ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP)

BERJAYA CKE INTERNATIONAL SDN BHD

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
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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBRIVIATIONS

AIRAH	Australian Institute of Refrigeration, Air Conditioning and Heating
APAD	*Agensi Pengangkutan Awam Darat* (Land Public Transport Agency)
ASHRAE	American Society of Heating, Refrigerating and Air-Conditioning Engineers
ATC	Authorized Training Center
ATEX	Explosive Atmosphere
BMP	Best Management Practices
BOMBA	Fire and Rescue Department
CCC	Certificate of Completion and Compliance
CE	Conformité Européenne
CePSWaM	Certified Environmental Professional in Scheduled Waste Management
CFC	Chlorofluorocarbon
CFO	Certificate of Fitness for Occupation
CHRA	Chemical Health Risk Assessment
CNC	Computer Numerical Control
CO2	Carbon Dioxide
CSTP	Certified Service Technician Program
DOE	Department of Environment
DOSH	Department of Occupational Safety and Health
ECOS	Energy Commission Online System
EE	Energy Efficiency
EHS	Environment, Health and Safety
EIA	Environmental Impact Assessment
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
e-SWIS	Electronic Scheduled Waste Information System
ExCom	Executive Committee
FC	Fire Certificate
FMA	Factories and Machinery Act
GA	Grant Agreement
GBV	Gender-Based Violence
GEMS	Greenhouse and Energy Minimum Standards
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
IC	Incident Commander
ICA	Industrial Coordination Act 1975
ICC	Incremental Capital Cost
IEC	International Electrotechnical Commission
IETS	Industrial Effluent Treatment System
ISO	International Organization for Standardization
IWK	Indah Water Konsortium
JPJ	*Jabatan Pengangkutan Jalan* (Road Transport Department)
KIP	Kigali Implementation Plan
LEL	Lower Explosion Limit
LMP	Labor Management Procedures
LPG	Liquefied Petroleum Gas
MAA	Malaysian Automobile Association
MAC	Mobile Air Conditioning
MEPS	Minimum Energy Performance Standard
MIDA	Malaysian Investment Development Authority
MLF	Multilateral Fund
MS	Malaysian Standard
MT	Metric Tons
NA	Not Available
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
OHS	Occupational Health and Safety
OSHA	Occupational Safety and Health Act
PMU	Project Management Unit
PPE	Personal Protective Equipment
PTI	Permit-to-Install
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)
SW	Scheduled Waste
TA	Technical Assistance
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
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 **Berjaya CKE International Sdn Bhd** 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 12-2029 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 technology transfer 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 and demonstrate or pilot safe and commercially viable HFC alternatives for MAC systems. Selection of eligible enterprises was 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 several of 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 to assess the energy efficiency of stand-alone commercial refrigeration equipment and explore the feasibility of implementing voluntary energy performance labelling for certain models and developing mandatory minimum energy performance standard applicable to most models. This component will also 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 energy efficient, lower-GWP technologies.
(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 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 BERJAYA CKE INTERNATIONAL SDN BHD

The subproject for **Berjaya CKE International Sdn Bhd** (hereinafter refer to as "Berjaya CKE") aims to convert from the use of HFC-134a and R-404A to low GWP hydrocarbon refrigerants R-290 and R-600a in all the commercial refrigeration units manufactured by the enterprise.

The enterprise uses HFC-134a and R-404A to manufacture 48 models of display chillers, upright chillers and freezers, counter chillers and freezers, and other stand-alone commercial refrigeration equipment. Berjaya CKE manufactures commercial refrigeration cabinets and fabricates piping for the refrigeration circuits within the units in-house. They procure heat exchange units from external suppliers according to their specifications. Additionally, the enterprise purchases compressors from local distributors of global brands such as Embraco, Danfoss, Secop, and Tecumseh. Berjaya CKE handles refrigerant charging themselves as part of their manufacturing process.

The enterprise has four manufacturing lines, and three charging machines: two for HFC-134a and one for R-404A. The three charging machines need to be replaced to be able to charge with hydrocarbon refrigerant; as the enterprise was in the process of converting two of its manufacturing lines that share an HFC-134a charging machine, it will finance that conversion, including by procuring the hydrocarbon refrigerant charging machine. Due to the flammability of R-290 and R-600a, the existing charging units will be replaced with new charging units suitable for use of R-290 and R-600a to meet national and international safety standards.

Due to the risk of R-290 and R-600a leakages during the handling and charging of the refrigeration units and the areas where R-290 and R-600a are stored, the following safety measures will be introduced:

a) ventilation of the charging areas and the R-290 and R-600a storage areas,
b) change of electrical installation in the charging areas to meet the electric code safety requirements,
c) grounding of conveyor belt and other steel structures in the charging areas to avoid sparks due to static electricity,
d) installation of R-290 and R-600a detectors in the charging areas and the R-290 and R-600a storage areas,
e) implementing proactive fire safety and emergency response systems to effectively manage potential leaks, fires, or other hazardous situations, and
f) providing comprehensive training for workers prior to the use of R-290 and R-600a in production to ensure safe handling and operation.

These safety precautions, along with the conversion activities, are fully funded. The approved amount from the Multilateral Fund for Incremental Capital Costs (ICCs) is US $186,850, which covers expenses related to redesigning and testing 48 models, providing safety training for workers, offering technical support, and conducting a plant safety audit.

In addition, the enterprise commits to implement inverter technology for its product lines through additional funding of up to US$257,911 approved by the Multilateral Fund in December 2024 for energy efficiency (EE). More energy efficient fan coils will be introduced to evaporators and condensers as well, where applicable. With these interventions, the

enterprise expects to improve energy performance of its product lines by at least 30% from its baseline level.

Specifically, for units that do not have skin evaporators and condensers, the heat exchanging process would need separate evaporators and condensers and fans to improve heat transfer performance. To reduce energy consumption of evaporators and condensers, electric motors of fans for these two components will be replaced by high energy efficient motors.

The EE part of Berjaya CKE's subproject therefore proposes to introduce the variable speed compressors with a drive board that runs on an automatic board. Technical assistance to enhance capacity of technicians and design engineers of Berjaya CKE to adopt this technology and enable them to perform basic repair on drive boards will be provided. Since the same drive board can be used in different modes of compressor operation, the proposed TA will also address basic repair and calibration of frequency generators.

Thus, TA activities to support training on the overall design and component selection (i.e., compressors, evaporators, and condensers) for commercial refrigerators and freezers will be included. The proposed training will familiarize design engineers with a computer simulation package which is readily available in the public domain. Proper component selection will result in the optimal performance for the required cooling load. In addition, the training will cover basic knowledge of driver control devices and frequency generators. The latter training will enable the enterprise to carry out further energy performance improvement in products.

Incremental capital costs related to research and development of new inverter refrigeration and freezers will be partially financed. Since other energy conservation measures to reduce the cooling load of refrigeration and freezers by eliminating fan coils or using EE motors for fan coils have already been undertaken by Berjaya CKE, component grant support will only cover the parts that relate to variable speed compressors for selected models for one year. The component grant support will only be provided after the selected models are tested and proven to meet the energy performance goal set (i.e. 30% better than baseline).

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 from HFC to low-GWP alternatives and energy efficiency improvement subproject;

(2) Formulate targeted mitigation measures to address and minimize adverse environmental and social impacts during the implementation and operation phases of the subproject;
(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 subproject, 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 commercial refrigeration units using R-290 and R-600a refrigerants and containing more energy efficient components at Berjaya CKE International Sdn Bhd. The ESMP outlines environmental and social mitigation measures to address impacts during implementation and operation of the project.

Key areas covered by the ESMP:

Conversion Activities at the Refrigerator Assembly and Production Line of Berjaya CKE:

- **Installation of fire safety features**: This includes modifications to the production lines or storage facilities to safely accommodate the flammable R-290 and R-600a 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 R-290 and R-600a.

Exclusions:

The project scope specifically covers the refrigerator assembly and production line, where the conversion from HFC-134a to R-290 and R-600a will take place as well as the development of new prototypes, then products at scale, that are more efficient and use the new refrigerant. Other operations and facilities at the manufacturing facility, such as the Stamping and Moulding, Bowl Sink and Special Project Assembly, CNC Machining and Bending, are not part of this project. These operations 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 refrigerator assembly and production lines.

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 landuse, 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.* Berjaya CKE obtained the required manufacturing licenses on: • 24 October 2002 for the manufacture of commercial kitchen equipment & refrigerators; and • 5 April 2006 for the manufacture of juice dispensers
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 completed.* Berjaya CKE has obtained a business license valid until 18 April 2026 from Majlis Bandaraya Seremban. 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 completed.* Berjaya CKE's current Fire Certificate is valid from 1 August 2024 to 7 August 2025. Berjaya CKE 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	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	Department of Occupational Safety and Health (DOSH)	*Annual audiometric testing completed on 20 July 2024 and the next renewal for CHRA is due in 2025.*

No.	Act and Regulation	Description	Relevant Authority	Relevance and Action Required
	Chemicals Hazardous to Health) Regulations 2000 • Occupational Safety and Health (Noise Exposure) Regulations 2019	mitigate potential health risks. Audiometric testing is required annually under the Noise Exposure regulations to monitor employees' hearing health. 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.		Berjaya CKE conducted its last CHRA in 2020, while the audiometric testing is performed every year. The chemical health risk of propane (R-290) needs to be evaluated in the upcoming CHRA. No further action is required. The subproject does not involve installation of machinery that requires registration and approval
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. Berjaya CKE 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.

