DUAL POWERED STREET LIGHT

An Innovation Research Technology

Presented to the Faculty and Staff

of Negros Oriental State University

Mabinay Campus

In Partial Fulfillment

of the Requirements for the Degree

Bachelor of Science in Industrial Technology

Major in Computer Technology

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2025

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Dedication

This project is lovingly dedicated to our cherished parents, whose unwavering love, support, and encouragement have been the cornerstone of our success. Their belief in our abilities and their tireless motivation have inspired us to persevere, even in the face of challenges. They have been our constant source of strength, instilling in us the values of hard work, determination, and resilience that have guided us throughout this journey.

We also extend this heartfelt dedication to our esteemed instructors, Dr. Carlito D. Acabal and Mr. Clyde Dael, whose expertise, dedication, and encouragement have greatly influenced the development of this project. Their valuable guidance, insightful feedback, and commitment to fostering excellence have been pivotal in shaping our work, and we are deeply grateful for their unwavering support and mentorship.

Above all, we dedicate this endeavor to the Almighty God, whose blessings, grace, and wisdom have been our guiding light throughout this journey. His constant presence has provided us with the clarity, strength, and perseverance to overcome obstacles and complete this project with determination and purpose. We are profoundly thankful for His divine guidance and protection.

This project is a testament to the collective contributions of all who have supported us emotionally, morally, and financially. Your unwavering belief in us has been our greatest motivation, and we are forever grateful for your invaluable support. Thank you for being an integral part of this journey.

Acknowledgement

We would like to extend our heartfelt gratitude to all the individuals who have contributed to the success of this project. Their guidance, support, and encouragement have been invaluable in helping us achieve this milestone. Without their contributions, this achievement would not have been possible.

First and foremost, we sincerely thank our instructors, Dr. Carlito D. Acabal and Mr. Clyde Dael, whose expertise, dedication, and insightful guidance have been a cornerstone of our journey. Their mentorship has fostered an environment of growth, creativity, and innovation, encouraging us to strive for excellence. Their unwavering support and constructive feedback have been instrumental in the development and success of this project.

We also express our deepest gratitude to our parents for their unconditional love, support, and patience throughout this endeavor. Their encouragement has been a source of strength and inspiration, providing us with the motivation to persevere through challenges and stay committed to our goals.

Finally, we would like to acknowledge the support of our friends, whose thoughtful ideas and suggestions have significantly contributed to the enrichment of this project. Their perspectives and collaborative spirit have broadened our understanding and strengthened our ability to deliver a meaningful and innovative solution. We are deeply grateful to all of you. Your vital contributions are key to our success and this achievement.

Abstract

The dual-powered street light system is an innovative solution designed to enhance the reliability and sustainability of public lighting. It integrates two power sources: renewable energy, typically solar or wind, as the primary power supply, and the conventional electrical grid as a backup. The system prioritizes renewable energy to reduce dependency on fossil fuels and lower operational costs. When renewable energy is insufficient due to weather conditions or system faults, the grid power seamlessly takes over to ensure uninterrupted illumination.

This hybrid approach ensures energy efficiency, reduces carbon footprints, and provides a reliable lighting solution for urban and rural areas. The design includes smart control systems for automatic power switching, energy storage in batteries, and real-time monitoring for efficient operation. The dual-powered street light system represents a practical step towards sustainable urban development while ensuring public safety and convenience.

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DUAL POWERED STREET LIGHT

CHAPTER I

INTRODUCTION

Humans have an innate fear of the dark. We equate the dark with ignorance and the unknown. Culturally, light is a symbol of enlightenment, knowledge and security. We use light metaphors to describe understanding and the good; we think of lighting as a good thing but all good things taken to extremes have their dark side. The earliest lamps were invented by Greek and Roman civilization, where the light was serving the purpose of security. Street lighting became widespread in 1930's when utility companies had excess energy at night and they needed a night time base load for their thermal power plants. Street lighting was the perfect solution. Street lights were made inefficient, so they used more energy. The light bulbs were designed to burn out to maintain an income stream for the manufacturers, suppliers and salesmen. Cities were charged a flat fee so they had no incentive to conserve.

The 21st century is striving hard to save electrical energy. Street lights are essential, but expensive, therefore there is need to optimize the system in a way that it is affordable and efficiently conserves energy. Manually controlling the street lights is a time taking and tedious process. Working in such manner could sometimes result in large disasters and destructions. The main problem that manual controls on the street lights face is that there would be a lot of time taking during evening times when they are to be switched ON and a significant waste of energy is done at morning at all could not be turned OFF together at once. Another way in which the wastage is done is that at midnight lights glow at full intensity although there is not much traffic.

A light sensing circuit is extremely useful and versatile in a wide range of renewable energy projects from automatic lighting to security systems. It is widely used in projects for security systems and light control.

Light sensors or sensors of light are often referred as types of photodetectors or photosensors. There are several varieties of these sensors. Light sensors detect light density but do not record images. Most common light density sensors are: Photodiodes (LDR Light Dependent Resistors) and photoresistors (LDR Light Dependent Resistors). Photo diode is capable of converting light into either current or voltage. Photo resistor is a resistor whose resistance decreases with increasing light intensity.

The purpose of this study was to determine the functionality and the convenience in operating the device.

OBJECTIVE OF THE STUDY

The objective of this study is to explore and enhance the functionality of dual-powered street lights by investigating their current configuration and the integration of solar and electric power sources to ensure uninterrupted lighting. The study aims to identify the materials and components required for upgrading these systems into automatic operation, particularly during rainy seasons, addressing challenges such as power interruptions and limited sunlight. It seeks to estimate the production costs of the upgraded dual-powered street light system, including materials and components. The research will assess the improvements made to the upgraded system, emphasizing its automatic features, durability, and overall reliability to enhance its performance in various environmental conditions.

STATEMENT OF THE PROBLEM

The aim of this study is to develop an automatic dual powered street light, especially, this answers the following questions:

1. What is a dual powered street light?

2. What materials are needed to design and construct an upgraded dual-powered street light with automatic operation during rainy seasons?

3. How much is the production cost of a dual powered street light?

4. What revisions have been made to enhance the functionality of the device?

Basically, the main hypothesis of the study is that a typical and simple dual powered street light can be upgraded into an uninterruptible rainy season, In the matter, there will be lots of people that can be benefited in the dual powered street light during rainy night because dual powered light is not damage because it's already connected in electricity and with battery.

SIGNIFICANCE OF THE STUDY

All the way dual powered street light users, investors, and producers can be benefited by this study especially when the power of the solar is lost, the innovation will play a big role on's life by making it easier and more comfortable The innovation would benefit the following:

Industry - This study can be a big help to those who utilize electricity in the process of product manufacturing and rendering services as this innovation will let the continue the work even in the absence of power from the main power source distributing companies, at the same time, it

minimize the cost of power consumption from the commercial power distribution company as it uses solar energy in generating which is a non-greenhouse effect factor.

Users - it would promote a fastest use of solar that means the production continues and is sustainable power supply.

