ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP)

PERUSAHAAN OTOMOBIL NASIONAL SDN BHD (PROTON)

MALAYSIA KIGALI IMPLEMENTATION PLAN (KIP) FOR HFC PHASEDOWN PROJECT STAGE I

July 2025

Status of Revision

Revision No	Date	Section	Details of Revision
0	November 2024	All pages	1st issue
1	March 2025	All pages	
2	July 2025	All pages	Edited post-project negotiations for consistency with Environment and Social Commitment Plan and minor edits

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBRIVIATIONS

ASHRAE	American Society of Heating, Refrigerating and Air-Conditioning Engineers
ATC	Authorized Training Center
ATEX	Explosive Atmosphere
BIW	Body-in-White
BMP	Best Management Practices
BOMBA	Fire and Rescue Department
CBU	Completely Built Up
CCC	Certificate of Completion and Compliance
CePSWaM	Certified Environmental Professional in Scheduled Waste Management
CFC	Chlorofluorocarbon
CFO	Certificate of Fitness for Occupation
CHRA	Chemical Health Risk Assessment
CO2	Carbon Dioxide
CSTP	Certified Service Technician Program
DOE	Department of Environment
DOSH	Department of Occupational Safety and Health
ECOS	Energy Commission Online System
EHS	Environment, Health and Safety
EIA	Environmental Impact Assessment
EMC	Environmental Management Centre
EN	European Norm
EPA	Environmental Protection Agency
EPEE	European Partnership for Energy & the Environment
EQA	Environmental Quality Act
ERP	Emergency Response Plan
ERT	Emergency Response Team
ESCP	Environmental and Social Commitment Plan
ESF	Environment and Social Framework
ESHS	Environmental, Social, Health and Safety
ESMP	Environmental and Social Management Plan
ESS	Environmental Social Standards
ETM	Engine and Transmission Machining
EU	European Union
e-SWIS	Electronic Scheduled Waste Information System
ExCom	Executive Committee
FC	Fire Certificate
FMA	Factories and Machinery Act
FMEA	Failure Modes and Effects Analysis
GA	Grant Agreement
GBV	Gender-Based Violence
GHG	Greenhouse Gas
GHS	Globally Harmonized System of Classification and Labelling of Chemicals
GRM	Grievance Redress Mechanism
GWP	Global Warming Potential
HC	Hydrocarbon

HCFC	Hydrochlorofluorocarbon
HFC	Hydrofluorocarbon
HFO	Hydrofluoroolefin
HIV	Human Immunodeficiency Virus
HPMP	Hydrochlorofluorocarbon Phaseout Management Plan
IBC	Immediate Bulk Container
ICA	Industrial Coordination Act 1975
ICC	Incremental Capital Cost
IEC	International Electrotechnical Commission
IETS	Industrial Effluent Treatment System
IOC	Incremental Operating Cost
ISO	International Organization for Standardization
JPJ	*Jabatan Pengangkutan Jalan* (Road Transport Department)
KIP	Kigali Implementation Plan
LEL	Lower Explosion Limit
LMP	Labor Management Procedures
MAA	Malaysian Automobile Association
MAC	Mobile Air Conditioning
MIDA	Malaysian Investment Development Authority
MIROS	Malaysia Institute of Road Safety Research
MLF	Multilateral Fund
MOT	Ministry of Transport
MS	Malaysian Standard
MT	Metric Tons
NA	Not Available
NCAP	New Car Assessment Program
NDEISC	Non-Domestic Electrical Installation Safety Code
NFPA	National Fire Protection Association
NOU	National Ozone Unit
NRES	Ministry of Natural Resources and Environmental Sustainability
ODS	Ozone Depleting Substances
OEM	Original Equipment Manufacturer
OHS	Occupational Health and Safety
OSHA	Occupational Safety and Health Act
PMU	Project Management Unit
PPE	Personal Protective Equipment
PTI	Permit-to-Install
PTMSB	PROTON Tanjung Malim Sdn Bhd
RAC	Refrigeration and Air Conditioning
SCBA	Self-Contained Breathing Apparatus
SDS	Safety Data Sheet
SEA	Sexual Exploitation and Abuse
SEP	Stakeholder Engagement Plan
SGA	Subproject Grant Agreement
SH	Sexual Harassment
SHE	Safety, Health and Environment
SIRIM	Standard & Industrial Research Institute of Malaysia

SME	Small and Medium-sized Enterprise
SNAP	Significant New Alternatives Policy
SOP	Standard Operating Procedures
SPAN	*Suruhanjaya Perkhidmatan Air Negara* (National Water Services Commission)
ST	*Suruhanjaya Tenaga* (Energy Commission)
SUV	Sport Utility Vehicle
SW	Scheduled Waste
TA	Technical Assistance
TF	Trim and Final Assembly
TNB	*Tenaga Nasional Berhad*
UBBL	Uniform Building By-Law
UEL	Upper Explosion Limit
UL	Underwriters Laboratories
UN	United Nations Committee of Experts on the Transport of Dangerous Goods
UPS	Uninterruptible Power Supply
US	United States
USA	United States of America
USECHH	Occupational Safety and Health (Use and Standard of Exposure of Chemical Hazardous to Health) Regulations
VTA	Vehicle Type Approval
WB	World Bank
WWTP	Waste Water Treatment Plant

1 INTRODUCTION

In accordance with the World Bank's Environmental and Social Standard 1 (ESS1), the Recipient is required to conduct an environmental and social assessment to evaluate the potential risks and impacts associated with the funded project throughout its life cycle. This assessment must be proportionate to the identified risks, considering all relevant direct, indirect, and cumulative environmental and social factors, as outlined in ESSs 2–10. For the Malaysia Kigali Implementation Plan for HFC Phasedown Project – Stage I, site-specific **Environmental and Social Management Plan (ESMP)** has been developed for each project Beneficiary as the primary instrument for managing associated risks across all subprojects.

This ESMP document is specifically designed for **Perusahaan Otomobil Nasional Sdn Bhd (PROTON)** to manage the environmental and social risks related to its subproject activities. It applies only to the activities outlined herein and is not intended for use by other entities or for any activities outside the scope of this World Bank-funded initiative.

1.1 BACKGROUND

Malaysia ratified the Vienna Convention and the Montreal Protocol on Substances that Deplete the Ozone Layer on 29 August 1989. It has acceded to all Montreal Protocol amendments which include the London Amendment (1990) on 5 August 1993; the Copenhagen Amendment (1992) on 3 November 1993; the 1997 Montreal Amendment; the 1999 Beijing Amendment; and, most recently the Kigali Amendment on 21 October 2020, which added hydrofluorocarbons (HFCs) as controlled substances under the Protocol, consistent with its policy to support international efforts to combat climate change.

As an Article 5 and Group 1 country under the Kigali Amendment, Malaysia is obligated to freeze the use of HFCs to not more than its baseline level by 2024 and gradually reduce consumption from this baseline up to 80% by 2045 as shown in **Table 1.1**. Under Kigali Amendment, Group 1 country baselines are partly made up of average HFC consumption (imports plus production minus exports) in the years 2020-2022, plus 65% of its 2009-2010 HCFC baseline in CO2eq (already known to be 8.2 million tons). The additional HCFC "headroom" is to account for the ongoing transition of Article 5 countries to HFCs from HCFCs that will be nearly eliminated by 2030. As Malaysia is not a HFC-producing country, it must ensure that its calculated level of consumption (imports minus exports) of controlled substances listed in Annex F and expressed in CO2 equivalent, does not exceed the ceiling in each 12-month period.

Table 1.1 Kigali Amendment Obligations for Group 1, Article 5 Parties*

Target Year	Kigali Amendment HFC Phasedown Obligation
2024	Freeze at the baseline level
2029	10% reduction from the baseline
2035	30% reduction from the baseline
2040	50% reduction from the baseline
2045	80% reduction from the baseline

*Baseline Calculation: 2020, 2021, and 2022 Average Consumption of HFCs plus 65% of the HCFC Baseline in CO2 eq.

Malaysia also receives financial assistance by the Montreal Protocol Multilateral Fund (MLF) to prepare and implement projects that support compliance. For HFC phasedown, the MLF Executive Committee agreed to provide funding to countries to prepare national phasedown plans termed “Kigali Implementation Plans (KIPs)”. Malaysia, through the Department of Environment (DOE) under the Ministry of Natural Resources and Environmental Sustainability (NRES) has completed its KIP and overarching strategy which when approved by the MLF and Cabinet respectively will become the basis for a new HFC phasedown project for the period 2024-2029, the Malaysia Kigali Implementation Plan for HFC Phasedown Project - Stage I.

Malaysia is proposing four stages for the KIP implementation. Stage I covering HFC phasedown commitments for the year 2024 to 2029, is proposed to be implemented by DOE simultaneously with its separate HCFC Phaseout Management Plan (HPMP) until 2030. Stage II is expected to cover a period of six years (from 2030 to 2035), Stage III is expected to cover a period of five years (from 2036 to 2040), and Stage IV is expected to cover a period of five years until 2045.

1.2 PROJECT DESCRIPTION

The Malaysia Kigali Implementation Plan for HFC Phasedown Project - Stage I (hereinafter referred to as “**the Project**”) focuses on reducing hydrofluorocarbon (HFC) consumption through a combination of investment and non-investment activities. The Project encompasses three major investment projects aimed at supporting this transition.

First, a pilot conversion project will be conducted at an automobile manufacturing enterprise to replace mobile air-conditioning (MAC) units in a new vehicle model, transitioning from HFC-134a to the lower Global Warming Potential (GWP) HFO-1234yf. This conversion will showcase the feasibility of adopting alternative refrigerants in the MAC sector. Second, two small- and medium-sized enterprises (SMEs) producing stand-alone commercial refrigeration equipment will shift from using HFC-based refrigerants to R-290 and R-600a. This conversion will eventually contribute to the total phase-out of HFC in the commercial refrigeration sector. These conversions will be implemented at the existing manufacturing facilities of the participating enterprises, with the Project providing investment support for research and development (R&D), necessary design changes (including explosion-proof equipment and safety measures), training, and efforts to improve energy performance.

In addition to these investment projects, the Project includes several non-investment activities aimed at strengthening the overall capacity of the refrigeration and air-conditioning (RAC) servicing sectors. This includes initiatives to improve servicing for MAC, as well as commercial and domestic refrigeration, alongside technical assistance in transport refrigeration servicing and MAC servicing for public transport. Other key non-investment activities involve support in enhancing recovery and recycling, building capacity within customs and industry stakeholders, enforcing bans, and supporting ongoing project monitoring and coordination.

This holistic approach combines targeted investments with capacity building initiatives to ensure a smooth transition away from HFCs, supporting both environmental sustainability and industry readiness.

KIP Stage I and Project activities will be supported by implementation of six bans:

(a) By 1 January 2026: a ban on the installation of new HFC-23 and HFC-125-based fire suppression systems; and

(b) By 1 January 2029: a ban on the manufacture and import of HFC-based stand-alone commercial refrigeration equipment; a ban on the manufacture and import of HFC-based domestic refrigeration; a ban on the manufacture and import of HFC-134a-, R-452A-, and R-404A-based components for refrigerated transport; a ban on the manufacture and import of R-407C-based split AC and heat pumps; a ban on new installations of R-407C-based chillers.

1.2.1 Project Components

The proposed project has four (4) components as described below:

Component 1 – Investment in HFC Consumption Reductions

Component 1 will channel financial funding to three manufacturing enterprises involved in HFC consuming industries in Malaysia. Conversion activities will assist complete HFC phaseout in the selected stand-alone commercial refrigeration manufacturing enterprises and demonstrate or pilot safe and commercially viable HFC alternatives for MAC systems. Selection of eligible enterprises is based on applying a compliance model to prioritize phasedown according to criteria aligned with Kigali Amendment objectives including use of high-GWP HFCs where commercially viable alternatives exist; where high-GWP HFCs are growing to the point that it might impact compliance later in Kigali implementation; and where there is a subsector grouping that facilitates government regulation for example with a subsector ban on HFCs used.

Two manufacturers of refrigerated display cabinets and freezers in Malaysia will be supported to replace the use of HFC-134a and HFC-404A as refrigerants with a low GWP substance. The proposed alternative, R-290, a type of hydrocarbon (HC), has become the commercial norm in developed economies because of its refrigerant properties, low cost and low GWP value. These enterprises will also receive assistance to improve energy performance in their products by 20 to 40 percent.

A Malaysian-owned car manufacturer will be supported to convert MAC units installed in new vehicles to a non-HFC refrigerant technology, HFO-1234yf. One automobile make and model will be targeted under the Project to introduce manufacturing with the HFC-134a alternative in Malaysia while monitoring the design changes, duration, technical challenges, and incremental cost changes all of which will be communicated to and disseminated among other manufacturers in generic but sufficiently pertinent manner through the association and/or a technical working group.

Component 2 – Support for Reducing HFC Demand in Servicing

Component 2 focuses on reducing HFC demand in servicing sectors crucial to Malaysia's KIP Stage I and beyond. Five separate initiatives under this sector will be initiated under four subcomponents in order to address immediate emissions of HFCs to the atmosphere and improve HFC management in light of expected overall restrictions in supply of R-404A, R-407C, R-410A, R-452A and R-134a. These initiatives cover MAC servicing, commercial and domestic refrigeration servicing, transport refrigeration servicing, MAC servicing in public transport, and strengthening recovery and recycling efforts. This will be accomplished by starting to build the infrastructure for lifecycle management of HFCs, developing technical capacity of technicians in specific applications on maintaining energy performance, safe handling of flammable substitutes, and recovery and recycling, and assist the government establish an inventory and system to ensure efficient, longer-term supply of R-407C for public transport while assess what is needed to change the network of rail and buses to lower-GWP alternatives.

Component 3 – Technical Assistance and Policy Support

This component will finance impact assessments to support proposed bans on certain substances, evaluating alternative technologies and their environmental, economic, and social impacts. Feasibility studies will focus on enhancing green public procurement and implementing mandatory MAC testing for passenger vehicles and building Customs capacity through training workshops and equipment provision. Furthermore, industry capacity-building efforts will include workshops for manufacturers, sector-specific training sessions, study tours, and technical working group meetings on HFO-1234yf developments in the MAC sector. A market survey is planned (subject to additional MLF assistance) to assess the energy efficiency of stand-alone commercial refrigeration equipment and exploring the feasibility of implementing voluntary energy performance labelling and developing mandatory energy performance standards. This component will facilitate HFC quota management through an online system and upgrade SIRIM's environmental test chamber for compliance verification.

Component 4 – Project Management

This component will support:

(a) the establishment and operations of a project management unit (PMU);
(b) capacity building and support for project management, financial management, procurement, environmental and social management, and others as needed;
(c) stakeholder engagement activities, including public awareness and outreach, inter-agency coordination and consultations, and the operation of a grievance redress mechanism (GRM);
(d) support for coordinating annual consumption verification audits; and
(e) project progress monitoring and reporting.

1.2.2 Project Objective

The KIP Stage I project aims to achieve sustainable HFC consumption reduction while minimizing the environmental and social impact, supporting economic growth, and fostering a smooth transition to low-GWP alternatives across key sectors.

The objectives of KIP Stage I project are to:

(1) Implement sustainable measures to reduce HFC consumption in targeted sectors, prioritizing high-GWP HFCs and facilitating the transition to lower-GWP alternatives.
(2) Develop technical capacity and infrastructure to reduce HFC demand in servicing sectors, emphasizing training, recovery and recycling, and transitioning to lower-GWP alternatives.
(3) Provide policy support through market surveys, feasibility studies, and impact assessments to facilitate the phasedown process and promote energy efficiency and green procurement practices.
(4) Ensure effective project management and coordination to support the implementation of bans, stakeholder engagement, and progress monitoring towards KIP Stage I objectives.

1.2.3 Project Beneficiaries

The Project is expected to provide financial support to three (3) eligible enterprises (among other beneficiaries) under Project Component 1 namely Berjaya CKE International Sdn Bhd and Zun Utara Industry Sdn Bhd in the commercial refrigeration manufacturing, and PROTON in the automobile manufacturing for each proposed conversion subproject from HFC to low GWP substances.

1.2.4 Project Duration

The proposed KIP for HFC Phasedown Project will be implemented over nearly six (6) years from mid-2025 through 2030.

1.2.5 Implementation Arrangements for The Project

The project will be implemented with the World Bank as the "Implementing Agency" under the Multilateral Fund (the project donor) and by Department of Environment (DOE) as the Project Executing Agency under the Ministry of Natural Resources and Environmental Sustainability (NRES) (the Grant recipient) and in accordance with the World Bank Environmental and Social Framework (ESF) and Environmental and Social Standards (ESSs) and Guidelines of the Montreal Protocol, and the related national regulations of Malaysia. The DOE Malaysia, under the NRES, is also designated as the focal point for overseeing the implementation of the Montreal Protocol in Malaysia.

1.3 DESCRIPTION OF SUBPROJECT FOR PROTON

The subproject for **Perusahaan Otomobil Nasional Sdn Bhd** (hereinafter refer to as "PROTON") aims to pilot the conversion from the use of HFC-134a to low GWP refrigerant HFO-1234yf in MAC units. This conversion will be implemented in one car model set to launch [redacted] before 2029, and the manufacturing will take place at Proton Tanjung Malim (the Plant)**.** Through the pilot project, the MAC manufacturing sector will be prewarned of the eventual and inevitable phaseout of HFC-134a-based MACs in new automobiles and the need to align new model development with new MAC systems; in addition, the MAC manufacturing sector and

supply chain will be sensitized about the costs, challenges and opportunities of transitioning away from HFC-134a.

The pilot project will not fully convert PROTON's manufacturing to HFO-1234yf; rather, one of the plant's two assembly lines will be modified to allow the manufacturing with HFO-1234yf and one of the seven car models the enterprise manufactures will be converted to HFO-1234yf; the plant's remaining models will continue to be manufactured with HFC-134a-based MACs during stage I, both on the plant's second line and the modified line, which will have the capacity to assemble MACs with both HFO-1234yf and HFC-134a.

The PROTON manufacturing facility in Tanjung Malim consists of five main buildings namely Engine and Transmission Machining (ETM), Stamping, Body Assembly, Painting, and Trim & Final Assembly. The plant has two Trim & Final Assembly lines: TF1 and TF2 for making different car models. The pilot project will be carried out on the TF2 assembly line. There are two multi-fluid filling machines – one on each side of the TF2 assembly line. This machine has a modular design where several filling modules can be installed, added, or replaced without changing the plant layout of the filling area. It allows the transfer of several fluids such as brake fluid, engine coolant, and refrigerant to a vehicle at the same time. There is another charging machine installed outside the TF2 assembly line (offline) in case an adjustment needs to be made if a vehicle's MAC is not properly charged in the assembly line.

For the pilot project under KIP Stage I, PROTON has selected a suitable model that will be redesigned and equipped with HFO-1234yf MAC. PROTON will need to add three HFO-1234yf charging modules to the three existing multi-fluid filling machines: two on the TF2 assembly line and one offline. This setup will allow PROTON to charge HFO-1234yf to the selected redesigned model and HFC-134a to other models on the same assembly line.

Although HFO-1234yf is mildly flammable and is very difficult to ignite with an electrical spark, safety precautions below must still be implemented as preventive measures:

(a) install ventilation systems around the filling area to prevent HFO-1234yf accumulation and ensure it remains below its lower flammability limit.
(b) construct a new storage room with safety features for HFO-1234yf tanks and connect to the TF2 assembly line.
(c) collaborate with MAC system suppliers to revise specifications and test MAC systems with HFO-1234yf.
(d) provide safety training to Tanjung Malim plant staff and staff from 25 selected service workshops.
(e) supply specialized tools to 25 PROTON authorized service workshops for handling HFO-1234yf.

These safety precautions, along with the conversion activities, are fully funded. The approved funding from the Multilateral Fund amounts to US $1,087,950, with US $ 788,250 allocated for Incremental Capital Costs (ICCs) and US $299,700 for Incremental Operating Costs (IOCs). The ICCs cover expenses for redesigning and testing, providing safety training for workers in the manufacturing plant and 25 authorized service workshops, and offering technical support. Additionally, PROTON will prepare an Environmental Management Plan (EMP) and develop

Standard Operating Procedures (SOPs) for handling flammable refrigerants, co-financed by PROTON. The IOCs are calculated based on the sales of 9,000 vehicles.

