

REUSE OF EXHAUST FANS IN INDUSTRIAL AS POWER SOURCE

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ABSTRACT

The energy interest of the world has gotten an uncontrolled in the previous years and is expanding significantly. With ascend in energy interest, the regular wellsprings of energy (petroleum products, atomic) are hampered with stupendous pressing factor and thus, its ceaseless utilization prompts deficiency of petroleum products. This has incited a broad examination into the zone of non-customary fuel sources like hydro, wind, nuclear power, and so on Out of these, the breeze energy is being examined in this paper. Wind energy has a great deal of potential and benefits however its usage is limited because of its inconsistency, topographical conditions and its accessibility. Our essential objective is to recommend a thought that can be conquered these issues and use the breeze energy to its greatest degree. This paper manages the breeze energy that can be separated from the squandered breeze energy from modern fumes fans. The breeze power from the fumes fan can drive a little windmill before it and the energy created from it will be put away in energy stockpiling unit. The force put away in the battery can be changed over into an air conditioner source with the assistance of an inverter and afterward it tends to be provided to the heap and henceforth, this squandered force from exhaust fan can be used to fulfill the developing energy need.

Keywords: *Wind power, exhaust fan, wind turbine, storage.*

1. INTRODUCTION

The interest in sustainable power has been restored an over most recent couple of years, especially after worldwide mindfulness with respect to the evil impacts of petroleum product consuming. The utilization of sustainable power innovation to satisfy the energy needs has been persistently expanding for as far back as couple of years. For this reason we have chipped away at a different thought. We considered fumes fans utilizing in enterprises as a high speed and consistent breeze source Now a days, worldwide energy utilization in both created and non-industrial nations has expanded quickly because of populace development and it is required to twofold or more constantly 2040.1 In Malaysia alone, complete energy request is developing at 5.5% per annum with 1.8% normal yearly populace development rate. In the long run, the energy interest in the year 2020 will be roughly 973 TWh with 33.5 million populaces. As an outcome, Malaysia is anticipated to turn into a net energy merchant by 2020.1 this energy utilization development is contributed by both mechanical and private areas. The current energy assets for power age in Malaysia mostly rely upon petroleum products (oil, coal and flammable gas) which contribute 94.6% of the power age while just a little part of energy supplies comes from hydroelectricity or others (sun based, biomass, and so forth) Be that as it may, the utilization of petroleum derivatives carries negative effects on the climate like ozone harming substances (GHG) emanation. As indicated by Ahmad et al., over 90% of the energy related GHG outflow is a

consequence of the CO₂ discharges from fuel burning globally.³ Currently, the increment in the centralization of GHG emanation has caused an eminent ascent of temperature in the world's climate (an unnatural weather change) and accordingly far reaching liquefying of snow and ice at the polar ice covers. The softening of ice causes the ascent of ocean level and lesser land can be utilized for an expanding total populace, alongside the adjustments in environment.

Exhaust air system

2. EXHAUST FAN

Exhaust Fan are heat removal devices used to transfer waste heat to the atmosphere; large office, buildings and Industrial established office typically install one or more exhaust fans for building ventilation system. This type of exhaust fans depends on power-driven fans to draw or force the air through the blades. Most air-conditioning systems and industrial processes generate heat that must be removed and dissipated. Water is generally used as a heat transfer medium to remove heat from refrigerant condensers or industrial process heat exchangers. Cooling towers are for the most part used to scatter heat from water-cooled refrigeration, cooling frameworks, and modern cycle frameworks. Cooling towers are heat evacuation gadgets used to move squander warmth to the environment; enormous places of business, emergency clinics and schools for the most part introduce at least one cooling towers for building ventilation framework. The fumes fan in large businesses can assume a creative part in delivering electrical energy which rely upon the energy interest to certain region. The breeze power from the fumes fan can be coordinated towards a little windmill before it. The breeze push from the fumes fan can drive wind turbine and these breeze turbines create power which can be put away unit. The capacity unit may shift as per the produce of power from the breeze turbines. At that point inverter will change over the put away dc energy into ac.



