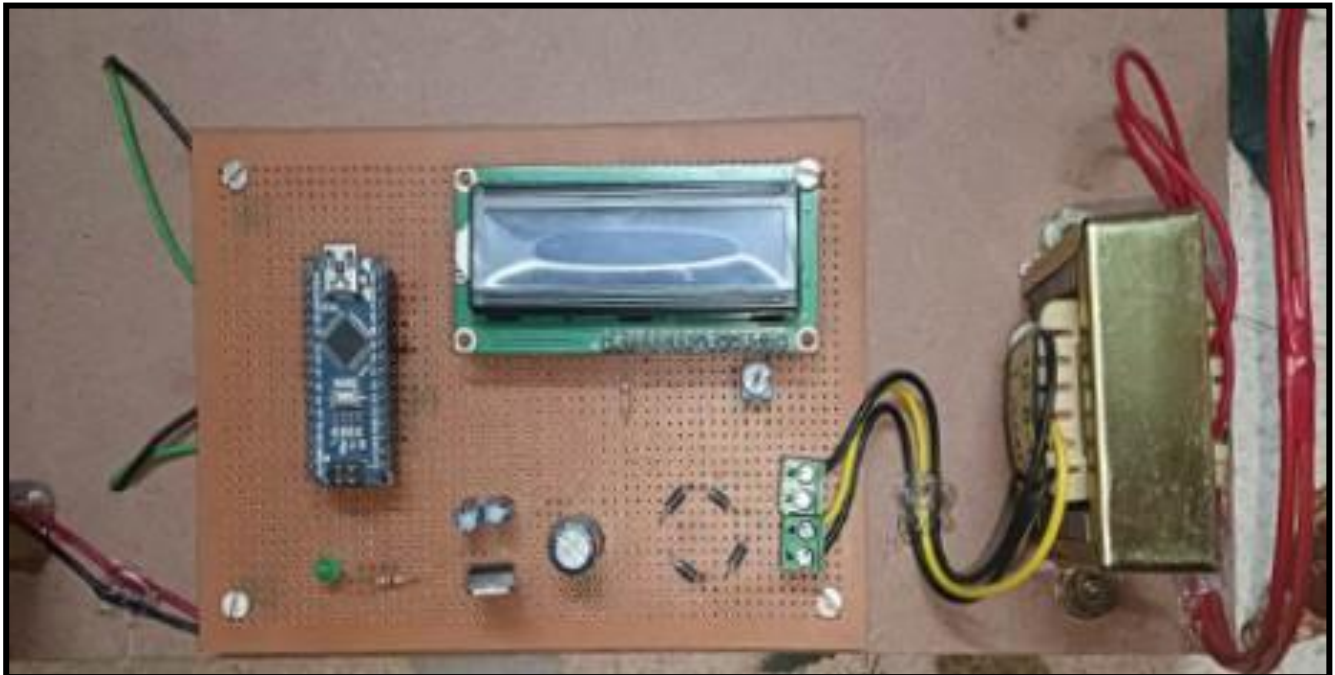


Figure: Model 1