Community - This research study would give the same ideas or knowledge especially to those individuals using solar and one to alternate current to direct current.

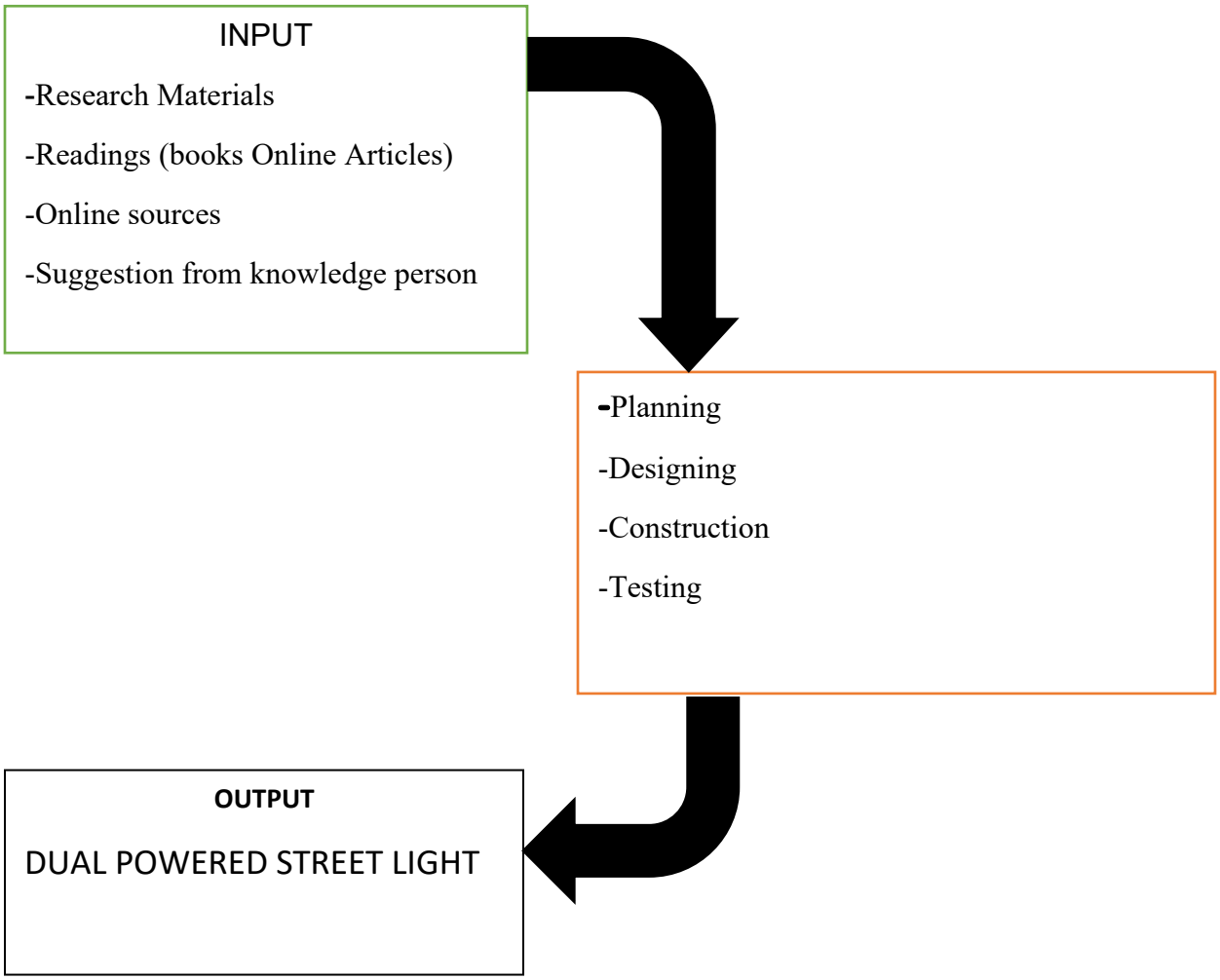
Student - Of course itself would be better at the younger age they already have an idea about this kind of advanced technology, in order to realize that even impossible things would happen.

Innovation - In the coming years there is an innovating such as simple things the students of future innovations itself already have a guide what to do.

SCOPE AND LIMITATION

The scope of this study includes the design and installation of dual-powered street light, which use both solar and grid electricity, includes reducing energy costs, enhancing sustainability, and providing reliable lighting in areas with intermittent power supply. However, their limitations involve high initial installation costs, dependence on sunlight availability for solar charging, and maintenance challenges associated with managing dual energy sources.

CONCEPTUAL FRAMEWORK



Input

Input refers to the references, materials, and advice that contain information useful in the making of the Dual Powered Street Light.

Research Materials

Research materials refer to the documents related to previous research that were found to be helpful in the current study by the researcher.

Readings

Readings refer to books and articles found on the internet that provide significant ideas to the researcher, helping to conceptualize the present study.

Online Sources

Online sources refer to websites and webpages used as references, providing the researcher with helpful information and insights about the study.

Suggestions from Knowledgeable Persons

Suggestions from knowledgeable persons refer to ideas shared by individuals with expertise in the field, which greatly helped and inspired the researcher to pursue the study.

Process

The process includes the activities that the researcher underwent to develop the Dual Powered Street Light.

- **Planning**

  Planning is the process of deciding the series of steps and procedures the researcher takes to achieve the desired output.

- **Designing**

  Designing is the process of finalizing the plans and designs for constructing the product. This includes the schematic diagram, overall design, and appearance of the Dual Powered Street Light.

- **Construction**

  Construction is the process of fabricating the components and parts that comprise the device.

- **Testing**

  Testing is the process of examining and checking for errors and identifying potential modifications and improvements.

Output

Output refers to the result after taking all considerations and processes into account, culminating in the complete product: the Dual Powered Street Light.

DEFINITION OF TERMS

LED (light-emitting diode). A semiconductor device that emits visible light when an electric current passes through it. The light is not particularly bright, but it is monochromatic, occurring at a single wavelength.

Male Plug. A connector attached to a wire, cable, or piece of hardware, having one or more exposed, unshielded electrical terminal s, and constructed in such a way that it can be inserted snugly into a receptacle (female connector) to ensure a reliable physical and electrical connection.

Relay. An electrically operated switch. This is used where it is necessary to control a circuit by a separate low-power signal, or where several circuits must be controlled by one signal.

Transformer. A static electrical device that transfers electrical energy between two or more circuits through electromagnetic induction.

Photodiode. A semiconductor device that converts light into an electrical current. The current is generated when photons are absorbed in the photodiode.

