UNIVERSIDAD PARA LA COOPERACION INTERNACIONAL
(UCI)

PROJECT MANAGEMENT PLAN FOR SUPPORTING THE SHIFT TO ELECTRIC MOBILITY IN SAINT LUCIA

STEPHIE STACIA ANDERSON

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Carlos Castro Torres
TUTOR

_____

Paula Villalta Olivares
REVIEWER No.1

_____

Fabio Muñoz Jimenez
REVIEWER No.2

_____

Stephie Stacia Anderson
STUDENT

DEDICATION

This Final Graduation Project is dedicated to my parents and significant other who provided me with motivation, encouragement and unwavering support.

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Firstly, I would like to take this opportunity to thank Jehovah God for providing me with the strength, patience and wisdom required to complete this Final Graduation Project and by extension, this Master's degree.

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ABSTRACT

The document aims to develop an integrated project management plan framed within the standards of Project Management Institute (PMI), in order to successfully manage Supporting the Shift to Electric Mobility in Saint Lucia Project. Due to the lack of key competencies at the Renewable Energy Unit of the Ministry of Infrastructure, Ports, Transport, Physical Development and Urban Renewal in Saint Lucia, an integrated project management plan is required to ensure the successful delivery of the project within scope, time, and budgetary constraints.

The final product of this project consists of an integrated project management plan document for the Supporting the Shift to Electric Mobility in Saint Lucia Project. This plan consists of the final deliverables of the project which correspond to ten (10) subsidiary management plans relating to: scope, schedule, cost, quality, resources, communications, risk, procurement and stakeholder management. To assist in the development of this plan, a combination of analytical, qualitative and quantitative research methodologies and the Project Body of Knowledge (PMBOK) Guide are used.

The conclusions established that it is feasible to develop an integrated Project Management Plan for the Supporting the Shift to Electric Mobility in Saint Lucia Project using the standards set by PMI (2017) including the ten project management knowledge areas, processes, inputs, tools and techniques. Additionally, it was concluded that the project can be classified as regenerative and sustainable. Several recommendations are also included.

Key Words: Project Management, Project Management Plan, Electric Mobility, Electric Vehicles, Sustainability, Regenerative Development.

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ABBREVIATIONS AND ACRONYMS

AA	Administrative Assistant
AC	Actual Cost
APM	Association for Project Management
CEO	Chief Energy Officer
CPI	Cost Performance Index
CTA	Chief Technical Advisor
CTB	Central Tenders Board
CV	Cost Variance
DSD	Department of Sustainable Development
E-Mobility	Electric Mobility
EO	Energy Officer
EV	Electric Vehicle
EVM	Earned Value Management
F&M&EO	Finance and Monitoring and Evaluation Officer
FGP	Final Graduation Project
GEF	Global Environment Facility
GHG	Greenhouse Gas
IC	International Consultant
ITO	Information Technology Officer
LC	Local Consultant
LUCELEC	St. Lucia Electricity Services Limited
MOA	Memoranda of Agreements
PM	Project Manager
PMBOK® Guide	Project Management Body of Knowledge Guide
PMI	Project Management Institute
PS	Project Sponsor
PSC	Project Steering Committee
PV	Planned Value
RACI	Responsible, Accountable, Consulted, Informed
REOI	Request for Expression of Interest
RBS	Resource Breakdown Structure
SLA	Service Level Agreement
SPI	Schedule Performance Index
SDGS	Sustainable Development Goals
SIDS	Small Island Developing State
TOR	Terms of Reference
UCI	Universidad para la Cooperación Internacional
USD	United States Dollars
WBS	Work Breakdown Structure

EXECUTIVE SUMMARY

As a Caribbean small island developing state (SIDS), Saint Lucia is highly pregnable to the effects of climatic change and natural hazards such as hurricanes, storms, and earthquakes, which have caused immense damage for decades. Saint Lucia relies almost entirely on fossil fuel imports for its supply of energy. Dependency on diesel-generated electricity results in high green-house gas (GHG) emissions from the electricity generation sub-sector, with it being responsible for close to thirty-nine (39%) of total national GHG emissions (GEF, 2022). Electric mobility is therefore an effective strategy in reducing GHG emissions and incentivizing economic and industrial growth in Saint Lucia. Due to this reason, the Renewable Energy Unit, a subsidiary unit of the Ministry of Infrastructure, Ports, Transport, Physical Development and Urban Renewal, emphasized the significance of implementing electric mobility in Saint Lucia and introduced the "Supporting the Shift to Electric Mobility in Saint Lucia" Project. The project aims to accelerate the introduction of electric mobility in Saint Lucia through capacity-building and electric vehicle demonstration, and to prepare the country for scaling-up and replication through the development of electric mobility policies, business models and finance schemes.

The Renewable Energy Unit is experienced in implementing and executing energy related projects in Saint Lucia. The Government of Saint Lucia secured grant funding from the Global Environment Facility (GEF) to execute the project. However, the Renewable Energy Unit lacks the key competencies required to develop an integrated project management plan. To ensure the successful delivery of the project within scope, time and budget, an integrated project management plan which includes the ten (10) subsidiary documents relating to the project management knowledge areas, tools and techniques was developed. The integrated project management plan was utilized as a guide for the execution of the project, project management activities which includes scope, schedule, cost, quality, resource, communications, risk, procurement and stakeholder management and definition on how the project was executed, monitored, controlled and closed. The implementation of the project will provide the following benefits; increased likelihood of the successful completion of the project on time and within budget, reduced likelihood of changes to project scope, effective communication among all stakeholders and the project management team, effective monitoring and control of the project's activities, early identification of risks and implementation of risk response mechanisms, and identification of existing resources and indication of additional requirements to complete the project.

The general objective of the project was to develop an integrated project management plan framed within the standards of Project Management Institute (PMI), in order to successfully manage Supporting the Shift to Electric Mobility in Saint Lucia Project. The specific objectives were to create a Project Charter to describe the project's components, rationale, key stakeholders, resources, and other project management activities and requirements; to create a Scope Management Plan to ensure that all work required is included to successfully complete the project; to create a Schedule Management Plan to ensure that the project is completed on time; to develop a Cost Management Plan to ensure that the project is

successfully completed within the approved budget; to create a Quality Management Plan to identify the quality requirements and to describe how quality will be managed throughout the project's lifecycle in order to ensure that results meet the stakeholders' expectations; to generate a Resource Management Plan to identify, acquire and manage the necessary resources (physical and human) effectively, in order to successfully complete the project within time, scope and cost constraints; to develop a Communications Management Plan to ensure effective and timely communication of the project's information to the project management team and stakeholders; to create a Risk Management Plan to outline the project's risk management approach by identifying, categorizing, analyzing, and responding effectively to potential project risks; to generate a Procurement Management Plan to manage the purchase of materials, and acquisition of services or results required for the project; to develop a Stakeholder Management Plan to identify, categorize and support stakeholders by developing suitable engagement strategies to ensure effective stakeholder engagement; and finally to determine the relationship and impact of the project's execution and its end product on regenerative and sustainable development.

The methodology for this research was a combination of analytical, qualitative, and quantitative. Data relevant to this study were collected by utilizing primary and secondary sources. Reports, interviews, and publications were interpreted, analyzed, conceptualized, synthesized and evaluated by the researcher in an objective manner. The PMBOK Guide was the main publication used in the development of the ten subsidiary management plans.

The conclusions defined highlight that it is possible to develop an integrated Project Management Plan for the Supporting the Shift to Electric Mobility in Saint Lucia Project using the standards set by PMI (2017). Overall, Supporting the Shift to Electric Mobility in Saint Lucia Project Management Plan was efficiently and successfully developed. The plan utilized the ten (10) project management knowledge areas established by PMI (2017) including Integration, Scope, Schedule, Cost, Quality, Resource, Communications, Risk, Procurement and Stakeholder Management. Additionally, based on analysis conducted, it was concluded that the project was classified as a regenerative and sustainable project.

Based on the recommendations, it is highly recommended that the Ministry of Infrastructure, Ports, Transport, Physical Development and Urban Renewal utilize the Project Management Plan developed for the Supporting the Shift to Electric Mobility in Saint Lucia Project. This would ensure that best practices and the project management knowledge areas recommended by PMI (2017) are considered throughout the project's lifecycle. This would ensure that there is efficient management and proper delivery of the project's outcomes which would ultimately benefit the citizens of Saint Lucia. Finally, to help promote regenerative and sustainable development, it is recommended that the citizens participate in the electric mobility awareness campaigns and activities to learn about the benefits of electric mobility and should later invest in the purchase of electric vehicles.

1 INTRODUCTION

Chapter 1 provides a comprehensive overview of the Final Graduation Project. Firstly, the location, organization, benefits and justification are provided in the background of the project. Secondly, the statement of the problem is identified which describes the main issue which this Final Graduation Project aims to address. Thirdly, the purpose and justification of the FGP is outlined along with the expected benefits related to the successful completion of the project. Additionally, the general objective of the project is provided, and finally, eleven (11) specific objectives of the FGP are outlined.

1.1. Background

Saint Lucia is a volcanic island and an upper-middle-income Small Island Developing State (SIDS) located at the Lesser Antillean Arc of the Caribbean Archipelago. The island is an open economy that has progressed within the context of a relatively stable social and political environment (UNCTAD, 2018). As a small island developing state (SIDS), Saint Lucia faces unique development challenges, including the vulnerabilities of a less diversified economy dependent on commodity imports and high susceptibility to the effects of climate change and natural disasters.

The Ministry of Infrastructure, Ports, Transport, Physical Development and Urban Renewal – Renewable Energy Unit is primarily responsible for the formulation of energy policies and execution of energy projects to contribute to the development of Saint Lucia. The main responsibilities of the Renewable Energy Unit as outlined in the National Energy Policy (NEP) include (1) Energy policy formulation, national energy planning and energy sector

co-ordination, (2) Mandating and co-ordination of studies on energy resources, production, transformation and marketing in close co-operation with the responsible operating agencies, (3) Compiling basic energy information useful for sectoral planning, and evaluating the impact of selected policy initiatives, (4) Fostering the development of appropriate legislation for the electricity, petroleum and gas sub-sectors through a participatory and consultative process, (5) Fostering the development and adoption of appropriate energy efficiency and safety standards, (6) Promoting and monitoring power sector demand-side management programmes and other programmes designed to encourage the purchase and adoption of energy-efficient appliances by final energy users, (7) Encouraging private sector participation in renewable energy technologies that are relevant to Saint Lucia, (8) Organizing energy awareness programmes and activities and disseminating appropriate information, (9) Advising the Cabinet on matters related to the regulation of the energy sector, and (10) Overseeing and coordinating activities relating to energy and the environment.

While electricity is supplied reliably, the country remains almost completely dependent on imported fuels for diesel-based generation, resulting in a negative impact on the balance of trade, high electricity tariffs, and exposure to volatile global fuel market prices. As such, the Government of Saint Lucia realized the need to implement electric mobility in Saint Lucia and secured grant funding from the Global Environment Facility (GEF) to execute the “Supporting the Shift to Electric Mobility in Saint Lucia” Project. The project aims to accelerate the introduction of electric mobility in Saint Lucia through capacity-building and electric vehicle demonstration, and to prepare the country for scaling-up and replication

through the development of electric mobility policies, business models and finance schemes. It is anticipated that this project will be beneficial to Saint Lucia as it will provide a sustainable, low carbon and resilient energy system and will lead to a decrease in GHG emissions and ultimately, climate resilience.

One major policy of the Government of Saint Lucia is to achieve energy independence and energy security through inter alia, increased use of indigenous renewable energy resources. The Renewable Energy Unit is a small department with competent energy officers and other employees. However, the unit lacks employees with competencies in project management methodologies and practices. Thus, it is critical that an integrated project management plan be developed for the Supporting the Shift to E-Mobility in Saint Lucia Project in order to ensure that the project meets all requirements relating to scope, cost, schedule and quality to fully benefit the citizens of Saint Lucia.

1.2. Statement of the problem

The Renewable Energy Unit is experienced in implementing and executing energy related projects. However, the department is a small unit which lacks the key competencies required to develop an integrated project management plan to help achieve the major components and objectives of the project. As a result of this and due to the major investment by the Global Environment Fund (GEF), it is imperative that an integrated project management plan be developed to assist in completing the project successfully. According to PMI (2017, p.82), developing a project management plan consists of defining, preparing, and coordinating all plan components and consolidating them into an integrated

project management plan. The project management plan for the project will be a comprehensive plan which addresses the ten (10) knowledge areas as outlined by the Project Management Institute (PMI) and will provide a framework for the successful implementation of electric mobility in Saint Lucia.

1.3. Purpose

Saint Lucia relies almost entirely on the importation of fossil fuel to meet its energy demands. Electricity is supplied via diesel generation by a privately-owned company, namely, St. Lucia Electricity Services Limited (LUCELEC). Dependency on diesel-generated electricity results in high greenhouse gas (GHG) emissions from the electricity generation sub-sector, with it being responsible for close to thirty-nine (39%) of total national GHG emissions. Additionally, electricity costs in Saint Lucia are volatile due to the county's dependence on imported diesel fuel.

Based on the country's current consumption and growth rates, and the old age and condition of the diesel plant, the Government of Saint Lucia has identified the need to expand capacity to allow for the disconnection of older diesel generators as their service life is completed and has discovered more than twenty (20) megawatts (MW) of additional renewable power generation capacity that could be deployed. Thus, the Government of Saint Lucia has secured grant funding from the Global Environment Facility (GEF) to execute "Supporting the Shift to Electric Mobility in Saint Lucia" Project. The primary objective of the project is to accelerate the introduction of electric mobility in Saint Lucia through capacity-building and electric vehicle demonstration, and to prepare the country for

scaling-up and replication through the development of electric mobility policies, business models and finance schemes. This project will be beneficial since it will provide a sustainable, low carbon and resilient energy system in St. Lucia. It will also lead to a decrease in GHG emissions and ultimately, climate resilience.

To ensure the successful delivery of the project within scope, time and budget, an integrated project management plan will be required. The Project Management Plan will be developed and utilized as a guide for the execution of the project to help maximise its success chances. This plan will define how the project will be executed, monitored, controlled and finally closed.

An integrated Project Management Plan for "Supporting the Shift to Electric Mobility in Saint Lucia" Project will be generated. It includes ten (10) subsidiary documents which will provide effective guidance to the project management team and organization relating to project management activities namely, scope, schedule, cost, quality, resource, communications, risk, procurement and stakeholder management. The following benefits will be derived from the implementation of the project:

- Increase in the likelihood of the successful completion of the project on time and within budget.
- Reduced likelihood of changes to project scope.
- Effective communication among all stakeholders and the project management team.
- Effective monitoring and control of the project's activities.
- Early identification of risks and implementation of risk response mechanisms.

- Identification of existing resources and indication of additional requirements to complete the project.

1.4. General objective

To develop an integrated Project Management Plan framed within the standards of Project Management Institute (PMI) in order to successfully manage the Supporting the Shift to Electric Mobility in Saint Lucia Project.

1.5. Specific objectives

1. To create a Project Charter to describe the project's components, rationale, key stakeholders, resources and other project management activities and requirements.
2. To create a Scope Management Plan to ensure that all work required is included to successfully complete the project.
3. To create a Schedule Management Plan to ensure that the project is completed on time.
4. To develop a Cost Management Plan to ensure that the project is successfully completed within the approved budget.
5. To create a Quality Management Plan to identify the quality requirements and to describe how quality will be managed throughout the project's lifecycle in order to ensure that results meet the stakeholders' expectations.
6. To generate a Resource Management Plan to identify, acquire and manage the necessary resources (physical and human) effectively, in order to successfully complete the project within time, scope and cost constraints.

7. To develop a Communications Management Plan to ensure effective and timely communication of the project's information to the project management team and stakeholders.
8. To create a Risk Management Plan to outline the project's risk management approach by identifying, categorizing, analyzing, and responding effectively to potential project risks.
9. To generate a Procurement Management Plan to manage the purchase of materials, and acquisition of services or results required for the project.
10. To develop a Stakeholder Management Plan to identify, categorize and support stakeholders by developing suitable engagement strategies to ensure effective stakeholder engagement.
11. To determine the relationship and impact of the project's execution and its end product on regenerative and sustainable development.

2 THEORETICAL FRAMEWORK

Chapter 2 outlines the relevant literature and theories which are related to the Final Graduation Project. This section builds a knowledge structure on the background of the organization, project management concepts and principles as well as applicable concepts related to the topic of study. It consists of the company/ enterprise framework which provides extensive information relating to the background of the organization, the mission and vision statement, organizational structure and products/ services offered by the organization. This section further explains project management concepts/theories which includes project management principles, project management domains, predictive, adaptive and hybrid projects, project management, project management knowledge areas and processes, project lifecycle, the company's strategy, portfolio, programs and projects. Finally, this section provides research on applicable concepts related to the topic in study and context.

2.1 Company/Enterprise framework

2.1.1 Company/Enterprise background

The Renewable Energy Unit is a subsidiary unit of the Ministry of Infrastructure, Ports, Transport, Physical Development and Urban Renewal. This department was previously part of the Department of Sustainable Development but transitioned to the Renewable Energy Unit in 2019. The Renewable Energy Unit is responsible for promoting sustainable energy and economic growth in Saint Lucia. Additionally, the department is responsible for energy policy formulation, national energy planning and energy sector co-ordination, fostering the

development and adoption of appropriate energy efficiency and safety standards, mandating and co-ordination of studies on energy resources, compiling basic energy information useful for sectoral planning, and evaluating the impact of selected policy initiatives, fostering the development of appropriate legislation for the electricity, petroleum and gas sub-sectors through a participatory and consultative process, organising energy awareness programmes and activities and disseminating appropriate information, promoting and monitoring power sector demand-side management programmes and other programmes designed to encourage the purchase and adoption of energy-efficient appliances by final energy users, encouraging private sector participation in renewable energy technologies that are relevant to Saint Lucia, advising the Cabinet on matters related to the regulation of the energy sector and finally overseeing and coordinating activities relating to energy and the environment.

2.1.2 Mission and Vision Statement

Mission

A mission statement defines the company's business, its objectives, and its approach to reach those objectives. According to the Ministry of Infrastructure, Ports, Transport, Physical Development and Urban Renewal (2023), the mission for the Ministry of Infrastructure, Ports, Transport, Physical Development and Urban Renewal – Renewable Energy Unit is: "To create an enabling environment that fosters a reliable, affordable and independent energy supply for Saint Lucia through the promotion of sustainable and efficient energy usage".

The development of the project management plan for Supporting the Shift to Electric Mobility Project will have a positive impact on the Renewable Energy Unit as it will assist the Unit in pursuing the desired objectives which are currently established in its mission.

Vision

A vision describes the desired future position of the company and can serve as a guide for the company indicating a defined direction for growth and goals. According to the Ministry of Infrastructure, Ports, Transport, Physical Development and Urban Renewal (2023), the vision for the Ministry of Infrastructure, Ports, Transport, Physical Development and Urban Renewal – Renewable Energy Unit is: “To be a vanguard in providing the legislative, regulatory, and policy framework for energy security, innovation, investment and the development of the energy sectors in Saint Lucia”.

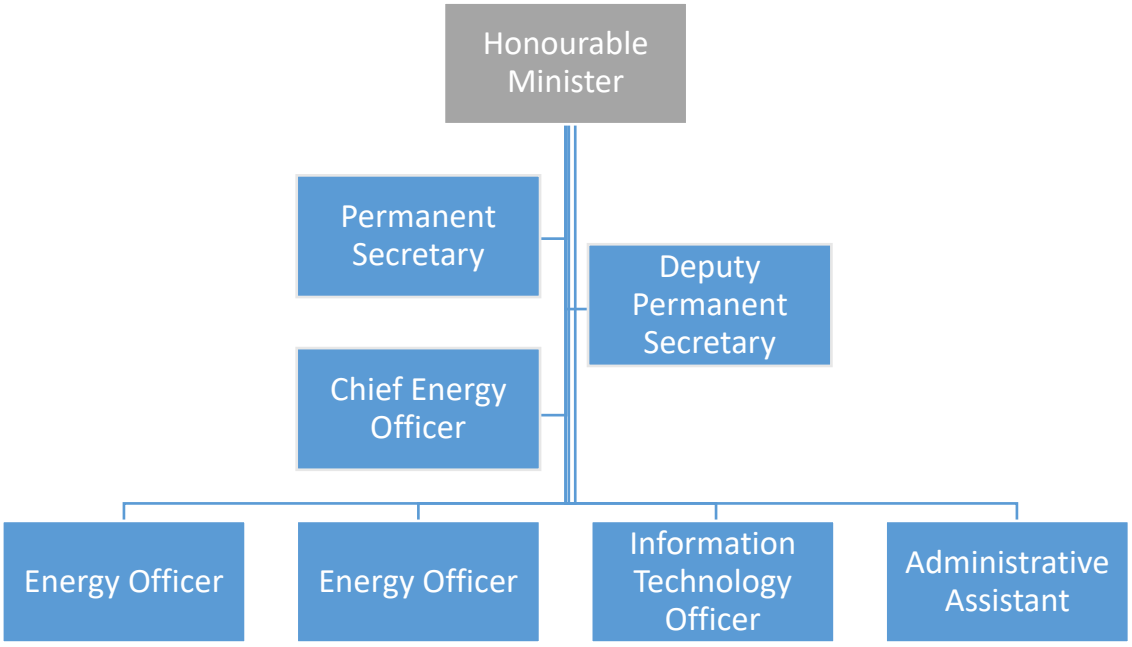
The development of the project management plan for the project will serve as a guide which will positively impact the Renewable Energy Department by assisting project management personnel in successfully completing the project and ultimately, achieving the Ministry’s vision.

2.1.3 Organizational structure

Figure 1 below depicts the organizational structure for the Renewable Energy Unit of the Ministry of Infrastructure, Ports, Transport, Physical Development and Urban Renewal – Renewable Energy Unit. The Renewable Energy Unit is headed by the Honourable Minister, Stephenson King and consists of One (1) Permanent Secretary, and one (1) Deputy Permanent Secretary. Presently there are five (5) employees at the department

including the Chief Energy Science and Technology Officer (Head of the Division); three (3) Energy Officers, one (1) Information and Technology Officer and a Secretary.

Figure 1: Organizational Structure



Note: Own Work.

2.1.4 Products offered

The Government of Saint Lucia has recognised the influence that developments in the global energy markets have on domestic needs and has taken steps to achieve higher energy security and independence. Thus, efforts have been made in recent years to adopt strategies to reduce GHG emissions in the country's energy sector, particularly on transport and electricity generation. To help fulfil its goal of reducing GHG emissions and promoting renewable energy in Saint Lucia, the Renewable Energy Unit of the Ministry of Infrastructure, Ports, Transport, Physical Development and Urban Renewal has been making significant strides by participating in renewable energy initiatives.

The Renewable Energy Unit is mainly responsible for formulation of policies for the development of the energy and water sectors, procuring of electric vehicles, feasibility studies, and designing and constructing public charging stations as part of their strategy to promote renewable energy in Saint Lucia. The Supporting the Shift to Electric Mobility in Saint Lucia Project falls within the portfolio of services which are offered by the Renewable Energy Unit.

2.2 Project Management concepts

2.2.1 Project management principles

There are twelve (12) project management principles which are broadly based and provide guidance for effective project management. It should be noted that the principles of project management are not prescriptive in nature and are aligned with the values identified in PMI Code of Ethics and Professional Conduct. Since the principles of project management provide guidance to project personnel, the degree of application and the way in which they are applied are influenced by the context of the organization, project, deliverables, project team, stakeholders, and other factors (PMI, 2021). The principles are internally consistent which means that no principle contradicts any other principle. However, in practice there may be times when the principles can overlap. According to PMI (2021), the twelve (12) project management principles are:

1. **Stewardship - Be a diligent, respectful, and caring steward**

Stewards act responsibly to execute activities with integrity, care and trustworthiness while maintaining compliance with internal and external guidelines. According to PMI (2021, p.24), they demonstrate a broad commitment to financial, social and environmental impacts

of the projects they support. Stewardship encompasses responsibilities within and external to the organization. A holistic view of stewardship considers financial, social, technical and sustainable environmental awareness.

2. **Team - Create a collaborative project team environment**

Creating a collaborative project team environment involves multiple contributing factors which support a culture that enables individuals to work together and provide synergistic effects from interactions. These factors include team agreements, structures, and processes (PMI, 2021, p. 28). Team agreements represent a set of behavioral parameters and working norms established by the project team and upheld through individual and project team commitment. Organizational structures are any arrangement of or relation between the elements of project work and organizational processes. These structures can be based on roles, functions or authority. Project teams use, tailor and implement structures that help coordinate the individual effort associated with project work. Examples of organizational structures that can improve collaboration include, but are not limited to:

- Definitions of roles and responsibilities,
- Allocation of employees and vendors into project teams,
- Formal committees tasked with a specific objective, and
- Standing meetings that regularly review a given topic.

Project teams define processes that enable completion of tasks and work assignments. For example, project teams may agree to a decomposition process using a work breakdown structure (WBS), backlog, or task board (PMI, 2021).

3. **Stakeholders - Effectively engage with stakeholders**

Stakeholders can be individuals, groups or organizations that may affect, be affected by, or perceive themselves to be affected by a decision, activity, or outcome of a portfolio, program, or project. Stakeholders also directly or indirectly influence a project, its performance, or outcome in either a positive or negative way. Project teams are groups of stakeholders who engage other stakeholders to understand, consider, communicate, and respond to their interests, needs and opinions. Engagement helps project teams detect, collect, and evaluate information, data, and opinions. This creates shared understanding and alignment, which enables project outcomes. Additionally, these activities help the project team to tailor the project to identify, adjust and respond to changing circumstances. Project teams actively engage other stakeholders throughout the project to minimize potential negative impacts and maximize positive impacts. Stakeholder engagements also enable opportunities for stronger project performance and outcomes in addition to increasing stakeholder satisfaction. It helps the project team to find solutions that may be more acceptable to a broader range of stakeholders (PMI, 2021).

4. **Value - Focus on value**

Value, including outcomes from the perspective of the customer or end user, is the ultimate success indicator and driver of projects. Value focuses on the outcome of the deliverables. The value of a project may be expressed as a financial contribution to the sponsoring or receiving organization. Value may be a measure of public good achieved, for example, social benefit or the customer’s perceived benefit from the project result. When the project

is a component of a program, the project's contribution to program outcomes can represent value (PMI, 2021).

5. **Systems Thinking - Recognize, evaluate and respond to system interactions**

A system is a set of interacting and interdependent components that function as a unified whole. According to PMI (2021), taking a holistic view, a project is a multifaceted entity that exists in dynamic circumstances, exhibiting the characteristics of a system. Project teams should acknowledge this holistic view of a project, seeing the project as a system with its own working parts. A project works within other larger systems, and a project deliverable may become part of a larger system to realize benefits. For example, projects may be part of a program which, in turn, may also be part of a portfolio. These interconnected structures are known as a system of systems. Project teams balance inside/out and outside/in perspectives to support alignment across the system of systems. The project may also have subsystems that are required to integrate effectively to deliver the intended outcome. For example, when individual project teams develop separate components of a deliverable, all components should integrate effectively. This requires project teams to interact and align subsystem work on a regular basis (PMI, 2021).

6. **Leadership - Demonstrate leadership behaviors**

Projects create a unique need for effective leadership. A project environment that prioritizes vision, creativity, motivation, enthusiasm, encouragement and empathy can support better outcomes. These traits are often associated with leadership. Leadership comprises the attitude, talent, character and behaviors to influence individuals within and outside the project team toward the desired outcomes. Effective leadership draws from or combines

elements of various styles of leadership. Documented leadership styles range from autocratic, democratic, laissez-faire, directive, participative, assertive, supportive and autocratic to consensus. Of all these, no single leadership style has proven to be the universally best or recommended approach. Instead, effective leadership is shown when it best fits a given situation. Effective leadership promotes project success and contributes to positive project outcomes (PMI, 2021).

7. **Tailoring - Tailor based on context**

Tailoring is the deliberate adaptation of approach, governance and processes to make them more suitable for the given environment and the work at hand. Project teams tailor the appropriate framework that will enable the flexibility to consistently produce positive outcomes within the context of the life cycle of the project. The business environment, team size, degree of uncertainty, and complexity of the project all factor into how project systems are tailored. Project systems can be tailored with a holistic perspective, including the consideration of interrelated complexities. Tailoring aims to maximize value, manage constraints and improve performance by using “just enough” processes, methods, templates and artifacts to achieve the desired outcome from the project. It is important to note that tailoring the project approach to suit the unique characteristics of the project and its environment can contribute to a higher level of project performance and an increased probability of success (PMI, 2021).

8. **Quality - Build quality into processes and deliverables**

Quality is the degree to which a set of inherent characteristics of a product, service or result fulfills the requirements. Quality includes the ability to satisfy the customer’s stated or

implied needs. The product, service or result of a project (deliverables) is measured for the quality of both the conformance to acceptance criteria and fitness for use. Quality management processes and practices help produce deliverables and outcomes that meet project objectives and align to the expectations, uses and acceptance criteria expressed by the organization and relevant stakeholders. Quality management processes and practices help produce deliverables and outcomes that meet project objectives and align to the expectations, uses and acceptance criteria expressed by the organization and relevant stakeholders (PMI, 2021).

9. Complexity - Navigate complexity

Complexity is a characteristic of a project or its environment that is difficult to manage due to human behavior, system behavior, uncertainty and ambiguity, and technological innovation. The nature and number of the interactions determine the degree of complexity in a project. Complexity emerges from project elements, interactions between project elements, and interactions with other systems and the project environment. Though complexity cannot be controlled, project teams can modify their activities to address impacts that occur as a result of complexity (PMI, 2021).

10. Risk - Optimize risk responses

A risk is an uncertain event or condition that, if it occurs, can have a positive or negative effect on one or more objectives. Identified risks may or may not materialize in a project. Project teams endeavor to identify and evaluate known and emergent risks, both internal and external to the project, throughout the life cycle. Project teams seek to maximize positive risks (opportunities) and decrease exposure to negative risks (threats). Threats may

result in issues such as delay, cost overrun, technical failure, performance shortfall or loss of reputation. Opportunities can lead to benefits such as reduced time and cost, improved performance, increased market share or enhanced reputation (PMI, 2021).

11. Adaptability and Resiliency - Embrace adaptability and resiliency

Most projects encounter challenges or obstacles at some stage. The combined attributes of adaptability and resiliency in the project team's approach to a project help the project accommodate impacts and thrive. Adaptability refers to the ability to respond to changing conditions. Resiliency consists of two complementary traits: the ability to absorb impacts and the ability to recover quickly from a setback or failure. Both adaptability and resiliency are helpful characteristics for anyone working on projects (PMI, 2021).

According to PMI (2021), building adaptability and resiliency in a project keeps project teams focused on the desired outcome when internal and external factors change, and it helps them recover from setbacks. These characteristics also help project teams learn and improve so that they can quickly recover from failures or setbacks and continue making progress toward delivering value.

12. Change - Enable change to achieve the envisioned future state

Project managers are uniquely poised to keep an organization prepared for changes. Projects, by their very definition, create something new: they are agents of change. Change management or enablement is a comprehensive, cyclic and structured approach for transitioning individuals, groups and organizations from a current state to a future state in which they realize desired benefits. It is different from project change control, which is a process whereby modifications to documents, deliverables, or baselines associated with the

project are identified and documented, and then are approved or rejected. Recognizing and addressing the needs of stakeholders to embrace change throughout the project life cycle helps to integrate the resulting change in the project work, making a successful outcome more likely (PMI, 2021).

It is important to note that the twelve (12) above-mentioned project management principles are related to the FGP and its objectives. The researcher will consider each principle when developing the project management plan for the Supporting the Shift to Electric Mobility Project in Saint Lucia. Observance of the twelve project management principles will lead to a successful FGP.

2.2.2 Project management domains

A Project Management Performance Domain is defined as a group of related activities that are critical for the effective delivery of project outcomes (PMI, 2021). The Project Management Performance Domain addresses activities and functions associated with establishing project processes, managing physical resources, and fostering a learning environment. There are eight (8) project performance domains, namely:

1. **Stakeholder -** The Stakeholder Performance Domain addresses activities and functions associated with stakeholders. Effective stakeholder interaction contributes to successful project outcomes. Stakeholder engagement includes implementing strategies and actions to promote productive involvement of stakeholders in project decision making and implementation (PMI, 2021). This performance domain will be addressed in the FGP when

developing objective 10 which is the creation of a Stakeholder Management Plan. Stakeholders will be identified and engaged for the project.

2. **Team –** The Team Performance Domain addresses activities and functions associated with the people who are responsible for producing project deliverables that realize business outcomes. The project team is a set of individuals performing the work of the project to achieve its objectives. An environment can be established to support the team in evolving into a high-performance team. This includes fostering team development, encouraging leadership behaviours from all project team members and sharing ownership for the outcomes. This performance domain will be observed when the students execute the FGP since team development and cooperation is required to develop the FGP.

3. **Development Approach and Life Cycle –** The Development Approach & Life Cycle Performance Domain addresses activities and functions associated with the development approach, cadence and life cycle phases of the project. The project deliverables determine the most appropriate development approach such as a predictive, adaptive, or hybrid approach. The deliverables and the development approach influence the number and cadence for project deliveries. The development approach and delivery cadence influence the project life cycle and its phases (PMI, 2021). This performance domain will be utilized in the FGP since the development approach will be established.

4. **Planning –** The Planning Performance Domain addresses activities and functions associated with the initial, ongoing and evolving organization and coordination necessary for delivering project deliverables and outcomes. Planning organizes, elaborates and coordinates work throughout the project. Planning takes place up front and throughout the

project. The amount, timing and frequency varies depending on the product, development approach, environment and stakeholders (PMI, 2021). This performance domain will be integral for the development of the project management plan since planning is required for all aspects of the FGP.

5. **Project Work –** The Project Work Performance Domain addresses activities and functions associated with establishing project processes, managing physical resources and fostering a learning environment. Project work is associated with establishing the processes and performing the work to enable the project team to deliver the expected value and outcomes. Project work includes communication, engagement, managing physical resources, procurements and other work to keep project operations running smoothly (PMI, 2021). Project work performance domain is significant in the development of the project management plan since project work is required for the Supporting the Shift to Electric Mobility Project in Saint Lucia.

6. **Delivery –** The Delivery Performance Domain addresses activities and functions associated with delivering the scope and quality that the project was undertaken to achieve. Projects support strategy execution and advancing business objectives. Project delivery focuses on meeting requirements, scope and quality expectations to deliver the expected outputs that will drive intended outcomes. Projects provide business value by developing new products or services, solving problems or fixing things that were defective or sub-optimal. Projects may use a delivery approach that supports releasing deliverables throughout the project life cycle, at specific points, or at the end of the project (PMI, 2021).

This performance domain relates to specific objective 2 and objective 5 which relates to scope and quality management for the FGP.

7. **Measurement -** The Measurement Performance Domain addresses activities and functions associated with assessing project performance and taking appropriate actions to maintain acceptable performance. Measurement involves assessing project performance and implementing appropriate responses to maintain optimal performance. The Measurement Performance Domain evaluates the degree to which the project deliveries and performance are meeting the intended outcomes. Having timely and accurate information about delivery and performance allows the team to learn and determine the appropriate action to take to address current or expected variances from the desired performance (PMI, 2021). This performance domain will be utilized for the FGP since the project's performance will be analysed.

8. **Uncertainty –** The Uncertainty Performance Domain addresses activities and functions associated with risk and uncertainty. Projects exist in environments with varying degrees of uncertainty, and uncertainty presents threats and opportunities that project teams explore and assess and then decide how to handle. Uncertainty, in the broadest sense, is a state of not knowing or unpredictability. There are many nuances to uncertainty, such as: risk associated with not knowing future events, ambiguity associated with not being aware of current or future conditions, complexity associated with dynamic systems with unpredictable outcomes, and many others (PMI, 2021). It is important to note that there will be risks and uncertainty for all projects and it can either be a threat or opportunity. Thus,

this project performance domain relates to the FGP and specific objective 8 where a risk management plan will be developed for the project.

Figure 2: Project Performance Domains

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2.2.3 Predictive, adaptive and hybrid projects

Predictive Projects

Also referred to as Waterfall life cycle or approach, in a predictive life cycle or project, the project scope, time and cost are determined in the early phases of the life cycle. Any changes to the scope are carefully managed (PMI, 2017). A predictive approach is useful when the project and product requirements can be defined, collected and analyzed at the start of the project. This approach may also be used when there is significant investment

involved and a high level of risk that may require frequent reviews, change control mechanisms and re-planning between development phases. The scope, schedule, cost, resource needs and risks can be well defined in the early phases of the project life cycle, and they are relatively stable. This development approach allows the project team to reduce the level of uncertainty early in the project and do much of the planning up front. Predictive approaches may use proof-of-concept developments to explore options, but the majority of the project work follows the plans that were developed near the start of the project. Many times, projects that use this approach have templates from previous, similar projects (PMI, 2021).

Adaptive Projects

Adaptive life cycles are agile, iterative or incremental. The detailed scope is defined and approved before the start of an iteration. Adaptive life cycles are also referred to as agile or change-driven life cycles (PMI, 2017). Adaptive projects consist of elements which are still evolving. Adaptive approaches are useful when requirements are subject to a high level of uncertainty and volatility and are likely to change throughout the project. A clear vision is established at the start of the project, and the initial known requirements are refined, detailed, changed or replaced in accordance with user feedback, the environment or unexpected events. Adaptive approaches use iterative and incremental approaches. However, on the far side of the adaptive methods, the iterations tend to get shorter, and the product is more likely to evolve based on stakeholder feedback.

While agility is a wide mindset that is broader than a development framework, agile approaches can be considered adaptive. Some agile approaches entail iterations that are one

(1) to two (2) weeks in duration with a demonstration of the accomplishments at the end of each iteration. The project team is very engaged with the planning for each iteration. The project team will determine the scope they can achieve based on a prioritized backlog, estimate the work involved, and work collaboratively throughout the iteration to develop the scope (PMI, 2021).

Hybrid Projects

A hybrid life cycle or project is a combination of a predictive and an adaptive life cycle (PMI, 2017). According to PMI (2021), this essentially means that some elements from a predictive approach are used and some from an adaptive approach are used. This development approach is useful when there is uncertainty or risk around the requirements. Hybrid is also useful when deliverables can be modularized, or when there are deliverables that can be developed by different project teams. A hybrid approach is more adaptive than a predictive approach, but less so than a purely adaptive approach.

It is important to note that hybrid approaches often use an iterative or incremental development approach. An iterative approach is useful for clarifying requirements and investigating various options. An iterative approach may produce sufficient capability to be considered acceptable prior to the final iteration. An incremental approach is used to produce a deliverable throughout a series of iterations. Each iteration adds functionality within a predetermined time frame (a time box). The deliverable contains the capability to be considered as completed only after the final iteration (PMI, 2021).

The Supporting the Shift to Electric Mobility in Saint Lucia will employee a predictive approach. This is because all the requirements for the project are defined, which includes scope, cost, schedule and resource needs.

2.2.4 Project management

The Project Management Institute defines Project Management as “the application of knowledge, skills, tools, and techniques to project activities to meet project requirements” (PMI, 2017, p.10). Project Management is generally accomplished through the appropriate application and integration of the project management processes which are identified for the project (PMI, 2017, p.10). APM Body of Knowledge defines Project Management as “the formulation of processes, methods, skills and experience to achieve specific project objectives according to the project acceptance criteria within agreed parameters”. Project management has the final deliverables that are constraint to a finite timescale and budget (APM Body of Knowledge, 2019). McDowell (n.d.) defines project management as the act of planning, organizing and managing a project in order to achieve a predefined goal or outcome.

Furthermore, project management considers the utilization of all the necessary tools, techniques and procedures to administer the Supporting the Shift to Electric Mobility in Saint Lucia Project from initiation to completion. The project management plan for the FGP will manage a wide range of areas relating to schedule, budget, time, stakeholders and resources.

2.2.5 Project management knowledge areas and processes

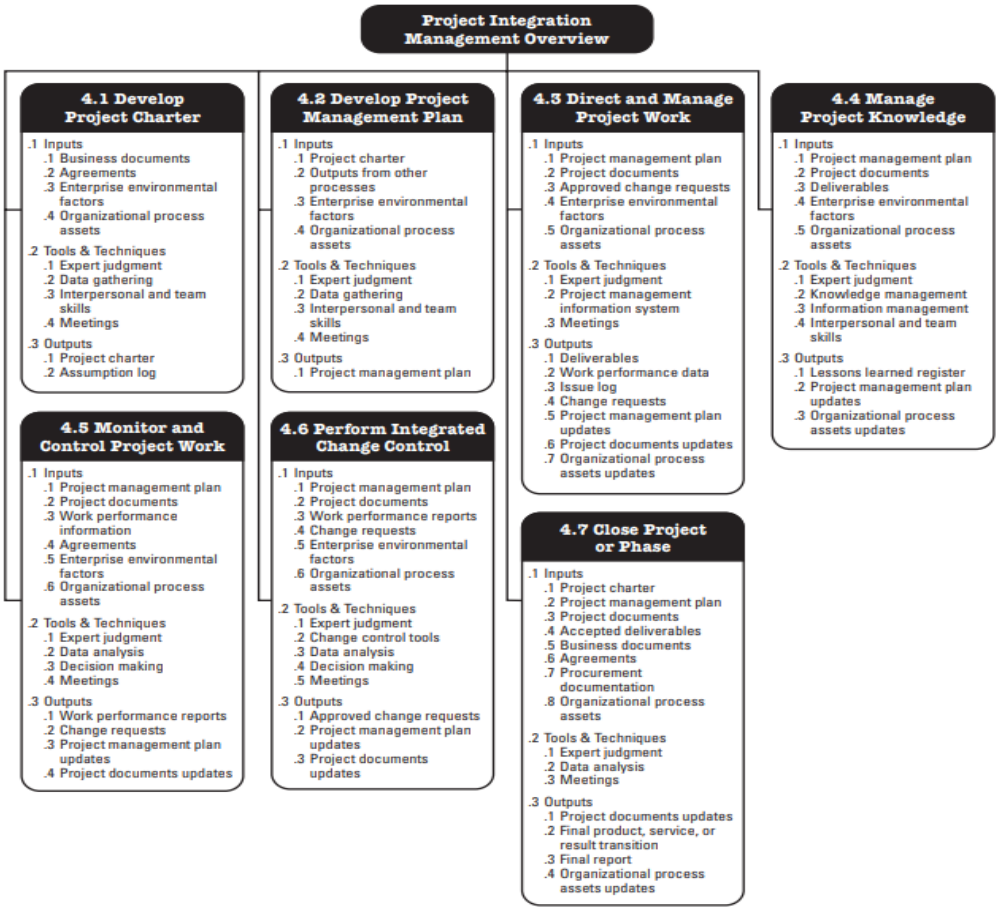
2.2.5.1.1 Project Management Knowledge Areas

According to the PMI (2017), a knowledge area is an identified area of project management defined by its knowledge requirements and described in terms of its component processes, practices, inputs, outputs, tools, and techniques. The ten knowledge areas will be utilized for the Final Graduation Project for the Project Management Plan of the Supporting the Shift to Electric Mobility Project. PMI (2017) stated that there are ten (10) Knowledge Areas of project management namely:

1) Project Integration Management consists of the processes and activities which identify, define, combine, unify and coordinates the various processes within the project management process groups (PMI, 2017, p.553). This knowledge area consists of six (6) processes:

1. Develop Project Charter
2. Develop Project Management Plan
3. Direct and Manage Project Execution
4. Monitor and Control Project Work
5. Perform Integrated Change Control
6. Close Project or Phase

Figure 3: Project Integration Management Overview



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2) Project Scope Management is the knowledge area during the project management process, which ensures that the project includes all the work required, and only the work required, to complete the project successfully (PMI, 2017, p.553). This knowledge area consists of six (6) processes:

1. Plan Scope Management

2. Collect Requirements

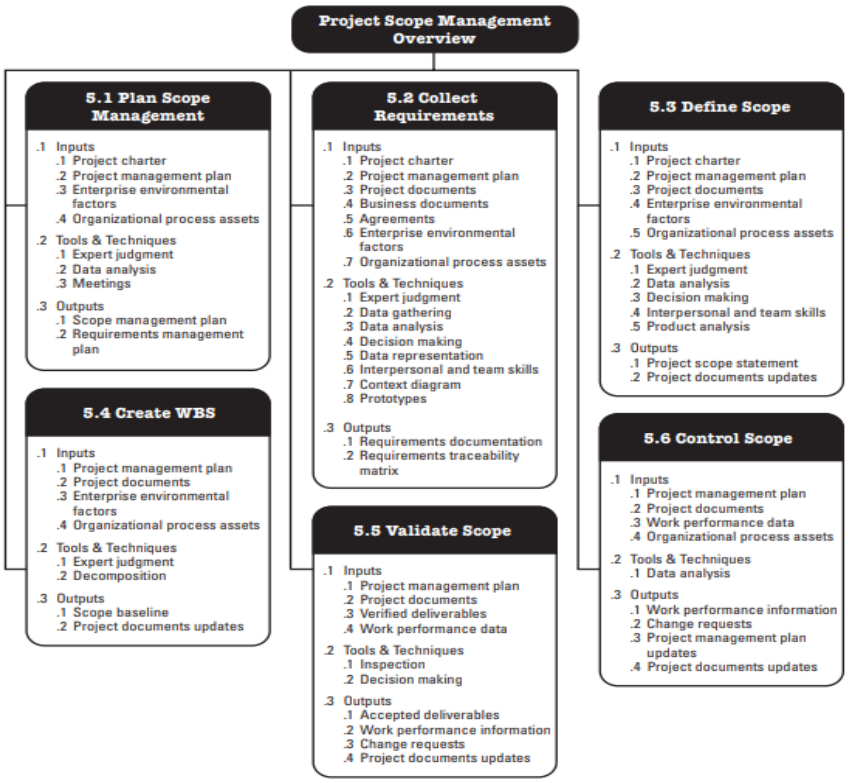
3. Define Scope

4. Create Work Breakdown Structure (WBS)

5. Validate Scope

6. Control Scope

Figure 4: Project Scope Management Overview



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3) Project Schedule Management consists of the processes required to manage the timely completion of the project (PMI, 2017, p.553). This knowledge area consists of the following six (6) processes:

1. Plan Schedule Management

2. Define Activities

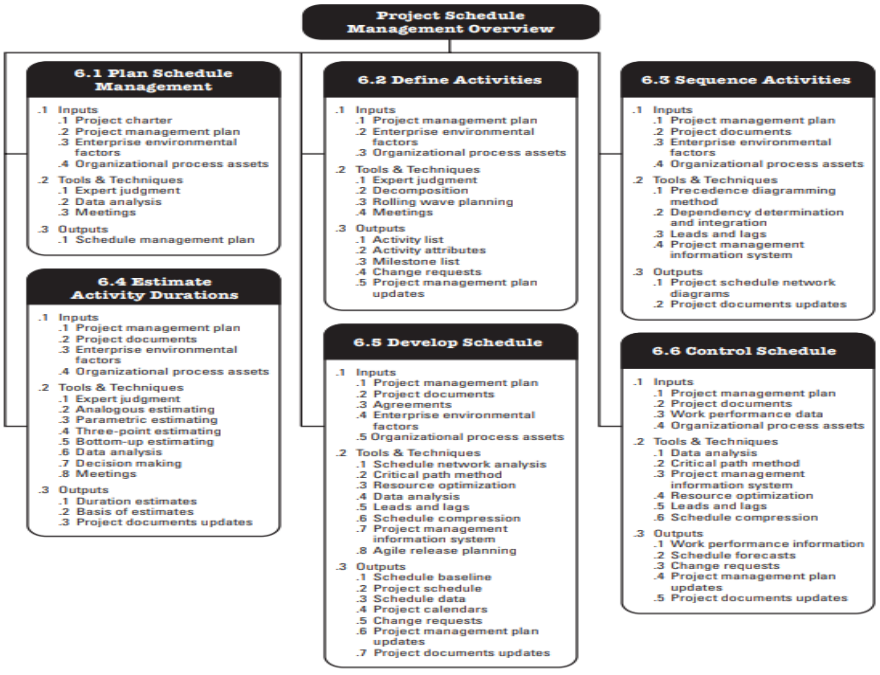
3. Sequence Activities

4. Estimate Activity Durations

5. Develop Schedule

6. Control Schedule.

Figure 5: Project Schedule Management Overview



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4) Project Cost Management includes the processes involved in planning, estimating, budgeting, financing, funding, managing and controlling costs so the project can be completed within the approved budget (PMI, 2017, p.553). This knowledge area consists of four (4) processes:

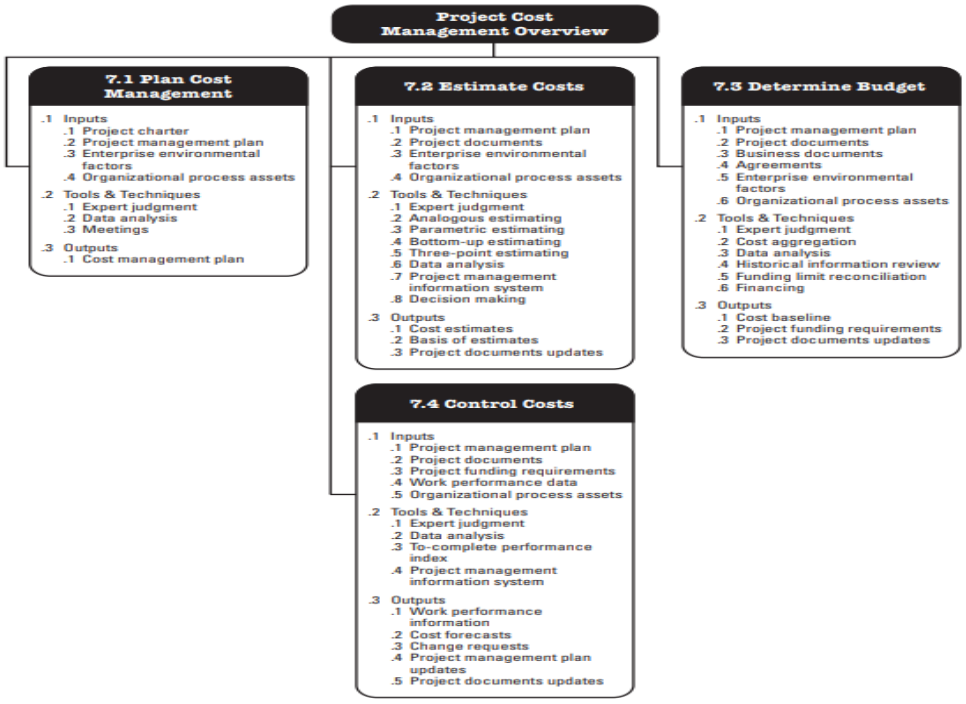
1. Plan Cost Management

2. Estimate Costs

3. Determine Budget

4. Control Costs

Figure 6: Project Cost Management Overview



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5) Project Quality Management includes the processes for incorporating the organization's quality policy regarding planning, managing and controlling project and product quality requirements, in order to meet stakeholders' expectations (PMI, 2017, p.553). This knowledge area involves three (3) processes:

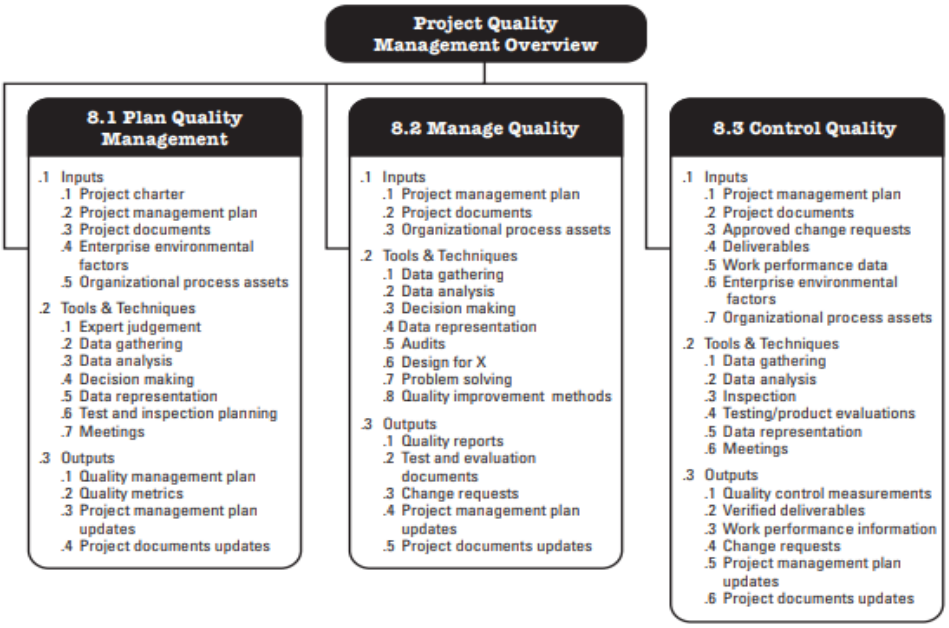
1. Plan Quality Management

2. Manage Quality

3. Control Quality

Figure 7 below provides an overview of Project Quality Management.