1.4 PURPOSE AND SCOPE OF ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP)

1.4.1 Purpose of ESMP

This ESMP has been prepared in line with the ESS1 of the World Bank Environmental and Social Framework and Malaysia's environmental and social requirements. To the extent relevant, the applicable World Bank Group's Environment, Health and Safety (EHS) Guidelines and requirements related to Sexual Exploitation and Abuse, Sexual Harassment (SEA/SH) has been considered when preparing the ESMP. The main objectives of the ESMP are to:

(1) Conduct assessment to identify potential environmental and social risks associated with the refrigerant conversion project from HFC to low-GWP alternatives;
(2) Formulate targeted mitigation measures to address and minimize adverse environmental and social impacts during the implementation and operation phases of the conversion project;
(3) Develop a thorough monitoring plan to systematically assess and track the project's environmental and social aspects, ensuring ongoing evaluation and effectiveness of mitigation measures; and
(4) Establish a streamlined institutional arrangement to oversee and manage the conversion project, incorporating policies, procedures, and organizational structures for effective coordination and decision-making regarding environmental and social concerns.

1.4.2 Scope of ESMP

The scope of this ESMP covers all activities associated with the redesign, conversion, and manufacturing of cars fitted with MACs using HFO-1234yf at the TF2 production line of the PROTON Tanjung Malim plant. It also includes technical assistance provided to 25 PROTON's authorized service centers for the adoption of HFO-1234yf technology. The ESMP outlines environmental and social mitigation measures to address impacts during implementation and operation of the project.

Key areas covered by the ESMP:

(1) Conversion Activities at the TF2 Production Line of PROTON Tanjung Malim:

- **Installation of fire safety features**: This includes modifications to the production lines or storage facilities to safely accommodate the mildly flammable HFO-1234yf refrigerant.
- **Management of environmental impacts:** Addressing impacts related to equipment upgrades and the removal of obsolete systems during the conversion process.

- **Occupational health and safety (OHS) measures**: Ensuring worker safety throughout the conversion, commissioning and testing of the new systems at the production line, focusing on the safe handling of HFO-1234yf.

(2) Technical Assistance and Support for PROTON's 25 Authorized Service Centers:

- **Training and capacity-building**: Providing training for service center workers on the handling and maintenance of vehicles fitted with HFO-1234yf MAC units.
- **Provision of specialized tools:** Equipping service centers with the necessary tools and equipment to safely manage the new refrigerant.

Exclusions:

a) Downstream Risks and Impacts at Service Centers

The ESMP excludes downstream risks and impacts related to the use and handling of refrigerants and tools at the 25 authorized service centers because these risks fall outside the direct control of the project. The project's primary focus is on providing technical assistance, which includes training and supplying tools to these service centers. However, ongoing operations at the service centers – such as how technicians apply the training, manage refrigerant handling, or handle potential leaks or accidents – are not part of the project's scope. The project does not have jurisdiction over the service centers' operational decisions or practices beyond the scope of the initial technical assistance provided. Service centers are independent entities responsible for complying with their own local environmental and safety regulations and managing risks associated with the use of refrigerants like HFO-1234yf after receiving the initial project support.

Similarly, the project does not extend its coverage to customers of the authorized service centers or to any outsourced workers involved in air conditioning services. The ESMP does not cover these groups because the project's direct influence is limited to the conversion process and technical assistance provided to PROTON authorized service centers. Managing risks associated with these external groups would require separate oversight and management plans, which fall outside the project's purview and are not part of the current project funding.

b) Non-TF2 Building Operations

The project scope specifically covers the TF2 production line, where the conversion from HFC-134a to HFO-1234yf takes place. Other operations and facilities at the manufacturing facility, such as the Engine and Transmission Machining (ETM), Painting, Stamping, and Body Assembly buildings, are not part of this project. These facilities are unrelated to the refrigerant conversion process and are excluded from the ESMP. The project's environmental and social management measures focus solely on activities associated with the TF2 production line.

1.5 OUTLINE AND FORMAT OF ESMP

This ESMP comprises the following sections:

Section	Title	Content
1	**Introduction**	Introduction to the Project background, ESMP scope and objectives.
2	**Policy and Legislative Framework**	Focuses on the national laws and regulations as well as international guidelines and policies.
3	**Enterprise Baseline Information**	Describes the enterprise profile including land use, factory layout, manufacturing process, proposed conversion, and grievance redress mechanism.
4	**Environmental and Social Risks and Impacts**	Identifies baseline environmental and social status, due diligence conduct, and inherent risk of alternative refrigerant.
5	**Mitigation Measures**	Elaborates on proposed mitigation measures, and environmental and social budget allocated for implementing mitigation measures.
6	**Organizational Structure and Responsibilities**	Identifies critical personnel/ stakeholder who are responsible for the implementation of the ESMP and their roles.
7	**Training Requirement**	Highlights training requirements on personnel relevant to environmental and social management.
8	**Environmental and Social Monitoring**	Highlights environmental and social requirements, compliance, environmental monitoring program, pollution controls practiced.
9	**Consultation and Information Dissemination**	Describes the consultations held thus far as towards development of ESMP and future information dissemination to ensure stakeholder inclusivity and transparency.
10	**Integration of ESMP in the Project Document**	Concludes the ESMP document and outlines the requirement for future revision, updating of the ESMP, and integration within the project document

2 POLICY AND LEGISLATIVE FRAMEWORK

This section reviews the prevailing legal and administrative framework required to prepare the ESMP of the proposed subproject. Applicable WB Environmental and Social Standards (ESSs) and guidelines and Environmental and Social (E&S) policies, laws, regulations laid out by the GoM have been duly discussed and the subproject enterprise will be required to adhere to these regulations throughout the course of the proposed subproject.

2.1 KEY NATIONAL AND PROVINCIAL LAWS, REGULATIONS AND POLICIES

Manufacturing companies in Malaysia are often governed by various laws and regulations aimed at ensuring compliance with safety, environmental, labor and other standards. In the context of undertaking a conversion project within Malaysia, it is important for project enterprises to navigate the regulatory requirement efficiently. This involves obtaining various certificates, licenses, and permits essential for legal compliance and smooth operation of the project. **Table 2.1** is a list of major laws and regulations that typically apply to manufacturing companies.

2.2 OTHER RELEVANT NATIONAL GUIDELINES AND POLICIES

Malaysian Standard MS 2678:2017 – Flammable Refrigerant System – Code of Practice

This Malaysian Standard defines safety requirements for class A2L, 2, and 3 refrigerants as per ISO 817, aligning with IEC 60079, IEC 60035-2-40, and ISO 5149-2. This standard aims to promote the safe design, construction, disposal, installation, and operation of refrigerating systems and equipment using flammable refrigerants. It is intended to minimize possible hazards to persons, property and the environment from refrigerating systems using flammable refrigerants. These hazards are associated essentially with the physical and chemical characteristics of flammable refrigerants as well as the pressures and temperatures occurring in refrigeration cycles.

This MS specifies the requirements for safety of persons and property, handling requirement for certified personnel, provides guidance for the protection of the environment, establishes procedures for the design and construction (including retrofitting), installation, operation, maintenance, and repair of refrigerating systems and the recovery of flammable refrigerants. However, this is a consensus technical document that specifies the minimum requirements of quality and safety for voluntary use by the public. The MS becomes mandatory when a regulatory agency enforces its use through the relevant Act and Regulations.

Table 2.1 Regulatory Requirements and Action Items for Project Compliance

No.	Act and Regulation	Description	Relevant Authority	Relevance and Action Required
1	Industrial Coordination Act (ICA) 1975	This Act regulates industrial development in Malaysia, including the issuance of manufacturing licenses for companies with shareholders' funds of RM2.5 million or more, or engaging 75 or more full-time paid employees. Manufacturing licenses are issued without the need for renewal.	Malaysian Investment Development Authority (MIDA)	*Requirement has been fulfilled.* PROTON obtained the required manufacturing license on 30 March 2021 for the manufacture and assembly of Energy Efficient Vehicle (EEV) and Its Component.
2	Local Government Act 1976	The Act empowers local authorities to govern and regulate various aspects of local administration, including the issuance of business licenses.	Local Authority	*Annual renewal required.* PROTON has obtained a business license valid until 17 March 2026 from Majlis Daerah Tanjong Malim. The license must be renewed before this date.
3	Fire Services Act 1988 • Fire Services (Fire Certificate) (Amendment) Regulations 2020 • Fire Services (Designated Premises) (Amendment) Order 2020	This Act mandates fire safety measures and requires a Fire Certificate for designated premises as stipulated in the Fire Services (Designated Premises) (Amendment) Order 2020. The Fire Certificate ensures proper maintenance and adequate working conditions of fire safety systems in a building.	Fire and Rescue Department Malaysia (BOMBA)	*Annual renewal required.* PROTON's current Fire Certificate is valid from 11 September 2023 to 10 September 2024. PROTON must renew the certificate annually and submit an updated fire safety plan for the project.
4	Occupational Safety and Health Act (OSHA) 1994 • Occupational Safety and Health (Use and Standards of Exposure of Chemicals Hazardous to Health) Regulations 2000 • Occupational Safety and Health (Noise Exposure) Regulations 2019	The Act ensures safety, health, and welfare of workers in various industries. The USECHH includes requirements for Chemical Health Risk Assessment (CHRA) every 5 years, to identify and mitigate potential health risks. Audiometric testing is required annually under the Noise Exposure regulations to monitor employees' hearing health.	Department of Occupational Safety and Health (DOSH)	*Annual audiometric testing is required and the next renewal for CHRA is due in 2026.* PROTON conducted its last CHRA in 2021, while the most recent audiometric testing was performed on 21 March 2024.

No.	Act and Regulation	Description	Relevant Authority	Relevance and Action Required
5	Environmental Quality Act (EQA) 1974 • Environmental Quality (Prescribed Activities) (Environmental Impact Assessment) Order 2015 • Environmental Quality (Refrigerant Management) Regulations 2020 • Environmental Quality (Clean Air) Regulations 2014 • Environmental Quality (Industrial Effluent) Regulations 2009 • Environmental Quality (Sewage) Regulations 2009 • Environmental Quality (Scheduled Waste) Regulations 2005	This Act regulates environmental pollution and management, encompassing those pertaining to environmental impact assessments (EIA), refrigerant management, air quality, industrial effluents, sewage, and scheduled waste.	Department of Environment (DOE)	*Maintain current monitoring and reporting.* The subproject is not subject to an EIA as the manufacturing activity is none of those listed as prescribed activity in First and Second Schedule of the EIA Order 2015. PROTON must continue periodic monitoring and reporting of scheduled waste in the e-SWIS system and industrial effluent discharge quality in the Online Environmental Reporting system.
6	Factories and Machinery Act (FMA) 1967	The Act ensures safety, health, and welfare of workers at the workplace and governs the operation of factories and machinery. It mandates the registration and inspection of certain machinery such as lifts, escalators, dumbwaiters, sandblasting machines, hoisting machines, petroleum pipelines and storage facilities, unfired pressure vessels and steam boilers to ensure compliance with safety regulations.	Department of Occupational Safety and Health (DOSH)	*No further action required.* The subproject does not involve installation of machinery that requires registration and approval under the FMA.
7	Electricity Supply Act 1990 • Non-Domestic Electrical Installation Safety Code (NDEISC)	This Act regulates the electricity supply industry, including the supply of electricity at reasonable prices, the licensing, registration and control of any electrical installation,	Energy Commission (ST)	*Annual renewal required.* PROTON's Certificate of Registration for electrical installations is valid until

No.	Act and Regulation	Description	Relevant Authority	Relevance and Action Required
		plant and equipment with respect to matters relating to the safety of persons and the efficient use of electricity.		6 April 2025. The certificate must be renewed through the Energy Commission Online System (ECOS) before it expires.
8	Solid Waste and Public Cleansing Management Act 2007	This Act regulates the management of controlled solid waste and public cleansing for the purpose of maintaining proper sanitation and environmental health.	Local Authority	*Requirement has been fulfilled.* A licensed solid waste contractor has been appointed in consultation with Majlis Daerah Tanjong Malim for solid waste collection, transport, and disposal.
9	Street, Drainage and Building Act 1974 • Uniform Building By-Laws (UBBL) 1984	This Act regulates street, drainage, and building activities in local authority areas in Peninsular Malaysia to ensure proper maintenance and safety. A Certificate of Completion and Compliance (CCC) (or previously known as Certificate of Fitness for Occupation (CFO) prior to 2007) is required before occupying a building.	Local Authority – Building Department	*Notification required for future renovations.* PROTON had obtained a CCC on 28 May 2019 for the current premises. For any future building renovation or changes associated with the project, PROTON must notify the Building Department at Majlis Daerah Tanjong Malim.

2.3 INTERNATIONAL GUIDELINES AND POLICIES

2.3.1 Regulations Concerning Flammable Substances

There is a broad range of means by which countries legislate (or not) the handling of flammable substances and associated equipment. Several countries and regions have adopted framework legislation that governs situations that involve the potential release of flammable gases (and dusts).

In Europe there are two sets of legislation: the European directive on equipment and protective systems intended for use in potentially Explosive Atmospheres ("ATEX equipment") and the European directive on the safety and health protection of workers potentially at risk from explosive atmospheres ("ATEX workplace"). The ATEX equipment directive applies to equipment that is to be used in potentially flammable atmospheres and installations that may come into contact with flammable atmospheres. It requires that a flammability risk assessment is carried out and necessitates reduction of the amount of flammable materials, minimization of likelihood of releases, application of measures (such as ventilation) to eliminate potentially flammable atmospheres, avoidance of potential sources of ignition and, where necessary, features to lessen the severity of consequences in the event of ignition. It does not impose any practical constraints such as limits on the quantity of flammable substances or situations where it can be used. The ATEX workplace directive follows a similar risk-based approach, but in addition requires that personnel handling flammable substances have been provided with the requisite training and suitable equipment. Notwithstanding this the regulatory framework and reliance on established codes such as NFPA and UL codes provide a similar safety objective to other Western countries.

US Environmental Protection Agency (EPA) through its Significant New Alternatives Policy (SNAP) program - Final Rule 16 has listed HFO-1234yf as acceptable, subject to use conditions, in new light-duty (LD) passenger cars and trucks. The use conditions for the listing, which intended to mitigate flammability and toxicity risks, require that MAC systems designed to use HFO-1234yf meet the requirements of three technical safety standards developed by SAE International (SAE) (i.e. SAE J639, SAE J1739, and SAE J2844).

- SAE J639 - Safety and Design Standards for Motor Vehicle Refrigerant Vapor Compression Systems
- SAE J1739 – Potential Failure Mode and Effects Analysis (FMEA) including Design FMEA, Supplemental FMEA-MSR, and Process FMEA
- SAE J2844 – R-1234yf (HFO-1234yf) New Refrigerant Purity and Container Requirements for Use in Mobile Air Conditioning Systems

2.3.2 Safety Standards for Flammable Substances in General Circumstances

Closely linked to the framework regulations concerning the safe application of flammable substances, are a series of international standards, which have been adopted nationally by most countries and invoked by those national regulations. These standards are primarily those within the IEC 60079 and ISO/IEC 80079 series. Among these standards are the following:

- IEC 60079-20-1 on classification and properties of flammable substances;

- IEC 60079-10-1 on area classification (zoning) of potentially flammable atmospheres;
- IEC 60079-29 series on gas sensors and detection systems for flammable gas;
- IEC 60079-0,-1,-2,-5,-6,-7,-15,-18,-26,-32,-33,-39 (etc.) on protection of electrical or other types of equipment for use within potentially flammable areas;
- IEC 60079-14 on design, selection and erection of electrical installations for use in potentially flammable atmospheres;
- ISO/IEC 80079-36,-37 and -38 on non-electrical equipment for use within potentially flammable atmospheres;
- IEC 60079-19 on repair, overhaul and reclamation of equipment used in potentially flammable atmospheres.

Although these are often overlooked when applying flammable refrigerants, since they are closely linked to many countries' safety regulations it is critical that they be considered. As a result of the general application requirements these standards are also applicable to buildings in many countries.

2.3.3 Regulations and Safety Standards for Automotive Industry

In the ever-evolving landscape of automotive regulations and safety standards, significant strides have been made to enhance road vehicle safety, environmental performance, and facilitate international trade through initiatives such as the World Forum for Harmonization of Vehicle Regulations (WP.29) and the ASEAN New Car Assessment Program (NCAP). However, amidst these commendable efforts, a notable gap emerges concerning the safety specifications for refrigerants utilized in mobile air conditioning systems installed within vehicles. While WP.29 and ASEAN NCAP predominantly focus on vehicle safety and performance criteria, they do not directly address the safety requirements or specifications for these refrigerants. This gap is particularly pertinent given the potential hazards associated with certain refrigerant types, including flammability or toxicity risks in the event of leakage during accidents, posing a safety threat to vehicle occupants.

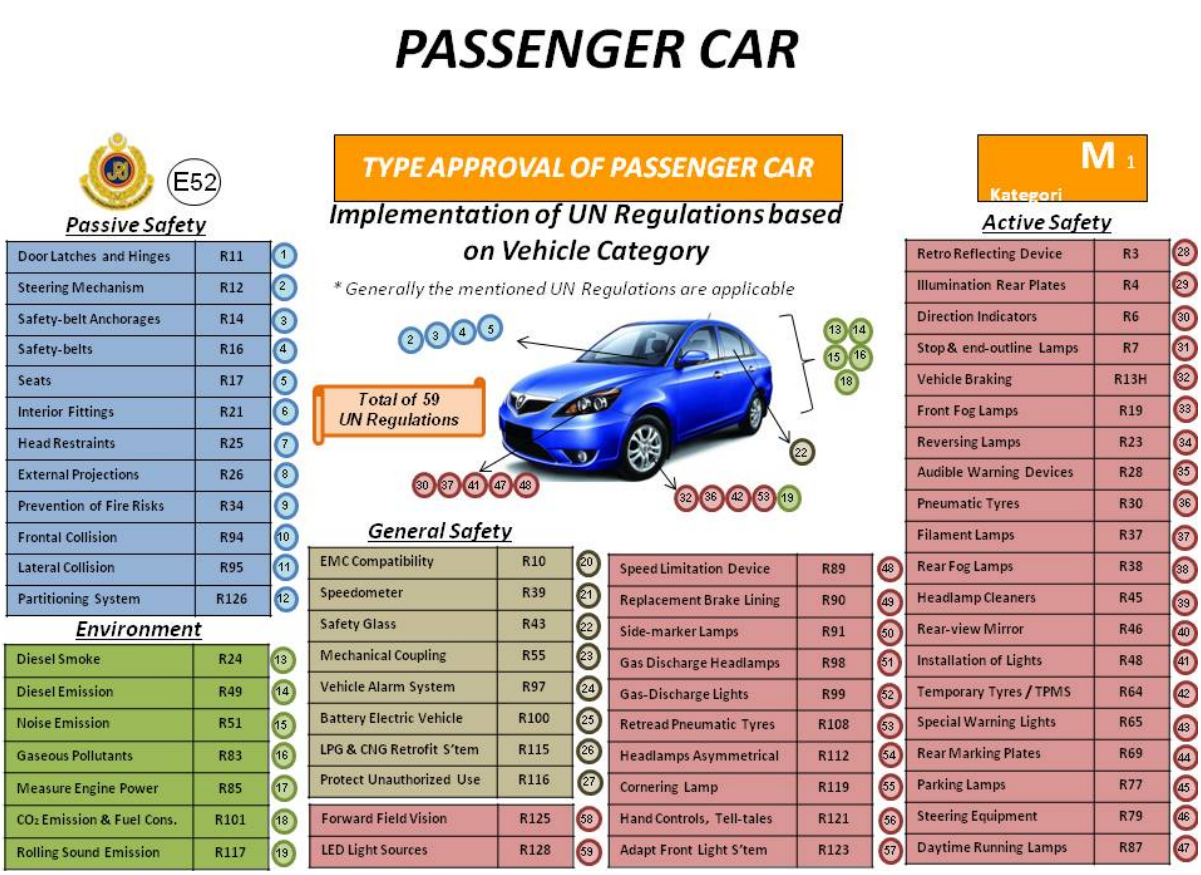
World Forum for Harmonization of Vehicle Regulations (WP.29)

The World Forum for Harmonization of Vehicle Regulations (WP.29) was created in 1952 as a permanent working party consisting of experts on technical requirements of vehicles. It serves as a platform for a global forum allowing open discussions on motor vehicle regulations. Three international agreements on motor vehicles are administered by the WP.29; the 1958 Agreement and the 1998 Agreement on the construction of vehicles, and the 1997 Agreement on periodic technical inspections. The objectives of the agreements are to increase road vehicle safety, vehicle environmental performance and facilitate vehicles trade.

