

# Energy Optimization of Industrial Drive at Sanjivani Sugar Factory

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**Abstract:** *In the present day world, energy conservation by a small means plays a significant role in making huge profits for any industry. The need of improving energy efficiency and particularly in motors. In industries, motor driven systems represents about 60% of all electrical energy used. Energy efficient motors are the best solution to solve energy crisis. NEMA (National Electrical Manufacturers Association) set standard for energy efficient motor and them named as premium efficiency motors. The standard induction motors in a process plant consumes large amount of energy due to low efficiency. To save energy consumption in a process plant, the use of energy efficient motors are chosen over standard induction motor. Energy efficient motor have better efficiency and power factor than standard induction motors. The plant under study has 40 motors has different ratings. The work presented in this project examines the usages of extra energy in various standard induction motor in a process plant and encourage the use of energy efficient motors over standard induction motor. For this objective, a comparison of standard induction motor with energy efficient motor based on efficiency, (KW) motor input power, (KVA) apparent power, power factor, energy consumed (Kwh) according to running hours in a year and current. The payback period for energy efficient motors has also been calculated. In the end the study found that replacing standard motors with energy efficient motors is better than overall plant motor load also reduces. Also an India's power sector is facing an acute problem of meeting the growing demand of electricity. Improving energy efficiency by employing energy efficiency devices would be the better alternative for meeting part of the new demand. Instead of generally used standard motors, if energy efficient motor are used, it will result into sustainable saving in electrical energy. Energy efficient motor (EEM) gives more efficiency over a standard motor (STM). This can be achieved by making some changes in the design aspects, material used etc. principle of operation of EEM is same as a three phase standard induction motor. The electric motors consume a significant amount of electricity in the industrial and in the Service sector. In Power Sector facing a huge amount of energy demand, by improving energy efficiency by employing energy efficient device such as Energy Efficient Motor (EEM). The electric motor manufacturers are seeking methods for improving motor efficiency, which resulted in a new generation of electric motors that are known as energy efficient motors (EEM). Because of its simplicity and robustness, the three-phase squirrelcage induction motor such as standard motor may be replaced by Efficient Motor (EEM) give more efficiency and better Performance. This project involves energy conservation by installing energy efficient motor (EEM) instead of standard efficiency motor. Therefore, there are different practical cases in EEM is compared with standard motors rang 11HP and more rating of the motor it is very interesting the implementation of EEM in the industry refers to sugar factory Kopergaon, and case study has been discussed.*

**Keywords:** Standard Induction Motor, Energy Efficient Motor, Efficiency, Kilowatt, Power Factor, Energy

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