Figure 7: Project Quality Management Overview



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6) Project Resource Management includes the processes to identify, acquire and manage the resources needed for the successful completion of the project (PMI, 2017, p.553). This knowledge area involves six (6) processes:

1. Plan Resource Management

2. Estimate Activity Resources

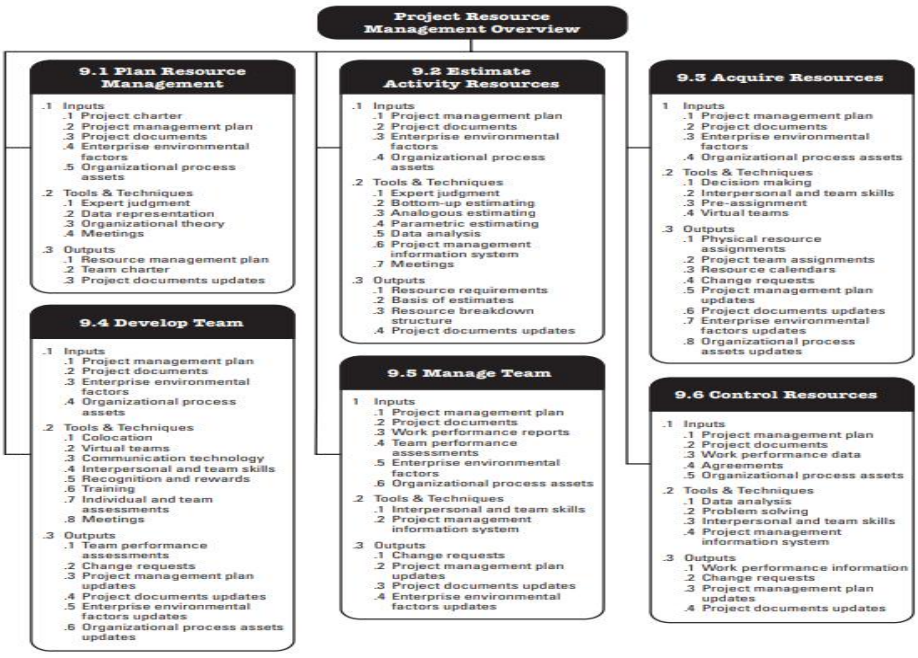
3. Acquire Resources

4. Develop Team

5. Manage Team

6. Control Resources

Figure 8: Project Resource Management Overview



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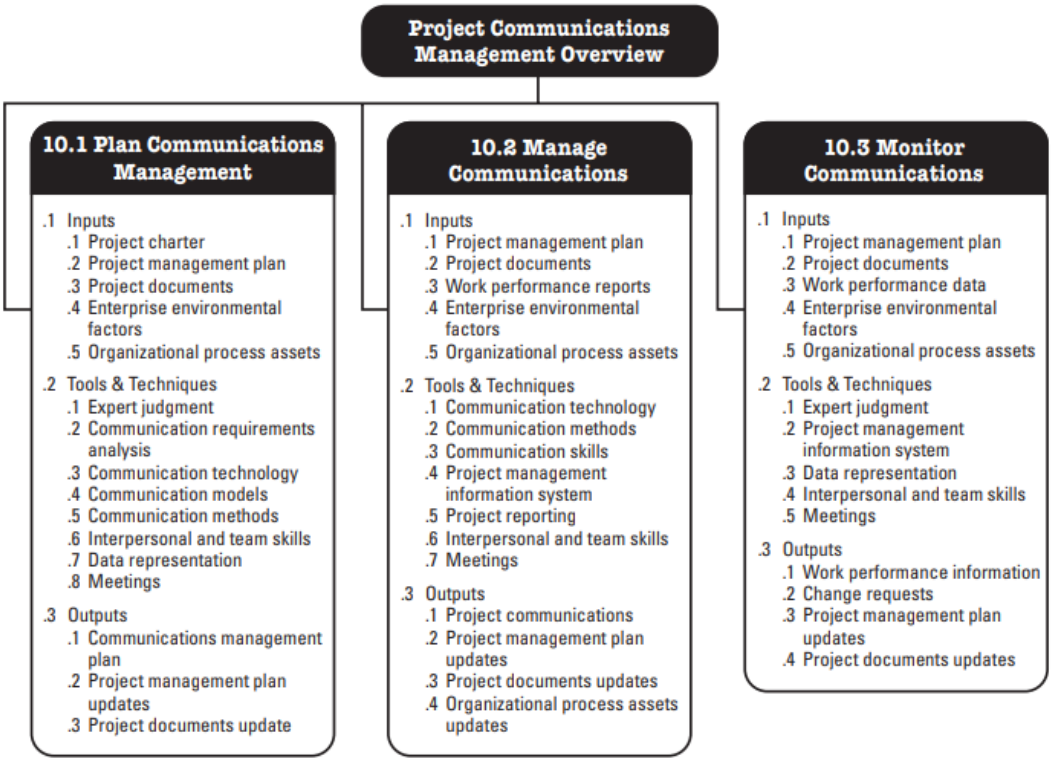
7) Project Communications Management consists of the processes required to ensure timely and appropriate planning, collection, creation, distribution, storage, retrieval, management, control, monitoring and ultimate disposition of project information (PMI, 2017, p.553). This knowledge area involves three (3) processes:

1. Plan Communications Management

2. Manage Communications

3. Monitor Communications

Figure 9: Project Communications Management Overview



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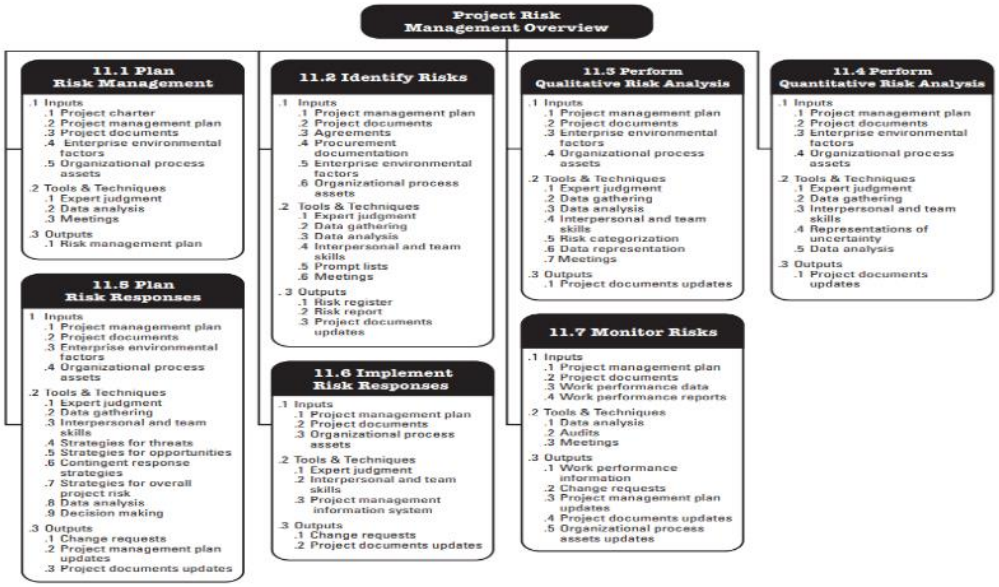
8) Project Risk Management involves the processes of conducting risk management planning, identification, analysis, response planning, response implementation and monitoring risk on a project (PMI, 2017, p.553). It involves seven (7) processes:

1. Plan Risk Management
2. Identify Risks
3. Perform Qualitative Risk Analysis
4. Perform Quantitative Risk Analysis
5. Plan Risk Responses
6. Implement Risk Responses
7. Monitor Risks

Figure 10: Project Risk Management Overview



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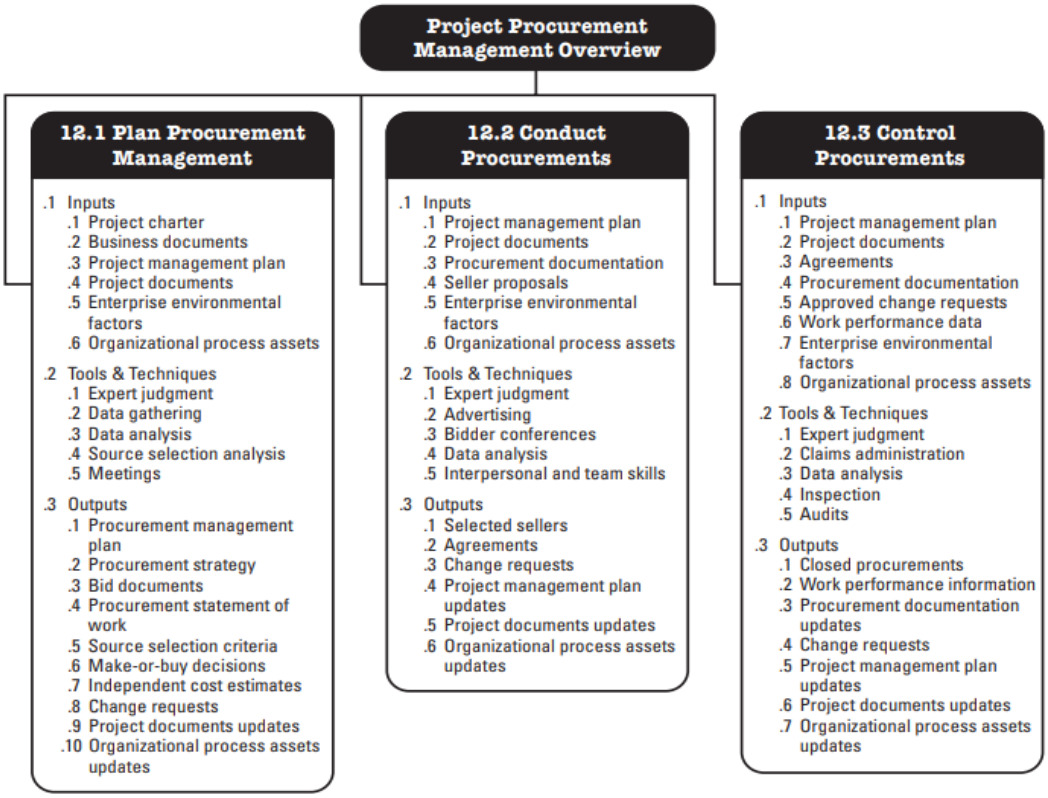
9) Project Procurement Management includes the processes necessary to purchase or acquire products, services or results needed from outside the project team (PMI, 2017, p.553). This knowledge area consists of three (3) processes:

1. Plan Procurement Management

2. Conduct Procurements

3. Control Procurements

Figure 11: Project Management Overview



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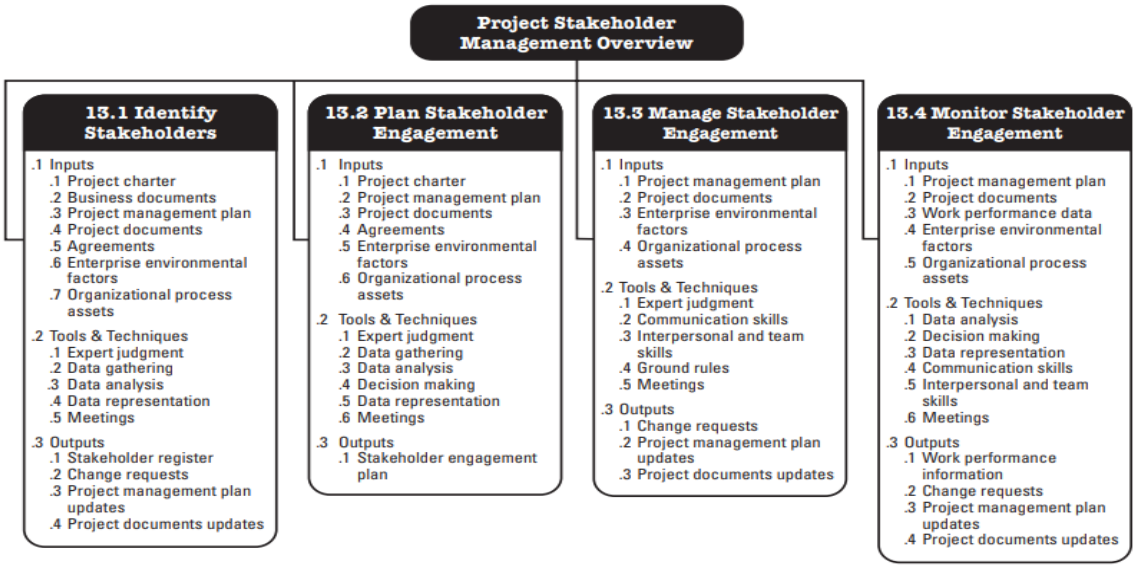
10) Project Stakeholder Management consists of the processes required to identify the people, groups or organizations that could impact or be impacted by the project, to analyze stakeholder expectations and their impact on the project, and to develop appropriate management strategies for effectively engaging stakeholders in project decisions and execution (PMI, 2017, p.553). This knowledge area consists of four (4) processes:

1. Identify Stakeholders
2. Plan Stakeholder Engagement
3. Manage Stakeholder Engagement
4. Monitor Stakeholder Engagement

Figure 12: Project Stakeholder Management Overview



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2.2.5.1.2 Project Management Processes

Project Management Process Groups are defined as a logical grouping of project management processes to achieve specific project objectives. Process groups are independent of project phases. (PMI, 2017, p.23). Project Management processes are grouped into the following five (5) groups:

1. **Initiating Process Group** – This group involves the processes performed to define a new project or a new phase of an existing project by obtaining authorization to start the project or phase (PMI 2017, p. 23).

2. **Planning Process Group** – This process group involves the processes required to establish the scope of the project, refine the objectives, and define the course of action required to attain the objectives that the project was undertaken to achieve (PMI 2017, p. 23).

3. **Executing Process Group** – This process group involves the processes performed to complete the work defined in the project management plan to satisfy the project requirements (PMI 2017, p. 23).

4. **Monitoring and Controlling Process Group** – The processes required to track, review, and regulate the progress and performance of the project; identify any areas in which changes to the plan are required; and initiate the corresponding changes (PMI 2017, p. 23).

5. **Closing Process Group** – The process (es) performed to formally complete or close a project, phase or contract (PMI 2017, p. 23).

It is important to note that the application of project management processes is integral for the development of the FGP. However, only the initiating and planning process groups will

be developed within the FGP. This is due to the short timeframe allocated for the completion of the project which does not allow for the inclusion of the execution, monitoring and control and closing processes. Figure 13 below depicts the relationship between the project knowledge areas and the project management processes.

Figure 13: Project Management Process Groups and Knowledge Area Mapping

Knowledge Areas	Project Management Process Groups				
	Initiating Process Group	Planning Process Group	Executing Process Group	Monitoring and Controlling Process Group	Closing Process Group
4. Project Integration Management	4.1 Develop Project Charter	4.2 Develop Project Management Plan	4.3 Direct and Manage Project Work 4.4 Manage Project Knowledge	4.5 Monitor and Control Project Work 4.6 Perform Integrated Change Control	4.7 Close Project or Phase
5. Project Scope Management		5.1 Plan Scope Management 5.2 Collect Requirements 5.3 Define Scope 5.4 Create WBS		5.5 Validate Scope 5.6 Control Scope	
6. Project Schedule Management		6.1 Plan Schedule Management 6.2 Define Activities 6.3 Sequence Activities 6.4 Estimate Activity Durations 6.5 Develop Schedule		6.6 Control Schedule	
7. Project Cost Management		7.1 Plan Cost Management 7.2 Estimate Costs 7.3 Determine Budget		7.4 Control Costs	
8. Project Quality Management		8.1 Plan Quality Management	8.2 Manage Quality	8.3 Control Quality	
9. Project Resource Management		9.1 Plan Resource Management 9.2 Estimate Activity Resources	9.3 Acquire Resources 9.4 Develop Team 9.5 Manage Team	9.6 Control Resources	
10. Project Communications Management		10.1 Plan Communications Management	10.2 Manage Communications	10.3 Monitor Communications	
11. Project Risk Management		11.1 Plan Risk Management 11.2 Identify Risks 11.3 Perform Qualitative Risk Analysis 11.4 Perform Quantitative Risk Analysis 11.5 Plan Risk Responses	11.6 Implement Risk Responses	11.7 Monitor Risks	
12. Project Procurement Management		12.1 Plan Procurement Management	12.2 Conduct Procurements	12.3 Control Procurements	
13. Project Stakeholder Management	13.1 Identify Stakeholders	13.2 Plan Stakeholder Engagement	13.3 Manage Stakeholder Engagement	13.4 Monitor Stakeholder Engagement	

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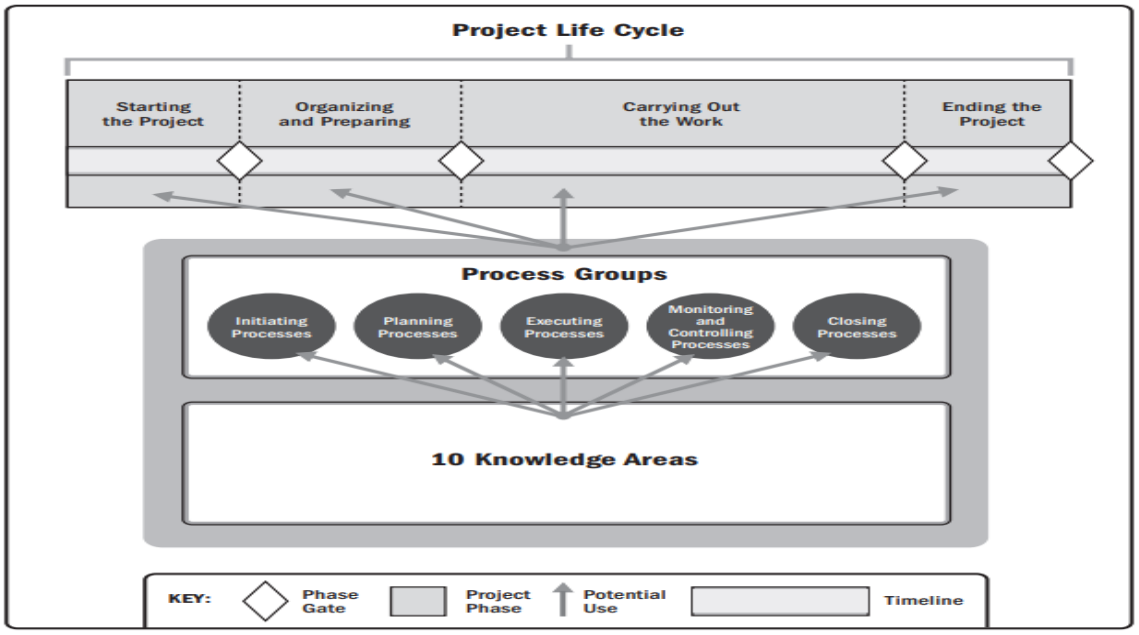
2.2.6 Project life cycle

A project life cycle is the series of phases that a project passes through from its initiation to its closure (PMI, 2017). The project life cycle can be influenced by the unique aspects of the organization, industry, development method or technology employed. According to PMI (2017), the project life cycle provides the basic framework for managing the project, regardless of the specific work involved. A typical project usually passes through the following phases: (1) Starting the project, (2) Organizing and preparing, (3) Carrying out the work and (4) Closing the project.

Figure 14: Project Life Cycle, Process Groups and Knowledge Areas



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APM Body of Knowledge (2019) defines a project management life cycle as a framework comprising a set of distinct high-level stages required to transform an idea of concept into reality in an orderly and efficient manner. Similarly, Martin (2023) defines project life cycle as a series of essential activities for accomplishing project objectives or targets. According to Martin (2023) the project life cycle entails the four (4) main phases:

1. **Project Initiation Phase** – this phase defines those processes that are required to start a new project. The purpose of the project initiation phase is to determine what the project should accomplish and is mainly composed of two main activities:

- Develop a Project Charter and
- Identify Stakeholders

All the information related to the project are entered in the Project Charter and Stakeholder Register. When the project charter is approved, the project becomes officially authorized (Martin, 2023).

2. **Planning Phase** – This phase determines the scope of the project as well as the objective of the project. It begins with the outputs of initiation phase (charter, preliminary scope statement, and project manager). The output of the planning phase serves as the input for the execution phase.

3. **Execution Phase** – This phase consists of those activities that are defined in the project management plan. This process involves managing stakeholder expectations, coordinating with people and resources, as well as performing other activities related to project deliverables. During the execution phase, the result may require re-baselining and updates

to existing project requirements. Action taken in execution phase may affect the project management plan or documents (Martin, 2023).

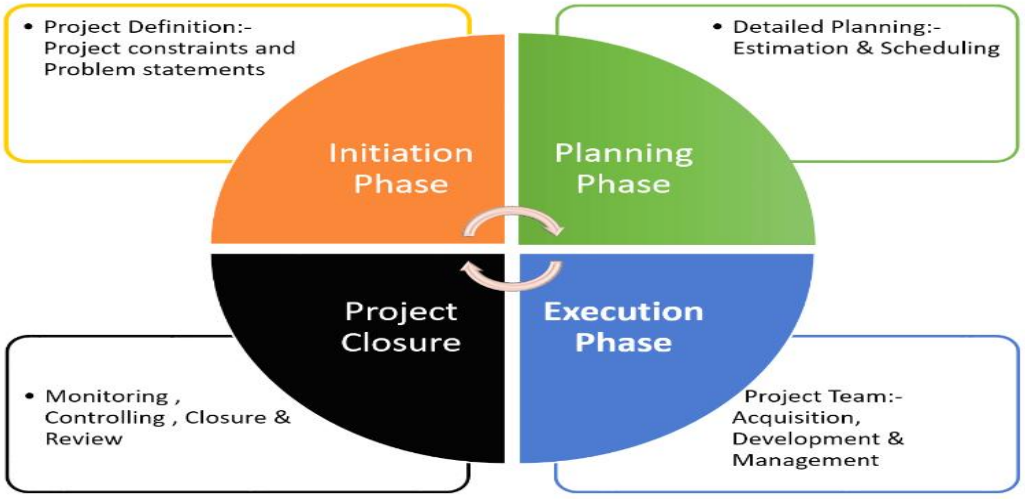
4. **Project Closure** –This phase is the stage which performs a controlled shut down of the project at the end. According to Martin (2023), in a project there are three (3) closure activities that are going on:

a) **Closure of the product** – Getting the customer to accept the final deliverables if the project is external.

b) **Closure of the project** – This include formally closing of administrative procedures, updating project documents and archiving those databases & documents.

c) **Closure of the resource behind the project** – The financial closure of the project, resources assigned to the project should be returned.

Figure 15: Phases of the Project Lifecycle



Note: Reprinted from Martin, M. (2023). Project Management Life Cycle Phases: What are the Stages? Permission not sought.

For the Supporting the Shift to Electric Mobility in Saint Lucia Project, the Renewable Energy Unit will be utilizing the above-mentioned phases:

1. Initiation (Starting the project)
2. Planning (Organizing and preparing)
3. Execution (Carrying out the work),
4. Project Closure (Closing the project.)

2.2.7 Company strategy, portfolios, programs and projects

Company Strategy

Organizational or company strategy is a result of the strategic planning cycle, where the vision and mission are translated into a strategic plan within the boundaries of the organizational values (Romano, 2014). Organizations build strategy to define how their vision will be achieved. The company creates a strategic plan which is subdivided into a set of organizational initiatives that are influenced in part by market dynamics, customer and partner requests, shareholders, government regulations, and competitor plans and actions. These initiatives may be grouped into portfolios to be executed during a predetermined period. In addition to aligning with organizational strategy, the program is formally authorized by means of the organization's initiative selection and authorization process (Romano, 2014).

According to PMI (2017), portfolios, programs and projects are aligned with or driven by organizational strategies and differ in the way each contributes to the achievement of strategic goals:

- Portfolio management aligns portfolios with organizational strategies by selecting the right programs or projects, prioritizing the work and providing the needed resources.
- Program management harmonizes its program components and controls interdependencies in order to realize specified benefits.
- Project management enables the achievement of organizational goals and objectives.

Portfolios

According to PMI (2017), a portfolio is a component collection of programs, projects or operations managed as a group to achieve strategic objectives. The portfolio components may not necessarily be interdependent or have related objectives. The portfolio components are quantifiable, that is, they can be measured, ranked and prioritized. A portfolio exists to achieve one or more organizational strategies and objectives and may consist of a set of past, current and planned or future portfolio components (Romano, 2014).

Portfolio management is defined as the centralized management of one or more portfolios to achieve strategic objectives. The programs or projects of the portfolio may not necessarily be interdependent or directly related. The aim of portfolio management is to:

- Guide organizational investment decisions.
- Select the optimal mix of programs and projects to meet strategic objectives.
- Provide decision-making transparency.
- Prioritize team and physical resource allocation.
- Increase the likelihood of realizing the desired return on investment.

- Centralize the management of the aggregate risk profile of all components.

Programs

A program component refers to projects and other programs within a program. Project management focuses on interdependencies within a project to determine the optimal approach for managing the project (PMI, 2017, p. 14). According to PMI (2017, p.14), program management focuses on the interdependencies between projects, and between projects and the program level to determine the optimal approach for managing them. Actions related to these program and project-level interdependencies may include:

- Aligning with the organizational or strategic direction that affects program and project goals and objectives.
- Allocating the program scope into program components.
- Managing interdependencies among the components of the program to best serve the program.
- Managing program risks that may impact multiple projects in the program.
- Resolving constraints and conflicts that affect multiple projects within the program.
- Resolving issues between component projects and the program level.
- Managing change requests within a shared governance framework.
- Allocating budgets across multiple projects within the program.
- Assuring benefits realization from the program and component projects

Projects

A project is defined as a temporary endeavour undertaken to create a unique product, service or result which has a beginning and an end (PMI, 2017, p.4). Projects are

progressively elaborated which means that projects consist of activities which occur in steps or phases and continues by increments. According to PMI (2017), projects consist of the following characteristics:

1. **Unique product, service or result -** Projects are undertaken to fulfil objectives by producing deliverables. An objective is defined as an outcome toward which work is to be directed, a strategic position to be attained, a purpose to be achieved, a result to be obtained, a product to be produced or a service to be performed. A deliverable is defined as any unique and verifiable product, result or capability to perform a service that is required to be produced to complete a process, phase or project.

2. Temporary Endeavour – The temporary nature of projects indicates that a project has a definite beginning and end. Temporary does not necessarily mean a project has a short duration.

3. **Projects drive Change** – From a business perspective, a project is aimed at moving an organization from one state to another state in order to achieve a specific objective. Before the project begins, the organization is commonly referred to as being in the current state. The desired result of the change driven by the project is described as the future state.

4. **Projects Enable Business Value Creation** – PMI defines business value as the net quantifiable benefit derived from a business endeavour. The benefit may be tangible, intangible or both. In business analysis, business value is considered the return, in the form of elements such as time, money, goods or intangibles in return for something exchanged. Figure 16 illustrates a comparative overview of Portfolios, Programs and Projects

Figure 16: Comparative Overview of Projects, Programs and Portfolios

Organizational Project Management			
	Projects	**Programs**	**Portfolios**
Definition	A project is a temporary endeavor undertaken to create a unique product, service, or result.	A program is a group of related projects, subsidiary programs, and program activities that are managed in a coordinated manner to obtain benefits not available from managing them individually.	A portfolio is a collection of projects, programs, subsidiary portfolios, and operations managed as a group to achieve strategic objectives.
Scope	Projects have defined objectives. Scope is progressively elaborated throughout the project life cycle.	Programs have a scope that encompasses the scopes of its program components. Programs produce benefits to an organization by ensuring that the outputs and outcomes of program components are delivered in a coordinated and complementary manner.	Portfolios have an organizational scope that changes with the strategic objectives of the organization.
Change	Project managers expect change and implement processes to keep change managed and controlled.	Programs are managed in a manner that accepts and adapts to change as necessary to optimize the delivery of benefits as the program's components deliver outcomes and/or outputs.	Portfolio managers continuously monitor changes in the broader internal and external environments.
Planning	Project managers progressively elaborate high-level information into detailed plans throughout the project life cycle.	Programs are managed using high-level plans that track the interdependencies and progress of program components. Program plans are also used to guide planning at the component level.	Portfolio managers create and maintain necessary processes and communication relative to the aggregate portfolio.
Management	Project managers manage the project team to meet the project objectives.	Programs are managed by program managers who ensure that program benefits are delivered as expected, by coordinating the activities of a program's components.	Portfolio managers may manage or coordinate portfolio management staff, or program and project staff that may have reporting responsibilities into the aggregate portfolio.
Monitoring	Project managers monitor and control the work of producing the products, services, or results that the project was undertaken to produce.	Program managers monitor the progress of program components to ensure the overall goals, schedules, budget, and benefits of the program will be met.	Portfolio managers monitor strategic changes and aggregate resource allocation, performance results, and risk of the portfolio.
Success	Success is measured by product and project quality, timeliness, budget compliance, and degree of customer satisfaction.	A program's success is measured by the program's ability to deliver its intended benefits to an organization, and by the program's efficiency and effectiveness in delivering those benefits.	Success is measured in terms of the aggregate investment performance and benefit realization of the portfolio.

Note: Reprinted from A Guide to the Project Management Body of Knowledge (PMBOK® Guide) Sixth Edition. Project Management Institute (PMI), 2017 Table 1- 2, p. 13

Based on the concepts identified above, it should be noted that the Renewable Energy Unit has a company strategy which includes a mission and vision statement. Additionally,

portfolios and programs do not apply to the department. The department is primarily responsible for the initiation and execution of projects.

2.3 Other applicable theory/concepts related to the project topic and context

2.3.1 Current situation of the problem or opportunity in study

Saint Lucia is heavily dependent on fossil fuel imports and the island's dependency on diesel-generated electricity results in increasing greenhouse gas (GHG) emissions from the electricity generation sub-sector, with it being responsible for close to 39% of total national GHG emissions. According to the Global Environment Fund (GEF) (2023), the Government of Saint Lucia conducted research on the feasibility of electric mobility in Saint Lucia and discovered the following barriers:

1. Fragmented institutions with insufficient coordination, planning and technical capacities.
2. Insufficient knowledge of the potential of electric mobility in passenger transport.
3. Policies and regulations are unsuited to e-mobility, leading to a mobility market dominated by high-carbon solutions.
4. Insufficient development of end-of-life vehicle (ELV) management systems, to which electric vehicles would put additional pressure to deal with batteries and other potentially hazardous components.

Based on the above-mentioned barriers, the Renewable Energy Unit identified the need to implement the Supporting the Shift to Electric Mobility Project where the main objective is to accelerate the introduction of electric mobility in Saint Lucia through capacity-building and electric vehicle demonstration and to prepare the country for scaling-up and replication

through the development of electric mobility policies, business models and finance schemes. To date, the project was divided into four (4) components. Component 1: Institutionalization of low-carbon electric mobility which addresses the existing institutional barriers that restrict the introduction of EVs in Saint Lucia, with a focus on private and public fleets, public transport and taxis; Component 2: Short term barrier removal through low-carbon e-mobility demonstrations which intends to provide first-hand evidence to fleet managers, government socials, key transport stakeholders and the general public about the performance of electric vehicles in the particular context of Saint Lucia; Component 3: Preparing for scale-up and replication of low-carbon electric mobility which seeks to provide the enabling conditions for the broad and long-term deployment of electric vehicles, by building upon the favourable institutional framework developed under Component 1 and the evidence provided by Component 2; Component 4: Long-term environmental sustainability of low-carbon electric mobility which this component addresses these challenges so that the ELV management system in the island is strengthened, the necessary burden is fairly shared by car-dealers and importers, and batteries and other EV components are managed following international best practice.

It is important to note that for previous projects, the Renewable Energy Unit did not utilize an integrated project management plan. As a result of this and due to the major investment by the Global Environment Fund (GEF), an integrated project management plan will be developed by the student to assist in completing the project successfully. The project management plan will be a comprehensive plan which addresses the ten knowledge areas

and will provide a framework for the successful implementation of electric mobility in Saint Lucia.

2.3.2 Previous research done for the topic in study

In 2018, Fontenelle (2018) conducted research at the Renewable Energy Unit on the implementation of a Project Management Plan on the Environmental and Social Impact of Geothermal Energy Development in Saint Lucia. Based on her conclusions and recommendations she recommended that the Renewable Energy Unit utilize the templates and tools provided in the project management plan.

Due to the establishment of the most recent PMBOK Guide seventh edition in 2021, this FGP will utilize the latest theories and templates for the project and will also incorporate the templates from the PMBOK Guide sixth edition which was utilized by Fontenelle.

2.3.3 Other theory related to the topic in study

2.3.1.1.1 Sustainability

Sustainability means meeting our own needs without compromising the ability of future generations to meet their own needs (McGill University, n.d.). According to McGill University (n.d.), sustainability is a holistic approach that considers ecological, social and economic dimensions, recognizing that all must be considered together to find lasting prosperity. Sustainability consists of three (3) essential pillars, namely, environmental sustainability, social sustainability and economic sustainability.

Environmental sustainability means that ecological integrity is maintained, all of earth's environmental systems are kept in balance while natural resources within them are consumed by humans at a rate where they are able to replenish themselves (McGill University, n.d.).

Factors such as environmental conservation, a commitment to renewable energy, saving water, incentivizing mobility, sustainable fashion, innovation in construction and sustainable architecture, all contribute to achieving environmental sustainability from various angles (Acciona, 2019).

Economic sustainability means that human communities across the globe are able to maintain their independence and have access to the resources that they require, financial and other, to meet their needs. Economic systems are intact, and activities are available to everyone, such as secure sources of livelihood (McGill University, n.d.). According to Acciona (2019), this pillar includes various activities such as finance, agriculture, tourism, etc. Investment, and equal distribution of economic resources, will allow development under the other sustainability pillars to be maximized across the board.

Social sustainability means that universal human rights and basic necessities are attainable by all people, who have access to enough resources in order to keep their families and communities healthy and secure. According to McGill University (n.d.), healthy communities have just leaders who ensure personal, labour and cultural rights are respected and all people are protected from discrimination. Acciona (2019) stated that at the social level, sustainability promotes social development, while seeking cohesion among communities and cultures to reach satisfactory levels of quality of life, healthcare, and education.

2.3.1.1.2 Electric Mobility

Electric mobility utilizes one or more electric motors to generate transportation. Currently, in developed and some developing countries, this type of mobility offers solutions for small

trips and low weight (with bicycles, scooters, and electric motorcycles) as well as long trips and heavy weight (with electric public transport vehicles) (Enel, n.d.).

One of the main advantages of electric mobility is that it improves people's quality of life by not emitting toxic gases. Furthermore, as electric vehicles do not have combustion engines, they avoid the emission of tonnes of greenhouse gases, which in turn helps to combat the effects of climate change. Thus, it is essential to achieve sustainable mobility which obtains increasing support around the world through public policies related to the electrification of urban public transport, changes in tax policies, creation of regulatory frameworks to regulate it and even its integration in projected urban infrastructures.

It is important to note that this technology is constantly evolving, making electric mobility increasingly efficient and creating new uses for it; lorries, aircraft and electric boats that are in an experimental phase would mark the beginning of the electrification of all mobility (Enel, n.d.).

According to World Bank Group (2018), electric mobility is fundamentally changing the traditional interaction between technology, market dynamics, production capacity, government policy, supply chains, manufacturing and complex political economy. World Bank Group (2018) stated that there is potential for governments at all levels of capacity to engage with electric mobility and engaging different stakeholder groups proactively and continuously is a key element in the success of electric mobility programs.

3 METHODOLOGICAL FRAMEWORK

Chapter 3 examines the methodological framework of this Final Graduation Project. The information sources for the project which includes primary and secondary sources are described. Secondly, the research method techniques utilized for the FGP which includes analytical research method, qualitative research method and quantitative research method are outlined and explained. Thirdly, the tools which were utilized in the development of the FGP are outlined and briefly described. Additionally, this section highlighted the assumptions and constraints for this FGP. Finally, this Chapter outlines eleven (11) deliverables which are linked to each specific objective for the FGP.

3.1 Information sources

Information sources refers to the various means by which information is recorded for use by an individual or an organization. It is the means by which a person is informed about something, or knowledge is availed to someone, a group of people or an organization (Ajuwon, 2011).

Information can be generated from several sources can be obtained from personal experiences, books, articles, expert opinions, encyclopaedias, the internet, etc. It can be in print, non-print and electronic media or formats. The type of information required will change depending on its application. According to University of California, Merced (2022), information sources can be categorized into three (3) categories, namely: (1) Primary, (2) Secondary and (3) Tertiary. Primary and Secondary sources will be utilized for the development of this FGP.

3.1.1 Primary sources

Primary sources of information are first-hand observations or direct evidence concerning a topic under investigation (University of California, Merced, 2022). According to University of California, Merced (2022), examples of primary sources include but are not limited to: eyewitness accounts, journalistic reports, financial reports, government documents, archaeological and biological evidence, court records, original research ephemerals (posters, handbills), literary manuscript, datasets, survey data such as such as census or economic statistics, photographs, video recordings, audio recordings, speeches, email communication, diaries, letters and interviews.

For the purpose of this FGP, the following primary sources will be utilized:

- Reports prepared by Ministry of Infrastructure Ports, Transport, Physical Development and Urban Renewal - Renewable Energy Unit on Supporting the Shift to Electric Mobility in Saint Lucia Project
- Global Environment Facility (GEF) Reports on Supporting the Shift to Electric Mobility in Saint Lucia Project
- World Bank Reports on Electric Mobility and Development
- Meetings, email communication and interviews with staff members from Renewable Energy Unit

3.1.2 Secondary sources

Secondary sources are works that describe, analyze, interpret, evaluate, comment on and discuss the evidence provided by primary sources, a historical event, era or phenomenon (Ajuwon, 2011). They may use primary sources to write a review, critique or interpretation

often well after the event (University of California, Merced, 2022). According to Ajuwon (2011), some examples of secondary sources include but are not limited to: biographies, encyclopaedias, dictionaries, handbooks, textbooks and monographs on a topic, journals, articles, such as literature reviews, commentaries, research articles in all subject disciplines and criticism of works of literature, art and music.

