



Corporate Greenhouse Gas Inventory

2023

9 April 2024

GHG Reporting References



Reporting Standard:

The GHG Protocol Corporate Accounting and Reporting Standard by World Resources Institute (WRI) and the World Business Council for Sustainable Development (WBCSD)

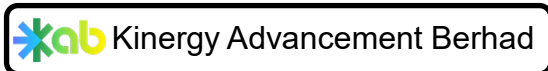


GHG Emissions Calculation:

Calculation based on internationally recognised calculation tools i.e., 2019 Refinement to the 2006 IPCC Guidelines and local emission factors (where applicable)



GHG Reporting Boundaries



CONTROL APPROACH
Operational Control

Reporting Year

1 January – 31 December 2023

ORGANISATIONAL
BOUNDARIES

Kejuruteraan Asastera Berhad

- HQ offices Lot 18 1-3, 20-3, 11-2 and 11-1 in Sri Petaling, Kuala Lumpur

KAB Energy Holdings Sdn Bhd

- Chiller Optimisation project in KL Eco City, Mercu 2 & 3 and BMC Mall.
- Solar PV project in SME Aerospace Sdn Bhd, Aapico Plastic Co. Ltd, Roongthavorn Plastic Co. Ltd., Mydin, NGPP, and MSSB
- Hydropower plant in Indonesia

KAB Energy Power Sdn Bhd

- Waste Heat Recovery project in Safran Landing System Sdn Bhd, Negeri Sembilan.
- M&E project sites.
- Biogas plant in Kedah

KAB Telco Sdn Bhd

OPERATIONAL BOUNDARIES

Scope 1



Machineries



Mobile Vehicles



Refrigeration & Air
Conditioning Equipment



Scope 2



Purchased Electricity

Scope 3



Business Travel



Employee Commuting

GHG Reporting Boundaries cont.

Consolidation Approach

The **Operational Control Approach** was adopted for this GHG inventory. This approach has the full authority to introduce and implement its operating policies at the operation.

Under the operational control approach, a company accounts for 100% of emissions from operations over which it or one of its subsidiaries has operational control.

The reporting coverage of Kinery Advancement Berhad (KAB) including **KAB HQ office** at Bandar Baru Sri Petaling and office in Medan; Sustainable Energy Solutions (**SES**) and Mechanical & Electrical (**M&E**) projects.

GHG Reporting Boundaries cont.

The **Operational boundary** for this GHG inventory is as below:

Scope 1 emission refers to the direct GHG emissions that occur from sources that are owned or controlled by the KAB and it is divided into three (3) categories

- **Stationary Combustion** – co-gensets
- **Mobile Combustion** - all vehicles owned or controlled by KAB
- **Fugitive Emissions** - leaks from air conditioning units

Scope 2 emission refers to indirect emissions account for GHG emissions from the generation of **purchased electricity**.

Scope 3 emission is an optional reporting category that allows for the treatment of all other indirect emissions. They are the consequence of the activities of the company but occur from sources not owned or controlled by the company.

- **Business Travel** by Road and Air
- **Employee Commuting** – commuting from home to work

The other categories have been excluded principally due to the decision to take a phased approach and data readiness (e.g. limitations/constraints for complete, accurate, and reliable data sets).

GHG Reporting Boundaries cont.

GHGs That Are Accounted

- ✓ Carbon Dioxide (CO₂)
- ✓ Methane(CH₄)
- ✓ Nitrous Oxide (N₂O)
- ✓ Hydrofluorocarbons(HFCs)

CH₄, N₂O, and HFCs were converted into CO₂ equivalents based on their global warming potential from the IPCC Sixth Assessment Report

GHGs That Are Not Accounted

- ✗ Nitrogen trifluoride (NF₃)
- ✗ Sulfur hexafluoride (SF₆)
- ✗ Perfluorocarbons (PFCs)

NF₃

Not accounted for in this reporting as NF₃ is not emitted in the reporting value chain. It is typically used in plasma etching and chamber cleaning during the manufacture of semiconductors and LCD (Liquid Crystal Display) panels.

SF₆

Not accounted for in this reporting as SF₆ is not emitted in the reporting value chain. It is usually sourced from electrical transmission and distribution equipment, manufacture of electronics/semiconductors, and production of magnesium.

PFCs

Not accounted for as it is usually emitted from Primary aluminum production and semiconductor manufacture.

