



1: GENERAL DETAILS, PURPOSE AND POLICY

1.1 Introduction

This report serves as the comprehensive emission inventory and greenhouse gas (GHG) report for Teknicast Sdn Bhd. It outlines our commitment to environmental responsibility, detailing our efforts to measure, manage, and mitigate our carbon footprint. Through this report, we aim to provide transparency regarding our emissions profile, sustainability initiatives, and adherence to international standards.

1.2 Purpose

Teknicast is playing our role in joining worldwide movements focused on reducing carbon emissions and preventing further degradation of the planet's climate. We are committed to this cause by pledging to reduce our carbon emissions by 50% by 2030 and achieve net-zero emissions by 2050. By aligning our efforts with global initiatives, we aim to make a significant contribution to mitigating climate change and safeguarding the environment for future generations.

1.3 Description of Teknicast

Teknicast is an aluminium die casting manufacturer based in Malaysia which started its operations in 1983. Supplying high-pressure aluminium die-casting parts with complex features and serving various Multi-National Corporations around the globe. Apart from being a die casting company, we are a fully-integrated facility providing a one stop centre concept extending to machining, trimming, leak test, impregnation, painting and sub-assembly services.

For further information, please visit our website: <https://teknicast.com/>

1.4 GHG and Sustainability Strategies and Programs

Our GHG and programs underscore our dedication to environmental stewardship, outlining our strategies and programs for reducing emissions and promoting sustainability throughout our operations.

1.5 Persons Responsible

The provided GHG Inventory and Report has been prepared by the Sustainability Team, with continuous support on data collection from all elected committee members.

Responsibility for the preparation of the inventory and report:

- Mr. Victor Huang Jiunn Yeh, Business Development Manager & Sustainability Champion

Supporting and preparation of the report:

- Noor Adilah Hamzah, Commercial Executive
- Nur Alia Johari, ESG Executive

Below appointees are responsible to collect and maintain the data in a secured database internally stored in our server. Meanwhile, TSB has sent Victor Huang Jiunn Yeh to Greenhouse Gas Practitioner training organized by BSI academy for better understanding on GHG Emission and the important of low carbon emission.

1.6 Sustainability Organizational Chart

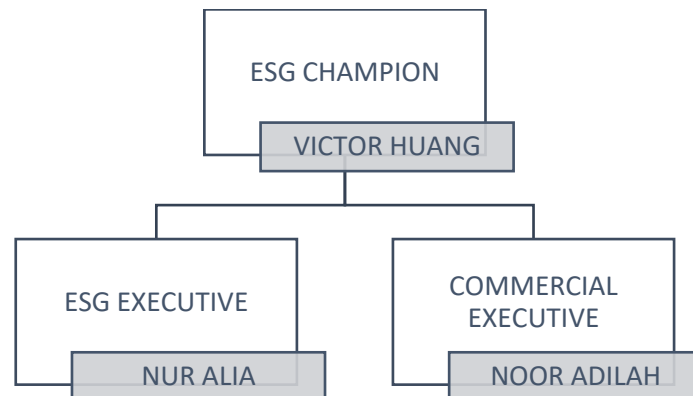


Figure 1.1: Sustainability Organizational Chart

Table 1.1 Sustainability Committee

Department	Name	Assisted by	Role
Management	John English	-	Chairman
Business Development	Victor Huang	Nur Alia Noor Adilah	Champion
Finance	Tan Chang Boon	Chan Wei Yuan	Committee
Human Resources	Foo Kok Yeong	Siti Umaimah	Committee
Strategic Sourcing	Des Morgan	Yee Seng Chun	Committee
CSCS	Alwin Wong	Nur Diyana	Committee
Operations	John Abraham	Abdul Rahim	Committee
HSE	Raymond David	Mohamad Naim	Committee
IT	Sum Weng	-	Committee

Team Trainings are provided for the Preparation of this Emission Inventory and GHG Report. The main members of the inventory presentative team are made to be aware of the all principles and requirements within ISO 14064-1:2018 standard.

1.7 Audience and Dissemination Policy

This report is intended for all Teknikast stakeholders that interested in its greenhouse gas emissions inventory and the associated reporting structure, notation, and explanations. The report will be provided publicly and published on our website and in EcoVadis platform following appropriate third-party verification.