No.	Act and Regulation	Description	Relevant Authority	Relevance and Action Required
6	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, plant and equipment with respect to matters relating to the safety of persons and the efficient use of electricity.	Energy Commission (ST)	*Annual renewal required.* Berjaya CKE's Certificate of Registration for electrical installation is valid until 12 December 2024. The certificate must be renewed through the Energy Commission Online System (ECOS) before it expires.
7	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 Bandaraya Seremban for solid waste collection, transport, and disposal.
8	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.* Berjaya CKE obtained a CFO on 18 July 2005 for the current premises. For any future building renovation or changes associated with the project, Berjaya CKE must notify the Building Department at Majlis Bandaraya Seremban.

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 dust).

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 22 modifies the use conditions required for use of three flammable refrigerants – isobutane (R-600a), propane (R-290), and R-441A in new household refrigerators, freezers, and combination refrigerators and freezers, effective September 7, 2018. The use conditions, which address safe use of flammable refrigerants, are being revised to reflect the updated UL Standard 60335-2-24. The new use conditions are:

1. New equipment only; not intended for use as a retrofit alternative
2. Use only in equipment that meets all requirements in the 2017 UL Standard 60335-2-24.

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 Safety Standards for Commercial Refrigeration Equipment, Installations or Products

Most familiar to those within the Refrigeration and Air Conditioning (RAC) industry are the sector-specific safety standards. The most prominent international standards and equivalent European regional standards and national USA standards are listed below:

- EN IEC 60335-2-89 Household and similar electrical appliances – Safety – Part 2-89: Particular requirements for commercial refrigerating appliances and ice-makers with an incorporated or remote refrigerant unit or motor-compressor
- UL/IEC 60335-2-24 Household and similar electrical appliances – Safety – Part 2-24: Particular requirements for refrigerating appliances, ice-cream appliances and ice-makers
- UL 471 Standard for Commercial Refrigerators and Freezers
- ISO 5149-1 Refrigerating systems and heat pumps – Safety and environmental requirements – Part 1: Definitions, classification and selection criteria
- ISO 5149-2 Refrigerating systems and heat pumps – Safety and environmental requirements – Part 2: Design, construction, testing, marking and documentation
- ISO 5149-3 Refrigerating systems and heat pumps – Safety and environmental requirements – Part 3: Installation site
- ISO 5149-4 Refrigerating systems and heat pumps – Safety and environmental requirements – Part 4: Operation, maintenance, repair and recovery
- EN 378-1 Refrigerating systems and heat pumps – Safety and environmental requirements – Part 1: Basic requirements, definitions, classification and selection criteria
- EN 378-2 Refrigerating systems and heat pumps – Safety and environmental requirements – Part 2: Design, construction, testing, marking and documentation
- EN 378-3 Refrigerating systems and heat pumps – Safety and environmental requirements – Part 3: Installation site and personal protection
- EN 378-4 Refrigerating systems and heat pumps – Safety and environmental requirements – Part 4: Operation, maintenance, repair and recovery
- ASHRAE-15 Safety Standard for Refrigeration Systems

These standards address the following topics, which are pivotal to the cost-effective application of flammable refrigerants:

- Limits on refrigerant charge amount
- Control of electrical components and components with hot surfaces
- Use of pressure limiting and relief devices
- Use of gas sensors
- Construction of machinery rooms
- Extract ventilation and/or circulation airflow rates

The present international standards for use of R-290 and R-600a allow charges in commercial refrigeration units.

2.3.4 Refrigeration and Air Conditioning (RAC) Industry Codes of Practice

Several industry organizations have developed safety codes to help guide practitioners through the myriad rules and regulations associated with the use of flammable refrigerants to help provide a more practical interpretation of what the obligations are. Examples of this include the British Institute of Refrigeration "Safety Code of Practice for Refrigerating Systems Utilizing A2 & A3 Refrigerants" and the Australian Institute of Refrigeration, Air Conditioning and Heating (AIRAH) "Flammable Refrigerant Safety Guide". In addition to these, many refrigeration systems and component manufacturers offer guidelines on the subject.

2.3.5 Specific Safety Provisions Regarding R-290 and R-600a

R-134a and R-404A are classified following GHS classifications as "Gas under pressure, Liquefied Gas" or referring the UN recommendations on the transport of dangerous goods as "non-flammable, non-toxic gas". R-290 and R-600a are classified as "flammable gas, gas under pressure, compressed gas". These are all considered hazardous substances. **Table 2.2** presents the hazards of these refrigerants.

Table 2.2 Hazard Classification of Refrigerants

	R-404A	R-134a	R-290	R600a
Boiling Point	-46°C	-26°C	-42°C	-12°C
Safety Group	A1	A1	A3	A3
GHS pictograms				
GHS Code / Hazard statement	Non-Flammable Gas	Non-Flammable Gas	Flammable Gas	Flammable Gas

Following the European Partnership for Energy & the Environment (EPEE), the conversion from HFC-134a and R-404A to R-290 (Propane) and/or R-600a (Isobutane) in commercial refrigeration sector faces the so-called "the refrigerant dilemma" meaning in one hand

reducing the GWP but in the other hand increasing flammable hazard properties. The main disadvantage discussed in connection with R-290 and R-600a use is the risk based in its flammability. This leads to the necessity for very careful handling and safety precautions. **Table 2.3** depicts the flammability of R-290 and R-600a.

Table 2.3 Flammability of R-290 and R-600a

	R-290		R-600a	
Lower Explosion Limit (LEL)	2.1%	Ca. 39 g/m^3	1.5%	Ca. 38 g/m^3
Upper Explosion Limit (UEL)	9.5%	Ca. 171 g/m^3	8.5%	Ca. 212 g/m^3
Minimum ignition temperature	470^{o}C		460^{o}C	

Due to their 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-290 or R-600a, 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-290 or R-600a leaks or is exposed to oxygen in the air, leading to the formation of the correct mixture.

Safety provisions regarding R-290 and R-600a typically include stringent protocols for handling, storage, and usage due to their flammable nature. Some of the key provisions are:

a) Storage: Flammable refrigerants like R-290 and R-600a 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.

2.3.6 Energy Performance Standards

Relevant international standards that govern energy performance, including testing, in refrigeration equipment similar to what Berjaya CKE produces include (but is not exhaustive):

- IEC 62552-1 Household refrigerating appliances – Characteristics and test methods: General requirements
- EC 62552-3 Household refrigerating appliances – Characteristics and test methods: Part 3: Energy consumption and volume
- ISO 22044 Commercial beverage coolers – Classification, requirements and test conditions

In the case of the subproject, the Multilateral Fund's methodology was utilized to identify models that were energy inefficient and will be supported to reduce energy consumption and hence indirect emissions of carbon dioxide from electricity generation. The methodology is based on U4E's model regulation guidelines for energy-efficient and climate-friendly commercial refrigeration equipment (U4E_CommercialRefrig_ ModelRegulation_20230728 _EN.pdf revised July 2023). Part of the EE support to Malaysia and the commercial refrigeration industry will be for the Energy Commission to develop a minimum energy performance standard (MEPS) and in cooperation with SIRIM, voluntary guidelines for equipment falling outside this forthcoming mandatory MEPS.

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. The improvement of energy performance in the equipment is conversely considered to be an opportunity for positive impact rather than a risk. 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.

Environmental and Social Standard	Description	Relevance and Management
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 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.	***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 to use a small amount of resources and materials for the installation of new conversion lines and to reduce resource (energy) requirements in the final products. Hence there is avoidance of additional, indirect GHG emissions, on top of the direct emission reductions from replacing HFCs in products. 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:	This standard recognizes that project-related land acquisition and	***Not Currently Relevant***

Environmental and Social Standard	Description	Relevance and Management
Land Acquisition, Restrictions on Land Use and Involuntary Resettlement	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 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.	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.
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	***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
	"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 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	***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

Environmental and Social Standard	Description	Relevance and Management
	the environmental and social sustainability of projects, enhance project acceptance, and make a significant contribution to successful project design and implementation.	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. 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

Berjaya CKE International Sdn Bhd (hereinafter refer to as "Berjaya CKE") was established in 1980 under the name Yowaki Corporation Sdn Bhd and registered in 1994 as a private owned limited share company under the name Berjaya Steel Product (Registration number 199401015760 (301440-W)) – 100% Malaysian-owned. In September 2024, Berjaya Steel Product Sdn. Bhd. and CKE Holdings Sdn. Bhd. were renamed to Berjaya CKE International Sdn. Bhd. and Berjaya CKE Enterprise Sdn. Bhd. when entered into a partnership with AIGF (Singapore), a private equity firm sponsored by Mitsubishi Corporation (Japan). Berjaya CKE is 70% Malaysian-owned and controlled with 30% foreign ownership by AIGF.

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Contact person: Mr. E.B. Au, Factory Director
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Berjaya CKE is the leading Malaysian producer of commercial refrigerators, electrical and gas cooking equipment, food servicing equipment, bakery equipment and other stainless-steel product and with exports of commercial refrigeration and food making equipment products to over 60 countries. Berjaya CKE's products are approved by SIRIM (Standard & Industrial Research Institute of Malaysia). Commercial refrigerator units are also obtaining Australia MEPS approval, Europe Standard (CE) certification and approved GEMS Australia. The company has ISO 9001 certification.

The commercial refrigeration product produced by Berjaya CKE includes 8 main models of display chillers, freezers, Upright Chiller, Upright Freezer, Counter Chiller, Counter Freezer and other refrigeration kitchen equipment. Berjaya CKE sells mainly its commercial refrigeration units in the Malaysia market but also exports to other countries in the region, to Singapore, Vietnam, Philippines, India and Middle Eastern, exporting to more than 60 countries. It also exports small number of commercial refrigeration units to Australia. In late 2009, Berjaya CKE initiated the manufacturing of commercial refrigeration systems with the use of HFC.