Since 4 April 2006, Malaysia has acceded to the 1958 Agreement (UN Vehicle Regulations) and the 1998 Agreement (UN Global Technical Regulations) as a Contracting Party. The Ministry of Transport (MOT) Malaysia has been appointed as the responsible government agency in coordinating and participating in WP.29 activities in Malaysia. Malaysia has incorporated the relevant UN Regulations into Road Transport Act 1987 and Environmental Quality Act 1974. Before a new vehicle can be road registered in Malaysia, it must first pass a vehicle type approval (VTA) process, which is conducted by the road transport department's (JPJ) automotive engineering division. The purpose of the VTA is to ensure a vehicle's

construction, usage and specifications are compliant with standards determined by the Road Transport Act 1987 which incorporated the relevant UN Regulations.

Malaysia is one of 64 countries participating in the WP.29, with other countries all signed to the multilateral 1958 Agreement (with differing effective dates) that permits participation. Any country that is part of the 1958 Agreement has the authority to test and approve any manufacturer's design of a regulated product, regardless of the country in which that vehicle's component was produced. Components that are type-approved according to the set technical guidelines are marked with an E and a number (i.e. E1) within a circle. This e-marking differs depending on the country the component originated from, for Malaysia it is assigned E52. In some instances, there are additional descriptors to indicate the precise version of the regulation met and type approval number.
Also differing from country to country is the number of UN Regulations being enforced. Malaysia has gazetted a total of 114 UNRs under the Vehicle Type Approval (VTA) procedure from 152 regulations issued by the United Nations (UN). Figure below shows the Type Approval for Passenger Car:



Source: Road Transport Department Malaysia, 2024

ASEAN New Car Assessment Program (NCAP)

The ASEAN NCAP was established in December 2011 through a joint effort by Global NCAP and Malaysian Institute of Road Safety Research (MIROS). Its primary objectives are to improve motor vehicle safety standards, build a market for safer vehicles and raise consumer awareness. Since its launch, ASEAN NCAP has carried out a number of crash tests on new cars entering the Southeast Asian region to ensure safe design standards in crashworthiness

and crash compatibility for various brands and models before awarding them with the appropriate safety star rating. In the past 10 years, ASEAN NCAP has tested cars which cover almost 90% of the passenger cars sold in the Southeast Asian market. More than 100 ratings have been produced, and three road maps have been introduced since ASEAN NCAP was first launched.

The first roadmap from 2012-2016 included two domains of assessment for vehicle occupants: the Adult Occupant Protection (AOP) and Child Occupant Protection (COP) domains. The second roadmap for 2017-2020 saw the addition of a third domain, Safety Assist Technologies (SATs). In doing so, it sought to ensure a car would be able to avoid a collision with other vehicles, especially motorcycles. ASEAN NCAP has continued this assessment in its third and current roadmap for 2021-2025, with the addition of a fourth domain of assessment: Motorcyclist Safety (MS). This domain concerns the provision of protection to vehicle occupants through technologies that could mitigate injuries and avoid collisions with motorcyclists and other vulnerable road users.

Due to ASEAN NCAP's efforts, the safety aspects of passenger vehicles in Southeast Asia have seen tremendous improvements compared to the past decades. As of August 2021, close to 90% of vehicles that ASEAN NCAP assessed had achieved a rating of 4-stars or above. To date, ASEAN NCAP had tested 28 brands, including all Japanese brands and 18 of the top 20 ASEAN brands (with the exception of Mercedes and Hino). ASEAN NCAP has successfully demonstrated the effectiveness of a consumer information program in encouraging the acceleration of vehicle safety in a region.

2.3.4 Safety Standards for HFO-1234yf Used in Mobile Air Conditioning

With the transition away from high-GWP refrigerants like HFC-134a, HFO-1234yf has emerged as a leading alternative in mobile air conditioning. However, its mildly flammable nature demands stricter safety considerations. The following lists some of the essential safety standards associated with use of HFO-1234yf in mobile air conditioning systems which covers the system design and components as well as service and handling.

- ISO 13043 Road vehicles – Refrigerant systems used in mobile air conditioning systems (MAC) – Safety requirements.
- SAE J639 - Safety and Design Standards for Motor Vehicle Refrigerant Vapor Compression Systems
- SAE J2773 – Standard for Refrigerant Risk Analysis for Mobile Air Conditioning Systems
- SAE J1739 – Potential Failure Mode and Effects Analysis (FMEA) including Design FMEA, Supplemental FMEA-MSR, and Process FMEA
- SAE J2670 – Stability and Compatibility Criteria for Additives and Flushing Materials Intended for Use in R-134a (HFC-134a) and R-1234yf (HFO-1234yf) Vehicle Air-Conditioning Systems
- SAE J2842 – R-1234yf and R-744 Design Criteria and Certification for OEM Mobile Air Conditioning Evaporator and Service Replacements
- SAE J2843 – R-1234yf (HFO-1234yf) Recovery/Recycling/Recharging Equipment for Flammable Refrigerants for Mobile Air-Conditioning Systems

- SAE J2845 – R-12 (CFC-12), R-134a (HFC-134a), R-1234yf (HFO-1234yf), R-744, and R-152a (HFC-152a) Technician Training for Service and Containment of Refrigerants Used in Mobile A/C Systems
- SAE J2888 – R-1234yf Service Hose, Fittings and Couplers for Mobile Refrigerant Systems Service Equipment
- SAE J2844 – R-1234yf (HFO-1234yf) New Refrigerant Purity and Container Requirements for Use in Mobile Air Conditioning Systems
- SAE J2913 – R-1234yf (HFO-1234yf) Refrigerant Electronic Leak Detectors, Minimum Performance Criteria
- SAE J2099 – Standard of Purity for Recycled R-134a (HFC-134a) and R-12134yf (HFO-1234yf) for Use in Mobile Air Conditioning Systems
- SAE J2927 – Integrated R-1234yf Refrigerant Identifier for Recovery and Recycling Equipment Used in Mobile A/C System Servicing
- SAE J2912 – Performance Requirements for R-134a and R-1234yf Refrigerant Diagnostic Identifiers (RDI) for Use with Mobile Air Conditioning Systems
- SAE J3030 – Automotive Refrigerant Recovery/Recycling/Recharging Equipment Intended for Use with Both R-1234yf and R-134a
- SAE J2851 Recovery Equipment for Contaminated R-134a or R-1234yf Refrigerant from Mobile Automotive Air Conditioning Systems
- SAE J3094 – Test Procedure for Internal Heat Exchangers of Mobile Air-Conditioning Systems with R-134a or R-1234yf Refrigerant
- SAE J2297 – Ultraviolet Leak Detection: Stability and Compatibility Criteria of Fluorescent Refrigerant Leak Detection Dyes for Mobile R-134a and R-1234yf (HFO-1234yf) Air Conditioning Systems
- SAE J2219 – Mobile Air Conditioning Industry Criteria and Guidelines
- ASHRAE-15 Safety Standard for Refrigeration Systems

2.3.5 Specific Safety Provisions Regarding R-1234yf

The refrigerant HFO-1234yf is similar to, but not the same as HFC-134a. The primary difference between this refrigerant and HFC-134a is its flammability, and care must always be taken concerning this hazard. To become flammable in an enclosed area (such as a vehicle's cabin), the mixture of air and refrigerant must contain between 6.5% and 12.3% of the chemical vapor. Additionally, the mixture then requires a significant amount of energy to ignite – in some laboratory tests a spark similar to a direct shot at the battery did not ignite the mixture. Other tests showed that a typical static discharge will not have sufficient energy to ignite the refrigerant. It is difficult to ignite, but not impossible.

HFO-1234yf in a direct evaporation system has been shown to be comparable to HFC-134a with respect to cooling performance and equivalent CO2 emissions due to MAC systems with some system modifications and qualifies for use under EU and US regulations. HFO-1234yf systems are able to reach same system performance and fuel efficiency as HFC-134a system if they use either an internal heat exchanger (IHX) or a condenser in which the subcooling area is enlarged by about 10% while keeping the same total exchange area.

All major global car OEMs have concluded after extensive testing and analysis that HFO-1234yf can be used as a global replacement refrigerant to HFC-134a in mobile air conditioning

systems and it can be safely accommodated through established industry standards and practices for vehicle design, engineering, manufacturing, and service. Almost 100% of new passenger cars in Europe are using HFO-1234yf since 1 January 2017 while the US completed the transition to HFO-1234yf in light-duty vehicles starting with model year 2021.

R-134a is classified following GHS classifications as “Gas under pressure, Liquefied Gas” or referring to the UN recommendations on the transport of dangerous goods as “non-flammable, non-toxic gas”. R-1234yf is classified as “flammable gas, gas under pressure”. It is considered a hazardous substance. **Table 2.2** presents the hazards of these refrigerants.

Table 2.2 Hazard Classification of Refrigerants

	R-134a	R1234yf
Boiling Point	-26°C	-30°C
Safety Group	A1	A2L
GHS pictograms		
GHS Code / Hazard statement	Non-Flammable Gas	Flammable Gas

The main disadvantage discussed in connection with R-1234yf use is the risk based in its flammability (**Table 2.3**). HFO-1234yf is designated as an A2L refrigerant, meaning that it is flammable under prescribed testing conditions, however, it exhibits a lower burning velocity than other flammable refrigerants designated as A2 or A3 flammability refrigerants. This leads to the necessity for very careful handling and safety precautions.

Table 2.3 Flammability of R-1234yf

	R-1234yf	
Lower Explosion Limit (LEL)	6.5%	Ca. 72 g/m^3
Upper Explosion Limit (UEL)	12.3%	Ca. 135 g/m^3
Minimum ignition temperature	405°C	

Due to its flammability across a wide concentration range, safety precautions are crucial both for the products themselves and within manufacturing facilities. The risk assessments for these scenarios differ significantly. However, they share a common starting point: accidents require two essential conditions. Firstly, there must be a flammable mixture of gas and air, and secondly, there needs to be an ignition source with a certain energy level or temperature. Both conditions must be present for combustion to occur, highlighting the importance of preventing this combination. In the event of a leak of R-1234yf, if the right mixture of oxygen in the air is present (within the LEL and UEL), it can create an explosive atmosphere. This poses a risk as any source of heat or ignition could potentially ignite a fire. Therefore, the primary risk arises when R-1234yf leaks or is exposed to oxygen in the air, leading to the formation of the correct mixture.

Safety provisions regarding R-1234yf typically include stringent protocols for handling, storage, and usage due to their mildly flammable nature. Some of the key provisions are:

a) Storage: Flammable refrigerants like R-1234yf should be stored in designated areas away from potential ignition sources such as electrical equipment, open flames, or sparks. Adequate ventilation and proper containment measures are essential to prevent leaks and minimize the risk of fire or explosion.
b) Handling: Workers should receive comprehensive training on the safe handling of flammable refrigerants, including proper techniques for transferring, charging, and recovering. PPE such as flame-resistant clothing, gloves, and safety goggles, should be worn during handling operations to minimize the risk of exposure.
c) Leak Detection: Regular leak detection and maintenance procedures should be implemented to promptly identify and address any leaks. Leak detection systems, such as electronic sensors or manual inspection, should be in place to ensure early detection and mitigation of leaks.
d) Fire Safety: Fire suppression systems, such as automatic sprinklers or fire extinguishers, should be installed in areas where flammable refrigerants are stored or used. Emergency response procedures should be established, including evacuation plans and training for employees on responding to fire incidents involving flammable refrigerants.
e) Training and Awareness: Ongoing training and awareness programs should be conducted to educate employees about the hazards associated with flammable refrigerants and the necessary safety precautions to mitigate risks. This includes proper emergency response procedures and the importance of adhering to safety protocols at all times.

2.4 APPLICABILITY OF WORLD BANK ENVIRONMENTAL AND SOCIAL STANDARDS

The World Bank has defined specific ESSs, provided in ESF, which are designed to avoid, minimize, reduce, or mitigate the adverse environmental and social risks and impacts of projects. These standards apply to projects supported through Investment Project Financing. A summary of the applicable ESSs and WB policies and their relevance to the proposed subproject are provided in **Table 2.4** below.

Table 2.4 Relevant Environmental and Social Standards

Environmental and Social Standard	Description	Relevance and Management
ESS1: Assessment and Management of Environmental and Social Risks and Impacts	ESS1 establishes responsibilities for assessing, managing and monitoring environmental and social risks and impacts associated with each stage of a project supported by the Bank through Investment Project Financing, in order to achieve environmental and social outcomes consistent with the Environmental and Social Standards (ESSs).	***Relevant*** Key adverse risks and impacts from the Project activities are associated with investment support under Component 1. The risks and impacts from the Project activities stem from conversion to alternative technologies that would involve the use of low or lower GWP substances with higher flammability in the range of mildly flammable to highly flammable. This may increase fire and exposure risks

Environmental and Social Standard	Description	Relevance and Management
		and occupational health and safety (OHS) risks during installation/conversion of production line/s and the operation and maintenance (O&M) phase. Most of the above-stated risks and impacts are anticipated at the implementation/operational phase and are temporary, site-specific, reversible and manageable by adopting simple mitigation measures provided in this ESMP. This ESMP has been prepared to identify risks and related mitigations considering ESS1 requirements.
ESS2: Labor and Working Conditions	This standard recognizes the importance of employment creation and income generation in the pursuit of poverty reduction and inclusive economic growth. Borrowers can promote sound worker-management relationships and enhance the development benefits of a project by treating workers in the project fairly and providing safe and healthy working conditions. ESS2 applies to project workers including fulltime, part-time, temporary, seasonal and migrant workers.	***Relevant*** The Project will include direct, contracted, and primary supply workers mainly associated with DOE and subproject enterprises. The key risks and impacts from the Project activities are related to fire and OHS risks exposure under Component 1 to the workers. For the commercial refrigeration subsector, conversion from non-flammable refrigerants (HFC-134a and R-404A) to hydrocarbons (R-290) technology is flammable/ highly flammable in two (2) enterprises, could increase fire and OHS risks of the subproject sites. Similarly, piloting conversion in MAC installation that will replace non-flammable refrigerant (HFC-134a) to mildly flammable alternative (HFO-1234yf) will increase fire and OHS risks. Labor Management Procedure (LMP) will need to be prepared. A labor-specific Grievance Redress Mechanism (GRM) will be developed and operationalized as per guidance of ESS2 and will be a part of the LMP.
ESS3: Resource Efficiency and Pollution Prevention	This standard recognizes that economic activity and urbanization often generate pollution to air, water, and land, and consume finite resources that may threaten people, eco-system services and the	***Relevant*** The potential impacts related to resource efficiency and pollution prevention and management are identified in the activities under Project Component 1. The Project is expected

Environmental and Social Standard	Description	Relevance and Management
	environment at the local, regional, and global levels. The current and projected atmospheric concentration of greenhouse gases (GHG) threatens the welfare of current and future generations. At the same time, more efficient and effective resource use, pollution prevention and GHG emission avoidance, and mitigation technologies and practices have become more accessible and achievable.	to use a small amount of resources and materials for the installation of new conversion lines. Risks and impacts relevant to the requirements of ESS3 have been identified including the release of pollutants, management of non-hazardous and hazardous wastes, and resource use efficiency. Technician training programs to enhance skills in HFC management and servicing practices, and other resources and waste management will be included in the project. Accordingly, these mitigation measures have been included in this ESMP.
ESS4: Community Health and Safety	This standard recognizes that project activities, equipment, and infrastructure can increase community exposure to risks and impacts. In addition, communities that are already subjected to impacts from climate change may also experience an acceleration or intensification of impacts due to project activities.	***Relevant*** The Project will support the conversion to alternative technology at two (2) manufacturers of refrigerated display cabinets and freezers in the subproject for commercial refrigeration and in a pilot subproject on converting MAC units that are installed for one car model. Safe handling of refrigerants and equipment during maintenance and repair would be required given the increasing likelihood that equipment on the market will be charged with flammable substitutes. To mitigate such risks, mitigation measures have been included in this ESMP, along with an effective and accessible GRM.
ESS5: Land Acquisition, Restrictions on Land Use and Involuntary Resettlement	This standard recognizes that project-related land acquisition and restrictions on land use can have adverse impacts on communities and persons. Project-related land acquisition or restrictions on land use may cause physical displacement (relocation, loss of residential land or loss of shelter), economic displacement (loss of land, assets or access to assets, leading to loss of income sources or other means of livelihood), or both. The term "involuntary resettlement" refers to	***Not Currently Relevant*** The conversion process and technical support will be conducted within the premises/sites of the individual commercial refrigeration manufacturers and car manufacturing plant. No land acquisition will be required under the Project.

Environmental and Social Standard	Description	Relevance and Management
	these impacts. Resettlement is considered involuntary when affected persons or communities do not have the right to refuse land acquisition or restrictions on land use that result in displacement.	
ESS6: Biodiversity Conservation and Sustainable Management of Living Natural Resources	This standard recognizes that protecting and conserving biodiversity and sustainably managing living natural resources are fundamental to sustainable development. Biodiversity is defined as the variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are a part; this includes diversity within species, between species, and of ecosystems. Biodiversity often underpins ecosystem services valued by humans. Impacts on biodiversity can therefore often adversely affect the delivery of ecosystem services.	***Not Currently Relevant*** The Project activities will be carried out in existing manufacturing facilities located within established industrial parks distanced away from sensitive receptors. Adverse impact on biodiversity or living natural resources is not anticipated.
ESS7: Indigenous Peoples/ Sub-saharan African Historically Underserved Traditional Local Communities	This standard applies to a distinct social and cultural group identified in accordance with paragraphs 8 and 9 of this ESS. The terminology used for such groups varies from country to country, and often reflects national considerations. ESS7 uses the term "Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities," recognizing that groups identified under paragraphs 8 and 9 may be referred to in different countries by different terms. Such terms include "Sub-Saharan African historically underserved traditional local communities," "indigenous ethnic minorities," "aboriginals," "hill tribes," "vulnerable and marginalized groups," "minority nationalities," "scheduled tribes," "first nations" or "tribal groups." ESS7 applies to all such groups, providing they meet the criteria set out in paragraphs 8 and 9. For the purposes of this ESS, the term "Indigenous Peoples/Sub-Saharan	***Not Currently Relevant*** The Project activities will be carried out in existing manufacturing facilities located within established industrial parks distanced away from sensitive receptors. Adverse impact on indigenous peoples is not anticipated.

Environmental and Social Standard	Description	Relevance and Management
	African Historically Underserved Traditional Local Communities" includes all such alternative terminology.	
ESS8: Cultural Heritage	This standard recognizes that cultural heritage provides continuity in tangible and intangible forms between the past, present and future. People identify with cultural heritage as a reflection and expression of their constantly evolving values, beliefs, knowledge and traditions. Cultural heritage, in its many manifestations, is important as a source of valuable scientific and historical information, as an economic and social asset for development, and as an integral part of people's cultural identity and practice. ESS8 sets out measures designed to protect cultural heritage throughout the project life cycle.	***Not Currently Relevant*** The Project activities will be carried out in existing manufacturing facilities located within established industrial parks distanced away from sensitive receptors. Adverse impact on cultural heritage is not anticipated.
ESS9: Financial intermediaries	This standard recognizes that strong domestic capital and financial markets and access to finance are important for economic development, growth and poverty reduction. The Bank is committed to supporting sustainable financial sector development and enhancing the role of domestic capital and financial markets.	***Not Currently Relevant*** The Project does not engage financial intermediaries.
ESS10: Stakeholder Engagement and Information Disclosure	This standard recognizes the importance of open and transparent engagement between the Borrower and project stakeholders as an essential element of good international practice. Effective stakeholder engagement can improve the environmental and social sustainability of projects, enhance project acceptance, and make a significant contribution to successful project design and implementation.	***Relevant*** The DOE has done several rounds of consultation and information-sharing activities with selected industries, particularly those that will implement conversion for commercial refrigeration manufacturing and pilot conversion for car manufacturing lines. These consultation engagements have included site visits to the industries and technical presentations about the Project. DOE has also conducted inter-agency coordination and consultations in preparation for this Project. Stakeholder engagement is crucial throughout the Project lifecycle from Project preparation to the Project implementation.