1.8 Reporting Period and Frequency of Reporting

The GHG Report encompasses the calendar year from January 1st, 2022, to December 31st, 2022. The chosen base year of 2022 is after post covid in 2021 and we were running at our maximum capacity in 2022, which makes it a good benchmark as a starting point. This period serves as the defined time-frame for assessing and reporting our organization's greenhouse gas emissions and related sustainability efforts. Moving forward, such reports will be generated every year, ensuring regular and consistent monitoring of our sustainability performance and progress towards our emission reduction targets.

1.9 Reporting Standards, Approach and Verification

The GHG emissions taken into account is carbon dioxide, methane, and nitrous oxide documented with:

- Compliance with ISO 14064-1:2018
The GHG Report has been prepared in accordance with ISO 14064-1:2018.
- Carbon Boarder Adjustment Mechanism (CBAM)- The report will be using hybrid approach calculation methodology to determine our average carbon emission per Kg of completed finished articles.
- Audit of GHG Inventory- Verified by BSI

2: ORGANIZATIONAL BOUNDRIES

2.1 Consolidation Approach

Teknicast utilises control consolidation method for our emission inventories. This approach considers all emissions that Teknicast has "financial control" over at all operation sites and a corporate office. This control allows the organisation to financially approve plans or investments towards a more sustainable environment achieving reduction of greenhouse gas emission goal.

2.2 Geographic Boundaries of inventory

Teknicast reporting protocols, gathers data from three separate sites (Figure 2.1), with its main operation centred at TPG. This site, served as the primary collection point, and contributes majority of the collected emission data whilst also serves as the central archive for all documents.

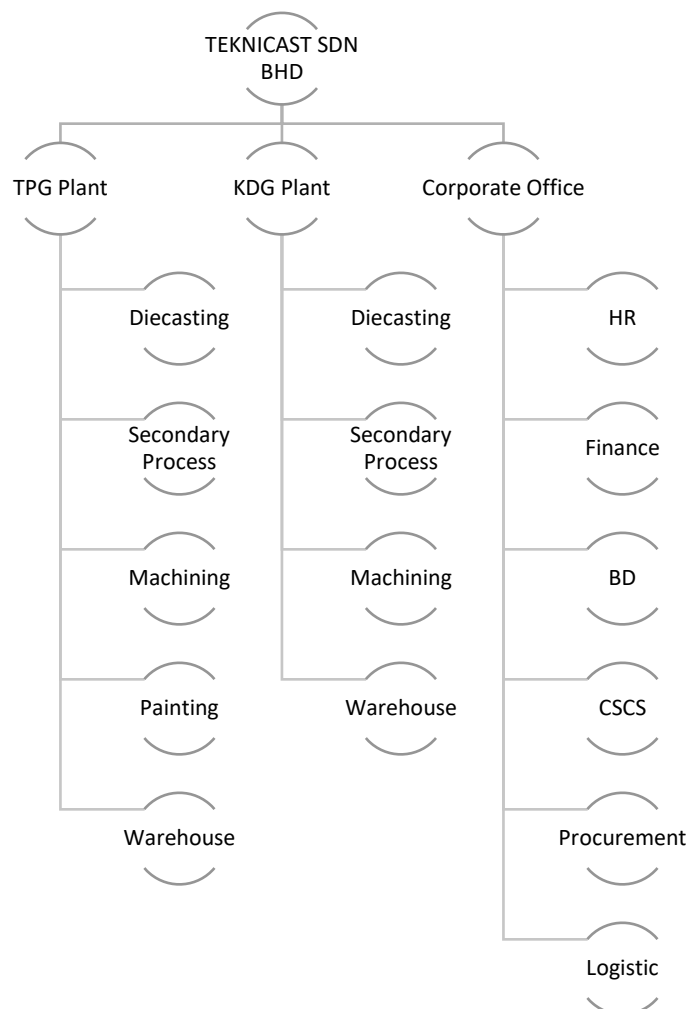


Figure 2.1: TSB Geographic Boundaries



2.3 Organizational Chart

The organizational chart presented below illustrates the operational structure of TSB pertinent to the emissions summary:

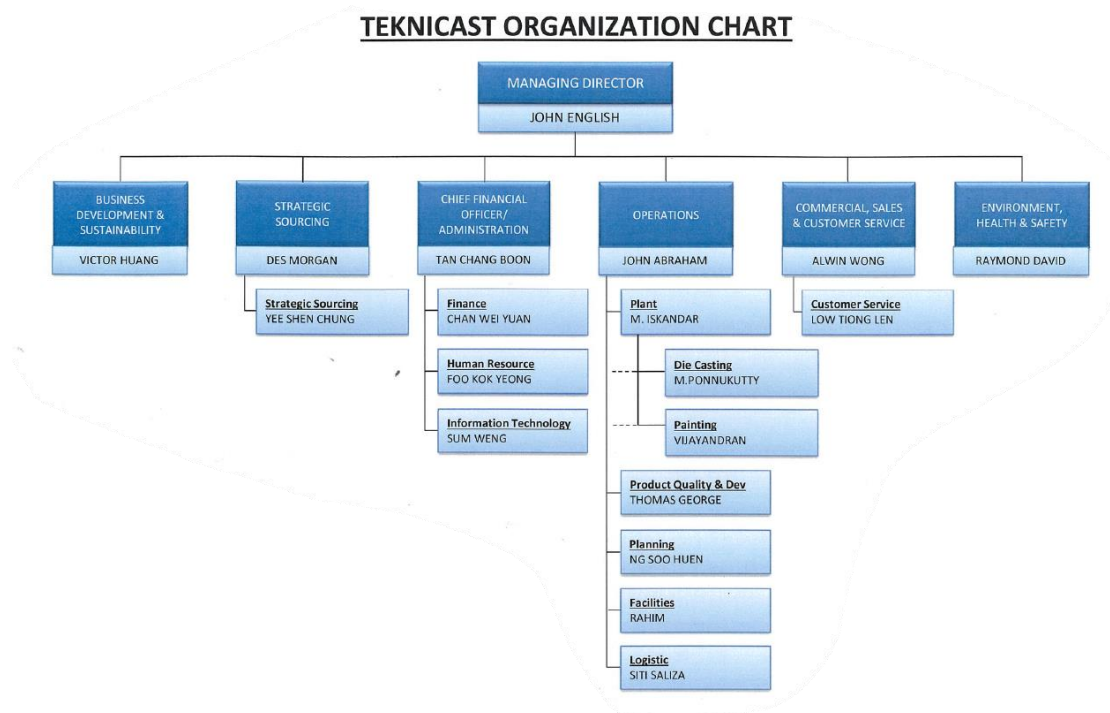


Figure 2.2: TSB Organizational Chart

3: REPORTING BOUNDRIES

3.1 Emissions Categories and Classification

Emissions sources were identified with the reference to the methodology described in the Greenhouse Gas Protocol and ISO 14064-1:2018. This report includes the following GHG Emissions;

Table 3.1: GHG Reference Index

Type of Emissions	GHG Protocol Index	ISO 14064-1:2018 Index
Direct Emissions	Scope 1	Category 1: Direct Emissions and Removals <ul style="list-style-type: none"> • Direct emission from stationary combustion • Direct emission from mobile combustion • Direct Fugitive Emission
Indirect Emissions	Scope 2	Category 2: Indirect Emissions from imported energy <ul style="list-style-type: none"> • Indirect emission from imported electricity
	Scope 3	Category 3: Indirect Emissions from transportation <ul style="list-style-type: none"> • Indirect emission from upstream transportation and distribution • Indirect emission from downstream transportation and distribution • Indirect emission from employee commuting • Indirect emission from business travel • Indirect emission from hotel stays
		Category 4: Indirect Emissions from products used by organization <ul style="list-style-type: none"> • Indirect emission from purchased good and services • Indirect emission from disposal of solid and liquid waste
		Category 5: Indirect Emissions associated with the use of products from the organization
		Category 6: Indirect Emissions from other sources



3.4 Summary of Greenhouse Gas Inventory

Table 3.2 tabulate the summary of GHG Inventory and the emission factor use for every category. For Category 2-Indirect Emission from Imported Electricity, the emission factor is taken from Grid Emission Factor by Energy Commission (ST). Meanwhile the International Emission Factor is referred to Defra 2023 and the National Emission Factor is indicated factor from Malaysian National Water Service Commission (SPAN). The purchasing of ingot is using the emission factor supplied by the manufacturer.