The Intergovernmental Panel on Climate Change (IPCC) is an intergovernmental body of the United Nations responsible for advancing knowledge on human-induced climate change. The IPCC is an internationally accepted authority on climate change, and its work is widely agreed upon by leading climate scientists as well as governments. Its reports play a key role in the United Nations Framework Convention on Climate Change (UNFCCC) with the Fifth Assessment Report heavily informing the landmark Paris Agreement in 2015. The IPCC has published five comprehensive assessment reports reviewing the latest climate science, as well as a number of special reports on particular topics.

Approaches and Methodologies

GHG Emissions

tCO₂eq

= Activity Data

x Emission Factor

Activity Data	
Scope 1 Emissions	
Stationary & Mobile Combustion	
	Fuel Consumption (L)
Fugitive Emissions	
	Refrigerant charge (kg)
	Annual leakage rate
Scope 2 Emissions	
Purchased Electricity	
	Total kilowatt-hours (kWh)
Scope 3 Emissions	
Business Travel	
Employee Commuting	
	Fuel Consumption (L)
	Distance Travelled (km)

Examples of Emission Factors and GWP					
Fuel for Mobile Combustion				Type of Gas	Global Warming Potential (GWP)
Type of Fuel	EF kg/TJ				
	CO ₂	CH ₄	N ₂ O		
Diesel	74100	3.9	3.9		
Petrol	69300	33	3.2	CO ₂	1
Source: IPCC Guidelines				CH ₄	27.9
				N ₂ O	273
Electricity Grid EF Gg CO ₂ e/GWh				HFC	Depends on type of refrigerants Range: 675 – 11,700
Year	Peninsular Malaysia	Sabah	Sarawak		
2021 <small>Latest available</small>	0.758	0.425	0.198		
Source: Malaysia Energy Information Hub, Suruhanjaya Tenaga					
Electricity Grid EF Gg CO ₂ e/GWh					
Year	Thailand				
2018 <small>Latest available</small>	0.569				
				Source: IGES Grid EF, 2023	

Coverage and Assumptions for Data

Emission Sources	Coverage and Assumptions
General	
Facilities	<p><u>Headquarters Office</u></p> <ul style="list-style-type: none"> ○ HQ Offices at Lot 18 1-3, 20-3, 11-2 and 11-1 in Sri Petaling, Kuala Lumpur. ○ Office in Medan <p><u>Project Site(s)</u></p> <ul style="list-style-type: none"> ○ Four (4) Chiller Optimisation project in KL Eco City, Mercu 2 & 3 and BMC Mall. ○ Seven (7) Solar PV project in SME Aerospace Sdn Bhd, Aapico Plastic Co. Ltd and Roongthavorn Plastic Co. Ltd, Mydin, Nextgreen Pulp & Paper (NGPP) and Matahari Suria Sdn Bhd (MSSB) ○ One (1) Waste Heat Recovery project in Safran Landing System Sdn Bhd, Negeri Sembilan. ○ One (1) Biogas project in Future Biomass Gasification, Kedah. ○ One (1) Hydropower project in Kombih III, Indonesia. ○ Fifteen (15) M&E project sites.
Total Building Floor Area (m ²)	<ul style="list-style-type: none"> ○ Floor area provided for HQ office at Lot 18 1-3, 20-3, 11-2 and 11-1 in Sri Petaling, Kuala Lumpur. ○ M&E project has temporary office within the project sites. ○ Project other than M&E has no site office.

Coverage and Assumptions for Data cont.

Emission Sources	Coverage and Assumptions
Scope 1 Direct Emissions	
Stationary	<ul style="list-style-type: none"> ○ No fuel consumption
Mobile	<ul style="list-style-type: none"> ○ Only HQ Office has company-owned vehicles. ○ Fuel consumed by company-owned vehicles are extracted from the petrol card statement, identified by the car registration number. ○ Company-owned vehicles that are provided with allowance are also included in this inventory by taking this assumptions: <ul style="list-style-type: none"> ○ Average amount of allowance of RM 400 is assumed for each company-owned vehicles. ○ Assumed only 50% of allowance (RM 200) is used for fuel purchased. ○ Company-owned vehicles that are used by directors and employees who are not given allowance are excluded in this inventory.
Refrigerant	<ul style="list-style-type: none"> ○ The missing annual leakage rate for air-conditioning is assumed to be 3%, based on the average value recommended by UNEP Ozone Secretariat, Workshop on HFC management: technical issues, Factsheet 9 – Large Air-Conditioning (air-to-air). ○ The missing annual leakage rate and refrigerant charge for refrigerator/freezer/chillers were assumed to be 0.9% and 0.3kg respectively based on the average value recommended by UNEP Ozone Secretariat, Workshop on HFC management: technical issues, Factsheet 4 – Commercial Refrigeration.
Wastewater Treatment	<p>HQ Office and project sites don't have any wastewater treatment plant.</p>

Coverage and Assumptions for Data cont.