The blowing agent of the insulation foam for Berjaya CKE's commercial refrigeration products cabinets was converted from HCFC-141b to Cyclopentane with financial support from the Multilateral Fund (MLF). Conversion of the foam production from HCFC-141b to Cyclopentane was included in Malaysia's Stage I HCFC Phaseout Management Plan (HPMP) approved at the 65th Executive Committee (ExCom) meeting in November 2011. Berjaya CKE was one of the 13 foam producers financed. As per the HPMP, Berjaya CKE's HCFC-141b consumption was 43 MT.

The company employs 682 workers of which 105 work in the office. The remaining 577 people work on the production lines. Most of them are foreign workers from Bangladesh, Nepal and Myanmar. The company offers housing for foreign workers. Male and female workers have equal employment opportunities. Due to the nature of the work, female workers prefer to hold office jobs reflected by the total number of more than 40 female workers having office jobs and three females working in the production lines. All three female employees working in the production lines are skilled workers. They are responsible for quality management and assurance.

3.2 LAND USE AND SENSITIVE RECEPTORS

Berjaya CKE is located in a 400-acre industrial park - Arab Malaysian Industrial Park in Negeri Sembilan state, approximately 30 km southeast of Putrajaya. This industrial park houses 200 factory lots. **Figure 3.1** shows the location of Berjaya CKE at the western corner of the industrial park. The area is mainly surrounded by other Light Industrial Area and commercial lots. The industrial park can be accessed via the North-South Expressway or the Kajang-Seremban Highway.

The nearest residential area is Desaria located 174 m west of the factory. Residential areas within 1 km radius from the factory are Bandar Puteri Bangi and Taman Desa Saga in the northwest direction. The more densely populated areas are located to the north and south of the factory more than 1 km away, namely Bandar Bukit Mahkota, Bandar Seri Putra, Laman Lavenda, Laman Jasmin, Laman Dahlia, and Nilai Impian. There is a memorial park located about 1 km to the southwest of the factory. Across the North-South Expressway, 2km southwest of the factory, lies Universiti Sains Islam Malaysia and the Malaysia National Velodrome and Sports Complex.

Regarding the designated land use for where the factory is located and according to the Department of Town and Country Planning, Berjaya CKE is located in an industrial land use type as shown in purple in **Figure 3.1**.

3.3 LAYOUT OF THE MANUFACTURING FACILITY

Berjaya CKE's existing manufacturing facility occupies a total area size of 11.4 acres. The building ground floor is divided into different blocks for different processing area as follows and as shown in **Figure 3.2**:

- Block A – Stamping and Moulding
- Block B – Bowl Sink and Special Project Assembly
- Block C – CNC Machining and Bending
- Block D – Special Project Packing
- Block E – Electrical and Gas Line Assembly
- Block F – Semi Material Store
- Block R – Refrigerator Assembly
- Block S – Raw Material Store and Process

The second floor of the building is mainly for storing finished products (**Figure 3.3**). An existing Wastewater Treatment Plant (WWTP) is located within the plant and a dedicated scheduled waste storage at the back of the plant as shown in **Figure 3.2**. Berjaya CKE segregates hazardous wastes (scheduled wastes) from general wastes and disposes accordingly. **Figure 3.4** shows an enlarged layout of Block R which shows the area where proposed conversion will be carried out at the production lines and gas charging station, as well as the gas storage area. The location of existing charging units is as marked in **Figure 3.4**.

3.3.1 Existing Production Equipment

The existing production equipment in the factory specifically at the charging station consists of those as listed in **Table 3.1**.

Table 3.1 Existing Production Equipment

Production line equipment	Brand name	Model number	Units	Year installed	Serial Number
Vacuum pumps	ULVAC	VDN301	12	2014-2017	NB63A-22813 NB63A-22811 NB63A-22810 NB63A-22809 NB63A-22806 NB63A-22816 NB63A-22814 NB63A-22812
AGRAMKOW HFC-134a charging unit	AGRAMKOW	EMAC-HS	2	2017	16300560 FQ3600206382-01001
AGRAMKOW HFC-R-404A charging unit	AGRAMKOW	EMAC-HS	1	2017	FQ3600206382-01002
Infrared refrigerant leak detector (Fieldpiece)	Fieldpiece	DR82	2	2021	22031142AACD 21051361AACD
Infrared refrigerant leak detector (Bacharach)	Bacharach	XP-704111	2	2021	NA
Helium leak detector	PROTEC	P3000	2	2017	NA
Helium Charging Station & Helium Recovery Station	AGRAMKOW	HRM6	1	2017	NA
Nitrogen Generation Sy Booster	ANOX	NX40	1	2014	NA
Nitrogen Generation Sy Booster	ANOX	NX40	1	2017	NA

Note:

Equipment to be replaced

3.3.2 Existing Commercial Refrigeration Product Type

The type of commercial refrigeration units produced by Berjaya CKE includes display units, upright display units, showcase units, counter units, chest freezers units and ice making units and a number of other more specialized refrigeration units as tabulated in **Table 3.2**.

The operating temperature of chest freezers is within the range of -18°C – 23°C and for chillers at 2°C – 4°C. While Berjaya CKE has decided to select only R-290 as future refrigerant, Berjaya CKE has also agreed that both R-290 and R-600a are listed as alternatives to replace R-134a and R-404A in the project.

Table 3.2 Commercial Refrigeration Product

Refrigerant	Equipment Type	Refrigerant Charge (gram/unit)	Models
HFC-134a	Display series	260-380	9
	Upright series	230-300	9
	Counter series	130-250	6
	Barline series	250-450	10
	Pizza salad	480-650	2
	Drawer series	340-450	3
	Juice dispensers	165-370	3
	R Display series	420-1,500	5
	F Display	400-750	3
R-404A	Display freezers	550-1,100	8
	Upright freezers	350-1,280	9
	Show cases series	310-830	10
	Counter freezer	250-500	10
	Pizza salad series	490-650	7
	Blast freezers	1,200-2,300	3
	OS display series	1,600-1,800	3
	R-Display series	2,200	1
	Piping series	660-1250	3

N

Scale:
As shown

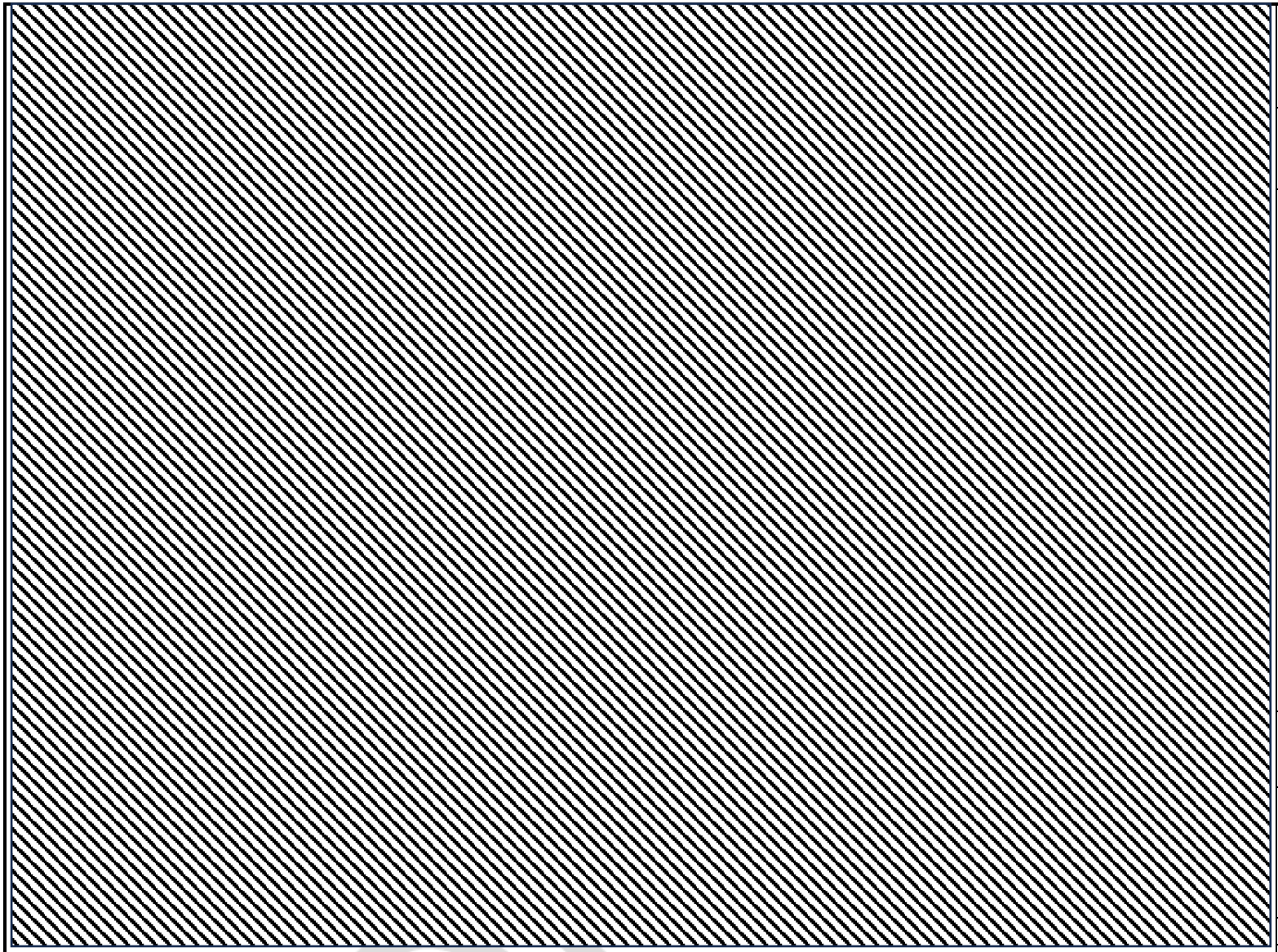
Legend:

	Berjaya CKE factory
	Existing industry
	Infrastructure and Utilities
	Open field and public recreation
	Agricultural
	Empty Land
	Commercial
	Residential
	Institution and public amenities

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

Drawing No. & Title:
Figure 3.1 Land Use Map of Berjaya CKE

Revision:	0
Date:	2 Feb 2024



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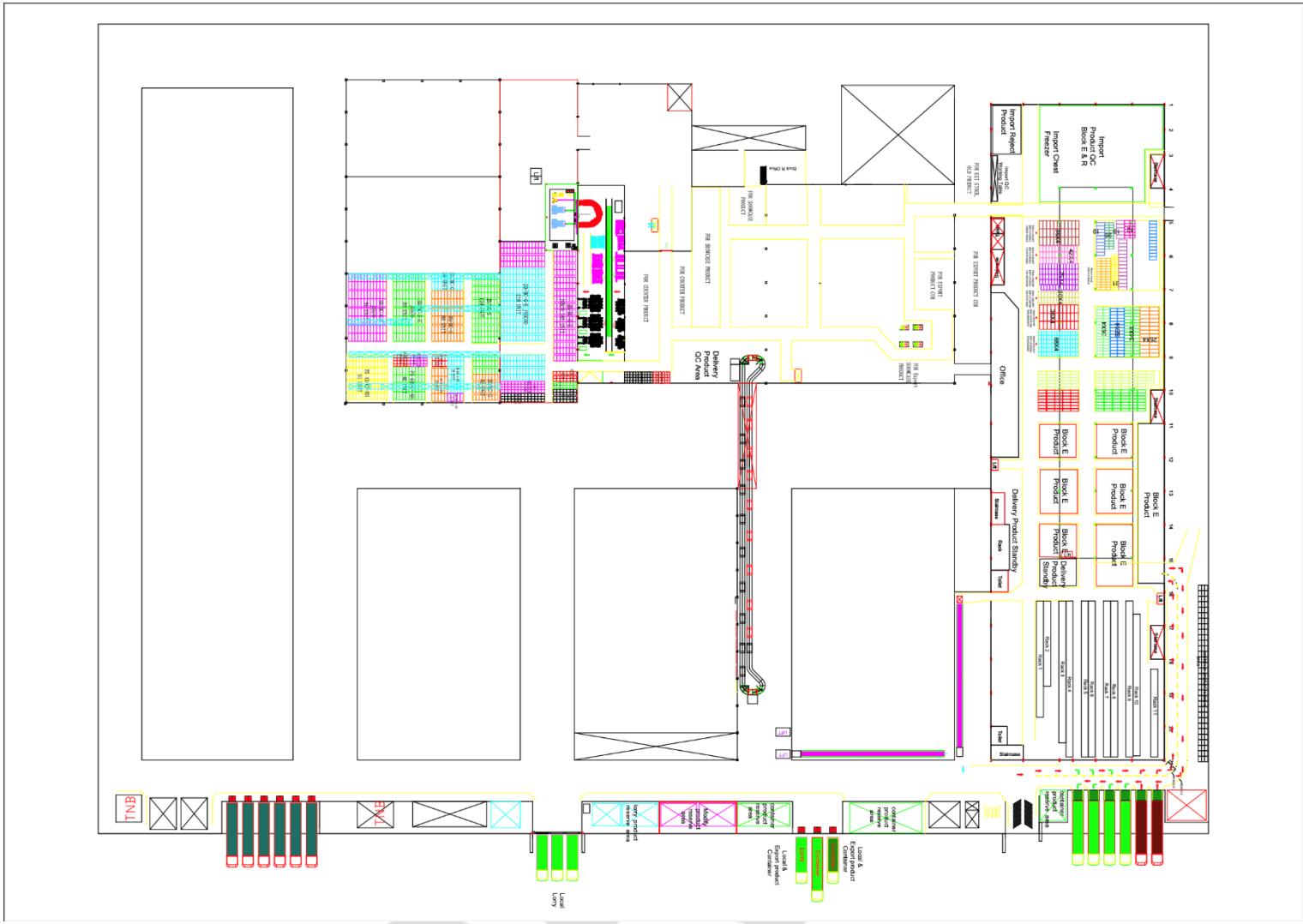
Data Source: Berjaya CKE, 2024	
Drawing No. & Title: **Figure 3.2 Berjaya CKE Factory Layout (Ground Floor)**	
Revision:	0
Date:	2 Feb 2024



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Not to Scale

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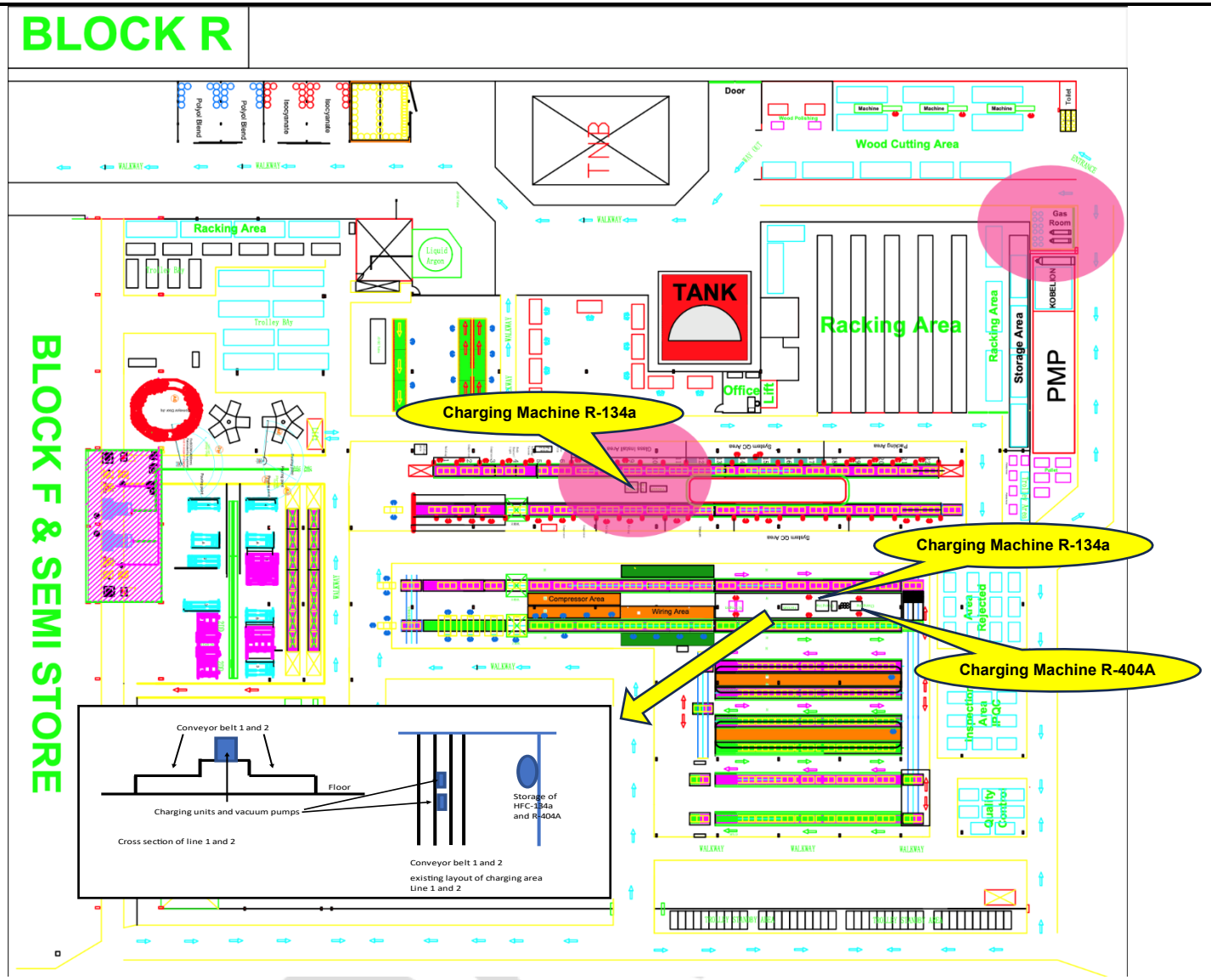
Data Source:
Berjaya CKE, 2024

Drawing No. & Title:
Figure 3.3
Berjaya CKE Factory Layout (Second Floor)

Revision:	0
Date:	2 Feb 2024



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Data Source:
Berjaya CKE, 2024

Drawing No. & Title:
Figure 3.4
Berjaya CKE
Layout for Block R

Revision:	0
Date:	2 Feb 2024

3.4 MANUFACTURING PROCESS

The commercial refrigerator production at Berjaya CKE includes the following and is summarized in **Figure 3.5**.

All cabinets are produced and assembled at the factory. The metal workshop produces all the steel plates for the units in the shape and form needed for the cabinets. The large number of different sizes and forms require highly specialized tools and machinery as found in the metal workshop. The steel plates are painted within the factory.