Table 3.2 Details of GHG Inventory

Category	Classification	Variable	Unit	Emission Factor kg CO2e per unit	Emission Factor Source	CO2	CH4	N2O	Others
1	Stationary combustion	Natural gas (GJ)	Cubic metres	2.02000	International EF	/	/	/	
	Mobile combustion	Trucks	Mileage (km)	0.49758	International EF	/	/	/	
		Company cars	Mileage (km)	0.17048	International EF	/	/	/	
		Fuel use (litre)	Litres	2.7000	International EF	/	/	/	
	Refrigerant	R22	kg	1810.0	International EF	/			
		R32	kg	675.00	International EF	/			
		R410A	kg	2088.0	International EF	/			
	Septic Tank	No of Employees	kg	0.02800*	National Emission Factor		/		
2	Indirect emissions from imported electricity	Electricity	kWh	0.75800**	Regional Emission Factor				
3	Emissions from Upstream transport and distribution for goods	Ingot transportation	Tonne.km	0.08153	International EF	/	/	/	
		Pallet's transportation	Tonne.km	0.38655	International EF	/	/	/	
		Component land Transportation	Tonne.km	0.08153	International EF	/	/	/	
		Component sea Transportation	Tonne.km	0.01614	International EF	/	/	/	
		Local vendor Transportation	Tonne.km	0.66945	International EF	/	/	/	
		Diesel Transportation	Tonne.km	0.66945	International EF	/	/	/	
		Household Residual Waste	Tonne.km	0.66945	International EF	/	/	/	

Category	Classification	Variable	Unit	Emission Factor kg CO2e per unit	Emission Factor Source	CO2	CH4	N2O	Others
3	Emissions from Downstream transport and distribution for goods	Commercial and Industrial waste	Tonne.km	0.66945	International EF	/	/	/	
		Diesel Transportation	Tonne.km	0.885.01	International EF	/	/	/	
		HGV (Diesel)	Tonne.km	0.08153	International EF	/	/	/	
		Rail/Train	Tonne.km	0.02782	International EF	/	/	/	
		Freight Flights	Tonne.km	1.01890	International EF	/	/	/	
	Emissions from Employee commuting includes emissions	Container Ship	Tonne.km	0.01614	International EF	/	/	/	
		Passenger Vehicle	Distance travelled (km)	0.17048	International EF	/	/	/	
	Emissions from Business Travel and hotel accommodation	Motorbike	Distance travelled (km)	0.11355	International EF	/	/	/	
		Flights	Travelling distance (km)	0.18362	International EF	/	/	/	
		Rental Cars	Travelling distance (km)	0.17048	International EF	/	/	/	
4	Emissions from Purchased goods	Taxi	Travelling distance (km)	0.20826	International EF	/	/	/	
		Train	Travelling distance (km)	0.03549	International EF	/	/	/	
		Hotel stays	Number of nights	***	International EF	/			
	Emissions from the disposal of solid and liquid waste	Ingot Purchased	Ton	0.21500	Manufacturer EF	/			
		Component Purchased	Ton	0.39000	International EF	/			
		Pallet Purchased	Ton	0.00820	International EF	/			
	Emissions from the disposal of solid and liquid waste	Household residual waste	Ton	60.23755	International EF	/	/	/	
		Commercial and Industrial waste	Ton	450.920	International EF	/	/	/	

*Malaysian Sewerage Industry Guidelines, The National Water Service Commission (SPAN)

**Malaysian Grid Emission Factor, Energy Commission (ST)

***Determine based on country- refer to Defra 2023



4: QUANTIFIED GHG INVENTORY OF EMISSIONS

4.1 Consolidated Statement of Greenhouse Gas Emissions

Table 4.1 shows the summary of the CO₂e emission in 2023. The details of calculation and emission factor used is in Appendix B.