Emission Sources	Coverage and Assumptions
Scope 2 Indirect Emissions	
Purchased Electricity	<ul style="list-style-type: none"> ○ Auxiliary electricity consumed from waste heat recovery plant and hydropower plant is included. ○ Auxiliary electricity consumed by solar PV project is assumed only around 1% of total electricity generated ^{1,2,3,4}. ○ Auxiliary electricity consumed by biogas power plant is assumed only around 10% of total electricity generated (9-12%) ⁵. ○ Electricity consumed by M&E offices in project sites is estimated from the equipment available.
Scope 3 Indirect Emission	
Business Travel	<ul style="list-style-type: none"> ○ Two (2) business travel (automobile) data sources; (1) fuel consumption extracted from the petrol card statement and (2) fuel consumption by allowance provided to the employees, 100% of allowance is assumed to be used for fuel purchased. ○ All business travel (automobile) fuel consumption are extracted from the petrol card statement. ○ All car travel is assumed to be the average between highway and city travel. ○ No business travel (railway) occurred. ○ All business travel are reported under HQ office

References:

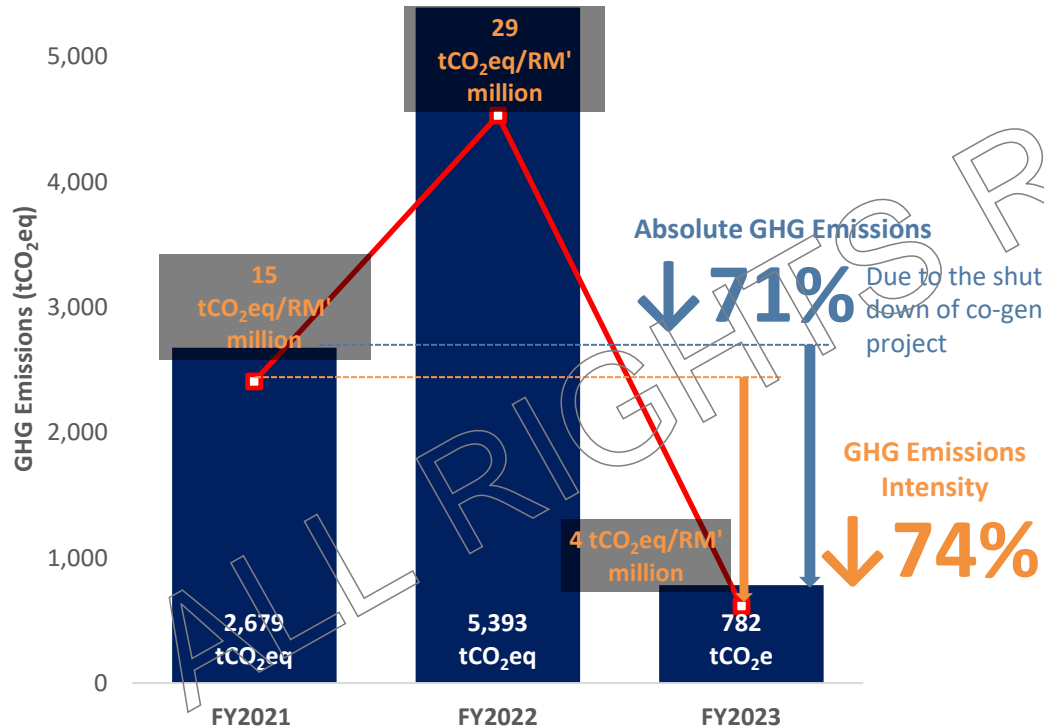
1. <https://inpressco.com/wp-content/uploads/2017/09/Paper61728-1729.pdf>
2. https://www.researchgate.net/publication/352247780_Analysis_of_Auxiliary_Energy_consumption_in_Utility_scale_Solar_PV_Power_plant
3. <https://www.sciencedirect.com/science/article/pii/S2772737822000268>
4. <https://www.sciencedirect.com/science/article/pii/S2589004222011622>
5. https://web.archive.org/web/20210427181037id_/https://backend.orbit.dtu.dk/ws/files/216849288/Zepter_et_al_2020_Biogas_plant_modelling_for_flexibility_provision.pdf

Coverage and Assumptions for Data cont.