Piping for the refrigeration circuits within the units is also made by the company. The company has the necessary tools for cutting and forming the pipes for the various models produced. Heat exchange units are procured from external suppliers based on specifications developed by Berjaya CKE. Compressors are also bought from the local distributors for global brands such as Embraco, Danfoss, Secop, Tecumseh etc.

The next step in the process is assembling the commercial refrigeration cabinets which are done on the platform next to the metal workshop area. The assembling of the units includes installing the refrigeration circuit, condenser, compressors, and other components.

After they are assembled, the units are moved to the charging area where they are vacuumed to ensure there are no leakages and to remove any moisture inside the refrigeration circuits. Each unit is marked with the amount to be charged and the charging unit injects the exact amount of refrigerant to the unit. After charging, the unit is connected to the performance testing unit to ensure it is functioning correctly. Leak detectors are used by the staff to check all the units after they are charged with the refrigerant.

Chillers and freezers are manufactured on four production lines. Each group of two production lines has vacuum pumps and refrigerant charging unit located on raised platform between the two production lines as shown in **Figure 3.4**. The first group has two refrigerant charging units: one for HFC-134a and another for R-404A which will be replaced with R-290 and R-600a charging machine. The second group of another two production lines has vacuum pumps with only one HFC-134a charging machine.

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 for new compressor suppliers for R-290 and R-600a refrigerants and inverter technology. Assembling units, including the refrigeration circuit, condenser, compressors, and other components, will utilize an ultrasonic welding system to mitigate any temperature spike. Upon refrigerant charging, either ultrasonic welding, pneumatic pinch off/ assembly tool or Lokring will be used to seal the circuit.

Figure 3.5 Manufacturing Process Flow

Fabrication
Fabrication will do at the beginning stage by using the following raw materials: Pre-cut stainless steel sheets, pre-cut galvanized iron plates, copper pipes in coil and pre-cut glass sheets.

Bending / Cutting
The pre-cut stainless-steel sheets and G.I sheets are bended / cut by the machine by follow the dimension of the body part respectively.

Body Assembly
The bended sheets are then assembled into its respective products by means of screw and reverting without welding.

PU Body
The assembled bodies are sent to chemical department for PU and gas injection respectively.

Glass / Door Fixing
The pre-cut glasses are fitted onto the doorframe and whole door will fix onto body of product.

Condenser and Evaporator Installation
After the bodies are injected chemical and gas at chemical department, it will send for install of condenser and evaporator.

Gas Leakage & Gas Injection
Refill gas and check for leakage.

Wiring & System
Electrical components such as compressor units, fans, digital thermostat, cooling coil etc. are then fixed onto the finished body and join with the electrical wires to form a finished product.

System Quality Control
The finished products are then sent to Quality Control department to do QC test for its proper function and specification compliance. The testing is mainly electrical components operated for temperature recordings. The QC approved finished products are then sent for cleaning.

Cleaning
The finished products are then wiped clean by wiping with moist cloth to clean dust and dirt before packing for storage.

Packaging
The cleaned products are then wiped in stretch film and labeled for export or local sales purposes.

Storage
The packed products are then put in storage areas accordingly and having stock controls.

Potential for refrigerant leakage

3.5 CHANGES NEED FOR PROPOSED CONVERSION

The company has four manufacturing and assembly lines which all will be converted to the use of R-290 and R-600a refrigerants. Due to the flammability of R-290 and R-600a, the existing charging units will be replaced with new charging units suitable for use of R-290 and R-600a to meet national and international safety standards.

The approved funding for this sub-project will finance incremental capital 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	The existing models will all have to be redesigned and tested to ensure that they meet the standards required by Berjaya CKE and its customers. This means that prototypes have to be developed for each model and must be tested to confirm that it meets specifications before it can go into production. Due to the use of R-290, several electrical components and the compressors must meet safety standards specific for use of R-290.
2	Charging Lines	Chillers and freezers are manufactured across four production lines. Among these, two assembly and production lines share vacuum pumps, with one HFC-134a charging unit and another for R-404A. These HFC-134a and R-404A refrigerant charging units will be replaced by two R-290 and R-600a charging units. Berjaya CKE has agreed that it will convert the other two assembly and charging lines which currently share one HFC-134a charging unit, at its own cost as soon as possible to meet customer demand for commercial refrigeration units with low-GWP refrigerants. This conversion cost of those two lines is considered as part of Berjaya CKE's co-financing.
3	Vacuum Pumps	Prior to charging refrigerant, all refrigeration units must be vacuumed to extract humidity. Due to the location of the vacuum pumps about 1 meter above floor level, they are above the area where an explosive atmosphere might be created. Funding has accordingly not been requested to replace the vacuum pumps. A national electrical expert would need to confirm this is consistent with the Malaysian Electrical Code regarding ex-zoning of electrical installation. It is likely that the vacuum pumps must be replaced due to risk of explosive atmosphere (to be confirmed at subproject technical appraisal by the PMU), and Berjaya CKE has confirmed that they will cover the cost of replacing the vacuum pumps if so needed.
4	Leak Detectors	The leak detectors procured in 2021 replaced existing leak detectors procured when the Berjaya CKE converted to use of HFC-134a and R-404A. Unfortunately, the Fieldpiece and the two Bacharach leak detectors cannot be used for R-290. Hence, funding for the replacement of two of the three leak detectors is requested. The existing three leak detectors will continue to be used as long as the company is producing new HFC units and servicing existing HFC units.

No.	Item	Required Modification
5	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-290 and R-600a charging and storage 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.
6	Storage Area	Both R-290 and R-600a will be delivered in high pressure cylinders. The sizes of the cylinders depend on the local supplier. Based on a future consumption of about 5,000 kg, the amount stored could be about 2,000 kg stored in cylinders outside the factory and with pipe connection and pump to the 3 charging stations. The existing storage tank area for the Cyclopentane cannot be used for storage of R-290 and R-600a as it is dedicated to Cyclopentane. Berjaya CKE to identify an area with easy access and outside the factory for storage of R-290 and R 600a by subproject appraisal and as acceptable to the PMU and WB.
7	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-290 and R-600a. This will require some training and might also take longer time to charge units. It is expected that the units produced during the trials will be checked to ensure safety and will be sold.

Redesign of existing refrigeration models for use of R-290: Existing models will be redesigned and tested to ensure that they meet the standards required by Berjaya and its customers. Prototypes will be developed and tested for each model to confirm that they meet specifications before going into commercial production. Due to the use of R-290, several electrical components and the compressors must meet safety standards specific for use of R-290.

All models converted from HFCs will undergo testing at a third-party testing center to ensure that they meet performance and safety requirements and the reduced energy consumption (for the selected models that will also be funded for EE improvement) as required by the energy efficiency activities under the KIP for HFC Phasedown Project.

Table 3.4 Actions for updating models for HC and improved energy efficiency

1	Upgrade of Berjaya CKE test room.
2	Design of select models for use of R-290, ensuring existing EE is maintained.
3	Design of select models for both the use of R-290 and for improved EE.
4	EE Testing at third Party testing center, (e.g. SIRIM)
5	Commercial production of redesigned models for HC and EE.

3.6 DUE DILIGENCE REVIEW ON ENVIRONMENTAL, HEALTH AND SAFETY

A visit to the Berjaya CKE manufacturing facility was conducted on 8th of March 2024 aimed to assess the enterprise's operational practices, safety protocols, and environmental compliance. Several good practices can be observed at Berjaya CKE:

a) **Worker Welfare:** The enterprise's dedication to worker welfare is evident through the provision of hostel facilities for foreign workers, showcasing a commitment to their well-being. Furthermore, initiatives to enhance sewage treatment facilities reflect a concern for environmental and health standards. Additionally, the provision of a water station within the plant ensures safe and clean drinking water, further highlighting the enterprise's commitment to employee well-being.

b) **Safety Measures:** The enterprise demonstrates a proactive approach to safety measures by ensuring the presence of first aiders on site, ventilation in the workplace to eliminate workers' chemical exposure, conducting regular audiometry monitoring, and providing workers with personal protective equipment (PPE) for work activities. Moreover, the installation of automatic sprinklers throughout the factory building, along with strategically placed fire extinguishers and first aid boxes within each process block, highlights a commitment to ensuring safety and health of worker.

c) **Regulatory Compliance:** Berjaya CKE exhibits a strong commitment to regulatory compliance by conduction air emission monitoring and appointing competent person to oversee the wastewater treatment plant (WWTP) and manage scheduled waste respectively, in accordance with DOE requirement. Berjaya CKE is equipped with an operational WWTP within its premises, ensuring the effective treatment of production wastewater to meet the discharge limits stipulated in the Environmental Quality (Industrial Effluent) Regulations 2009. Moreover, sewage generated on-site will undergo collection and treatment via a septic tank system, with regular desludging conducted by Indah Water Konsortium (IWK) contractors twice annually. The enterprise diligently conducts monitoring and reporting activities to ensure the quality of treated wastewater and maintains accurate records of scheduled waste inventory.

d) **Emergency Preparedness:** Despite the lack of recent emergency drills, Berjaya CKE demonstrates preparedness for emergencies through designated assembly points and fire tunnels, highlighting their commitment to safety. Efforts to expand assembly areas and enhance emergency procedures further underscore their dedication. Additionally, allocating a budget for environmental, health and safety (EHS) management, along with documented training plans, exemplifies proactive preparedness. Their emergency response procedures include evacuation protocols and steps to address fires, chemical spills, and major accidents, ensuring timely notification of key personnel and emergency services. The comprehensive emergency response plan encompasses an Emergency Response Team (ERT) chart, contact details for company representatives, and emergency contact numbers, addressing various emergencies and detailing the location of emergency equipment and first aid provisions. An annual review process ensures its effectiveness.

