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Paper Title	*Analysis and Control Strategy for Induction Motor Transient Torque & Current during Short Circuit Fault Condition*
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Abstract & Keyword	*Abstract Induction motors are the workhorses of modern industry,* *valued for their simplicity, reliability, and efficiency. Despite their robust design, these motors are vulnerable to short circuit faults that trigger sudden surges in torque and current. These transients, if not properly mitigated, can lead to severe mechanical and thermal stress, resulting in premature motor failure and unplanned industrial downtime. This paper presents a comprehensive study on the behaviour of induction motors under short circuit fault conditions, with a focus on the generation and control of transient torque and current.The research begins by examining the root causes of transient torque and current spikes, analysing different fault types such as three-phase-to-ground and two-phase short circuits. Using analytical modelling and simulation tools like ANSYS RMxprt and Maxwell 2D, the study quantifies the extent of faultinduced surges and their impact on the motor and associated mechanical systems. Results show that transient torque can reach up to 7.2 times the motor's rated torque during a twophase fault, which can inflict significant stress on bearings, shafts, and couplings.To address these challenges, the study proposes a multi-layered control strategy. The first layer involves design-based optimization, modifying key electrical parameters such as resistance, inductance, and reactance to build inherent fault resilience into the motor. The second layer introduces Variable Frequency Drives (VFDs) for dynamic torque control during and after fault events. The third and most advanced layer employs adaptive control systems that monitor motor behaviour in real-time and respond to disturbances with corrective actions. Simulation results demonstrate that combining these strategies significantly reduces transient torque by up to 40% and limits current spikes by 30%.* *Keywords Induction Motor, Transient Torque, Short Circuit Fault,* *Electromagnetic Stress, ANSYS RMxprt, Maxwell 2D, Finite Element Analysis (FEA), Control Strategy, Torque Spike*
Paper Download Link	https://ijemmr.co.in/wp-content/uploads/2025/05/ijemmr_vol-11issue-4-2025_rohit_pagenumber.pdf
Paper Title	*Electrical device systems for commercial construction with solar power*
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Abstract & Keyword	*Abstract In order to reach the climate targets, a sustainable energy system based on renewable energy generation is required. Battery storage systems are considered part of the solution, as electricity generation from renewable energy sources such as wind and solar does not match the energy consumption at all times. The net present cost of different system combinations is calculated with the HOMER software, and it was found that larger photovoltaic systems without battery storage was the more profitable solution. The optimisation based on the day-ahead spot prices was able to reduce costs based on energy fees, although it also increased the peaks in power consumption. This was due to low prices coinciding with hours of high power consumption, which in turn can increase the fees for power consumption. For the power consumption driven optimisation, the peaks are reduced during high demand periods and increased during low demand periods, thus balancing the power consumption of the commercial building. However, this does not reduce costs in terms of energy fees but power fees, and the profit is dependent on which fees that apply. The goal of installing a battery storage* *system should therefore be carefully evaluated so that it can be optimised with regard to the most profitable parameters for a given system and building.* *Keywords:- Flooded batteries, Gel batteries, AGM batteries, Lithium batteries, Electrical models of batteries.*
Paper Download Link	https://ijemmr.co.in/wp-content/uploads/2025/06/ijemmr_april_2025_Mohit-Paper-1_pagenumber.pdf
Paper Title	*High-grade collection of wind energy with a renewable supported micro grid for progressive applications*
Authors & Affiliation	*Harsh Vardhan Shrivastava1 Keshav Singh2* *M. Tech. Scholar, Department of Mechanical Engineering, SRIST Jabalpur1, M.P. India* *Department of Mechanical Engineering, SRIST Jabalpur 2 M.P. India*
