JCM Sustainable Development and Safeguards Assessment Report Form

Project description	
Title	Energy saving by installation of evaporator with mechanical vapor recompression and high-efficiency chiller.
Project participant (Thai)	THAI KYOWA BIOTECHNOLOGIES CO., LTD.
Project participant (Japanese)	KYOWA HAKKO BIO CO., LTD.
Project location	399 IRPC Industrial Zone, Moo 1, Choengnoen District, Rayong, Thailand
Latitude, longitude	12°41'00.8" N 101°19'14.8"E
Project status	Operated since 01/01/2019

Report description		
Date of report completion	31 January 2025	
Version	1.0	
Corresponding author	Name	Tsukihashi Akira
	Title	Managing Executive Officer
	Organization	KYOWA HAKKO BIO CO. LTD.
	Telephone	[redacted]
	E-mail	

Note:

- Related figures, documents, evidence related to the description may be attached as attachment.
- In the case where there is any other relevant issue that needs to be considered, it is be specified in the last row of each area of assessment.

Certification letter

31/01/2025

I, the undersigned, hereby certify that KYOWA HAKKO BIO CO., LTD. is the author of the "Sustainable Development and Safeguards Assessment Report" of the project titled Energy saving by installation of evaporator with mechanical vapor recompression and high-efficiency chiller developed by KYOWA HAKKO BIO CO., LTD. and THAI KYOWA BIOTECHNOLOGIES CO., LTD. located at 399 IRPC Industrial Zone, Moo 1, Choengnoen District, Rayong, Thailand.

The report was prepared by the team members as follows:

No.	Name	Position
1	Tsukihashi Akira	Managing Executive Officer KYOWA HAKKO BIO CO., LTD.
2	Yasuhara Akinori	President of THAI KYOWA BIOTECHNOLOGIES CO., LTD.

[redacted]

Signature [redacted]

(Tsuki[redacted]

Position Managing Executive Officer of KYOWA HAKKO BIO CO., LTD.

Seal (if any)

Part 1: General information of the project area before project implementation

Area of Assessment	Description
1. Environment and natural resources	
1.1 Air pollution	The project is located inside 399 IRPC Industrial Zone. No air pollution was found in the area.
1.2 Water pollution	No surface water and ground water pollution problem were reported in the area.
1.3 Soil pollution	No soil pollution was reported in the area.
1.4 Noise pollution	No point sources of noise pollution were found in the area.
1.5 Odor pollution	No odor was reported in the area.
1.6 Water consumption	Industrial water is produced by IRPC, using water from nearby reservoir (pond), and was consumed within the capacity of water supply.
1.7 Solid waste/municipal solid waste	Solid waste is properly disposed of by industrial waste disposal and treatment operators under a three-party contract TK(THAI KYOWA BIOTECHNOLOGIES CO., LTD.) has with the industrial waste disposal and treatment operators and the DIW (Factories Bureau, Department of Industrial Works).
1.8 Hazardous waste/infectious waste/electronic waste	Hazardous waste is properly disposed of by industrial waste disposal and treatment operators under a three-party contract TK(THAI KYOWA BIOTECHNOLOGIES CO., LTD.) has with the industrial waste disposal and treatment operators and the DIW (Factories Bureau, Ministry of Industry).
1.9 Energy (i.e. Wasted Energy, Renewable Energy)	The factory uses electricity from power grid.
1.10 Land Use	The project is located inside an Amino Acid Producing factory in the IRPC Industrial Zone.
1.11 Biodiversity	Biodiversity is not relevant in IRPC Industrial Zone.
1.12 Wild animal/ Aquatic ecosystem	Notable ecosystems are not found in the IRPC Industrial Zone and its surrounding.
1.13 Other (Please specify…)	－
2. Society	
2.1 Socio-cultural characteristics	The socio-cultural characteristics of the area have long