Table 4.1 Greenhouse Gas Emissions

Direct emissions in tonnes CO₂-e

		CO ₂ e EMISSIONS			
	Notes	CO ₂ e Total	CO ₂	CH ₄	N ₂ O
		GWP	1	27.9	273
1	Category 1: Direct GHG Emissions and Removals in tonnes CO₂-e				
	Direct emissions from stationary combustion	3276.367935	3269.905966	4.932577373	1.52939
	Direct emissions from mobile combustion	111.572	110.291	0.035	1.247
	Direct fugitive emissions from the release of GHGs in anthropogenic systems	1	107.168	-	-
	Direct emissions and removals from land use and forest change systems	NA	-	-	-
	One off - refrigerant major leakage	NA	-	-	-
		3,495.109	3,380.197	4.968	2.776

Indirect emissions in tonnes CO₂-e

2	Category 2: Indirect GHG Emissions from Imported Energy	Notes	CO ₂ e Total	CO ₂	CH ₄	N ₂ O
	Indirect emissions from imported electricity		8,271.641	8,271.641	-	-
	Indirect emissions from imported energy		-	-	-	-
			8,271.641			

3	Category 3: Indirect GHG Emissions from Transportation	Notes	CO2e Total	CO2	CH4	N2O
	Emissions from upstream transportation and distribution of goods		54.731			
	Emissions from downstream transportation and distribution of goods		349.261			
	Emissions from employee commuting		163.035			
	Emissions from client and visitor transport		-			
	Emissions from business travels		41.278			
	Emissions from hotel stays		2.451			
			610.756	0.000	0.000	0.000
4	Category 4: Indirect GHG Emissions from Products Used by an Organization	Notes	CO2e Total	CO2	CH4	N2O
	Emissions from purchased goods and services		682.743			
	Emissions from capital goods	NA	-			
	Emissions from the disposal of solid and liquid waste		229.869			
	Emissions from the use assets	NA	-			
	Emissions from other services not described above	NA	-			
			912.613	0.000	0.000	0.000
5	Category 5: Indirect GHG Emissions Associated with the Use of Products from the Organization	Notes	CO2e Total	CO2	CH4	N2O
	Emissions or removals from the usage of product	NA	-			
	Emissions from downstream leased assets	NA	-			
	Emissions from end-of-life stage of the product	NA	-			
	Emissions from investments	NA	-			
			-	0.000	0.000	0.000
6	Category 6: Indirect GHG Emissions from Other Sources		-			
	TOTAL EMISSIONS CATEGORIES 1-6		13,290.1182	3,380.1966	4.9676	2.7762