For the purpose of this FGP, the following secondary sources will be utilized:

- Project Management Body of Knowledge (PMBOK) Guide 7th Edition
- Project Management Body of Knowledge (PMBOK) Guide 6th Edition
- Program Management Institute. (PMI) Practice Standard for Scheduling - Third Edition.
- Sustainable Project Management: The GPM Reference Guide
- Project Management Institute (PMI) Database
- Ministry of Infrastructure Ports, Transport, Physical Development and Urban Renewal Website
- Global Environment Facility (GEF) Website
- Internet

Chart 1: Information Sources

Objectives	**Information sources**	
	Primary	**Secondary**
1. To create a Project Charter to describe the project's components, rationale, key stakeholders, resources, and other project	• Reports prepared by Ministry of Infrastructure Ports, Transport, Physical Development and	• PMBOK Guide 7th Edition • PMBOK Guide 6th Edition • Project Management Institute (PMI) Database

Objectives	Information sources	
	Primary	**Secondary**
management activities and requirements.	Urban Renewal - Renewable Energy Unit • Global Environment Facility (GEF) Reports • World Bank Reports • Meetings, email communication and interviews with staff members from Renewable Energy Unit	• Ministry of Infrastructure Ports, Transport, Physical Development and Urban Renewal Website • Global Environment Facility (GEF) Website • Internet
2. To create a Scope Management Plan to ensure that all work required is included to successfully complete the project.	• Reports prepared by Ministry of Infrastructure Ports, Transport, Physical Development and Urban Renewal - Renewable Energy Unit • Global Environment Facility (GEF) Reports • Meetings, email communication and interviews with staff members from Renewable Energy Unit	• PMBOK Guide 7th Edition • PMBOK Guide 6th Edition • Project Management Institute (PMI) Database • Ministry of Infrastructure Ports, Transport, Physical Development and Urban Renewal Website • Global Environment Facility (GEF) Website • Internet
3. To create a Schedule Management Plan to ensure that the project is completed on time.	• Reports prepared by Ministry of Infrastructure Ports, Transport, Physical Development and	• PMBOK Guide 7th Edition • PMBOK Guide 6th Edition • Project Management Institute (PMI) Database

Objectives	Information sources	
	Primary	**Secondary**
	Urban Renewal - Renewable Energy Unit • Global Environment Facility (GEF) Reports • Meetings, email communication and interviews with staff members from Renewable Energy Unit	• Program Management Institute - Practice Standard for Scheduling 3rd Edition • Ministry of Infrastructure Ports, Transport, Physical Development and Urban Renewal Website • Global Environment Facility (GEF) Website • Internet
4. To develop a Cost Management Plan to ensure that the project is successfully completed within the approved budget.	• Reports prepared by Ministry of Infrastructure Ports, Transport, Physical Development and Urban Renewal - Renewable Energy Unit • Global Environment Facility (GEF) Reports • Meetings, email communication and interviews with staff members from Renewable Energy Unit	• PMBOK Guide 7th Edition • PMBOK Guide 6th Edition • Project Management Institute (PMI) Database • Ministry of Infrastructure Ports, Transport, Physical Development and Urban Renewal Website • Global Environment Facility (GEF) Website • Internet
5. To create a Quality Management Plan to identify the quality requirements and to describe how quality will be managed throughout the project's lifecycle in order to ensure that results	• Reports prepared by Ministry of Infrastructure Ports, Transport, Physical Development and Urban Renewal -	• PMBOK Guide 7th Edition • PMBOK Guide 6th Edition • Project Management Institute (PMI) Database • Ministry of Infrastructure Ports, Transport,

Objectives	Information sources	
	Primary	**Secondary**
meet the stakeholders' expectations.	Renewable Energy Unit • Global Environment Facility (GEF) Reports • Meetings, email communication and interviews with staff members from Renewable Energy Unit	Physical Development and Urban Renewal Website • Global Environment Facility (GEF) Website • Internet
6. To generate a Resource Management Plan to identify, acquire and manage the necessary resources (physical and human) effectively, in order to successfully complete the project within time, scope and cost constraints.	• Reports prepared by Ministry of Infrastructure Ports, Transport, Physical Development and Urban Renewal - Renewable Energy Unit • Global Environment Facility (GEF) Reports • Meetings, email communication and interviews with staff members from Renewable Energy Unit	• PMBOK Guide 7th Edition • PMBOK Guide 6th Edition • Project Management Institute (PMI) Database • Ministry of Infrastructure Ports, Transport, Physical Development and Urban Renewal Website • Global Environment Facility (GEF) Website • Internet
7. To develop a Communications Management Plan to ensure effective and timely communication of the project's information to the project management team and stakeholders.	• Reports prepared by Ministry of Infrastructure Ports, Transport, Physical Development and Urban Renewal - Renewable Energy Unit	• PMBOK Guide 7th Edition • PMBOK Guide 6th Edition • Project Management Institute (PMI) Database • Ministry of Infrastructure Ports, Transport, Physical Development

Objectives	Information sources	
	Primary	**Secondary**
	• Global Environment Facility (GEF) Reports • Meetings, email communication and interviews with staff members from Renewable Energy Unit	and Urban Renewal Website • Global Environment Facility (GEF) Website • Internet
8. To create a Risk Management Plan to outline the project's risk management approach by identifying, categorizing, analyzing, and responding effectively to potential project risks.	• Reports prepared by Ministry of Infrastructure Ports, Transport, Physical Development and Urban Renewal - Renewable Energy Unit • Global Environment Facility (GEF) Reports • Meetings, email communication and interviews with staff members from Renewable Energy Unit	• PMBOK Guide 7th Edition • PMBOK Guide 6th Edition • Project Management Institute (PMI) Database • Ministry of Infrastructure Ports, Transport, Physical Development and Urban Renewal Website • Global Environment Facility (GEF) Website • Internet
9. To generate a Procurement Management Plan to manage the purchase of materials, and acquisition of services or results required for the project.	• Reports prepared by Ministry of Infrastructure Ports, Transport, Physical Development and Urban Renewal - Renewable Energy Unit • Global Environment	• PMBOK Guide 7th Edition • PMBOK Guide 6th Edition • Project Management Institute (PMI) Database • Ministry of Infrastructure Ports, Transport, Physical Development and Urban Renewal Website

Objectives	Information sources	
	Primary	**Secondary**
	Facility (GEF) Reports • Meetings, email communication and interviews with staff members from Renewable Energy Unit	• Global Environment Facility (GEF) Website • Internet
10. To develop a Stakeholder Management Plan to identify, categorize and support stakeholders by developing suitable engagement strategies to ensure effective stakeholder engagement.	• Reports prepared by Ministry of Infrastructure Ports, Transport, Physical Development and Urban Renewal - Renewable Energy Unit • Global Environment Facility (GEF) Reports • Meetings, email communication and interviews with staff members from Renewable Energy Unit	• PMBOK Guide 7th Edition • PMBOK Guide 6th Edition • Project Management Institute (PMI) Database • Ministry of Infrastructure Ports, Transport, Physical Development and Urban Renewal Website • Global Environment Facility (GEF) Website • Internet
11. To determine the relationship and impact of the project's execution and its end product on regenerative and sustainable development.	• Reports prepared by Ministry of Infrastructure Ports, Transport, Physical Development and Urban Renewal - Renewable Energy Unit • Meetings, email communication and interviews with staff members from	• PMBOK Guide 6th Edition • Sustainable Project Management: The GPM Reference Guide • Internet

Objectives	Information sources	
	Primary	Secondary
	Renewable Energy Unit	

Note: Own Work.

3.2 Research methods

Research methods are the strategies, processes or techniques utilized in the collection of data or evidence for analysis in order to uncover new information or create better understanding of a topic (University of Newcastle Library, 2023). Tiffin University (2022) defines research methods as the ways in which persons collect data for a research project. For the purpose of this FGP, three (3) research method techniques will be utilized to achieve the objectives of the Project Management Plan, namely, (1) Analytical Research Method, (2) Qualitative Research Method and (3) Quantitative Research Method

3.2.1 Analytical Research Method

Analytical research is a specific type of research that involves critical thinking skills and the evaluation of facts and information relative to the research being conducted (Mohanlal Sukhadia University, n.d.).

3.2.2 Qualitative Research Method

Friese & Sybing (2023) describes qualitative research as a" type of research method which involves looking in-depth at non-numerical data, organizing the data, and analyzing the data in a way that provides in-depth insights into the concepts under study. This type of research typically involves in-depth interviews, focus groups or observations in order to collect data that is rich in detail and context.

3.2.3 Quantitative Research Method

According to University of Southern California (2023) as cited in Babbie (2010), "quantitative methods emphasize objective measurements and the statistical, mathematical, or numerical analysis of data collected through polls, questionnaires and surveys, or by manipulating pre-existing statistical data using computational techniques". Quantitative research focuses on gathering numerical data and generalizing it across groups of people or to explain a particular phenomenon (University of Southern California, 2023).

Chart 2: Research Methods

Objectives	**Research methods**		
	Analytical Research Method	**Qualitative Research Method**	**Quantitative Research Method**
1. To create a Project Charter to describe the project's components, rationale, key stakeholders, resources and other project management activities and requirements.	This research method will apply critical-thinking skills to examine and analyze the facts and information from the primary and secondary sources previously identified in Chart 1 to create the Project Charter.	This method will provide in-depth insight relating to the major components of this knowledge area and will collect and interpret data gathered from interviews and reports to create the Project Charter.	
2. To create a Scope Management Plan to ensure that all work required is included to successfully complete the project.	This method provides for the application of critical-thinking skills to examine and analyze the facts and information from the primary and secondary sources previously identified in Chart 1 to create the Scope Management Plan.	This method will provide in-depth insight relating to the major components of this knowledge area and will collect and interpret data gathered from interviews and reports to create the Scope Management Plan.	

Objectives	Research methods		
	Analytical Research Method	**Qualitative Research Method**	**Quantitative Research Method**
3. To create a Schedule Management Plan to ensure that the project is completed on time.	This method provides for the application of critical-thinking skills to examine and analyze the facts and information from the primary and secondary sources previously identified in Chart 1 to create the Schedule Management Plan.	This method will provide in-depth insight relating to the major components of this knowledge area and will collect and interpret data gathered from interviews and reports to create the Schedule Management Plan.	This research method will utilize numerical type data to determine cost estimations and reserve analysis.
4. To develop a Cost Management Plan to ensure that the project is successfully completed within the approved budget.	This method provides for the application of critical-thinking skills to examine and analyze the facts and information from the primary and secondary sources previously identified in Chart 1 to develop the Cost Management Plan.	This method will provide in-depth insight relating to the major components of this knowledge area and will collect and interpret data gathered from interviews and reports to develop the Cost Management Plan.	This research method will utilize numerical type data to determine cost estimations and reserve analysis.
5. To create a Quality Management Plan to identify the quality requirements and to describe how quality will be managed throughout the project's lifecycle in order to ensure that results meet the stakeholders' expectations.	This method provides for the application of critical-thinking skills to examine and analyze the facts and information from the primary and secondary sources previously identified in Chart 1 to create the Quality Management Plan.	This method will provide in-depth insight relating to the major components of this knowledge area and will collect and interpret data gathered from interviews and reports to create the Quality Management Plan.	
6. To generate a Resource Management Plan to identify, acquire and manage	This method provides for the application of critical-thinking skills to examine and analyze	This method will provide in-depth insight relating to the major components of this	

Objectives	Research methods		
	Analytical Research Method	**Qualitative Research Method**	**Quantitative Research Method**
the necessary resources (physical and human) effectively, in order to successfully complete the project within time, scope and cost constraints.	the facts and information from the primary and secondary sources previously identified in Chart 1 to generate the Resource Management Plan.	knowledge area and will collect and interpret data gathered from interviews and reports to generate the Resource Management Plan.	
7. To develop a Communications Management Plan to ensure effective and timely communication of the project's information to the project management team and stakeholders.	This method provides for the application of critical-thinking skills to examine and analyze the facts and information from the primary and secondary sources previously identified in Chart 1 to develop the Communications Management Plan.	This method will provide in-depth insight relating to the major components of this knowledge area and will collect and interpret data gathered from interviews and reports to develop the Communications Management Plan.	
8. To create a Risk Management Plan to outline the project's risk management approach by identifying, categorizing, analyzing and responding effectively to potential project risks.	This method provides for the application of critical-thinking skills to examine and analyze the facts and information from the primary and secondary sources previously identified in Chart 1 to create the Risk Management Plan.	This method will provide in-depth insight relating to the major components of this knowledge area and will collect and interpret data gathered from interviews and reports to create the Risk Management Plan.	
9. To generate a Procurement Management Plan to manage the purchase of materials, and acquisition of services or results required for the project.	This method provides for the application of critical-thinking skills to examine and analyze the facts and information from the primary and secondary sources previously	This method will provide in-depth insight relating to the major components of this knowledge area and will collect and interpret data gathered from interviews and	

Objectives	Research methods		
	Analytical Research Method	**Qualitative Research Method**	**Quantitative Research Method**
	identified in Chart 1 to generate the Procurement Management Plan.	reports to generate the Procurement Management Plan.	
10. To develop a Stakeholder Management Plan to identify, categorize and support stakeholders by developing suitable engagement strategies to ensure effective stakeholder engagement.	This method provides for the application of critical-thinking skills to examine and analyze the facts and information from the primary and secondary sources previously identified in Chart 1 to develop the Stakeholder Management Plan.	This method will provide in-depth insight relating to the major components of this knowledge area and will collect and interpret data gathered from interviews and reports to create the Stakeholder Management Plan.	
11. To determine the relationship and impact of the project's execution and its end product on regenerative and sustainable development.	This method provides for the application of critical-thinking skills to examine and analyze the facts and information from the primary and secondary sources previously identified in Chart 1 to determine the impact of the project's execution and its end-product on regenerative and sustainable development.	This method will provide in-depth insight relating to regenerative and sustainable development and will collect and interpret data gathered from interviews and reports to determine the impact of the project's execution and its end product on regenerative and sustainable development.	

Note. Own Work.

3.3 Tools

According to PMI (2017, p.725), a tool is defined as "something tangible, such as a template or software program, used in performing an activity to produce a product or result". For the development of the FGP, the following tools will be utilized:

1. **Expert Judgment** – Judgment provided based upon expertise in an application area, knowledge area, discipline or industry as appropriate for the activity being performed (PMI, 2017, p.706). For this FGP, expertise will be provided by individuals with specialized education, knowledge, skills, experience and training in specific project management knowledge areas.

2. **Data Gathering Techniques** – These are techniques utilized to organize, assess, and evaluate data and information (PMI, 2017, p.704).

a) **Brainstorming** – The PMBOK defines brainstorming as "A general data gathering and creativity technique that can be utilized to identify risks, ideas, or solutions to issues by using a group of team members or subject-matter experts. Typically, a brainstorming session is structured so that each participant's ideas are recorded for later analysis".

b) **Interviews** – A formal or informal approach to elicit information from stakeholders by talking to them directly (PMI, 2017, 209).

3. **Meetings** – Meetings are discussions held in order to communicate with individuals or groups.

4. **Decomposition** – Decomposition refers to a technique used for dividing and sub-dividing the project scope and project deliverables into smaller, more manageable parts (PMI, 704).

5. **Reserve Analysis** – According to PMI (2017, p. 719), reserve analysis refers to an analytical technique to determine the essential features and relationships of components in the project management plan to establish a reserve for the schedule duration, budget, estimated cost, or funds for a project.

7. **Parametric Estimating** – This is an estimating technique in which an algorithm is used to calculate cost or duration based on historical data and project parameters (PMI, 2017, 712).

8. **Analogous Estimating** – This is an estimating technique where the duration or cost of an activity or a project is estimated by using historical data from a similar activity or project (PMI, 2017, p. 699).

9. **Three-Point Estimating** – This estimating technique is used to estimate cost or duration by applying an average or weighted average of optimistic, pessimistic, and most likely estimates when there is uncertainty with the individual activity estimates (PMI, 2017, p. 724).

10. **Bottom-up Estimating –** This estimating method is used to estimate project duration or cost by aggregating the estimates of the lower-level components of the work breakdown structure (WBS) (PMI, 2017, p. 700).

Chart 3: Tools

Objectives	**Tools**
1. To create a Project Charter to describe the project's components, rationale, key stakeholders, resources and other project management activities and requirements.	• Expert Judgment • Data Gathering Techniques including Brainstorming and Interviews • Meetings

Objectives	Tools
2. To create a Scope Management Plan to ensure that all work required is included to successfully complete the project.	• Expert Judgment • Data Gathering Techniques including Brainstorming and Interviews • Meetings • Decomposition
3. To create a Schedule Management Plan to ensure that the project is completed on time.	• Expert Judgment • Meetings • Decomposition • Reserve Analysis • Parametric Estimating • Analogous Estimating • Three-Point Estimating
4. To develop a Cost Management Plan to ensure that the project is successfully completed within the approved budget.	• Expert judgment • Meetings • Analogous estimating • Parametric estimating • Bottom-up estimating • Three-Point estimating • Reserve analysis
5. To create a Quality Management Plan to identify the quality requirements and to describe how quality will be managed throughout the project's lifecycle in order to ensure that results meet the stakeholders' expectations.	• Expert Judgment • Benchmarking • Brainstorming • Interviews
6. To generate a Resource Management Plan to identify, acquire and manage the necessary resources (physical and human) effectively, in order to successfully complete the project within time, scope and cost constraints.	• Expert Judgment • Data Gathering Techniques: Hierarchical Charts • Meetings
7. To develop a Communications Management Plan to ensure effective and timely communication of the project's information to the project management team and stakeholders.	• Communication Model • Communication Method • Meetings
8. To create a Risk Management Plan to outline the project's risk management	• Expert Judgment • Stakeholder Analysis

Objectives	Tools
approach by identifying, categorizing, analyzing and responding effectively to potential project risks.	• Brainstorming • Interviews • SWOT Analysis
9. To generate a Procurement Management Plan to manage the purchase of materials and acquisition of services or results required for the project.	• Expert Judgment • Source Selection Analysis • Meetings • Advertising • Interpersonal and Team Skills • Inspection • Audit
10. To develop a Stakeholder Management Plan to identify, categorize and support stakeholders by developing suitable engagement strategies to ensure effective stakeholder engagement.	• Expert Judgment • Brainstorming • Stakeholder Analysis • Power/Interest Grid • Communication Skills • Interpersonal and Team Skills • Meetings
11. To determine the relationship and impact of the project's execution and its end product on regenerative and sustainable development.	• Interviews • Meetings

Note: Own Work.

3.4 Assumptions and constraints

PMI (2017, p.699) describes assumptions as "a factor in the planning process that is considered to be true, real, or certain, without proof or demonstration". Assumptions can be false and may negatively affect a project, adding risk to the project (Usmani, 2021). On the other hand, a constraint is defined by PMI (2017, p.701) as "a limiting factor which affects the execution of a project, program, portfolio or process. It is important to note that there will be assumptions and constraints for the development of the FGP. Assumptions for the FGP will be expected by the researcher during the project's lifecycle. Constraints for the FGP may be related to the triple constraints (scope, time, and cost), quality and risk.

The **assumptions** for the development of the FGP are:

1. The project charter will be developed prior to other subsidiary plans.

2. Information will be readily available for the development of the scope management plan.

3. The project will be completed within the stipulated time frame.

4. The project will be completed within budget.

5. Information will be readily available and will identify the quality requirements for the development of the quality management plan.

6. There are available human resources with the relevant expertise to manage the project.

7. The communication methods utilized will effectively convey information and communication needs to stakeholder to ensure appropriate stakeholder engagement.

8. The Scope Management Plan will provide sufficient information to identify and analyze the overall risks of the project.

9. All resources required for the project will be procured in a timely manner.

10. The stakeholder register will identify all stakeholders and their level of interest and power over the project.

11. Information will be readily available to determine the relationship and impact of the project's execution and its end-product on regenerative and sustainable development.

The **constraints** for the development of the FGP are:

1. Limited timeframe for the development of the project charter.

2. The scope requirements may change as the project progresses.

3. The project must be completed within the allocated time frame.

4. The project must be executed and completed within the established cost.

5. The project must satisfy the required or certain quality standards.

6. The available human resources with the relevant expertise may be insufficient to execute the project.

7. Limitation or disruptions in communications technology may affect the ability to effectively communicate and engage stakeholders.

8. All project risks to be identified in the project planning stage.

9. Items required may not readily be available for procurement.

10. Stakeholder's level of interest or power may change as the project progresses.

11. Limited information may be available.

Chart 4: Assumptions and Constraints

Objectives	**Assumptions**	**Constraints**
1. To create a Project Charter to describe the project's components, rationale, key stakeholders, resources and other project management activities and requirements.	The project charter will be developed prior to other subsidiary plans.	Limited timeframe for the development of the project charter.
2. To create a Scope Management Plan to ensure that all work required is included to successfully complete the project.	Information will be readily available for the development of the scope management plan.	The scope requirements may change as the project progresses.
3. To create a Schedule Management Plan to ensure that the project is completed on time.	The project will be completed within the stipulated time frame.	The project must be completed within the allocated time frame.
4. To develop a Cost Management Plan to ensure that the project is successfully completed within the approved budget.	The project will be completed within budget.	The project must be executed and completed within the established cost.
5. To create a Quality Management Plan to identify the quality requirements and to	Information will be readily available and	The project must satisfy the required

Objectives	Assumptions	Constraints
describe how quality will be managed throughout the project's lifecycle in order to ensure that results meet the stakeholders' expectations.	will identify the quality requirements for the development of the quality management plan.	or certain quality standards.
6. To generate a Resource Management Plan to identify, acquire and manage the necessary resources (physical and human) effectively, in order to successfully complete the project within time, scope and cost constraints.	There are available human resources with the relevant expertise to manage the project.	The available human resources with the relevant expertise may be insufficient to execute the project.
7. To develop a Communications Management Plan to ensure effective and timely communication of the project's information to the project management team and stakeholders.	The communication methods utilized will effectively convey information and communication needs to stakeholder to ensure appropriate stakeholder engagement.	Limitation or disruptions in communications technology may affect the ability to effectively communicate and engage stakeholders.
8. To create a Risk Management Plan to outline the project's risk management approach by identifying, categorizing, analyzing and responding effectively to potential project risks.	The Scope Management Plan will provide sufficient information to identify and analyze the overall risks of the project.	All project risks to be identified in the project planning stage.
9. To generate a Procurement Management Plan to manage the purchase of materials, and acquisition of services or results required for the project.	All resources required for the project will be procured in a timely manner.	Items required may not readily be available for procurement.
10. To develop a Stakeholder Management Plan to identify, categorize and support stakeholders by developing suitable engagement strategies to ensure effective stakeholder engagement.	The stakeholder register will identify all stakeholders and their level of interest and power over the project.	Stakeholder's level of interest or power may change as the project progresses.

Objectives	Assumptions	Constraints
11. To determine the relationship and impact of the project's execution and its end product on regenerative and sustainable development.	Information will be readily available to determine the relationship and impact of the project's execution and its end product on regenerative and sustainable development.	Limited information may be available

Note: Own Work.

3.5 Deliverables

PMI (2017, p.704) defines deliverable as any verifiable product, result or capability to perform a service that is required to be produced to complete a process, phase, or project. Wrike (2023) defines a deliverable as an element of output within the scope of a project. It is the result of objective-focused work completed within the project process.

To help achieve the objectives of the FGP, the following deliverables will be produced:

1. Project Charter
2. Scope Management Plan
3. Schedule Management Plan
4. Cost Management Plan
5. Quality Management Plan
6. Resource Management Plan
7. Communications Management Plan
8. Risk Management Plan
9. Procurement Management Plan

10. Stakeholder Management Plan

Chart 5: Deliverables

Objectives	**Deliverables**
1. To create a Project Charter to describe the project's components, rationale, key stakeholders, resources and other project management activities and requirements.	**Project Charter:** This plan formally authorizes the project and provides the project manager with the authority to apply organizational resources to the project's activities.
2. To create a Scope Management Plan to ensure that all work required is included to successfully complete the project.	**Scope Management Plan:** This plan will document how the project scope will be defined, validated and controlled as well as how the project's schedule will be developed.
3. To create a Schedule Management Plan to ensure that the project is completed on time.	**Schedule Management Plan:** This plan will establish the criteria and the activities for developing, monitoring and controlling the schedule.
4. To develop a Cost Management Plan to ensure that the project is successfully completed within the approved budget.	**Cost Management Plan:** This plan will outline how the project's costs will be planned, structured and controlled.
5. To create a Quality Management Plan to identify the quality requirements and to describe how quality will be managed throughout the project's lifecycle in order to ensure that results meet the stakeholders' expectations.	**Quality Management Plan:** This plan will outline how applicable policies, procedures and guidelines will be implemented to achieve quality objectives for the project.
6. To generate a Resource Management Plan to identify, acquire and manage the necessary resources (physical and human) effectively, in order to successfully complete the project within time, scope and cost constraints.	**Resource Management Plan:** This plan will provide guidance relating to the categorization, allocation, management, and finally release of the project's resources.
7. To develop a Communications Management Plan to ensure effective and timely communication of the project's information to the project management team and stakeholders.	**Communications Management Plan:** This plan will provide information on how the project's communications will be planned, structured, implemented and monitored for effectiveness.

Objectives	Deliverables
8. To create a Risk Management Plan to outline the project's risk management approach by identifying, categorizing, analyzing and responding effectively to potential project risks.	**Risk Management Plan:** This plan will provide information on risk-related roles and responsibilities, indicate how risk management activities are included in the budget and schedule and describe categories of risk expressed in a risk breakdown structure. **Risk Register:** This document provides information on the identified risks of the project.
9. To generate a Procurement Management Plan to manage the purchase of materials, and acquisition of services or results required for the project.	**Procurement Management Plan:** This plan outlines information relating to the activities which were undertaken during the procurement process, procurement metrics, bidding process, etc.
10. To develop a Stakeholder Management Plan to identify, categorize and support stakeholders by developing suitable engagement strategies to ensure effective stakeholder engagement.	**Stakeholder Engagement Plan:** This plan provides information and guidance on managing stakeholder expectations. **Stakeholder Register:** This document will provide a list of all project stakeholders. **Power/Interest Grid:** This matrix will provide information on the level of power and interest of stakeholders for the project.
11. To determine the relationship and impact of the project's execution and its end product on regenerative and sustainable development.	A **Sustainability Analysis** will be developed outlining the relationship and impact of the project's execution and its end product on regenerative and sustainable development.

Note: Own Work.

4 RESULTS

Chapter 4 presents an analysis and findings for the FGP. It provides comprehensive information related to each deliverable of the FGP which includes Project Integration Management, Scope Management Plan, Schedule Management Plan, Cost Management Plan, Quality Management Plan, Resource Management Plan, Communications Management Plan, Risk Management Plan, Procurement Management Plan, Stakeholder Management Plan.

4.1 Project Integration Management

Project integration management knowledge area includes the processes and activities to identify, define, combine, unify and coordinate the various processes and project management activities within the Project Management Process Groups (PMI, 2017, p. 69). Project integration management is critical for the effective management and ultimate success of the supporting the shift to electric mobility project in Saint Lucia. This knowledge area consists of seven (7) processes; namely, (1) Develop Project Charter, (2) Develop Project Management Plan, (3) Direct and Manage Project Work, (4) Manage Project Knowledge, (5) Monitor and Control Project Work, (6) Perform Integrated Change Control and (7) Close Project or Phase. The aforementioned processes will be considered for the Project Integration Management Plan.

4.1.1 Develop Project Charter

Develop Project Charter is the process of developing a document which formally authorizes the existence of a project and provides the project manager with the authority to apply organizational resources to project activities (PMI, 2017, p.75). The Project Charter is an

essential component of project integration management and is utilized throughout the project's lifecycle. The PMBOK Guide, and interviews assisted in the generation of the Project Charter. The Project Charter was developed by utilizing a recommended template from the Universidad para la Cooperacion Internacional. The Project Charter provides the project's objectives, its rationale, assumptions and constraints, budget, main project milestones and the key stakeholders for the project. Chart 6 below displays a Project Charter which provides the framework for the Project Management Plan for Supporting the Shift to Electric Mobility in Saint Lucia project.

Chart 6: Project Charter

<table>
<tr><th colspan="3">PROJECT CHARTER</th></tr>
<tr><td>Date</td><td colspan="2">Name of Project</td></tr>
<tr><td>March 26, 2023</td><td colspan="2">Project Management Plan for Supporting the Shift to Electric Mobility in Saint Lucia Project.</td></tr>
<tr><td>Type of project:</td><td colspan="2">Predictive</td></tr>
<tr><td>Knowledge areas / process groups</td><td colspan="2">Application area (Sector / Activity)</td></tr>
<tr><td>Knowledge areas: Integration Management, Scope Management, Schedule Mangagement, Cost Management, Quality Management, Resource Management, Communications Management, Risk Management, Procurement Management, Stakeholder Management
Processes: Initiating, Planning, Executing, Monitoring and Controlling</td><td colspan="2">Environment, Climate Change Mitigation</td></tr>
<tr><td>Tentative start date</td><td>Tentative completion date</td><td>Duration (months)</td></tr>
<tr><td>January 09, 2023</td><td>December 28, 2026</td><td>47 months</td></tr>
<tr><td colspan="3">Project objectives (general and specific)</td></tr>
</table>

General objective:
The general objective of this project is to promote an integrated, sustainable, and low-emissions transport system and reduce fossil fuel consumption, GHG emissions and air pollution from the transport sector in Saint Lucia. It is structured across four components, which are necessary to address the barriers and facilitate the successful implementation of baseline efforts to achieve an integrated, sustainable, and low emissions transport.

Specific Objectives:

1. To institutionalize low carbon electric mobility through coordination, planning, and capacity in order to promote electric mobility by December 27, 2024.

2. To conduct demonstrations and training of electric vehicles in order to create awareness of electric mobility to stakeholders by November 28, 2025.

3. To implement an enabling environment and business models and finance schemes in order to promote low carbon electric mobility by April 24, 2026.

4. To implement policy frameworks in order to ensure the long-term sustainability of low carbon electric mobility by November 06, 2026.

5. To ensure that the project meets national quality standards and requirements by November 27, 2026.

6. To successfully close the project documenting lessons learned, producing a project completion report and archiving files/documents by December 28, 2026.

Justification or purpose of the project (Contribution and expected results)

Saint Lucia relies almost entirely on the importation of fossil fuel to meet its energy demands. Electricity is supplied via diesel generation by a privately-owned company, namely, St. Lucia Electricity Services Limited (LUCELEC). Dependency on diesel-generated electricity results in high greenhouse gas (GHG) emissions from the electricity generation sub-sector, with it being responsible for close to thirty-nine (39%) of total national GHG emissions (GEF, 2023). Additionally, electricity costs in Saint Lucia are volatile due to the county's dependence on imported diesel fuel.

The Supporting the Shift to Electric Mobility in Saint Lucia Project comprises of the introduction of electric vehicles through capacity building, demonstrations, and implementation of new policies related to electric mobility which will be completed by April 01, 2026. It aims at the integration of electric mobility within a wider effort to work towards a sustainable, low carbon and resilient energy system in St. Lucia. The project also aims at achieving an understanding that e-mobility in combination with decentralized renewable power supply will be key to improve resiliency of St. Lucia against extreme weather events and to reduce energy

use and emissions from fossil fueled back-up power, thus providing economic and GHG savings. According to Future Learn, (n.d.), electric mobility enhances people's quality of life since it does not produce harmful gases in the environment. As an added benefit, since electric cars do not have combustion engines, they reduce the release of tonnes of greenhouse gases into the atmosphere, which aids in the battle against the consequences of climate change. The project will assist in the improvement of air quality and the reduction in noise pollution in Saint Lucia. It is expected that the project will decrease CO2 emissions by 686,345 tonnes (t) and produce energy savings of 7,935,874,327 Megajoules (MJ).

Description of the product or service that the project will generate - Final project deliverables

The following are the expected deliverables of the project:

1. **Component 1: Institutionalization of low carbon electric mobility** – This deliverable consists of the following expected outputs:
   a. Establishment of an inter-sectorial coordination body established within the Government.
   b. Implementation of a Sustainable Passenger Mobility Policy for Government approval.
   c. Implementation of a National low-carbon e-mobility strategy for Government approval.
   d. To train key public and private stakeholders on e-mobility technologies.

2. **Component 2: Short term barrier removal through low-carbon e-mobility demonstrations** – This deliverable consists of the following expected outputs:
   a. Monitoring, reporting and verification (MRV) system to track demonstration performance.
   b. Demonstration of at least 15 electric vehicles in public and private fleets conducted and new charging infrastructures installed.
   c. Delivery of professional training relating to electric vehicle safety, driving and maintenance to communicate demonstration results to national and local stakeholders.

3. **Component 3: Preparing for scale-up and replication of low carbon electric mobility** – This deliverable consists of the following outputs:
   a. Delivery of regulatory and tax reforms for the uptake of electric vehicles in Saint Lucia for Government approval.
   b. Delivery of business models, financial schemes and procurement guidelines for electric vehicle fleets and charging stations to Government and car dealers.

4. **Component 4. Long-term environmental sustainability of low-carbon electric mobility** – This deliverable consists of the following outputs:
   a. Analysis of current management of vehicles at their end-of-life undertaken and recommendations based on international best practices delivered to Government for approval.
   b. Updated legislation on end-of-life vehicle management, including electric vehicles and second-life use of their batteries, delivered to the Government for adoption.

c. New business models, including the responsibility of vehicle distributors, delivered to the government and ELV management companies.
d. Enhanced awareness and capacity of public, private and civil society stakeholders on management of electric vehicles at their end of life.

5**. Quality Standards Certification**

a. Validation, Permits and Approvals
b. Quality Testing

6. **Project Closure**

a. Document Lessons Learned
b. Update Files or Records
c. Project Completion Report
d. Archive Files/Documents

Assumptions

The project's assumptions are listed below:

1. It is assumed that there will not be significant change requests from the Project Sponsor which can cause scope creep.
2. It is assumed that the project will be completed within 36 months.
3. It is assumed that the project will be completed within a fixed budget of USD $785,688.00.
4. It is assumed that all key stakeholders have been identified for the project
5. It is assumed that there is sufficient human resources who posess the requisite knowledge, experience and technical skills required to complete the project within scope, time and cost constraints.
6. It is assumed that the project's outcome will be of the highest quality.
7. It is assumed that the relevant policies and legislation generated from the project will be approved on time by the Government of Saint Lucia.

Restrictions/ Constraints

1. The project's duration should not exceed the stipulated time of 47 months.
2. The project will not exceed the allocated budget of USD $785,688.00
3. The project will satisfy national and legal requirements as stipulated by the Government.
4. Stakeholder expectations must be aligned with the project's scope and objectives.

Preliminary identification of risks

1. If major legislation, policies and regulations developed through the project are not approved by the Government on time, the project schedule may be impacted.

2. If there is objection or low commitment to electric mobility technology from established car dealers in the automotive industry, this may impact the project's scope.

3. If there are delays in the supply of electric vehicles and other required goods/materials, this may affect the project's schedule and budget.

4. Adverse weather conditions such as hurricanes, tropical storms, earthquakes may affect the project's schedule due to delays.

5. If there is a lack of communication between the project's key stakeholders, this may result in project delays.

6. Inflation and other market conditions may cause an increase in the cost of electric vehicles and other required materials which may result in an increase in the project's budget.

Budget	
The total project budget is USD $785,688.00	
Deliverable	**Total USD$**
Component 1 Deliverable	174,100
Component 2 Deliverable	297,112
Component 3 Deliverable	107,650
Component 4 Deliverable	96,500
Quality Standards Certification Costs	18,000
Project Management Costs	92,326
TOTAL	**$785,688.00**

Milestones schedule	
Milestone name	**End date**
Project Start	January 09, 2023
Component 1 Completed	December 27, 2024
Component 2 Completed	November 28, 2025
Component 3 Completed	April 24, 2026
Component 4 Completed	November 06, 2026
Quality Standards Certification completed	November 27, 2026
Project Completion Report	December 18, 2026
Project End	December 28, 2026

Relevant historical information	
The Renewable Energy Unit is a subsidiary unit of the Ministry of Infrastructure, Ports, Transport, Physical Development and Urban Renewal. The Department is responsible for promoting sustainable energy and economic growth in Saint Lucia. Additionally, the department is responsible for energy policy formulation, national energy planning and energy sector co-ordination, fostering the development and adoption of appropriate energy efficiency and safety standards, mandating and co-ordination of studies on energy resources, compiling basic energy information useful for sectoral planning, among other responsibilities. According to GEF (2023), plans and projects regarding e-mobility in Saint Lucia have been drafted in recent years. In 2015, Siemens supported the Government in preparing an inception report for a project on "Electric Mobility Solutions in the Caribbean", but the project did not materialize. Additionally, the Rocky Mountain Institute (RMI), within the Islands Energy Program and with United Nations Development Programme (UNDP) and GEF support, completed in 2017 the Saint Lucia Government Electric Vehicle Study, identifying 131 vehicles within the government's fleet as suitable to be replaced by electric vehicles, on the grounds that the fuel saving costs they would provide would compensate their higher capital cost. This was complemented by three electric cars donated by the Government of Italy, which are currently being used by the Government of Saint Lucia. It should be noted that Saint Lucia's local context also provides unique conditions well-suited to the use of electric vehicles, as the size and geographical characteristics of the island make range constraints and charging infrastructure more manageable than in most countries. Thus, the Supporting the Shift to Electric Mobility Project, with the support of the global program, will build upon the assessment on electrifying government vehicles previously carried out by the RMI and will review and enhance supportive policies, implement demonstration projects and prepare for upscaling and replication to accelerate the introduction of electric mobility in Saint Lucia, thus reducing air pollution and GHG emissions.	
Identification of groups of interest (stakeholders)	
Direct Stakeholders	**Indirect Stakeholders**
1. Project Sponsor – Global Environment Facility (GEF) 2. Project Manager/National Project Director 3. Project Team members: Chief Technical Advisor, Finance and M&E Officer, etc. 4. Consultants 5. Sub-contractors 6. Project Steering Committee: United Nations Environmental Programme (UNEP), The Department of Sustainable Development (DSD), Renewable Energy and Public Utilities Division, National Utilities Regulatory	1. Saint Lucia Development Bank 2. Bank of Saint Lucia 3. LUCELEC 4. Car Fleet Manager, Fedex 5. Car Fleet Manager, Massy 6. Hotel Associations 7. National Council on Public Transport (NCPT) and public transport route associations 8. Taxi Associations 9. Beachcomber Ltd. (Car Dealer) 10. Nissan (Car Dealer)

Commission, Transport Division, Ministry for Economic Development, Housing, Urban Renewal, Transport and Civil Aviation, Department of Equity, Ministry of Finance, 7. St. Lucia Solid Waste Management Authority	11. JQ Motors (Car Dealer) 12. Local car importers (Car Dealers) 13. Sir Arthur Lewis Community College 14. University of the West Indies (UWI) 15. NGOs 16. The Civil Society Organizations Coalition for Sustainable Development in Saint Lucia or Coalition of Civil Society Organizations (CCSO) 17. UAE- IRENA-Caribbean Renewable Energy Fund
Project Manager:	**Signature:**
Name and title of the authorizing person (facilitator):	**Signature:**

Note: Own Work.

4.1.2 Integrated Change Control Process

Perform Integrated Change Control is the process of reviewing all change requests; approving changes and managing changes to deliverables, project documents and the project management plan; and communicating the decisions (PMI, 2017, p.113). According to PMI (2017), this process reviews all requests for changes to project documents, deliverables or the project management plan and determines the resolution of the change requests. There may be scope changes during the Supporting the Shift to Electric Mobility Project. If a stakeholder requests a change, it will be managed via a change request form. The change request form contains all the information required to support the decision-making processes that are used to manage the unforeseen changes that inevitably arise during the project. Chart 7 on the subsequent page displays the change request form which will be utilized for the project.

Chart 7: Change Request Form

Supporting the Shift to Electric Mobility Project Integrated Change Control Form		
Project Title:		**Project Number:**
Project Manager:		**Change Request ID:**
Sponsor:		**Date Prepared:**
Change Request Quick Summary		
Proposed Change to: (scope, schedule, cost, risk or complexity level, quality, contract administration, customer satisfaction, project management plans or procedures)	***Impact on Project:*** (Low, Medium, High)	***Status:*** (Open, Approved for Analysis, Approved for Implementation, Implemented, Deferred, Rejected, Closed)
Change Request Identification		
Short Description	A brief summary of the proposed change.	
Requestor Estimate of Priority	The priority of the change request (critical, high, medium, low). Critical - Request is very urgent requiring immediate analysis. All project work halts. High - Request is urgent requiring analysis before most project work can continue. Medium - Request requires analysis before significant work towards the next project deliverable is completed. Low - Request is not urgent but needs to be analyzed before the next project deliverable is complete.	
Date raised	The date on which the request was raised.	
Raised by	The name of the originator of the request.	
Further analysis?	☐ Approved ☐ Rejected ☐ Deferred Name: _____ (Project Manager)	
Change Request Assessment		
Detailed description	A detailed description of the proposed change including justification and/or benefits.	
Time scale for analysis	Time period for performing the analysis.	

Small change?	Yes or no. A small change is defined as an elementary modification having little potential impact on the project team and none outside it.
Assigned on	The date the change was assigned for analysis.
Accepted for analysis by	The name of person who accepted for analysis.
Accepted for analysis on	The date the change was accepted for analysis.
Change Request Analysis	
Impact analysis	A specification of all project elements to be modified as a result of the change.
Scope Impact Description	A description of the scope of the change and any impacts to overall project scope.
Schedule Impact Description	A description of the schedule for the change and any impacts to overall project schedule.
Cost Impact Description	A description of the costs for the change.
Impact of not implementing	A description of the impact to the overall project of not implementing the change.
Alternatives	Identify alternatives.
Completion Criteria for Change Request	A description of the completion criteria for the change.
Estimated effort	An estimate of the effort to implement the change.
Estimated cost	An estimate of the total cost of the change.
Impact level	High – Major modification having a repercussion on the entire project: Medium – Average modification having limited repercussions on the project: Low – An elementary modification having little potential impact on the project team and none outside it. Factors to be considered in determining the impact level include: • Impact on the initially planned main features of the solution (scope), • Impact on the cost of the project, • Impact on the project end date or a major milestone.
Analyzed Priority of Request	The priority of the change request (critical, high, medium, low). Critical Change - Request is very urgent requiring immediate implementation. High Change - Request is urgent requiring implementation before most project work can continue. Medium Change - Request requires implementation before significant work towards the next project deliverable is completed.

	Low Change - Request is not urgent but needs to be implemented before the next project deliverable is complete.
Resources	The number of resources required for the change.
Estimates validated on	The date when the impact estimates were validated.
Estimates validated by	The name of the person who validated the impact estimates.
Analyzed by	The name of the person performing the impact analysis.
Change Request Decision	
Decision	☐ Approved for implementation ☐ Deferred ☐ Rejected
Rationale for decision	A description of the reason for the decision.
Approved resources	The amount of the approved resources if change is implemented.
Approved cost	The amount of the approved cost if change is implemented.
Comments	Any additional comments.
Change Request Decision Signatures	
Project Manager: _____ **Printed name, Signature, Date** ***Project Steering Committee:*** _____ **Printed name, Signature, Date**	

Note: Own Work.

A change request log will also be utilized to record information about all change requests. Chart 8 below displays a change request log form which will be utilized for the project.

Chart 8: Change Request Log

Change Request Log	
Content	**Description**
Project Name	
Project Number	
Project Change Request (PCR) ID	
Short Description	
Raised by	
Priority	
Date Raised	
Owner	
Target Date	
Status	
Status Date	

Note: Own Work.

If any changes arise, the project stakeholder, project manager, project team and project steering committee will undergo a six (6) step process for the integrated change control process, namely:

1. Change Request Identification

2. Change Request Assessment

3. Change Request Analysis

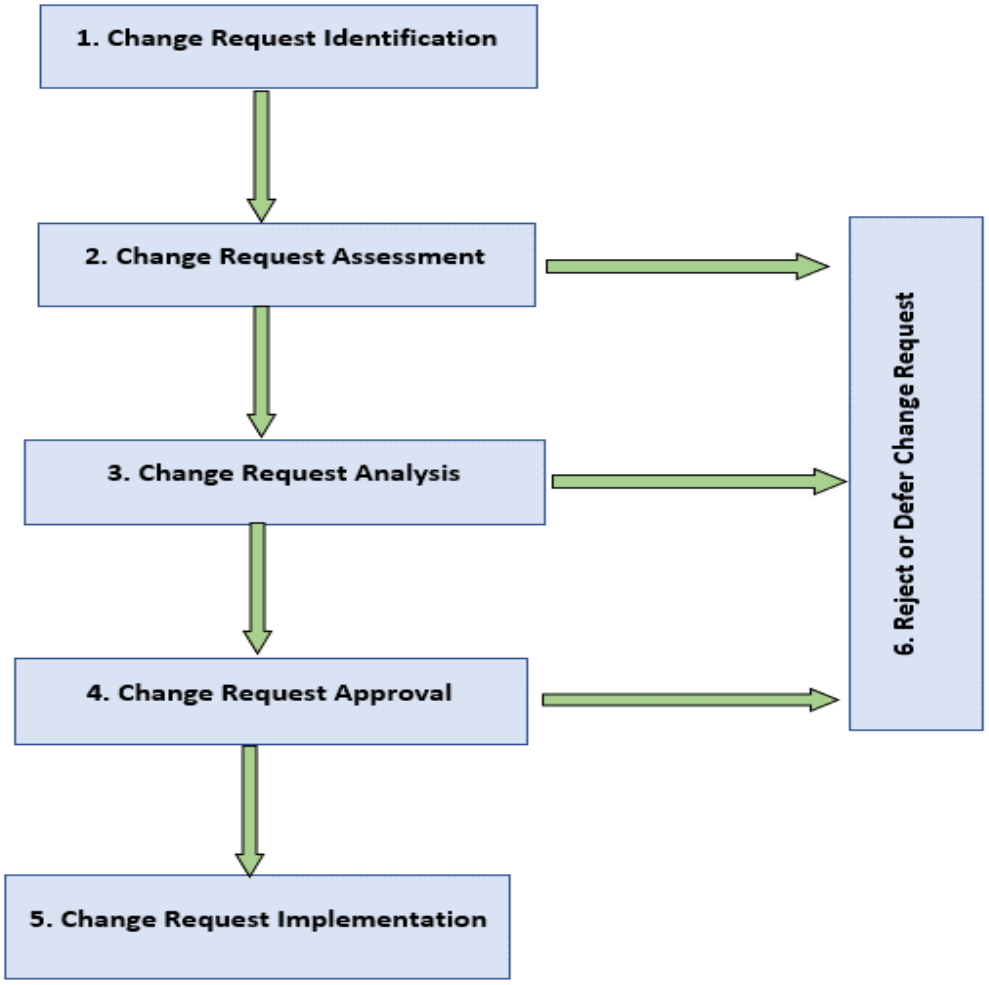
4. Change Request Approval

5. Change Request Implementation

6. Reject or Defer Change Request

Figure 17 displays the integrated change control process on the subsequent page.

Figure 17: Flow Diagram of Integrated Change Control Process



Note: Own Work.

4.1.3 Project Closure

The Close Project or phase is the process of finalizing all activities for the project, phase, or contract (PMI, 2017, p. 121). The following activities will be undertaken by the Project Manager to ensure the successful and official closure of the project:

1. The Project Manager will review the project management plan to ensure that all deliverables are completed and the project's objectives were achieved.

2. Complete administrative duties activities such as closing project accounts, contractual agreements, auditing final project results and finalizing other agreements.

3. Measure stakeholders' satisfaction – This will be measured by having a stakeholder meeting at the end of the delivery of the final deliverable and conducting a survey.

4. Ensure that all project documents are up-to-date, and all issues are resolved.

5. Identify lessons learnt from the project and record in lessons learned register.

6. Archive project documentation and information for future retrieval.

7. Generate final project completion report – The Project Manager and project team members will compile project information and produce a final project completion report.

4.2 Scope Management Plan

Project Scope Management includes the processes required to ensure that the project includes all the required, and only the work required, to complete the project successfully (PMI, 2017, p.129). As stated in the PMBOK ® Guide, the Project Scope Management processes are defined by the following processes:

1. Plan Scope Management

2. Collect Requirements

3. Define Scope

4. Create Work Breakdown Structure (WBS)

5. Validate Scope

6. Control Scope

4.2.1 Plan Scope Management

The Plan Scope Management process for the Supporting the Shift to Electric Mobility Project provides guidance and direction on how the scope for the project will be defined, developed, monitored, managed, controlled and validated. The inputs which will be utilized for this process includes the Project Charter, Project Management Plan, Enterprise Environmental Factors and Organizational Process Assets. This process was a key part of the project planning process which commenced after the development of the Project Charter.

The Enterprise Environmental Factors considered for the project includes organizational culture, and marketplace conditions. The organizational process assets considered are organizational policies and procedures, and historical information from previous projects which were undertaken by the department. To support the development of the scope management plan, expert judgment, data analysis and meetings with key stakeholders were used as the main tools and techniques which resulted in the Scope Management Plan for the project.

4.2.2 Collect Requirements

Collect Requirements refers to the process of determining, documenting and managing stakeholder needs and requirements to meet objectives (PMI, 2017, p.138). This process provides the basis for defining the project scope. The Project Charter, assumption log and stakeholder register were the main inputs utilized for this process. Expert judgment, interviews, workshops and brainstorming assisted the project team in gathering information

to help identify the key stakeholder needs and requirements for the project. A requirements traceability matrix was utilized as the main output for the project which assisted in tracking requirements throughout the project's life cycle, and helping to ensure that approved requirements are delivered at the end of the project. A prioritization scale was utilized to determine the priority of each WBS Deliverable and was categorized by High, Medium, or Low. Chart 9 on the subsequent page displays the requirements traceability matrix for the Supporting the Shift to Electric Mobility Project.

Chart 9: Requirements Traceability Matrix

Requirements Traceability Matrix	
Project Name:	Supporting the Shift to Electric Mobility in Saint Lucia
Project ID	10283
Project Description	Accelerate the introduction of electric mobility in Saint Lucia through capacity-building and electric vehicle demonstration and prepare it for scaling-up and replication through the development of electric mobility policies, business models and finance schemes.