RELATED LITERATURE

Now-a-days, it became essential for people work during nights and returning back to homes late nights; also increasing crime rate during night times. This can be best achieved by implementing proper solar based lighting system on Streets. The efficient monitoring and controlling of this lighting system must be taken into account. We will get more power consumption, saving money through solar panel. The Street lights are controlled through a specially designed Graphical User Interface (GUI) in the PC. The Zigbee technology can be used for the street lights monitoring and controlling at the PC end. (K. Subramanyam et al. 2013)

According to Assoc. Prof. Noam Levin, (2015) remote sensing of night-time lights offers a unique ability to monitor human activity from space. Since the 1990s, many studies have taken advantage of the DMSP/OLS sensor, to monitor artificial lights from space and to quantify the relationships between human activity and socio-economic variables and night-time brightness. In the last decade, new avenues have opened to advance the study of remote sensing of night lights, with the availability of new sensors, offering better spatial, temporal and radiometric resolution than DMSP/OLS. These products show the locations where artificial lighting is present and a measure of the brightness as observed from space. From 1992 to 2013, there is a consistently processed annual time series of night-time lights processed from low-light imaging data collected

by the US Air Force Defense Meteorological Satellite Program (DMSP) Operational Linescan System (OLS) (Baugh et al. 2010)

Wireless Sensor Network (WSN) is a wireless network consisting of spatially distributed autonomous devices using sensors to cooperatively monitor physical or environmental conditions, such as temperature, sound, vibration, pressure, motion or pollutants, at different locations In addition to one or more sensors, each node in a sensor network which typically equipped with a radio transceiver or other wireless communications device, a small microcontroller, and an energy source, usually a battery. The envisaged size of a single sensor node can vary from shoebox-sized nodes down to devices the size of grain of dust. A sensor network normally constitutes a wireless ad-hoc network, meaning that each sensor supports a multi-hop routing algorithm (several nodes may forward data packets to the base station). (Deepak Kapgate, 2012)

PRIOR ARTS

Parts that are used:

3V SRD relay is an electromagnetic switch designed to control high-power circuits using a low-power 3V DC signal. It provides electrical isolation between the control and power circuits, ensuring safety while allowing devices like motors, lights, and appliances to be managed efficiently. Commonly used in applications such as home automation, robotics, and industrial systems, it enables low-power control systems to operate high-power devices reliably.

Buck converter, also known as a **step-down converter**, is a type of DC-DC converter that reduces a higher input voltage to a lower output voltage while maintaining efficiency. It operates

using switching and energy storage components like inductors and capacitors to regulate voltage and current.

12V AC/DC adapter converts high-voltage alternating current (AC) from an electrical outlet into a stable 12V direct current (DC) suitable for powering low-voltage electronic devices. It ensures steady voltage regulation, providing consistent power to devices like routers, LED lights, and CCTV cameras. The adapter includes components like a transformer to step down the voltage, a rectifier to convert AC to DC, and a regulation circuit to maintain a constant 12V output, ensuring safe and reliable operation of connected devices.

Diode is a semiconductor device that allows current to flow in one direction while blocking it in the opposite direction. Its primary functions include rectifying alternating current (AC) into direct current (DC), protecting circuits from overvoltage by directing excess current away, and controlling the flow of current in a single direction. Diodes are essential in applications such as power supplies, signal processing, and voltage regulation, ensuring safe and efficient operation of electronic systems.

PARTS/COMPONENTS	Dual-power street lamp automatic switching circuit	Dual power LED (Light-emitting Diode) street lamp circuit with wireless detection and control function	Solar street lamp double-power source automatic switching circuit	PROPOSED INNOVATION
AUTOMATIC SWITCH	✓		✓	✓
POWER SOURCES	✓	✓	✓	✓
RELAY CONTROL CIRCUIT	✓	✓		✓
BATTERY			✓	✓
PV SOLAR PANEL			✓	✓
INDIVIDUAL CHARGING MODULE				✓
BATTERY LOW VOLTAGE				✓
BATTERY FAILURE AUTOMATIC SWICTH				✓

RESEARCH METHODOLOGY

The study approach for the dual powered street light of NORSU Mabinay Campus was separated in five steps; literature review, design, prototype devolopment, testing and data collection.

1. Literature Review: Review existing research on dual-powered street lights, focusing on solar and grid integration to understand current technologies and practices.

2. Design: Develop a basic design for the dual-powered street light, outlining the components like solar panels, batteries, and grid connections.

3. Prototype Development: Build a prototype based on the design to test its functionality and efficiency in a real-world setting.

4. Testing: Install the prototype in a specific location and monitor its performance, battery charging, and the automatic switch to grid power when necessary.

5. Data Collection: Collect data on energy usage, lighting performance, and any operational issues that arise during testing.

DUAL POWERED STREET LIGHT

CHAPTER II

DEVELOPMENT OF THE PROJECT

DEVELOPMENT OF THE PROJECT

This chapter covers the planning and design of the dual power street light system, including the selection of components and overall system layout. It details the construction and assembly process, including the integration of solar panels and grid power connections. A list of materials used, along with their associated costs is provided.

STRATEGY

The study adopted a research method consisting of five phases: planning and designing, construction and assembly, testing and revising, and the definition of the Dual-Powered Street Light System. This system combines solar and grid power to ensure continuous operation, even during power outages. By integrating various materials and technologies, the dual-powered street light provides an uninterrupted energy supply, making it highly effective in areas with frequent power interruptions.

DEFINITION OF THE DUAL POWERED STREET LIGHT

A Dual Powered Street Light is an innovative product developed by students of Norsu Mabinay, designed to efficiently by utilizing both AC and DC power sources. This system ensures a continuous, uninterrupted power supply, even during power interruptions, making it highly reliable for public lighting. It is integrated with an Automatic Transfer Switch (ATS) and Uninterrupted Power Supply (UPS) to maintain seamless operation, providing an automated solution that ensures

constant lighting in any conditions. This product is highly beneficial for communities, ensuring street lights remain operational without disruption.

PLANNING AND DESIGNING

To begin planning and designing a dual powered street light, first step is to break down the device into its essential components and determine its primary functions and capabilities. A dual powered street light is typically powered by two energy sources- solar power and grid power. This allows for energy efficiency and ensures the light can function even when one power source is unavailable.

Table 1: List of material and cost

Materials	Cost
Solar Street Light	1991.00
Constant Current Buck Converter	344.00
fuse	197.00
Power Supply Automatic Switching Module	205.00
Glass Fuse Holder	126.00
Diode	92.00
Soldering wire	15.00
3v SRD relay	111.00
TOTAL	**3,081**

Table 2: List of tools being used

TOOLS	FUNCTIONS
Flat Head Screwdriver	A **flat-head screwdriver**, also known as a **slotted screwdriver**, is a type of hand tool primarily used for turning screws with a straight, horizontal indentation across the head.
Philip Screwdriver	A **Phillips screwdriver** is a type of screwdriver specifically designed to work with screws that have a **cross-shaped (X-shaped) recess** in their heads.
Multimeter	A **multimeter** is an essential tool in electronics and electrical work, used to measure various electrical properties. It combines multiple functions in one device, allowing users to test and troubleshoot circuits and electrical components.
Soldering iron	A soldering iron is a tool used in electronics and metalworking to melt solder, a metal alloy, and join electronic components or wires together. The primary function of a soldering iron is to provide a controlled heat source that melts the solder, allowing it to flow and bond two surfaces.