Environmental and Social Standard	Description	Relevance and Management
		A separate Stakeholder Engagement Plan (SEP) for the overall KIP Stage I Project will be prepared which will focus on identification of and engagement with directly affected parties, other interested parties and vulnerable groups. Procedures for engaging with them, topics and frequencies are described in the document, as well as institutional requirements, grievance redress mechanisms and budgets.

3 ENTERPRISE BASELINE INFORMATION

3.1 ENTERPRISE PROFILE

Perusahaan Otomobil Nasional Sdn Bhd (hereinafter refer to as “PROTON”) is a Malaysian corporation active in automobile design, manufacturing, distribution and sales. PROTON was established in 1983 as the first nationally produced car company. In 2017, PROTON entered into a strategic partnership with China’s car manufacturer Geely holding a 49.9 percent stake in PROTON. This partnership enables PROTON to manufacture vehicles based on Geely’s designs starting with the PROTON X70, a new sport utility vehicle (SUV) model that first rolled off the assembly line in 2018.

Perusahaan Otomobil Nasional Sdn Bhd
Persiaran Kuala Selangor, Seksyen 26,
40400 Shah Alam,
Selangor, Malaysia.

[redacted]

PROTON has two manufacturing facilities, the first one was established in 1985 at Shah Alam, Selangor and the second one was established in 2003 at Tanjung Malim, Perak. PROTON currently has about 250 authorized service workshops located across Malaysia for servicing PROTON vehicles. Service workshops are equipped with vacuum pumps, leak detectors, and refrigerant charging machines for servicing installed mobile air conditioning (MAC) systems. PROTON also export their cars to Pakistan, Brunei Darussalam, Bangladesh, and Sri Lanka.

The PROTON Tanjung Malim plant currently has 90% male and 10% female staffs. **Table 3.1** details the percentage of male and female employees. At TF2, there are 99% male workers and 1% female worker. PROTON has recruited foreign professionals exclusively for management positions, drawing talent from various countries. [redacted] To ensure their comfort and well-being during their tenure, accommodation is provided. PROTON prioritizes job specifications and qualifications in its hiring process and does not specify any gender requirements. PROTON promotes equality, allowing anyone who is fit and suitable for a position to apply and work at PROTON.

Table 3.1 Total Workers in PROTON Tanjung Malim

Gender	Total Percentage
Female	10%
Male	90%
Total	100%

3.2 LAND USE AND SENSITIVE RECEPTORS

PROTON Tanjung Malim plant is located in a 238.4-acre Proton City Industrial Park in Perak state located in the Northern region of Malaysia. **Figure 3.1** shows the location of the

PROTON Tanjung Malim plant. Proton City is a township with industrial, commercial and residential area spread over 4,000 acres in Muallim District, Perak, Malaysia. Most of the PROTON Tanjung Malim plant workforce resides within this area. Additionally, Proton City is home to students and staff of Universiti Pendidikan Sultan Idris (UPSI), with its campus occupying 800 acres within Proton City. The Proton City Industrial Park, which hosts a variety of medium and heavy automotive industries, is well-connected via the North-South Expressway and the Behrang-Tanjung Malim Highway.

The nearest residential area, Proton City Residential, is located 830 m east of the factory. Within a 2 km radius from the factory, educational institutions include Universiti Pendidikan Sultan Idris (UPSI) to the south, and Sekolah Kebangsaan Proton City and Sekolah Menengah Kebangsaan Proton City to the east. Beyond 2 km, there is the Taman Sekiah Makmur residential area to the northwest. Additionally, the National Institute of Land and Survey (INSTUN) is located approximately 2.4 km to the North.

Regarding the designated land use for where the factory is located and according to the Department of Town and Country Planning, PROTON Tanjung Malim plant is located in an industrial land use zone as shown in purple in **Figure 3.1**.

3.3 LAYOUT OF THE MANUFACTURING FACILITY

PROTON Tanjung Malim's existing manufacturing facility occupies a total land area of 1,200 acres (4,856,400 m^2), with around 10% of total built-up area. The total built-up area is as shown in **Figure 3.2** and table below:

No.	Building	Built-up Area
1	Environmental Management Centre (EMC)	0.5%
2	Engine and Transmission Machining (ETM) Shop	8.7%
3	Stamping Shop	7.5%
4	Body Shop – Body 1	6.9%
5	Painting Shop	18.8%
6	Trim and Final – TF 1	16.0%
7	Pilot Shop	0.3%
8	Energy Centre	1.9%
9	Wax Building	2.6%
10	Sport Complex	2.8%
11	Main Office	4.3%
12	Guard House	0.1%
13	BIW – Body 2	7.4%
14	Sub Assembly – body	5.6%
15	Trim and Final – TF 2	12.4%
16	Extension ETM Shop	0.5%
17	Extension Stamping Shop	3.8%
	TOTAL	**100%**

An existing Wastewater Treatment Plant (WWTP) and a dedicated scheduled waste storage is located in the Environmental Management Centre (EMC) as shown in **Figure 3.2**. PROTON

Tanjung Malim segregates hazardous wastes (scheduled wastes) from general wastes and disposes accordingly.

HFC-134a is delivered in a one-ton tank and kept in the storage room which is located along the outer wall of Trim and Final Assembly building. Four one-ton tanks are stored in the room at any given time, two tanks are connected via separate pipelines to TF1 and TF2 assembly lines while the remaining two tanks are on standby. HFC-134a is transferred via transfer pump located in the storage room.

3.3.1 Existing Baseline Equipment

PROTON Tanjung Malim has two Trim and Final Assembly lines: TF1 and TF2 for making different car models. The pilot project will be carried out on the TF2 assembly line. There are two multi-fluid filling machines – one on each side of the assembly line. This machine has a modular design where several filling modules can be installed, added, or replaced without changing the plant layout of the filling area. It allows the transfer of several fluids such as brake fluid, engine coolant, and refrigerant to a vehicle at the same time.

Additionally, there is another charging machine installed outside the TF2 assembly line (offline) in case an adjustment needs to be made if a vehicle's AC was not properly charged in the assembly line. The existing baseline equipment in the factory specifically at the TF2 charging station consists of those as listed in **Table 3.2**.

Table 3.2 Existing Production Equipment on TF2

Production line equipment	Type	Units	Year installed
Refrigerant Charging Module	HFC-134a	1	2018
Refrigerant Charging Module	HFC-134a	1	2018
Refrigerant Charging Module	HFC-134a	1	2018

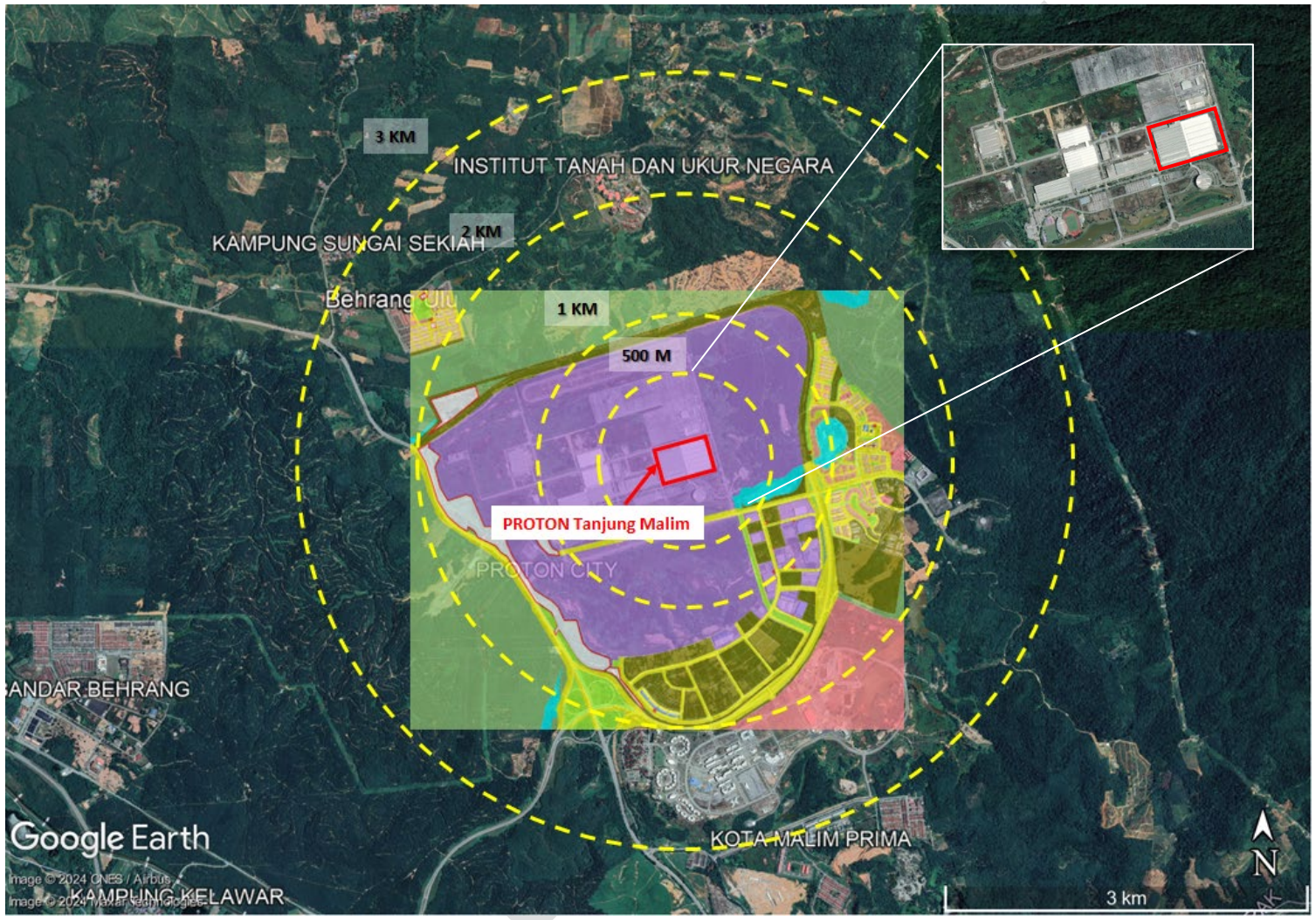
Note:

Equipment to be modified

3.3.2 Existing Vehicle Models

PROTON operates two manufacturing facilities, the first one was established in 1985 at Shah Alam, Selangor and the second one was established in 2003 at Tanjung Malim, Perak. Vehicle models produced by PROTON include Saga, Persona, Iriz, X50, X70, X90 and S70. [redacted]

PROTON has selected a suitable model to be redesigned and equipped with an HFO-1234yf MAC system. The refrigerant charges for every model range from 0.5-0.9 gram/unit.



N

Scale:
As shown

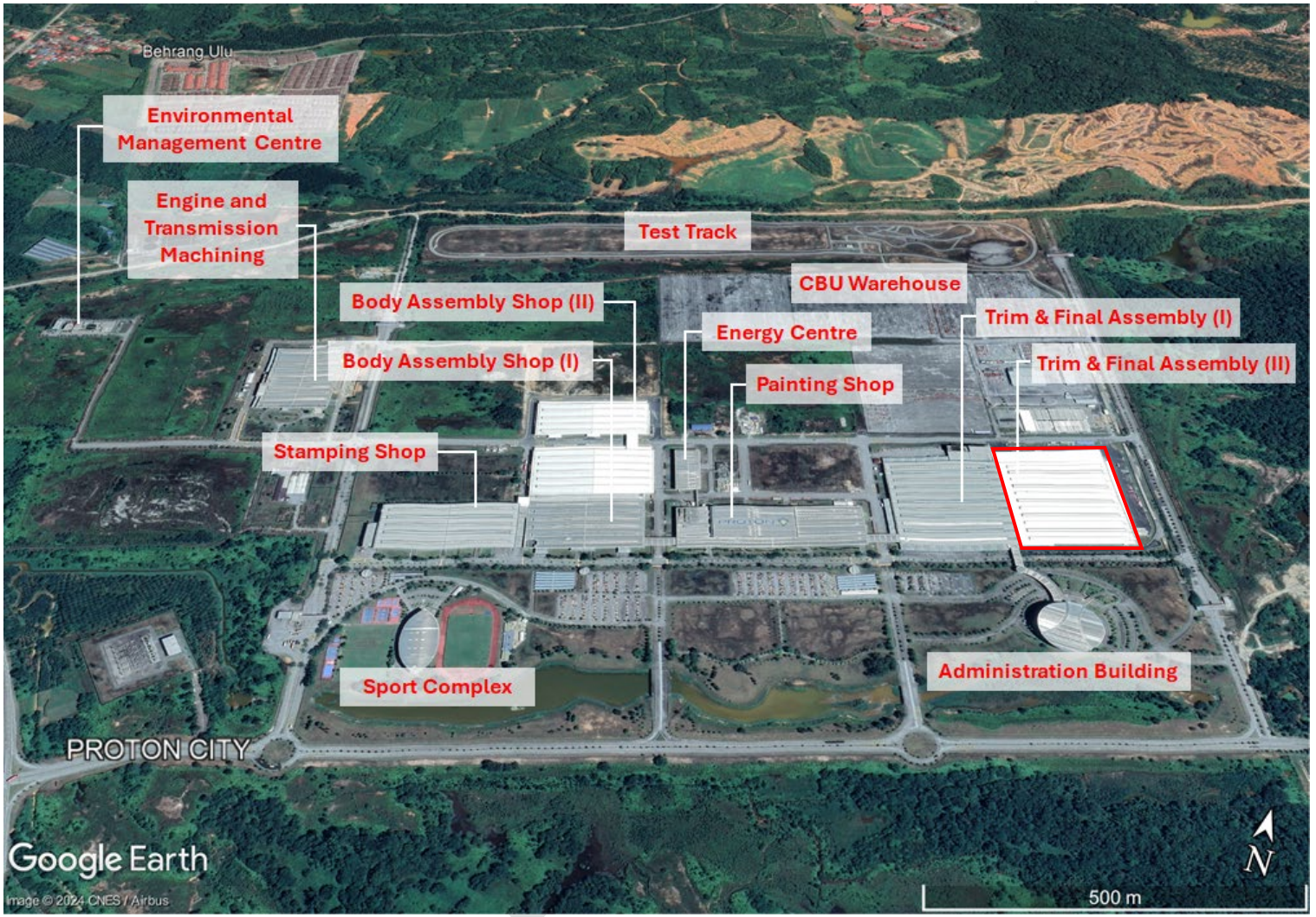
Legend:

	PROTON Tanjung Malim Trim and Final Assembly Area
	Existing industry
	Infrastructure and Utilities
	Open field and public recreation
	Agricultural
	Empty Land
	Commercial
	Waterbodies
	Residential
	Institution and public amenities

Data Source:
i) Google Earth, 2024
ii) iPLAN, 2023

Drawing No. & Title:
Figure 3.1 Land Use Map of PROTON Tanjung Malim

Revision:	0
Date:	2 Feb 2024



Scale:
As shown

Legend:

	Subproject Conversion Area – TF2

Data Source:
Google Earth, 2024

Drawing No. & Title:
Figure 3.2
PROTON
Tanjung Malim Plant Layout

Revision:	0
Date:	2 Feb 2024

3.4 MANUFACTURING PROCESS

The vehicle production and assembly at PROTON Tanjung Malim plant includes the following and is summarized in **Figure 3.3**.

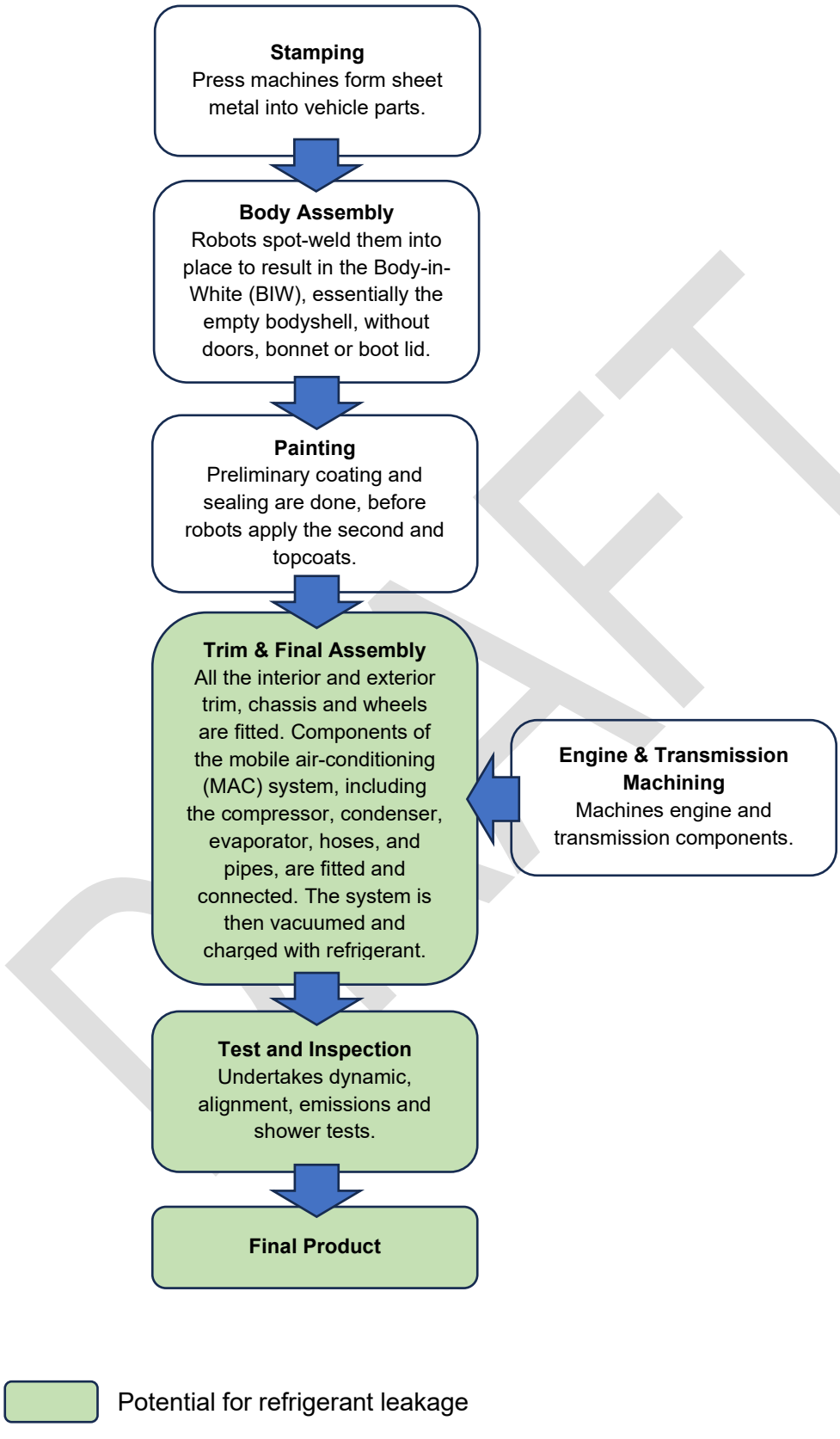
At the stamping section, press machines form sheet metal into vehicle parts. The moulded parts then go to Body Assembly, where robots spot-weld them into place to result in the Body-in-White (BIW), essentially the empty bodyshell, without doors, bonnet or boot lid. There are also roller hemming robots (joining inner and outer closure panels) and CO_2 welding robots. After the BIWs have gone through a layout machine inspection, they continue down the conveyor belt to Painting, where preliminary coating and sealing are done, before robots apply the second and topcoats.