ID	WBS ID	WBS Deliverable	Requirements Description	Goals/Objectives	Project Objective	Priority
1	1	**Supporting the Shift to Electric Mobility in Saint Lucia**	Project is completed within scope, time and budget constraints and meeting stakeholder expectations.	To ensure that the project is completed successfully.	To promote an integrated, sustainable and low-emissions transport system and reduce fossil fuel consumption, GHG emissions and air pollution from the transport sector in Saint Lucia.	High

ID	WBS ID	WBS Deliverable	Requirements Description	Goals/Objectives	Project Objective	Priority
2	1.1	**Component 1: Institutionalization of Low-Carbon Electric Mobility**	Component 1 is completed within scope, time, and budget by establishing an inter-sectorial coordination body, sustainable passenger mobility policy, national low-carbon e-mobility strategy and finally implementing e-mobility technologies training.	To strengthen institutions and coordination for facilitating the transformation to electric mobility.	To institutionalize low carbon electric mobility through coordination, planning and capacity in order to promote electric mobility by March 31, 2024.	High
3	**1.1.1**	Inter-sectorial Coordination Body	To draft terms of reference and work plan for the body, with identification of all participating ministries and public institutions; Hold quarterly body meetings and reports from date of inception; Present a stakeholder consultation strategy for government approval; Knowledge management and dissemination platform operational (information platform and website containing products including quarterly online workshops and quarterly position papers); Report with recommendations on the body's work plan and its sustainable operation (including the platform) after project completion.	To develop the e-mobility strategy, and to coordinate the strategy's actions to be implemented by the different stakeholders.	To institutionalize low carbon electric mobility through coordination, planning, and capacity in order to promote electric mobility by March 31, 2024.	High

ID	WBS ID	WBS Deliverable	Requirements Description	Goals/Objectives	Project Objective	Priority
4	**1.1.2**	Sustainable Passenger Mobility Policy	Gender-sensitive data collection and analysis of passenger mobility demand conducted; Study on sustainable alternatives for the public transport system and road safety, including gender analysis conducted; Sustainable and safe passenger mobility policy including gender action plan completed; Recommendations for the improvement of passenger transport statistics and GHG monitoring to support, inter alia, the implementation of the mobility policy.	To develop a Sustainable Passenger Mobility Policy which will focus on the identification of infrastructure needs to develop a multi-modal, integrated, sustainable transport policy, which makes provision for future road transport demands for Saint Lucia. It will focus on three (3) main areas: 1. Establishment of a multi-modal transportation system that reduces reliance on any single mode of transport and encourages walking and cycling and promotes energy efficiency. 2. Movement of persons and goods	To institutionalize low carbon electric mobility through coordination, planning and capacity in order to promote electric mobility by March 31, 2024.	High

ID	WBS ID	WBS Deliverable	Requirements Description	Goals/Objectives	Project Objective	Priority
				efficiently and safely. 3. Promotion of public/private partnerships.		
5	**1.1.3**	National low-carbon e-mobility strategy	Gender-sensitive fleet electrification feasibility analysis conducted; Study on the integration of renewable power and e-mobility in the energy system; National charging network analysis: Impact analysis on the electricity sector and deployment of charging points; Draft national e-mobility strategy (including gender action plan) circulated for stakeholder consultation and validated; and Final national e-mobility strategy completed and submitted for government adoption.	To provide the much-needed strategic framework for the action of the government, the public and the private sector and other individuals until 2030, so that all stakeholders can take their decisions concerning e-mobility with a reasonable confidence about the future environment.	To institutionalize low carbon electric mobility through coordination, planning and capacity in order to promote electric mobility by March 31, 2024.	High

ID	WBS ID	WBS Deliverable	Requirements Description	Goals/Objectives	Project Objective	Priority
6	**1.1.4**	E-mobility technologies training	E-mobility communication plan completed and implemented; Capacity-building materials targeting decision-makers and other government officials implemented; Training activities conducted on sustainable transport and e-mobility policies, standards and regulations, addressing civil servants and public and private decision-makers; Knowledge management guidelines and training materials addressing electricity and transport specialists completed.	To provide the initial capacity-building needs on e-mobility to ensure that key governmental officials and actors in the public and private sectors receive sufficient technical and legal training on e-mobility to be able to undertake the activities in the other project components and to assure the sustainability of the e-mobility strategy beyond project completion.	To institutionalize low carbon electric mobility through coordination, planning and capacity in order to promote electric mobility by March 31, 2024.	High

ID	WBS ID	WBS Deliverable	Requirements Description	Goals/Objectives	Project Objective	Priority
7	**1.2**	**Component 2: Short term barrier removal through low-carbon e-mobility demonstrations**	Component 2 is completed within scope, time and budget by implementing a Monitoring, reporting and verification (MRV) system, demonstration of electric vehicles, procuring and installing charging points for the electric vehicles and providing professional training to key stakeholders relating to electric vehicle safety, driving and maintenance.	To demonstrate the feasibility of EV operations in Saint Lucia through the inclusion of at least 15 electric cars in the government's fleet and electric vehicles in interested private fleets and the monitoring and subsequent dissemination of results among other public and private fleet managers, as well as public transport operators and taxi owners.	To conduct demonstrations and training of electric vehicles in order to create awareness of electric mobility to stakeholders by October 31, 2024.	High
8	**1.2.1**	Monitoring, reporting and verification (MRV) system	Demonstration design, including its monitoring, reporting and verification (MRV) plan completed; Evaluation report and knowledge management of demonstration completed.	To design the demonstration plan and the subsequent preparation of a monitoring, reporting and verification (MRV) plan.	To conduct demonstrations and training of electric vehicles in order to create awareness of electric mobility to stakeholders by October 31, 2024.	High

ID	WBS ID	WBS Deliverable	Requirements Description	Goals/Objectives	Project Objective	Priority
9	**1.2.2**	Electric Vehicle Demonstration	Demonstration plan completed which includes selection of car fleets participating in the pilot demonstration, technical characteristics of electric vehicles and charging stations, locations of charging stations, work plan for successful implementation of the demonstrations and vulnerability study of the locations selected to install the charging stations.	To successfully demonstrate electric cars by replacing conventional vehicles in the governmental fleet, as well as EVs from private fleets.	To conduct demonstrations and training of electric vehicles in order to create awareness of electric mobility to stakeholders by October 31, 2024.	High
10	**1.2.3**	Procurement and Installation of Charging Points	Procurement of pilot vehicles including technical support conducted; and Procurement and installation of charging points for the government fleet.	To ensure that the Government of Saint Lucia procurement policies and guidelines are adhered to	To conduct demonstrations and training of electric vehicles in order to create awareness of electric mobility to stakeholders by October 31, 2024.	High

ID	WBS ID	WBS Deliverable	Requirements Description	Goals/Objectives	Project Objective	Priority
11	**1.2.4**	Professional training relating to electric vehicle safety	Communication plan for the project demonstrations, including awareness raising actions addressed to the public completed; Communication materials provided to stakeholders on the project demonstrations, including materials for the general public, focused on raising awareness about the advantages of e-mobility as shown in the pilots; Training materials on EV and charging infrastructure technology and maintenance provided to stakeholders; and Professional training activities on EV safety (emergency services), driving and maintenance delivered.	To provide professional training on EV driving and maintenance to ensure the successful demonstration of electric vehicles.	To conduct demonstrations and training of electric vehicles in order to create awareness of electric mobility to stakeholders by October 31, 2024.	High

ID	WBS ID	WBS Deliverable	Requirements Description	Goals/Objectives	Project Objective	Priority
12	**1.3**	**Component 3: Preparing for scale-up and replication of low carbon electric mobility**	Component 3 is completed within scope, time and budget by implementing regulatory tax reforms and business models, financial schemes and procurement guidelines for electric vehicle fleets and charging stations.	To provide the enabling conditions for the broad and long-term deployment of EVs, to create the appropriate financial schemes and business models to stimulate the availability of EVs in the national market. To provide an adequate array of incentives and support for early adopters.	To implement an enabling environment and business models and finance schemes in order to promote low carbon electric mobility by April 25, 2025.	High

ID	WBS ID	WBS Deliverable	Requirements Description	Goals/Objectives	Project Objective	Priority
13	**1.3.1**	Regulatory and Tax Reforms	Regulatory proposal on vehicle approval and periodic technical inspection completed; Regulatory proposal on technical approval and installation of public and private charging stations completed; Regulatory proposal on public transport authorizations and concession contracts to improve quality and stimulate electrification; Tax reform proposal to facilitate fiscal stability while Saint Lucia transitions towards e-mobility; and Stakeholder consultations on regulatory reforms conducted.	To propose comprehensive legislation on vehicle authorization and technical inspection establishing (1) future emission standards for motor vehicles (in collaboration with the Saint Lucia Bureau of Standards, including CO2, as well as pollutants), converging with global practice; (2) inclusion of EV vehicles in the motor vehicle legislation; and (3) periodic technical inspection	To implement an enabling environment and business models and finance schemes in order to promote low carbon electric mobility by April 25, 2025.	High

ID	WBS ID	WBS Deliverable	Requirements Description	Goals/Objectives	Project Objective	Priority
14	**1.3.2**	Business models, financial schemes and procurement guidelines for electric vehicle fleets and charging stations	Scenarios on the potential of the electric vehicle market in Saint Lucia completed; Development of business models for electrification of public and private fleets in Saint Lucia; Development of financial schemes to support fleet electrification; and E-mobility recommendations and procurement guidelines to fleet managers published and disseminated.	To develop business models, financial instruments and procurement guidelines to create more favourable conditions for electric vehicle adoption in Saint Lucia.	To implement an enabling environment and business models and finance schemes in order to promote low carbon electric mobility by April 25, 2025.	High
15	**1.4**	**Component 4: Long-term environmental sustainability of low-carbon electric mobility**	Component 4 is completed within scope, time and budget by ensuring long-term environmental sustainability of low-carbon electric mobility in Saint Lucia.	To complement the efforts of Component 3 by providing the necessary arrangements for adequate management of EVs at their end of life and strengthening the current framework for ELV management.	To implement policy frameworks in order to ensure the long-term sustainability of low carbon electric mobility by September 30, 2025.	High

ID	WBS ID	WBS Deliverable	Requirements Description	Goals/Objectives	Project Objective	Priority
16	**1.4.1**	Assessment and Recommendations on ELV management	Assessment of local conditions and characteristics of ELV management conducted; Forecast of ELV components generation, considering internal combustion and electric vehicles completed; and Recommendations on ELV management in Saint Lucia, based on international best practice, submitted to the government for adoption.	To provide the necessary information for subsequently undertaking regulatory changes and sector reform.	To implement policy frameworks in order to ensure the long-term sustainability of low carbon electric mobility by September 30, 2025	High
17	**1.4.2**	Updated legislation on end-of-life vehicle management	Report summarizing international and regional regulations on ELV management, including EV components and second-life use of their batteries delivered; Comprehensive review of existing and planned international regulations on second-life battery use and recommendations for the Saint Lucia context; and Proposal for ELV regulation submitted to the government for adoption.	To provide recommendations on end-of-life management of all vehicles, including EVs and their lithium batteries and to explore the feasibility of strengthening the responsibility of distributors in the ELV management system.	To implement policy frameworks in order to ensure the long-term sustainability of low carbon electric mobility by September 30, 2025	High

ID	WBS ID	WBS Deliverable	Requirements Description	Goals/Objectives	Project Objective	Priority
18	**1.4.3**	Development of commercially viable business models	Screening and systematization of successful financial and business models on ELV components and second-life battery use; Development of commercially viable business models for ELV components and EV batteries, including cost benefit analysis estimating investment needs and financing schemes; and Development of a roadmap on sustainable and commercially viable ELV and battery management submitted to government for adoption.	To support key stakeholders in establishing financial schemes (to assure funding of ELV management operations) and business models (to help the sector to transition to the new framework) to consolidate sustainable ELV management.	To implement policy frameworks in order to ensure the long-term sustainability of low carbon electric mobility by September 30, 2025.	High
19	**1.4.4**	National electric mobility campaign	Design and delivery of a training programme for policymakers and local academia, and available for wider dissemination; Provision of technical and managerial support to producers and importers, with a focus on the local industry; and Design and implementation of a national campaign to raise awareness among consumers.	To provide the necessary capacity building to all the stakeholders involved in the end-of-life management of batteries and other EV components, essential for the successful implementation of the roadmap delivered in 1.4.3.	To implement policy frameworks in order to ensure the long-term sustainability of low carbon electric mobility by September 30, 2025.	High

ID	WBS ID	WBS Deliverable	Requirements Description	Goals/Objectives	Project Objective	Priority
20	**1.5**	**Quality Standards Certification**	To ensure that the project is designed according to approved plans in compliance with labor and environmental regulations as stated by the Government of Saint Lucia and to meet minimum quality standards requirements	To ensure that the project meets national quality standards, permits, regulations and requirements.	To ensure that the project meets national quality standards and requirements by November 20, 2026.	High
21	**1.5.1**	Validation, Permits and Approvals	To evaluate the various stages of the project and to ensure that all permits and approvals are met.	To ensure that the project is validated and the project obtains all necessary clearances.	To ensure that the project is validated and meets national quality standards, permits, clearances and approvals by November 20, 2026.	High
22	**1.5.2**	Quality Testing	To ensure that all materials utilized for the project is inspected and meets minimum quality standards.	To ensure that the project meets quality assurance through quality inspections, audits, and quality standards and regulations.	To ensure that the project meets national quality standards and quality assurance through quality inspections by November 20, 2026.	High

ID	WBS ID	WBS Deliverable	Requirements Description	Goals/Objectives	Project Objective	Priority
23	**1.6**	**Project Closure**	To ensure that the project is successfully closed, and all project closure activities are delivered.	To ensure that all project requirements and objectives were achieved.	To successfully close the project documenting lessons learned, producing a project completion report and archiving files/documents by January 31, 2026.	High
24	**1.6.1**	Document Lessons Learned	Project Manager to conduct a lessons learned meeting and documents the lessons learned from the project.	To ensure that lessons learned are recorded for future use.	To successfully close the project documenting lessons learned, producing a project completion report and archiving files/documents by January 31, 2026.	Medium
25	**1.6.2**	Update Files/Records	Update all files and records both physically and electronically.	To ensure that all files and records are successfully updated.	To successfully close the project documenting lessons learned, producing a project completion report and archiving files/documents by January 31, 2026.	High

ID	WBS ID	WBS Deliverable	Requirements Description	Goals/Objectives	Project Objective	Priority
26	**1.6.3**	Project Completion Report	To deliver project completion report on time and to disseminate it to key stakeholders.	To ensure that a project completion report is generated for key stakeholders and future use.	To successfully close the project documenting lessons learned, producing a project completion report and archiving files/documents by January 31, 2026.	High
27	**1.6.4**	Archive Files/Documents	All project related files and documents are formally archived.	To ensure that all project related files and documents are archived for future retrieval.	To successfully close the project documenting lessons learned, producing a project completion report and archiving files/documents by January 31, 2026.	Medium

Note: Own Work

4.2.2.1 Scope Management Roles and Responsibilities

The Project Sponsor, Project Manager and Project Steering Committee (PSC) will play a critical role in the management of the project's scope and will mainly be responsible for the acceptance and approval of the final project deliverables. It is important that the roles and responsibilities for scope management be defined to ensure that all responsibilities are clearly comprehended. Chart 10 depicts the respective roles and responsibilities for the Supporting the Shift to Electric Mobility in Saint Lucia Project.

Chart 10: Scope Roles and Responsibilities

Role	Responsibilities
Project Sponsor – Global Environment Facility	• Approval of Scope Management Plan. • Provides financial resources for the project. • Approval of major scope change requests. • Overall decision-making responsibility for Scope Management activities. • Reviews escalated scope issues and provide direction for resolution.
Project Manager	• Overall responsibility for Scope Management. • Ensures that scope changes are incorporated into appropriate project documents. • Reviews Change Requests • Communicates scope changes to the project team. • Approves scope change requests.
Project Steering Committee	• Reviews major scope change requests and makes final decision or recommendations to the Project Sponsor. • Aids in resolving issues that arise beyond the project manager's jurisdiction. • Monitors project progress and provide necessary tools and support when milestones are in jeopardy.

Role	Responsibilities
Project Team Members	• Communicates change requests to the project manager. • Submits scope change requests. • Reviews scope change requests when assigned. • Provides feedback as and when required. • Participates in team-level scope change reviews.
Project Steering Committee	• Reviews major scope change requests and makes final decision or recommendations to the Project Sponsor. • Aids in resolving issues that arise beyond the project manager's jurisdiction. • Monitors project progress and provide necessary tools and support when milestones are in jeopardy.
Other Stakeholders	• Submits requests for scope changes. • Communicates justification of project change requests to the project team

Note. Own Work.

4.2.3 Define Scope

Define scope is the process of developing a detailed description of the product (PMI, 2017.p.148). This process provides the key benefit of describing the product, service or result boundaries and acceptance criteria. The Project Charter, enterprise environmental factors and organizational process assets were the main inputs utilized for this process. Expert judgment and facilitation were the main techniques utilized. The project scope statement was the major output utilized for this process. According to PMI (2017, p. 154), the project scope statement provides a description of all the elements of the entire project scope, major deliverables, assumptions, project requirements and may contain explicit scope exclusions. Chart 11 displays the Scope Statement for the project on the subsequent page.

Chart 11: Scope Statement

Project Scope Statement

Project Details	
Project Name:	Supporting the Shift to Electric Mobility in Saint Lucia
Project ID:	10283
Estimated Budget:	USD $785,688.00
Estimated Project Duration:	Jan 09, 2023- Jan 31, 2026 (36 months)
Scope Definition	
Scope Description:	The objective of the project is to promote an integrated, sustainable and low-emissions transport system and reduce fossil fuel consumption, GHG emissions and air pollution from the transport sector in Saint Lucia. It is structured across four components, which are necessary to address the barriers and facilitate the successful implementation of baseline efforts to achieve an integrated, sustainable and low-emissions transport system.
Project Deliverables:	1. Component 1: Institutionalization of low carbon electric mobility. 2. Component 2: Short term barrier removal through low-carbon e-mobility demonstrations. 3. Component 3: Preparing for scale-up and replication of low carbon electric mobility. 4. Component 4: Long-term environmental sustainability of low-carbon electric mobility. 5. Project Closure
Scope Exclusions:	Training is limited only to key stakeholders. The general public is not included.
Acceptance Criteria: **(General)**	The project will be accepted when all deliverables are successfully completed within the estimated time frame,quality and budget constraints.

Assumptions:	1. It is assumed that there will not be significant change requests from the Project Sponsor which can cause scope creep. 2. It is assumed that the project will be completed within 36 months. 3. It is assumed that the project will be completed within a fixed budget of USD $785,688.00. 4. It is assumed that all key stakeholders have been identified for the project. 5. It is assumed that there is sufficient human resources who posess the requisite knowledge, experience and technical skills required to complete the project within scope, time and cost constraints. 6. It is assumed that the project's outcome will be of the highest quality. 7. It is assumed that the relevant policies and legislation generated from the project will be approved on time by the Government of Saint Lucia.
Constraints:	1. The project's duration should not exceed the stipulated time of 36 months. 2. The project will not exceed the allocated budget of USD $785,688.00. 3. The project will satisfy national and legal requirements as stipulated by the Government. 4. Stakeholder expectations must be aligned with the project's scope and objectives.
Scope Statement Decision	
□Approved □Approved with modifications □Rejected □Deferred	
Approval Date:	
Project Manager:	Printed Name: Signature
Project Sponsor	Printed Name: Signature:

Note: Own Work.

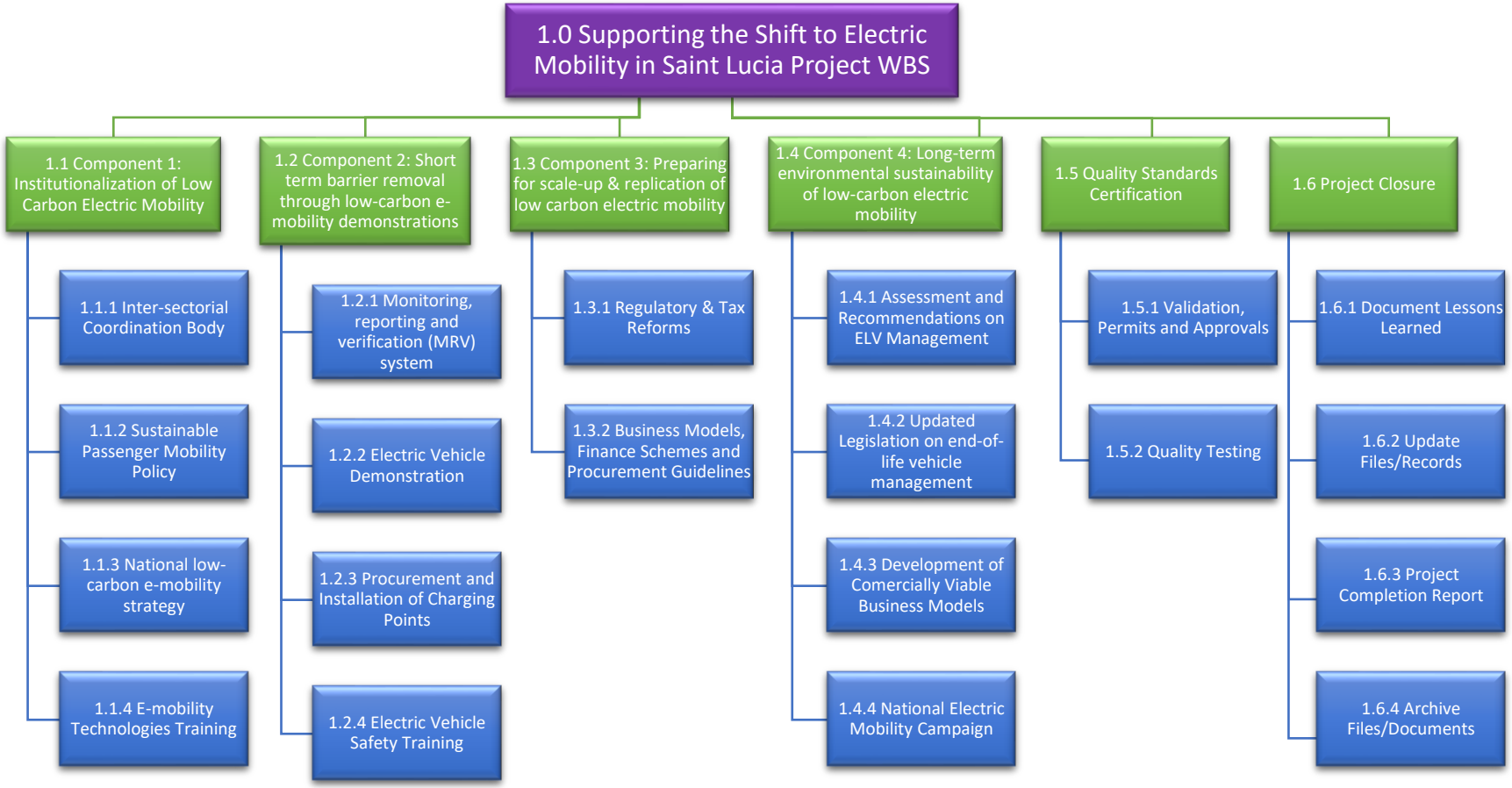
4.2.4 Create Work Breakdown Structure (WBS)

According to PMI (2017, p.156), create work breakdown structure is a process which entails subdividing the project's deliverables, and project work into smaller, more manageable components. The key benefit of this process is that it provides a structured framework of what has to be delivered for the Supporting the Shift to Electric Mobility in Saint Lucia Project. The work breakdown structure is a hierarchical decomposition of the total scope of work to be carried out by the project team, to assist in achieving the project's objectives and create the required deliverables.

4.2.4.1 Work Breakdown Structure

Figure 18 on the subsequent page represents the WBS for the Supporting the Shift to Electric Mobility in Saint Lucia Project (Level 1) which is composed of five (5) main components as the primary deliverables (Level 2). The primary deliverables are further decomposed into the work packages which is the last level in the WBS.

Figure 18: Work Breakdown Structure



Note: Own Work.

4.2.4.2 Work Breakdown Structure (WBS) Dictionary

The Work Breakdown Structure (WBS) Dictionary supports the WBS as it provides detailed deliverable, activity, and scheduling information about each component identified in the WBS (PMI, 2017). Chart 12 below displays the WBS Dictionary for the Supporting the Shift to Electric Mobility in Saint Lucia Project.

Chart 12: Work Breakdown Structure Dictionary

WBS Level	WBS Code	WBS Element	Description of Work
1	1	Supporting the Shift to Electric Mobility in Saint Lucia Project	Completion of the total project scope including completion of Component 1: Institutionalization of Low-Carbon Electric Mobility, Component 2: Short term barrier removal through low carbon e-mobility demonstrations, Component 3: Preparing for scale-up and replication of low carbon electric mobility, and Component 4: Long-term environmental sustainability of low-carbon electric mobility.
2	1.1	Component 1: Institutionalization of Low-Carbon Electric Mobility	Completion of required inter-sectorial coordination body, sustainable passenger mobility policy, national low-carbon e-mobility strategy and finally implementing e-mobility technologies training.
3	1.1.1	Inter-sectorial coordination body	Completion of terms of reference and body's work plan, quarterly body meetings, reports, stakeholder consultation strategy for government approval; knowledge management and dissemination platform operational.
3	1.1.2	Sustainable Passenger Mobility Policy	Completion of Gender-sensitive data collection and analysis of passenger mobility demand, study on sustainable alternatives for the public transport system and road safety, sustainable and safe passenger mobility policy and recommendations for the

WBS Level	WBS Code	WBS Element	Description of Work
			improvement of passenger transport statistics and GHG monitoring.
3	1.1.3	National low-carbon e-mobility strategy	Completion of Gender-sensitive fleet electrification feasibility analysis, study on the integration of renewable power and e-mobility in the energy system, national charging network analysis and impact analysis, national e-mobility strategy (including gender action plan) circulated for stakeholder consultation and validated; and submitted for government adoption.
3	1.1.4	E-mobility technologies training	Completion of E-mobility communication plan, capacity-building materials and Training activities conducted on sustainable transport and e-mobility policies, standards and regulations, addressing civil servants, and public and private decision-makers and knowledge management guidelines and training materials addressing electricity and transport specialists.
2	1.2	Component 2: Short term barrier removal through low-carbon e-mobility demonstrations	Completion of Monitoring, reporting and verification (MRV) system, demonstration of electric vehicles, procuring and installing charging points for the electric vehicles and providing professional training to key stakeholders relating to electric vehicle safety, driving and maintenance
3	1.2.1	Monitoring, reporting and verification (MRV) system	Completion of demonstration design, including its monitoring, reporting and verification (MRV) plan, evaluation report and knowledge management of demonstration.
3	1.2.2	Electric Vehicle Demonstration	Completion of demonstration plan, work plan for successful implementation of the demonstrations and vulnerability study of the locations selected to install the charging stations.

WBS Level	WBS Code	WBS Element	Description of Work
3	1.2.3	Procurement and Installation of Charging Points	Procurement of pilot vehicles and procurement and installation of charging points for the government fleet.
3	1.2.4	Professional training relating to electric vehicle safety	Completion of communication plan for the project demonstrations, communication materials provided to stakeholders on the project demonstrations, including materials for the general public, focused on raising awareness about the advantages of e-mobility as shown in the pilots; Training materials on EV and charging infrastructure technology and maintenance provided to stakeholders; and Professional training activities on EV safety (emergency services), driving and maintenance.
2	1.3	Component 3: Preparing for scale-up and replication of low carbon electric mobility	Implementation of regulatory tax reforms and business models, financial schemes and procurement guidelines for electric vehicle fleets and charging stations.
3	1.3.1	Regulatory and tax reforms	Completion of regulatory proposals and tax reform proposals.
3	1.3.2	Business models, financial schemes and procurement guidelines for electric vehicle fleets and charging stations	Completion of scenarios on the potential of the electric vehicle market in Saint Lucia, development of business models for electrification of public and private fleets in Saint Lucia, development of financial schemes to support fleet electrification; and publication of e-mobility recommendations and procurement guidelines to fleet managers.
2	1.4	Component 4: Long-term environmental sustainability of low-carbon electric mobility	Completion of policies and measures relating to long-term environmental sustainability of low-carbon electric mobility.
3	1.4.1	Assessment and Recommendations on ELV management	Completion of assessments, forecasts and recommendations on ELV management.
3	1.4.2	Updated legislation on end-of-life vehicle management	Completion of reports, comprehensive review, and proposal on ELV regulation submitted to government for adoption.

WBS Level	WBS Code	WBS Element	Description of Work
3	1.4.3	Development of commercially viable business models	Screening and systematization of successful financial and business models on ELV components and second-life battery use, development of commercially viable business models for ELV components and EV batteries, development of a roadmap on sustainable and commercially viable ELV and battery management submitted to government for adoption.
3	1.4.4	National electric mobility campaign	Design and delivery of a training programme for policymakers and local academia, and available for wider dissemination, provision of technical and managerial support to producers and importers, with a focus on the local industry; and design and implementation of a national campaign to raise consumer awareness.
2	1.5	Quality Standards Certification	Completion of all activities related to validation, obtaining permits and approvals, as well as quality testing for standards certification
3	1.5.1	Validation, Permits and Approvals	Conduct validation and acquisition of all necessary environmental and labor permits and approvals.
3	1.5.2	Quality Testing	Completion of all activities related to quality testing including inspections, audits and standards certification.
2	1.6	Project Closure	Completion of closure process and procedures.
3	1.6.1	Document Lessons Learned	Lessons learned meeting conducted and documentation of lessons learned completed.
3	1.6.2	Update Files/Records	Files and records updated physically and electronically.
3	1.6.3	Project Completion Report	Complete project completion report and distribute to key stakeholders.
3	1.6.4	Archive Files/Documents	Archive all project related files and documents.

Note: Own Work.

4.2.5 Validate Scope

Validate scope is the process of formalizing acceptance of the completed project deliverables (PMI, 2017, p.163). For this project, the following activities will be undertaken to validate scope:

a. The Project Steering Committee (PSC) will conduct monthly meetings to review and accept all completed project deliverables.
b. The Project Sponsor will make decisions relating to the approval or disapproval of any project deliverable.
c. Project deliverables which meet the acceptance criteria will be formally signed off by the Project Sponsor. The Project Sponsor will also communicate with the project manager about the disapproval of project deliverables for further corrective action.
d. All submitted project deliverables will be verified against the Scope Statement, Requirements Traceability Matrix, WBS and WBS Dictionary for compliance with the established scope baseline.
e. Deliverables which are not formally accepted will be documented along with valid reasons for non-acceptance.
f. Work performance information will be documented including lessons learned.

4.2.6 Control Scope

Control scope refers to the process of monitoring the status of the project scope and managing the scope baseline. For this project, the following activities will be undertaken to Control Scope:

a. The Project Manager and the project team will work together to control of the scope of the project.
b. The project team will leverage the WBS Dictionary by using it as a statement of work for each WBS element.
c. The project team will ensure that they perform only the work described in the WBS dictionary and generate the defined deliverables for each WBS element. The project manager will oversee the project team and the progression of the project to ensure that this scope control process is adhered to.
d. If a change request is required, the change request will be processed for review and disposition through the “Perform Integrated Change Control Process”.
e. Project scope changes may be initiated by any member of the Project Steering Committee where the Integrated Change Control Process will be adhered to as outlined in **Figure 17**.
f. The Change Request form identified in **Chart 7** will be utilized and will detail the impact of the change on the scope and schedule.
g. If the change has been approved, the Project Manager and PSC formally accepts the change by signing the change request form.

4.3 Schedule Management Plan

Project Schedule Management includes the processes required to manage the timely completion of the project (PMI, 2017, p.173). According to PMI (2017), the schedule management processes are defined by the following processes:

- Plan Schedule Management
- Define Activities
- Sequence Activities
- Estimate Activity Durations
- Develop Schedule
- Control Schedule

4.3.1 Plan Schedule Management

Plan schedule management is an integral process in the development of the project schedule for the Supporting the Shift to Electric Mobility in Saint Lucia Project. It is the process of establishing the policies, procedures and documentation to plan, develop, manage, execute and control the project schedule. This process also provides guidance and direction on how the project will be managed by the project manager throughout the project's lifecycle. To help develop the project schedule, the Project Manager utilized the project charter, project management plan, the scope management plan, enterprise environmental factors and organizational process assets to create the schedule management plan. Meetings involving the project sponsor, project manager, project team members and project steering committee and expert judgment were the main tools and techniques utilized during this process.

Microsoft Office Project 2019 was utilized as the main scheduling software to develop the schedule management plan and other required schedule management resources.

4.3.2 Define Activities

Define activities is the process of identifying and documenting the specific actions to be performed to produce the project deliverables (PMI, 2017, p. 183). This process decomposed work packages into schedule activities which provide a basis for estimating, scheduling, monitoring and controlling the project work. The Work Breakdown Structure and Work Breakdown Dictionary from the scope management knowledge area were utilized to define the activities for the Supporting the Shift to Electric Mobility Project. Expert judgment, meetings and decomposition were utilized as the main tools and techniques to define the activities. The output was an activity list. A milestone list was also utilized as a guide to define activities. According to PMI (2017, p.186), a milestone list identifies all project milestones and have zero duration since they represent a significant point or event. Chart 13 below displays the milestone list for the project.

Chart 13: Milestone List

Milestones List	
Milestone name	**Estimated End date**
Project Start	January 09, 2023
Completion of Component 1 Completed	December 27, 2024
Completion of Component 2 Completed	November 28, 2025
Completion of Component 3 Completed	April 24, 2026

Milestone name	Estimated End date
Completion of Component 4 Completed	November 06, 2026
Completion of Quality Standards Certification	November 27, 2026
Completion Project Completion Report	December 18, 2026
Project Closure	December 28, 2026

Note: Own Work.

4.3.3 Sequence Activities

Sequence activities is the process of identifying and documenting relationships among the project deliverables (PMI, 2017, p. 187). The key benefit of this process is that it defines the logical sequence of work to obtain the greatest efficiency given all project constraints. The WBS, milestone list and constraints and assumptions of the project were utilized to conduct this process. A project schedule network diagram was developed from this process.

4.3.4 Estimate Activity Durations

Estimate activity durations is the process of estimating the number of work periods required to complete individual activities with estimated resources. The key benefit of this process is that it provides the amount of time that each activity will take to complete (PMI, 2017, p. 195). In order to estimate activity durations, several meetings were held with key stakeholders and a combination of the analogous estimating technique where estimates were made by utilizing historical data from similar projects, and bottom-up estimating technique where the duration of the project was estimated by aggregating the lower levels of the WBS. Chart 14 displays the activity list for the project in the subsequent page.

Chart 14: Activity List

ID #	WBS ID	Activity ID	Task Name	Duration	Start	Finish	Predecessors
1	**1**		**1. Supporting the Shift to Electric Mobility in Saint Lucia Project**	**1036 days**	**Mon 09/01/23**	**Mon 28/12/26**	
2	**1.1**		**Component 1: Institutionalization of Low-Carbon Electric Mobility**	**515 days**	**Mon 09/01/23**	**Fri 27/12/24**	
3	**1.1.1**		**Inter-sectorial Coordination Body**	**145 days**	**Mon 09/01/23**	**Fri 28/07/23**	
4		1.1.1.1	Draft terms of reference and body's work plan	30 days	Mon 09/01/23	Fri 17/02/23	
5		1.1.1.2	Quarterly Body Meetings and reports from date of inception	30 days	Mon 20/02/23	Fri 31/03/23	4
6		1.1.1.3	Stakeholder consultation strategy presented for approval	35 days	Mon 03/04/23	Fri 19/05/23	5
7		1.1.1.4	Operational knowledge management and dissemination platform	50 days	Mon 22/05/23	Fri 28/07/23	6
8	**1.1.2**		**Sustainable Passenger Mobility Policy**	**110 days**	**Mon 31/07/23**	**Fri 29/12/23**	**3**
9		1.1.2.1	Complete gender-sensitive data collection and analysis of passenger mobility demand	25 days	Mon 31/07/23	Fri 01/09/23	
10		1.1.2.2	Complete study on sustainable alternatives for the public transport system and road safety	40 days	Mon 04/09/23	Fri 27/10/23	9
11		1.1.2.3	Complete sustainable and safe passenger mobility policy including gender action plan	25 days	Mon 30/10/23	Fri 01/12/23	10
12		1.1.2.4	Complete recommendations for the improvement of passenger transport statistics and GHG monitoring	20 days	Mon 04/12/23	Fri 29/12/23	11
13	**1.1.3**		**National low-carbon e-mobility strategy**	**125 days**	**Mon 01/01/24**	**Fri 21/06/24**	**3,8**
14		1.1.3.1	Gender-sensitive fleet electrification feasibility analysis	20 days	Mon 01/01/24	Fri 26/01/24	
15		1.1.3.2	Complete study on the integration of renewable power and e-mobility in the energy system	25 days	Mon 29/01/24	Fri 01/03/24	14
16		1.1.3.3	Complete national charging network analysis	20 days	Mon 04/03/24	Fri 29/03/24	15

ID #	WBS ID	Activity ID	Task Name	Duration	Start	Finish	Predecessors
16		1.1.3.4	Draft national e-mobility strategy including gender action plan and circulate to key stakeholders for consultation and validation	45 days	Mon 01/04/24	Fri 31/05/24	16
18		1.1.3.5	Complete and submit final national e-mobility strategy (Vision 2030) for government adoption.	15 days	Mon 03/06/24	Fri 21/06/24	17
19	**1.1.4**		**E-mobility Technologies Training**	**135 days**	**Mon 24/06/24**	**Fri 27/12/24**	**3,8,13**
20		1.1.4.1	Complete and implement E-mobility Communication Plan	30 days	Mon 24/06/24	Fri 02/08/24	
21		1.1.4.2	Provide Capacity-building materials to decision makers and government officials	30 days	Mon 05/08/24	Fri 13/09/24	20
22		1.1.4.3	Conduct training activities on sustainable transport and e-mobility policies, standards, and regulations	50 days	Mon 16/09/24	Fri 22/11/24	21
23		1.1.4.4	Complete knowledge management guidelines and training materials addressing electricity and transport specialists	25 days	Mon 25/11/24	Fri 27/12/24	22
24	**1.2**		**Component 2: Short term barrier removal through low-carbon e-mobility demonstrations**	**240 days**	**Mon 30/12/24**	**Fri 28/11/25**	**2**
25	**1.2.1**		**Monitoring, reporting and verification (MRV) system**	**45 days**	**Mon 30/12/24**	**Fri 28/02/25**	19
26		1.2.1.1	Complete demonstration design, including its monitoring, reporting and verification (MRV) plan	25 days	Mon 30/12/24	Fri 31/01/25	
27		1.2.1.2	Complete evaluation report and knowledge management of demonstration	25 days	Mon 03/02/25	Fri 07/03/25	26
28	**1.2.2**		**Electric Vehicle Demonstration**	**35 days**	**Mon 10/03/25**	**Fri 25/04/25**	**25**
29		1.2.2.1	Completion of demonstration plan	30 days	Mon 10/03/25	Fri 18/04/25	
30		1.2.2.2	Conduct procurement of pilot vehicles including technical support	30 days	Mon 21/04/25	Fri 30/05/25	29

ID #	WBS ID	Activity ID	Task Name	Duration	Start	Finish	Predecessors
31	**1.2.3**		**Procurement and Installation of Charging Points**	**35 days**	**Mon 02/06/25**	**Fri 18/07/25**	**28,29,30**
32	**1.2.4**		**Professional training relating to electric vehicle safety**	**95 days**	**Mon 21/07/25**	**Fri 28/11/25**	**25,28,31**
33		1.2.4.1	Complete communication plan for the project demonstrations, including awareness raising actions addressed to the public	30 days	Mon 21/07/25	Fri 29/08/25	
34		1.2.4.2	Communication materials on the project demonstrations	20 days	Mon 01/09/25	Fri 26/09/25	33
35		1.2.4.3	Provide training materials on EV and charging infrastructure technology and maintenance	15 days	Mon 29/09/25	Fri 17/10/25	34
36		1.2.4.4	Conduct professional training activities on EV safety (emergency services), driving and maintenance	30 days	Mon 20/10/25	Fri 28/11/25	35
37	**1.3**		**Component 3: Preparing for scale-up and replication of low carbon electric mobility**	**105 days**	**Mon 01/12/25**	**Fri 24/04/26**	**2,24**
38	**1.3.1**		**Regulatory and tax reforms**	**55 days**	**Mon 01/12/25**	**Fri 13/02/26**	
39		1.3.1.1	Complete regulatory proposal on vehicle approval and periodic technical inspection, including electric vehicles	15 days	Mon 01/12/25	Fri 19/12/25	
40		1.3.1.2	Complete regulatory proposal on technical approval and installation of public and private charging stations	10 days	Mon 22/12/25	Fri 02/01/26	39
41		1.3.1.3	Complete regulatory proposal on public transport authorizations and concession contracts	10 days	Mon 05/01/26	Fri 16/01/26	40
42		1.3.1.4	Complete tax reform proposal to facilitate fiscal stability	10 days	Mon 19/01/26	Fri 30/01/26	41
43		1.3.1.5	Conduct stakeholder consultations on regulatory reforms	10 days	Mon 02/02/26	Fri 13/02/26	42

ID #	WBS ID	Activity ID	Task Name	Duration	Start	Finish	Predecessors
44	**1.3.2**		**1.3.2 Business models, financial schemes and procurement guidelines for electric vehicle fleets and charging stations**	**50 days**	**Mon 16/02/26**	**Fri 24/04/26**	**38**
45		1.3.2.1	Complete scenarios on the potential of the electric vehicle market in Saint Lucia.	15 days	Mon 16/02/26	Fri 06/03/26	
46		1.3.2.2	Development of business models for electrification of public and private fleets in Saint Lucia	15 days	Mon 09/03/26	Fri 27/03/26	45
47		1.3.2.3	Development of financial schemes to support fleet electrification	15 days	Mon 30/03/26	Fri 17/04/26	46
48		1.3.2.4	Publish and disseminate e-mobility recommendations and procurement guidelines to fleet managers	5 days	Mon 20/04/26	Fri 24/04/26	47
49	**1.4**		**Component 4: Long-term environmental sustainability of low-carbon electric mobility**	**140 days**	**Mon 27/04/26**	**Fri 06/11/26**	**2,24,37**
50	**1.4.1**		**Assessment and Recommendations on ELV management**	**35 days**	**Mon 27/04/26**	**Fri 12/06/26**	
51		1.4.1.1	Complete assessment of local conditions and characteristics of ELV management	15 days	Mon 27/04/26	Fri 15/05/26	
52		1.4.1.2	Complete forecast of ELV components generation, considering internal combustion and electric vehicles	15 days	Mon 18/05/26	Fri 05/06/26	51
53		1.4.1.3	Submit recommendations on ELV management in Saint Lucia to the government for adoption	5 days	Mon 08/06/26	Fri 12/06/26	52
54	**1.4.2**		**Updated legislation on end-of-life vehicle management**	**35 days**	**Mon 15/06/26**	**Fri 31/07/26**	**50**
55		1.4.2.1	Complete report summarizing international and regional regulations on ELV management	15 days	Mon 15/06/26	Fri 03/07/26	
56		1.4.2.2	Conduct comprehensive review of existing and planned international regulations on second-life	15 days	Mon 06/07/26	Fri 24/07/26	55

ID #	WBS ID	Activity ID	Task Name	Duration	Start	Finish	Predecessors
			battery use and recommendations for the Saint Lucia context				
57		1.4.2.3	Complete and submit proposal for ELV regulation to the government for adoption	5 days	Mon 27/07/26	Fri 31/07/26	56
58	**1.4.3**		**Development of commercially viable business models**	**25 days**	**Mon 03/08/26**	**Fri 04/09/26**	**50,54**
59		1.4.3.1	Conduct screening and systematization of successful financial and business models on ELV components and second-life battery use	5 days	Mon 03/08/26	Fri 07/08/26	
60		1.4.3.2	Development of commercially viable business models for ELV components and EV batteries	10 days	Mon 10/08/26	Fri 21/08/26	59
61		1.4.3.3	Development of a roadmap on sustainable and commercially viable ELV and battery management submitted to government for adoption	10 days	Mon 24/08/26	Fri 04/09/26	60
62	**1.4.4**		**National electric mobility campaign**	**35 days**	**Mon 07/09/26**	**Fri 23/10/26**	**58**
63		1.4.4.1	Complete design and delivery of a training programme for policymakers and local academia	15 days	Mon 07/09/26	Fri 25/09/26	
64		1.4.4.2	Provision of technical and managerial support to producers and importers, with a focus on the local industry	10 days	Mon 28/09/26	Fri 09/10/26	63
65		1.4.4.3	Complete design and implementation of a national campaign to raise awareness among consumers	20 days	Mon 12/10/26	Fri 23/10/26	64
66	**1.5**		**Quality Standards Certification**	**25 days**	**Mon 26/10/26**	**Fri 27/11/26**	**2,24,37,49**
67	**1.5.1**		**Validation Permits and Approvals**	**10 days**	Mon 26/10/26	Fri 06/11/26	
68		1.5.1.1	Environmental Permits	5 days	Mon 26/10/26	Fri 30/11/26	
69		1.5.2.2	Labor Permits	5 days	Mon 02/11/26	Fri 06/11/26	68
70	**1.5.2**		**Quality Testing**	**15 days**	**Mon 09/11/26**	**Fri 27/11/26**	**67**
71		1.5.2.1	Quality Inspections	10 days	Mon 09/11/26	Fri 20/11/26	

ID #	WBS ID	Activity ID	Task Name	Duration	Start	Finish	Predecessors
72		1.5.2.2	Standards Certification	5 days	Mon 23/11/26	Fri 27/11/26	71
73	**1.6**		**Project Closure**	**21 days**	**Mon 30/11/26**	**Fri 28/12/26**	**2,24,37,49,66**
74	**1.6.1**		**Document Lessons Learned**	**5 days**	**Mon 30/11/26**	**Fri 04/12/26**	
75		1.6.1.1	Conduct lessons learned meeting	1 day	Mon 30/11/26	Mon 30/11/26	
76		1.6.1.2	Complete documentation of lessons learned	4 days	Tue 01/12/26	Fri 04/12/26	75
77	**1.6.2**		**Update Files/Records**	**5 days**	**Mon 07/12/26**	**Fri 11/12/26**	**74**
78		1.6.2.1	Complete updates of files and records physically and electronically	5 days	Mon 07/12/26	Fri 11/12/26	
79	**1.6.3**		**Project Completion Report**	**6 days**	**Mon 14/12/26**	**Fri 21/12/26**	**74,77**
80		1.6.3.1	Complete project completion report	15 days	Mon 14/12/26	Fri 18/12/26	
81		1.6.3.2	Distribute to key stakeholders	1 day	Mon 21/12/26	Mon 21/12/26	80
82	**1.6.4**		**Archive Files/Documents**	**5 days**	**Tue 22/12/26**	**Mon 28/12/26**	**81**

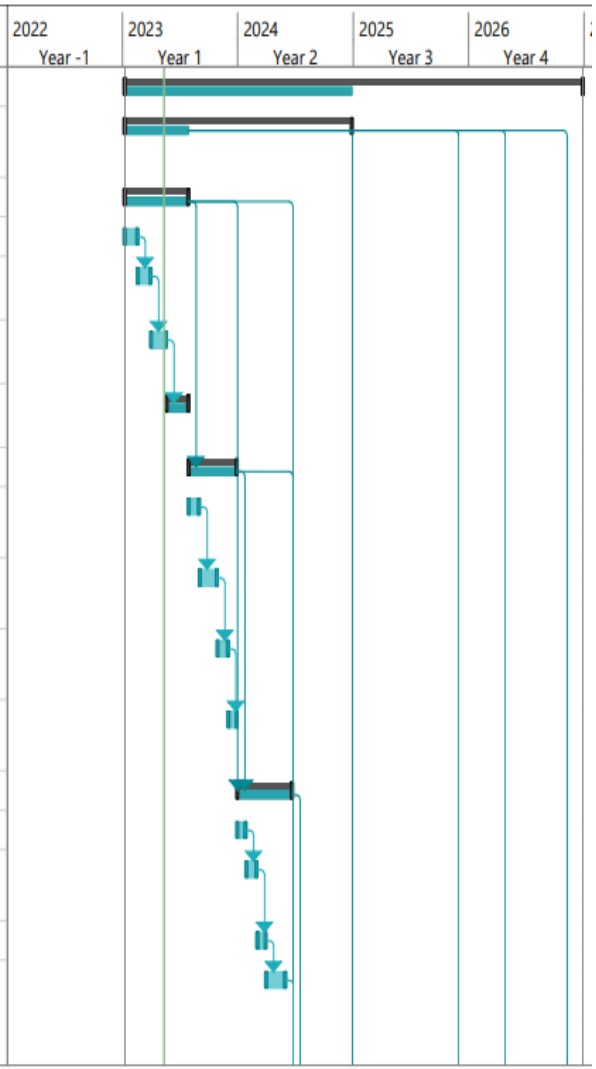
Note: Own Work.