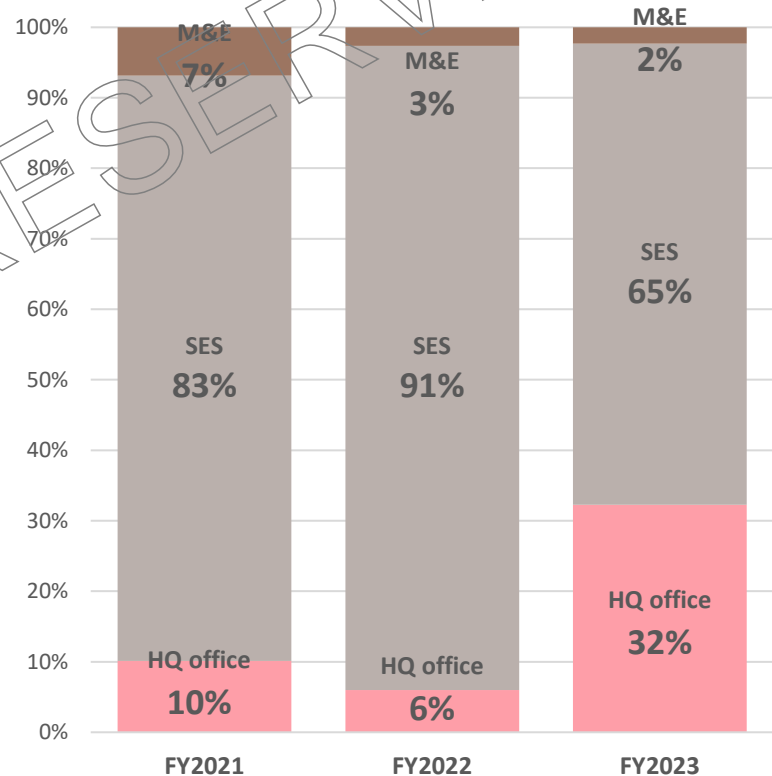
Emission Sources	Coverage and Assumptions
Scope 3 Indirect Emissions	
Employee Commuting	<ul style="list-style-type: none"> Average mode of transport and travel distances are calculated based on data obtained from the survey conducted in 2023. Survey sample size is determined using statistical sampling method whereby confidence interval 95% and error of margin 5% are applied. The sample size is further distributed to all the operations (i.e. HQ and project sites) using stratified sampling method and random sampling is applied to the facility level. <div> <div>Sample Size</div> <div>Distribute Sample</div> <div>Survey</div> </div> <div> <div> Statistical sampling Confidence Interval 95% Error of margin 5% </div> <div> Stratified sampling by HQ and project sites </div> <div> Random sampling An online survey was distributed to all employees. </div> </div> <ul style="list-style-type: none"> Only annual, medical, replacement, schedule and unpaid leave are taking into account. Compassionate, marriage, maternity, paternity and hospitalisation leave are excluded from the accounting.