The colored shells then arrive at Trim and Final Assembly, where all the interior and exterior trim, chassis and wheels are fitted. As each car moves along the production line in the Trim & Final Assembly building, workers install and connect each component of a mobile air-conditioning system (compressor, condenser, evaporator, hoses and pipes) and then vacuum and charge the MAC system with refrigerant. Leak tests are conducted at various stages, before, during and after charging. Before charging, a positive pressure leak test is performed by filling the system with nitrogen to ensure there are no leaks. During charging, a negative pressure leak test is conducted by vacuuming the system prior to charging. After charging, a leak detector is used to monitor and detect any potential leaks from the system.

A separate Tester Line undertakes dynamic, alignment, emissions and shower tests. The ETM shop machines engine and transmission components. The engine parts are sent to the Shah Alam plant to be assembled, before returning to Tanjung Malim for the fitment of the cylinder head assembly.

Following the conversion, the manufacturing process will **largely remain consistent with minor modifications**, as detailed in the subsequent section outlining changes need. The company will source a new refrigerant charging module from its supplier for R-1234yf refrigerants.

Figure 3.3 Manufacturing Process Flow



Source: PROTON, 2024

3.5 CHANGES NEED FOR PROPOSED CONVERSION

PROTON Tanjung Malim has two Trim and Assembly lines of which one will be modified to the use of R-1234yf refrigerants. Due to the mild flammability of R-1234yf, the existing charging module will be modified to add a new charging module for R-1234yf with necessary safety measures, to meet national and international safety standards.

The approved funding for this sub-project will finance incremental capital costs and incremental operating costs for the changes that are needed for the conversion to low GWP substances as summarized below:

Table 3.3 Changes Need for Conversion to Low GWP Alternative Gases

No.	Item	Required Modification
1	Model Redesign	Due to the mild flammability of HFO-1234yf, PROTON needs to adjust the placement of the compressor and condenser and reroute hose and pipe connections between MAC system components to avoid hot surfaces in the engine compartment. This will involve developing a new design in collaboration with MAC component suppliers.
2	Charging Lines	As part of the pilot project, PROTON will modify one of its two assembly lines to accommodate the use of HFO-1234yf for manufacturing one of the eight car models. This involves adding an HFO-1234yf charging module to the existing setup of three multi-fluid filling machines (two are on the TF2 assembly line and one offline). This modification will enable PROTON to charge HFO-1234yf to the redesigned model while continuing to charge HFC-134a for other models on the same assembly line.
3	Safety Measures	Safety measures will be installed in accordance with national requirements and as guided by the supplier of the charging units. The safety measures will include installation of ventilation in the R-1234yf charging areas, change of electrical installation identified as area where an explosive atmosphere might occur, ground of conveyor belt and steel structures and installations of gas sensors.
4	Storage Area	A new storage room is needed to house two HFO-1234yf one-ton tanks and will need an explosion proof transfer pump and new pipeline to connect with the three new HFO-1234yf charging modules in the selected assembly line. The current room is limited in size and cannot accommodate additional one-ton tanks. Furthermore, the new storage room will need to comply with Malaysian regulation related to storage of flammable substances. For this reason, the new storage room will be equipped with a ventilation system, and gas detection, alarm and safety system.
5	Trial Production	After completion of installation of the new charging units and safety measures, the production will start up. There will be an initial period where the workers will have to learn how to work with R-1234yf. This will require some training and might also take longer time to charge units. It is expected that the vehicle produced during the trials will be checked to ensure safety and will be sold.
6	Servicing Tools	Another component of the pilot project is to ensure that 25 out of PROTON's 250 authorized service workshops are equipped to service the new model with an R-1234yf MAC system. Each of these

No.	Item	Required Modification
		25 service workshops will receive the necessary tools (vacuum pump, charging machine, manifold gauges) to handle R-1234yf refrigerant. In addition, staff at these workshops will undergo training on servicing R-1234yf MAC systems.

3.6 DUE DILIGENCE REVIEW ON ENVIRONMENTAL, HEALTH AND SAFETY

A visit to the PROTON's manufacturing facility in Tanjung Malim was conducted on 18th of April 2024 aimed to assess the enterprise's operational practices, safety protocols, and environmental compliance. Several good practices can be observed at PROTON:

a) **Worker Welfare:** Provision of multiple breaks for workers ensures better productivity and health, demonstrating good labour practices. Anti-sexual harassment posters in the cafeteria underscore a commitment to maintaining a safe and respectful work environment. Good ventilation and lighting in the workplace ensure a comfortable and safe working environment.

b) **Safety Measures:** Daily monitoring and maintenance of gas storage areas, along with regular equipment leak tests, ensure high health and safety standard for workers and the surrounding environment. Comprehensive provision of Personal Protective Equipment (PPE), including safety boots, safety glasses, respirators, gloves, and more, with consistent use by workers and prominently displayed safety signs throughout the factory. Good housekeeping practices with wide walkways and neatly arranged equipment and materials, clear of obstructions.

c) **Regulatory Compliance:** PROTON exhibits a strong commitment to regulatory compliance by appointing competent person to oversee the wastewater treatment plant (WWTP) and manage scheduled waste respectively, in accordance with DOE requirement. The wastewater treatment plant (WWTP) has double the capacity compared to its current usage, ensuring it can handle future increases in sewage and wastewater. Treated water is recycled for landscaping and toilets, with excess water discharged safely, complying with Standard A limits stipulated in the Environmental Quality (Industrial Effluent) Regulations 2009. The enterprise diligently conducts monitoring and reporting activities to ensure the quality of treated sewage and wastewater and maintains accurate records of scheduled waste inventory. Additionally, PROTON holds ISO 14001 (Environmental Management) and ISO 45001 (Occupational Health and Safety Management) certifications, indicating proper environmental and OHS management system in place to ensure adherence to international standards for environmental and safety standards.

d) **Emergency Preparedness:** PROTON demonstrates preparedness for emergencies through a robust Emergency Preparedness and Response Plan, featuring designated assembly points and a system for notifying emergency incidents via 'WhatsApp'. Annual emergency drills ensure readiness, while regular assessments of evacuation protocols, such as assembly point adequacy and location suitability for production building workers, further enhance preparedness. Budget allocation for Environmental, Health and Safety (EHS) management, coupled with documented training plans, showcases proactive measures. Their emergency response procedures cover a range

of scenarios, including fire and explosion, gas leakage, chemical spillage, disease outbreak, electricity supply failure or power outage, structural collapse or landslide and medical emergency, flood etc. The comprehensive emergency response plan encompasses an Emergency Response Organization, key emergency contact list, and inventory of emergency facilities. Regular reviews of the Emergency Preparedness and Response Plan in every three years are vital for enhancing its efficacy.

e) **Environmental Initiatives:** In addition to recycling treated wastewater for internal plant usage, including landscaping and toilets, PROTON demonstrates its commitment to sustainability by installing solar panels on the roof of the CBU warehouse. These solar panels generate 12 GW of power for internal use, with surplus energy sold to the grid at TNB tariff rates. This initiative not only showcases environmental responsibility but also contributes to reducing the company's carbon footprint.

During the site visit at PROTON Tanjung Malim, no environmental or social concerns were observed. The company diligently adheres to ISO requirements and upholds stringent standards to ensure that proper management systems are consistently in place and fully compliant.

Some observations from the visit are shown below:

Gas Cylinder Storage Area
The Gas Cylinder Storage Area is located along the outer wall of Trim and Final Assembly building and securely houses four one-ton tanks of HFC-134a, accessible only to authorized personnel. Four one-ton tanks are stored in the room at any given time, two tanks are connected via separate pipelines to TF1 and TF2 assembly lines while the remaining two tanks are on standby. The storage area is equipped with a control panel, transfer pumps and pipelines for safe handling. Clear work instructions or procedures are displayed for operational guidance.
Refrigerant Charging Station – TF2
On the TF2 assembly line, two multi-fluid filling machines are installed, one on each side, enabling simultaneous transfer of various fluids like brake fluid, engine coolant, and refrigerant during vehicle assembly. The filling nozzles marked in orange are designated refrigerant filling nozzles. Prior to filling, equipment leak tests are conducted. Vehicles are positioned on raised platforms and conveyed along the assembly line. There is a proper work procedure for the refrigerant filling process. The entire multi-fluid filling process typically takes about 3 minutes, with coolant being the first to complete filling, followed by refrigerant, and lastly brake fluid. Workers are equipped with appropriate PPE such as earplugs and gloves while operating in this area. A portable leak detector is utilized to inspect for potential leaks at the testing and inspection area.
Environmental Management Centre (EMC)
PROTON ensure proper management and disposal of 20 types of scheduled waste (SW 102 – Lead Acid Battery, SW 109 – E-waste, SW 110 – E-waste, SW 204 – Wastewater Sludge, SW 305 – Waste Oil, SW 307 – Coolant Waste, SW 322 – Waste of Solvent, SW 409 – Empty Carboy, Drum, Pail, IBC Tank, SW 410 – Contaminated Rags, SW 416 – Paint Sludge, SW 417 – Waste of Paint, SW 421 – Coolant Sludge, SW 422 – Cast Iron Chips, Grinding Waste, Beta Sealant, White Sealant, SW 427 – Phosphate Sludge). The storage area is sheltered/roofed and equipped with spill kits, fire extinguisher, and emergency showers for safety measures.

In conclusion, the due diligence review of PROTON's manufacturing facility in Tanjung Malim highlights several commendable practices in environmental, health, and safety management. From strategic production planning to efficient waste management and renewable energy use, PROTON demonstrates a commitment to sustainability and responsible business practices. The emphasis on health and safety measures, including comprehensive provision of personal protective equipment and regular equipment maintenance, ensures a safe working environment for employees. Moreover, the proper management of scheduled waste and adherence to environmental regulations showcase PROTON's dedication to environmental stewardship. Overall, these practices reflect PROTON's commitment to excellence in operational efficiency, safety, and environmental sustainability.

3.7 EMERGENCY RESPONSE PLAN (ERP)

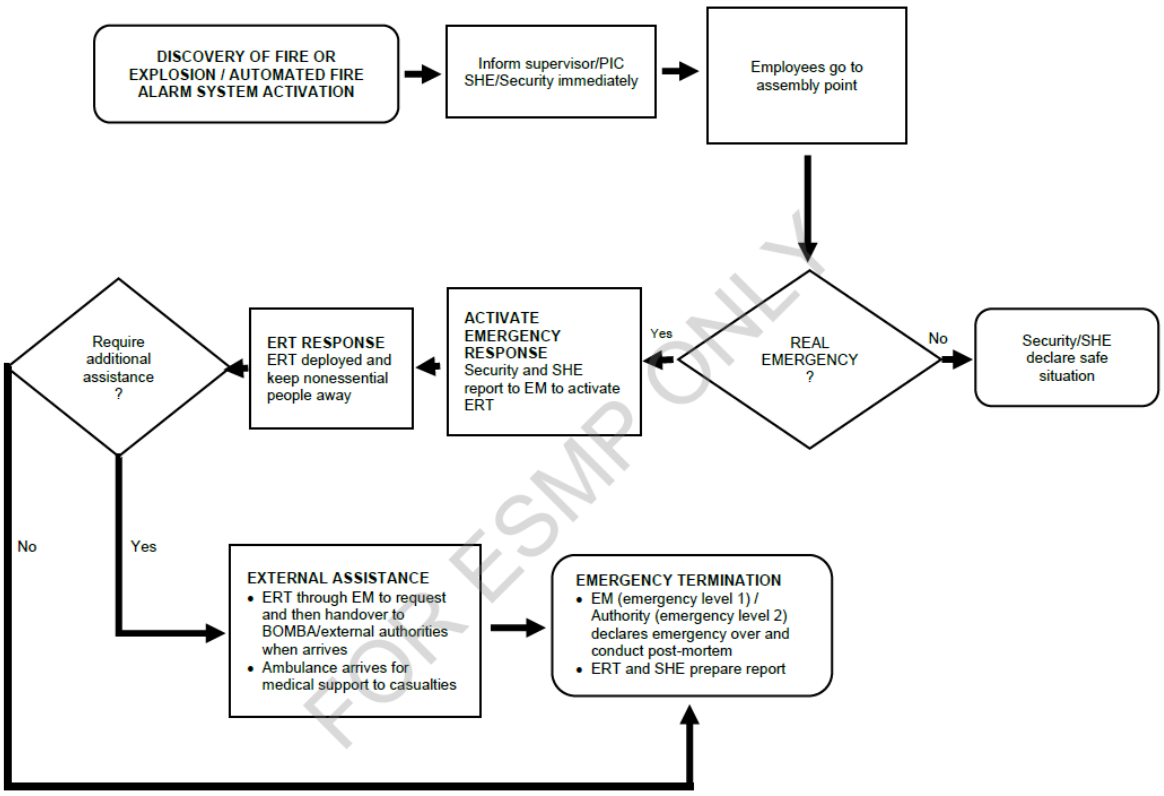
PROTON has developed a comprehensive Emergency Preparedness and Response document to address various potential emergencies within the factory premises, including fire & explosion, gas leakage, chemical spillage, WWTP failure, stack failure, disease outbreak, electricity supply failure/power outage, structural collapse/landslide & medical emergency, flood, bomb threat/suspected object response, and terrorism/car hijacking response. The emergency response procedures/flowchart for fire & explosion, gas leakage, and chemical spillage are shown in **Figure 3.4**.

Emergency facilities at PROTON Tanjung Malim plant include fire hose reels, fire monitors, sprinklers, first-aid kits, detectors for heat, smoke, and hydrocarbons, spill control kits, emergency showers, eyewash stations, portable fire extinguishers, gas suppression systems, fire and emergency response vehicles, ERT suits, breathing apparatuses, an in-house clinic, ambulance, lifebuoys, walkie-talkies, emergency staircases, and relief supplies. PROTON Tanjung Malim plant also has fourteen (14) assembly points designated across the facility for emergency situations.

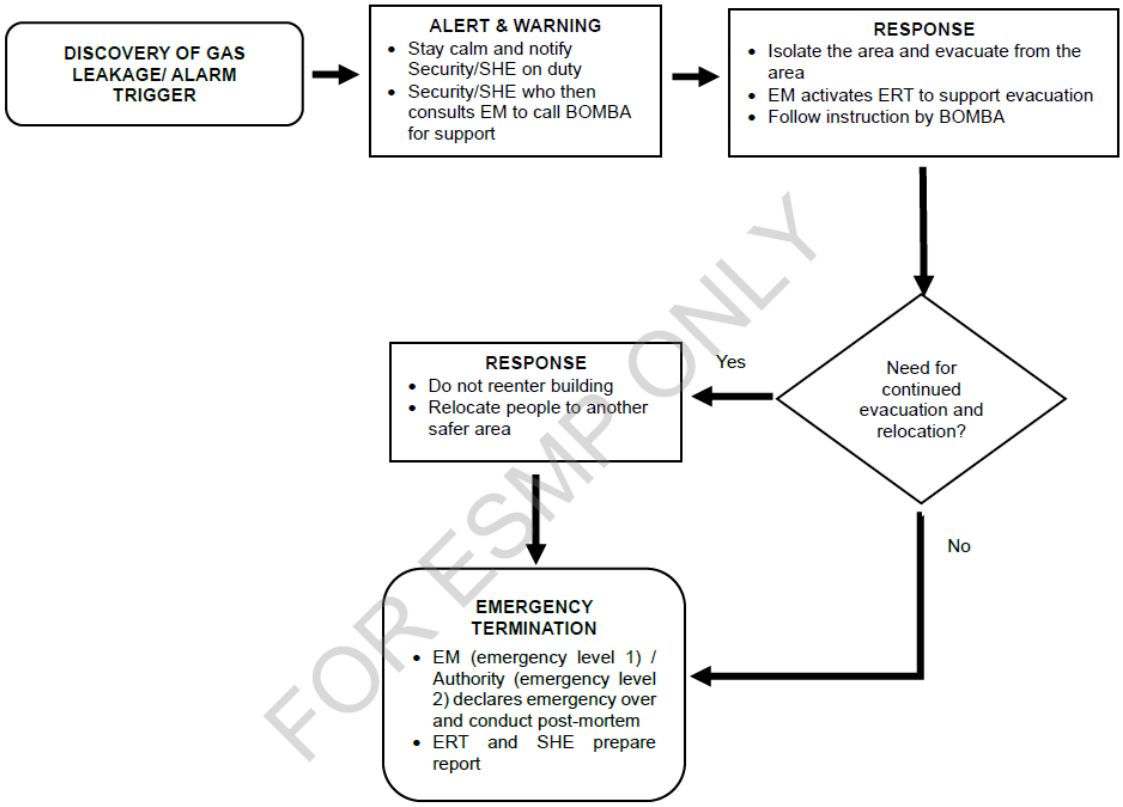
PROTON has established an Emergency Response Team (ERT) comprising skilled personnel trained to swiftly and effectively respond to various emergencies within the factory premises. Additionally, the ERT collaborates closely with relevant authorities and departments to mitigate risks and ensure prompt and coordinated response to emergencies. **Figure 3.5** depicts the organizational structure of the ERT.