4.3.5 Develop Schedule

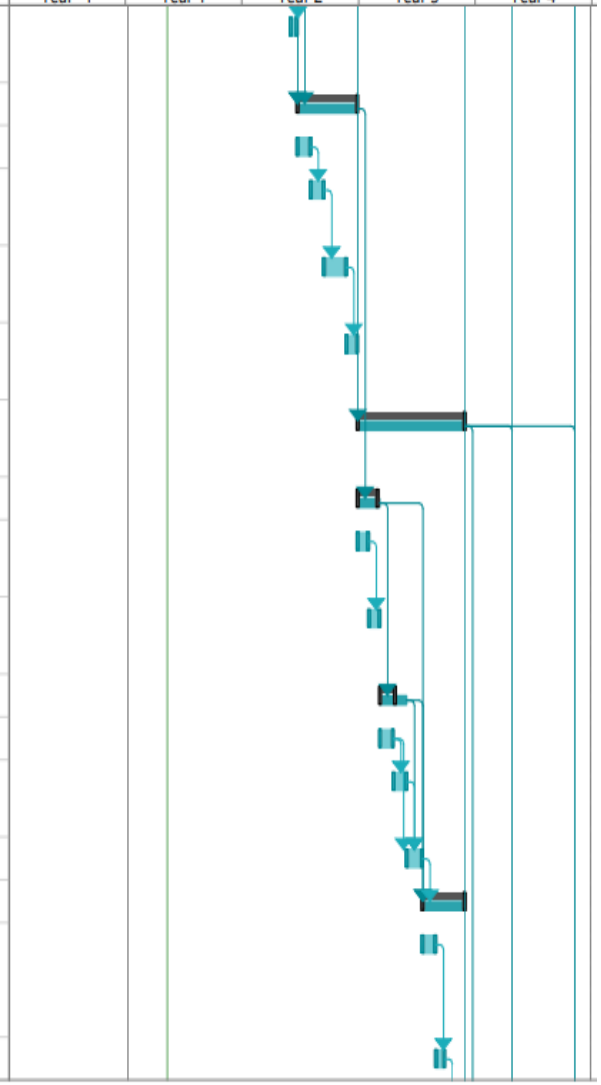
Develop Schedule is the process of analyzing activity sequences, durations, resource requirements and schedule constraints to create a schedule model for project execution and monitoring and controlling (PMI, 2017, p.205). The main advantage of this process is that it generates a schedule model with planned dates for completing project activities. The schedule for the Supporting the Shift to Electric Mobility in Saint Lucia Project was developed using Microsoft Project 2016. Activity sequences, durations, resource requirements and schedule constraints were analyzed to generate the project's schedule. Several meetings and consultations were held with key stakeholders to determine the start and finish dates for each activity. After the start and finish dates were determined, the project team were assigned to the activities, and it was confirmed that the start and finish dates presented no conflict with resource calendars. The project schedule for the Supporting the Shift to Electric Mobility in Saint Lucia Project is displayed in Figure 19 on the subsequent page.

Figure 19: Project Schedule - Activity View

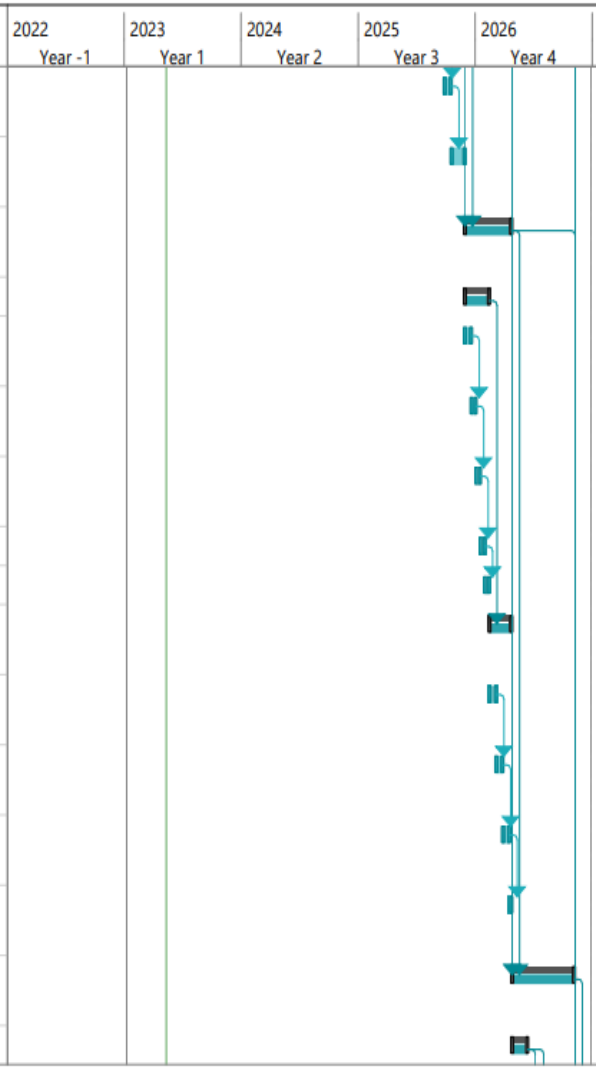
ID	Task Mode	Task Name	Duration	Start	Finish
1		**1. Supporting the Shift to Electric Mobility in Saint Lucia Project**	**1036 days**	**Mon 09/01/23**	**Mon 28/12/26**
2		**1.1 Component 1: Institutionalization of Low-Carbon Electric Mobility**	**515 days**	**Mon 09/01/23**	**Fri 27/12/24**
3		**1.1.1 Inter-sectorial Coordination Body**	**145 days**	**Mon 09/01/23**	**Fri 28/07/23**
4		1.1.1.1 Draft terms of reference and body's work plan	30 days	Mon 09/01/23	Fri 17/02/23
5		1.1.1.2 Quarterly Body Meetings and reports from date of inception	30 days	Mon 20/02/23	Fri 31/03/23
6		1.1.1.3 Stakeholder consultation strategy presented for approval	35 days	Mon 03/04/23	Fri 19/05/23
7		1.1.1.4 Operational knowledge management and dissemination platform	50 days	Mon 22/05/23	Fri 28/07/23
9		**1.1.2 Sustainable Passenger Mobility Policy**	**110 days**	**Mon 31/07/23**	**Fri 29/12/23**
10		1.1.2.1 Complete gender-sensitive data collection and analysis of passenger mobility demand	25 days	Mon 31/07/23	Fri 01/09/23
11		1.1.2.2 Complete study on sustainable alternatives for the public transport system and road safety	40 days	Mon 04/09/23	Fri 27/10/23
12		1.1.2.3 Complete sustainable and safe passenger mobility policy including gender action plan	25 days	Mon 30/10/23	Fri 01/12/23
13		1.1.2.4 Complete recommendations for the improvement of passenger transport statistics and GHG monitoring	20 days	Mon 04/12/23	Fri 29/12/23
14		**1.1.3 National low-carbon e-mobility strategy**	**125 days**	**Mon 01/01/24**	**Fri 21/06/24**
15		1.1.3.1 Gender-sensitive fleet electrification feasibility analysis	20 days	Mon 01/01/24	Fri 26/01/24
16		1.1.3.2 Complete study on the integration of renewable power and e-mobility in the energy system	25 days	Mon 29/01/24	Fri 01/03/24
17		1.1.3.3 Complete national charging network analysis	20 days	Mon 04/03/24	Fri 29/03/24
18		1.1.3.4 Draft national e-mobility strategy including gender action plan and circulate to key stakeholders for consultation and validation	45 days	Mon 01/04/24	Fri 31/05/24



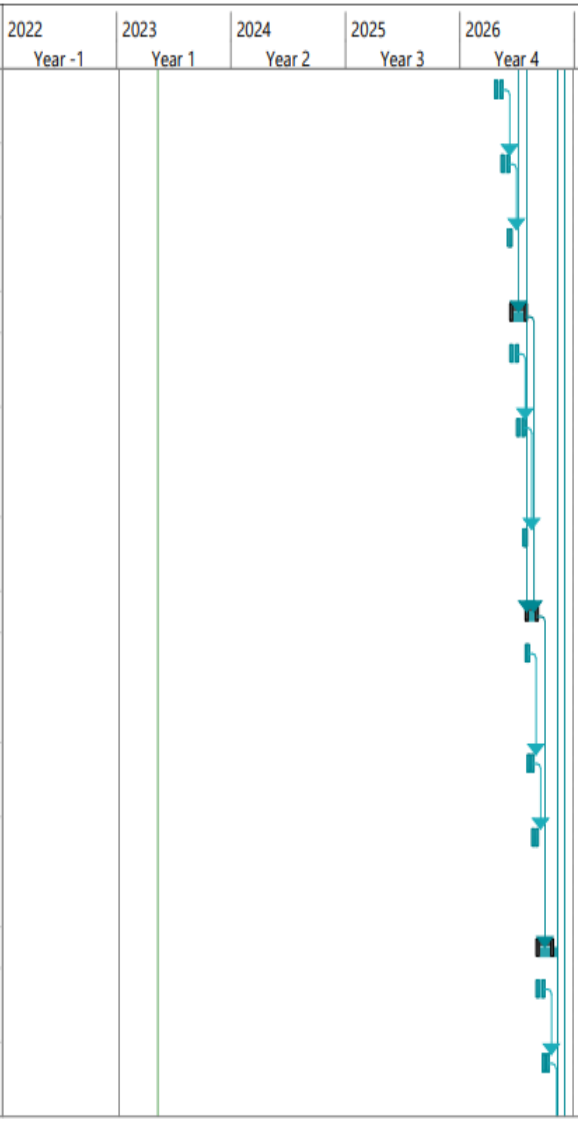
ID	Task Mode	Task Name	Duration	Start	Finish
19		1.1.3.5 Complete and submit final national e-mobility strategy (Vision 2030) for government adoption.	15 days	Mon 03/06/24	Fri 21/06/24
20		**1.1.4 E-mobility Technologies Training**	**135 days**	**Mon 24/06/24**	**Fri 27/12/24**
21		1.1.4.1 Complete and implement E-mobility Communication Plan	30 days	Mon 24/06/24	Fri 02/08/24
22		1.1.4.2 Provide Capacity-building materials to decision makers and government officials	30 days	Mon 05/08/24	Fri 13/09/24
23		1.1.4.3 Conduct training activities on sustainable transport and e-mobility policies, standards, and regulations	50 days	Mon 16/09/24	Fri 22/11/24
24		1.1.4.4 Complete knowledge management guidelines and training materials addressing electricity and transport specialists	25 days	Mon 25/11/24	Fri 27/12/24
25		**1.2 Component 2: Short term barrier removal through low-carbon e-mobility demonstrations**	**240 days**	**Mon 30/12/24**	**Fri 28/11/25**
26		**1.2.1 Monitoring, reporting and verification (MRV) system**	**45 days**	**Mon 30/12/24**	**Fri 28/02/25**
27		1.2.1.1 Complete demonstration design, including its monitoring, reporting and verification (MRV) plan	25 days	Mon 30/12/24	Fri 31/01/25
28		1.2.1.2 Complete evaluation report and knowledge management of demonstration	25 days	Mon 03/02/25	Fri 07/03/25
29		**1.2.2 Electric Vehicle Demonstration**	**35 days**	**Mon 10/03/25**	**Fri 25/04/25**
30		1.2.2.1 Completion of demonstration plan	30 days	Mon 10/03/25	Fri 18/04/25
31		1.2.2.2 Conduct procurement of pilot vehicles including technical support	30 days	Mon 21/04/25	Fri 30/05/25
32		**1.2.3 Procurement and Installation of Charging Points**	**35 days**	**Mon 02/06/25**	**Fri 18/07/25**
33		**1.2.4 Professional training relating to electric vehicle safety**	**95 days**	**Mon 21/07/25**	**Fri 28/11/25**
34		1.2.4.1 Complete communication plan for the project demonstrations, including awareness raising actions addressed to the public	30 days	Mon 21/07/25	Fri 29/08/25
35		1.2.4.2 Communication materials on the project demonstrations	20 days	Mon 01/09/25	Fri 26/09/25



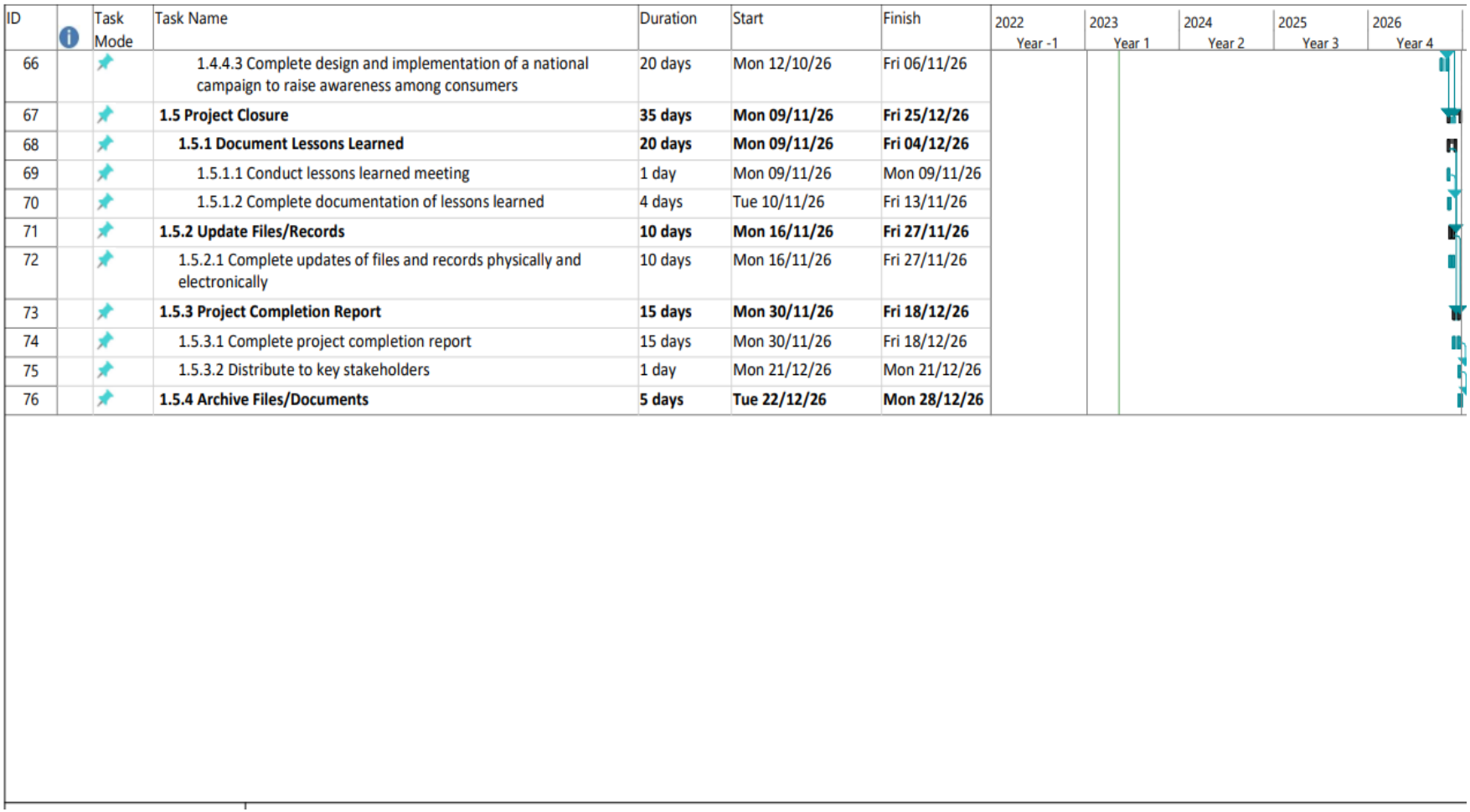
ID	Task Mode	Task Name	Duration	Start	Finish
36		1.2.4.3 Provide training materials on EV and charging infrastructure technology and maintenance	15 days	Mon 29/09/25	Fri 17/10/25
37		1.2.4.4 Conduct professional training activities on EV safety (emergency services), driving and maintenance	30 days	Mon 20/10/25	Fri 28/11/25
38		**1.3 Component 3: Preparing for scale-up and replication of low carbon electric mobility**	**105 days**	**Mon 01/12/25**	**Fri 24/04/26**
39		**1.3.1 Regulatory and tax reforms**	**55 days**	**Mon 01/12/25**	**Fri 13/02/26**
40		1.3.1.1 Complete regulatory proposal on vehicle approval and periodic technical inspection, including electric vehicles	15 days	Mon 01/12/25	Fri 19/12/25
41		1.3.1.2 Complete regulatory proposal on technical approval and installation of public and private charging stations	10 days	Mon 22/12/25	Fri 02/01/26
42		1.3.1.3 Complete regulatory proposal on public transport authorizations and concession contracts	10 days	Mon 05/01/26	Fri 16/01/26
43		1.3.1.4 Complete tax reform proposal to facilitate fiscal stability	10 days	Mon 19/01/26	Fri 30/01/26
44		1.3.1.5 Conduct stakeholder consultations on regulatory reforms	10 days	Mon 02/02/26	Fri 13/02/26
45		**1.3.2 Business models, financial schemes and procurement guidelines for electric vehicle fleets and charging stations**	**50 days**	**Mon 16/02/26**	**Fri 24/04/26**
46		1.3.2.1 Complete scenarios on the potential of the electric vehicle market in Saint Lucia.	15 days	Mon 16/02/26	Fri 06/03/26
47		1.3.2.2 Development of business models for electrification of public and private fleets in Saint Lucia	15 days	Mon 09/03/26	Fri 27/03/26
48		1.3.2.3 Development of financial schemes to support fleet electrification	15 days	Mon 30/03/26	Fri 17/04/26
49		1.3.2.4 Publish and disseminate e-mobility recommendations and procurement guidelines to fleet managers	5 days	Mon 20/04/26	Fri 24/04/26
50		**1.4 Component 4: Long-term environmental sustainability of low-carbon electric mobility**	**140 days**	**Mon 27/04/26**	**Fri 06/11/26**
51		**1.4.1 Assessment and Recommendations on ELV management**	**35 days**	**Mon 27/04/26**	**Fri 12/06/26**



ID	Task Mode	Task Name	Duration	Start	Finish
52		1.4.1.1 Complete assessment of local conditions and characteristics of ELV management	15 days	Mon 27/04/26	Fri 15/05/26
53		1.4.1.2 Complete forecast of ELV components generation, considering internal combustion and electric vehicles	15 days	Mon 18/05/26	Fri 05/06/26
54		1.4.1.3 Submit recommendations on ELV management in Saint Lucia to the government for adoption	5 days	Mon 08/06/26	Fri 12/06/26
55		**1.4.2 Updated legislation on end-of-life vehicle management**	**35 days**	**Mon 15/06/26**	**Fri 31/07/26**
56		1.4.2.1 Complete report summarizing international and regional regulations on ELV management	15 days	Mon 15/06/26	Fri 03/07/26
57		1.4.2.2 Conduct comprehensive review of existing and planned international regulations on second-life battery use and recommendations for the Saint Lucia context	15 days	Mon 06/07/26	Fri 24/07/26
58		1.4.2.3 Complete and submit proposal for ELV regulation to the government for adoption	5 days	Mon 27/07/26	Fri 31/07/26
59		**1.4.3 Development of commercially viable business models**	**25 days**	**Mon 03/08/26**	**Fri 04/09/26**
60		1.4.3.1 Conduct screening and systematization of successful financial and business models on ELV components and second-life battery use	5 days	Mon 03/08/26	Fri 07/08/26
61		1.4.3.2 Development of commercially viable business models for ELV components and EV batteries	10 days	Mon 10/08/26	Fri 21/08/26
62		1.4.3.3 Development of a roadmap on sustainable and commercially viable ELV and battery management submitted to government for adoption	10 days	Mon 24/08/26	Fri 04/09/26
63		**1.4.4 National electric mobility campaign**	**35 days**	**Mon 07/09/26**	**Fri 23/10/26**
64		1.4.4.1 Complete design and delivery of a training programme for policymakers and local academia	15 days	Mon 07/09/26	Fri 25/09/26
65		1.4.4.2 Provision of technical and managerial support to producers and importers, with a focus on the local industry	10 days	Mon 28/09/26	Fri 09/10/26



ID	Task Mode	Task Name	Duration	Start	Finish
66		1.4.4.3 Complete design and implementation of a national campaign to raise awareness among consumers	20 days	Mon 12/10/26	Fri 06/11/26
67		**1.5 Project Closure**	**35 days**	**Mon 09/11/26**	**Fri 25/12/26**
68		**1.5.1 Document Lessons Learned**	**20 days**	**Mon 09/11/26**	**Fri 04/12/26**
69		1.5.1.1 Conduct lessons learned meeting	1 day	Mon 09/11/26	Mon 09/11/26
70		1.5.1.2 Complete documentation of lessons learned	4 days	Tue 10/11/26	Fri 13/11/26
71		**1.5.2 Update Files/Records**	**10 days**	**Mon 16/11/26**	**Fri 27/11/26**
72		1.5.2.1 Complete updates of files and records physically and electronically	10 days	Mon 16/11/26	Fri 27/11/26
73		**1.5.3 Project Completion Report**	**15 days**	**Mon 30/11/26**	**Fri 18/12/26**
74		1.5.3.1 Complete project completion report	15 days	Mon 30/11/26	Fri 18/12/26
75		1.5.3.2 Distribute to key stakeholders	1 day	Mon 21/12/26	Mon 21/12/26
76		**1.5.4 Archive Files/Documents**	**5 days**	**Tue 22/12/26**	**Mon 28/12/26**



Note: Own Work.

4.3.6 Control Schedule

Control Schedule is the process of monitoring the status of the project to update the project schedule and managing changes to the schedule baseline (PMI, 2017, p. 222). According to the PMBOK Guide, the key benefit of this process is that the schedule baseline is maintained throughout the project. For the Supporting the Shift to Electric Mobility Project, the schedule baseline will be maintained by conducting periodic reviews utilizing the Earned Value Management technique. This would include using schedule performance measurements which includes schedule variance (SV) and schedule performance index (SPI) in order to assess the magnitude of variation to the original schedule baseline. It is anticipated that this review would be conducted at 30%, 50% and 70% of project schedule execution. Performance reviews will be conducted to measure, compare and analyze schedule performance against the schedule baseline. Any change requests which are related to the schedule baseline or project's schedule will be processed for review and disposition through the Perform Integrated Change Control Process. A Change Request Form as displayed in **Chart 7** will need to be utilized followed by the Integrated Change Control Process as displayed in **Figure 17**.

4.4 Cost Management Plan

Project Cost Management includes the processes involved in planning, estimating, budgeting, (PMI, 2017, p.231). According to PMI (2017, p. 231), the cost management processes are:

- Plan Cost Management
- Estimate Costs
- Determine Budget
- Control Costs

4.4.1 Plan Cost Management

Plan Cost Management is the process of defining how the project costs will be estimated, budgeted, managed, monitored and controlled (PMI, 2017, p. 235). The main inputs which were utilized in the creation of the cost management plan for the Supporting the Shift to Electric Mobility in Saint Lucia Project are the project management plan, project charter, schedule management plan, risk management plan, enterprise environmental factors and the organizational process assets. The tools and techniques utilized were data analysis, expert judgment and meetings. The plan cost management process will provide guidance and direction on how the costs will be managed throughout the Supporting the Shift to Electric Mobility in Saint Lucia Project.

4.4.2 Estimate Costs

Estimate costs is the second process of project cost management which involves developing an approximation of the cost of resources required to complete project work (PMI, 2017, p. 240). According to PMI (2017, p.240), the key benefit of this process is that it determines the monetary resources which are required for the project. The inputs which were utilized for this process include the project management subsidiary plans which included the quality management plan and the scope baseline; project documents which included the lessons learnt register, the project schedule, resource requirements and the risk register; enterprise environmental factors and organizational process assets. The tools and techniques utilized for this process were expert judgment and analogous estimating technique. The estimates for the project were calculated based on the predefined scope of the project and historical information from previous projects.

Chart 15 highlights the total cost to deliver all the project's deliverables on the subsequent page. The various costs for the project are disaggregated based on the schedule baseline of four (4) years (2023-2026) for execution and completion. No contingency and management reserves are included in the estimated costs.

Chart 15: Estimated Costs

ID #	WBS ID	Activity ID	Task Name	Activity Description/ Basis of Estimates	Year 1 (2023) Cost (USD)	Year 2 (2024) Cost (USD)	Year 3 (2025) Cost (USD)	Year 4 (2026) Cost (USD)	Total (USD)
1	**1**		**1. Supporting the Shift to Electric Mobility in Saint Lucia Project**						
2	**1.1**		**Component 1: Institutionalization of Low-Carbon Electric Mobility**						**$174,100.00**
3	**1.1.1**		**Inter-sectorial Coordination Body**						
4		1.1.1.1	Draft terms of reference and body's work plan	Consultancy service from Chief Technical Advisor	18,500	-	-		18,500
5		1.1.1.2	Quarterly Body Meetings and reports from date of inception	Contract services to support meetings and events	16,500	-	-		16,500
6		1.1.1.3	Stakeholder consultation strategy presented for approval		-	-	-		-
7		1.1.1.4	Operational knowledge management and dissemination platform	Contract services to provide technical assistance for design, implementation, and operation of website	20,000	-	-		20,000
			Sub-Total						**$55,000.00**
8	**1.1.2**		**Sustainable Passenger Mobility Policy**						
9		1.1.2.1	Complete gender-sensitive data collection and analysis of passenger mobility demand	Consultancy service from Chief Technical Advisor	7,400	-	-		7,400
10		1.1.2.2	Complete study on sustainable alternatives for the public transport system and road safety	Contract services to provide consultancy on passenger mobility policy and impacts of electrification	20,000	-	-		20,000

ID #	WBS ID	Activity ID	Task Name	Activity Description/ Basis of Estimates	Year 1 (2023) Cost (USD)	Year 2 (2024) Cost (USD)	Year 3 (2025) Cost (USD)	Year 4 (2026) Cost (USD)	Total (USD)
11		1.1.2.3	Complete sustainable and safe passenger mobility policy including gender action plan	Contract services to provide consultancy on gender analysis and action plan	10,000	-	-		10,000
12		1.1.2.4	Complete recommendations for the improvement of passenger transport statistics and GHG monitoring	Contract services to provide technical support on communication plans and activities (including website)	5,000	-	-		5,000
			Sub- Total						**$42,400.00**
13	**1.1.3**		**National low-carbon e-mobility strategy**						
14		1.1.3.1	Gender-sensitive fleet electrification feasibility analysis	Consultancy service from Chief Technical Advisor	-	7,400	-		7,400
15		1.1.3.2	Complete study on the integration of renewable power and e-mobility in the energy system	Consultancy services	-	20,000	-		20,000
16		1.1.3.3	Complete national charging network analysis	Consultancy services	-	5,000	-		5,000
16		1.1.3.4	Draft national e-mobility strategy including gender action plan and circulate to key stakeholders for consultation and validation	Consultancy services	-	10,000	-		10,000
18		1.1.3.5	Complete and submit final national e-mobility strategy (Vision 2030) for government adoption.		-	-	-		-
			Sub-Total						**$42,400.00**
19	**1.1.4**		**E-mobility Technologies Training**						
20		1.1.4.1	Complete and implement E-mobility Communication Plan	Consultancy service from Chief Technical Advisor	-	6,300	-		6,300

ID #	WBS ID	Activity ID	Task Name	Activity Description/ Basis of Estimates	Year 1 (2023) Cost (USD)	Year 2 (2024) Cost (USD)	Year 3 (2025) Cost (USD)	Year 4 (2026) Cost (USD)	Total (USD)
21		1.1.4.2	Provide Capacity-building materials to decision makers and government officials	Consultancy services	-	10,000	-		10,000
22		1.1.4.3	Conduct training activities on sustainable transport and e-mobility policies, standards, and regulations	Consultancy services	-	8,000	-		8,000
23		1.1.4.4	Complete knowledge management guidelines and training materials addressing electricity and transport specialists	Consultancy services	-	10,000	-		10,000
			Sub-Total						**$34,300.00**
24	**1.2**		**Component 2: Short term barrier removal through low-carbon e-mobility demonstrations**						**$297,112.00**
25	**1.2.1**		**Monitoring, reporting and verification (MRV) system**						
26		1.2.1.1	Complete demonstration design, including its monitoring, reporting and verification (MRV) plan	Consultancy service from Chief Technical Advisor	-	-	5,250		5,250
27		1.2.1.2	Complete evaluation report and knowledge management of demonstration	Technical support to demonstrations and EV potential market assessment	-	-	10,000		10,000
			Sub-Total						**$15,250.00**
28	**1.2.2**		**Electric Vehicle Demonstration**						
29		1.2.2.1	Completion of demonstration plan	Consultancy service from Chief Technical Advisor	-	-	5,250		5,250
30		1.2.2.2	Conduct procurement of pilot vehicles including technical support	Technical support and grants to EV beneficiaries	-	-			210,000
			Sub-Total						**$215,250.00**

ID #	WBS ID	Activity ID	Task Name	Activity Description/ Basis of Estimates	Year 1 (2023) Cost (USD)	Year 2 (2024) Cost (USD)	Year 3 (2025) Cost (USD)	Year 4 (2026) Cost (USD)	Total (USD)
31	**1.2.3**		**Procurement and Installation of Charging Points**		-	-			
			Sub-Total						**$15,000.00**
32	**1.2.4**		**Professional training relating to electric vehicle safety**						
33		1.2.4.1	Complete communication plan for the project demonstrations, including awareness raising actions addressed to the public	Consultancy service from Chief Technical Advisor	-	-	7,700		7,700
34		1.2.4.2	Communication materials on the project demonstrations	Technical support on communication plans and activities	-	-	10,000		10,000
35		1.2.4.3	Provide training materials on EV and charging infrastructure technology and maintenance	Technical support	-	-	9,912		9,912
36		1.2.4.4	Conduct professional training activities on EV safety (emergency services), driving and maintenance	Services to support meetings and events	-	-	24,000		24,000
			Sub-Total						**$51,612.00**
37	**1.3**		**Component 3: Preparing for scale-up and replication of low carbon electric mobility**						**$107,650.00**
38	**1.3.1**		**Regulatory and tax reforms**						
39		1.3.1.1	Complete regulatory proposal on vehicle approval and periodic technical inspection, including electric vehicles	Consultancy service from Chief Technical Advisor	-	-	7,700		7,700

ID #	WBS ID	Activity ID	Task Name	Activity Description/ Basis of Estimates	Year 1 (2023) Cost (USD)	Year 2 (2024) Cost (USD)	Year 3 (2025) Cost (USD)	Year 4 (2026) Cost (USD)	Total (USD)
40		1.3.1.2	Complete regulatory proposal on technical approval and installation of public and private charging stations	Consultancy services	-	-		13,000	13,000
41		1.3.1.3	Complete regulatory proposal on public transport authorizations and concession contracts	Consultancy services	-	-		12,000	12,000
42		1.3.1.4	Complete tax reform proposal to facilitate fiscal stability	Consultancy services	-	-		10,000	10,000
43		1.3.1.5	Conduct stakeholder consultations on regulatory reforms		-	-	-		-
			Sub-Total						**$42,700.00**
44	**1.3.2**		**Business models, financial schemes and procurement guidelines for electric vehicle fleets and charging stations**						
45		1.3.2.1	Complete scenarios on the potential of the electric vehicle market in Saint Lucia.	Consultancy service from Chief Technical Advisor	-	-	-	19,950	19,950
46		1.3.2.2	Development of business models for electrification of public and private fleets in Saint Lucia	Consultancy on business models	-	-	-	17,000	17,000
47		1.3.2.3	Development of financial schemes to support fleet electrification	Consultancy on finance schemes	-	-	-	18,000	18,000
48		1.3.2.4	Publish and disseminate e-mobility recommendations and procurement guidelines to fleet managers	Technical support	-	-	-	10,000	10,000
			Sub-Total						**$64,950.00**

ID #	WBS ID	Activity ID	Task Name	Activity Description/ Basis of Estimates	Year 1 (2023) Cost (USD)	Year 2 (2024) Cost (USD)	Year 3 (2025) Cost (USD)	Year 4 (2026) Cost (USD)	Total (USD)
49	**1.4**		**Component 4: Long-term environmental sustainability of low-carbon electric mobility**						**$96,500.00**
50	**1.4.1**		**Assessment and Recommendations on ELV management**						
51		1.4.1.1	Complete assessment of local conditions and characteristics of ELV management	Consultancy service from Chief Technical Advisor	-	-	-	3,500	3,500
52		1.4.1.2	Complete forecast of ELV components generation, considering internal combustion and electric vehicles	Consultancy service on future ELV management regulations	-	-	-	20,000	20,000
53		1.4.1.3	Submit recommendations on ELV management in Saint Lucia to the government for adoption		-	-	-	-	
			Sub-Total						**$23,500.00**
54	**1.4.2**		**Updated legislation on end-of-life vehicle management**						
55		1.4.2.1	Complete report summarizing international and regional regulations on ELV management	Consultancy service from Chief Technical Advisor	-	-	-	3,500	3,500
56		1.4.2.2	Conduct comprehensive review of existing and planned international regulations on second-life battery use and recommendations for the Saint Lucia context	Consultancy services on ELV regulations	-	-	-	15,000	15,000
57		1.4.2.3	Complete and submit proposal for ELV regulation to the government for adoption		-	-	-	-	

ID #	WBS ID	Activity ID	Task Name	Activity Description/ Basis of Estimates	Year 1 (2023) Cost (USD)	Year 2 (2024) Cost (USD)	Year 3 (2025) Cost (USD)	Year 4 (2026) Cost (USD)	Total (USD)
			Sub-Total						**$18,500.00**
58	**1.4.3**		**Development of commercially viable business models**						
59		1.4.3.1	Conduct screening and systematization of successful financial and business models on ELV components and second-life battery use	Consultancy service from Chief Technical Advisor	-	-	-	7,000	7,000
60		1.4.3.2	Development of commercially viable business models for ELV components and EV batteries	Consultancy services	-	-	-	10,000	10,000
61		1.4.3.3	Development of a roadmap on sustainable and commercially viable ELV and battery management submitted to government for adoption	Consultancy services	-	-	-	10,000	10,000
			Sub-Total						**$27,000.00**
62	**1.4.4**		**National electric mobility campaign**						
63		1.4.4.1	Complete design and delivery of a training programme for policymakers and local academia	Consultancy service from Chief Technical Advisor	-	-	-	7,500	7,500
64		1.4.4.2	Provision of technical and managerial support to producers and importers, with a focus on the local industry	Technical support on communication plans and activities	-	-	-	10,000	10,000
65		1.4.4.3	Complete design and implementation of a national campaign to raise awareness among consumers	Consultancy services	-	-	-	10,000	10,000
			Sub-Total						**$27,500.00**
66	**1.5**		**Quality Testing**						**$18,000.00**

ID #	WBS ID	Activity ID	Task Name	Activity Description/ Basis of Estimates	Year 1 (2023) Cost (USD)	Year 2 (2024) Cost (USD)	Year 3 (2025) Cost (USD)	Year 4 (2026) Cost (USD)	Total (USD)
67	**1.5.1**		**Validation, Permits and Approvals**						
68		1.5.1.1	Environmental Permits		-	-	-	4,000	4,000
69		1.5.1.2	Labor Permits		-	-	-	3,000	3,000
			Sub-Total						**$7,000.00**
70	**1.5.2**		**Quality Testing**						
71		1.5.2.1	Quality Inspections		-	-	-	6,000	6,000
72		1.5.2.2	Standards Certification		-	-	-	5,000	5,000
			Sub-Total						**$11,000.00**
73	**1.6**		**Project Closure**						**$92,326.00**
74	**1.6.1**		**Document Lessons Learned**						
75		1.6.1.1	Conduct lessons learned meeting	Project Management Costs including office operations, furniture, and office supplies,	-	-	-	21, 000	21,000
76		1.6.1.2	Complete documentation of lessons learned		-	-	-	-	-
			Sub-Total						**$21,000.00**
77	**1.6.2**		**Update Files/Records**						
78		1.6.2.1	Complete updates of files and records physically and electronically	Personnel costs	-	-	-	30,550	30,550
			Sub-Total						**$30,550.00**
79	**1.6.3**		**Project Completion Report**						
80		1.6.3.1	Complete project completion report	Personnel costs/ consultancy services	-	-	-	40,776	40,776
81		1.6.3.2	Distribute to key stakeholders		-	-	-	-	-
			Sub-Total						**$40,776.00**

ID #	WBS ID	Activity ID	Task Name	Activity Description/ Basis of Estimates	Year 1 (2023) Cost (USD)	Year 2 (2024) Cost (USD)	Year 3 (2025) Cost (USD)	Year 4 (2026) Cost (USD)	Total (USD)
82	**1.6.4**		**Archive Files/Documents**		-	-	-	-	-
			TOTAL PROJECT BUDGET						**$785,688.00**

Note: Own Work.

4.4.3 Determine Budget

Based on the established project cost estimate in Chart 14, the total project budget can hereby be generated. Determine Budget is the process of aggregating the estimated costs of individual activities or work packages to establish an authorized cost baseline (PMI, 2017, p.248). According to PMI (2017, p.248), the key benefit of this process is that it determines the cost baseline against which project performance can be monitored and controlled. The inputs for this process include the project management plans including the cost management plan, resource management plan and the scope baseline. The tools and techniques used in this process were expert judgement, cost aggregation, historical information review and financing.

To determine the cost baseline, it is assumed that there is a contingency reserve of 10% and a management reserve of 3%. Chart 16 below demonstrates the total project budget for the Supporting the Shift to Electric Mobility in Saint Lucia Project which includes the contingency reserve, cost baseline and management reserve.

Chart 16: Project Budget

WBS ID	Activity ID	WBS Deliverable	Estimated Cost (USD)
1.1		**Component 1: Institutionalization of Low-Carbon Electric Mobility**	**$174,100.00**
1.1.1		**Inter-sectorial Coordination Body**	**$55,000.00**
	1.1.1.1	Draft terms of reference and body's work plan	$18,500.00
	1.1.1.2	Quarterly Body Meetings and reports from date of inception	$16,500.00
	1.1.1.3	Stakeholder consultation strategy presented for approval	0
	1.1.1.4	Operational knowledge management and dissemination platform	$20,000.00
1.1.2		**Sustainable Passenger Mobility Policy**	**$42,400.00**

WBS ID	Activity ID	WBS Deliverable	Estimated Cost (USD)
	1.1.2.1	Complete gender-sensitive data collection and analysis of passenger mobility demand	$7,400.00
	1.1.2.2	Complete study on sustainable alternatives for the public transport system and road safety	$20,000.00
	1.1.2.3	Complete sustainable and safe passenger mobility policy including gender action plan	$10,000.00
	1.1.2.4	Complete recommendations for the improvement of passenger transport statistics and GHG monitoring	$5,000.00
1.1.3		**National low-carbon e-mobility strategy**	**$42,400.00**
	1.1.3.1	Gender-sensitive fleet electrification feasibility analysis	$7,400.00
	1.1.3.2	Complete study on the integration of renewable power and e-mobility in the energy system	$20,000.00
	1.1.3.3	Complete national charging network analysis	$5,000.00
	1.1.3.4	Draft national e-mobility strategy including gender action plan and circulate to key stakeholders for consultation and validation	$10,000.00
	1.1.3.5	Complete and submit final national e-mobility strategy (Vision 2030) for government adoption.	0
1.1.4		**E-mobility Technologies Training**	**$34,300.00**
	1.1.4.1	Complete and implement E-mobility Communication Plan	$6,300.00
	1.1.4.2	Provide Capacity-building materials to decision makers and government officials	$10,000.00
	1.1.4.3	Conduct training activities on sustainable transport and e-mobility policies, standards and regulations	$8,000.00
	1.1.4.4	Complete knowledge management guidelines and training materials addressing electricity and transport specialists	$10,000.00
1.2		**Component 2: Short term barrier removal through low-carbon e-mobility demonstrations**	**$297,112.00**
1.2.1		**Monitoring, reporting and verification (MRV) system**	**$15,250.00**
	1.2.1.1	Complete demonstration design, including its monitoring, reporting and verification (MRV) plan	$5,250.00
	1.2.1.2	Complete evaluation report and knowledge management of demonstration	$10,000.00
1.2.2		**Electric Vehicle Demonstration**	**$215,250.00**
	1.2.2.1	Completion of demonstration plan	$5,250.00
	1.2.2.2	Conduct procurement of pilot vehicles including technical support	$210,000.00
1.2.3		**Procurement and Installation of Charging Points**	**$15,000.00**
1.2.4		**Professional training relating to electric vehicle safety**	**$51,612.00**

WBS ID	Activity ID	WBS Deliverable	Estimated Cost (USD)
	1.2.4.1	Complete communication plan for the project demonstrations, including awareness raising actions addressed to the public	$7,700.00
	1.2.4.2	Communication materials on the project demonstrations	$10,000.00
	1.2.4.3	Provide training materials on EV and charging infrastructure technology and maintenance	$9,912.00
	1.2.4.4	Conduct professional training activities on EV safety (emergency services), driving and maintenance	$24,000.00
1.3		**Component 3: Preparing for scale-up and replication of low carbon electric mobility**	**$107,650.00**
1.3.1		**Regulatory and tax reforms**	**$42,700.00**
	1.3.1.1	Complete regulatory proposal on vehicle approval and periodic technical inspection, including electric vehicles	$7,700.00
	1.3.1.2	Complete regulatory proposal on technical approval and installation of public and private charging stations	$13,000.00
	1.3.1.3	Complete regulatory proposal on public transport authorizations and concession contracts	$12,000.00
	1.3.1.4	Complete tax reform proposal to facilitate fiscal stability	$10,000.00
	1.3.1.5	Conduct stakeholder consultations on regulatory reforms	0
1.3.2		**Business models, financial schemes and procurement guidelines for electric vehicle fleets and charging stations**	**$64,950.00**
	1.3.2.1	Complete scenarios on the potential of the electric vehicle market in Saint Lucia.	$19,950.00
	1.3.2.2	Development of business models for electrification of public and private fleets in Saint Lucia	$17,000.00
	1.3.2.3	Development of financial schemes to support fleet electrification	$18,000.00
	1.3.2.4	Publish and disseminate e-mobility recommendations and procurement guidelines to fleet managers	$10,000.00
1.4		**Component 4: Long-term environmental sustainability of low-carbon electric mobility**	**$96,500.00**
1.4.1		**Assessment and Recommendations on ELV management**	**$23,500.00**
	1.4.1.1	Complete assessment of local conditions and characteristics of ELV management	$3,500.00
	1.4.1.2	Complete forecast of ELV components generation, considering internal combustion and electric vehicles	$20,000.00
	1.4.1.3	Submit recommendations on ELV management in Saint Lucia to the government for adoption	0
1.4.2		**Updated legislation on end-of-life vehicle management**	**$18,500.00**

WBS ID	Activity ID	WBS Deliverable	Estimated Cost (USD)
	1.4.2.1	Complete report summarizing international and regional regulations on ELV management	$3,500.00
	1.4.2.2	Conduct comprehensive review of existing and planned international regulations on second-life battery use and recommendations for the Saint Lucia context	$15,000.00
	1.4.2.3	Complete and submit proposal for ELV regulation to the government for adoption	0
1.4.3		**Development of commercially viable business models**	**$27,000.00**
	1.4.3.1	Conduct screening and systematization of successful financial and business models on ELV components and second-life battery use	$7,000.00
	1.4.3.2	Development of commercially viable business models for ELV components and EV batteries	$10,000.00
	1.4.3.3	Development of a roadmap on sustainable and commercially viable ELV and battery management submitted to government for adoption	$10,000.00
1.4.4		**National electric mobility campaign**	**$27,500.00**
	1.4.4.1	Complete design and delivery of a training programme for policymakers and local academia	$7,500.00
	1.4.4.2	Provision of technical and managerial support to producers and importers, with a focus on the local industry	$10,000.00
	1.4.4.3	Complete design and implementation of a national campaign to raise awareness among consumers	$10,000.00
1.5		**Quality Standards Certification**	**$18,000.00**
1.5.1		**Validation, Permits and Approvals**	**$7,000.00**
	1.5.1.1	Environmental Permits	$4,000.00
	1.5.1.2	Labor Permits	$3,000.00
1.5.2		**Quality Testing**	**$11,000.00**
	1.5.2.1	Quality Inspections	$6,000.00
	1.5.2.2	Standards Certification	$5,000.00
1.6		**Project Closure**	**$92,326.00**
1.6.1		**Document Lessons Learned**	**$21,000.00**
	1.6.1.1	Conduct lessons learned meeting	$21,000.00
	1.6.1.2	Complete documentation of lessons learned	0
1.6.2		**Update Files/Records**	**$30,550.00**
	1.6.2.1	Complete updates of files and records physically and electronically	$30,550.00
1.6.3		**Project Completion Report**	**$40,776.00**
	1.6.3.1	Complete project completion report	$40,776.00
	1.6.3.2	Distribute to key stakeholders	0

WBS ID	Activity ID	WBS Deliverable	Estimated Cost (USD)
1.6.4		**Archive Files/Documents**	**0**
		Total Cost Estimate	**$785,688.00**
		Contingency (10%)	**$78,568.80**
		Total Cost Baseline	**$864,256.80**
		Management Reserve (3%)	**$25,927.70**
		Total Project Budget	**$890,184.50**

Note. Own Work.

4.4.4 Control Costs

Control costs is the process of monitoring the status of the project to update the project costs and managing changes to the cost baseline (PMI, 2017, p.257). According to PMI (2017, p.257), the key benefit of this process is that the cost baseline is maintained throughout the project. The inputs for this process include the cost management plan, cost baseline and performance measurement baseline. The tools and techniques used in this process were expert judgement, earned value analysis and variance analysis.

The status of the project will be monitored monthly by the Project Manager where he/she will update the project costs and will manage any necessary changes to the cost baseline. It is important to note that any change requests that are subsequently received which are related to the project's cost would need to utilize the Change Request Form in Chart 7 and a Change Request Log as displayed in Chart 8, following the Integrated Change Control Process established in Figure 17.

Performance will be measured using the Earned Value Analysis technique which compares the performance measurement baseline to the actual schedule and cost performance.

Variance Analysis will be used to determine the cause of any schedule and cost variances.

The following earned value metrics will be used:

- Schedule Variance
- Cost Variance
- Schedule Performance Index
- Cost Performance Index

For the Supporting the Shift to Electric Mobility in Saint Lucia Project, the following Performance Management Scorecard will be utilized as displayed in Chart 17.