Area of Assessment	Description
	been agricultural and orchard production, and traditional customs and culture are still carried on today.
2.2 Health and safety	There is no major concern in terms of health and safety in the area.
2.3 Traditions, cultures and/or valuable places worthy of conservation	The tradition and cultural values of the people in the area are those commonly found in the central region of Thailand. There are no distinctive places of high conservation values.
2.4 Race, religion, and ethnic group	Most of the population in the area are of Thai origin who practice Buddhism.
2.5 Transportation	Primary mode of transportation in the area is private vehicles (cars, trucks and motorbikes).
2.6 Other (Please specify…)	―
3. Economic	
3.1 Overall local economy (i.e. income, expenditure, etc.)	The local economy in the area is largely driven by the manufacturing sector.
3.2 Employment/Career	Factory workers, clerical workers.
3.3 Major agricultural activity in the area	Major agricultural activity in the area is orchard.
3.4 Major industry in the area	Petrochemicals, Manufacturing, and Automotive.
3.5 Major service sector in the area	Hospitality (particularly restaurants) and retail are the main service sector in the area.
3.6 Basic infrastructure (i.e. road, school, etc.)	The basic infrastructure in the area included transportation (road network), utilities (electricity, water supply, waste management), healthcare as well as telecommunications.
3.7 Other (Please specify…)	

**Project Participant explains in detail of provenance and importance of issue consider about before project implement and specify if the project is rightful/environmental law, social, and economy. To have Negative impact assessment (Do-no-net-harm) with supporting documents.*

Part 2 Sustainable Development Goals

2.1 Sustainable Development Contributions Assessment

*Please mark ✓ in ☐ to identify the contributions of the proposed project to specific SDG. The project is required to contribute to **at least two SDGs, in addition to** SDG13: Climate Action.*

Project Contributions to SDGs	Indicator (Please specify)	Description of Indicator
☐ SDG 1: No Poverty		
☐ SDG 2: Zero Hunger		
☐ SDG 3: Good Health and Well-being		
☐ SDG 4: Quality Education		
☐ SDG 5: Gender Equality		
☐ SDG 6: Clean Water and Sanitation		
☐ SDG 7: Affordable and Clean Energy		
■ SDG 8: Decent Work and Economic Growth	Amount of energy saved (Unit: MWh)	Energy saving reduces costs and contributes to economic outputs.
☐ SDG 9: Industry, Innovation and Infrastructure		
☐ SDG 10: Reduced Inequality		
☐ SDG 11: Sustainable Cities and Communities		
☐ SDG 12: Responsible Consumption and Production		
☐ SDG 13: Climate Action		
☐ SDG 14: Life Below Water		
☐ SDG 15: Life on Land		

Project Contributions to SDGs	Indicator (Please specify)	Description of Indicator
☐ SDG 16: Peace and Justice Strong Institutions		
■ SDG 17: Partnerships to achieve the Goal	Last progress report submission date	Operational continuity of the JCM project, which mobilizes additional financial resources, disseminates low-carbon technologies, and reduces GHG emissions in Thailand#

**Project Participant provides the description for each indicator of the selected SDGs and presents currently available datasets along with supporting documents.*

2.2 Details on Monitoring Parameters for Demonstrating SDG Contributions

Provide details on how to monitor the indicators identified in Section 2.1.
(Tables can be added based on the number of selected SDGs.)

SDG Number	8
SDG Target	Decent Work and Economic Growth
Variable or Indicator	Amount of energy saved (Unit: MWh)
Duration/Frequency	Monthly
Method/Tool	Power meter
Responsible person	Staff of THAI KYOWA BIOTECHNOLOGIES CO., LTD.

SDG Number	17
SDG Target	Partnerships to achieve the Goal
Variable or Indicator	Last progress report submission date
Duration/Frequency	Yearly
Method/Tool	—
Responsible person	Staff of THAI KYOWA BIOTECHNOLOGIES CO., LTD.

Part 3 Do no net harm

3.1 'Do no net harm' Risk Assessment and Safeguards

Specify impacts and mitigation plans to mitigate negative impacts.

Potential Impact of Project Activity	Severity Level of Impact				Description of Impact	Action Plan to mitigate harmful impacts
	None	Low	Moderate	High		
1. Impacts on Environment and Natural Resources						
1.1 Physical resources						
Water pollution	✓					
Soil pollution	✓					
Air pollution	✓					
Noise pollution	✓					
Odor pollution	✓					
Soil erosion, coastal/river erosion	✓					
Vulnerability to natural disaster	✓					
Other	✓					
1.2 Waste management						
Increase in solid waste/municipal solid waste	✓					