Figure 3.4 PROTON Emergency Response Procedures

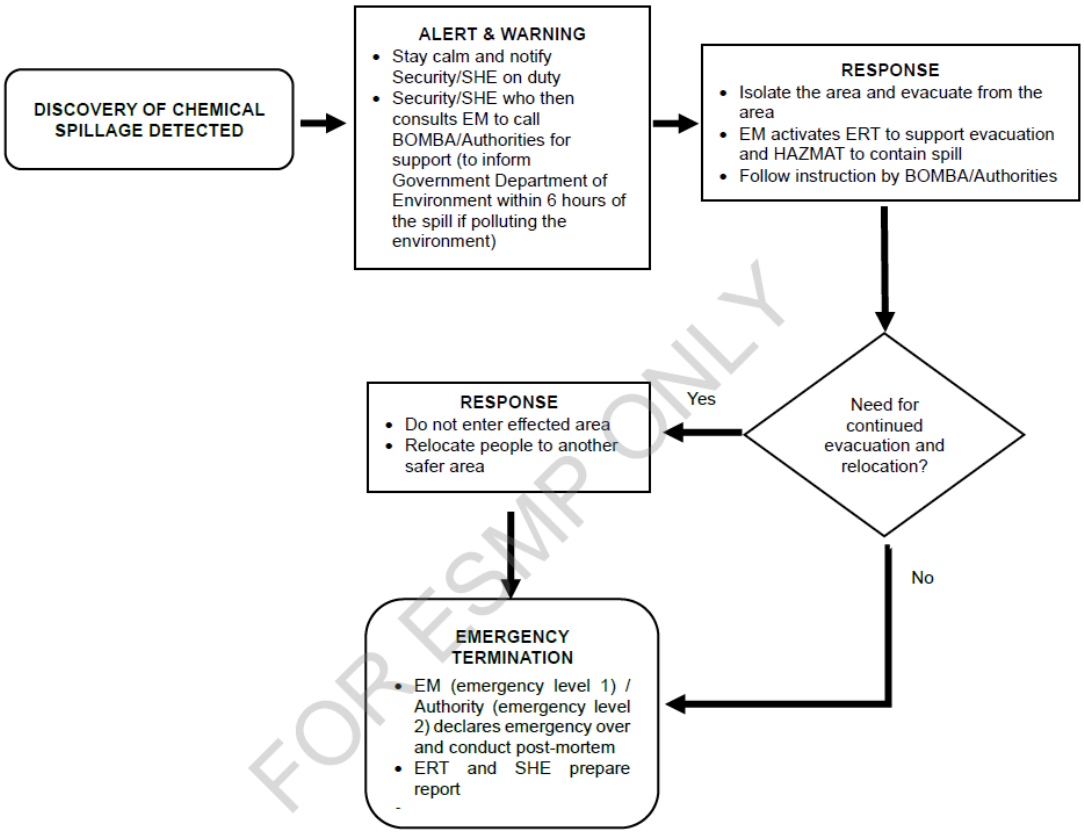
Fire & Explosion



Gas Leakage

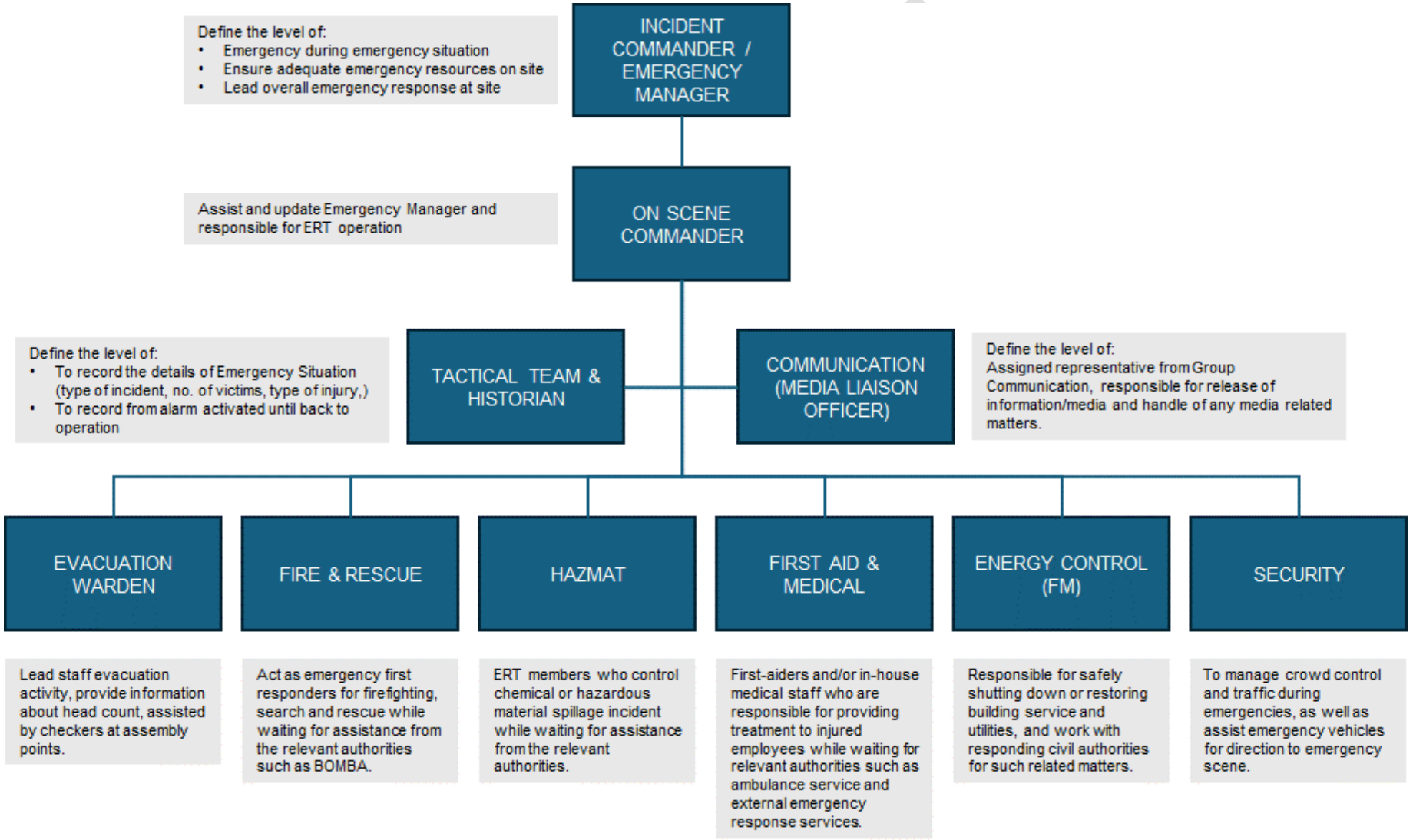


Chemical Spillage



Source: PROTON, 2024

Figure 3.5 PROTON Tanjung Malim Emergency Response Team

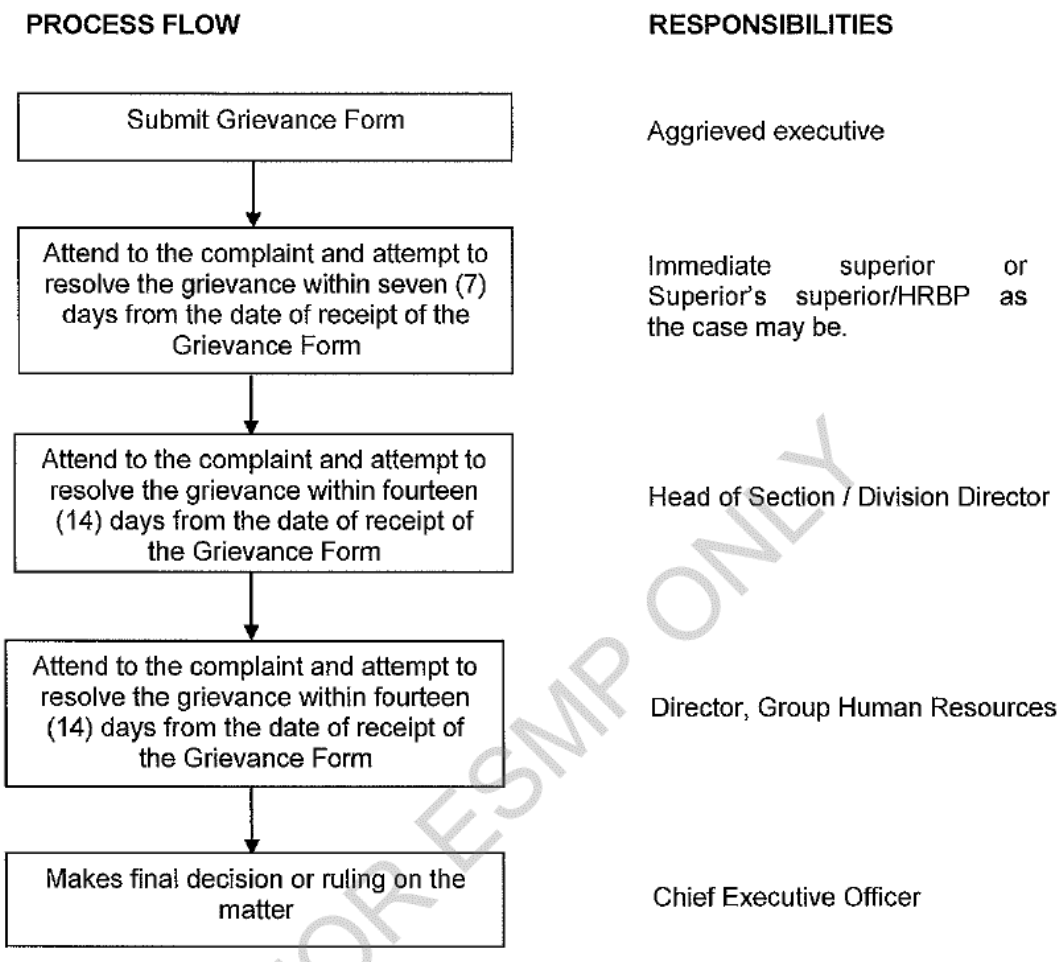


Source: PROTON, 2024

3.8 GRIEVANCE REDRESS MECHANISM (GRM)

PROTON upholds a systematic and consistent approach to managing grievances to ensure a harmonious working environment. Grievances shall be resolved amicably as fast as possible by the immediate superior at the lowest possible level. Wherever possible, grievances should be resolved through hierarchy, except if it is regarding the aggrieved executive's immediate superior. In such cases, he may raise the grievance either directly to his Head of Department or to Division Director or Director, Group Human Resources. Grievances are considered resolved when the solution offered by the aggrieved executives' superior or other authorized personnel is accepted by the complainant. If at any time the grievance is not referred to the next step by the aggrieved executive within the time period specified or if he fails to attend any meetings arranged in connection with the grievance, the grievance will be considered withdrawn, and he will be notified officially. In the event the grievance is referred to the Chief Executive Officer, the ruling or decision of the Chief Executive Officer is considered final. The company shall not penalize an employee who raises a grievance except in the case where a grievance is made with malicious intent. **Figure 3.6** presents PROTON's grievance redress process flow.

Figure 3.6 PROTON Grievance Redress Process Flow



Source: PROTON, 2024

4 ENVIRONMENTAL AND SOCIAL RISKS AND IMPACTS

This chapter provides a comprehensive overview of the potential consequences of PROTON's conversion subproject, focusing on both the construction and operation phases. Through a detailed examination of each potential impact, this chapter lays the groundwork for informed decision-making and effective mitigation strategies, ensuring sustainable practices and responsible project management throughout the project lifecycle.

4.1 SOCIAL RISK AND IMPACT

The social risks and impacts of PROTON's conversion subproject are considered minimal during both the construction and operation phases. This section outlines the anticipated social risks and impacts, emphasizing generally the positive effects of the project on the workforce and local community.

Construction Phase

During the construction phase, the social impact of PROTON's conversion subproject is minimal. Since the upgrade does not require expanding the factory premises, there are no concerns related to land acquisition or resettlement. The construction activities involve a small workforce and are expected to be completed in a short duration, thus minimizing any potential social disruptions.

Operation Phase

During the operation phase, the social impact remains positive due to the gradual elimination of HFCs in mobile air conditioning fitted in the passenger cars. Additionally, the workforce of 8,001 employees is expected to remain unchanged during this phase. The conversion subproject does not result in potential labor influx at the factory, maintaining stability in employment.

4.2 ENVIRONMENTAL RISK AND IMPACT

This section provides an overview of the potential environmental risks and impacts associated with PROTON's conversion subproject during both the construction and operation phases. It highlights environmental risks related to waste management, emissions and discharges, and occupational safety and health that could have adverse effects on the environment.

Construction Phase

Potential Impact	Description
Wastewater and Sewage Generation	During the construction/installation phase of equipment to upgrade production lines, the workforce involved is minimal, typically ranging from 5-7 individuals at any given time. This phase is expected to be short, lasting between 1-3 weeks. Consequently, the amount of sewage and wastewater generated at the factory is insignificant and can be effectively managed using the existing treatment system in place.
Domestic or Solid Waste Generation	Domestic or solid waste, consisting of leftovers, food containers, and plastic, is anticipated to see a minimal increase during the construction/installation

Potential Impact	Description
	phase of equipment to upgrade production lines. With only 5-7 people expected to be mobilized at any given time and construction/installation activities projected to last between 1-3 weeks, additional domestic or solid waste generated at the factories can be effectively managed through regular daily collection and housekeeping practices. Construction waste, including excess parts and pieces of old equipment, is also expected to be insignificant due to the small scale of construction, replacement, and installation efforts.
Scheduled Waste Generation	Regarding scheduled waste, such as contaminated rags, contaminated parts or parts from old lines, and welding tips, the quantity generated is generally limited due to the small scale of installation and replacement activities. This waste will be segregated and stored in designated containers with appropriate labels, then stored in the enterprise's existing scheduled waste storage, resulting in minimal impact.
Air Emission	During the construction or installation phase, there is a possibility of generating fugitive dust. However, the impact is anticipated minimal as it is expected that any dust generated will be confined to the immediate vicinity of its source and settle within without further dispersing outside factory boundary.
Occupational Safety and Health	In the process of transporting equipment, dismantling old lines, installing new lines may cause some risks of labor accidents and traffic accidents affecting employees. However, due to the small scale of installation and replacement, these activities can take place quickly, the level of risk can be limited.

Operation Phase

Potential Impact	Description
Wastewater and Sewage Generation	During the operation phase, PROTON does not plan to increase the number of factory workers, so sewage generation shall be consistent. Additionally, the characteristics of the production lines remain unchanged both before and after upgrading, with no additional stages generating or altering the properties of production wastewater. Consequently, changes to the quantity and quality of wastewater generated at the factory is insignificant.
Domestic or Solid Waste Generation	During the operation phase, PROTON has no intention of expanding its workforce, resulting in a consistent generation of domestic or solid waste. The production lines before and after upgrading do not have additional stages of generating or changing the characteristics of solid waste.
Scheduled Waste Generation	The production lines before and after upgrading do not have additional stages of generating or changing the characteristics of scheduled waste. The type of scheduled waste generated from the existing operation are: • SW102 – Lead acid battery • SW109 – E-waste • SW110 – E-waste • SW204 – Wastewater sludge • SW305 – Waste oil • SW307 – Coolant waste • SW322 – Waste of solvent • SW409 – Empty carboy, drum, pail, IBC tank • SW410 – Contaminated rags • SW416 – Paint sludge • SW417 – Waste of paint

Potential Impact	Description
	• SW421 – Coolant sludge • SW422 – Cast iron chips, grinding waste, beta sealant, white sealant • SW427 – Phosphate sludge
Air Emission	Refrigerants using R1234yf are lower chronic toxicity (Class A) according to ISO 817 and therefore does not cause toxic harm to environment or health. However, during manufacturing activities that involve the use of R-134a, air emissions may occur due to the release of this refrigerant into the atmosphere. R-134a is high GWP refrigerants, contributing to greenhouse gas emissions when released.
Occupational Safety and Health	Risks affecting occupational health and safety mainly from the process of replacing, using and operating refrigerants. R-1234yf falls under the category of class 2L “mild flammability”. Refrigerants in the *L group will burn, but their burning velocity is below 10 cm/s which is lower than A2 or A3. They are difficult to ignite and self-extinguish. The refrigerant is stored in the cylinder as a liquefied gas. Upon exiting the cylinder container and entering the atmosphere will switch to the gas phase immediately due to their very low boiling point. When mixed with the air around the leak area, reaching a certain concentration in the air, it can ignite. The general condition of the refrigerant charging process has very little chance of uncontrol leakage and reaching the combustion limit. However, in the event that the refrigerant may leak out due to connection failure, hose breakage, the possibility of a mixture of refrigerant and air at the combustion limit is possible. When poor connections, hoses, seals and connectors are not up to technical standards, and combined with incompetent and unskilled workers performing the work may increase the risk of refrigerant leakage. In this case, the risk of fire will increase. An open flame from a welding torch used at a nearby assembly line or a small arc from an electrical outlet due to poor installation can also ignite a flammable atmosphere.

While both phases present environmental risks, the operation phase requires more significant and sustained attention due to its ongoing nature and the potential for cumulative impacts. Effective management of air emissions, scheduled waste, and occupational safety during the operation phase is critical to ensure long-term environmental sustainability and worker safety. The construction phase, although important, presents temporary and more manageable risks that can be effectively controlled with proper planning and execution.

5 MITIGATION MEASURES

This Chapter outlines a comprehensive strategy to address and minimize potential environmental and social risks associated with PROTON's conversion subproject. By implementing proactive measures at each phase of the project, this chapter aims to mitigate adverse impacts and promote sustainable practices, ensuring the project's alignment with environmental and social responsibility standards.

5.1 DESIGN PHASE

In the design phase, proactive measures are crucial to anticipate and address potential risks before construction begins. The proposed mitigation measures focus on changes needed for the conversion. By addressing these environmental and social issues at the design stage, PROTON will be able to minimize risks and ensure the environmental and safety integrity of its existing and future plant operation. The table below presents general mitigation measures during the design phase of the subproject.

Table 5.1 Mitigation Measures During Design Phase

Potential Impact	Magnitude of Potential Impact	Proposed Mitigation Measures
Occupational Safety and Health • Car model redesign • Storage of R-1234yf refrigerant	Low	• Engage in collaboration with MAC manufacturers or suppliers to ensure system compatibility with HFO-1234yf. • Share technical specifications and requirements for the MAC system redesign with the MAC manufacturers or suppliers. • Ensure components such as compressor and condenser are strategically located to minimize exposure to hot surfaces in the engine compartment. • Reroute hoses and pipes between MAC system components to avoid proximity to potential ignition sources. • Use materials that are compatible with the properties of HFO-1234yf and can withstand temperature and pressure encountered in the engine compartment. • Identify and designate a specific area for the storage of R-1234yf refrigerants. • Ensure the storage area is easily accessible, located outside the main factory building and situated away from potential source of ignition to minimize risks. • Address potential leakage and associated environmental and safety risks in the new storage design by integrating safety measures such as ventilation system and gas detection system.

5.2 CONSTRUCTION PHASE

During the construction phase, effective management practices are essential to minimize environmental impacts and ensure worker safety. The proposed mitigation measures target areas where potential impacts have been identified in **Chapter 4**, such as wastewater and sewage generation, domestic and solid management, scheduled waste generation, air emissions, and occupational safety and health. The table below presents general mitigation measures during the construction/ installation phase of the subproject.

Table 5.2 Mitigation Measures During Construction Phase

Potential Impact	Magnitude of Potential Impact	Proposed Mitigation Measures
Wastewater and Sewage Generation	Low	• Wastewater and sewage are managed through the existing treatment system at the plant. • Establish a regular monitoring and maintenance schedule for the wastewater treatment system to ensure its proper performance and compliance with regulatory standards.
Domestic or Solid Waste Generation • Construction waste	Low	• Daily collection and housekeeping practices adhering to best management practices and regulatory standards. • Separate collection and sorting of solid waste and hazardous wastes at the source, followed by storage in designated containers with lids and labels at the waste storage areas prior to disposal. • Promote recycling and reusing materials where possible. • Solid waste generated to be segregated for recyclable and non-recyclable materials; and stored in different containers. Recyclable waste will be sent to recycling centers while non-recyclable materials are to be disposed at approved landfill. • Reduction of construction waste through daily housekeeping at the end of each workday, temporary storage in sheltered areas, and the engagement of waste contractors for proper disposal or send to recycling facilities in compliance with regulations upon completion of all construction activities. • Burning of construction waste is strictly prohibited.
Scheduled Waste Generation • Construction waste	Low	• Management of scheduled waste is to be supervised by a Competent Person – Certified Environmental Professional in Scheduled Waste Management (CePSWaM).

Potential Impact	Magnitude of Potential Impact	Proposed Mitigation Measures
		• Implement routine housekeeping and cleaning practices to manage and reduce waste accumulation on-site. • Properly segregate scheduled waste and clearly label containers for scheduled waste to ensure correct handling and storage. • Storage of scheduled waste at designated storage area and shall be stored not more than 20 MT or 180 days, whichever comes first. • Ensure the scheduled waste storage has secondary containment with capacity able to accommodate at least 110% of the biggest container volume in the storage. • Arrange for timely collection and disposal of scheduled waste at DOE Licensed Facilities according to regulatory requirements. • Train construction workers on proper scheduled waste management and handling procedures, including segregation, labelling and storage. • The notification of scheduled waste generation at site, E-Consignment Notes and inventory record shall be done via eSWIS.
Air Emission • Fugitive dust from construction	Low	• Housekeeping practices adhering to best management practices and regulatory standards. • Installing temporary windbreaks, such as mesh barriers or temporary fencing, to minimize spread of dust to surrounding areas. • Providing training to construction workers on dust control measures, proper handling of materials, and the importance of maintaining good housekeeping practices.

Occupational Health and Safety
• Transport of equipment
• Construction/ Installation work
	Low	• Before commencing construction and equipment installation in factory, contractors must collaborate closely with factory leaders and safety departments to develop and agree upon detailed industrial safety plans. These plans encompass various aspects such as:
		  ○ Code of Conduct for accessing the factory;
		  ○ Regulations concerning industrial safety during production (including daily worker lists, restricted access areas, designated smoking zones, waste classification and disposal guidelines, etc.);

Potential Impact	Magnitude of Potential Impact	Proposed Mitigation Measures
		○ Traffic and fire safety regulations within the factory premises; ○ Site handover procedures and demarcation of permitted areas for the contractor; ○ Ensuring favorable working conditions for contractors, including temperature control, noise reduction, air quality, water supply, sanitation facilities, etc.; Equip fire extinguishers, first aid kits, and medicine cabinets with a variety of locally common medications. ○ Additional regulations encompass material storage, site cleanliness, work hours, and fire safety measures. • Establish exclusion zones/fences and install warning signs in construction/equipment installation areas. • Conduct worker training on environmental, safety, and health issues, raising awareness about HIV/AIDS and infectious diseases prior to commencing construction. • Provide worker safety training and ensure full compliance with labor protection measures. • Establish codes of conduct and rules for workers during working hours at construction sites. Strictly adhere to occupational and explosion safety measures as per factory regulations while operating within the factory premises. Fully comply with internal factory rules and regulations during work and travel within the factory area. • Ensure appropriate PPE is worn by workers during all tasks. • Store fuels and chemicals safely in impermeable areas with roofing and surrounded by berms, accompanied by safety warning signs. In the event of chemical leaks, follow specific steps: ○ Immediately check for any injuries and provide first aid, if necessary, then transport the injured to the nearest medical facility while informing the Supervising Engineer and Project Owner. ○ Assess the extent of the spill/leak.