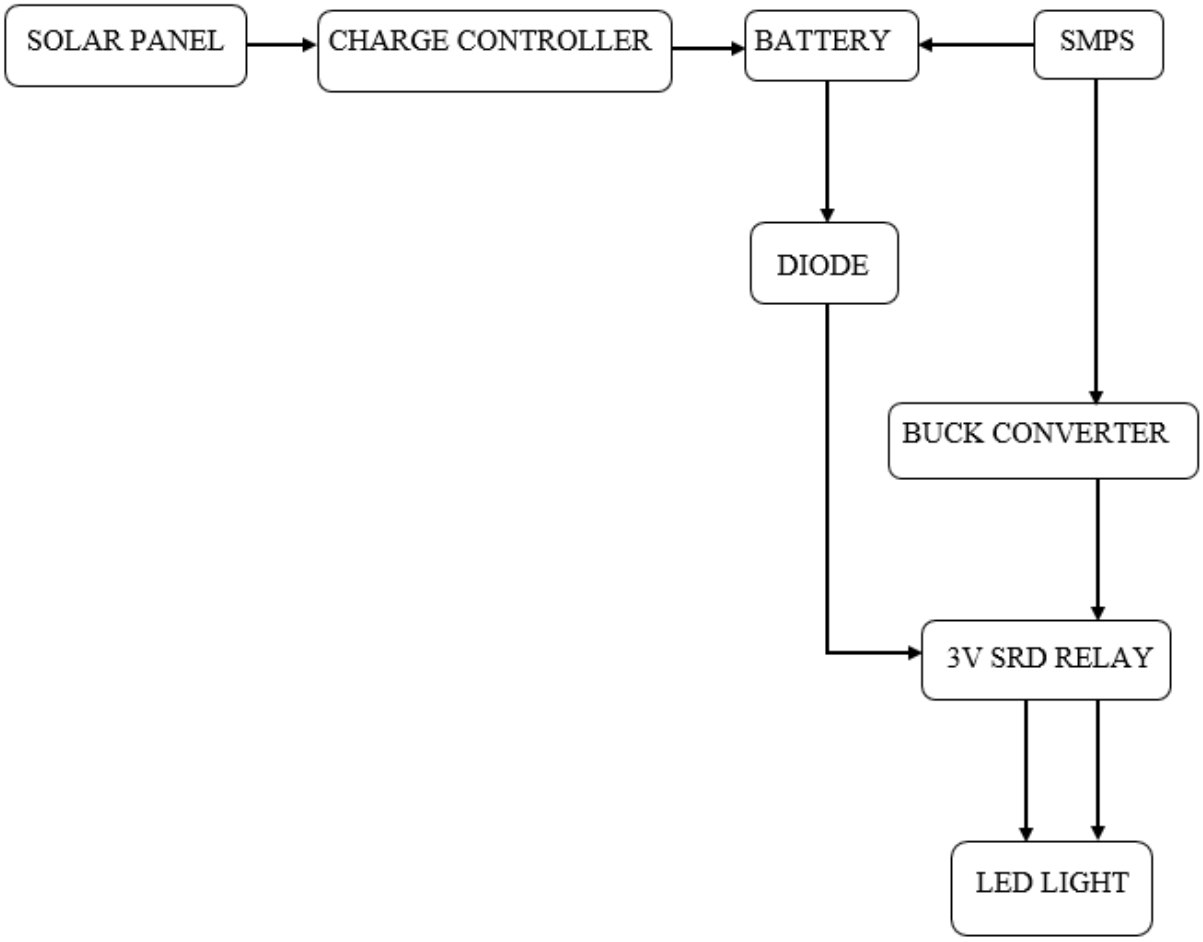
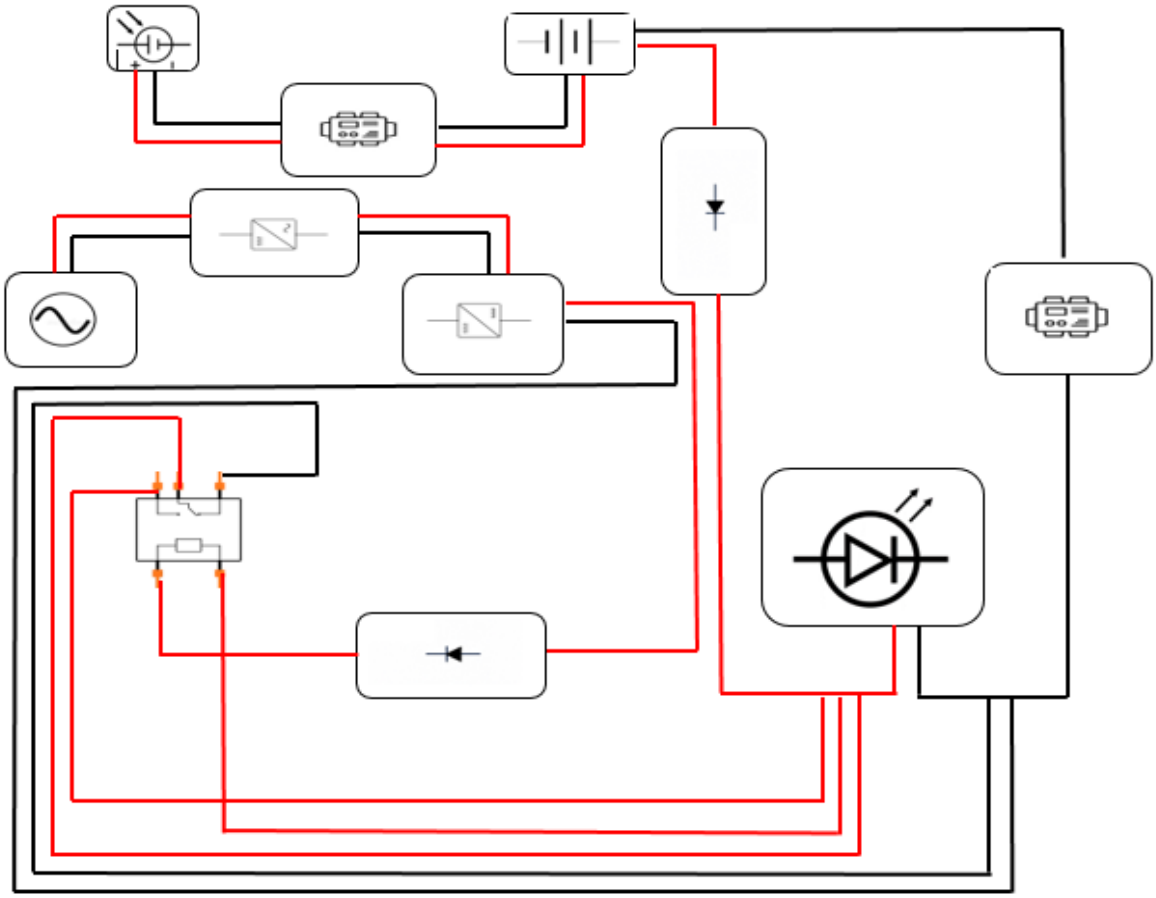
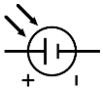


figure 1: Block diagram

Figure2: Schematic diagram



Legend:

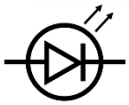

-Solar panel


-Diode

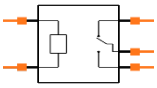
-Solar charge controller

-Buck converter


-Battery


- LED light


-AC


source

- SRD 3v relay

Table 3: Testing (Non-innovated)

Trial Number	Number of hours that the solar street light (Non-Innovated) operates without being charged from the renewable power source	X-x Bar	(X-XBAR)2)
1	12 hours	2.8	7.8
2	12 hours	2.8	7.8
3	12 hours	2.8	7.8
4	12 hours	2.8	7.8
5	9 hours	-0.2	0.4
6	0 hours	-9.2	84.6
7	0 hours	-9.2	84.6
Trial Number	Number of hours that the solar street light (Non-Innovated) operates during cloudy or rainy weather		
1	8 hours	-1.2	1.4
2	10 hours	0.8	0.6
3	7 hours	-2.2	4.8
4	10 hours	0.8	0.6
5	5 hours	-4.2	19.4

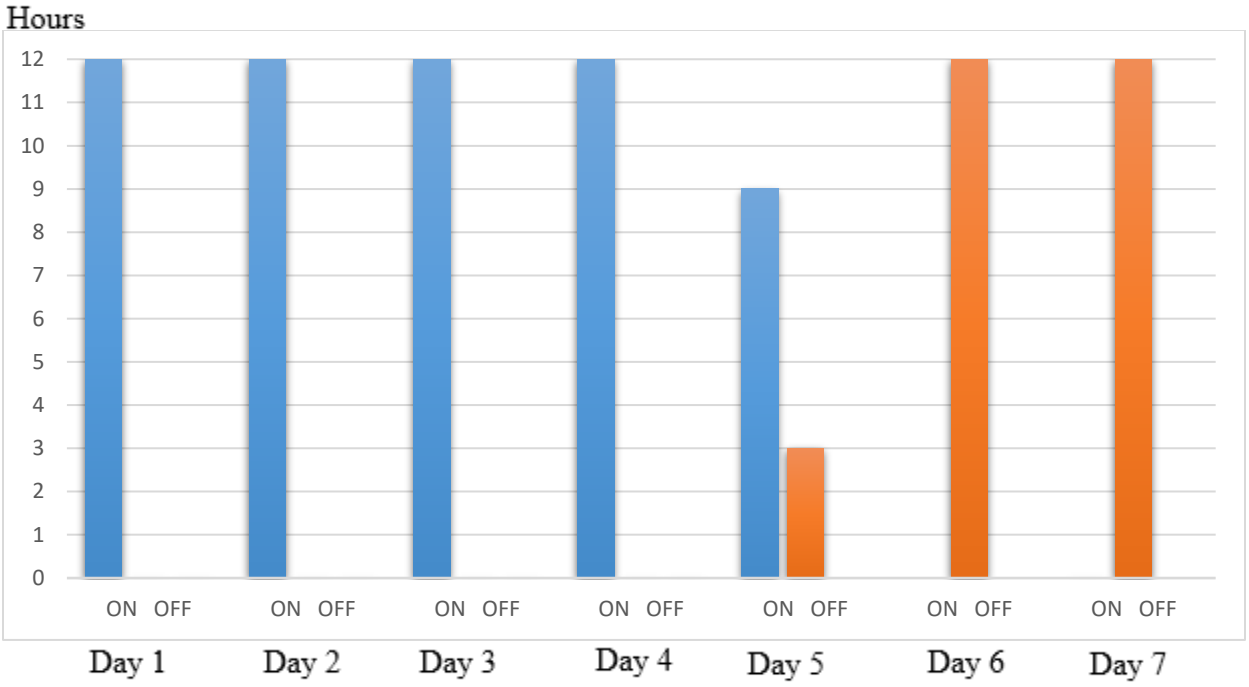
Trial number	Number of hours that the solar street light (Non-Innovated) operates during sunny weather		
1	12 hours	2.8	7.8
2	12 hours	2.8	7.8
3	12 hours	2.8	7.8
4	12 hours	2.8	7.8
5	12 hours	2.8	7.8
Total	157		266.6
Mean	9.2	Standard deviation	3.9

Table 4: Testing (Innovated)

	Number of hours that the solar street light (Innovated) operates in different types of weather		
1	12 Hours	0	0
2	12 Hours	0	0
3	12 Hours	0	0
4	12 Hours	0	0
5	12 Hours	0	0
6	12 Hours	0	0
7	12 Hours	0	0
8	12 Hours	0	0
9	12 Hours	0	0
10	12 Hours	0	0
11	12 Hours	0	0
12	12 Hours	0	0
13	12 Hours	0	0
14	12 Hours	0	0
15	12 Hours	0	0
Total	180		
Mean	12	Standard Deviation	0

The results of our testing on the dual-powered street light using different environmental conditions are displayed in the table above as part of our test run for the demonstration. The number of hour (x) of illumination does not remain constant throughout the trials; instead, it fluctuates due to varying weather conditions.