Notes: -

1. Calculate based on overall refrigerant used in the plant and estimated 5% leakage rate over per year.

[NA]- Not Applicable



4.2 Methodologies for the Collection and Quantification of Data

4.2.1 Methodologies

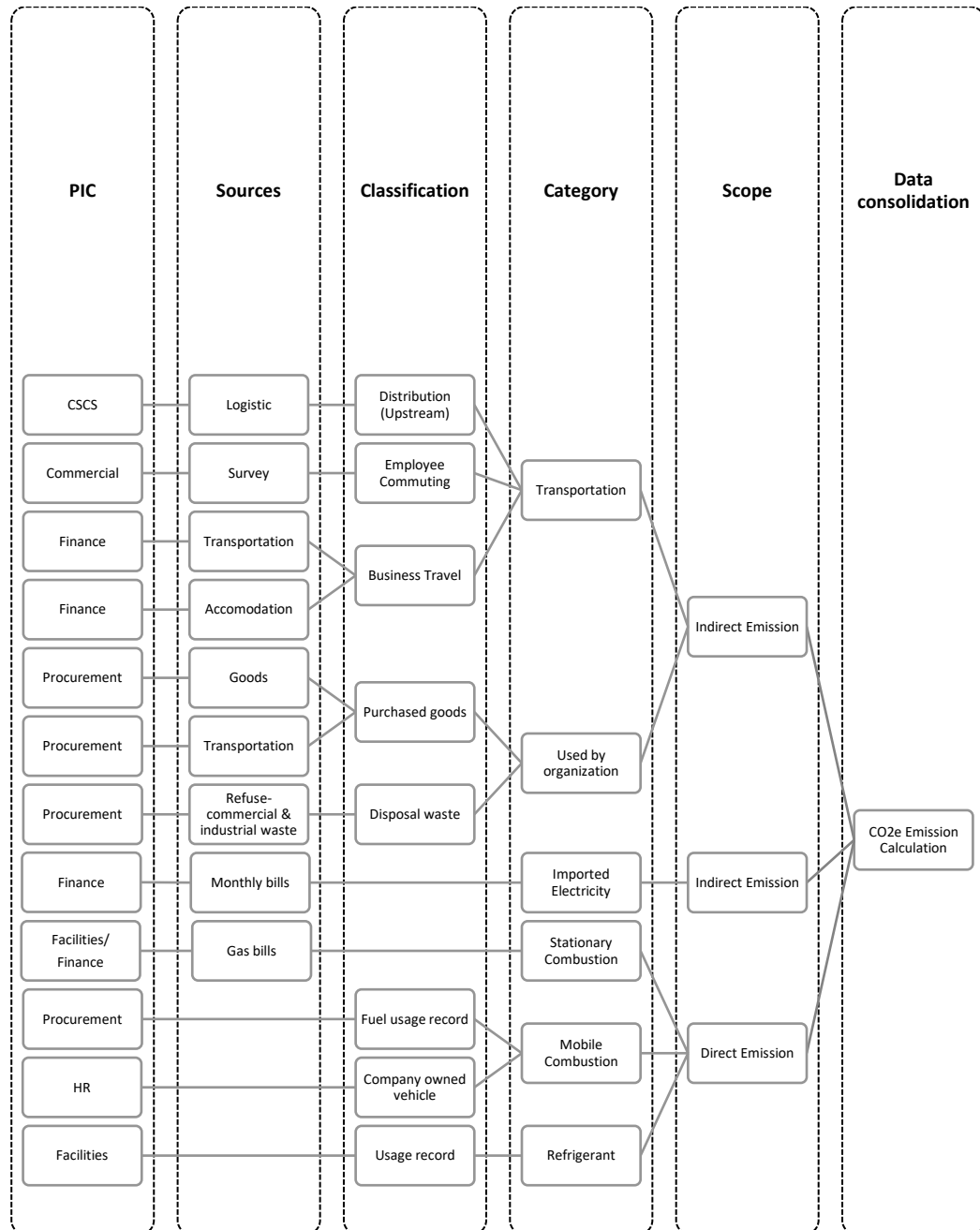


Figure 4.1 Data Information Management



4.2.1 The Description of Methodologies

Category 1 – Direct Emission and Removals

- Stationary Combustion - Collected based on monthly utility bills, recorded by facilities department, and verified by Finance department. Calculation is using 2023 Defra UK emission factor.
- Mobile Combustion – recorded mileage on all company owned vehicle is by HR department and forklift diesel usage is recorded by Facility department and verified by Procurement department. Calculation is using 2023 Defra UK emission factor.
- Total direct fugitive emission was calculated based on overall refrigerant used in the plant and estimated 5% leakage rate per year.
- HR Dept will provide the headcount for employee for the reporting year and Sustainability department will calculate the wastewater discharge using emission factor obtain from IPCC wastewater treatment and discharge and Malaysian Sewerage Industrial guideline.

Category 2- Indirect Emission from imported energy

- Usage data is recorded by facility department on monthly basis using the utility bill data from the service provider (Tenaga Nasional Berhad). CO₂e emission factor is obtained from the latest Malaysia Energy Commission (Suruhanjaya Tenaga) Grid Emission Factor (GEF) for Peninsular Malaysia.

Category 3- Indirect Emission from Transportation

- Emission from Downstream transportation and distribution of goods – System collected “Shipment Vs Invoice” data is tabulated and summarized. Calculation is using 2023 Defra UK emission factor (tonne.KM) and using the following links to obtain point to point location either by road, sea, air or rail:
 - maps.google.com
 - ports.com
 - airmilescalculator.com
- Emission from upstream transportation and distribution of goods – Based on good receive note and data is tabulated and summarized. Calculation is using 2023 Defra UK emission factor (tonne.KM) and using the following links to obtain point to point location either for all road, sea, air or rail transportation:
 - maps.google.com
 - ports.com
- Emission from the disposal of solid waste and liquid is categorised by:
 - Household residual waste – Data is tracked and recorded by procurement department based on supplier provided information in tonnage of disposal. Calculation is using 2023 Defra UK emission factor.
 - Commercial and industrial waste – Data is tracked and recorded by procurement department based on supplier provided information in tonnage of disposal. Calculation is using 2023 Defra UK emission factor.
- A survey form was created and handed to all individual department to obtain the weekly travelling mileage by type of vehicle commuting to work. Collected data is then tabulated to



obtain a full year mileage by type of vehicle into two categories which are passenger vehicle and motorcycle. Calculation is using 2023 Defra UK emission factor.