GHG Emissions

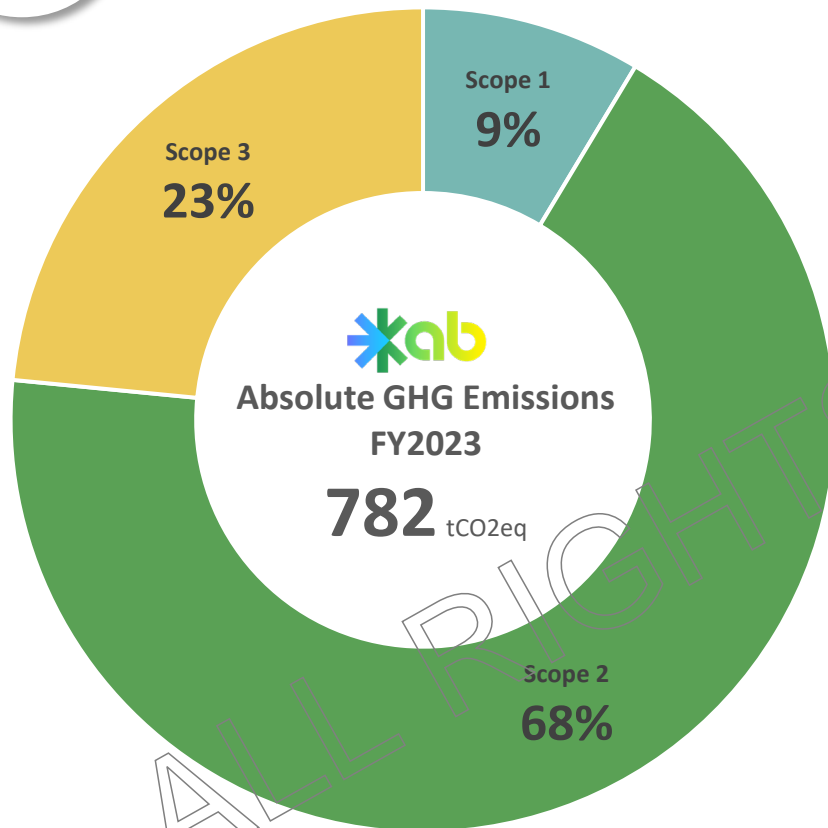
GHG Emissions FY2021 - FY2022



Distribution of GHG Emissions



GHG Emissions FY2023

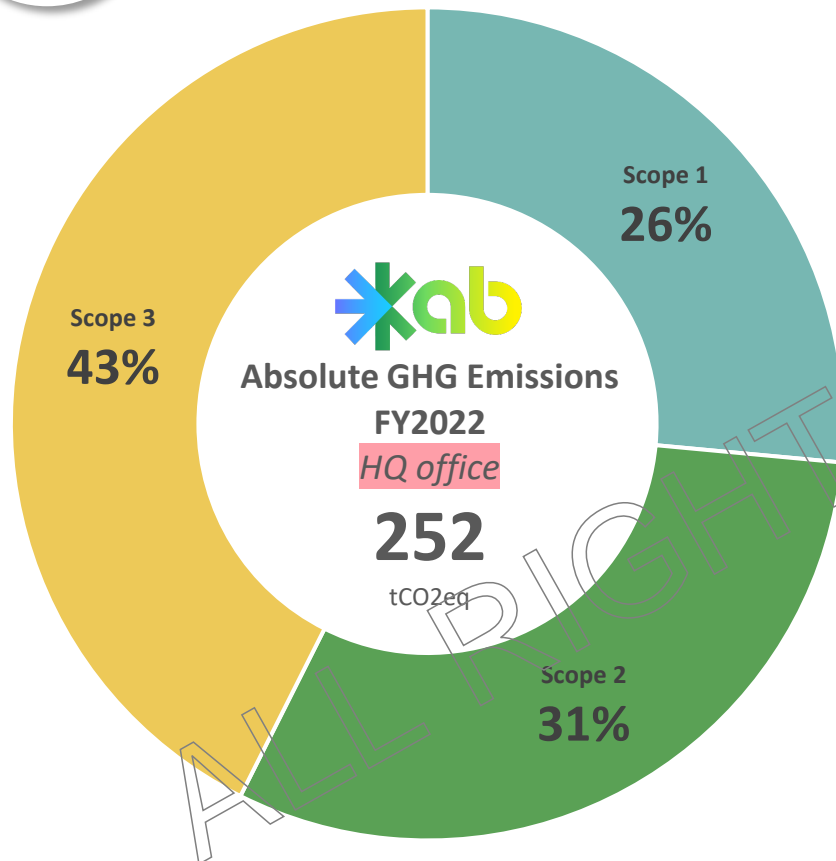


Emissions source	GHG Emissions (tCO ₂ eq)
Scope 1 - Direct emissions	67
Stationary combustion (co-generator sets)	0
Mobile combustion (company-owned vehicles)	66
Fugitive Emissions (Refrigerants)	1
Scope 2 - Indirect emissions	531
Purchased electricity	531
Scope 3 - Other indirect emissions	183
Business travel	52
Employee Commuting	132
Absolute Emissions	782

	Breakdown Emissions by GHG			
	CO ₂	CH ₄	N ₂ O	HFCs
Scope 1	65	1	1	1
Scope 2	531	-	-	-
Scope 3	174	2	7	-
Absolute Emissions	770	3	8	1
	782			

Note: Due to rounding, some totals may not correspond with the sum of the separate figures.