Chart 17: Earned Value Management (EVM) Performance Management Scorecard

Earned Value Management (EVM) Measure	Formula	Green	Yellow	Red
Schedule Variance (SV)	Earned Value (EV) – Planned Value (PV)	**Neutral:** Project is performing on schedule	**Positive:** Project is performing ahead of schedule.	**Negative:** Project is performing behind schedule.
Cost Variance (CV)	Earned Value (EV) – Actual Cost (AC)	**Neutral:** Project is performing on planned cost.	**Positive:** Project is performing under planned cost.	**Negative:** Project is performing above planned cost.
Schedule Performance Index (SPI)	Earned Value (EV) / Planned Value (PV)	**Equal to 1:** Project is performing on planned schedule.	**Greater than 1:** Project is performing ahead of planned schedule.	**Less than 1:** Project is performing behind planned schedule.
Cost Performance Index (CPI)	Earned Value (EV) / Actual Cost (AC)	**Equal to 1:** Project is performing on planned budget.	**Greater than 1:** Project is performing below planned budget (under-budget).	**Less than 1:** Project is performing above planned budget (over-budget).

Note: Own Work.

4.5 Quality Management Plan

Project Quality Management includes the processes for includes the processes for incorporating the organization's quality policy regarding planning, managing and controlling project and product quality requirements in order to meet stakeholders' objectives (PMI, 2017, p.271). According to PMI (2017), the project quality management processes are:

- Plan Quality Management
- Manage Quality
- Control Quality

4.5.1 Plan Quality Management

The Plan Quality Management process identifies quality requirements and/or standards for the project and its deliverables, documenting how the project will demonstrate compliance with quality requirements and /or standards (PMI, 2017). For the Supporting the Shift to Electric Mobility in Saint Lucia Project, quality is of utmost importance. The inputs used for this process were the project charter, project documents which includes the requirements traceability matrix, risk register and stakeholder register, enterprise environmental factors and organizational process assets. The tools and techniques utilized during the process were expert judgment, data gathering through benchmarking and interviews, cost of quality data analysis, and meetings. The Plan quality management process determines the quality which must be established throughout the entire project life cycle. This process supports the development of the Quality Management Plan as it

provides guidance and direction on how the project will be managed and verified throughout the project.

4.5.1.1 Quality Objectives

The quality objectives of the project are listed below:

1. To ensure that the project's quality characteristics are defined, agreed and achieved throughout the project.
2. To ensure that the project is completed within the scope, schedule and stipulated budget.
3. To maintain the quality of all the project's deliverables.
4. To assure compliance with all statutory laws, regulations and requirements as stipulated by the Government of Saint Lucia.

4.5.1.2 Quality Metrics and Baseline

Chart 18: Quality Metrics and Baseline

Quality Objective	Metric	Metric Definition	Expected Outcome/Result	Measurement Frequency	Responsible
1. To ensure that the project's quality characteristics are defined, agreed and achieved throughout the project.	On time completion of project's deliverables	Number of milestones achieved	100% of project's quality characteristics are achieved and 100% of project's milestones completed	Weekly	Project Manager
2. To ensure that the project is completed within the scope, schedule and stipulated budget.	Project completion within the stipulated time frame of three (3) years. Schedule Performance Index (SPI).	Schedule Performance Index (SPI) above 0.95 (SPI ≥0.95) **SPI = EV/PV**	No more than 10 days schedule delay	Weekly	Project Manager
	Adherence to stipulated budget. Cost Performance Index (CPI)	Cost Performance Index (CPI) above 0.95 (CPI≥0.95) **CPI =EV/AC**	99% budget consistent		

Quality Objective	Metric	Metric Definition	Expected Outcome/Result	Measurement Frequency	Responsible
3. To maintain the quality of all project's deliverables.	Earned value management	EV = Sum of the planned value of completed work	Successful project performance (planned performance matched actual performance)	Monthly	Project Manager Chief Technical Advisor
4. To assure compliance with all statutory laws, regulations and requirements as stipulated by the Government of Saint Lucia.	Number of errors in specifications	Measure of the number of noncompliance errors	100% compliance with all regulation and statutory body requirements	At the end of the completion of each project deliverable	Project Manager Chief Technical Advisor Consultant

Note: Own Work.

4.5.2 Manage Quality

The Manage Quality process is concerned with translating the quality management plan into executable quality activities that incorporate the organization's policies into the project (PMI, 2017, p. 288). The Project Manager at the Project Management Unit (PMU) of the Ministry of Infrastructure, Ports, Transport, Physical Development and Urban Renewal, is ultimately accountable for the scheduling and management of quality control activities as well as the correct and full completion of all quality assurance activities. The Chief Technical Advisor and the Consultant are also held accountable in ensuring and verifying that the performance and compliance of the project and project management activities complies with the defined quality requirements and established quality assurance plan. This is to ensure that all the project's activities conducted during the project meets the highest established standards. All contractors must have a Quality Assurance Plan which must be approved by the Project Manager and validated throughout the project.

The inputs used for the manage quality process consists of the subsidiary project management plans, organizational process assets and project documents which include the lessons learnt register, quality control measurements and the quality metrics for the project. The tools and techniques utilized during the process were checklists, and a continuous improvement plan which includes the Plan-Do-Check-Act (PDCA) model. The PDCA model is an effective quality assurance tool which analyses and evaluates opportunities for improvement. It consists of the following processes:

1. **Plan** – Establish objectives and define proper standard for the project team to help deliver desired results.
2. **Do** – Implement plan and test small changes or potential solutions according to the approved standards.
3. **Check** – Monitor and evaluate data and identify deviations between outcomes and planned objectives.
4. **Act** – Apply actions necessary for improvement if the results require changes.

4.5.3 Control Quality

Control quality is the process of monitoring and recording results of executing the quality management activities in order to assess performance, and ensure the project outputs are complete, correct and meet customer expectations (PMI, 2017, p. 298). The inputs used for the control quality process consists of the subsidiary project management plans, approved change requests, organizational process assets, enterprise environmental factors, and project documents which include the lessons learnt register, and the quality metrics for the project. The tools and techniques for this process include checklists, performance reviews and meetings which includes approved change requests review and retrospectives/lessons learned.

To control quality for the Supporting the Shift to Electric Mobility in Saint Lucia project, the following processes will be conducted:

1. Specific responsibilities are assigned to project members for overseeing and verifying that requirements are delivered.

2. Quality review checklists will be used to assess the project's compliance with the planned activities (and related outputs) in domains such as scope, time, cost, quality, project organization, communications, risks, contracts and stakeholders' satisfaction.
3. Weekly progress reports will be prepared and communicated to the project team to verify that the results are accurate and in alignment with the project's scope.
4. Performance reviews will be conducted to measure, compare and analyze the quality metrics defined by the Plan Quality Management process against actual results.
5. Cost and schedule performance will be monitored by examining planned versus actual results. The source of variances will be identified, and the necessary corrective actions will be performed.
6. Quality audits and inspections will be conducted, and the results will be analyzed by the Project Manager. Immediate corrective or preventative actions are to be implemented, as required in accordance with the established integrated change control process.
7. Standards certification will be conducted by the Saint Lucia Bureau of Standards to ensure that the project meets the national quality standards.
8. Any change requests that are received which are related to quality management would need to utilize the Change Request Form in **Chart 7** and a Change Request Log as displayed in **Chart 8**, following the Integrated Change Control Process established in **Figure 17**.

4.6 Resource Management Plan

Project Resource Management includes the processes to identify, acquire and manage the resources required for the successful completion of the project (PMI, 2017, p. 307). According to PMI (2017), these processes help to ensure that the right resources will be available to the project manager and project at the right time and place. Project Resource Management consist of the following processes:

- Plan Resource Management
- Estimate Activity Resources
- Acquire Resources
- Develop Team
- Manage Team
- Control Resources

4.6.1 Plan Resource Management

The Plan Resource Management process defines how team and physical resources are estimated, acquired, managed and used establishing the approach and level of management effort needed (PMI, 2017, p.312). This process is beneficial because it establishes the direction and management effort needed to manage project resources. It is imperative that the right personnel with the suitable skills and qualifications be employed for the Supporting the Shift to Electric Mobility in Saint Lucia Project to help meet the established project's objectives. The Project Manager is ultimately responsible for the human resource functions of the project which includes, recruiting, motivating, developing competencies

and the skills sets of the project team. As per the contractual agreement for the project and based on the defined respective contractual obligations, the Consultants are responsible for providing all human resources, equipment and material which are required to undertake the various project activities.

The inputs required to undertake the plan resource management process are the scope baseline, project documents which includes project schedule, project requirements, risk register and stakeholder register, enterprise environmental factors and organizational process assets. The tools and techniques required for this process are expert judgment, data representation technique which includes a Resource Breakdown Structure (RBS), Responsibility Assignment Matrix (RACI Chart), and meetings.

4.6.1.1 Resource Breakdown Structure

The Resource Breakdown Structure is a hierarchical list of team and physical resources related by category and resource type that is used for planning, managing and controlling project work (PMI, 2017). Figure 20 below displays the Resource Breakdown Structure (RBS) for the Supporting the Shift to Electric Mobility in Saint Lucia Project. The RBS for the project illustrates the human resources, equipment, facilities and materials which will be required to successfully complete the project.

Figure 20: Resource Breakdown Structure

Note: Own Work.

4.6.1.2 RACI Matrix

The Responsible, Accountable, Consult and Inform (RACI) Matrix/Chart is another critical tool which will be used for the Supporting the Shift to Electric Mobility in Saint Lucia project. It is used to clarify employee roles and responsibilities for each task, milestone and decision that takes place throughout a project. The RACI chart will be used to ensure that

there is clear assignment of roles and responsibilities as it relates to the project's tasks and the human resources assigned. This tool assigns a specific category to each role across four (4) categories including:

1. **R – Responsible:** The individual(s) with responsibility for the task or deliverable is typically responsible for developing and completing the project deliverables themselves. The responsible parties are typically hands-on team members that make direct contributions toward the completion of the project (Good, 2023).
2. **A – Accountable:** Accountable parties ensure accountability to project deadlines, and ultimately, accountability to project completion (Good, 2023).
3. **C – Consulted:** Consulted individuals' opinions are crucial, and their feedback needs to be considered at every step of the game. These individuals provide guidance that is often a prerequisite to other project tasks (Good, 2023).
4. **I – Informed:** Informed persons are those that need to stay in the loop of communication throughout the project. These individuals do not have to be consulted or be a part of the decision-making, but they should be made aware of all project updates (Good, 2023).

The following human resources are part of the project's team:

- Project Sponsor (PS)
- Project Steering Committee (PSC)
- Project Manager (PM)
- Chief Energy Officer (CEO)
- Chief Technical Advisor (CTA)

- Energy Officers (EO)
- Information Technology Officer (ITO)
- Administrative Assistant (AA)
- Local Consultant (LC)
- International Consultants (IC)
- Finance and Monitoring and Evaluation Officer (F & M&EO)
- Contractor (CON.)

Chart 19 on the subsequent page displays the RACI Matrix for the Supporting the Shift to Electric Mobility in Saint Lucia Project on the following page.

Chart 19: RACI Matrix

WBS Code	WBS Element/Deliverable	Project Team/Stakeholders			
		R	**A**	**C**	**I**
1.1	**Component 1: Institutionalization of Low Carbon Electric Mobility**				
1.1.1	Inter-sectorial coordination body	PM	PM CEO CTA F&M&EO CON.	PS PSC EO ITO LC IC	AA
1.1.2	Sustainable Passenger Mobility Policy	PM	CEO CTA F&M&EO CON.	PS PSC EO ITO LC IC	AA
1.1.3	National low-carbon e-mobility strategy	PM	PM CEO CTA F&M&EO CON.	PS PSC EO ITO LC IC	AA
1.1.4	E-mobility technologies training	PM	PM CEO CTA F&M&EO CON.	PS PSC EO ITO LC IC	AA

WBS Code	WBS Element/Deliverable	Project Team/Stakeholders			
		R	**A**	**C**	**I**
1.2	**Component 2: Short term Barrier Removal through Low-Carbon E-Mobility Demonstrations**				
1.2.1	Monitoring, reporting and verification (MRV) system	PM	PM CEO CTA F&M&EO	PS PSC EO ITO LC IC	AA
1.2.2	Electric Vehicle Demonstration	PM	PM CEO CTA	PS PSC EO F&M&EO ITO LC IC	AA
1.2.3	Procurement and Installation of Charging Points	PM	PM CEO CTA F&M&EO	PS PSC EO ITO LC IC	AA
1.2.4	Professional training relating to electric vehicle safety	PM CEO	CEO CTA CON.	PS PSC EO F&M&EO ITO LC IC	AA

WBS Code	WBS Element/Deliverable	Project Team/Stakeholders			
		R	**A**	**C**	**I**
1.3	**Component 3: Preparing for Scale-up and Replication of Low Carbon Electric Mobility**				
1.3.1	Regulatory and tax reforms	PM	PM CEO CTA	PS PSC EO F&M&EO ITO	AA
1.3.2	Business models, financial schemes and procurement guidelines for electric vehicle fleets and charging stations	PM	PM CEO CTA F&M&EO	PS PSC EO ITO	AA
1.4	**Component 4: Long-term Environmental Sustainability of Low Carbon Electric Mobility**				
1.4.1	Assessment and Recommendations on ELV management	PM	PM CEO CTA	PS PSC EO ITO F&M&EO	AA
1.4.2	Updated legislation on end-of-life vehicle management	PM	PM CEO CTA	PS PSC EO ITO F&M&EO	AA
1.4.3	Development of commercially viable business models	PM	PM CEO CTA F&M&EO	PS PSC EO ITO	AA
1.4.4	National electric mobility campaign	PM	PM	PSC	PS

WBS Code	WBS Element/Deliverable	Project Team/Stakeholders			
		R	**A**	**C**	**I**
			CEO CTA F&M&EO CON.	EO ITO	
1.5	**Quality Standards Certification**				
1.5.1	**Validation, Permits and Approvals**	PM	PM	PSC	PS
1.5.2	**Quality Testing**	PM	PM	PSC	PS
1.6	**Project Closure**				
1.6.1	Document Lessons Learned	PM	PM CEO CTA	AA LC IC F&M&EO	PS PSC EO ITO
1.6.2	Update Files/Records	PM	PM	ITO AA LC IC	PS PSC EO F&M&EO
1.6.3	Project Completion Report	PM	PM	AA LC IC	PS PSC EO F&M&EO
1.6.4	Archive Files/Documents	PM	PM	ITO AA	PS PSC EO F&M&EO

Note: Own Work.

4.6.2 Estimate Activity Resources

Estimate Activity Resources is the process of estimating team resources and the type and quantities of materials, equipment, and supplies necessary to perform project work (PMI, 2017, p. 320). The inputs used for this process include inputs of the Project Management Plan including the resource management plan and scope baseline, projects document including activity list, assumption log, cost estimates, resource calendar, and risk register, enterprise environmental factors and finally, organizational process assets. A resource calendar would be established at the start of the project to manage the availability of team and physical resources based on the established project schedule of three years which is equivalent to 1,036 days. The project would follow the standard working hours in Saint Lucia which is eight (8) hours per day and forty (40) hours per week.

The tools and techniques which were used for this process include expert judgment, bottom- up estimating, analogous estimating and meetings. In relation to the estimating techniques, for bottom-up estimating, the human resources and physical resources would be estimated at the activity level and then aggregated to develop the total estimates required for work packages, control accounts and summary project levels. In relation to analogous estimating, information regarding resources from previous similar projects would be used as a basis for estimating the resources required.

4.6.3 Acquire Resources

Acquire resources is the process of obtaining team members, facilities, equipment, materials, supplies and other resources necessary to complete project work (PMI, 2017).

This process is critical for the Supporting the Shift to Electric Mobility in Saint Lucia project as it outlines and guides the selection of resources and assigns them to their respective activities. This process is performed periodically during the life cycle of the project. The resources required for the project are both internal and external. In relation to the human resource personnel required for the project, the Project Manager, Chief Energy Officer, Energy Officers, Information Technology Officer, and Administrative Assistant were pre-assigned since they both possessed the requisite qualifications for the project. External resources were procured accordingly, and the Ministry of Infrastructure, Ports, Transport, Physical Development and Urban Renewal advertised the vacancies on the Government of Saint Lucia's website. The vacancies were advertised as consultancy services and the terms of reference was provided in the advertisement. Chart 20 below establishes the resource acquisition plan for the team and physical resources identified in the RBS in Figure 20.

Chart 20: Resource Acquisition Plan

ID	Resources	Source	Type of Acquisition
	Human Resources/Personnel		
1	Project Manager	Internal	Pre – Assigned
2	Chief Energy Officer	Internal	Pre – Assigned
3	Chief Technical Advisor	External	Local procurement process, CVs
4	Energy Officers (2)	Internal	Pre – Assigned
5	Information Technology Officer	Internal	Pre – Assigned
6	Administrative Assistant	Internal	Pre – Assigned
7	Local Consultant	External	Local procurement process, Proposal, CVs, Interviews
8	International Consultants (8)	External	Local procurement process, Proposal, CVs, Interviews

ID	Resources	Source	Type of Acquisition
9	Project Finance and Monitoring and Evaluation Officer	External	Local procurement process, Proposal, CVs, Interviews
10	Contractor	External	Local procurement process, Proposal, CVs, Interviews
	Equipment		
11	Computers	External	Tender process from local firm (local purchase)
12	Mobile Phones	External	Tender process from local firm (local purchase)
13	Tablets	External	Tender process from local firm (local purchase)
14	Electric Vehicles	External	Foreign purchase
15	Vehicle Equipment	External	Local and foreign purchase
16	Charging Points Equipment	External	Foreign purchase
	Facilities		
17	Meeting Rooms	Internal	Pre – Assigned
18	Workshop Venues	External	Local purchase/procurement process
19	Storage Room	Internal	Local purchase/procurement process
20	Electric Vehicles Parking Lot	External	Local purchase/procurement process
	Materials		
21	Furniture	External	Local purchase
22	Training Materials	External	Local purchase
23	Contracts	Internal	Pre – Assigned
24	National Reports	Internal	Pre – Assigned
25	Office Supplies	External	Local purchase

Note: Own Work.

4.6.4 Develop Team

The Develop Team process is the process of improving competencies, team member interaction and the overall team environment to enhance project performance (PMI, 2017, p. 336). For the Supporting the Shift to Electric Mobility in Saint Lucia project, the Project Manager is primarily responsible for team building activities, empowerment, capacity development and providing learning opportunities for staff. It is expected that this will create improvement in team members' skills and knowledge, promoting collaboration and cohesion and creating a conducive work environment to execute project deliverables in an efficient manner, thereby facilitating the successful completion of the project.

The inputs required for the develop team process include project documents such as lessons learned register, project schedule, project team assignments and resource calendars, resource management plan, enterprise environmental factors and organizational process assets. The tools and techniques for this process include communication technology which includes emails, meetings, internal and external training workshops, recognition and rewards and interpersonal and team skills namely conflict management, motivating, negotiating and team building activities.

4.6.5 Manage Team

Manage Team is the process of tracking team member performance, providing feedback, resolving issues and managing team changes to optimize project performance (PMI, 2017, p.345). The Project Manager is ultimately responsible for managing the project team, helping to resolve conflict and other issues related to project work, to help foster teamwork

throughout the project's lifecycle. From the project's inception, the Project Manager will communicate with the project team members to inform them of their roles and responsibilities and the expectations of the project assignments to be performed. Additionally, the Project Manager is responsible for evaluating each team member's performance, assessing how each team member complete their tasks and providing critical feedback. Staff members will be rewarded by a staff recognition ceremony at the end of each year and rewards will be provided through salary bonus payments.

The inputs required for the manage team process include the resource management plan, project documents such as issue log, lessons learned register, and project team assignments, work performance reports, team performance assessments, enterprise environmental factors and organizational process assets. The tools and techniques for this process include interpersonal and team skills which includes conflict management, decision making, emotional intelligence, influencing and leadership.

4.6.6 Control Resources

Control Resources is the process of ensuring that the physical resources assigned and allocated to the project are available as planned, as well as monitoring the planned versus actual utilization of resources and taking corrective action as necessary (PMI, 2017, p. 352). This process will be performed by the Project Manager during the entire project life cycle to ensure that all assigned resources are available to the project at the right time and in the right place to ensure that all the project's deliverables are achieved thereby ensuring the successful completion of the project.

The inputs required for the control resources process include the resource management plan, project documents such as issue log, lessons learned register, project schedule, physical resource assignments, resource breakdown structure, resource requirements and risk register, work performance data, agreements, and organizational process assets. The tools and techniques for this process include data analysis techniques which include cost-benefit analysis, and performance reviews, problem solving, and interpersonal and team skills which includes negotiation and influencing. For the Supporting the Shift to Electric Mobility in Saint Lucia project, if any project-related problem arises, the Project Manager will employ the following methodical steps as provided by the PMBOK Guide (2017):

1. **Identify the problem** – Specify the problem.
2. **Define the problem** – Break the problem into smaller, manageable problems.
3. **Investigate** – Collect data.
4. **Analyze** – Find the root cause of the problem.
5. **Solve** – Choose the most suitable solution from a variety of available ones.
6. **Check the solution** – Determine if the problem has been resolved.

Any change requests that are received related to resource management, which includes physical or team resources, would need to utilize the Change Request Form in **Chart 7** following the Integrated Change Control Process established in **Figure 17**.

4.7 Communications Management Plan

Project Communications Management includes the processes necessary to ensure that the information needs of the project and its stakeholders are met through development of artifact and implementation of activities designed to achieve effective information exchange (PMI, 2017, p.359). According to PMI (2017, p.359), project communications management consists of two (2) main parts, the first part is based on the development of a strategy to ensure that communication is effective for stakeholders, while the second part focuses on the execution of activities necessary to implement the communication strategy. Project communications management consists of three (3) major processes:

- Plan Communications Management
- Manage Communications
- Monitor Communications

4.7.1 Plan Communications Management

PMI (2017, p. 359) states that Plan Communications Management is the process of developing an appropriate approach and plan for project communication activities based on the information needs of each stakeholder or group, available organizational assets and the needs of the project. This process is a documented approach to effectively, and efficiently engage stakeholders by presenting relevant information in a timely manner. The plan communications management process is significant to the successful completion of the Supporting the Shift to Electric Mobility Project since frequent communication and stakeholder engagement keeps all project stakeholders informed and involved which can further lead to more effective decision making.

The inputs required for the plan communications management process include the project charter, project management plan, stakeholder register, enterprise environmental factors and organizational process assets. The tools and techniques for this process include expert judgment, and communication methods which include interactive communication, push communication, pull communication and mass communication. Chart 21 below displays the communication type and communication methods/artefacts used for the Supporting the Shift to Electric Mobility in Saint Lucia project.

Chart 21: Communication Type and Communication Methods/Artifacts

Communication Type	**Communication Method/Artifacts**
Interactive Communication	• Telephone Conversations • Videoconferencing • Meetings • Workshops • Consultation Groups • Focus Groups • Instant Messaging via WhatsApp Messenger • Presentations
Push Communication	• Letters • Memos • Reports • Emails • Press Releases
Pull Communication	• Knowledge repositories/databases

Note: Own Work.

A Communications Matrix will also be utilized as a guide in planning and managing communication throughout the project's lifecycle. The matrix, as presented in Chart 22 on the subsequent page defines the communication type, specific audience, purpose, frequency, owner/responsibility and communication channel for the project.

Chart 22: Communication Matrix

Communication Type	Purpose/Objectives	Audience	Medium	Frequency	Owner/ Responsibility
Kick-off Meeting	• Introduce the project team and project. • Review project's objectives and management approach. • Establish the project governance structure. • Establish the expectations of all the key project stakeholders and their roles and responsibilities. • Identify all the relevant risks of the project.	• Project Sponsor • Project Steering Committee (PSC) • Project Team	• Face-to-face meetings	For each major project phase	Project Manager
Project Team Meetings	• Review status of the project with the project team. • Review project schedule. • Assess new change requests.	• Project Team	• Face-to-face meetings	Weekly	Project Manager
Project Status Meetings	• Discuss Project status, open actions and check progress. • Discuss new risks or/and issues and define action points.	• Project Sponsor • Project Steering Committee (PSC) • Project Team	• Face-to-face meetings • Video Conference call	Monthly	Project Manager

Communication Type	Purpose/Objectives	Audience	Medium	Frequency	Owner/ Responsibility
	• Discuss and resolve conflicts.				
Project Review Meetings	• Review project's progress, scope and budget.	• Project Steering Committee (PSC) • Project Team	• Face-to-face meetings	Monthly	Project Manager
Project Steering Committee (PSC) Meetings	• Discuss the status and follow-up of the project. • Discuss contractual aspects. • Discuss formal project approvals.	• Project Steering Committee (PSC)	• Face-to-face meetings • Video Conference call	Monthly or as needed	Project Manager
Change Control Meetings	• Discuss and prioritise change requests, and stakeholder's inquiries. • Discuss and prioritise maintenance requests. • Prepare for decisions to be made by the PSC and to possibly approve/reject requests.	• Project Sponsor • Project Steering Committee (PSC)	• Face-to-face meetings	As needed	Project Manager
Townhall Meetings	• Engage the local community, provide project information and seek feedback.	• Indirect stakeholders including Saint Lucia Development Bank (SLDB), Bank of Saint Lucia (BOSL), LUCELEC, UAE-IRENA-Caribbean Renewable Energy Fund, Car Fleet Manager, Fedex, Car Fleet Manager,	• Face-to-face meetings	As needed	Project Manager

Communication Type	Purpose/Objectives	Audience	Medium	Frequency	Owner/ Responsibility
		Massy, Hotel Associations, National Council on Public Transport (NCPT) and public transport route associations, Taxi Associations, Car dealers, NGO's, local academia,			
Project Status Reports	• Provides summary information regarding the overall project performance, the status of important milestones for the current reporting period and forecasts for future performing periods.	• Project Sponsor • Project Steering Committee (PSC) • Project Team	• Email • Printed Hardcopy upon request	Monthly	Project Manager
Project Progress Reports	• Provides a high-level overview of the entire project and its actual status. The report includes a Project Overview (Project Stakeholders, Milestones and Deliverables, Project Plan, Budget, and	• Project Sponsor • Project Steering Committee (PSC) • Project Team	• Email • Printed Hardcopy upon request	Monthly	Project Manager

Communication Type	Purpose/Objectives	Audience	Medium	Frequency	Owner/ Responsibility
	other costs) and further Project Details (Scope Changes, Major Risks/Issues and Actions Taken, Achievements).				
Outsourcing (Contractor) Status Report	• Provides the status of the contractors work for the current reporting period and provides forecasts for future performing periods, along with information on new risks, disputes and issues.	• Project Sponsor • Project Steering Committee (PSC) • Project Manager	• Email • Printed Hardcopy upon request	Monthly	Contractor
Presentations	• Discuss project updates and other project information	• Project Sponsor • Project Steering Committee (PSC) • Project Team • Indirect Stakeholders	• Face-to-face meetings • Video Conferences	Monthly	Project Manager

Note: Own Work.

4.7.2 Manage Communications

Manage Communications is the process of ensuring timely and appropriate collection, creation, distribution, storage, retrieval, management, monitoring, and the ultimate disposition of project information (PMI, 2017, p. 379). The Communications Matrix for the Supporting the Shift to Electric Mobility in Saint Lucia project as established in Chart 21, is utilized as the main tool to manage communications for the project. This effective tool will ensure that the relevant information is communicated to the appropriate audience at the right time and place. The Project Manager is ultimately responsible for the communications strategy by generating, distributing, conveying and storing the necessary information for the project. The Project Manager will ensure that there is effective communication between all project stakeholders.

The inputs required for the manage communications process include the resource management plan, communications management plan, project documents which include change log, issue log, lessons learned register, quality report, risk report and stakeholder register, enterprise environmental factors and organizational process assets. The tools and techniques which will be utilized to manage communications include project management information system (PMIS), project reporting, feedback, presentations, meetings, interpersonal and team skills which includes active listening, conflict management, meeting management and networking.

Project Management Information Systems (PMIS) ensure that stakeholders can easily retrieve the information that they require in a timely manner (PMI, 2017). The following examples of PMIS will be utilized:

1) **Electronic Project Management Tools** – The project manager and project team will utilize Microsoft Project 2019 and Share Point. Microsoft Project is useful in developing the project schedule, assigning resources to tasks, tracking progress, managing the budget, and analyzing resource workloads. SharePoint is useful to store, organize, share, and access project documents.
2) **Electronic Communication Management** – Due to the complexity of the project, emails, video conferencing and audio communications will be utilized.
3) **Social Media Management** – Social media applications and websites will also be utilized to engage with stakeholders and the local community for the national electric mobility campaign.

4.7.3 Monitor Communications

Monitor Communications is the process of ensuring the information needs of the project and its stakeholders are met (PMI, 2017). It enables an optimal flow of information and is performed throughout the project's lifecycle. It determines if the planned communications artefacts have had the desired effect of increasing or maintaining stakeholders' support for the project's deliverables and expected outcomes (PMI, 2017). This process enables the project manager to identify the need to amend aspects of the communications strategy to

better satisfy the expectations of the targeted audience, by changing the frequency and/ medium of communication.

The inputs required for the manage communications process include the resource management plan, communications management plan, project documents which include issue log, lessons learned register, and project communications, enterprise environmental factors and organizational process assets. The tools and techniques which will be utilized to manage communications include expert judgment, project management information system (PMIS), interpersonal and team skills which include observation/conversation and meetings.

4.7.3.1 Communications Escalation Process

The Escalation model will be utilized to assist in identifying issues within the project, which may need to be escalated for resolution. This means that there would be a way to identify, track and resolve project issues throughout the project's lifecycle, while ensuring effective communication of these issues with all stakeholders. Issues will be resolved at the lowest possible level but can be identified at any level during the project. In relation to the issues that cannot be resolved at the lowest possible level, these issues can be brought up to the appropriate party at the higher level. This procedure would allow for visibility of unresolved issues as well as maintaining a historical record of issues that occurred and the associated resolution. Chart 23 displays the five (5) main steps to manage issues for the communication escalation process on the subsequent page.

Chart 23: Steps to Manage Issues for the Communication Escalation Process

Step	Action
1	Identify and Document Issues
2	Review of Issues
3	Communication of Issues
4	Escalate Issues
5	Issue Resolution

Note: Own Work.

Chart 24 below displays the Communications Escalation Matrix which highlights the priority level, definition of the specific priority level, decision authorities and timeframe for resolution. It is important to note that any change requests that are received related to communications management would need to utilize the Change Request Form in Chart 7 following the Integrated Change Control Process established in Figure 17.

Chart 24: Communications Escalation Matrix

Priority Level	Definition	Decision Authority	Timeframe for Resolution
Priority 1	Major impact to the project that could cause a significant negative impact to the project's scope, schedule or budget.	Project Steering Committee (PSC)	Within 24 hours
Priority 2	Medium impact to the project that could result in some impact to the project's scope, schedule or budget.	Project Sponsor	Within 1- 2 days
Priority 3	Minor or slight impact that can have a minor impact on the project's scope, schedule or budget.	Project Manager	Within 2- 3 days
Priority 4	No significant impact to the project's scope, schedule or budget.	Project Manager	The work continues and recommendations are submitted via the Integrated Change Control Process.

Note. Own Work.

4.8 Risk Management Plan

Project Risk Management includes the processes of conducting risk management planning, identification, analysis, response planning, response implementation and monitoring risk on a project (PMI, 2017, p. 395). It aims to identify and manage risks that are not addressed by the other project management processes. To effectively manage risk, the Project Manager will ensure that he/ she has a clear understanding of the project's objectives to assist in identifying any possible barriers that could impact on the project team's ability to produce results. The purpose of the risk management plan for the Supporting the Shift to Electric Mobility in Saint Lucia project is to identify, evaluate and plan for possible risks which may arise during the project management process. Project Risk Management consist of seven (7) processes:

1. Plan Risk Management
2. Identify Risks
3. Perform Qualitative Risk Analysis
4. Perform Quantitative Risk Analysis
5. Plan Risk Responses
6. Implement Risk Responses
7. Monitor Risks

4.8.1 Plan Risk Management

Plan Risk Management is the process of defining how to conduct risk management activities for a project based on the risks identified (PMI, 2017, p. 401). For the Supporting the Shift to Electric Mobility in Saint Lucia Project, the plan risk management process

commenced from the project's initiation and will be conducted at predefined intervals during the project's lifecycle.

The inputs for the plan risk management process include the Project Charter, all components of the project management plan, stakeholder register, enterprise environmental factors and organizational process assets. In relation to enterprise environmental factors, the overall risk threshold set by the Government of Saint Lucia and other key stakeholders was considered. The main organizational process assets considered included organizational risk policies, risk categories, common definitions of risk concepts and terms, templates for the risk management plan, risk register and risk report, authority levels for decision-making and the lessons learned repository from previous projects. Expert judgment, stakeholder analysis and meetings were the main tools which were utilized for this process. The risk management plan was developed during the project kick off meeting where the project manager, project team, project steering committee and other key stakeholders were in attendance.

4.8.2 Identify Risks

Risk identification is the process of defining individual project risks, as well as sources of overall project risk, and documenting their characteristics (PMI, 2017, p. 409). The identified risks may be classified according to their cause or source and ranked roughly according to ability to manage effective responses. For the Supporting the Shift to Electric Mobility in Saint Lucia, this process will be conducted throughout the project's lifecycle by the project manager, project team and other key stakeholders, since new risks may emerge as the project progresses through its life cycle and the level of overall project risk is most

likely to change. The inputs utilized for this process include components from the project management plan such as schedule management plan, cost management plan, quality management plan, resource management plan, scope baseline, schedule baseline and cost baseline, project documents which include assumption log, cost estimates, duration estimates, issue log, lessons learned register, resource requirements and stakeholder register, procurement documentation, enterprise environmental factors and organizational process assets. The main tools and techniques used for this process include expert judgment, checklists, interviews, assumption and constraint analysis, document analysis, prompt lists, meetings and facilitation where a skilled facilitator would assist the project team and key stakeholders in remaining focused on the risk identification process, ensuring clear risk descriptions, identifying and overcoming sources of bias and resolving any disagreements which may arise.

The Risk Breakdown Structure (RBS) which is a hierarchical representation of potential sources of risk was utilized to identify risks for the Supporting the Shift to Electric Mobility in Saint Lucia Project. The Risk Breakdown Structure presented in Chart 25 on the subsequent page will assist the project team in considering the full range of sources from which project individual risks may arise. The RBS is divided into five (5) main categories namely, technical risks, management risks, commercial risks, organizational risks and external risks.

Chart 25: Risk Breakdown Structure

Supporting the Shift to Electric Mobility in Saint Lucia – Risk Breakdown Structure (RBS)			
RBS LEVEL 0	**RBS LEVEL 1**	**RBS LEVEL 2**	**RBS LEVEL 3**
0. All Sources of Project Risk	1. Technical Risk	1.1 Contractor Performance	1.1.1 Contractor performs below required standard.
		1.2 Technical Capacity of Project Team	1.2.1 Inexperienced personnel with technical capacity and skills in electric mobility field.
	2. Management Risk	2.1 Project Management	2.1.1 Lack of accountability
		2.2 Communication	2.2.1 Poor team communication
	3. Commercial Risk	3.1 Suppliers	3.1.1 Unavailability of required electric vehicle materials/equipment.
	4. Organizational Risk	4.1 Leadership Responsibility	4.1.1 Insufficient leadership abilities displayed by Project Manager
	5. External Risk	5.1 Political	5.1.1 Time lag of results
		5.2 Economic	5.2.1 Higher upfront cost of electric vehicles.
			5.2.2 Objection or low commitment from industry to technology changes.
		5.3 Environmental	5.3.1 Materials from EVs (e.g., from batteries) will generate environmental pollution.
			5.3.2 Natural disasters/inclement weather conditions.
		5.4 Social	5.4.1 Gender barriers in the transport sector and women are marginalized
			5.4.2 Higher public transport fares

4.8.3 Perform Qualitative Risk Analysis

Perform Qualitative Risk Analysis is the process of prioritizing individual project risks for further analysis or action by assessing their probability of occurrence and impact as well as other characteristics (PMI, 2017, p. 419). This process is beneficial to the project since it focuses efforts on high priority risks. For the Supporting the Shift to Electric Mobility in Saint Lucia project, this process was conducted by the Project Manager and project team which lead to the prioritization of risks and the assessment of their probability of occurrence and corresponding impact on the project's objectives. This process is performed regularly and will be conducted throughout the project's lifecycle.

The main inputs which were utilized for this process include the risk management plan, project documents which included the assumption log, risk register and stakeholder register, enterprise environmental factors and organizational process assets. The main tools utilized for this process include expert judgment, interviews, risk probability and impact assessment, facilitation, risk categorization, probability and impact matrix and meetings/risk workshops.

The risk probability assessment considers the likelihood that a specific risk will occur, while the risk impact assessment considers the potential effect on one or more project objectives such as schedule, cost, quality or performance (PMI, 2017). The risk probability and impact of assessment was conducted by the project manager and project team by utilizing a probability and impact matrix.

4.8.3.1 Probability and Impact Scales

Risks which were most likely to occur and could have a significant impact on the project were rated at the highest priority while the risks which were more unlikely or have a low impact were rated at a lower priority. Chart 26 displays the probability scale which is classified according to the ranking of Very Low, Low, Medium, High and Very High.

Chart 26: Probability Scale

Probability Scale Definition		
Likelihood		**Definition**
Relative	**Numerical**	
Very Low	0.10	Highly unlikely to occur
Low	0.30	Will most likely not occur
Medium	0.50	Possible to occur
High	0.70	Likely to occur
Very High	0.80	Highly likely to occur

Note: Own Work.

The impact scale in Chart 27 below is classified according to Very Low, Low, Moderate, High and Very High along with the project's objectives which includes schedule, cost, scope, and quality.

Chart 27: Impact Scale

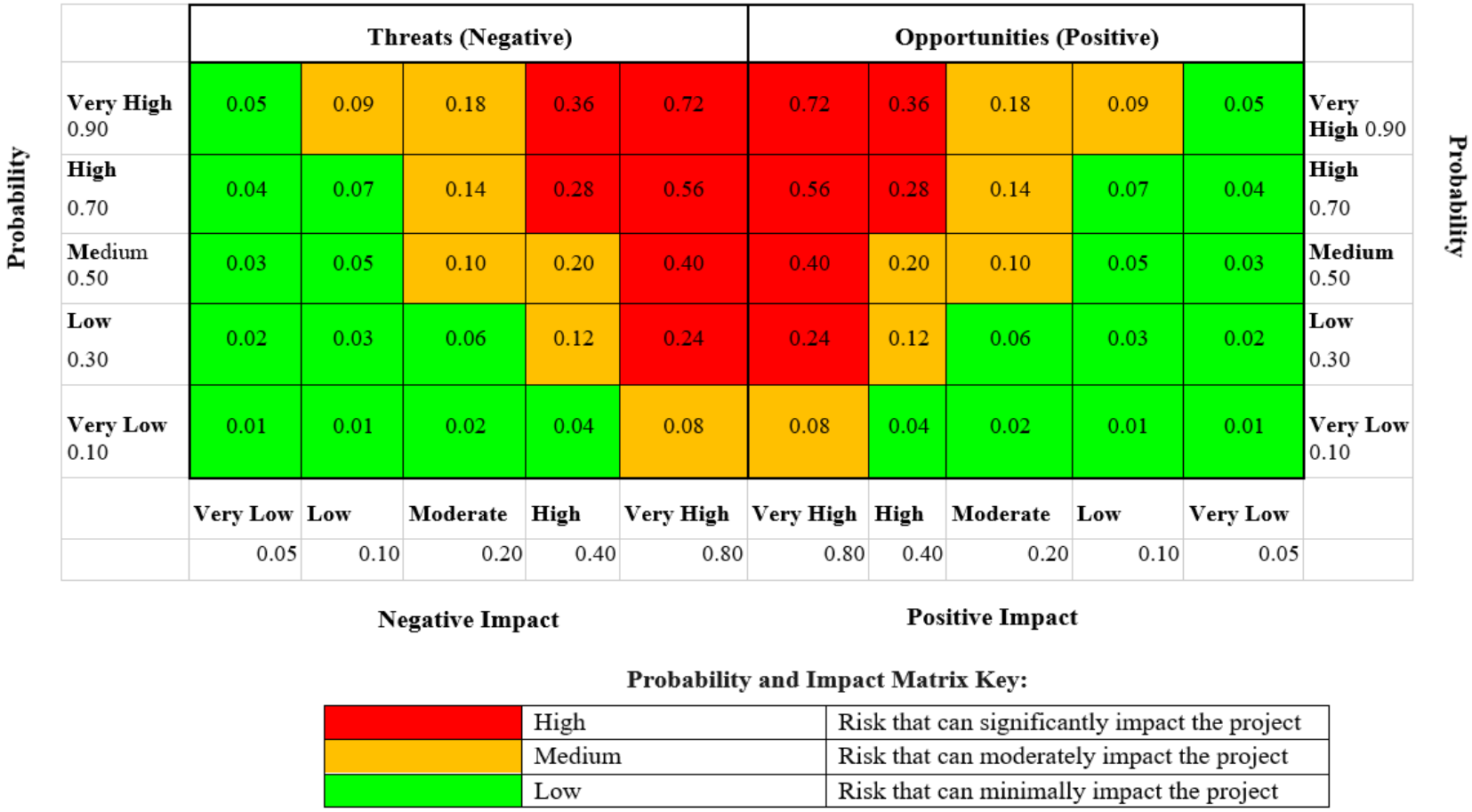
Scale		+/ – Impact on Project Objectives				
		Very Low	**Low**	**Moderate**	**High**	**Very High**
Impact Score/ Percentage		0.10	0.30	0.50	0.70	0.90
Project Objectives	**Schedule**	1 to 2 days (Insignificant change in schedule)	3 to 7 days	8 to 14 days	14 to 21 days	>21 days
	Cost	< 1 to 2% increase (Insignificant change in cost)	3 to 5% increase	6 to 8% increase	9 to 11% increase	>12% increase
	Scope	Barely noticeable scope change	Minor scope change	Major scope change	Unacceptable scope reduction	Extremely high scope change
	Quality	Minor impact on secondary functions	Minor impact on overall functionality	Some impact in key functional areas	Significant impact on overall functionality	Very significant impact on overall functionality

Note: Own Work.

4.8.3.2 Probability and Impact Matrix

The Project Manager and project team will focus its risk mitigation and response efforts on the project risks which are ranked as very high, high or medium on the probability and impact matrix based on the established scale provided in Figure 21. Descriptive terms such as Very Low, Low, Medium, High and Very High were used and numeric values ranging from 0.10 (Very Low), 0.30 (Low), 0.50 (Medium), 0.70 (High) and 0.90 (Very High) were utilized for probability and impact.

Figure 21: Probability and Impact Matrix



Probability	Threats (Negative)					Opportunities (Positive)					Probability
Very High 0.90	0.05	0.09	0.18	0.36	0.72	0.72	0.36	0.18	0.09	0.05	**Very High** 0.90
High 0.70	0.04	0.07	0.14	0.28	0.56	0.56	0.28	0.14	0.07	0.04	**High** 0.70
Medium 0.50	0.03	0.05	0.10	0.20	0.40	0.40	0.20	0.10	0.05	0.03	**Medium** 0.50
Low 0.30	0.02	0.03	0.06	0.12	0.24	0.24	0.12	0.06	0.03	0.02	**Low** 0.30
Very Low 0.10	0.01	0.01	0.02	0.04	0.08	0.08	0.04	0.02	0.01	0.01	**Very Low** 0.10
	Very Low	**Low**	**Moderate**	**High**	**Very High**	**Very High**	**High**	**Moderate**	**Low**	**Very Low**	
	0.05	0.10	0.20	0.40	0.80	0.80	0.40	0.20	0.10	0.05	

Negative Impact **Positive Impact**

Probability and Impact Matrix Key:

	High	Risk that can significantly impact the project
	Medium	Risk that can moderately impact the project
	Low	Risk that can minimally impact the project

Note: Reprinted from A Guide to the Project Management Body of Knowledge (PMBOK® Guide) Sixth Edition. Project Management Institute (PMI), 2017 Figure 11- 15, p. 408. Copyright 2017 by PMI, Inc. Permission not sought.

4.8.4 Perform Quantitative Risk Analysis

Perform Quantitative Risk Analysis is the process of numerically analyzing the combined effect of identified individual risks and other sources of uncertainty on overall project objectives (PMI, 2017, p. 428). According to PMI (2017), the inputs for this process are the components of the project management plan which include the risk management plan, scope baseline, schedule baseline and cost baseline, project documents which includes assumption log, basis of estimates, cost estimates, cost forecasts, duration estimates, milestone list, resource requirements, risk register, risk report and schedule forecasts, enterprise environmental factors and organizational process assets. The tools and techniques used are expert judgment, interviews, facilitation, representations of uncertainty, data analysis techniques which includes simulation, sensitivity analysis, decision tree analysis and influence diagrams.

The quantitative risk analysis determines the impact of the risks in dollars and days. In order to conduct a quantitative risk analysis, the project manager would require high-quality data, a well-developed project model, and a prioritized list of project risks which is generated after performing the qualitative risk analysis. For the purpose of the Supporting the Shift to Electric Mobility in Saint Lucia project, the Perform Quantitative Risk Analysis was not utilized by the Ministry of Infrastructure, Ports, Transport, Physical Development and Urban Renewal – Renewable Energy Unit since the ministry does not contain the required capacity to perform this analysis at this time. However, the Ministry considers this process and intends to source the required capacity and resources to perform the quantitative analysis.

4.8.5 Plan Risk Responses

Plan Risk Responses is the process of developing options, selecting strategies, and agreeing on actions to address overall risk exposure, as well as to treat individual project risks (PMI, 2017, p. 437). According to PMI (2017, p. 439), effective and appropriate risk responses can minimize individual threats, maximize individual opportunities and reduce overall risk exposure.

For the Supporting the Shift to Electric Mobility in Saint Lucia project, this process was performed in the planning stage of the project and appropriate risk mitigation strategies were developed by the Project Manager and project team to help respond to each individual risk which was identified for the plan risk management process. It is expected that this process will be performed throughout the project's lifecycle. During this process, a risk owner was also identified to address any threats that may negatively impact the project or to maximize any opportunities.

The inputs which were utilized for this process include the resource management plan, risk management plan, cost baseline, project documents which include the lessons learned register, project schedule, resource calendars, risk register and risk report, enterprise environmental factors and organizational process assets. The main tools and techniques utilized were expert judgment, interviews, facilitation, strategies for threats, strategies for opportunities and strategies for overall project risk.

4.8.5.1 Risk Register

Additionally, a Risk Register was generated to capture the details of all identified risks. The results of the Qualitative Risk Analysis, Plan Risk Responses, Implement Risk Responses,

and Monitor Risks are recorded in the risk register as these processes are conducted throughout the project lifecycle. Chart 28 on the subsequent page displays the Risk Register for the Supporting the Shift to Electric Mobility in Saint Lucia project which lists the identified risks, cause and consequence of each risk, risk trigger, probability score, impact score and subsequently calculates the probability multiplied by impact score for each risk and further assigning the respective classification colour code of high, medium or low. Thereafter, the potential risk mitigation strategy or responses for overall project risks as mentioned by PMI (2017) namely, avoid, exploit, transfer/share, mitigate/ enhance or accept is highlighted for each risk. Finally, a risk owner is identified to lead the implementation of the response.