Abstract & Keyword	*Abstract The urban terrain is more complex than for open spaces and has a critical influence on wind flow at the studied site. This approach proposes an integration of the surrounding buildings in the studied site and then simulating the wind flow, considering both simple and advanced turbulence models to quantify and simulate the wind flow fields in an urban environment and evaluate the potential wind energy. These simulations are conducted with an accessible computational fluid dynamic tool (Wind sim) implementing available commercial wind turbines and performed on a case study at Agder county in the southern part of Norway for an industrial facility specialized in food production. Several simulations were considered and repeated to achieve a convergence after adding the buildings to the domain, which mainly simulates the wind flow patterns, power density, and annual energy production. These simulations will be compared with previous results, which adapted different manipulation techniques applied on the same site where the elevation and roughness data were manipulated to mimic the actual conditions in the studied urban site.* *Keyword : -Balancing Energy Flows, Battery Storage, Voltage and Frequency Regulation, Smart Grid Integration, Sustainability*
Paper Download Link	https://ijemmr.co.in/wp-content/uploads/2025/06/ijemmr_april_2025_Harsh-Vardhan-Paper-1_pagenumber.pdf
Paper Title	*PV-Wind-Diesel Hybrid Energy System with V2G Integration for Residential and Industrial Loads: A Literature Review*

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Abstract & Keyword	Abstract In this paper a review analysis of A hybrid energy system integrating photovoltaic (PV) and wind farms, a diesel generator, and vehicle-to-grid (V2G) technology to effectively meet residential and industrial energy demands. A comprehensive Simulink model was developed to replicate realistic operational scenarios, incorporating variable solar irradiance, fluctuating wind profiles, and dynamic load variations. The system is configured to support a total load of 10 MW for residential use and 0.16 MVA for industrial operations. It comprises an 8 MW PV farm, a 4.5 MW wind farm, and a 15 MW diesel generator, complemented by a 4 MW V2G capacity harnessed from 100 electric vehicles.Simulation results underscore the synergistic operation of renewable and conventional energy sources in maintaining grid reliability. PV and wind systems primarily contribute during favorable conditions, significantly reducing the operational load on the diesel generator. During low renewable output periods, the diesel generator ensures uninterrupted power supply. The inclusion of V2G enhances system flexibility and stability by providing additional power during peak demand and transient conditions.. Keywords:- Solar , Wind, diesel generator , V2G ,MATLAB, Simulink
Paper Download Link	https://ijemmr.co.in/wp-content/uploads/2025/06/ijemmr_april_2025_niraj_paper_pagenumber.pdf
Paper Title	*Literature Review of Solar PV and Battery Based Standalone Inverter System for AC Load Applications*
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Abstract & Keyword	This paper presents the comprehensive review modeling, design, and simulation of a standalonerenewable energy system integrating solarphotovoltaic (PV) generation and battery storage. The main objective is to ensure a reliable and continuous AC power supply to loads under varyingsolar irradiance and dynamic load conditions. The developed system model employs a solar PVarray as the primary energy source and incorporates a battery bank to store excess energy, whichcan be utilized during periods of low or no solar generation. A sophisticated battery controller isdesigned to manage charging and discharging operations based on real-time battery state-of-charge (SOC) and system demand.The conversion from DC to AC is performed using a three phase bridge inverter, which is regulated through a Pulse Width Modulation (PWM) control scheme. This ensures the generation of a stable three-phase AC voltage suitable for powerinconventional electrical loads. The model is built and simulated using MATLAB/Simulink, takingadvantage of its robust environment for power electronics and renewable energy system simulations.Special attention is given to the effective DC-AC energy conversion process,dynamic battery energy management, and system voltage stability during fluctuating input andoutput conditions. Through detailed simulation studies, the system's behavior is analyzed under different environmental and loading scenarios. Results show that the inverter consistentlyprovides a balanced and regulated three-phase AC output even during transient disturbances, highlighting the robustness and reliability of the proposed system. The overall performance demonstrates the potential of solar PV combined with battery storage to form an efficient standalone renewable

	energy solution. Keywords:- Solar PV , Battery, SOC, Inverter ,MATLAB, Simulink .
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