

UNIVERSITI TEKNOLOGI MARA

**DESIGN AND FABRICATION OF
SOLAR POWERED LAWN MOWER**

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ABSTRACT

The conventional lawn mower has long been a common tool for maintaining lawns and tidy outdoor spaces. However, its reliance on fuels comes with a significant environmental cost. The combustion of these fuels releases harmful emissions into the atmosphere, contributing to air pollution. To address this issue, the transition to renewable energy sources emerges as a crucial step forward. Solar power can be seen as an alternative. By transitioning to solar-powered lawn mowers, the harmful emissions associated with conventional gasoline-powered models are effectively eliminated. This not only mitigates air pollution but also reduces the carbon footprint of lawn maintenance activities, contributing to overall environmental sustainability. Furthermore, the adoption of solar-powered equipment promotes public awareness of renewable energy solutions and encourages eco-friendly practices in landscaping and lawn care. Solar-powered mowers utilize photovoltaic panels to harness energy from the sun's rays, converting sunlight into electrical energy through a process known as the photovoltaic effect. This energy is then stored in a rechargeable battery, ensuring a consistent power supply even during periods of low sunlight or at night. The utilization of solar power for lawn mowers is particularly advantageous due to its inherent alignment with the typical operational schedule of lawn care. Most lawn mowing activities occur during daylight hours when the sun's energy is readily available, making solar power an efficient and practical energy source for this purpose. The harvested solar energy is then utilized to power the mower's electric motor, which drives the rotation of the cutting blades without the need for fuels. In conclusion, the development of solar-powered lawn mowers represents a significant step towards creating a cleaner, healthier, and more sustainable environment. This innovative approach underscores the importance of harnessing renewable energy sources to address pressing environmental challenges and foster a greener, more resilient planet.

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CHAPTER ONE

INTRODUCTION

1.1 Background of Study

A lawn mower is an essential tool for maintaining outdoor spaces, using rotating blades to trim grass to a uniform height. While traditional lawn mowers typically rely on fossil fuels or electricity, the focus of this project is harnessing solar energy as a sustainable power source for this device.

The concept of a solar-powered lawn mower involves a sophisticated system that efficiently converts solar radiation into usable energy. At its core is a solar panel, also known as a photovoltaic cell, which captures sunlight and converts it into electrical energy. When sunlight strikes the solar panel, it generates voltage, initiating the energy conversion process [1].

The generated electricity from the solar panel is directed to a charge controller, a crucial component that regulates the flow of current between the solar panel and the battery. The charge controller serves multiple functions, including monitoring the battery's voltage levels and managing the charging process. If the battery voltage surpasses a predetermined threshold, the charge controller halts the current flow from the solar panel to prevent overcharging. Conversely, if the battery voltage drops below a set level, the charge controller facilitates the flow of current to recharge the battery [2][3][4].

The energy stored in the battery is then utilized to power the lawn mower's motor, which drives the rotation of the cutting blades, enabling efficient grass cutting. By using solar energy, this innovative approach not only reduces reliance on non-renewable energy sources but also minimizes carbon emissions and operating costs associated with traditional lawn mowers [5].

To conclude, the solar-powered lawn mower integrates advanced technology to harness solar energy, demonstrating a sustainable and eco-friendly alternative for groundskeeping activities. Through efficient energy conversion and management, this project demonstrates the potential of renewable energy in powering everyday devices while promoting environmental sustainability [6].

1.2 Problem Statement

In today's technologically advancing world, there's a growing consciousness about environmental impact, prompting individuals to seek ways to mitigate their carbon footprint. Pollution is made by human, many of the daily activities of a human contribute harm to the environment. Among these, the prevalent use of gasoline-powered lawn mowers stands out as a contributor to environmental degradation. These machines emit harmful pollutants, increase global warming and depleting the ozone layer.

Gasoline-powered lawn mowers present a dual threat which is noise and air pollution. The sound of their engines disrupts tranquillity, disrupting neighbourhoods and natural habitats. Meanwhile, the combustion process within these engines releases a huge number of pollutants, including carbon monoxide, nitrogen oxides, and volatile organic compounds. These emissions not only degrade air quality but also lead to health risks to humans and wildlife [7][8][9].

Given these concerns, it is crucial to explore alternatives to fossil fuel-powered lawn mowers. Transitioning to renewable energy sources, such as solar power, presents a promising solution. By harnessing the sun's energy, solar-powered lawn mowers offer a cleaner, quieter alternative. They operate without emissions, reducing air pollution and noise levels in residential areas and public spaces [10].

Moreover, embracing renewable energy aligns with broader environmental goals, promoting sustainability and resilience against climate change. It encourages a shift towards a greener economy, less dependent on finite resources and harmful practices. Through innovation and conscious consumer choices, individuals can contribute to a healthier planet and a more sustainable future [11].

In conclusion, to reduce environmental damage, sustainable lawn mower alternatives to gasoline-powered ones are essential. Embracing renewable energy not only addresses immediate concerns regarding pollution but also lays the foundation for a more environmentally conscious society. By embracing cleaner technologies, we can collectively work towards a greener, more sustainable future [12].