Chart 28: Risk Register

RBS Code	Cause	Risk Description	Consequence	Risk Trigger	Probability P	Impact I	Risk Score PxI	Risk Response & Strategy	Risk Owner
1.1.1	Incompetence of contractor	Contractor performs below required standard	Project schedule delays and increase in costs.	Project activities behind schedule by 7 days.	0.70	0.20	**0.14**	**Mitigate:** Utilize contract outlining strict performance criteria and procedures, inclusive of penalty clauses for non-performance.	Project Steering Committee
1.2.1	Limitations in availability of persons with technical capacity and skills in electric mobility within the Public Sector.	Inexperienced personnel with technical capacity and skills in electric mobility field	Project schedule delays and additional costs to be allocated for staff training.	Project activities behind schedule by 7 days.	0.30	0.40	**0.12**	**Mitigate:** Utilization of Chief Technical Advisor and E-Mobility consultant in overseeing activities while employees are being trained.	Project Manager
2.1.1	Project team members avoiding accountability for delayed project activities/tasks.	Lack of accountability	Project Schedule Delays	Misunderstandings which arise over delayed project activities.	0.50	0.40	0.20	**Mitigate:** Have weekly project progress meetings and ensure that roles and responsibilities are clarified.	Project Manager
2.2.1	Poor team communication and delayed	Poor team communication	Project delays caused by	Delays in delivery and feedback of	0.50	0.40	**0.20**	**Mitigate:** Track frequency of the existing	Project Manager

RBS Code	Cause	Risk Description	Consequence	Risk Trigger	Probability P	Impact I	Risk Score PxI	Risk Response & Strategy	Risk Owner
	delivery in communication		ineffective communication	essential project information				communication methods in the communication plan and stakeholder management plan. Implement corrective actions.	
3.1.1	Timely availability or delayed supply of required material for electric vehicles and installation of charging points	Unavailability of required electric vehicle materials/equipment	Project schedule delays and increased cost.	Project activities delayed by 7 days	0.70	0.40	**0.28**	**Mitigate:** Place orders for required materials from the start of the project to determine availability and the need for any change in suppliers.	Project Manager
4.1.1	Limited timely reporting, approvals, guidance, and direction	Insufficient leadership abilities displayed by Project Manager	Project schedule delays	Delays in project activities	0.30	0.40	**0.12**	**Mitigate:** Communicate with project team members regularly and hold frequent meetings to ensure proper guidance is provided at all project phases.	Project Manager
5.1.1	Major legislation, policies and	Time lag of results	Project schedule delays	Delays in project activities	0.50	0.40	**0.20**	**Mitigate:** Develop proposals on regulations, taxes,	Project Manager

RBS Code	Cause	Risk Description	Consequence	Risk Trigger	Probability P	Impact I	Risk Score PxI	Risk Response & Strategy	Risk Owner
	regulations developed through the project may not be approved by Government before the end of the project period.							strategies and policies collaboratively with key stakeholders and deliver them ahead of schedule to facilitate legislative or governmental approval. **Mitigate:** Provide additional support to government to help with adoption of some legislation.	
5.2.1	Higher upfront cost of electric vehicles may pose a barrier to implementation and scale up of activities.	Higher upfront cost of electric vehicles	Project schedule delays.	Concerns and lack of participation from stakeholders in the car dealer industry.	0.30	0.80	**0.24**	**Mitigate:** Hold meeting with key stakeholders and deliver presentation by providing evidence and assessment of expected decrease of batteries and electric vehicles at the global level. Highlight financial schemes and regulatory and fiscal incentives to	Project Manager

RBS Code	Cause	Risk Description	Consequence	Risk Trigger	Probability P	Impact I	Risk Score PxI	Risk Response & Strategy	Risk Owner
								be developed by the project.	
5.2.2	Limited interest and objections from car dealers about e-mobility project.	Objection/ low commitment from industry (car dealers and corporate end-users) to technology changes.	Project schedule delays	Lack of participation and negative feedback from car dealers	0.70	0.20	**0.14**	**Mitigate:** Collaborate with those car dealers who are more open to innovations. Demonstration results from the project will increase EV demand from early adopters on the Island.	
5.3.1	Environmental groups address concerns that materials from electric vehicles will generate environmental pollution	Materials from EVs (e.g., from batteries) will generate environmental pollution.	Scope changes	Environmental groups concerns/protests	0.30	0.10	**0.03**	**Exploit:** Integrate recycling and tracking of EV materials in project scope. Exploit: Host public awareness campaign of ELV management, including batteries.	
5.3.2	Major unforeseen weather events or natural disasters such as tropical storms,	Natural disasters/inclement weather conditions.	Schedule delays and loss of resources.	Commencement of the rainy season	0.70	0.40	**0.28**	**Mitigate:** Liaise with St. Lucia Meteorological Office and establish disaster management plan. Also include	Project Manager

RBS Code	Cause	Risk Description	Consequence	Risk Trigger	Probability P	Impact I	Risk Score PxI	Risk Response & Strategy	Risk Owner
	flooding, hurricanes, earthquakes							time buffer in schedule for delays.	
5.4.1	Traditional gender barriers in the transport sector and women are marginalized in generating employment in electric mobility.	Gender barriers in the transport sector and women are marginalized	Opposition to project scope	Lack of participation of women in the transport sector	0.50	0.80	**0.40**	**Mitigate:** Provide professional training activities targeting women in priority.	Project Manager
5.4.2	Higher public transport fares due to additional costs of higher quality services.	Higher public transport fares	Schedule delays	Concerns from public about increase in transport fares.	0.30	0.10	**0.03**	**Exploit:** Include affordability as a key element within final Sustainable Passenger Mobility Policy.	Project Manager

Note: Own Work.

4.8.6 Implement Risk Responses

Implement Risk Responses is the process of implementing agreed-upon risk response plans (PMI, 2017, p. 449). According to PMI (2017, p. 449), this process is beneficial to projects since it ensures that agreed-upon risk responses are executed as planned in order to address overall risk exposure, minimize individual project threats and maximize individual project opportunities.

The inputs required for this process include the risk management plan, project documents which includes the risk register, lessons learned register, risk report and organizational process assets. The tools and techniques utilized for this process include expert judgement, influencing and the project management information system (PMIS). It should be noted that this the Project Manager is ultimately responsible for this process.

4.8.7 Monitor Risks

Monitor Risks is the process of monitoring the implementation of agreed upon risk response plans, tracking identified risks, identifying and analyzing new risks and evaluating risk process effectiveness throughout the project (PMI, 2017, p. 453). For the Supporting the Shift to Electric Mobility in Saint Lucia project, the risk owners will continuously track and monitor project work for new, changing and outdated project risks so that the project team and key stakeholders are aware of the current levels of risk exposure. The process will also be conducted throughout the project lifecycle. The following activities will be conducted when monitoring risks for the project:

- Ensure that all requirements of the Risk Management Plan are being implemented.

- Identify and analyze new risks.
- Assess the effectiveness of the Risk Management Plan that has been executed.
- Share risk status information with the Project Sponsor and project team.
- Identify any un-anticipated results of risk management activities.
- Reassess project assumptions and determining their validity.
- Update the risk management plan as lessons are learned from the project.

The inputs utilized for the monitor risks process include the risk management plan, project documents which include the issue log, lessons learned register, risk register, and risk report, work performance data and work performance reports. Risk audits and evaluations is a key tool which will be utilized for monitoring of project risks. A risk audit is a type of audit which may be used to consider the effectiveness of the risk management process (PMI, 2017, p.456). The Project Manager will be solely responsible for ensuring that risk audits are performed at the appropriate time and frequency throughout the project life cycle. Another key tool which will be utilized is risk reviews. According to PMI (2017, p.457), a risk review is a meeting to examine and document the effectiveness of risk responses in dealing with overall project risk and with identified individual project risks. Risk reviews will be held as part of the period project status meeting as determined by the Project Manager and established in the Communication Matrix in **Chart 22**.

It is important to note that any change requests that are received from stakeholders related to risk management would need to utilize the Change Request Form in **Chart 7** following the Integrated Change Control Process established in **Figure 17**.

4.9 Procurement Management Plan

Project Procurement Management includes the processes necessary to purchase or acquire products, services or results needed from outside the project team (PMI, 2017, p. 459). It includes the management and control processes required to develop and administer agreements which includes contracts, purchase orders, memoranda of agreements (MOAs), or internal service level agreements (SLAs). The Procurement Management processes include:

- Plan Procurement Management
- Conduct Procurement Management
- Control Procurement Management

4.9.1 Plan Procurement Management

Plan procurement management is the process of documenting project procurement decisions specifying the approach and identifying potential sellers. The key benefit of this process is that it determines whether to acquire goods and services from outside the project, and if so, what should be acquired as well as how and when to acquire it (PMI, 2017, p. 466). For the Supporting the Shift to Electric Mobility in Saint Lucia project, the Ministry of Infrastructure, Ports, Energy and Labour is the buyer and will ensure that all procurement agreements and relationships with suppliers of goods and services are managed carefully and efficiently.

The inputs required for the plan procurement management process include the project charter, components of the Project Management Plan which includes the scope management plan, quality management plan and resource management plan, project

documents which includes the milestone list, requirements traceability matrix, resource requirements, risk register and stakeholder register, enterprise environmental factors and organizational process assets. The main enterprise environmental factors considered include marketplace conditions, availability of products and services, sellers' track records, regulatory requirements for local sellers and financial accounting and contract payments system. The organizational process assets considered include the preapproved seller list, formal procurement policies, procedures and guidelines and contract types. The main tools and techniques used for this process include expert judgement, market research, source selection analysis and meetings.

4.9.2 Conduct Procurements

Conduct Procurements is the process of obtaining seller responses, selecting a seller and awarding a contract (PMI, 2017, p. 482). For the Supporting the Shift to Electric Mobility in Saint Lucia project, qualified sellers of products and services will be selected, and a legal agreement will be implemented for delivery. This process will be performed periodically throughout the project life cycle as required.

The inputs required for this process include components of the Project Management Plan such as the scope management plan, communications management plan, risk management plan, procurement management plan and cost baseline, project documents which includes lessons learned register, project schedule, risk register and stakeholder register, procurement documentation, enterprise environmental factors and organizational process assets. The main tools and techniques which were utilized for this process include expert judgment, advertising, bidder conferences, proposal evaluation and negotiation skills.

4.9.2.1 Procurement Process

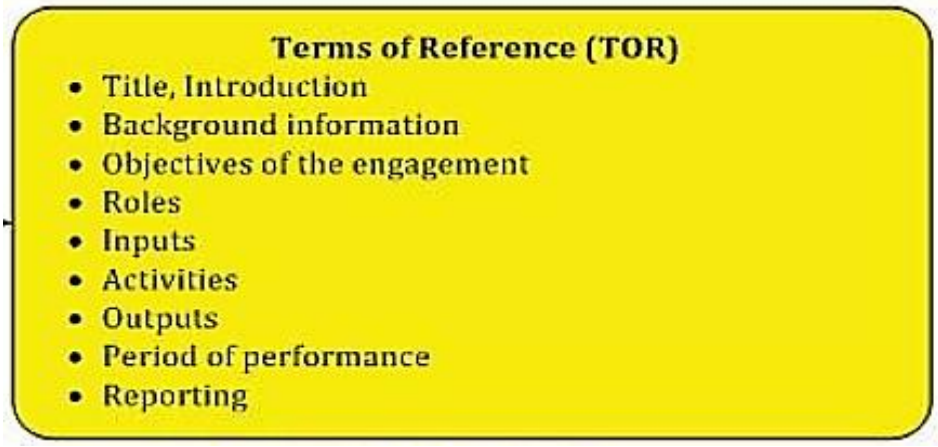
The Project Manager will be responsible for conducting the procurement process according to the Procurement Legislative framework for Saint Lucia which consists of the Public Procurement Act No. 19 of 2015, and the Public Procurement Amendment Act No. 13 of 2020 established by the Ministry of Finance, Economic Development and Youth Economy in collaboration with the Global Environment Facility (GEF). Additionally, the Project Manager will be responsible for the following activities including but not limited to:

- Prepare the annual Procurement Plan.
- Ensure that funding is authorised and available for any procurement.
- Draft, review and/or prepare procurement documents including Specific Procurement Notice, Request for Expression of Interest (REOI), Invitation to Quotes and Purchase Orders for procurement of goods using Request for Quotation procedures, Requests for Bids and Request for Proposals; and Terms of References (TORs)
- Ensure that procurements take account of the actual policy requirements.
- Manage the tender process.
- Ensure the necessary approvals are obtained from the relevant authorities.
- Manage contracts including ensuring the approval of payments to suppliers.
- Publication of procurement notices including contract award notices and REOIs

For the Supporting the Shift to Electric Mobility in Saint Lucia project, the Project Manager will firstly develop the Terms of References (TOR) and subsequently a Request for Expression of Interest (REOIs) for consultancy and contractor services. The TOR will

define the work required and respective responsibilities of the Supplier to provide Consulting Services. Figure 22 below displays the elements included in the TOR.

Figure 22: Terms of Reference (TOR)



Note: Reprinted from Saint Lucia Procurement Manual. (2021). Procurement Administration Unit: Department of Finance, Economic Affairs & Job Creation Saint Lucia. [PDF File].

Thereafter, the REOIs will be advertised on the Government of Saint Lucia website and interest persons can upload their expressions of interest on the Government of Saint Lucia E- Procurement portal or in person. The REOI will allow candidates to present details of the following:

- Technical capability and experience (similar assignments and work)
- Financial and administrative capability
- Systems and managerial capability
- Personnel (availability of appropriate experience and professional qualifications)
- Business and other organisational factors

The Central Tenders Board (CTB) established by the Ministry of Finance is appointed to evaluate tenders and proposals for the procurement of goods and service and sale of public goods. The CTB is composed of the following individuals:

1. The Director of Finance (Chairman) or his alternate
2. A nominee from the Attorney General's Chambers
3. The Chief Economist from Ministry of Planning or his or her nominee
4. A representative of another Ministry depending on the subject matter of the tender
5. A representative of the Saint Lucia Chamber of Commerce, Industry and Agriculture.

4.9.2.2 Source Selection Analysis

For the Supporting the Shift to Electric Mobility in Saint Lucia Project the following selection methods will be utilized:

1. **Quality – Based/ Highest Technical Proposal Score** – For this method, the bidders will be required to submit a proposal outlining technical and cost details and will be invited to negotiate the contract if the technical proposal proves acceptable.
2. **Quality and Cost-Based** – This selection method would be used for higher costing goods and services factoring in the element of quality procurement.

The CTB will be responsible for receiving the EOIs and will provide the Project Manager with copies of the documents for evaluation. An evaluation committee of at least three (3) persons approved by the CTB will evaluate and shortlist prospective bidders. The Project Manager will then prepare an evaluation report and submit it to the Project Sponsor and CTB for approval.

Thereafter, a Request for Proposal (RFP) will be requested from the approved shortlisted bidders where the bidders will be invited to submit their proposals by using a prescribed template as established by the Government of Saint Lucia. All proposals will be received and handled by the CTB and will be referred to the evaluation committee. Thereafter, all proposals will be evaluated using specific technical and financial criteria. Some of the criteria includes capacity and capability of the bidder, technical expertise and approach, specific relevant experience, management experience, delivery dates, qualifications, availability and competence. The Project Manager will then prepare a technical and financial evaluation report inclusive of the proposals which will be submitted to the Project Sponsor and CTB for approval.

A contract will then be awarded to the top- ranked bidder based on the technical and financial evaluation. Fixed priced contracts will be utilized for the Supporting the Shift to Electric Mobility in Saint Lucia Project. The Project Manager will facilitate contract negotiations and will assist in the development of a contract which is legal and binding between the supplier and buyer. The contract will include as applicable the following elements:

- The identification of parties to the Contract (Government and Supplier).
- Reference to all contracting documents
- The responsibilities of the Contractor and Government
- A full description of the Procurement (Specification, TOR, SOW)
- A schedule of activities and delivery dates
- Pricing Basis and Terms of Payment

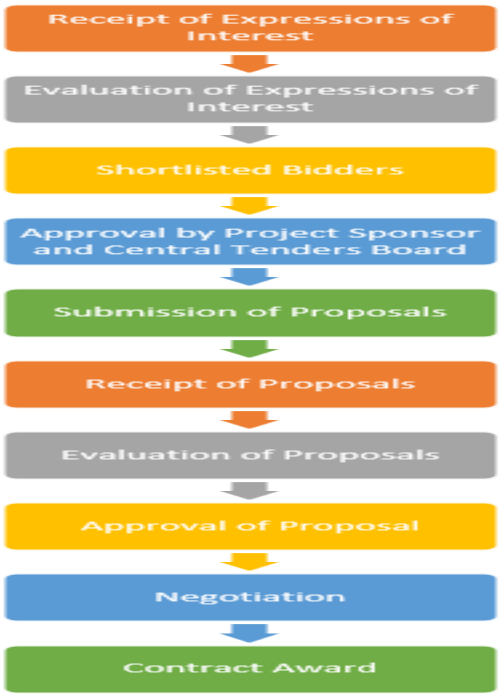
- General terms and conditions or specific terms and conditions and Signatures

After the development of the contract, it will be approved and signed by both parties. To support transparency, all contract awards above $10,000 USD and all awards resulting from publicly opened offers, will be posted on the Government of Saint Lucia website. The Contract award notice shall cover the following:

- Contract reference and brief description of the Procurement
- Value of Contract
- Date of Contract award
- Name of Supplier and Supplier location (country)

Figure 23 below illustrates the Procurement Process and Source Selection Analysis which will be conducted for the Supporting the Shift to Electric Mobility in Saint Lucia Project.

Figure 23: Procurement Process and Source Selection Analysis



Note: Own Work.

4.9.3 Control Procurements

Controlling procurements is the process of managing procurement relationships, monitoring contract performance, making changes and corrections as appropriate and closing out contracts (PMI, 2017, p. 492). The key benefit of this process is that it ensures that both the seller's and buyer's performance meet the project's requirements according to the legal terms of the agreement. This process will be performed throughout the project's lifecycle as determined by the Project Manager. The Project Manager is ultimately responsible for overseeing the procurement relationship with the consultants and contractors and will ensure that the parties meet their contractual obligations based on the established procurement guidelines and procedures stipulated for the project.

During the control procurements process, the Project Manager will be responsible for contract management by maintaining an overall register of contracts, monitoring key milestones for the project and ensuring that the consultants and contractor deliver the project deliverables as agreed on time and within budget. The project team will also assist the Project Manager in reviewing contracts to monitor effective performance of the consultants and contractor.

The inputs used for this process include some components of the project management plan which includes risk management plan, procurement management plan, and schedule baseline, project documents such as assumption log, lessons learned register, milestone list, quality reports, requirements traceability matrix, risk register and stakeholder register, enterprise environmental factors and organizational process assets. The tools utilized for this process include expert judgment, claims administration, performance reviews, inspection and audits. It is important to note that any change requests that are received related to procurement management would need to utilize the Change Request Form in **Chart 7** following the Integrated Change Control Process established in **Figure 17**.

4.10 Stakeholder Management Plan

Project Stakeholder Management includes the processes required to identify the people, groups or organizations that could impact or be impacted by the project, to analyze stakeholder expectations and their impact on the project and to develop appropriate management strategies for effectively engaging stakeholders in project decisions and execution (PMI, 2017, p. 503). The Stakeholder Management Plan for the Supporting the Shift to Electric Mobility in Saint Lucia Project will identify all stakeholders, outline their

main expectations, and determine their power, interest, and influence/impact for the project. Project Stakeholder Management consists of four (4) major processes:

- Identify Stakeholders
- Plan Stakeholder Engagement
- Manage Stakeholder Engagement
- Monitor Stakeholder Engagement

4.10.1 Identify Stakeholders

Identify Stakeholders is the process of identifying project stakeholders regularly and analyzing and documenting relevant information relating to their interests, involvement, interdependencies, influence and potential impact on project success (PMI, 2017, p.507). This process is beneficial to the Supporting the Shift to Electric Mobility in Saint Lucia Project as it enables the project team to identify the appropriate focus for engagement of each stakeholder and group of stakeholders. It is an ongoing process which will be conducted as required throughout the project's lifecycle to identify all relevant stakeholders during each project phase.

The inputs utilized during this process include the project charter, communications management plan, project documents which include the change log and issue log, enterprise environmental factors and organizational process assets. The tools and techniques which were utilized for the identification of stakeholders were expert judgment, document analysis, power/interest grid and stakeholder analysis which resulted in a stakeholder register containing a list of all stakeholders, their expectations and interests and a series of

meetings which were used to develop a shared understanding of the significant stakeholders required for the project.

4.10.1.1 Stakeholder Register

Chart 29 displays a Stakeholder Register for the Supporting the Shift to Electric Mobility in Saint Lucia Project which provides an analysis of all key stakeholders identified, their functional role, stakeholder classification, main expectations, power and interest. The scale below was used when classifying the level of power and interest of each stakeholder:

1. **High** – The stakeholder displays a significant level of direct power or interest over the project.
2. **Medium** – The stakeholder displays a moderate level of direct power or interest over the project.
3. **Low** – The stakeholder displays a minimal level of direct power or interest over the project.

Chart 29: Stakeholder Register

ID	Stakeholder	Functional Role	Type	Main Expectations	Power	Interest
1	Project Sponsor – Global Environment Facility (GEF)	Donor/Sponsorship	Direct/ Internal	• To ensure that the project is successfully completed within scope, schedule and budget constraints.	High	High
2	Project Manager/National Project Director	Project Management & Implementation	Direct/ Internal	• To utilize project management expertise in order to achieve the project's objectives and to ensure that the project is successfully completed within scope, schedule and budget constraints.	High	High
3	National Government (Ministry of Infrastructure, Ports, Energy and Labour – Renewable Energy Unit, Department of Sustainable Development (DSD), National Utilities Regulatory Commission, Transport Division, Ministry for Economic Development, Housing, Urban Renewal, Transport and Civil Aviation, Department of Equity, Ministry of Finance)	Government Authority	Direct/ Internal	• Ensure that the project supports policies on climate change mitigation, energy efficiency and sustainable transport. • National e-mobility strategy delivered by the project. • Quicker deployment of electric vehicles in Saint Lucia	High	High
4	Local Government	Government Authority	Direct/ Internal	• Ensure that there is an improvement in the quality of service of public transport and taxis	High	High

ID	Stakeholder	Functional Role	Type	Main Expectations	Power	Interest
				in Saint Lucia, improved air quality and guidance on the installation of charging points.		
5	Project Steering Committee (PSC)	Project Management & Implementation	Direct/ Internal	• Provide overall guidance and oversee the progress and performance of the project as well as to enhance and optimize the coordination and contribution with various project partners.	High	High
6	Project Team/ Project Management Unit (PMU) – Chief Technical Advisor (CTA) and Project Finance and Monitoring and Evaluation (M&E) Officer, Administrative Assistant	Project Management & Implementation	Direct/ Internal	• Manage the day-to-day operations of the project. • Ensure that the project is successfully completed within scope, schedule, and cost with efficient and effective project management leadership.	Medium	High
7	Consultants (International and Local)	Service Providers	Direct/ External	• Complete all project deliverables within scope, schedule, and budget, understanding the complexity of the project and the associated risks that may trigger variation, scope creep and huge financial requirements.	High	High
8	Contractors	Service Providers	Direct/ External	• Complete all project deliverables within scope, schedule, and budget,	High	High

ID	Stakeholder	Functional Role	Type	Main Expectations	Power	Interest
				understanding the complexity of the project and the associated risks that may trigger variation, scope creep and huge financial requirements.		
9	Saint Lucia Development Bank (SLDB)	Financial Services	Indirect/External	• New financial schemes and business opportunities associated to electric mobility.	Low	High
10	Bank of St. Lucia (BOSL)	Financial Services	Indirect/External	• New financial schemes and business opportunities associated to electric mobility.	Low	High
11	St. Lucia Electricity Services Ltd. (LUCELEC)	Electricity Services	Indirect/External	• Increased electricity consumption outside peak demand period. • New business opportunities linked to charging infrastructure and services	Medium	High
12	Public and Private Car Fleet managers (FEDEX, MASSY)	Business	Indirect/External	• To provide support in accessing electric vehicle technologies at reasonable costs, in order to benefit from lower fuel consumption and maintenance. • Capacity building on electric vehicle technology, its potential	High	Low

ID	Stakeholder	Functional Role	Type	Main Expectations	Power	Interest
				and limitations, as well as on fleet management.		
13	National Council on Public Transport (NCPT) and Public Transport Route Associations	Public Associations	Indirect/External	• Improvement of public transport service quality and support to access EV technologies at reasonable costs, in order to benefit from lower fuel consumption and maintenance. • Capacity building on public transport operations and EV technologies	Low	High
14	Taxi associations	Transportation Services	Indirect/External	• Support to access EV technologies at reasonable costs, in order to benefit from lower fuel consumption and maintenance. Capacity building on EV technology, its potential and limitations.	Low	Medium
15	Hotel Associations	Private Associations	Indirect/ External	• Support to access EV technologies at reasonable costs, in order to benefit from lower fuel consumption and maintenance. Capacity building on EV technology, its potential and limitations.	Low	Medium

ID	Stakeholder	Functional Role	Type	Main Expectations	Power	Interest
16	EV Car dealers and importers including Beachcomber Ltd., Nissan, JQ Motors and Local car importers	Transportation Services/ Business	Indirect/External	• Establish clear electric vehicle regulations	Medium	High
17	NGOs and Civil Society organizations	Non-Governmental Organizations/ Associations	Indirect/External	• Implementation of sustainable mobility practices in Saint Lucia. Improvement of urban mobility conditions of vulnerable groups and women	Low	High
18	Academia – Sir Arthur Lewis Community College, University of the West Indies (UWI)	Education	Indirect/External	• Conduct new research and educational opportunities linked to electric vehicles.	Low	Medium
19	Vulnerable Social Groups	End-users/Socio-Economic	Indirect/External	• Affordable mobility services, better tailored to the needs and priorities of women and vulnerable social groups.	Low	Low
20	Suppliers	Sellers	Indirect/External	• Outline purchase orders with timely payment for goods.	Low	Low

Note: Own Work.

4.10.1.2 Stakeholder Power/Interest Grid

The Stakeholder Power/Interest Grid was also utilized by grouping each stakeholder identified in the Stakeholder Register in Chart 24 above, according to their level of authority (power) and level of concern about the project's outcomes (interest). Figure 21 presents a Stakeholder Power/Interest Grid that highlights the position of each stakeholder under the Supporting the Shift to Electric Mobility in Saint Lucia Project. It classifies each stakeholder by a high, medium or low level of power and interest as established within the Stakeholder Register in Figure 24. The Stakeholder Power/Interest Grid is divided into four (4) categories including:

1. **High Power, Low Interest: <u>Strategy</u>:** Keep Satisfied
2. **Low Power, Low Interest: <u>Strategy</u>**: Monitor
3. **Low Power, High Interest: <u>Strategy</u>**: Keep Informed
4. **High Power, High Interest: <u>Strategy</u>**: Manage Closely

Figure 24: Stakeholder Power/Interest Grid

Note: Own Work.

4.10.2 Plan Stakeholder Engagement

Plan Stakeholder Engagement is the process of developing approaches to involve project stakeholders based on their needs, expectations, interests and potential impact on the project (PMI, 2017, p. 516). This process provides an actionable plan to interact effectively with stakeholders. To facilitate the plan the stakeholder engagements for the Supporting the Shift to Electric Mobility in Saint Lucia Project, the inputs utilized were project charter, resource management plan, communications management plan, risk management plan, project documents which included the assumption log, change log, project schedule, stakeholder register and risk register, enterprise environmental assets and organizational process assets. As part of the organizational process assets, the lessons learnt repository which contained information about stakeholder preferences, actions and past involvement in previous similar projects conducted by the Ministry of Infrastructure, Ports, Energy and Labour were utilized. The main tools and techniques which were utilized for this process include, expert judgment, assumption and constraint analysis, stakeholder engagement assessment matrix and meetings.

4.10.2.1 Stakeholder Engagement Assessment Matrix

The Stakeholder Engagement Assessment Matrix is an effective technique which assists in documenting the current and desired level of stakeholder engagement of all stakeholders. It is essential towards the success of the project since it helps to identify potential gaps in the involvement of stakeholders.

Chart 30 on the subsequent page displays the Stakeholder Engagement Assessment Matrix for the Supporting the Shift to Electric Mobility in Saint Lucia Project. The engagement levels of stakeholders can be classified utilizing the following key:

1. **Unaware** – Stakeholders who are unaware of the project and its potential impacts.
2. **Resistant** – Stakeholders who are aware of the project and potential impacts but resistant to any changes that may occur as a result of the work or project outcomes.
3. **Neutral** – Stakeholders who are aware of the project but neither supportive nor unsupportive of the project.
4. **Supportive** – Stakeholders who are aware of the project and potential impacts and supportive of the work and its outcomes.
5. **Leading** – Stakeholders who are aware of the project and potential impacts and actively engaged in ensuring that the project is a success.

In the Stakeholder Engagement Assessment Matrix below, **C** represents the current engagement level of each stakeholder and **D** represents the desired level of stakeholder engagement which is required for the project.

Chart 30: Stakeholder Engagement Assessment Matrix

ID	Stakeholder	Unaware	Resistant	Neutral	Supportive	Leading
1	Project Sponsor – Global Environment Facility (GEF)					**C, D**
2	Project Manager/National Project Director					**C, D**
3	National Government (Ministry of Infrastructure, Ports, Energy and Labour – Renewable Energy Unit, Department of Sustainable Development (DSD), National Utilities Regulatory Commission, Transport Division, Ministry for Economic Development, Housing, Urban Renewal, Transport and Civil Aviation, Department of Equity, Ministry of Finance)					**C, D**
4	Local Government					**C, D**
5	Project Steering Committee (PSC)					**C, D**
6	Project Team/ Project Management Unit (PMU) – Chief Technical Advisor (CTA) and Project Finance and Monitoring and Evaluation (M&E) Officer, Administrative Assistant					**C, D**
7	Consultants (International and Local)				**C**	**D**
8	Contractors				**C**	**D**
9	Saint Lucia Development Bank (SLDB)				**C, D**	
10	Bank of St. Lucia (BOSL)				**C, D**	

ID	Stakeholder	Unaware	Resistant	Neutral	Supportive	Leading
11	St. Lucia Electricity Services Ltd. (LUCELEC)				**C, D**	
12	Public and Private Car Fleet managers (FEDEX, MASSY)				**C, D**	
13	National Council on Public Transport (NCPT) and Public Transport Route Associations				**C, D**	
14	Taxi associations				**C, D**	
15	Hotel Associations				**C, D**	
16	EV Car dealers and importers including Beachcomber Ltd., Nissan, JQ Motors and Local car importers				**C, D**	
17	NGOs and Civil Society organizations			**C**	**D**	
18	Academia – Sir Arthur Lewis Community College, University of the West Indies (UWI)			**C**	**D**	
19	Vulnerable Social Groups			**C**	**D**	

Note: Own Work.

4.10.3 Manage Stakeholder Engagement

Manage Stakeholder Engagement is the process of actively communicating and working with all stakeholders of the project to meet their needs and expectations, address their issues and foster appropriate stakeholder involvement (PMI, 2017, p. 523). During this process, stakeholders are engaged at appropriate project phases to obtain, confirm and maintain their continued commitment to the success of the project, stakeholders' expectations are managed through effective communication and negotiation, risks or potential concerns related to stakeholder management are addressed, and clarification and resolution is provided for any identified issues.

The inputs utilized for this process include the communications management plan, risk management plan, project documents which include change log, issue log, lessons learned register and stakeholder register, enterprise environmental assets and organizational process assets. The tools and techniques utilized for this process include expert judgment, communication skills where the project team will utilize feedback to assist in the comprehension of stakeholder reactions to key decisions and project management activities, interpersonal and team skills which include conflict management, negotiation and a series of meetings.

4.10.4 Monitor Stakeholder Engagement

Monitor Stakeholder Engagement is the process of monitoring project stakeholder relationships and tailoring strategies for engaging stakeholders through modification of engagement strategies and plans (PMI, 2017, p. 530). This process is beneficial to the

Supporting the Shift to Electric Mobility in Saint Lucia Project as it maintains and increases the efficiency and effectiveness of stakeholder engagement activities as the project evolves and the environment changes. This process will be performed throughout the project's life cycle.

The inputs utilized for this process include the resource management plan, communications management plan, project documents which include issue log, lessons learned register, project communications, risk register and stakeholder register, enterprise environmental assets and organizational process assets. The main tools and techniques utilized for this process include stakeholder analysis, stakeholder engagement assessment matrix as displayed in Chart 30 where changes in the engagement level of stakeholders will be tracked, the use of communication techniques which include feedback and presentations, interpersonal and team skills which include active listening, leadership skills and networking and a series of meetings.

5 CONCLUSIONS

Chapter 5 provides a general conclusion as well as conclusions for each projective of this FGP.

The Supporting the Shift to Electric Mobility in Saint Lucia Project supports the Mission of the Ministry of Infrastructure, Ports, Transport, Physical Development and Urban Renewal – Renewable Energy Unit which is "To create an enabling environment that fosters a reliable, affordable and independent energy supply for Saint Lucia through the promotion of sustainable and efficient energy usage". It was observed that this project will be beneficial to Saint Lucia since it will provide a sustainable, low carbon and resilient energy system in the country and will help decrease greenhouse gas emissions, thereby promoting climate resilience. Through the introduction and scale-up of electric vehicles over the medium to long-term, this project will support electric vehicles to replace internal combustion engines in the country, thereby reducing air contamination due to transport related emissions and thus, improving air quality for the country's citizens. This has the co-benefit of improving the health of the citizens and reducing associated health care costs and possibly mortality rates. Also, once electric vehicles and charging infrastructure are enabled, the transition will make the country less dependent on global oil prices which will lead to economic development.

To ensure that these benefits are realized, it is imperative that the project be executed in a timely and effective manner by the Ministry of Infrastructure, Ports, Energy and Labour – Renewable Energy Unit and other stakeholders involved in the project. It was discovered that although the Renewable Energy Unit is experienced in implementing and executing

energy related projects, the department lacks the key competencies required to develop an integrated project management plan to help achieve the major components and objectives of the project. As a result of this and due to the major investment by the Global Environment Fund (GEF), it is imperative that an integrated project management plan be developed for this project to ensure that the project will deliver the anticipated benefits to the citizens of Saint Lucia within scope, time and budget constraints, thereby successfully achieving the project's objectives. The Project Management Plan utilized the best practices, project management framework and recommendations which are established in the PMBOK® Guide by the Project Management Institute (PMI). This led to the achievement of the project management plan general objective which was to develop an integrated Project Management Plan framed within the standards of Project Management Institute (PMI) in order to successfully manage the Supporting the Shift to Electric Mobility in Saint Lucia Project.

Furthermore, the Project Management Plan incorporated the ten (10) Project Management Knowledge Areas knowledge areas developed by PMI (2017) which includes: Integration Management, Scope Management, Schedule Management, Cost Management, Quality Management, Resource Management, Communications Management, Risk Management, Procurement Management and Stakeholder Management. Based on the specific objectives established, the following conclusions were drawn:

1. The Project Charter was developed to formally authorize the Supporting the Shift to Electric Mobility in Saint Lucia Project and provided the Project Manager with the authority to assign the required resources for the project. Additionally, the

Integrated Change Control Process was established and applied throughout the project life cycle.

2. The Scope Management Plan was developed and described how the scope for the project will be defined, validated, monitored and controlled to meet stakeholder needs and requirements. The main tools which were utilized to clearly establish the project's scope include the Project Scope Statement, Requirements Traceability Matrix, Work Breakdown Structure and Work Breakdown Dictionary. To avoid scope creep for the project, this plan ensures that only the work required for the project is detailed.
3. The Schedule Management Plan was developed to ensure that the project is successfully completed within the stipulated time frame. This plan outlined how the project schedule will be developed, managed, executed and controlled for the project. The main tools which were utilized in this plan include the Milestone List, Activity List and Project Schedule which was presented in the form of a GANTT Chart.
4. The Cost Management Plan was developed and defined how the project costs for the Supporting the Shift to Electric Mobility in Saint Lucia Project will be planned, estimated, determined, managed, monitored and controlled in order to complete the project within the established budget. The Project Cost Estimate was generated at the activity level generating the total project budget as USD$890,184.50 including a 10% contingency and 3% management reserve. It was established that the Earned Value Management (EVM) technique would be utilized to control the project costs.

5. The Quality Management Plan was developed, and it established the policies, guidelines, standards and quality requirements to be implemented to achieve the quality objectives of the Supporting the Shift to Electric Mobility in Saint Lucia Project and to meet stakeholders' objectives. The Quality Metrics and Baseline was established for each work package to ensure that the project delivered meets the quality requirements. The Plan-Do-Check-Act (PDCA) model was also highlighted as a quality assurance tool to help manage quality for the project.
6. The Resource Management Plan was developed for the project, and it outlined how project resources would be acquired, developed, managed and controlled to complete the Supporting the Shift to Electric Mobility in Saint Lucia Project. The Resource Breakdown Structure was generated as well as the RACI Matrix to clarify and assign team roles and responsibilities. The Resource Acquisition Plan was also developed to outline human resources and physical resources that would be required for the project.
7. The Communications Management Plan was developed, and it outlined how communications will be planned, disseminated, managed, monitored and controlled for the Supporting the Shift to Electric Mobility in Saint Lucia Project. The Communications Type and Artifacts, Communications Matrix, and Communications Escalation Matrix were established as part of the Communications Management Plan.
8. The Risk Management Plan was developed and established how risks will be identified, analyzed, monitored and controlled along with appropriate risk response

planning and mitigation strategies for the project. The Risk Breakdown Structure, Probability and Impact Scale, Probability and Impact Matrix and Risk Register were created as part of the risk management processes. Identified risks were prioritized as Very High, High, Medium, Low or Very Low and the respective risk response strategies for threats and opportunities were highlighted for each risk.

9. The Procurement Management Plan was developed, and it determined how goods and services will be acquired and how procurement will be planned, conducted and controlled through the required processes and tools for the Supporting the Shift to Electric Mobility in Saint Lucia Project. Critically, the Procurement Process and Source Selection Analysis for the project was established. It was outlined that the Quality – Based/ Highest Technical Proposal Score and Quality and/ or Cost- based methods would be utilized for the Source Selection Criteria.
10. The Stakeholder Management Plan was developed, and it established the key stakeholders for the project as well as the strategies and actions to effectively engage stakeholders for the Supporting the Shift to Electric Mobility in Saint Lucia Project. A Stakeholder Register was created which identified a total of twenty (20) stakeholders for the project including their main expectations, power and interest relating to the project. Additionally, the Stakeholder Power / Interest Grid and the Stakeholder Engagement Assessment Matrix were created as tools to plan and manage stakeholder engagement to reach the desired levels of participation.
11. Finally, an analysis of the Supporting the Shift to Electric Mobility in Saint Lucia Project was completed and it was determined that the project is in compliance with

the principles of regenerative development and sustainable development goals and objectives. Based on the regenerative development analysis, using the six (6) dimensions established by Muller (2017), the project is in compliance with three (3) out of the six (6) dimensions. Based on the Sustainable Development Goal (SDG) analysis, the project showed compliance to eight (8) out of the seventeen (17) SDGs. Additionally, based on the subcategories of the GPM P5 ontology, the project is in compliance with eleven (11) out of the sixteen (16) subcategories. Thus, the analysis indicated that the project can generally be classified as a regenerative and sustainable venture.

6 RECOMMENDATIONS

Chapter 6 provides recommendations for the FGP. It is imperative to note that recommendations are provided for each objective which was previously identified in Chapter 1.

1. The Project Manager should ensure that any changes should utilize the established Change Request Form and Integrated Change Control Process. Also, the project team should ensure that all changes are recorded in the change request log for future reference.
2. In addition to the established Requirements Traceability Matrix, the Project Manager should develop a Requirements Management Plan to determine how the project's requirements will be analyzed, documented and managed, the requirements prioritization process and a traceability structure which reflects requirements attributes captured on the matrix.
3. The Project Manager should ensure that the project team be apprised of their roles and responsibilities and should ensure that the team members follow the established schedule baseline for the project to avoid schedule delays. Any delays in activities or duties should be communicated to the Project Manager urgently.
4. The Finance and Monitoring and Evaluation Officer should review project expenditures and ensure that project funds are utilized in compliance with the Cost Management Plan and established financial rules and procedures in order to maintain the project's budget. It is also recommended that the earned value metrics be applied when required to determine the cause of any schedule and cost variances.

5. The Project Manager and the Project team should conduct quality audits on a regular basis or at the completion of major milestones to determine the effectiveness of the quality assurance activities and if they are having the desired result.
6. The Project Manager should ensure that the human and physical resources required for the project are assigned in a timely manner to avoid any schedule delays. It is also recommended that the Project Manager conduct market research about available suppliers required to provide goods or services for the project, along with the costs.
7. The Project Manager should ensure that there is constant effective communication among all stakeholders and that the types of communication and channels should be employed as established in the Communications Matrix. It is also recommended that the Project Manager should have daily stand- up meetings with the project team adopted from the Agile Methodology to encourage increased communication relating to the progress or status of the project.
8. The Project Manager and project team should identify, analyze and prioritize any new risks to determine whether it is a threat or opportunity, then applying the appropriate risk response strategy. This should be presented to the Project Sponsor and Project Steering Committee at the Project Status meetings. Additionally, it is recommended that the Project Manager maintains the Risk Register by continuously reviewing and updating it with new risk information and taking any preventive or corrective actions needed to ensure that the risks do not affect project outcomes. Also, it is recommended that for the Perform Quantitative Risk Analysis process,

the Ministry of Infrastructure, Ports, Transport, Physical Development and Urban Renewal should invest in quantitative modelling tools to conduct a quantitative risk analysis for complex projects such as the Supporting the Shift to Electric Mobility in Saint Lucia Project. It should be noted that the quantitative risk analysis is objective and uses verifiable data to examine the impact of risks on a project's objectives and provides a quantitative approach to making decisions when there is uncertainty.

9. The Project Manager and the Finance and Monitoring and Evaluating Officer should ensure that all procurement processes are conducted in a fair, equal and transparent manner by adhering to the National Public Procurement Act No. 19 of 2015, and the National Public Procurement Amendment Act No. 13 of 2020 as established by the Ministry of Finance and the established source selection criteria. Additionally, the Project Manager should ensure that all contracts are vetted and reviewed by a legal representative at the Attorney General's Chambers to avoid legal disputes.
10. The Project Manager should ensure that all stakeholders are actively engaged by ensuring that there is continuous and effective communication throughout the project life cycle which will help address any issues or misunderstandings which may occur and to foster stakeholder engagement in project decisions and activities. Additionally, the Project Manager should create and disseminate surveys to stakeholders to gain feedback which would provide a clearer understanding of stakeholder needs and expectations, thereby leading to better decision making.

11. In order to promote regenerative development and sustainability during the project, the citizens of Saint Lucia should participate in electric mobility awareness campaigns and activities to gain knowledge about the various benefits of electric mobility. Additionally, after the project's completion, they should aim to invest in the purchase of electric vehicles to help decrease GHG emissions.

7 VALIDATION OF THE FGP IN THE FIELD OF REGENERATIVE AND SUSTAINABLE DEVELOPMENT

Chapter 7 examines and validates the FGP in relation to regenerative and sustainable development. To achieve this, a sustainability analysis and regenerative analysis were conducted.

Regenerative development refers to a system of technologies and strategies for generating the patterned whole system understanding of a place and developing the strategic systemic thinking capacities and the stakeholder engagement or commitment required to ensure regenerative design processes, to achieve maximum systemic leverage and support, that is self- organizing and self-evolving (Mang 2012, as cited in Muller, 2017). Muller (2017) identified six (6) principles of regenerative development which includes: (1) Functional regeneration of ecosystems and their services, (2) Regenerating functional societies, (3) Regenerating the economic development model, (4) The cultural dimension, (5) The political realm and (6) The spiritual element.

Based on the main objective of the Supporting the Shift to E-Mobility in Saint Lucia Project, the project promotes regenerative development and its principles. The project promotes three (3) regenerative development principles, namely, (1) Functional regeneration of ecosystems and their services, (2) Regenerating functional societies and (3) Regenerating the economic development model. The project's execution and its end-product will not affect ecosystems since the project management team will utilize sustainable practices. The Renewable Energy Division will ensure that policies are

developed to ensure that the environment is not impacted in any harmful manner when implementing electric mobility technologies.

Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs (International Institute for Sustainable Development, n.d.). The Sustainable Development Goals (SDGs) aim to transform our world and are a call to action to end poverty and inequality, protect the planet, and ensure that all people enjoy health, justice, and prosperity (World Health Organization, n.d.). The United Nations implemented a list of seventeen (17) SDGs which includes: (1) Goal 1: No Poverty, (2) Goal 2: Zero Hunger, (3) Goal 3: Good Health and Well-being, (4) Goal 4: Quality Education, (5) Goal 5: Gender Equality, (6) Goal 6: Clean Water and Sanitation, (7) Goal 7: Affordable and Clean Energy, (8) Goal 8: Decent Work and Economic Growth, (9) Goal 9: Industry, Innovation and Infrastructure, (10) Goal 10: Reduced Inequality, (11) Goal 11: Sustainable Cities and Communities, (12) Goal 12: Responsible Consumption and Production, (13) Goal 13: Climate Action, (14) Goal 14: Life Below Water, (15) Goal 15: Life on Land, (16) Goal 16: Peace and Justice Strong Institutions, and (17) Goal 17: Partnerships to achieve the Goal.

Based on the project's objectives, the project's execution and end-product promotes sustainable development. This project aims to reduce GHG emissions in Saint Lucia and to foster a sustainable transport system. From an emission-mitigation perspective, the environmental sustainability of the project is strongly related to the ability of Saint Lucia to increase its share of renewables in energy generation, together with its ability to create a growing market for EV and to promote sustainable passenger mobility options (GEF,

2022). The project also supports the Government of Saint Lucia in establishing more sustainable passenger mobility policies, and more specifically to strengthen the public transport sector, so that it can provide higher quality services and entice citizens to use it rather than private cars. This would reduce the number of cars on the road and their associated GHG emissions. From a solid waste management perspective, the project actively contributes to the correction of the currently unsustainable patterns in ELV management, so that the expansion of electric vehicles is undertaken within a context in which they do not become the source of additional environmental hazards.

The project aims to promote several SDGS including: (1) Goal 7: Clean and Affordable Energy, (2) Goal 1: No Poverty, (3) Goal 3: Good Health and Wellbeing, (4) Goal 5: Gender Equality, (5) Goal 13: Climate Action, (6) Goal 11: Sustainable Cities and Communities, (7) Goal 8: Decent Work and Economic Growth and (8) Goal 9: Industry, Innovation and Infrastructure.

The P5 standard was also utilized to analyze the effects of the project on sustainability. P5 stands for People, Planet, Prosperity, Process, and Products. According to Carboni et al. (2018), the P5 standard is a tool that supports the alignment of portfolios, programs and projects with an organizational strategy for sustainability and focuses on the impacts of project processes and deliverables on the environment, society, the corporate bottom line and the local economy. The elements of P5 describe the actions to be taken by a project manager to deliver a sustainable project in a sustainable way. Chart 31 presents a P5 Analysis for the Supporting the Shift to Electric Mobility in Saint Lucia Project on the subsequent page.