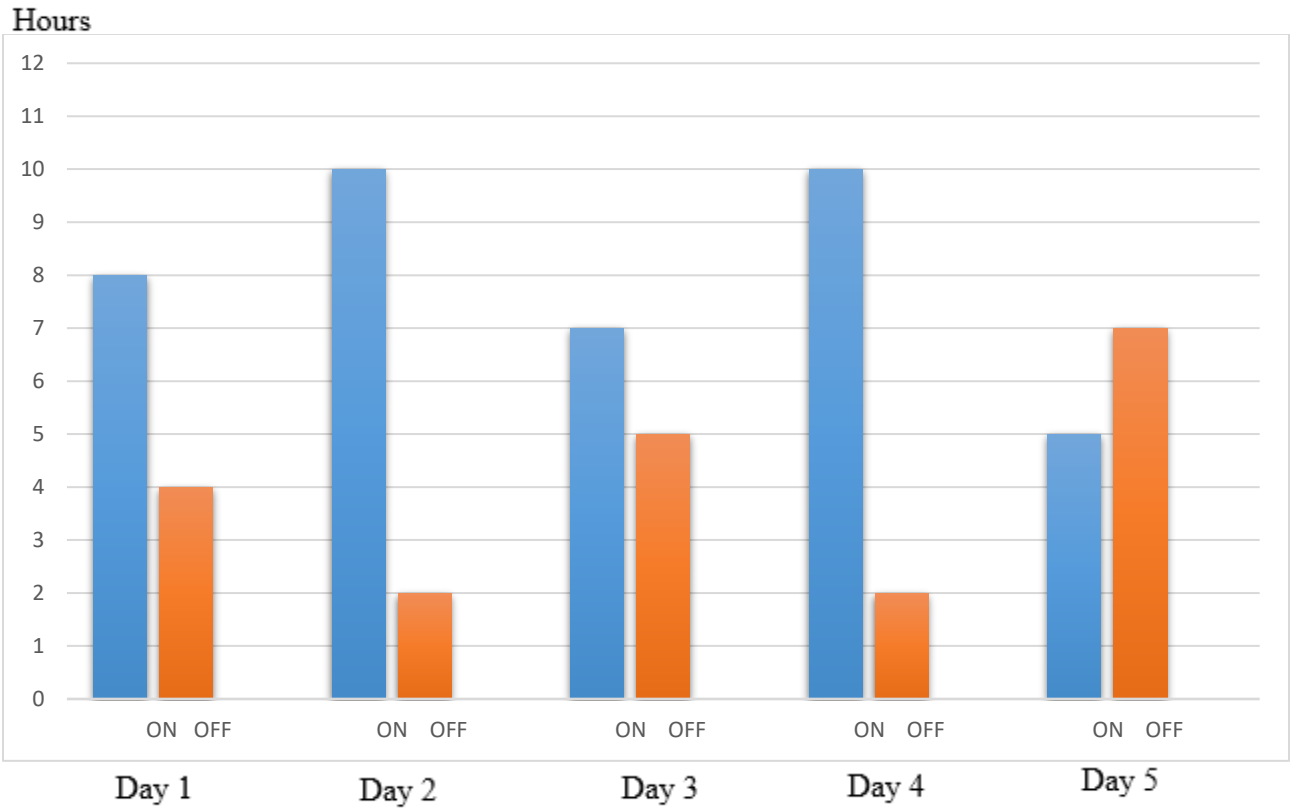
Figure 3



BAR GRAPH OF THE SOLAR STREET LIGHT (NON-INNOVATED) OPERATES WITHOUT BEING CHARGED FROM THE RENEWABLE POWER SOURCE

This bar graph shows how many hours the solar street light operates and how many hours it has a dead battery that hasn't been charged by a renewable power source.

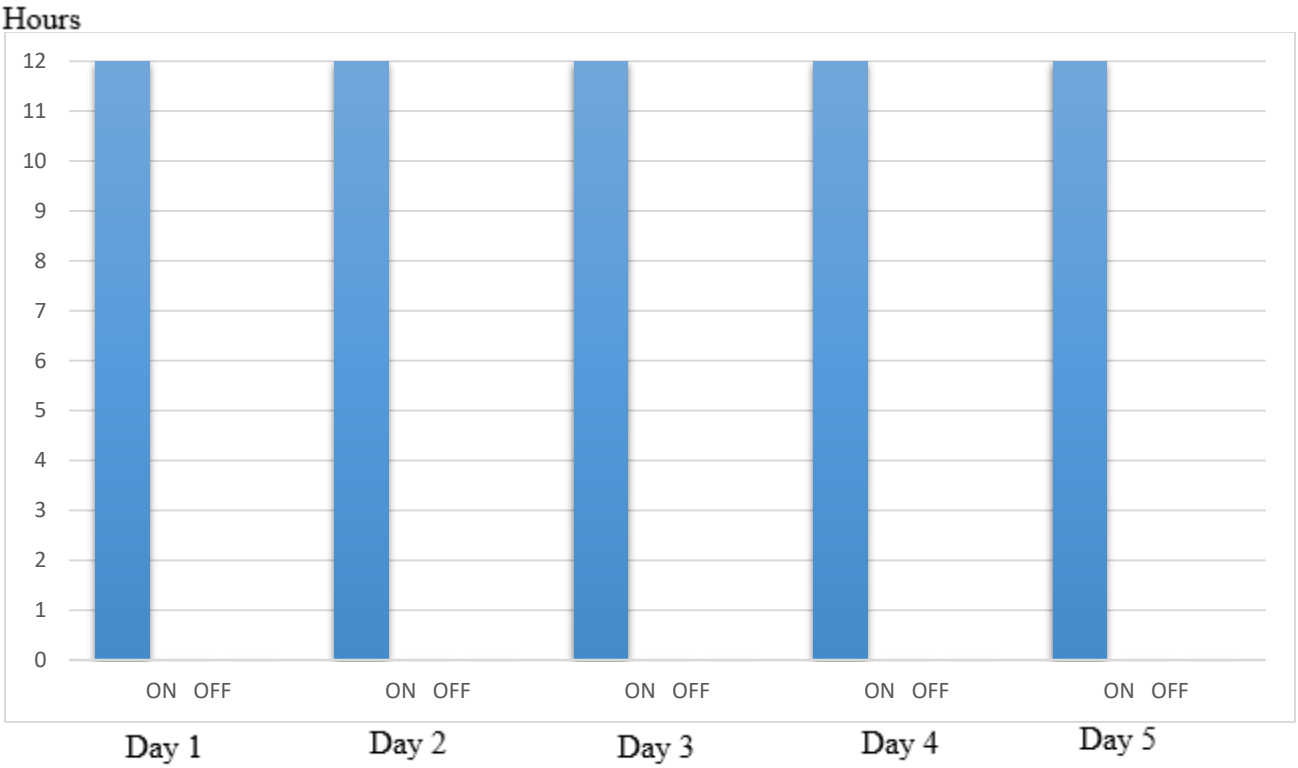
Figure 4



BAR GRAPH OF THE SOLAR STREET LIGHT (NON-INNOVATED) OPERATES DURING CLOUDY OR RAINY WEATHER

This bar graph shows how many hours the solar street light operates at its best performance and how many hours it operates with low battery power due to cloudy or rainy weather.

Figure 5



BAR GRAPH OF THE SOLAR STREET LIGHT (NON-INNOVATED) OPERATES DURING SUNNY WEATHER

This bar graph shows how many hours the solar street light operates at its best performance during sunny weather.

Procedure for operating a dual-powered street light:

Step 1: Connect the solar panel to the charge controller. Link the solar panel's positive and negative terminals to the charge controller to regulate solar energy charging.

Step 2: Connect the charge controller to the battery. Attach the charge controller's output to the battery to store energy.

Step 3: Connect the battery to the street light. Connect the battery's output to the street light to power it during the night.

Step 4: Plug in the AC-DC power supply adapter into the grid's AC power source for backup.

FINAL ASSEMBLY

The assembly involves connecting all the primary components of the dual powered street light into a single unit.

Step 1: All parts of the Dual-Powered Street Light are prepared

Step 2: All parts and components of the Dual-Powered Street Light are placed into their respective places.

Step 3: After putting the parts and component of Dual-Powered Street Light into their respective positions, connect all the parts for the successful operation of the Dual-Powered Street Light.

Front View **Back View**

Steps for using a dual powered street light:

Step 1: Make sure that all wires and connections are connected properly

Step 2: Plug in the AC-DC adapter into the grid AC source for backup

Step 3: Press the turn on button located in front of the dual powered street light

REVISIONS

Upgrading the power system from a single solar energy source to a Dual-Powered System, which integrates both solar power and grid power for backup. This allows for continuous operation of the street light, ensuring it functions efficiently even during cloudy days or at night when solar energy is insufficient. The dual powered system guarantees that the light remains fully operational around the clock, enhancing its reliability and performance in varying weather conditions.