Potential Impact of Project Activity	Severity Level of Impact				Description of Impact	Action Plan to mitigate harmful impacts
	None	Low	Moderate	High		
Increase in hazardous waste such as waste contaminated with oil, chemicals and used oil etc.		✓			Possible leakage of used refrigerants and used lubricating oil into the atmosphere, as well as leakage during transfer.	The used refrigerants and used lubricating oil are collected and disposed of by specialized companies, and the extracted amounts are checked to confirm that there are no leaks. In addition, they are sealed in special containers, and the absence of leaks during processing is confirmed by weight. In addition to the current measures, proper disposal of hazardous waste will be rigorously implemented. This includes collection, secure containment, and disposal by specialized licensed companies to prevent any environmental contamination or health risks associated with hazardous waste.
Increase in infectious waste	✓					
Increase in electronic waste	✓					
Other	✓					
1.3 Biological resources						
Impacts on forest areas and land-use change	✓					

Potential Impact of Project Activity	Severity Level of Impact				Description of Impact	Action Plan to mitigate harmful impacts
	None	Low	Moderate	High		
1.4 Human livelihood						
Water drainage or waterway diversion	✓					
Change in water consumption	✓					
Change in land ownership	✓					
Other	✓					
2. Social impacts						
Public security such as increase in crime risks	✓					
Health impacts	✓					
Relocation or temporary/permanent loss of land	✓					
Loss of housing	✓					
Impact on public utilities such as electricity, telephone service etc.	✓					
Impact on traffic	✓					
Community conflict						
Employment and labor	✓					

Potential Impact of Project Activity	Severity Level of Impact				Description of Impact	Action Plan to mitigate harmful impacts
	None	Low	Moderate	High		
Impact on people of certain race, religion and ethnic groups	✓					
Damage to areas of high conservation value, such as religious sites, historic sites, monuments, important places of the community etc.	✓					
Impact on human rights such as education, freedom of thought, religion etc.	✓					
Gender inequality such as in employment opportunities, salary, promotion, benefits, termination of contract etc.	✓					
Other	✓					
3. Economic impacts						
Increase unemployment /loss of income of people in local communities	✓					

Potential Impact of Project Activity	Severity Level of Impact				Description of Impact	Action Plan to mitigate harmful impacts
	None	Low	Moderate	High		
Other	✓					

Criteria for assessing the level of impact severity

1. None: The proposed activity has no direct/indirect impacts on the environment, society and economy.

2. Low: The proposed activity causes some changes to the existing conditions but has no implication on the quality of the environment, society and economy. The impact is short-lived and temporary, and the extent of the affected area is not large (1km perimeter).

3. Moderate: The proposed activity causes some changes to the existing conditions and has implications on values or qualities of the environment, society and economy. The impact is short-lived and temporary. The extent of the affected area is large but confined to the related area (2km perimeter).

4. High: The proposed activity causes some changes to the existing conditions and has implications on value or quality of the environment, society, economy, and potentially the ecosystem. The impact is permanent and the extent of the affected area id extensive (3km perimeter).

3.2 Details on Monitoring Parameters for Ensuring No Negative Impacts

Provide details on how to monitor the impacts identified in Section 3.1.
(Tables can be added based on the number of negative impacts identified)

Category of negative impact	1.2 Waste management （used refrigerant）
Subcategory of negative impact	Increase in hazardous waste such as waste contaminated with oil, chemicals and used oil etc.
Vulnerable group	—
Possible negative impact	Possible leakage of used refrigerant to the atmosphere or leakage during transfer.
Parameter/indicator	Amount of disposed refrigerant (kg)
Reference	「Ministry of Industry Announcement on Waste and Scrap Management, 2023」
Duration/frequency	Yearly
Method/Tools	Waste Manifest
Responsible person	Staff of THAI KYOWA BIOTECHNOLOGIES CO., LTD.
Expected outcome	The refrigerant is properly handled, thereby protecting the environment.

Category of negative impact	1.2 Waste management （used lubricating oil）
Subcategory of negative impact	Increase in hazardous waste such as waste contaminated with oil, chemicals and used oil etc.
Vulnerable group	People in nearby communities
Possible negative impact	Possible leakage of used lubricating oil to the outside or leakage during transfer.
Parameter/indicator	Amount of disposed lubricating oil (L)
Reference	「Ministry of Industry Announcement on Waste and Scrap Management, 2023」
Duration/frequency	Yearly
Method/Tools	Waste Manifest
Responsible person	Staff of THAI KYOWA BIOTECHNOLOGIES CO., LTD.
Expected outcome	The used lubricating oil is properly handled by specialized contractors, thereby protecting the environment. The collected oil is disposed of at a specialized plant by a company licensed to handle industrial waste.