Chart 31: P5 Analysis

P5 Domain	Category	Description (Cause)	Potential Impact	Proposed Response
Product	Lifespan of product	Non-compliance of international electric vehicles recommendations	This can decrease the lifespan of the electric vehicles.	All persons will be provided with training on electric vehicles.
	Servicing of product	Lack of EV mechanics	This can cause damages and early deterioration of electric vehicles	Local mechanics will be trained in electric vehicle maintenance.
Process	Effectiveness of project processes	Sustainability costs can increase project costs.	Increase in project costs/budget	Renewable Energy Unit will favour consultants with lowest costs during the procurement process.
	Efficiency of project processes	No utilization of modern project management approach	This can cause project delays and increase in costs.	An integrated project management plan will be utilized for guidance and direction
	Fairness of project processes	N/A	N/A	N/A
People	Labour practices and decent work	Insufficient staff to complete project activities	This can cause project delays	Consultancy services will be advertised publicly to hire specialists in the field of energy
	Society and customers	Customers and society may lose confidence in project management team	This can result in public protests in the communities.	All stakeholders and communities will be invited to meetings to discuss the

P5 Domain	Category	Description (Cause)	Potential Impact	Proposed Response
				project's objectives and other relevant information.
	Human rights	N/A		
	Ethical behaviour	N/A		
Planet	Transport	Deplorable road conditions cause damaged parts of Electric Vehicles	This can result in less revenue	The electric vehicles will be utilized after completion of road works.
	Energy	Solar or renewable energy not used	This can result in higher costs.	Solar energy will be utilized for charging ports.
	Land, Air, and Water	N/A		
	Consumption	Lack of electric vehicle charging ports.	This can result in vehicle breakdowns.	Renewable Energy Unit will install charging ports both in the northern and southern part of the country
Prosperity	Business Case analysis	Project will be completed over budget.	This can cause project delays since additional funding would need to be sourced.	The project management plan will assist in managing costs effectively.
	Business agility	N/A		
	Economic stimulation	The government will generate increased revenue.	Revenue can be wasted on irrelevant projects.	Develop action plan

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APPENDICES

Appendix 1: FGP Charter

CHARTER OF THE PROPOSED
FINAL GRADUATION PROJECT (FGP)

1. Student name

Stephie Stacia Anderson

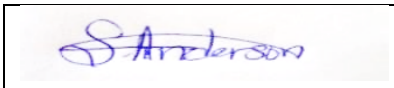
2. FGP name

Project Management Plan for Supporting the Shift to Electric Mobility in Saint Lucia

3. Application Area (Sector or activity)

Environment/Climate Change Mitigation

4. Student signature



5. Name of the Graduation Seminar facilitator

Roger Valverde Jimenez

6. Signature of the facilitator

7. Date of charter approval

February 26, 2023

8. Project start and finish date

January 09, 2023	July 16, 2023

9. Research question

What strategies will be utilized to support the shift to electric mobility in Saint Lucia to help decrease greenhouse gas emissions?

10. Research hypothesis

Is it possible to implement strategies or policies to help support the shift to electric mobility in Saint Lucia which will lead to a decrease in greenhouse gas emissions?

11. General objective

To develop an integrated Project Management Plan framed within the standards of Project Management Institute (PMI) in order to successfully manage Supporting the Shift to Electric Mobility in Saint Lucia Project.

12. Specific objectives

1. To create a Project Charter to describe the project's components, rationale, key stakeholders, resources and other project management activities and requirements.
2. To create a Scope Management Plan to ensure that all work required is included to successfully complete the project.
3. To create a Schedule Management Plan to ensure that the project is completed on time.
4. To develop a Cost Management Plan to ensure that the project is successfully completed within the approved budget.
5. To create a Quality Management Plan to identify the quality requirements and to describe how quality will be managed throughout the project's lifecycle in order to ensure that results meet stakeholders' expectations.
6. To generate a Resource Management Plan to identify, acquire and manage the necessary resources (physical and human) effectively in order to successfully complete the project within time, scope and cost constraints.
7. To develop a Communications Management Plan to ensure effective and timely communication of the project's information to the project management team and stakeholders.
8. To create a Risk Management Plan to outline the project's risk management approach by identifying, categorizing, analyzing and responding effectively to potential project risks.
9. To generate a Procurement Management Plan to manage the purchase of materials, and acquisition of services or results required for the project.
10. To develop a Stakeholder Management Plan to identify, categorize and support stakeholders by developing suitable engagement strategies to ensure effective stakeholder engagement.

13. FGP purpose or justification

Saint Lucia relies almost entirely on the importation of fossil fuel to meet its energy demands. Electricity is supplied via diesel generation by a privately-owned company, namely, St. Lucia Electricity Services Limited (LUCELEC). Dependency on diesel-generated electricity results in high greenhouse gas (GHG) emissions from the electricity generation sub-sector, with it being responsible for close to thirty-nine (39%) of total national GHG emissions. Additionally, electricity costs in Saint Lucia are volatile due to the county's dependence on imported diesel fuel.

Based on the country's current consumption and growth rates, and the old age and condition of the diesel plant, the Government of Saint Lucia have identified the need to expand capacity to allow for the disconnection of older diesel generators as their service life is completed and have discovered more than twenty (20) megawatts (MW) of additional renewable power generation capacity that could be deployed. Thus, the Government of Saint Lucia has secured grant funding from the Global Environment Facility (GEF) to execute "Supporting the Shift to Electric Mobility in Saint Lucia" Project. The primary objective of the project is to accelerate the introduction of electric mobility in Saint Lucia through capacity-building and electric vehicle demonstration, and to prepare the country for scaling-up and replication through the development of electric mobility policies, business models and finance schemes. The project will be beneficial to since it will provide a sustainable, low carbon and resilient energy system in St. Lucia. It will also lead to a decrease in GHG emissions and ultimately, climate resilience.

To ensure the successful delivery of the project within scope, time and budget, an integrated project management plan is required. The Project Management Plan will be developed and utilized as a guide for the execution of the project to help maximise its success chances. This plan will define how the project will be executed, monitored, controlled, and finally closed.

14. Work Breakdown Structure (WBS). In table form, describing the main deliverable as well as secondary, products or services to be created by the FGP.

Work Breakdown Structure (WBS) for Project Management Plan for Supporting the Shift to Electric Mobility in Saint Lucia

1. Graduation Seminar
   - 1.1 FGP Deliverables
     - 1.1.1 Charter
     - 1.1.2 Work Breakdown Structure (WBS)
     - 1.1.3 Chapter I: Introduction
     - 1.1.4 Chapter II: Theoretical Framework
     - 1.1.5 Chapter III: Methodological Framework
     - 1.1.6 Annexes
       - 1.1.6.1 Bibliography
       - 1.1.6.2 FGP Schedule
   - 1.2 Graduation Seminar Approval
2. Tutoring Process
   - 2.1 Tutor
     - 2.1.1 Tutor Assignment
     - 2.1.2 Communication
   - 2.2 Previous Chapter Adjustments
   - 2.3 Chapter IV: Development (Results)
     - 2.3.1 Project Charter
     - 2.3.2 Scope Management Plan
     - 2.3.3 Schedule Management Plan
     - 2.3.4 Cost Management Plan
     - 2.3.5 Quality Management Plan
     - 2.3.6 Resource Management Plan
     - 2.3.7 Communications Management Plan
     - 2.3.8 Risk Management Plan
     - 2.3.9 Procurement Management Plan
     - 2.3.10 Stakeholder Management Plan
   - 2.4 Chapter V: Conclusions
   - 2.5 Chapter VI: Recommendations
   - 2.6 Chapter VII: Validation of Regenerative and Sustainable Development
3. Reading by Reviewers
   - 3.1 Reviewers Assignment Request
   - 3.1.1 Assignment of Two Reviewers
   - 3.1.2 Communication
   - 3.1.3 FGP Submission to Reviewers
   - 3.2 Reviewers Work
   - 3.2.1 Reviewer 1
     - 3.2.1.1 FGP Reading
     - 3.2.1.2 Reader 1 Report
   - 3.2.2 Reviewer 2
     - 3.2.2.1 FGP Reading
     - 3.2.2.2 Reader 2 Report
4. Adjustments
   - 4.1 Report for Reviewers
   - 4.2 FGP Update
   - 4.3 Second Review by Reviewers
5. Presentation to Board of Examiners
   - 5.1 Final Review by Board
   - 5.2 FGP Grade Report

15. FGP budget

$600.00 USD is the estimated budget for financial resources required to print, bind and ship the Final Graduation Project to Costa Rica.

16. FGP planning and development assumptions

1. All necessary information required for the FGP will be accessible and readily available to the student from the Government of Saint Lucia. 2. The student possesses the requisite knowledge and expertise from relevant completed courses in the Master's in Project Management (MPM) program which will assist in the successful completion of the Project Management Plan. 3. The project can be completed within a stipulated timeframe of twelve (12) weeks. 4. There are tutors available to provide support and guidance when required. 5. The project can be executed and successfully completed by one (1) individual. 6. The FGP requirements as established by UCI will remain the same. 7. The student will be in good health to complete the FGP within scope and time.

17. FGP constraints

1. The FGP must be completed within twelve (12) weeks, which is a short time frame. 2. Limited human resources as only one (1) person will be required to complete the FGP. 3. Given the short time frame, the scope of the project is quite large. 4. Delays in obtaining relevant information for the FGP will impede scheduled delivery.

18. FGP development risks

1. Lack of timely feedback and support from Tutor can result in late submissions of revisions and quality of the Project Management Plan. 2. Occurrence of natural disasters e.g., hurricane, earthquakes can result in the delay of obtaining the necessary information and will ultimately impede the scheduled delivery of the FGP. 3. If the schedule for the FGP's milestones is not adhered to, the FGP may not be completed within twelve (12) weeks. 4. Failure to understand the weekly requirements and instructions may lead to delays in meeting the estimated deadlines for the project's milestones.

19. FGP main milestones

Deliverable	Finish Estimated Date
1. Graduation Seminar	February 26, 2023
1.1 FGP Deliverables	February 26, 2023
1.1.1 FGP Project Charter	February 12, 2023
1.1.2 Work Breakdown Structure (WBS)	January 29, 2023
1.1.3 Chapter I: Introduction	February 19, 2023
1.1.4 Chapter II: Theoretical Framework	February 05, 2023
1.1.5 Chapter III: Methodological Framework	February 12, 2023
1.1.6 Annexes	February 26, 2023
1.1.6.1 Bibliography	February 26, 2023
1.1.6.2 Schedule	February 19, 2023
1.2 Graduation Seminar Approval	February 26, 2023
2. Tutoring Process	June 30, 2023
2.1 Tutor	March 17, 2023
2.1.1 Tutor Assignment	March 13, 2023
2.1.2 Communication	March 17, 2023
2.2 Previous Chapter Adjustments	March 24, 2023
2.3 Chapter IV: Development (Results)	June 16, 2023
2.3.1 Project Charter	March 31, 2023
2.3.2 Scope Management Plan	April 07, 2023
2.3.3 Schedule Management Plan	April 14, 2023
2.3.4 Cost Management Plan	April 28, 2023
2.3.5 Quality Management Plan	May 05, 2023
2.3.6 Resource Management Plan	May 12, 2023
2.3.7 Communications Management Plan	May 19, 2023
2.3.8 Risk Management Plan	May 26, 2023
2.3.9 Procurement Management Plan	June 02, 2023
2.3.10 Stakeholder Management Plan	June 09,2023
2.4 Chapter V: Conclusions	June 16, 2023
2.5 Chapter VI: Recommendations	June 16, 2023
2.6 Chapter VII: Validation of Regenerative and Sustainable Development	June 16, 2023
2.7 Tutor Approval	June 30, 2023
3. Reading by Reviewers	July 13, 2023
3.1 Reviewers Assignment Request	July 03, 2023
3.1.1 Assignment of Two Reviewers	July 03, 2023
3.1.2 Communication	July 04, 2023
3.1.3 FGP Submission to Reviewers	July 03, 2023
3.2 Reviewers Work	July 13, 2023
3.2.1 Reviewer 1	July 13, 2023

Deliverable	Finish Estimated Date
3.2.1.1 FGP Reading	July 13, 2023
3.2.1.2 Reader 1 Report	July 13, 2023
3.2.2 Reviewer 2	July 13, 2023
3.2.2.1 FGP Reading	July 13, 2023
3.2.2.2 Reader 2 Report	July 13, 2023
4. Adjustments	July 25, 2023
4.1 Report for Reviewers	July 19, 2023
4.2 FGP Update	July 19, 2023
4.3 Second Review by Reviewers	July 25, 2023
5. Presentation to Board of Examiners	July 31, 2023
5.1 Final Review by Board	July 28, 2023
5.2 FGP Grade Report	July 31, 2023

20. Theoretical framework

20.1 Estate of the “matter”

Saint Lucia is heavily dependent on fossil fuel imports and the island’s dependency on diesel-generated electricity results in increasing greenhouse gas (GHG) emissions from the electricity generation sub-sector, with it being responsible for close to 39% of total national GHG emissions. According to the Global Environment Fund (GEF) (2022), the Government of Saint Lucia conducted research on the feasibility of electric mobility in Saint Lucia and discovered the following barriers:

1. Fragmented institutions with insufficient coordination, planning and technical capacities.

2. Insufficient knowledge of the potential of electric mobility in passenger transport.

3. Policies and regulations are unsuited to e-mobility, leading to a mobility market dominated by high-carbon solutions.

4. Insufficient development of end-of-life vehicle (ELV) management systems, to which electric vehicles would put additional pressure to deal with batteries and other potentially hazardous components.

Based on the above-mentioned barriers, the Renewable Energy Unit identified the need to implement the Supporting the Shift to Electric Mobility Project where the main objective is to accelerate the introduction of electric mobility in Saint Lucia through capacity-building and electric vehicle demonstration and to prepare the country for scaling-up and replication through the development of electric mobility policies, business models and finance schemes. To date, the project was divided into four (4) components. Component 1: Institutionalization of low-carbon electric mobility which addresses the existing institutional barriers that restrict the introduction of EVs in Saint Lucia, with a focus on private and public fleets, public transport and taxis; Component 2: Short term barrier removal through low-carbon e-mobility demonstrations which intends to provide first-hand evidence to fleet managers, government socials, key transport stakeholders and the general public about the performance of electric vehicles in the particular context of Saint Lucia; Component 3: Preparing for scale-up and replication of low-carbon electric mobility which seeks to provide the enabling conditions for the broad and long-term deployment of electric vehicles, by building upon the favourable institutional framework developed under Component 1 and the evidence provided by Component 2; Component 4: Long-term environmental sustainability of low-carbon electric mobility which This component addresses these challenges so that the ELV management system in the island is strengthened, the necessary burden is fairly shared by car-

dealers and importers, and batteries and other EV components are managed following international best practice.

It is important to note that for previous projects, the Renewable Energy Unit did not utilize an integrated project management plan. As a result of this and due to the major investment by the Global Environment Fund (GEF), an integrated project management plan will be developed by the student to assist in completing the project successfully. The project management plan will be a comprehensive plan which addresses the ten knowledge areas and will provide a framework for the successful implementation of electric mobility in Saint Lucia.

20.2 Basic conceptual framework

List of the basic concepts to be included in the document.

Examples: project management, project life cycle, project knowledge areas, project performance domains, project management processes, electric mobility

21. Methodological framework

Objective	Name of Deliverable	Information Sources	Research Method	Tools	Restrictions
1. To create a Project Charter to describe the project's components, rationale, key stakeholders, resources and other project management activities and requirements.	Project Charter	**Primary:** 1. Reports prepared by Ministry of Infrastructure Ports, Transport, Physical Development and Urban Renewal - Renewable Energy Unit 2. Global Environment Facility (GEF) Reports 3. World Bank Reports 4. Meetings, email communication and interviews with staff members from Renewable Energy Unit **Secondary:** 1. PMBOK Guide 7th Edition 2. PMBOK Guide 6th Edition	Analytical Research Method and Qualitative Research Method	Expert Judgment, Data Gathering Techniques including Brainstorming and Interviews and Meetings	**Assumptions:** The project charter will be developed prior to other subsidiary plans. **Constraints:** Limited timeframe for the development of the project charter.

Objective	Name of Deliverable	Information Sources	Research Method	Tools	Restrictions
		3. Project Management Institute (PMI) Database 4. Ministry of Infrastructure Ports, Transport, Physical Development and Urban Renewal Website 5. Global Environment Facility (GEF) Website 6. Internet			
2. To create a Scope Management Plan to ensure that all work required is included to successfully complete the project.	Scope Management Plan	**Primary:** 1. Reports prepared by Ministry of Infrastructure Ports, Transport, Physical Development and Urban Renewal - Renewable Energy Unit 2. Global Environment Facility (GEF) Reports 3. Meetings, email communication and interviews with staff members from Renewable Energy Unit	Analytical Research Method and Qualitative Research Method	Expert Judgment, Data Gathering Techniques including Brainstorming and Interview, Meetings, Decomposition	**Assumptions:** Information will be readily available for the development of the scope management plan. **Constraints:** The scope requirements may change as the project progresses.

Objective	Name of Deliverable	Information Sources	Research Method	Tools	Restrictions
		Secondary: 1. PMBOK Guide 7th Edition 2. PMBOK Guide 6th Edition 3. Project Management Institute (PMI) Database 4. Ministry of Infrastructure Ports, Transport, Physical Development and Urban Renewal Website 5. Global Environment Facility (GEF) Website 6. Internet			
3. To create a Schedule Management Plan to ensure that the project is completed on time.	Schedule Management Plan	**Primary:** 1. Reports prepared by Ministry of Infrastructure Ports, Transport, Physical Development and Urban Renewal - Renewable Energy Unit	Analytical Research Method, Qualitative Research Method and Quantitative Research Method	Expert Judgment, Meetings, Decomposition, Critical Path Method, Reserve Analysis, Parametric Estimating,	**Assumptions:** The project will be completed within the stipulated time frame.

Objective	Name of Deliverable	Information Sources	Research Method	Tools	Restrictions
		2. Global Environment Facility (GEF) Reports 3. Meetings, email communication and interviews with staff members from Renewable Energy Unit **Secondary:** 1. PMBOK Guide 7th Edition 2. PMBOK Guide 6th Edition 3. Project Management Institute (PMI) Database 4. Program Management Institute – Practice Standard for Scheduling 3rd Edition. 5. Ministry of Infrastructure Ports, Transport, Physical Development and Urban Renewal Website		Analogous Estimating, Three-Point Estimating	**Constraints:** The project must be completed within the allocated time frame.

Objective	Name of Deliverable	Information Sources	Research Method	Tools	Restrictions
		6. Global Environment Facility (GEF) Website 7. Internet			
4. To develop a Cost Management Plan to ensure that the project is successfully completed within the approved budget.	Cost Management Plan	**Primary:** 1. Reports prepared by Ministry of Infrastructure Ports, Transport, Physical Development and Urban Renewal - Renewable Energy Unit 2. Global Environment Facility (GEF) Reports 3. Meetings, email communication and interviews with staff members from Renewable Energy Unit **Secondary:** 1. PMBOK Guide 7th Edition 2. PMBOK Guide 6th Edition	Analytical Research Method, Qualitative Research Method and Quantitative Research Method	Expert judgment. Meetings, Analogous estimating, Parametric estimating, Bottom-up Estimating. Three-Point estimating, Reserve analysis	**Assumptions:** The project will be completed within budget. **Constraints:** The project must be executed and completed within the established cost.

Objective	Name of Deliverable	Information Sources	Research Method	Tools	Restrictions
		3. Project Management Institute (PMI) Database 4. Ministry of Infrastructure Ports, Transport, Physical Development and Urban Renewal Website 5. Global Environment Facility (GEF) Website 6. Internet			
5. To create a Quality Management Plan to identify the quality requirements and to describe how quality will be managed throughout the project's lifecycle in order to ensure that results meet the stakeholders' expectations.	Quality Management Plan	**Primary:** 1. Reports prepared by Ministry of Infrastructure Ports, Transport, Physical Development and Urban Renewal - Renewable Energy Unit 2. Global Environment Facility (GEF) Reports 3. Meetings, email communication and interviews with staff members from Renewable Energy Unit	Analytical Research Method and Qualitative Research Method	Expert Judgment, Benchmarking, Brainstorming, Interviews	**Assumptions:** Information will be readily available and will identify the quality requirements for the development of the quality management plan. **Constraints:** The project must satisfy the required or certain quality standards.

Objective	Name of Deliverable	Information Sources	Research Method	Tools	Restrictions
		Secondary: 1. PMBOK Guide 7th Edition 2. PMBOK Guide 6th Edition 3. Project Management Institute (PMI) Database 4. Ministry of Infrastructure Ports, Transport, Physical Development and Urban Renewal Website 5. Global Environment Facility (GEF) Website 6. Internet			
6. To generate a Resource Management Plan to identify, acquire and manage the necessary resources (physical and human) effectively, in order to successfully	Resource Management Plan	**Primary:** 1. Reports prepared by Ministry of Infrastructure Ports, Transport, Physical Development and Urban Renewal - Renewable Energy Unit	Analytical Research Method and Qualitative Research Method	Expert Judgment, Data Gathering Technique: Hierarchical Charts, Meetings	**Assumptions:** There are available human resources with the relevant expertise to manage the project. **Constraints:** The available human resources with the

Objective	Name of Deliverable	Information Sources	Research Method	Tools	Restrictions
complete the project within time, scope and cost constraints.		2. Global Environment Facility (GEF) Reports 3. Meetings, email communication and interviews with staff members from Renewable Energy Unit **Secondary:** 1. PMBOK Guide 7th Edition 2. PMBOK Guide 6th Edition 3. Project Management Institute (PMI) Database 4. Ministry of Infrastructure Ports, Transport, Physical Development and Urban Renewal Website 5. Global Environment Facility (GEF) Website 6. Internet			relevant expertise may be insufficient to execute the project.

Objective	Name of Deliverable	Information Sources	Research Method	Tools	Restrictions
7. To develop a Communications Management Plan to ensure effective and timely communication of the project's information to the project management team and stakeholders.	Communications Management Plan	**Primary:** 1. Reports prepared by Ministry of Infrastructure Ports, Transport, Physical Development and Urban Renewal - Renewable Energy Unit 2. Global Environment Facility (GEF) Reports 3. Meetings, email communication and interviews with staff members from Renewable Energy Unit **Secondary:** 1. PMBOK Guide 7th Edition 2. PMBOK Guide 6th Edition 3. Project Management Institute (PMI) Database 4. Ministry of Infrastructure Ports, Transport, Physical	Analytical Research Method and Qualitative Research Method	Communication Model, Communication Method, Meetings	**Assumptions:** The communication methods utilized will effectively convey information and communication needs to stakeholder to ensure appropriate stakeholder engagement. **Constraints:** Limitation or disruptions in communications technology may affect the ability to effectively communicate and engage stakeholders.

Objective	Name of Deliverable	Information Sources	Research Method	Tools	Restrictions
		Development and Urban Renewal Website 5. Global Environment Facility (GEF) Website 6. Internet			
8. To create a Risk Management Plan to outline the project's risk management approach by identifying, categorizing, analyzing and responding effectively to potential project risks.	Risk Management Plan Risk Register	**Primary:** 1. Reports prepared by Ministry of Infrastructure Ports, Transport, Physical Development and Urban Renewal - Renewable Energy Unit 2. Global Environment Facility (GEF) Reports 3. Meetings, email communication and interviews with staff members from Renewable Energy Unit **Secondary:** 1. PMBOK Guide 7th Edition	Analytical Research Method and Qualitative Research Method	Expert Judgment, Stakeholder Analysis, Brainstorming, Interviews, SWOT Analysis	**Assumptions:** The Scope Management Plan will provide sufficient information to identify and analyze the overall risks of the project. **Constraints:** All project risks to be identified in the project planning stage.

Objective	Name of Deliverable	Information Sources	Research Method	Tools	Restrictions
		2. PMBOK Guide 6th Edition 3. Project Management Institute (PMI) Database 4. Ministry of Infrastructure Ports, Transport, Physical Development and Urban Renewal Website 5. Global Environment Facility (GEF) Website 6. Internet			
9. To generate a Procurement Management Plan to manage the purchase of materials and acquisition of services or results required for the project.	Procurement Management Plan	**Primary:** 1. Reports prepared by Ministry of Infrastructure Ports, Transport, Physical Development and Urban Renewal - Renewable Energy Unit 2. Global Environment Facility (GEF) Reports 3. Meetings, email communication and interviews with staff	Analytical Research Method and Qualitative Research Method	Expert Judgment, Source Selection Analysis, Meetings**,** Advertising, Interpersonal and Team Skills, Inspection, Audit	**Assumptions:** All resources required for the project will be procured in a timely manner. **Constraints:** Items required may not readily be available for procurement.

Objective	Name of Deliverable	Information Sources	Research Method	Tools	Restrictions
		members from Renewable Energy Unit **Secondary:** 1. PMBOK Guide 7th Edition 2. PMBOK Guide 6th Edition 3. Project Management Institute (PMI) Database 4. Ministry of Infrastructure Ports, Transport, Physical Development and Urban Renewal Website 5. Global Environment Facility (GEF) Website 6. Internet			
10. To develop a Stakeholder Management Plan to identify, categorize and support stakeholders by	Stakeholder Engagement Plan Stakeholder Register Power/Interest Matrix	**Primary:** 1. Reports prepared by Ministry of Infrastructure Ports, Transport, Physical Development and Urban	Analytical Research Method and Qualitative Research Method	Expert Judgment, Brainstorming, Stakeholder Analysis, Power/Interest Grid,	**Assumptions:** The stakeholder register will identify all stakeholders and their level of interest

Objective	Name of Deliverable	Information Sources	Research Method	Tools	Restrictions
developing suitable engagement strategies to ensure effective stakeholder engagement.		Renewal - Renewable Energy Unit 2. Global Environment Facility (GEF) Reports 3. Meetings, email communication and interviews with staff members from Renewable Energy Unit **Secondary:** 1. PMBOK Guide 7th Edition 2. PMBOK Guide 6th Edition 3. Project Management Institute (PMI) Database 4. Ministry of Infrastructure Ports, Transport, Physical Development and Urban Renewal Website 5. Global Environment Facility (GEF) Website		Communication Skills, Interpersonal and Team Skills, Meetings	and power over the project. **Constraints:** Stakeholder's level of interest or power may change as the project progresses.

Objective	Name of Deliverable	Information Sources	Research Method	Tools	Restrictions
		6. Internet			
11. To determine the relationship and impact of the project's execution and its end product on regenerative and sustainable development.	Comprehensive Document	**Primary:** 1. Reports prepared by Ministry of Infrastructure Ports, Transport, Physical Development and Urban Renewal - Renewable Energy Unit 2. Meetings, email communication and interviews with staff members from Renewable Energy Unit **Secondary:** 1. PMBOK Guide 6th Edition 2. Sustainable Project Management: The GPM Reference Guide 3. Internet	Analytical Research Method and Qualitative Research Method	Interviews, Meetings	**Assumptions:** Information will be readily available to determine the relationship and impact of the project's execution and its end product on regenerative and sustainable development. **Constraints:** Limited information may be available

22. Validation of the work in the field of regenerative and sustainable development.

The project promotes both regenerative and sustainable development. The project. The project promotes three (3) regenerative development principles, namely, (1) Functional regeneration of ecosystems and their services, (2) Regenerating functional societies, and (3) Regenerating the economic development model. The project aims to promote several SDGS out of the 17 SDGS including: (1) Goal 7: Clean and Affordable Energy, (2) Goal 1: No Poverty, (3) Goal 3: Good Health and Wellbeing, (4) Goal 5: Gender Equality, (5) Goal 13: Climate Action, (6) Goal 11: Sustainable Cities and Communities, (7) Goal 8: Decent Work and Economic Growth and (8) Goal 9: Industry, Innovation and Infrastructure.

The FGP will comply with the concepts of regenerative and sustainable development by utilizing the P5 Impact Analysis and Key Performance Indicators. Potential indicators are:

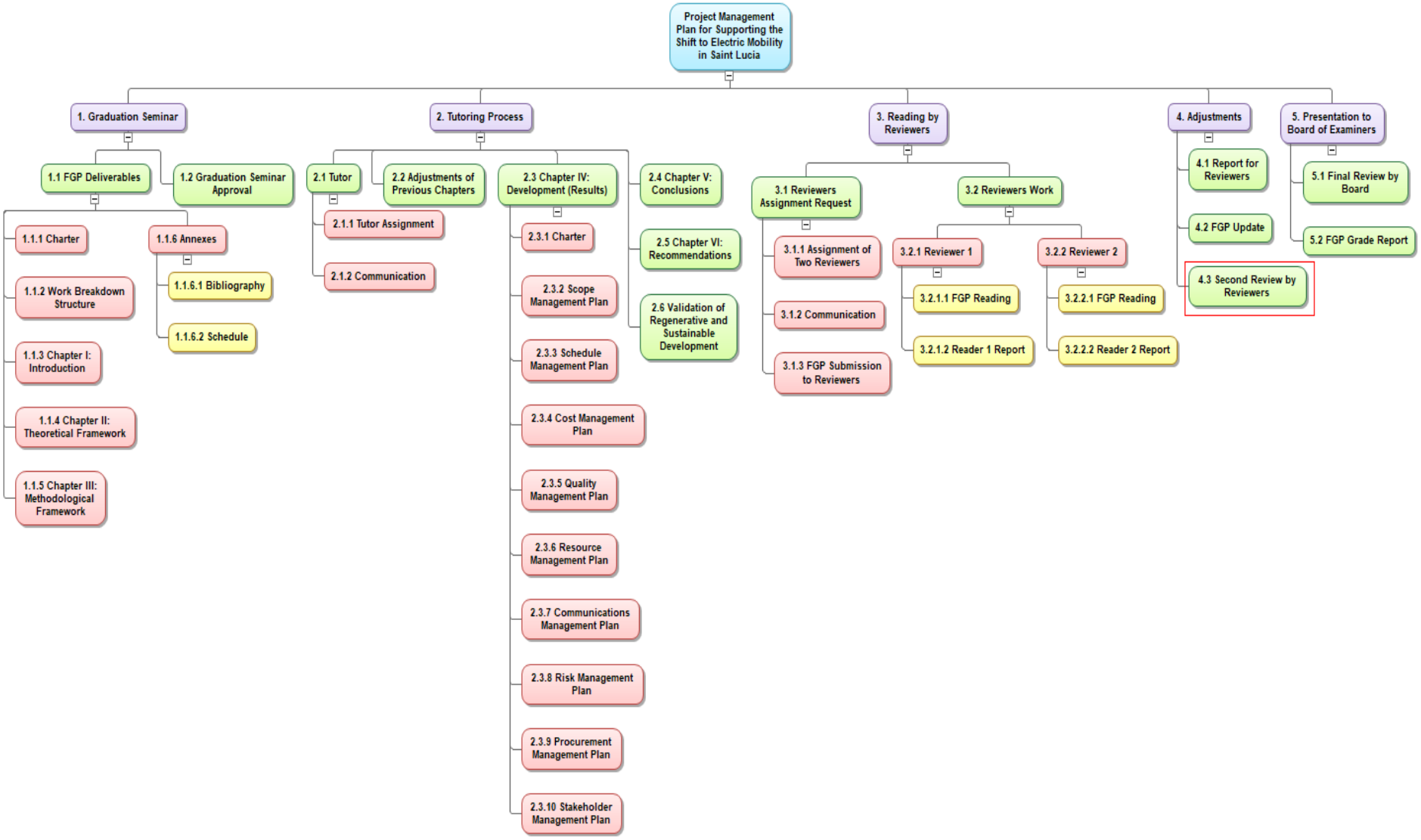
1. Reduced transportation costs. This will be measured by comparing transportation costs before implementation of electric vehicles and after.

2. Residents understand the project's benefits and do not disturb the project's progress. This will be measured by 95% of residents have good opinions about the project.

3. Project procurement favours local companies. This will be measured by 70% of contracts are performed by local companies.

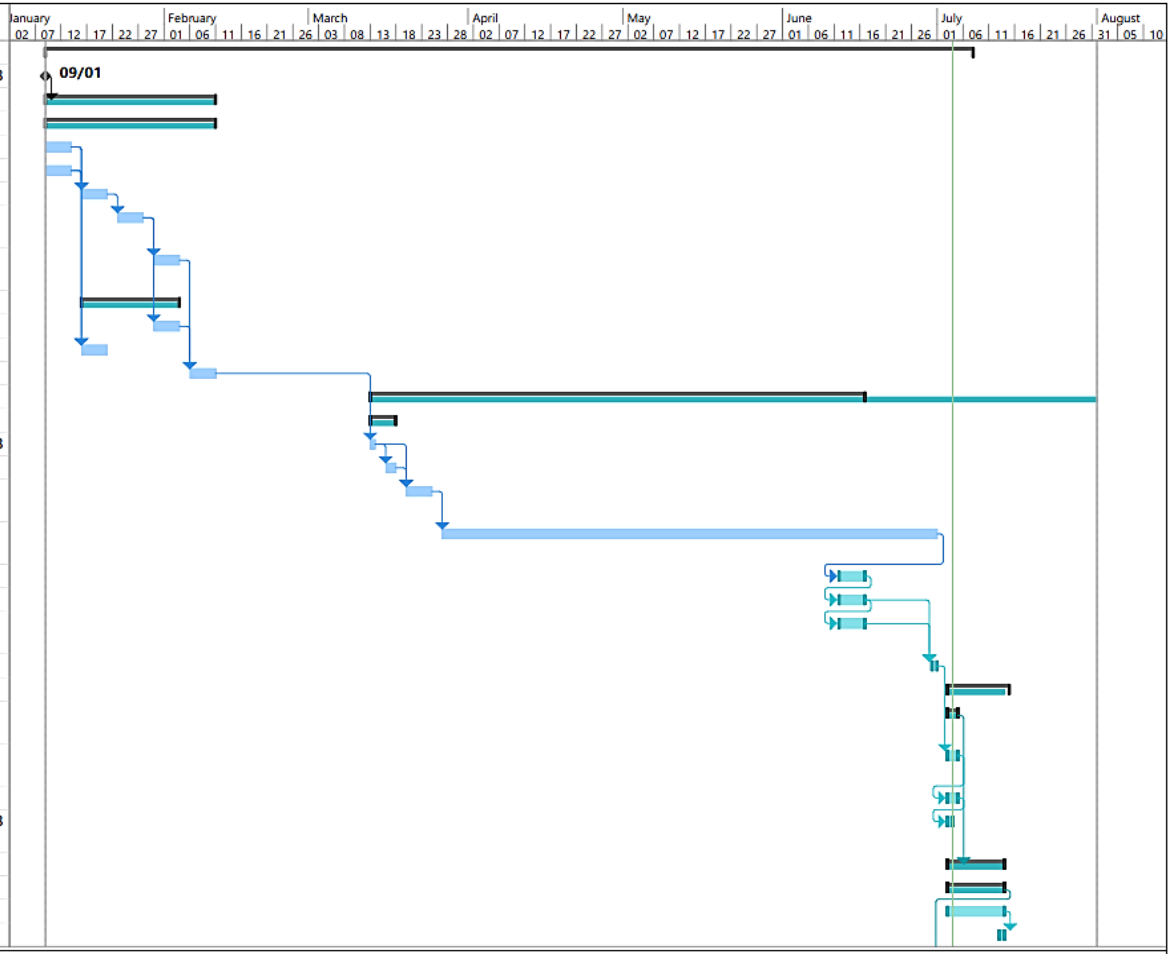
4. All project activities are successfully executed, and deliverables are planned. This will be measured by less than 1% of margin of error reported in all project deliverables.

Appendix 2: FGP WBS

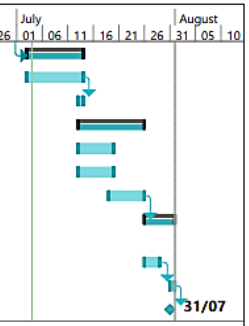


Appendix 3: FGP Schedule

ID	Task Name	Duration	Start	Finish
1	**Final Graduation Project**	**130 days**	**Mon 09/01/23**	**Fri 07/07/23**
2	FGP Start	0 days	Mon 09/01/23	Mon 09/01/23
3	**1. Graduation Seminar**	**25 days**	**Mon 09/01/23**	**Fri 10/02/23**
4	**1.1 FGP Deliverables**	**25 days**	**Mon 09/01/23**	**Fri 10/02/23**
5	1.1.1 Charter	5 days	Mon 09/01/23	Fri 13/01/23
6	1.1.2 Work Breakdown Structur	5 days	Mon 09/01/23	Fri 13/01/23
7	1.1.3 Chapter I: Introduction	5 days	Mon 16/01/23	Fri 20/01/23
8	1.1.4 Chapter II: Theoretical Framework	5 days	Mon 23/01/23	Fri 27/01/23
9	1.1.5 Chapter III: Methodological Framework	5 days	Mon 30/01/23	Fri 03/02/23
10	**1.1.6 Annexes**	**15 days**	**Mon 16/01/23**	**Fri 03/02/23**
11	1.1.6.1 Bibliography	5 days	Mon 30/01/23	Fri 03/02/23
12	1.1.6.2 Schedule	5 days	Mon 16/01/23	Fri 20/01/23
13	1.2 Graduation Seminar Approv	5 days	Mon 06/02/23	Fri 10/02/23
14	**2. Tutoring Process**	**70 days**	**Mon 13/03/23**	**Fri 16/06/23**
15	**2.1 Tutor**	**5 days**	**Mon 13/03/23**	**Fri 17/03/23**
16	2.1.1 Tutor Assignment	1 day	Mon 13/03/23	Mon 13/03/23
17	2.1.2 Tutor Communication	2 days	Thu 16/03/23	Fri 17/03/23
18	2.2 Adjustments of Previous Chapters (if required)	5 days	Mon 20/03/23	Fri 24/03/23
19	2.3 Chapter IV: Development(Results)	70 days	Mon 27/03/23	Fri 30/06/23
20	2.4 Chapter V: Conclusions	5 days	Mon 12/06/23	Fri 16/06/23
21	2.5 Chapter VI: Recommendations	5 days	Mon 12/06/23	Fri 16/06/23
22	2.6 Validation of Regenerative and Sustainable Development	5 days	Mon 12/06/23	Fri 16/06/23
23	Tutor Approval	1 day	Fri 30/06/23	Fri 30/06/23
24	**3. Reading by Reviewers**	**10 days**	**Mon 03/07/23**	**Fri 14/07/23**
25	**3.1 Reviewers Assignment Request**	**2 days**	**Mon 03/07/23**	**Tue 04/07/23**
26	3.1.1 Assignment of Two Reviewers	2 days	Mon 03/07/23	Tue 04/07/23
27	3.1.2 Communication	2 days	Mon 03/07/23	Tue 04/07/23
28	3.1.3 FGP Submission to Reviewers	1 day	Mon 03/07/23	Mon 03/07/23
29	**3.2 Reviewers Work**	**9 days**	**Mon 03/07/23**	**Thu 13/07/23**
30	**3.2.1 Reviewer 1**	**9 days**	**Mon 03/07/23**	**Thu 13/07/23**
31	3.2.1.1 FGP Reading	9 days	Mon 03/07/23	Thu 13/07/23
32	3.2.1.2 Reader 1 Report	1 day	Thu 13/07/23	Thu 13/07/23



ID	Task Name	Duration	Start	Finish
33	**3.2.2 Reviewer 2**	**9 days**	**Mon 03/07/23**	**Thu 13/07/23**
34	3.2.2.1 FGP Reading	9 days	Mon 03/07/23	Thu 13/07/23
35	3.2.2.2 Reader 2 Report	1 day	Thu 13/07/23	Thu 13/07/23
36	**4. Adjustments**	**9 days**	**Thu 13/07/23**	**Tue 25/07/23**
37	4.1 Report for Reviewers	5 days	Thu 13/07/23	Wed 19/07/23
38	4.2 FGP Update	5 days	Thu 13/07/23	Wed 19/07/23
39	4.3 Second Review by Reviewer	5 days	Wed 19/07/23	Tue 25/07/23
40	**5. Presentation to Board of Examiners**	**4 days**	**Wed 26/07/23**	**Mon 31/07/23**
41	5.1 Final Review by Board	3 days	Wed 26/07/23	Fri 28/07/23
42	5.2 FGP Grade Report	1 day	Mon 31/07/23	Mon 31/07/23
43	FGP End	0 days	Mon 31/07/23	Mon 31/07/23



Project: FGP Schedule
Date: Tue 04/07/23

Task | Split | Milestone | Summary
Project Summary | Inactive Task | Inactive Milestone | Inactive Summary
Manual Task | Duration-only | Manual Summary Rollup | Manual Summary
Start-only | Finish-only | External Tasks | External Milestone
Deadline | Progress | Manual Progress

Appendix 4: Preliminary Bibliographical Research

Ercan, T., Onat, N. C., Keya, N., Tatari, O., Eluru, N., & Kucukvar, M. (2022). Autonomous Electric Vehicles Can Reduce Carbon Emissions and Air Pollution in Cities. Transportation Research Part D: Transport and Environment, 112, 103472. Retrieved from https://doi.org/10.1016/j.trd.2022.103472

Justification: The reference above was selected to provide background information on electric mobility which relates to my final graduation project. The article assisted in the development of the FGP since it points out critical points relating to electric vehicles and the reduction in greenhouse gas emissions.

Fontenelle, C. (2018). Project Management Plan on the Environmental and Social Impact of Geothermal Energy Development in Saint Lucia. University of International Cooperation (UCI).

Justification: The reference above was selected to provide guidance on the FGP since it highlights previous research on the topics required for the theoretical framework which is an element of the Project Management Plan.

Global Environment Facility (GEF). (2023). Support the Shift to Electric Mobility in Saint Lucia. Retrieved from https://www.thegef.org/projects-operations/projects/10283

Justification: The reference above was selected to provide extensive information about the project which was required for the sections of the FGP.

Martin, M. (2023). Project Management Life Cycle Phases: What are the Stages? Retrieved from https://www.guru99.com/initiation-phase-project-management-life-cycle.html#5

Justification: The reference above was selected to provide additional information about the project life cycle. This article assisted in the development of the FGP due to the substantial information which was outlined relating to project life cycles.

McDowell, Z. (n.d.). What is Project Management? Planview. Retrieved from https://www.planview.com/resources/guide/what-is-project-management/#:~:text=Project%20management%20is%20the%20act,are%20how%20things%20get%20done.

Justification: The reference above was chosen since it provided the definition of project management which was required for the theoretical framework of the FGP.

Ministry of Infrastructure, Ports, Transport, Physical Development and Urban Renewal. (2023). About the Ministry of Infrastructure, Ports, Transport, Physical Development and Urban Renewal. Retrieved from https://infrastructure.govt.lc/about

Justification: The reference above was selected since it provided essential information relating to the vision and mission statements and other departmental information of the Ministry of Infrastructure, Ports, Transport, Physical Development and Urban Renewal – Renewable Energy Unit required for the FGP.

Müller, E. (2017). Regenerative Development, the way forward to Saving our Civilization, University for International Cooperation. San Jose, Costa Rica. [PDF File]

Justification: The reference above was selected to ensure that the Project Management Plan is developed to meet the standards and principles of Regenerative Development as established by Muller.

Nationally Determined Contribution (NDC). (2020). E- Mobility: Making Way for Electric Mobility in Saint Lucia. NDC Newsletter Volume 2, Issue 1. Retrieved from https://gggi.org/wp-content/uploads/2020/09/NDC-newsletter-2020-no.-3-.pdf

Justification: The reference above was selected since it provided relevant information related to electric mobility in Saint Lucia and background information about the electric mobility project and previous renewable energy projects.

Program Management Institute (2006). Practice Standard for Work Breakdown Structures - Second Edition. Project Management Institute.

Justification: The reference above was chosen since it provided guidance on Work Breakdown Structures (WBS), definitions, and related concepts which assisted in the development of the final graduation project.

Program Management Institute. (2019). Practice Standard for Scheduling - Third Edition. Project Management Institute. [PDF File]

Justification: The reference above was selected since it provided extensive guidance on scheduling techniques, definitions, models and other relevant information required for the development of this final graduation project.

Project Management Institute (PMI). (2017). A Guide to the Project Management Body of Knowledge (PMBOK Guide) – Sixth Edition. Project Management Institute. [PDF File]

Justification: The reference above was selected since it is a fundamental resource for project management terminology, practices, inputs, tools and techniques, outputs and processes. By using this reference, the Project Management Plan was developed according to the standards and guidelines set by the Project Management Institute (PMI, 2017). This edition of the PMBOK® Guide defines ten (10) knowledge areas and five (5) process groups which form the basis of the structure for the Final Graduation Project.

Project Management Institute (PMI). (2021). A Guide to the Project Management Body of Knowledge (PMBOK Guide) – Seventh Edition. Project Management Institute. [PDF File]

Justification: The reference above was selected to ensure that the Project Management Plan was developed according to the standards and guidelines set by the Project Management Institute (PMI, 2021). It assisted in the development of my final graduation project since I referred to information relating to the project management knowledge areas, eight (8) project performance domains and associated project management processes and terminology.

Romano, L. (2014). Corporate Strategy for Project Managers: Why Strategic Alignment and Awareness is So Important. Paper Presented at PMI® Global Congress 2014—EMEA, Dubai, United Arab Emirates. Newtown Square, PA: Project Management Institute.

Justification: The reference above was selected since it provides extensive information relating to organizational strategy, portfolios and programs which was required for the theoretical framework of the FGP.

Wanner, R. (2013). Project Risk Management: The Most Important Methods and Tools for Successful Projects. [PDF File]

Justification: The reference above was selected since it provides guidance on risk management tools and methods and how to successfully apply risk management in projects. It assisted in the development of the risk management plan for the Supporting the Shift to Electric Mobility in Saint Lucia Project.

World Bank Group; International Association of Public Transport. (2018). Electric Mobility and Development. ESMAP Paper. World Bank, Washington, DC. Retrieved from https://openknowledge.worldbank.org/handle/10986/30922

Justification: The reference above was selected since it provided evidence, perspectives and an analysis of electric mobility programs. It assisted in the development of my final graduation project since I gathered information relating to the implementation of electric mobility in other countries.

Appendix 5: Philological Dictum

Angela Marie Paul Jean Baptiste
P.O. Box CHOC 8238, Union Hill Top
Castries, St. Lucia
ajnbaptiste@sjc.edu.lc; (758)584-6047/450-2789

Monday 26th June, 2023

Academic Advisor

Master's Degree in Project Management (MPM)

Universidad para la Cooperacion Internacional (UCI)

Dear Academic Advisor,

Re: Philological Review of Final Graduation Project submitted by **Ms. Stephie Stacia Anderson** in partial fulfilment of the requirements for the Masters in Project Management (MPM) Degree.

I hereby confirm that **Ms. Stephie Stacia Anderson** has made all the corrections to the Final Graduation Project document as have advised. In my opinion the document meets the literary and linguistic standards expected of a student reading for a degree at the Masters Level.

I am a trained English Language teacher who have been instructing students at the high school level since 2011. I have a Bachelor's Degree in Education from the *University of the West Indies, Cave Hill Campus*, Barbados. A copy of the same is attached.

Sincerely,

Angela Jean Baptiste, B.Ed.

THE UNIVERSITY OF THE WEST INDIES

Angela Marie P. Jean-Baptiste

having completed the Course of Study approved by the University and having satisfied the Examiners, has this day been admitted by the Senate to the Degree of

BACHELOR OF EDUCATION

EDUCATION

(TEACHING OF LANGUAGE ARTS)

with

Second Class Honours (Upper Division)

July 1, 2011

DATE

VICE-CHANCELLOR

UNIVERSITY REGISTRAR

This Document is not valid unless it bears the University's seal