CHAPTER III

SUMMARY OF FINDINGS

1. The dual-powered street light integrates both solar and AC-DC power sources to ensure continuous lighting. It utilizes solar energy as the primary power source and switches to AC-DC power when solar energy is insufficient, providing an energy-efficient and reliable lighting solution.
2. The key components for the dual-powered street light include solar panel, 12v battery, charge controller, LED light, relay switches, transformer, and supporting wiring and electrical components.
3. The total cost for building the dual-powered street light is PHP 3,081.00, factoring in the cost of materials and components.
4. The street light's dual power system ensures that it operates optimally, drawing power from the solar panel and from AC-DC during at night or when there is insufficient solar energy. This results in reduced energy costs and reliance on conventional power sources.
5. After initial testing, the dual powered street light design was improved for durability and performance. Enhancements included optimizing the connection system between the solar panel, battery, and AC-DC power source to ensure seamless switching and extend the product's operational life.
6. The dual powered street light contributes to sustainability by reducing dependence on the grid and using renewable energy, making it an eco-friendly for street lighting.

SUMMARY OF REVISION

Upgrading to a dual-powered system that integrates solar power with grid backup ensures continuous, efficient street light operation, even during cloudy days or at night, enhancing reliability and performance in all weather conditions.

CONCLUSION

The materials needed for developing and constructing a dual-powered street light are solar panels, 12v battery, LED light bulbs, charge controller, relay switches and power inverter. Additional components include wiring, fuses, and connectors. The equipment required includes a wire cutter, screwdriver and flat head screwdriver. The total cost for the dual-powered street light is PHP 3,081.00, with standard devision of 3.9 (non-innovated) and 0 (innovated).

The dual-powered street light is an effective and eco-friendly solution for outdoor lighting. The components used are readily available in the marketplace, making it practical and reliable choice for public lighting system.

RECOMMENDATION

Based on the findings and conclusion of the present study, the following recommendations are hereby proposed:

1. It is suggested that before using the dual-powered street light, sufficient charge should be stored in its battery to ensure uninterrupted operation, especially during periods of low sunlight or power outstages.

2. Further imporvements and modifications to the dual-powered street light are recommended to address any identified limitations and enhance its performance and effieciency.

3. A dual-powered street light equipped with a rechargeable battery capable of being charged through solar energy. The system should automatically detect the available power source and switch seamlessly betweeen solar and AC power, ensuring continuos operation. This plug and play functionality can be achieved through a combination of advanced mechanical design and integrated software controls.

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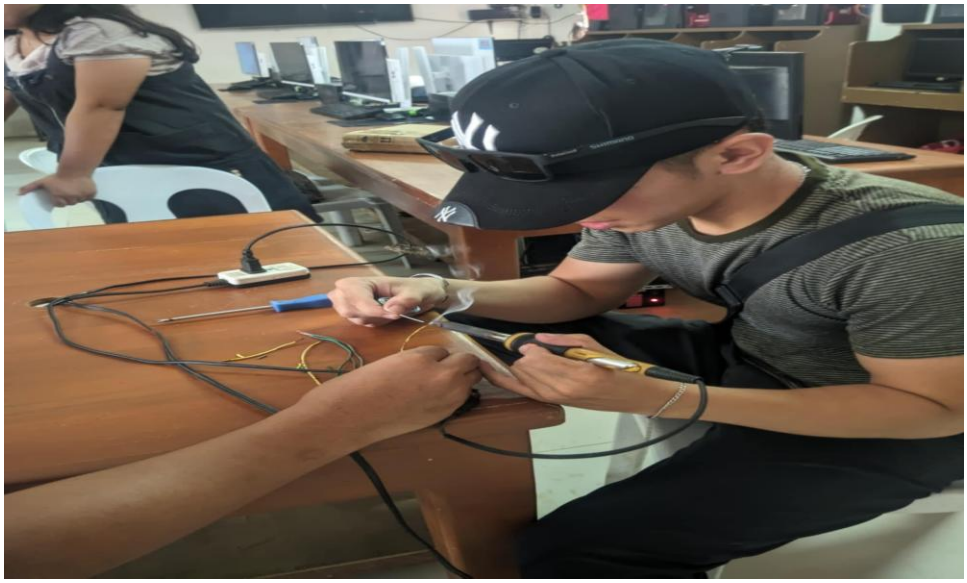
DOCUMENTATION

In this picture, we are preparing the wire to connect it to the SRD relay

In this picture we are assembling and connecting wires with the groupmates and with the assistance of our adviser sir Clyde Dael.

In this picture, we a putting a soldering wire on the materials that we are going to use