- Business Commuting is recorded by finance department upon presentation of individual expense claim, where all claimants is to provide the mileage categorised by air, taxi, rental cars, and train mode of traveling during expense submission.
- Hotels stays is also recorded by Finance department with reference to claimant hotel invoices. Calculation is using 2023 Defra UK emission factor

Category 4- Indirect Emission from products used by organisation

- Top 3 spend purchase goods categorised by Aluminium Ingots, wooden pallets, and stainless-steel component (National Manufacturing) data are collected based on goods received notes and shipping document and tracked by procurement department. 2023 Defra UK emission factor with additional emission factor obtain from
 - Aluminium Ingot – Supplier provided information; using average value of 3 out of 4 supplier provided data.
 - Wooden Pallet – using www.Scileo.cl emission factor.
 - Stainless Steel Component – using www.worldstainless.org emission factor.

4.2.3 GHG Emission Calculation

$$\text{GHG emissions} = \text{activity data} \times \text{emission conversion factor}$$

By referring to UK Government GHG Conversion Factors, navigate the sheet relating to the related activity, determine the unit and define the emission factors. Refer to the guidance (for example, the amount of electricity used or distance travelled). Then multiply this activity data by the relevant (emission) conversion factor. This gives an estimate of the GHG emissions for that activity.

4.2.4 GWP Calculation and Source

$$\text{Greenhouse gas emission CO}_2 \text{ equivalent} = \text{annual activity intensity of emission source} \times \text{emission factor} \times \text{GWP}$$

Greenhouse Gas	Global Warming Potential (GWP)
Carbon dioxide (CO ₂)	1
Methane (CH ₄)	27.9
Nitrous oxide (N ₂ O)	273

Figure 4.2 Global Warming Potential Values, Kyoto Gases (IPCC 2021-6th Assessment Report Values)

4.2.5 Review, Internal Audit and Continuous Improvement

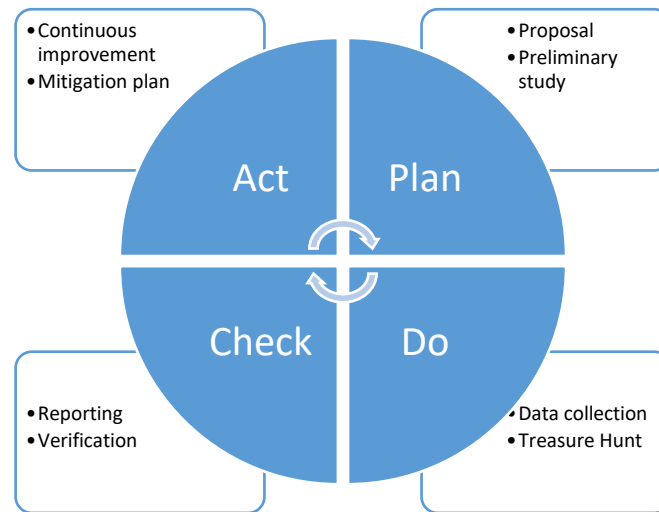


Figure 4.3 Yearly Project Plan

This report for the year ending 31st December 2023 has been prepared.

4.3 Assessment of Uncertainty

The GHG emission was quantified separately for CO₂, CH₄, N₂O and others in tonnes of CO₂ equivalent. The GHG Inventory framework was determined based on ISO 14064-1 Standard Report. The Uncertainty Assessment was conducted based on several types of evaluation which are magnitude, level of influence, risk or opportunity, sector-specific guidance, outsourcing and employee engagement. In accordance with their magnitude and level of influence have been prioritized as high, medium, and low (refer Table 3.2). Meanwhile, the data for sector-specific guidance, outsourcing and employee engagement were identified by Yes and No criteria, with further details available in the report's Appendix.