Breakdown GHG Emissions by Operations



Emissions source	GHG Emissions (tCO ₂ eq)
Scope 1 - Direct emissions	67
Stationary combustion (co-generator sets)	0
Mobile combustion (company-owned vehicles)	66
Fugitive Emissions (Refrigerants)	1
Scope 2 - indirect emissions	78
Purchased electricity	78
Scope 3 - Other indirect emissions	107
Business travel	52
Employee Commuting	56
Absolute Emissions	252

Note: Including business travel by SES & M&E

	Breakdown Emissions by GHG			
	CO ₂	CH ₄	N ₂ O	HFCs
Scope 1	65	0.5	0.6	0.6
Scope 2	78	-	-	-
Scope 3	100	1	6	-
Absolute Emissions	243	1	6	1
	252			

Note: Due to rounding, some totals may not correspond with the sum of the separate figures.

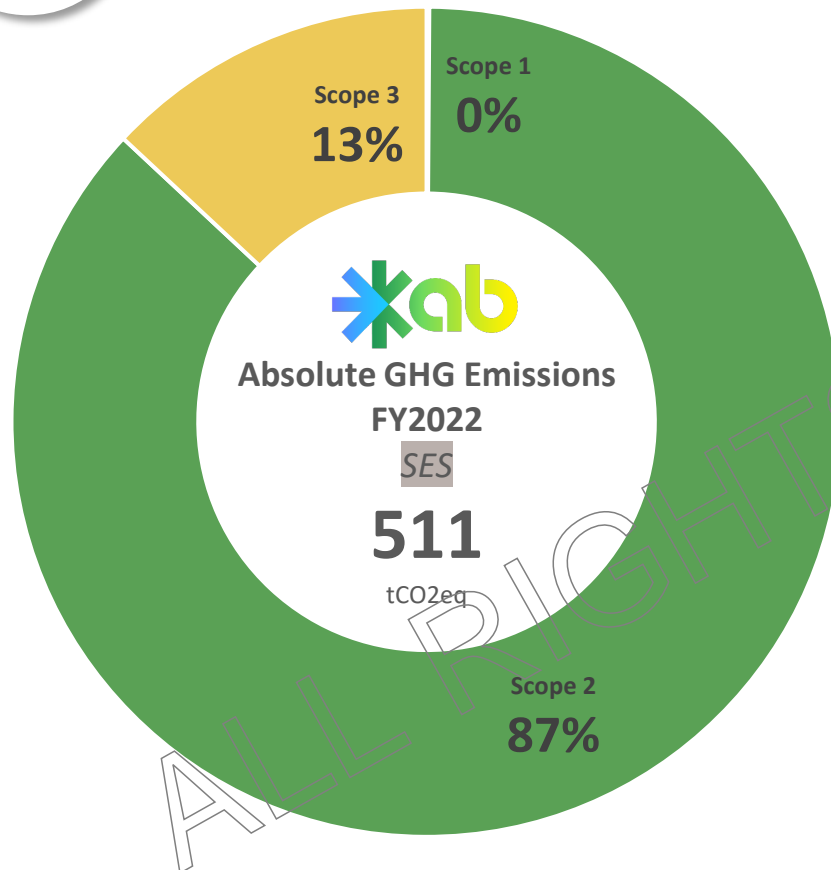
Breakdown GHG Emissions by Operations cont.

HQ Office

Emissions source	Emissions in Year (tCO ₂ eq)		
	FY2021	FY2022	FY2023
Scope 1 - Direct emissions	59	64	67
Stationary combustion (machineries)	0	0	0
Mobile combustion (company-owned vehicles)	59	63.5	66
Fugitive Emissions (Refrigerants)	1	0.5	1
Scope 2 - Indirect emissions	77	82	78
Purchased electricity	77	82	78
Scope 3 - Other indirect emissions	135	177	107
Business travel	71	71	52
Employee Commuting	64	106	56
ABSOLUTE EMISSIONS	272	323	252

Note: Due to rounding, some totals may not correspond with the sum of the separate figures.

Breakdown GHG Emissions by Operations cont.



Emissions source	GHG Emissions (tCO ₂ eq)
Scope 1 - Direct emissions	0.5
Stationary combustion (co-generator sets)	0
Mobile combustion (company-owned vehicles)	0
Fugitive Emissions (Refrigerants)	0.5
Scope 2 - indirect emissions	444
Purchased electricity	444
Scope 3 - Other indirect emissions	67
Business travel	0
Employee Commuting	67
Absolute Emissions	511

Note: Business travel reported under HQ office

	Breakdown Emissions by GHG			
	CO ₂	CH ₄	N ₂ O	HFCs
Scope 1	0	0	0	0.5
Scope 2	444	-	-	-
Scope 3	65	0.6	1	-
Absolute Emissions	509	0.6	1	0.5
	511			

Note: Due to rounding, some totals may not correspond with the sum of the separate figures.