e) **Quality Management:** Berjaya CKE's ISO 9001 certification demonstrates a commitment to quality management systems. It signifies the enterprise's ability to

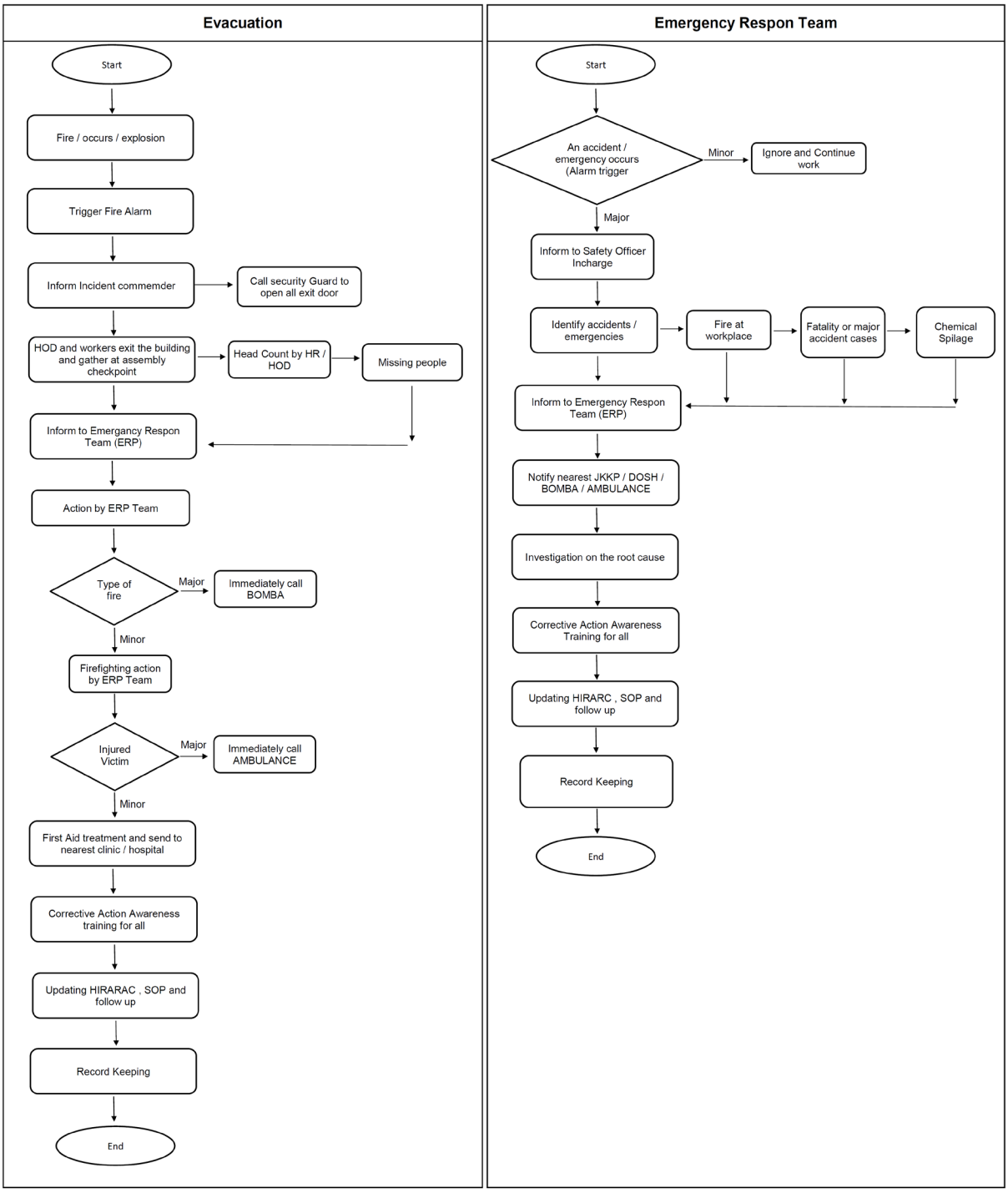
consistently meet customer requirements, enhance organizational performance, and drive continuous improvement in its processes.

The field visit to Berjaya CKE revealed a company deeply committed to various aspects of employee welfare, safety, regulatory adherence, emergency readiness, and quality management. However, there are areas of concern identified during the visit, such as inadequate storage practices for hazardous materials, non-compliant waste storage facilities, and improper design of wastewater collection systems. These findings indicate a need for corrective actions to address environmental and safety risks and ensure compliance with regulations. Overall, while the enterprise exhibits strong environmental and social baseline conditions in many aspects, there are areas requiring improvement to enhance environmental stewardship and social responsibility.

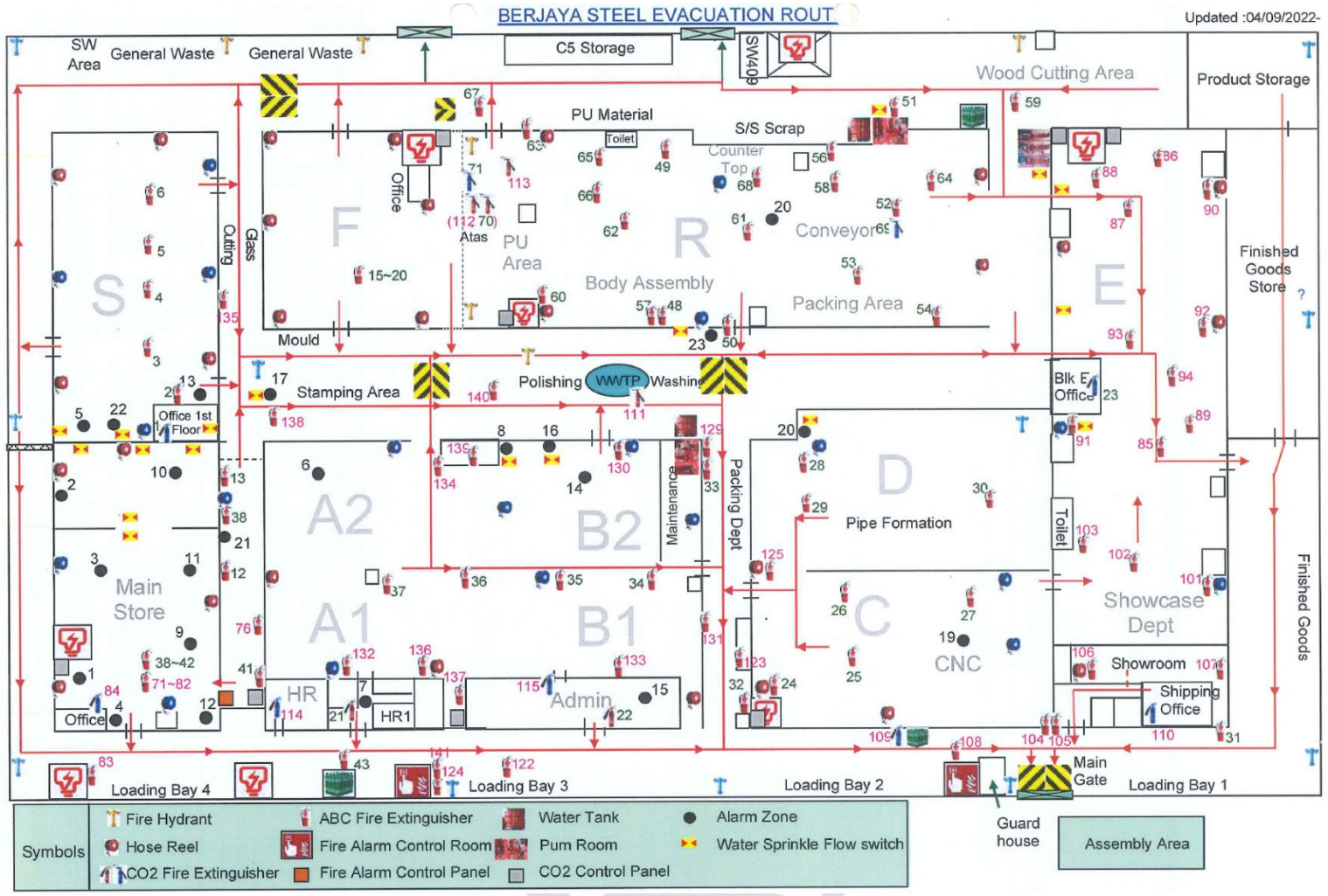
3.7 EMERGENCY RESPONSE PLAN (ERP)

Berjaya CKE has developed comprehensive emergency response plans to address various potential emergencies within the factory premises, including fires, explosions, natural disasters (earthquakes), and chemical spillages. The emergency response procedures/flowchart are shown in **Figure 3.6**. Berjaya CKE's emergency response procedures, outlined in **Figure 3.6**, encompass evacuation protocols for fire or explosion incidents, as well as procedures for addressing fire, chemical spills, and major accidents. These protocols include steps to notify key personnel such as the safety officer, Incident Commander (IC), Emergency Response Team (ERT), and emergency services such as the fire department and ambulance. Their comprehensive emergency response plan includes an Emergency Response Team (ERT) chart, contact details for company representatives, and emergency contact numbers for local fire stations, ambulance services, police, and hospitals. This plan addresses potential emergencies such as fire, explosion, natural disasters, and chemical spills, along with the location of emergency equipment and trained personnel, provisions for first aid, and employee emergency contact information (including foreign worker representatives). An annual review process ensures the plan remains current and effective. Key emergency response resources include 140 nos fire extinguishers, 2 nos fire water tanks/reservoirs with a capacity of 42,000 gallons each, 48 nos fire hose reels, 17 nos strategically placed fire hydrants within the factory and around its perimeter, and 22 nos fire alarms installed throughout the facility. Additionally, an assembly area has been designated infront of the factory, adjacent to the guard house, providing a safe gathering point in case of evacuation. The emergency evacuation route is clearly illustrated in **Figure 3.7**.