Fig 1: Exhaust Fan: 230V, 1400rpm

The exhaust fan in big industries can play a leading role in producing electrical energy which can raise the energy demand to certain extent. The wind force from the exhaust fan can be controlled by placing a small windmill in front orbit.

The wind thrust coming out from the exhaust fan can be used to rotate the wind turbine and these wind turbines produce electricity which can be stored in storage unit. The size of storage unit can be varied as per the amount of production of electricity.

The storage unit may vary according to the production of electricity from the wind turbines. Then inverter will convert the stored dc energy into ac. This ac energy can be provided to the load and grid. This mechanism begets several advantages:

- Intoxicated wind force from the exhaust fan can be used to generate electrical power.
- wind energy conversion, that is, it can provide a constant source of wind and the wind fluctuations can be surmounted
- It will not be affected by geographical locations and hence can be implemented in many big industries.
- It will be sufficient, renewable, clean and eco-friendly source of energy.
- The stored energy can be used when main supply is cut off. Hence, can be used as an emergency unit.
- The electricity produced from wind energy can be utilized which in turn will reduce the impact of huge electric bills that big industries pay.

3. BLOCK KDIAGRAM:

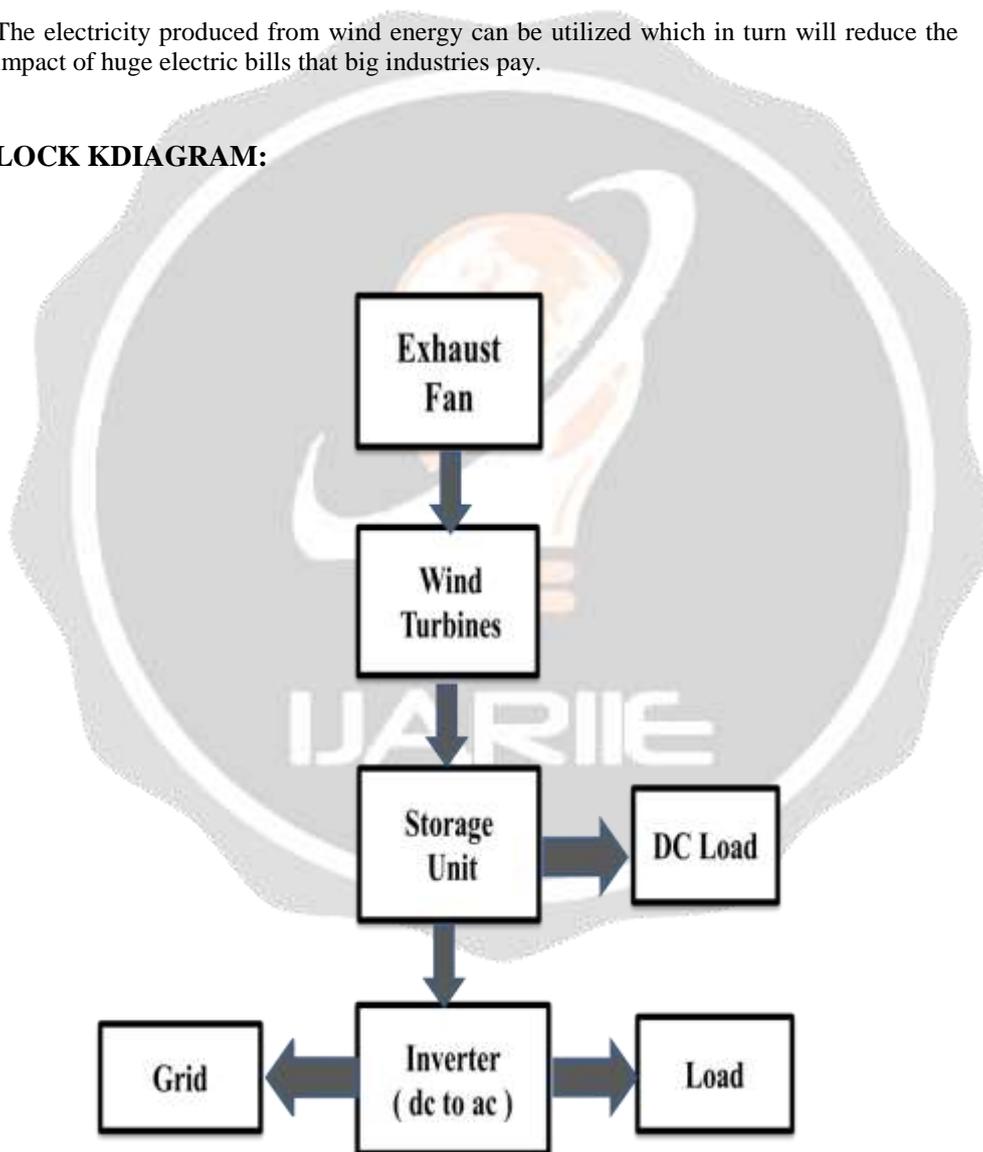


Fig2. Block Diagram of the exhaust fan as a source of power.



Fig: Exhaust air outlet in Industries

4. WIND ENERGY

Today, wind energy is the most reliable source of the renewable energy technologies apart from hydro. Also it is the most cleanest type of conventional source of energy comparing with other energy sources. This wind technology is much safer than other renewable energy source. In the wind mill a wind turbine is used where wind turbines - capture the air flow by converting it into a mechanical rotational movement, which gradually drives a conventional generator for electricity. When air mass is flowing through an area A with speed v , the power of that air movement at time t is given by:

Where ρ is the density of air, which is around 1.22kg/m^3 . The energy (kWh) is the product of power and time:

$$E = PT = \frac{1}{2} \rho A \Delta t \sum_{i=1}^N v_i^3$$