Potential Impact	Magnitude of Potential Impact	Proposed Mitigation Measures
		○ Deploy personnel with appropriate protective gear to clean up the spilled material. ○ After any incidents or accidents, the Contractor must compile a detailed report describing the incident and actions taken for review and recordkeeping by the Supervising Engineer and Project Owner. This incident report may also need to be submitted to the DOE or relevant authorities if required. • When employing foreign labor/technical personnel, introduce local customs and practices to avoid conflicts with local residents and factory workers. • Ensure that equipment transport vehicles adhere to designated load capacities, maintain a speed limit of 5 km/h when moving within the factory premises, especially in production areas. All vehicles must undergo full inspection and registration.

5.3 OPERATION PHASE

In the operation phase, ongoing monitoring and maintenance are vital to sustainably manage environmental and occupational risks. Similar to construction phase, the proposed mitigation measures focus on areas where potential impacts have been identified in **Chapter 4**, such as wastewater and sewage generation, domestic and solid waste management, scheduled waste management, air emissions, and occupational safety and health. The table below presents general mitigation measures during the operation phase of the subproject.

Table 5.3 Mitigation Measures During Operation Phase

Potential Impact	Magnitude of Potential Impact	Proposed Mitigation Measures
Wastewater and Sewage Generation • Malfunction of wastewater treatment system	Low	• Performance monitoring of the wastewater treatment system shall be conducted by the Competent Person. The performance monitoring data shall be recorded and well kept. • Regular inspection and maintenance of wastewater and sewage treatment systems. • Implement periodic monitoring of treated effluent quality to ensure it meets the limits of Environmental Quality (Industrial Effluent) Regulations 2009.

Potential Impact	Magnitude of Potential Impact	Proposed Mitigation Measures
		• Ensure proper management and disposal of wastewater sludge – declared as scheduled waste (SW204).
Domestic or Solid Waste Generation	Low	• Daily collection and housekeeping practices adhering to best management practices and regulatory standards. • Separate collection and sorting of solid waste and hazardous wastes at the source, followed by storage in designated containers with lids and labels at the waste storage areas prior to disposal. • Promote recycling and reusing materials where possible. • Solid waste generated to be segregated for recyclable and non-recyclable materials; and stored in different containers. Recyclable waste will be sent to recycling centers while non-recyclable materials are to be disposed at approved landfill. • Burning of solid waste is strictly prohibited.
Scheduled Waste Generation • Spillage of scheduled waste due to mishandling of containers	Low	• Management of scheduled waste is to be supervised by a Competent Person – Certified Environmental Professional in Scheduled Waste Management (CePSWaM). • Implement routine housekeeping and cleaning practices to manage and reduce waste accumulation on-site. • Properly segregate scheduled waste and clearly label containers for scheduled waste to ensure correct handling and storage. • Storage of scheduled waste at designated storage area and shall be stored not more than 20 MT or 180 days, whichever comes first. • Ensure the scheduled waste storage has secondary containment with capacity able to accommodate at least 110% of the biggest container volume in the storage. • Arrange for timely collection and disposal of scheduled waste at DOE Licensed Facilities according to regulatory requirements. • Train workers on proper scheduled waste management and handling procedures, including segregation, labelling and storage. • The notification of scheduled waste generation at site, E-consignment Notes and Inventory record shall be done via eSWIS.
Air Emission • Release of high GWP	Low	• Use leak detection equipment to identify and repair leaks promptly.

Potential Impact	Magnitude of Potential Impact	Proposed Mitigation Measures
refrigerants during manufacturing • Release of R-1234yf during storage and production		• Implement regular maintenance schedules to check for potential leaks. • Provide comprehensive training for technicians on proper handling procedures for refrigerants. • Stay informed about mobile air conditioning service training programs offered by DOE and ensure technicians attend these trainings. • Use proper recovery equipment to capture refrigerants before repair or modification. • Ensure proper disposal of contaminated refrigerants in accordance with regulatory requirements. • Install and maintain proper ventilation and exhaust systems to avoid accumulation of flammable refrigerants R-1234yf. • Regular maintenance of ventilation systems to maintain efficiency. • Follow safe storage practices to minimize the release of R-1234yf and implement strict production protocols to control emissions at source. • Develop and implement emergency response plans for accidental release of refrigerants. • Regularly train staff on emergency procedures and response actions.
Occupational Safety and Health • Gas Leakage	Moderate	• Use high-quality connections, hoses, seals, and connectors that meet technical standards. • Implement gas detection systems with sensors positioned strategically to detect releases of refrigerant and activate alarms and ventilation systems upon gas detection. • Ventilate storage areas and working areas with floor-level grilles to exhaust emitted refrigerant safely. • Use dual-speed fans rated for hazardous areas to maintain ventilation flow rates. • Install pressure sensors in ventilation ducting to monitor flow rates and ensure continuous operation. • Employ emergency shut-off buttons for operators to initiate ventilation or shut down equipment in case of emergencies. • Ensure regular calibration and maintenance of gas detection systems and ventilation systems. • Conduct routine maintenance checks on all equipment used in the refrigerant charging process.

Potential Impact	Magnitude of Potential Impact	Proposed Mitigation Measures
		• Regularly inspect storage facilities and handling equipment for signs of wear and potential failure.
• Health and safety	Moderate	• Conduct mandatory Chemical Health Risk Assessments (CHRAs) for new gases. • Provide comprehensive training for operators and supervisors on safe handling procedures. • Restrict access to gas storage and charging areas to trained personnel only. • Ensure proper storage and handling of flammable refrigerants, including minimum quantities inside charging areas. • Implement strict protocols for refrigerant pumping and control, including pressure relief devices and warning signs. • Equip areas with fire extinguishers, emergency stop buttons, and audible/visual alarms. • Adhere to national and international regulations for transporting refrigeration products containing HFO refrigerants. • Implement emergency response plans for potential refrigerant leaks and fires and regularly inspect and maintain all safety and emergency equipment. • Install fire extinguishers and conduct regular fire drills. • Provide workers with appropriate PPE, including flame-resistant clothing and gas detectors and ensure workers use PPE correctly and consistently during refrigerant handling process. • Conduct comprehensive worker training for safe refrigerant handling and operation.
• Fire and explosion	Moderate	• Install fire detection and suppression systems in storage areas and charging areas. • Maintain proper distances between gas cylinders and surrounding occupancies. • Provide warning signs and flammable gas/hazardous area signage. • Prohibit the use of open flames and welding torches near refrigerant storage and handling areas. • Prohibit potential sources of ignition within hazardous areas and ensure proper electrical grounding. • Ensure all electrical installations comply with industry codes and are regularly inspected to prevent arcs and sparks.

Potential Impact	Magnitude of Potential Impact	Proposed Mitigation Measures
		• Implement bonding measures to dissipate electrostatic build-up. • Utilize anti-static flooring in hazardous areas to mitigate sparks. • Develop and enforce safe working procedures to avoid releases and ignition of HFO refrigerants.

5.4 ENVIRONMENTAL AND SOCIAL BUDGET

Table 5.4 outlines the estimated budgets for implementing mitigation measures as discussed above. The first part of this budget is associated with the conversion project or installation (including those items to be co-financed by the enterprise) and typically is a one-time expense incurred during the initial phase of the project to address environmental and social considerations. The approved funding from MLF will support the conversion of TF2 assembly line only.

On the other hand, the second part of the budget details the estimated cost allocation for ongoing environmental and social management (continuous improvement) during the operation and maintenance stage of the project, encompassing continuous investments required to maintain and improve environmental and social performance throughout the operational phase to comply with related regulatory requirements. This part of the cost will be fully covered by PROTON.

Table 5.4 Budget for Mitigation Measures

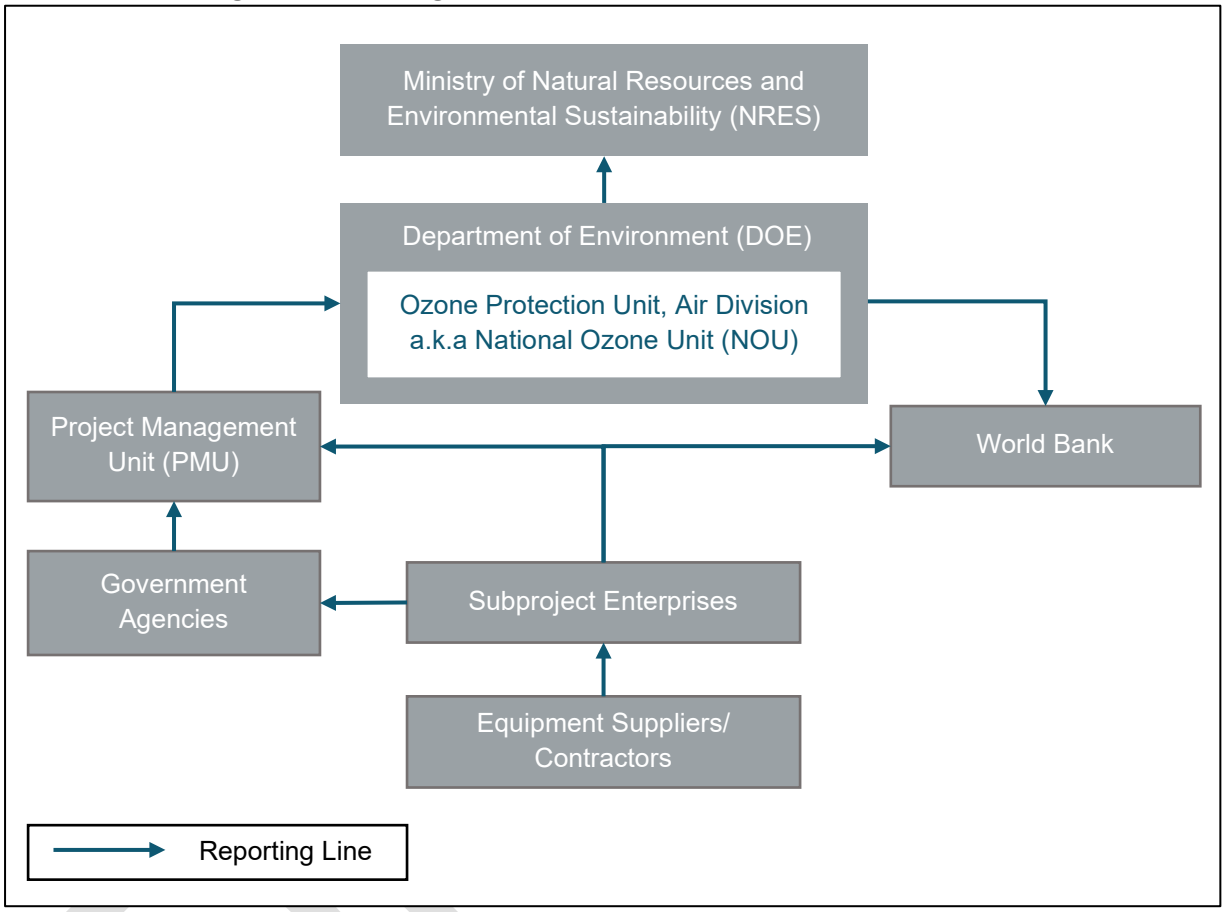
No	Item	Estimated Budget (US$)	Project Funding (US$)	PROTON (US$)
	Assembly Line			
1	HFO charging equipment (two online, one offline)	[redacted]	[redacted]	[redacted]
2	Refrigerant supply (piping, civil construction of new refrigerant room)	[redacted]	[redacted]	[redacted]
3	Ventilation and plant safety	[redacted]	[redacted]	[redacted]
4	Research, development and performance testing	[redacted]	[redacted]	[redacted]
5	Training at PROTON plant	[redacted]	[redacted]	[redacted]
	Authorized Workshop			
6	Tools (vacuum pump, charging machine, manifold gauges)	[redacted]	[redacted]	[redacted]
7	Training at service centre	[redacted]	[redacted]	[redacted]
8	Contingencies	[redacted]	[redacted]	[redacted]
9	Environmental management plan and SOPs to handle a flammable refrigerant	[redacted]	[redacted]	[redacted]

No	Item	Estimated Budget (US$)	Project Funding (US$)	PROTON (US$)
10	Incremental Operating Cost (IOC)	[redacted]	[redacted]	[redacted]
	Subtotal	[redacted]	[redacted]	[redacted]
	Continuous improvement			
11	Environmental Monitoring (Stack Emission)	[redacted]	[redacted]	[redacted]
12	Environmental Monitoring (Boundary Noise)	[redacted]	[redacted]	[redacted]
13	Waste Water Analysis	[redacted]	[redacted]	[redacted]
14	Environmental Conservation Program	[redacted]	[redacted]	[redacted]
15	Emergency Response – Fire Drill Program	[redacted]	[redacted]	[redacted]
16	OHS Monitoring and Assessment - Noise Risk Assessment - Indoor Air Quality - Chemical Exposure Monitoring - Local Exhaust Ventilation	[redacted]	[redacted]	[redacted]
	Subtotal	[redacted]	[redacted]	[redacted]
	Grand Total	[redacted]	[redacted]	[redacted]

6 ORGANIZATIONAL STRUCTURE AND RESPONSIBILITIES

This section outlines the organizational framework and delineates the roles and responsibilities of stakeholders involved in the implementation of ESMP. **Figure 6.1** illustrates the organizational framework of stakeholders involved and the flow of responsibilities between them.

Figure 6.1 Organization Chart of ESMP Implementation



6.1 ROLES AND RESPONSIBILITIES

Effective ESMP implementation requires a clear identification of the personnel and authorities involved and understanding of the responsibilities of all the relevant parties in environmental and social management. This will assist in establishing proper lines of communications needed in managing the environment and social risks incident(s) occurred. Parties involved in the Project are listed in **Table 6.1**, and their roles and responsibilities are presented in the same table.

Table 6.1 Stakeholders Responsibilities for ESMP Implementation

Stakeholder	Roles & Responsibility
PROTON	• To bear all responsibilities, but under monitoring and supervision of the World Bank and the PMU, for the conversion from HFC-134a to

Stakeholder	Roles & Responsibility
	R-1234yf for refrigerant. Technical assistance will be provided through the Project to the enterprise. • To request the chemical supplier to provide safety data sheets for each chemical and full guidance and training on safety handling these chemicals. • To prepare and submit documents on fire prevention and protection to Fire and Resue Department • To prepare and submit the measures on precautions and chemical emergency responses to Department of Occupational Safety and Health • To have safety audit and fire safety certificate from the fire protection authority • To follow stringently the safety data sheets when handling these chemicals • To assign technical staff to (i) monitor the compliance with the safety occupational health and environment requirements on using chemicals and (ii) monitor the compliance with safety requirements when working with R-1234yf and fire protection rules during the conversion process and after conversion operation • To keep the workers continuously trained, in cooperation with PMU and chemical and equipment suppliers on the safe automobile vehicle production • To take all necessary measures to prevent leakage of the chemicals during the manufacturing process • To carry out the mitigation measures for each chemical and each use of chemical leakage • To have contract with local environment servicing company for collection and disposal of waste and empty chemical drums • To ensure that all bidding documents and contracts for civil works under the Project include the obligation of contractors, and subcontractors and supervising entities to: (a) comply with the relevant aspects of ESCP and the environmental and social instruments referred to therein; and (b) adopt and enforce codes of conduct that should be provided to and signed by all workers, detailing measures to address environmental, social, health and safety risks, and the risks of sexual exploitation and abuse, sexual harassment and violence against children, all as applicable to such civil works commissioned or carried out pursuant to said contracts.
PMU established under NOU	• To sign the subproject grant agreement (SGA) with participating automobile vehicle manufacturer. The SGA will list enterprise responsibilities and documents/ plans it is obligated to adhere to on implementation of the ESMP • To coordinate and supervise the subproject implementation, including all environmental and safety requirements by hiring technical consultants as necessary • To ensure the project implementation will achieve the HFC phase-down target and safety requirements for the used chemicals and refrigerants in accordance with the National Law and Regulations and the World Bank ESF

Stakeholder	Roles & Responsibility
	• To prepare the project progress and environmental monitoring reports
Equipment/Chemical Suppliers	• To provide the environmentally safety design and installation of the production line of the passenger car fitted with R-1234yf MAC system • To provide good after-sale service and warranty in the case of accident due to the technical faults • Chemical suppliers to provide Safety Data Sheet of R-1234yf, while equipment suppliers to provide operation manual and equipment specifications to PROTON • To provide adequate training and guidance on safe operation of the supplied equipment, including the environmental and health risks and mitigation measures
Government Agencies	Department of Environment State Offices, Fire and Rescue Department, Department of Occupational Safety and Health, to be invited by the PMU to carry out the enforcement control and monitoring of the occupational health, environment and fire safety at PROTON.

7 TRAINING REQUIREMENT

Training is important to educate personnel to gain a deeper understanding of the importance of environmental and social management on site. Training will also serve to increase environmental and social awareness among the workers so that they will be able to implement effective environmental and social management measures on site.

7.1 TRAINING FOR OPERATION PHASE

The training for the enterprise's technical staff and all workers of PROTON on the safe refrigeration production using R-1234yf will be conducted by the equipment supplier and taken over by PROTON in cooperation with chemical suppliers and local fire and rescue department and DOE. The training courses will be conducted regularly, particularly in the preparation and commission stage of enterprise.

Table 7.1 Training Plan

Organizer	Participants	Frequency	Duration	Content
PROTON in cooperation with chemical and equipment suppliers and local fire and rescue department	All technical staff and workers of enterprise	One at the beginning of the project Before production startup and after conversion operation About twice a year during project implementation period	1-2 days	• The Montreal Protocol and HFC phase down • Environment and fire risk during the conversion and after conversion operations • Environment and OHS risk mitigations measures • Safe handling of chemical and refrigerants • Chemical and waste collection and treatment • Emergency responses in case of accidents

The training of staff in the safe handling of R-1234yf chemicals and refrigerants should at least cover the following training topics and sub-topics:

No.	Topics	Subtopics
1	Properties of Dangerous Goods and Hazardous Substances	- Dangerous goods classes, hazardous substances storage classes, and GHS - Parameters of refrigerants R-1234yf, e.g. LEL, UEL, etc. - Fire risks of flammable gases, specifically on R-1234yf in the car manufacturing process - Sources of ignition in the car manufacturing process - Avoidance of confine space and ventilation in working areas - Flammable gas detector for hydrocarbon refrigerators
2	Personal Protective Equipment (PPE)	- Kinds of Personal Protective Equipment (PPE) and how to use (covering safety goggles, safety shoes, safety gloves, work wears)

No.	Topics	Subtopics
3	Operating Instructions and Safety Data Sheets (SDS)	- Contents of operating instructions in general - Contents of operating instructions for R-1234yf - Contents of SDS in general - Contents of SDS for R-1234yf - Storage and handling of R-1234yf
4	Emergency Response	- Alarm signals, evacuation procedures and assembly point - Emergency Response information for R-1234yf - Appropriate fire extinguishers for fire from R-1234yf and the application - Emergency Response Team within the company

7.2 INDUCTION TRAINING

Contractors, visitors, and suppliers will undergo an EHS Briefing prior entering the site. Upon completion of the briefing, they will be given a pass to allow their entry into the site. The content of the briefing touches on EHS Rules and Regulations that are being implemented on site. All contractors, visitors and suppliers will need to adhere to the rules and regulations once they are within the site compound.