Figure 3.6 Berjaya CKE Emergency Response Procedures



Source: Berjaya CKE, 2024



Scale:
Not to Scale

Legend:
Refer Drawing

Data Source:
Berjaya CKE, 2024

Drawing No. & Title:
Figure 3.7
Berjaya CKE Evacuation Route and Fire Protection Systems

Revision:	0
Date:	2 Feb 2024

3.8 GRIEVANCE REDRESS MECHANISM (GRM)

Communities and individuals who believe that they are adversely affected by this conversion from HFC-134a and R-404A to R-290 and/or R-600a in commercial refrigeration manufacturing at Berjaya CKE may submit complaints or feedback directly to Berjaya CKE through various communication channels, including

Website: https://berjayacke.com/
Tel.: +606-799 6363
Fax: +606-799 6364
Contact person: Mr. E.B. Au, Factory Director
E-mail: au.eb@berjayacke.com

The GRM ensures that complaints received are promptly reviewed in order to address project-related concerns. Project affected communities and individuals may submit their complaint or feedback to the Berjaya CKE Environmental, Health and Safety Officer which determines whether harm occurred, or could occur, as a result of Berjaya CKE non-compliance with its policies and procedures. Complaints may be submitted at any time after concerns have been brought directly to Berjaya CKE, and the Berjaya CKE management has been given an opportunity to respond within a 5-day timeframe.

4 ENVIRONMENTAL AND SOCIAL RISKS AND IMPACTS

This chapter provides a comprehensive overview of the potential consequences of Berjaya CKE'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 risk and impacts of Berjaya CKE'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 Berjaya CKE'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 commercial refrigeration production. Additionally, the workforce of 682 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 Berjaya CKE'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 wastewater and sewage 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 phase of equipment to upgrade production lines. With only 5-7 people

Potential Impact	Description
	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, Berjaya CKE 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, Berjaya CKE 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: • SW204 – wastewater treatment sludge • SW305 – spent lubricating oil from maintenance and production • SW306 – spent hydraulic oil from maintenance and production • SW307 – spent mineral oil-water emulsion from production • SW409 – contaminated containers, bags, or equipment from production • SW410 – contaminated rags, plastics, papers or filters
Air Emission	Refrigerants using R-290 and R-600a are lower chronic toxicity (Class A) according to ISO 817 and therefore does not cause toxic harm to environment or health. However, during servicing activities that involve the use of R-134a and R-404A, air emissions may occur due to the release of

Potential Impact	Description
	these refrigerants into the atmosphere. Both R-134a and R-404A are high GWP refrigerants, contributing to greenhouse gas emissions when released. Conversion to inverter compressors and other EE improvements will further reduce emissions of carbon dioxide in addition to eliminating R-134a and R-404A.
Occupational Safety and Health	Risks affecting occupational health and safety mainly from the process of replacing, using and operating refrigerants. R-290 and R-600a fall under the category of class 3 “higher flammability”. 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. The gases R-290 and R-600a have higher density than air. When leaked, the gas can accumulate and travel along the underlying area such as water collection pits, drains and towards ignition sources away from the leak site. The fire will flare back to the source of leak and burn violently. Therefore, ventilation in storage areas, handling and using refrigerants is very important. 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 Berjaya CKE'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 issues identified during the due diligence process. By addressing these environmental and social issues at the design stage, Berjaya CKE 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 • Vacuum pumps replacement • Storage of R-290 and R-600a refrigerant • Emergency Response Plan	Low	• Assess and replace existing vacuum pumps if needed to address the risk of explosive atmospheres during subproject technical appraisal by the PMU. • Identify and designate a specific area for the storage of R-290 and R-600a refrigerants. • Ensure the storage area is easily accessible, located outside the main factory building and situated away from potential source of ignition (i.e. wood cutting area) 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. • Enhance the current emergency response plan by incorporating specific procedures to address potential gas leaks and electric issues. This includes implementing evacuation protocols, integrating gas detection systems, ensuring proper ventilation measures, and providing guidance for handling electric emergencies. • Ensure the existing emergency assembly area is expanded to accommodate all factory workers.
Scheduled Waste Generation • Storage area	Low	• Immediate removal of sand from the bund containment area, followed by a thorough inspection and reinforcement of bund integrity. • Implement clear labelling protocols to differentiate between recycled waste and scheduled waste.

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 waste 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 Safety and Health
• 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.);
		  ○ Traffic and fire safety regulations within the factory premises;

Potential Impact	Magnitude of Potential Impact	Proposed Mitigation Measures
		○ 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. ○ Deploy personnel with appropriate protective gear to clean up the spilled material. ○ After any incidents or accidents, the Contractor must compile a detailed

Potential Impact	Magnitude of Potential Impact	Proposed Mitigation Measures
		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 generation, 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 meet the limits of Environmental Quality (Industrial Effluent) Regulations 2009. • Ensure regular desludging by contractor on a biannual basis for sewage treatment system.
Domestic or Solid Waste Generation	Low	• Daily collection and housekeeping practices adhering to best management practices and regulatory standards.

Potential Impact	Magnitude of Potential Impact	Proposed Mitigation Measures
		• 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 refrigerants during servicing • Release of R-290 and R-600a	Low	• Install at the charging and storage areas and correct height, and employ leak detection equipment to identify and repair leaks promptly. • Implement regular maintenance schedules to check for potential leaks. • Provide comprehensive training for technicians on proper handling procedures for refrigerants.

Potential Impact	Magnitude of Potential Impact	Proposed Mitigation Measures
during storage and production		• Stay informed about commercial refrigeration service training programs offered by DOE and ensure technicians attend these trainings. • Use proper recovery equipment to capture refrigerants before servicing. • 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-290 and R-600a. • Regular maintenance of ventilation systems to maintain efficiency. • Follow safe storage practices to minimize the release of R-290 and R-600a 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. • 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.

Potential Impact	Magnitude of Potential Impact	Proposed Mitigation Measures
		• Perform a Noise Risk Assessment for changes in the process. • Review process Hazard Identification, Risk Assessment and Risk Control (HIRARC). • 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 HC refrigerants. • Develop and 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 or deploy alternative, safe brazing techniques (ultrasonic welding or Lokrings). • 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 HC refrigerants. • Conduct regular maintenance of leak detectors and ventilation at storage and charging areas. • Apply the emergency evacuation and response plan (ERP) for the plant and environs, in line with any required by national /local law. • Arrange for an external safety audit prior to commencing operations with hydrocarbons as refrigerant.

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 (for all production lines including those to be co-financed by the enterprise) and is typically 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 two production lines only and in accordance with ownership decisions of the MLF Executive Committee.

On the other hand, the second part of the budget details the estimated cost allocation for ongoing environmental and social management 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 Berjaya CKE.

Table 5.4 Budget for Mitigation Measures

No	Item	Estimated Budget (US$)	Project Funding (US$)	Berjaya CKE (US$)
	Production line conversion			
1	Refrigerant charging machine	[redacted]	[redacted]	[redacted]
2	Refrigerant leak detector	[redacted]	[redacted]	[redacted]
3	Safety measures (ventilation, gas sensors, ex-proof electrical and grounding)	[redacted]	[redacted]	
4	Monitoring and safety panel	[redacted]	[redacted]	
5	Storage area and piping	[redacted]		
	Product research and development		[redacted]	[redacted]
6	Product redesign and testing	[redacted]		

	Technical assistance and training			
7	Safety training for workers	[redacted]		
8	Technical support for conversion	[redacted]		
9	Plant safety audit and permit	[redacted]		
10	Commissioning and startup	[redacted]		
11	Contingency	[redacted]	[redacted]	[redacted]
	Subtotal	[redacted]	[redacted]	[redacted]
	Continuous improvement			
12	DOE compliance monitoring	[redacted]	[redacted]	[redacted]
13	DOSH compliance and requirement	[redacted]	[redacted]	[redacted]
14	BOMBA compliance and requirement	[redacted]	[redacted]	[redacted]
15	5S activities	[redacted]	[redacted]	[redacted]
16	Safety and health training	[redacted]	[redacted]	[redacted]
17	JPJ (APAD) training	[redacted]	[redacted]	[redacted]
	Subtotal	[redacted]	[redacted]	[redacted]
	Grand Total	**396,832**	[redacted]	[redacted]