To take account of wind fluctuations, the energy from an air flow over a time period P is made up of the sum of wind speeds of small time intervals. Often, average hourly wind speeds are measured, thus providing 24 time buckets per day. While the air density is more or less constant, the two parameters to watch out for are the windswept area A and the wind speed v . The latter is even more critical, as it is cubed. A location with double average wind speed has eight times the power for the same area. Or to capture the same energy, the blades of the wind turbine in the low wind speed location would have to be almost 3 times as long.

5. BATTERY

All independent and utility interface PV frameworks require battery stockpiling. Photovoltaic modules charge the batteries during sunlight hours and the batteries supply the force as its required, regularly around evening time and during overcast climate. Utility intertie PV frameworks supply power straightforwardly to the utility network: no battery stockpiling is required anyway a few inverters currently join highlights which make battery

utilize an alternative. The two most basic kinds of battery-powered batteries being used are lead-corrosive and antacid. Lead corrosive batteries have plates made of lead, blended in with different materials, lowered in a sulfuric corrosive arrangement. Basic batteries can be either nickel-cadmium or nickel-iron batteries. They have plates made of nickel lowered in an answer of potassium hydroxide. We don't list these battery types in this index in view of their exceptionally significant expense. But since these have up to multiple times the usable existence of lead corrosive batteries, we can supply the nickel cadmium type whenever mentioned. Nickel iron batteries require higher pinnacle voltages to turn out to be appropriately charged than photovoltaic modules will deliver accordingly we don't sell this battery type.

6. CONCLUSION

It is seen that the breeze from the fumes can function as an awesome wellspring of power. The breeze speed is now and again more than the common velocity and henceforth can create much more electrical force than what is delivered from normal air. As it is examined before that breeze from exhaust fan may get scattered after some time, there ought to be some sort of chiefs/connectors that will manage the breeze from the fumes fan straightforwardly to twist turbines without getting the normal speed of the breeze diminished as the speed of the breeze is most significant factor in the framework. The squandered breeze from exhaust fan can be practically used to produce power if appropriate executions are finished.

7. REFERANCES

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