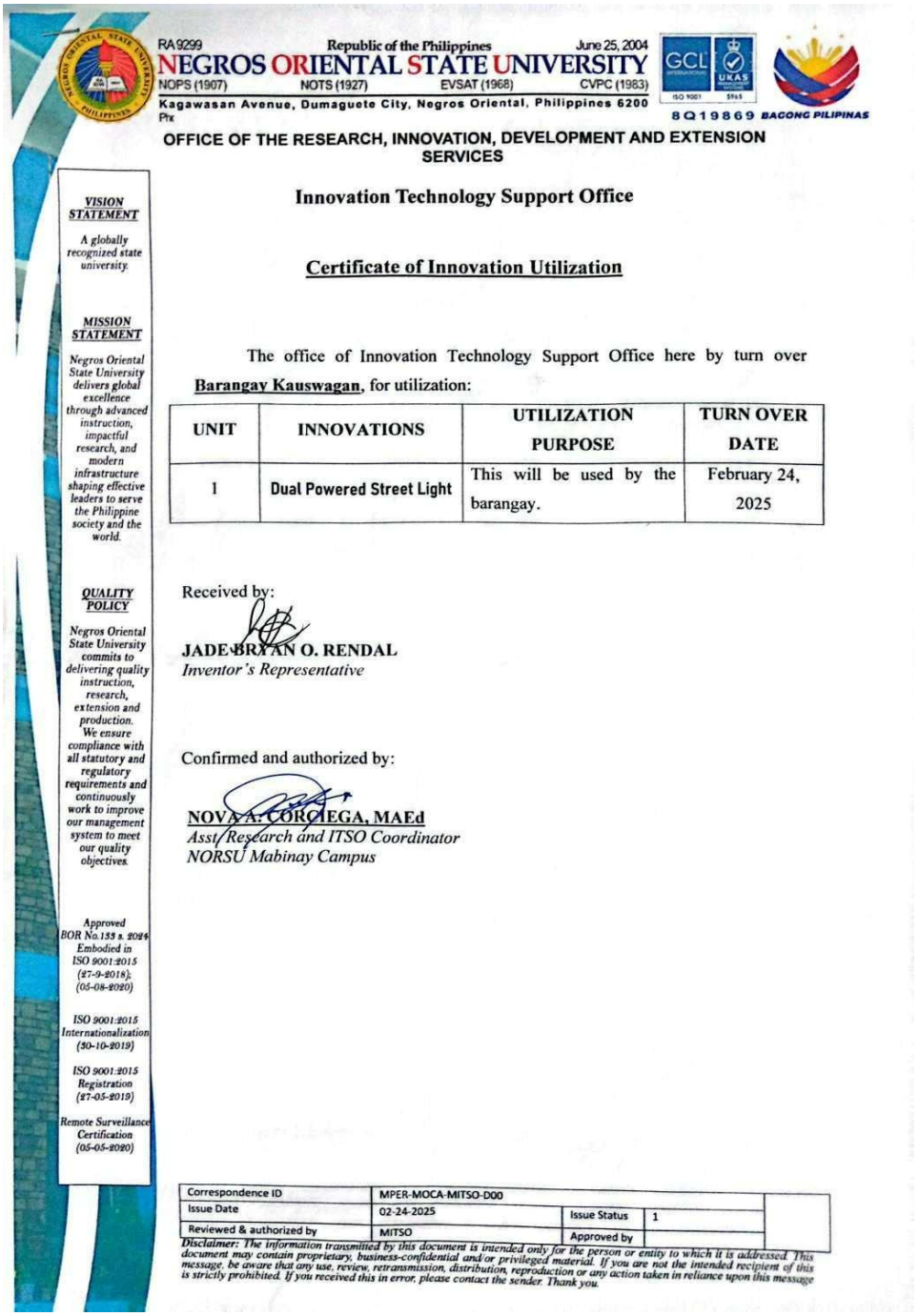


In this picture, we continued working on what Sir Clyde Dael had started

In this picture, is our final oral defense together with my groupmates, adviser sir Clyde Dael and panelists.

UTILIZATION OF PROJECT

This utilization highlights the deployment of the Dual Powered Street Light innovation, developed by Bachelor of Science in Industrial Technology major in Computer Technology students of NORSU-Mabinay Campus. Designed to enhance energy efficiency and community safety through dual-source power technology, the prototype was formally turned over to Barangay Kauswagan on February 24, 2025. The initiative demonstrates the practical application of student-driven research, fostering local development, sustainability, and collaborative engagement between academe and community stakeholders.



RA 9299 Republic of the Philippines June 25, 2004
NEGROS ORIENTAL STATE UNIVERSITY
NOPS (1907) NOTS (1927) EVSAT (1968) CVPC (1983)
Kagawasan Avenue, Dumaguete City, Negros Oriental, Philippines 6200
PHx
8Q19869 BAGONG PILIPINAS

OFFICE OF THE RESEARCH, INNOVATION, DEVELOPMENT AND EXTENSION SERVICES

Innovation Technology Support Office

Certificate of Innovation Utilization

The office of Innovation Technology Support Office here by turn over **Barangay Kauswagan**, for utilization:

UNIT	INNOVATIONS	UTILIZATION PURPOSE	TURN OVER DATE
1	Dual Powered Street Light	This will be used by the barangay.	February 24, 2025

Received by:

JADE BRYAN O. RENDAL
Inventor's Representative

Confirmed and authorized by:

NOVA A. CORCIEGA, MAEd
Asst. Research and ITSO Coordinator
NORSU Mabinay Campus

VISION STATEMENT
A globally recognized state university.

MISSION STATEMENT
Negros Oriental State University delivers global excellence through advanced instruction, impactful research, and modern infrastructure shaping effective leaders to serve the Philippine society and the world.

QUALITY POLICY
Negros Oriental State University commits to delivering quality instruction, research, extension and production. We ensure compliance with all statutory and regulatory requirements and continuously work to improve our management system to meet our quality objectives.

Approved BOR No.155 s. 2024
Embodied in ISO 9001:2015 (27-9-2018); (05-08-2020)
ISO 9001:2015 Internationalization (30-10-2019)
ISO 9001:2015 Registration (27-05-2019)
Remote Surveillance Certification (05-05-2020)

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Issue Date	02-24-2025	Issue Status	1
Reviewed & authorized by	MITSO	Approved by	

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DUAL POWERED STREET LIGHT BY: Rendal Jade Bryan, Durango Micheal Dave, Pabuaya Kanrie Ihnce, Quiñanola Nerhyl Jane, Ma.Ann Loraine Armeje

CURRICULUM VITAE

Name: Rendal, Jade Bryan O.

Address: Purok 1 Poblacion, Mabinay Negros Oriental

Contact number: 09558600942

PERSONAL DATA

Age: 19 years old

Birthday: August 4, 2005

Gender: Male

Civil Status: Single

Weight: 61

Height: 5’8

Citezenship: Filipino

Religion: Catholic

Dialect speaks: Bisaya, English, Tagalog

Mother’s Name: Jovelyn O. Rendal

Father’s Name: Jasper A. Rendal

Elementary: Mabinay Central School

Secondary: Mabinay National High School

Senior High: Mabinay National High school

Teritary: Negros Oriental State University Mabinay Campus, Bachelor of Science in Industrial Technology Major in Computer Technology

Name: Pabuaya Kanrie Ihce Macapobre

Address: Purok proper Kauswagan Manjuyod Negros Oriental

Contact number: 09536239895

PERSONAL DATA

Age: 19 years old

Birthday: September 9, 2005

Gender: Female

Civil Status: Single

Weight: 58

Height: 5’1

Citezenship: Filipino

Religion: Catholic

Dialect speaks: Bisaya, English, Tagalog

Mother’s Name: Elizabeth M. Pabuaya

Father’s Name: Larry Pabuaya Sr.

Elementary: Kayotesan Elementary School

Secondary: Kauswagan High School

Senior High: Kauswagan Senior High School

Teritary: Negros Oriental State University Mabinay Campus, Bachelor of Science in Industrial Technology Major in Computer Technology

Name: Quiñanola Nerhyll Jane Acaso

Address: Proper Carol-an Negros Oriental

Contact number: 09531668270

PERSONAL DATA

Age: 19 years old

Birthday: March 10, 2005

Gender: Female

Civil Status: Single

Weight: 59

Height: 5’6

Citezenship: Filipino

Religion: Seventh-day Adventist Church

Dialect speaks: Bisaya, Hiligaynon, English, Tagalog

Mother’s Name: Nelsie A. Quiñanola

Father’s Name: Gibson G. Quiñanola Sr.

Elementary: Carol-an Elementary School

Secondary: ANHS Carol-an National High School

Senior High: Carol-an National High School

Teritary: Negros Oriental State University Mabinay Campus

Bachelor of Science in Industrial Technology Major in Computer Technology

Name: Ma. Ann Loraine S. Armeje

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Contact number: 09364833695

PERSONAL DATA

Age: 24 years old

Birthday: July 18, 2000

Gender: Female

Civil Status: Single

Weight: 53

Height: 5’0

Citezenship: Filipino

Religion: Catholic

Dialect speaks: Bisaya, English, Tagalog

Mother’s Name: Roselyn S. Armeje

Father’s Name: Norberto D. Armeje jr.

Elementary: Manlingay Elementary School

Secondary: Manlingay National High School

Senior High: Manlingay National High School

Teritary: Negros Oriental State University Mabinay Campus

Bachelor of Science in Industrial Technology Major in Computer Technology