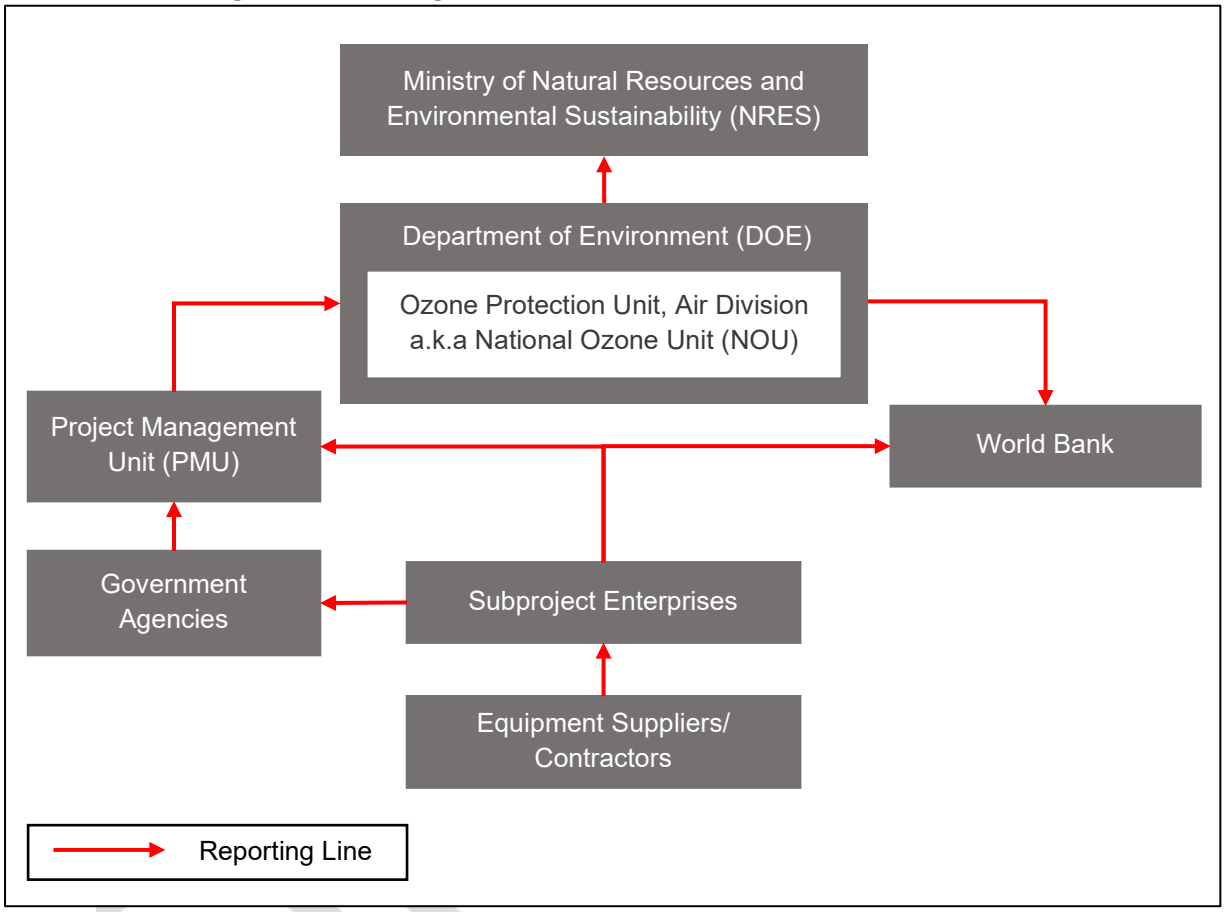
The MLF approved budget for the EE improvement activities is up to US$257,911 for the items indicated below. No additional risk is posed by this work, instead additional indirect climate benefits are expected to accrue at the consumer level.

- Upgrading the in-house testing facility.
- Additional cost of EE components, e.g. variable speed compressors and associated hardware and software.
- Third-party testing for all models.

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
Berjaya CKE Company	• To bear all responsibilities, but under monitoring and supervision of the World Bank and the PMU, for the conversion from HFC-134a and R-404A to R-290 and R-600a for refrigerants. 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 an external safety audit and a 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-290, R-600a 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 commercial refrigeration 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 and goods 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 commercial refrigeration manufacturers. 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

Stakeholder	Roles & Responsibility
	refrigerants in accordance with the National Law and Regulations and the World Bank ESF • 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 commercial refrigeration production using R-290 and R-600a • 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-290 and R-600a, while equipment suppliers to provide operation manual and equipment specifications to Berjaya CKE • To provide adequate training and guidance on safe operation of the supplied equipment and chemicals, 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 Berjaya CKE.

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 Berjaya CKE on the safe refrigeration production using R-290 and R-600a will be conducted by the equipment supplier and taken over by Berjaya CKE 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
Berjaya CKE 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-290/R-600a 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-290 and R-600a, e.g. LEL, UEL, etc. - Fire risks of flammable gases, specifically on R-290 and R-600a in the commercial refrigeration manufacturing process - Sources of ignition in the commercial refrigeration 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-290/R-600a - Contents of SDS in general - Contents of SDS for R-290/R-600a - Storage and handling of R-290/R-600a
4	Emergency Response	- Alarm signals, evacuation procedures and assembly point - Emergency Response information for R-290/R-600a - Appropriate fire extinguishers for fire from R-290/R-600a 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
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 Berjaya CKE

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

a. Berjaya CKE's ESMP implementation work plan and PMU reviewed summary of implementation progress
b. Implementation of Berjaya CKE'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

Berjaya CKE will share this report on a bi-annually basis during the subproject implementation with the PMU. Additionally, Berjaya CKE 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
Berjaya CKE	2025 – 2029	- Periodic **Environment Monitoring Report** required by the national and local regulations prepared by Berjaya CKE 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 Berjaya CKE to ensure compliance with environmental and occupational safety and health regulations. This includes monitoring regulatory compliance, environmental performance, and occupational safety and health practices. Berjaya CKE 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 Berjaya CKE adhere 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	Wastewater discharge quality	Laboratory testing	Weekly	DOE regulations	Wastewater final discharge	Berjaya CKE and its assigned staff	DOE
Solid wastes	Amount of solid waste generated	Weighing/ inventory recording	Weekly	Best Management Practices	Solid waste storage facility	Berjaya CKE, and solid waste collector and disposal facility	Berjaya CKE's management
Hazardous/ scheduled wastes	Amount of hazardous/ scheduled wastes generated	Weighing/ inventory recording	Weekly	DOE regulations	Scheduled waste storage facility	Berjaya CKE, 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	Berjaya CKE, and its contractor and assigned staff	Berjaya CKE's management
Spills and leakage of chemicals	Chemical spilled/ leaked	Visual inspection	Daily	DOE and DOSH regulations	Chemical storage and production area	Berjaya CKE and its assigned staff	Berjaya CKE'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	Berjaya CKE production workshop	Berjaya CKE 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	Berjaya CKE production workshop	Berjaya CKE, 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
Recommended corrective action from due diligence	Implementation status	Review documentation and site visits	Once after completion	DOE and DOSH regulations	Entire plant (Refer to due diligence findings)	Berjaya CKE and its assigned staff	PMU, and the World Bank
Renovation Notification	Acknowledgement Letter	Review documentation	Once before start construction	Local Authority requirement	Area of renovation/ change	Berjaya CKE 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	Wastewater discharge quality	Laboratory testing	Weekly	DOE regulations	Wastewater final discharge	Berjaya CKE and its assigned staff	DOE
Air emission	Oven stack emission quality	Isokinetic stack testing	Annually	DOE regulations	Oven stack	Berjaya CKE and its assigned staff	DOE
Solid wastes	Amount of solid waste generated	Weighing/ inventory recording	Weekly	Best Management Practices	Solid waste storage facility	Berjaya CKE and solid waste collector and disposal facility	Berjaya CKE's management
Hazardous/ scheduled wastes	Amount of hazardous/ scheduled wastes generated	Weighing/ inventory recording	Weekly	DOE regulations	Scheduled waste storage facility	Berjaya CKE 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	Berjaya CKE and its assigned staff	Berjaya CKE's management, and local authorities in case of accident
Explosive atmosphere	Concentration of gas	Control panel and HC sensors	Continuously	Best Management Practices/ Industrial Code	Chemical storage and production area	Berjaya CKE and its assigned staff	Berjaya CKE'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	Berjaya CKE production workshop	Berjaya CKE 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 2025)	DOSH regulations	Entire plant	Berjaya CKE 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	Berjaya CKE and approved audiometric testing centre	DOSH
Fire Certificate	Validity period	Review documentation and site visits	Annually	Fire Services regulations	Entire plant including modified area	Berjaya CKE and BOMBA	Berjaya CKE's management
Business License	Validity period	Review documentation	Annually	Local authority requirement	Entire plant	Berjaya CKE and its assigned staff	Berjaya CKE's management
Certificate of registration for electrical installations	Validity period	Review documentation	Annually	Energy Commission regulations	Entire plant	Berjaya CKE and its assigned staff	Berjaya CKE'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 2025 – 2029. After receiving Berjaya CKE'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 Berjaya CKE Progress Report. All activities of Berjaya CKE's conversion would be reported to PMU and the World Bank. The report is to be submitted bi-annually to the World Bank by June 30 and December 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	Berjaya CKE	Approved action plan under subproject
Implement mitigation action plans, re-layout, install new equipment	After signing of subgrant agreement	Berjaya CKE	Approved action plan under subproject
Rearrange and construct storage area for R-290 and R-600a	After signing of subgrant agreement	Berjaya CKE	Approved action plan under subproject
Install gas detectors and alarm at refrigerants charging, vacuum, leak testing, and warehouse	After installing new equipment	Berjaya CKE	Approved action plan under subproject
Install fire protection system at storage area of R-290 and R-600a	During and after construction	Berjaya CKE	Approved action plan under subproject
Provide training/ SOPs training	After signing of subgrant agreement	Berjaya CKE	Training records

During conversion and EE improvement period of 2025 – 2029, Berjaya CKE 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 Berjaya CKE 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 and a carmaker, PROTON. 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 Berjaya CKE.

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.