The evaluation of the activity data is determined by data quality level which is continuous measurement, regular measurement and owned estimation. Continuous measurement is a real-time measurement which involves machines to constantly check and record the value. Regular measurement involves taking samples at pre-determined intervals such as daily, weekly, monthly or annually. Then, process by which individual or organization assesses and quantifies the uncertainty as associated with their owned GHG emissions inventory or measurement data. This systematic approach can be broken down by assessment, quantification, documentation and communication.

Appendix A displays the significant scores of all identified emission sources within the reported boundaries of the inventory. All direct and indirect emissions sources with significant, medium and insignificant are reported in this document. Emission sources with less than 30 % score mark as insignificant. Meanwhile more than 50% score is marked as insignificant and the score between 31% to 50% labelled as medium.



4.4 Hybrid Calculation Approach - CBAM

Total emission will be used to generate our average CO₂e value per Kg of all completed articles or finish goods.

Combined Emission value (tonne CO ₂ e)	=	X value of CO ₂ e per Kg
2023 total produced articles in tonne		

X-Value

$$\frac{13,290.118 \text{ tCO}_2\text{e}}{2,967.47 \text{ tonne}} = \mathbf{4.4785994 \text{ KgCO}_2\text{e/Kg}}$$

4.5 Removals

There are no carbon removals to report for the current reporting period.

4.6 Base-year GHG Inventory

The 2022 GHG Inventory Report is the first report made by Teknicast Sdn Bhd, it provides the base year for the original assessment and for the future years. The following represents changes in methodology with respect to the based year and our commitment to improve the accuracy and breadth of reporting year on year;

- Total finished goods weight
- Emission factor updates
- Purchasing of Green Electricity Tariff (GET)
- Introducing a Science Based Target Initiative (SBTi) framework
- Implementing and organized methodology for gathering and handling data

5: INTERNAL REPORTING AND PERFORMANCE

5.1 Emissions by Scope – GHG Protocol

The emissions breakdown by scope is details below: -

Table 5.1: Data emission based on GHG Protocol Index

Scope	Classification	Total CO ₂ e
1	Direct Emission	3,495.109
2	Indirect Emission – Purchased Electricity	8,271.641
3	Indirect Emission – Corporate Value Chain	1,523.369
TOTAL		13,290.118

5.2 Emissions by Category – ISO 14064-1 Standard

The emissions breakdown by category is details below: -

Table 5.2: Data emission based on ISO 14064-1 Index

Category	ISO 14064-1:2018 Index	Total CO ₂ e
Category 1	Direct Emissions and Removals	3,495.109
Category 2	Indirect Emissions from imported energy	8,271.641
Category 3	Indirect Emissions from transportation	610.756
Category 4	Indirect Emissions from products used by organization	912.613
Category 5	Indirect Emissions associated with the use of products from the organization	-
Category 6	Indirect Emissions from other sources	-
TOTAL		13,290.118



5.4 GHG Reduction initiatives and Internal Performance Tracking

Based on the provided information about TSB's commitment to reducing its carbon emissions, here are some GHG reduction initiatives and strategies TSB currently consider:

Reduction Initiatives	Strategies	Action/Plan/Example/Activities
Energy Efficiency Improvements	Implementing energy-saving measures	Upgrade to more energy-efficient equipment, optimizing manufacturing processes to reduce energy consumption, and conducting energy audits to identify areas for improvement.
Transition to Renewable Energy	Investing in renewable energy sources	Installing solar panels on factory roofs or purchasing renewable energy from services providers.
Transportation Optimization	Encouraging employees to carpool, use public transportation, or switch to electric vehicles.	Optimizing transportation routes and logistics to minimize fuel consumption and emissions.
Waste Reduction and Recycling	Implementing 3R Program	Reusing materials, recycling scrap metal or other waste products generated during manufacturing processes, and properly managing hazardous waste to minimize environmental impact.
Supply Chain Optimization	Lower carbon footprints or implementing sustainable procurement practices.	Work with suppliers to improve their environmental performance and reduce emissions throughout the supply chain.
Employee Engagement and Training	Educating employees	Providing training on energy-saving practices and promoting a culture of environmental responsibility within the organization.
Continuous Monitoring and Reporting	Regularly monitoring and reporting carbon emissions	Using data to identify trends, assess the effectiveness of implemented measures, and make adjustments as needed to further reduce emissions.