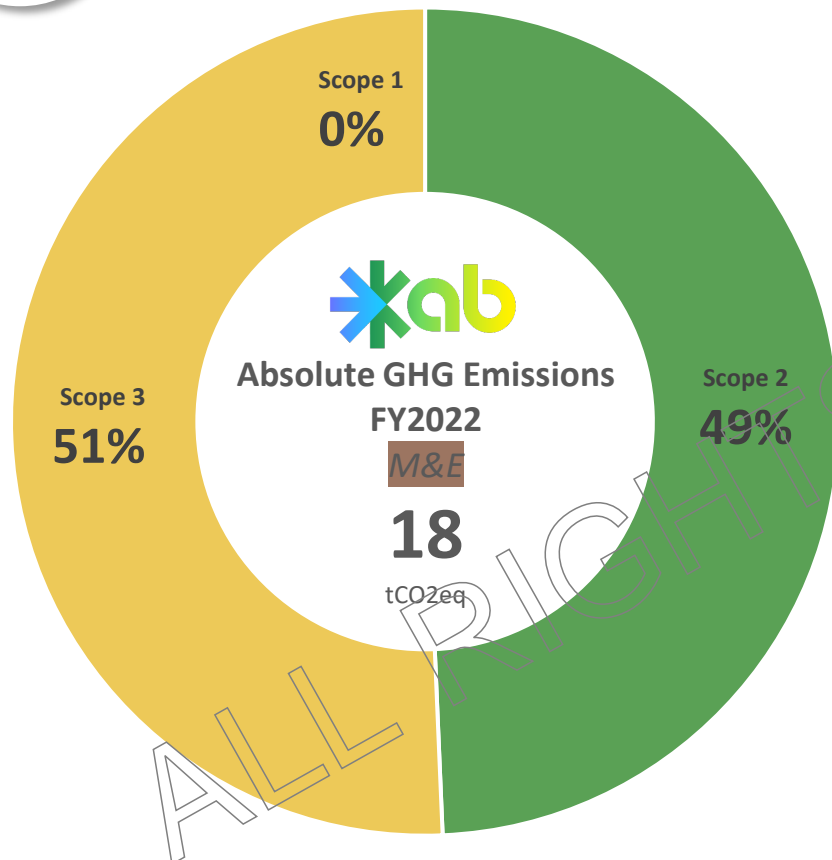
Breakdown GHG Emissions by Operations cont.

SES

Emissions source	Emissions in Year (tCO ₂ eq)		
	FY2021	FY2022	FY2023
Scope 1 - Direct emissions	1,941	4,426	1
Stationary combustion (machineries)	1,941	4,426	0
Mobile combustion (company-owned vehicles)	0	0.0	0
Fugitive Emissions (Refrigerants)	0	0.2	1
Scope 2 - Indirect emissions	275	490	444
Purchased electricity	275	490	444
Scope 3 - Other indirect emissions	7	10	67
Business travel	0	0	0
Employee Commuting	7	10	67
ABSOLUTE EMISSIONS	2,223	4,926	511

Note: Due to rounding, some totals may not correspond with the sum of the separate figures.

Breakdown GHG Emissions by Operations cont.



Emissions source	GHG Emissions (tCO ₂ eq)
Scope 1 - Direct emissions	0
Stationary combustion (co-generator sets)	0
Mobile combustion (company-owned vehicles)	0
Fugitive Emissions (Refrigerants)	0
Scope 2 - indirect emissions	9
Purchased electricity	9
Scope 3 - Other indirect emissions	9
Business travel	0
Employee Commuting	9
Absolute Emissions	18

Note: Business travel reported under HQ office

Breakdown Emissions by GHG				
	CO ₂	CH ₄	N ₂ O	HFCs
Scope 1	0	0	0	0
Scope 2	9	-	-	-
Scope 3	9	0.1	0.1	-
Absolute Emissions	18	0.1	0.1	0
	18			

Note: Due to rounding, some totals may not correspond with the sum of the separate figures.

Breakdown GHG Emissions by Operations cont.