The relevant topics for training shall include the following:

1.	**Legislations and Regulations**
	• Environmental Quality Act 1974 • Occupational Safety and Health Act 1994 • Factory and Machineries Act 1967
2.	**Environmental Best Management Practices (BMPs)**
	• Dust Control • Noise Control • Solid Waste & Scheduled Waste Management • Housekeeping
3.	**Safety, Health and Environmental Awareness**
	• Use of Personal Protection Equipment (PPE) • Fire Drill, Emergency Preparedness and Response • Basic Occupational First Aid Training • Accident and Incident Investigation and Reporting • Basic Safe Handling of Chemical and Waste Management • EHS Law of Malaysia, EQA, OSHA, FMA • Transportation and Handling of Materials • Chemical Spillage and Drills Training

Training and re-training on the topics mentioned above are mandatory for all factory staff, excluding contractors, visitors, and suppliers. All records of training program and list of training attendees shall be maintained on-site and made available to relevant authorities.

8 MONITORING AND REPORTING

8.1 REPORTING

8.1.1 Project-level Bi-annual Reports Prepared by PMU

A Bi-annual Progress Report will be prepared capturing details on E&S performance of the project. Details will include implementation status of the following:

a. Environmental and Social Commitment Plan (ESCP)
b. Environmental and Social Management Plan (ESMP, GBV framework and LMP)
c. Compliance to Environmental and Social statutory requirements
d. Design modification or change in scope brought to World Bank notice
e. Assessment of changes and updating/addendum to ESMP
f. Site observations on Contractor's performance on Environmental Social Health and Safety and other plans in ESMP
g. Summary of stakeholder engagement activities
h. Summary of grievances received and redressed
i. Status of Environmental and Social staffing within PMU and other implementation partners/agencies
j. Capacity building/ training activities undertaken
k. Corrective actions and planned E&S activities for next 6 months

PMU will share on bi-annually basis ESMP implementation status and relevant plans as per Environment Standards and all activities as stated above, with NOU at DOE. DOE in turn will share these reports with The World Bank.

8.1.2 Subproject-level Bi-annual Reports Prepared by PROTON

Bi-annual Progress Report prepared by PROTON explaining the compliance status of the subproject with the ESMP in its scope. Details will include status on:

a. PROTON's ESMP implementation work plan and PMU reviewed summary of implementation progress
b. Implementation of PROTON's ESMP
c. Status of compliance with E&S statutory requirements
d. Status on actions indicated in the Labor Management Procedures
e. ESHS incidents & supervision
f. Usage of Personal Protective Equipment (PPE) by workers
g. Safety at work sites
h. Training conducted, and workers participation
i. Functioning of GRM relating to labor aspects, including summary details of Workers grievances
j. Community grievances
k. Gender mainstreaming notes
l. Corrective actions and planned E&S activities for next 6 months

PROTON will share this report on a bi-annually basis during the subproject implementation with the PMU. Additionally, PROTON shall submit to PMU in its final subproject completion report when conversion is completed, all certificate and permits.

Table 8.1 Implementation Schedule and Reporting Procedure

Stakeholder/ Organization	Implementing schedule	Report on/ to	Time	Frequency
PROTON	2024 – 2029	- Periodic **Environment Monitoring Report** required by the national and local regulations prepared by PROTON to state DOE and copy to PMU	By the end of each monitoring period	Monthly/ Annually
		- **Subproject Implementation Progress Report** to PMU	30 June and 31 December	Bi-annually
		- Environment and safety issues, if any, to local authority and to PMU	When needed	Occasionally
		- Notification to the chemicals and equipment suppliers and copy to the PMU on any faults happened during the conversion and after conversion operation	When the fault arises	Occasionally
		- Plans or measures on chemical precautions and emergency response	Before commissioning	Once

8.2 MONITORING PLAN

Monitoring and evaluation are meant to check whether the adverse environmental and social impacts identified are being adequately mitigated and that the proposed mitigation plan is resulting in achieving desired results. Monitoring and evaluation will be done at 2 levels viz., overall Project level monitoring of ESF implementation and subproject level monitoring of ESMP implementation. This, essentially, involves cross-checking the implementation of the ESF and subproject ESMPs as well as monitoring the environmental quality through suitable indicators in the specific subproject during both the construction and operation phases.

8.2.1 Project-level Monitoring

Internal monitoring of E&S aspects in accordance with the ESF and ESMPs comprising relevant mitigation plans will be undertaken. It will be a regular on-going feature within the

PMU for all the subprojects. PMU will share on biannual basis ESMP implementation status and plans during the subproject implementation.

Third party consultant will be engaged by the PMU for project environmental and social monitoring works. The consultant hired by the PMU will check compliance of subproject being implemented as part of the Project with the ESF from the stage of inception to the stage of completion and commissioning. This would include compliance with the World Bank's ESF and ESSs provisions. The consultant to be hired by PMU for each subproject will undertake inspection of different parts of work, implementation of ESMP and environmental quality monitoring.

An evaluation of the subproject implementation through the review of the subproject completion report will be commissioned by the PMU with specific objective to understand the compliance with the provisions of ESMP, among other subproject implementation details. The consultant engaged will work in close association with PMU.

8.2.2 Subproject-level Monitoring

This involves internal processes within PROTON to ensure compliance with environmental and occupational safety and health regulations. This includes monitoring regulatory compliance, environmental performance, and occupational safety and health practices. PROTON may engage third party consultant to conduct periodic monitoring works according to their established schedules, which encompass items outlined in the Budget for Mitigation Measures and those proposed in **Table 8.2** and **Table 8.3** to address environmental and social impacts identified in **Chapter 4**. This monitoring process is integral to ensuring that PROTON adheres to environmental and safety standards throughout the construction and operation phases.

Table 8.2 Monitoring Plan During Construction Phase

Parameters	Indicator	Monitoring Methods	Monitoring Frequency	Standard Applied	Location	Responsibility	Report To
Wastewater and sewage generation	Wastewater discharge quality	Laboratory testing	Weekly	DOE regulations	Wastewater final discharge	PROTON and its assigned staff	DOE
Solid wastes	Amount of solid waste generated	Weighing/ inventory recording	Weekly	DOE regulations	Solid waste storage facility	PROTON, and solid waste collector and disposal facility	PROTON's management
Hazardous/ scheduled wastes	Amount of hazardous/ scheduled wastes generated	Weighing/ inventory recording	Weekly	DOE regulations	Scheduled waste storage facility	PROTON, and scheduled waste collector and disposal facility	DOE
Air emission	Condition of temporary barriers or fencing	Visual inspection	Daily	Best Management Practices	Construction/ installation area	PROTON, and its contractor and assigned staff	PROTON's management
Spills and leakage of chemicals	Chemical spilled/ leaked	Visual inspection	Daily	DOE and DOSH regulations	Chemical storage and production area	PROTON and its assigned staff	PROTON's management, and local authorities in case of accident
Occupational Health and Safety	No. of work-related illnesses/ injuries, and safety man-hours	Inventory/ database registration	Daily	DOSH regulations	PROTON production workshop	PROTON and its assigned staff	DOSH, in case of accident
Safety audit	Non-compliance/ Observation	Review documentation and site visits	Once after completion of construction before production startup	International and local requirement	PROTON production workshop	PROTON, third-party auditor/ consultant, local authorities	Local authorities, PMU, and the World Bank

Parameters	Indicator	Monitoring Methods	Monitoring Frequency	Standard Applied	Location	Responsibility	Report To
Renovation Notification	Acknowledgement Letter	Review documentation	Once before start construction	Local Authority requirement	Area of renovation/ change	PROTON and its assigned staff	PMU, and the World Bank

Table 8.3 Monitoring Plan During Operation Phase

Parameters	Indicator	Monitoring Methods	Monitoring Frequency	Standard Applied	Location	Responsibility	Report To
Wastewater and sewage generation	Wastewater discharge quality	Laboratory testing	Monthly	DOE regulations	Wastewater final discharge	PROTON and its assigned staff	DOE
Air emission	TF2 stack emission quality	Isokinetic stack testing	Annually	DOE regulations	Stack V29, V30, V31	PROTON and its assigned staff	DOE
Solid wastes	Amount of solid waste generated	Weighing/ inventory recording	Weekly	Best Management Practices	Solid waste storage facility	PROTON, and solid waste collector and disposal facility	PROTON's management
Hazardous/ scheduled wastes	Amount of hazardous/ scheduled wastes generated	Weighing/ inventory recording	Weekly	DOE regulations	Scheduled waste storage facility	PROTON, and scheduled waste collector and disposal facility	DOE
Spills and leakage of chemicals	Chemical spilled/ leaked	Visual inspection	Daily	DOE and DOSH regulations	Chemical storage and production area	PROTON and its assigned staff	PROTON's management, and local authorities in case of accident
Explosive atmosphere	Concentration of gas	Control panel and HFO sensors	Continuously	Best Management Practices/ Industrial Code	Chemical storage and production area	PROTON and its assigned staff	PROTON's management, and local authorities in case of accident
Occupational Health and Safety	No. of work-related illnesses/ injuries, and safety man-hours	Inventory/ database registration	Daily	DOSH regulations	PROTON production workshop	PROTON and its assigned staff	DOSH, in case of accident
	Chemical Health Risk Assessment (CHRA)	Review documentation and site visits	Every 5 years (next due is 2026)	DOSH regulations	Entire plant	PROTON and third-party consultant	DOSH

Parameters	Indicator	Monitoring Methods	Monitoring Frequency	Standard Applied	Location	Responsibility	Report To
	Audiometric testing	Audiogram	Annually	DOSH regulations	Plant workers	PROTON and approved audiometric testing centre	DOSH
Fire Certificate	Validity period	Review documentation and site visits	Annually	Fire Services regulations	Entire plant including modified area	PROTON and BOMBA	PROTON's management
Business License	Validity period	Review documentation	Annually	Local authority requirement	Entire plant	PROTON and its assigned staff	PROTON's management
Certificate of registration for electrical installations	Validity period	Review documentation	Annually	Energy Commission regulations	Entire plant	PROTON and its assigned staff	PROTON's management

Note: Frequency and scope of monitoring to be updated based on equipment and chemical supplier recommendations.

8.3 IMPLEMENTATION SCHEDULE

The PMU would carry out supervision of the implementation of the conversion subproject during the implementation period of 2024 – 2029. After receiving PROTON's Progress Report, all mentioned conversion activities will be reviewed by PMU. The details of conversion activities such as time of conversion, testing, trials, and the project Environmental Monitoring Report should be included in the PROTON Progress Report. All activities of PROTON's conversion would be reported to PMU and the World Bank. The report is to be submitted bi-annually to the World Bank by January 31 and July 31 each year and annually to NRES.

Table 8.4 Time Schedule for Implementation of the ESMP

Actions	Schedule	Responsible	Monitoring/ Measurement
Develop action plans against mitigation measures	Before signing of subgrant agreement	PROTON	Approved action plan under subproject
Implement mitigation action plans, re-layout, install new equipment	After signing of subgrant agreement	PROTON	Approved action plan under subproject
Rearrange and construct storage area for R-1234yf	After signing of subgrant agreement	PROTON	Approved action plan under subproject
Install gas detectors and alarm at refrigerants charging, vacuum, leak testing, and warehouse	After installing new equipment	PROTON	Approved action plan under subproject
Install fire protection system at storage area of R-1234yf	During and after construction	PROTON	Approved action plan under subproject
Provide training/ SOPs training	After signing of subgrant agreement	PROTON	Training records

During conversion period of 2024 – 2029, PROTON should detail all activities of conversion in the Progress Report such as implementation timing, testing, trials and proto sample to be produced, and progress and results of mitigation and monitoring measures. Frequency and duration of mitigation measures and monitoring as well as remedial actions, if any, showing consequences in accordance with the phasing down targets and schedule should be inclusive. A breakdown timetable consisting of detailed activities should be included in the report. Besides, the periodic Environment and Safety Report prepared by PROTON should be submitted to the state DOE. A copy of the report of Plans/or Measures on chemical precautions and emergency response together with the Environmental and Safety Report should be sent to PMU.

9 CONSULTATION AND INFORMATION DISSEMINATION

9.1 CONSULTATION IN THE FORM OF MEETINGS

In the process of preparing and developing the proposal for the implementation of KIP Stage I, PMU and World Bank held meetings and workshops to exchange and consult on activities under KIP Stage I. The list of consultations organized thus far is tabulated in **Table 9.1**. Another stakeholder consultation will be carried out upon the completion of the ESMP. Feedback from this stakeholder consultation will be incorporated into the final ESMP.

Table 9.1 Consultations on Environmental & Social Risks and Impacts and Mitigation Measures

No.	Date	Meeting/ Workshop	Stakeholders
1	13 March 2024	Meeting on Preparation of ESMP	Subproject Enterprises (Berjaya CKE, Zun Utara and PROTON)
2	14 March 2024	KIP Stage 1 Stakeholder Consultation Meeting (Preparation of Project Document)	Industries (Servicing), associations, Authorised Training Centres, Government Agencies
3	14 August 2024	Meeting on Draft E&S Instruments	Government Agencies, associations and Subproject Enterprises (Berjaya CKE, Zun Utara and PROTON)

Stakeholder Consultation on 13 March 2024

The three companies that will make up Component 1 of the project were briefed on the ExCom approval and detailed costs (separately). Investment activities will be carried out via subgrant agreements (SGAs) with standalone commercial refrigeration manufacturers, Berjaya CKE and Zun Utara (Subcomponent 1.1) and a carmaker, PROTON (Subcomponent 1.2). Procurement of equipment by each enterprise will follow commercial practices acceptable to the World Bank.

The meeting reiterated the importance of the enterprises' active participation in ESMP and LMP preparation and implementation even if the environmental and social risks continued to be assessed as "moderate" and "low" respectively. Because the commercial refrigeration companies have received MLF grant support in the past, there is good understanding of subproject requirements and strong willingness to cooperate. PROTON asked whether its 25 authorized service providers that part of the project are subject to ESF, which the meeting confirmed were. They must therefore be addressed in the ESMP. Enterprises pledged full cooperation and welcomed the DOE/consultant visit.

Stakeholder Consultation on 14 March 2024

DOE and the consultant organized a stakeholder consultation on E&S, focusing this time on the servicing sector (though not exclusively) given that past project consultations tended to attract manufacturers and importers and because percentage of the project funding will go towards servicing sector capacity building. Invitees included Ministry of Education, Skills Development, Standard and Industrial Research Institute of Malaysia (SIRIM), Malaysia

Automotive Association (MAA), Electrical Appliance Association, Women Automotive Association, MASHRAE representatives and several authorized training centers (ATCs). Some manufacturers were also present.

DOE and the consultant presented the project and E&S requirements that apply specifically to the project, respectively. Although it is quite clear what is needed of the 3 enterprises, there is less clarity in the servicing sector since the entire objective is to strengthen the capacity to safely handle flammable and mildly flammable refrigerants that will be introduced through conversion from HFCs in standalone commercial refrigeration and car MACs. Ideas would be for the stakeholders to actively contribute to the development of the training curricula and the training or to help develop specifications for the training equipment and technician tools.

The meeting discussed at length approaches to voice grievances and promoting gender balance in the servicing field. Participants were invited to provide additional ideas, inputs, as well as names of other project stakeholders that were not at the workshop on top of the suggestions and observations summarized below. Feedback will be sent to DOE, either directly to the Ozone Protection Section or through the DOE online portal (where the business standard requires a response within 24 hours).

Servicing sector stakeholder observations:

- Communication channels and invitations should reach all concerned stakeholders and ensure no one is left behind – association and representative of each sector will provide DOE with any missing stakeholders, noting that many invitees did not show up at the consultation meeting
- Additional clarification was requested on the objectives of this consultation
- DOE should ensure that the servicing training modules will be specific for two different sectors (MAC and refrigeration sectors). WB suggested their engagement with relevant agencies in drafting the training module for service technician training
- Concern on safety issues associated with mildly flammable refrigerant (HFO-1234yf)
- Clarification sought as to whether CO2 refrigeration system training could be included to which it was clarified that the training will be targeted for priority sectors according to Malaysia's KIP strategy. This type of training will be included in future KIP stages as the focus of this KIP is standalone commercial refrigeration and MAC with other alternatives.
- Whether DOE's Certified Service Technician Program (CSTP) training will require technicians to go through the whole process or just the new update given a concern on cost to businesses
- Suggestion to combine the launch workshop with the HCFC phaseout engagement
- Engagement with end users/consumers is important to ensure that the right information goes to the end-user
- Gender equality and why is there a low number of female service technicians in Malaysia was discussed including the nature of the servicing work (carrying heavy cylinders, entering other people's homes etc.) as a possible barrier rather than lack of training opportunities
- Suggest having a separate meeting with women groups separately to hear directly their voices and concerns

- What is the most effective channel to report grievances? Does the existing e-aduan system work for establishing a project level GRM including addressing gender issues?
- Suggestion to have criteria for selection of first 2,000 RAC service technicians or should it be on a first-come-first-serve basis?
- Suggestion to use ATCs that are still in good operation to avoid closing down their business and selling off service tools instead of selecting newly established ATCs; and
- The possibility to use both private and public ATCs should be explored.

Stakeholder Consultation on 14 August 2024

The meeting aims to collect feedback and comments from various key stakeholders on the draft Environmental and Social (E&S) instruments prepared for the Project. The E&S instruments presented in the meeting and discussed are Environmental and Social Commitment Plan (ESCP), Stakeholder Engagement Plan (SEP), site-specific Environmental and Social Management Plans (ESMPs), Labor Management Procedures (LMP), and gender mainstreaming notes.

Summary of feedback:

- Concerns about relevance and exclusion of certain ESS, with requests for clear justifications and potential updates if project conditions change.
- Suggestions for stronger gender mainstreaming efforts, with a focus on training female technicians and management, and clearer reporting on gender indicators.
- Need for clarification on the handling of grievances, especially sexual harassment, with suggestions that enterprises handle such issues and notify the PMU.
- Feedback on site-specific ESMPs, including compliance with waste and environmental regulations, and ensuring gender considerations in biannual progress reports.
- Comments on LMP, ensuring compliance with labor laws, addressing sexual harassment, immigration issues, and removing references to child labor and irrelevant sectors.

9.2 INFORMATION DISSEMINATION

Once finalized, the ESMP will be disclosed on the official websites of DOE and shall also be available in World Bank repositories. The ESMP will be shared with affected communities and locals. This will ensure the locals to be aware of the E&S aspects, its mitigation, responsible staff and mode of implementation. Hard copies of these documents will also be maintained at PMU and at PROTON.

10 INTEGRATION OF ESMP IN THE PROJECT DOCUMENT

The Environmental and Social Commitment Plan (ESCP) sets out material measures and actions, any specific documents and plans, as well as the timing for each of these. The ESCP which will be part of legal agreement and will be signed by each participating enterprise and implementing agencies will require the implementing agencies to comply with the provisions of any other E&S documents required under the ESF and referred to in the ESCP, such as the Environmental and Social management Plan (ESMP), Labor Management Procedures (LMP), Stakeholder Engagement Plan (SEP), etc. The ESCP will be prepared considering the findings of the environmental and social assessment based on the ESF, the Bank's environmental and social due diligence and the results of engagement with stakeholders. It will clearly spell out the plans to be prepared with time frame and responsibility. Adherence to the aforementioned processes and provisions will therefore be ensured through the ESCP.

The ESMP is a 'living document' in which detailed out the potential impacts, mitigation measures that will be implemented, monitoring and audit programs as well as reporting and requirement. From time to time, information from the work activities may change due to the latest development of the factory. Also, as the factory activities progress, there may be improvements recommended in addition to or to replace those suggested in this ESMP. As such, these will require updating of the ESMP to ensure that the information within this document is the latest to be used in the factory by all stakeholders involved.

Prior to updating this ESMP document, a review of the suggestions, opinions and comments by all stakeholders involved shall be undertaken. This is to ensure that the ESMP accomplishes its objective of being practical and useful. Any update to this ESMP has to be documented and submitted to the DOE.