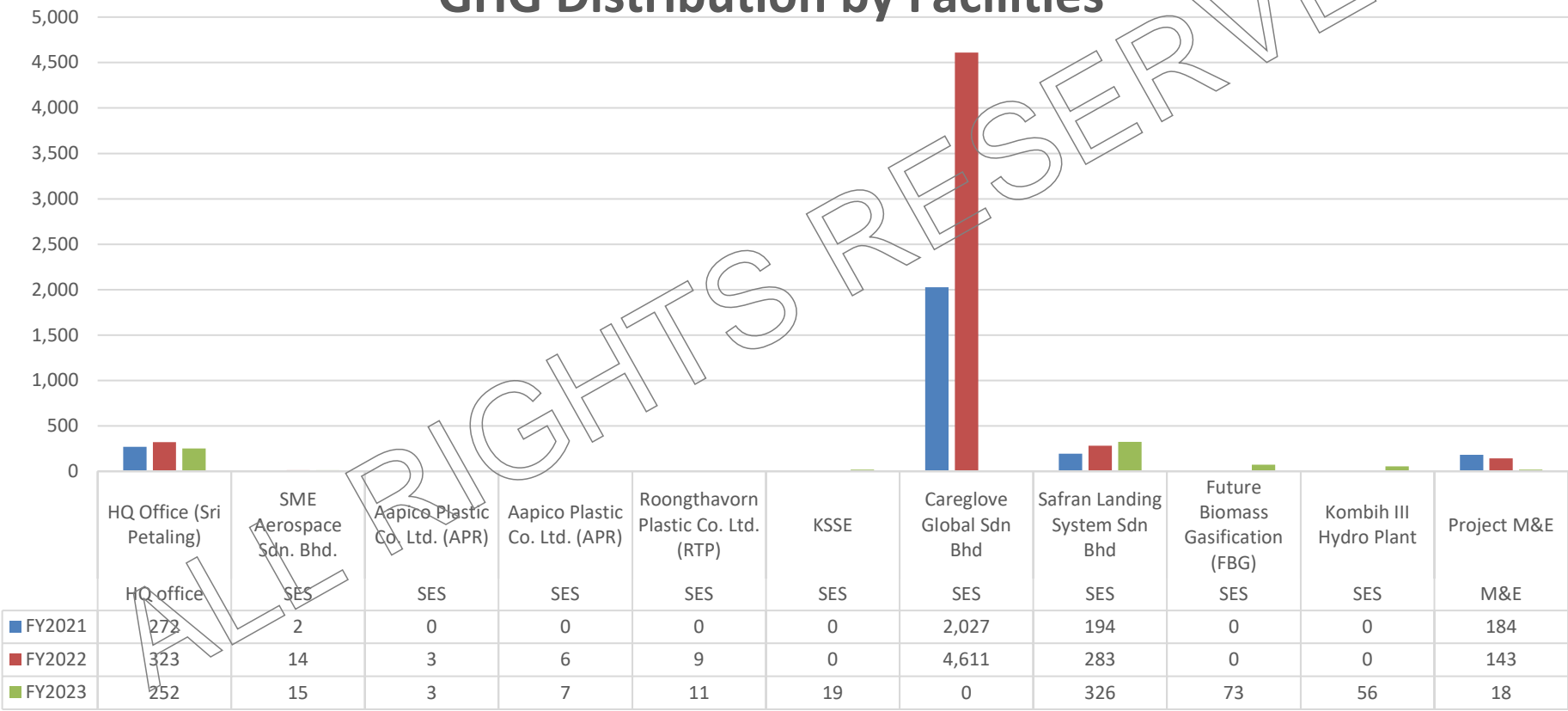
M&E

Emissions source	Emissions in Year (tCO ₂ eq)		
	FY2021	FY2022	FY2023
Scope 1 - Direct emissions	0	0	0
Stationary combustion (machineries)	0	0	0
Mobile combustion (company-owned vehicles)	0	0	0
Fugitive Emissions (Refrigerants)	0	0	0
Scope 2 - Indirect emissions	9	12	9
Purchased electricity	9	12	9
Scope 3 - Other indirect emissions	175	131	9
Business travel	0	0	0
Employee Commuting	175	131	9
ABSOLUTE EMISSIONS	184	143	18

Note: Due to rounding, some totals may not correspond with the sum of the separate figures.

Breakdown GHG Emissions by Operations cont.

GHG Distribution by Facilities





Thank You



☎ + (60) 3- 2284 8102 | + (60) 3- 2284 8103 (Fax)

✉ econsult@ecoideal.com.my

🌐 www.ecoideal.com.my

📍 Unit C10-4, Wisma Goshen, Bangsar Trade Centre, Jalan 4/83A, 59200 Kuala Lumpur

📍 1st Floor, Lot 378, Jalan Nanas, 93400 Kuching, Sarawak

Carbon | Waste | Data

