PETERSON

2023 Scope 3 Emissions

Inventory Assessment and Report

for

Anglo-Eastern Plantation PLC

8 February 2024

Contents

1. General Information

Project Information	
Title	SCOPE 3 EMISSIONS Inventory Assessment and Report for Anglo Eastern Plantation PLC
Client Information	
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Assessment Data	
Assessment type	Scope 3 GHG inventory assessment for corporate carbon footprint
Assessment Guideline	1. ISO 14064-1:2018 2. Greenhouse Gas protocol: A Corporate Accounting and Reporting Standard 3. Corporate Value Chain (Scope 3) Accounting and Reporting Standard 4. Technical Guidance for Calculating Scope 3 Emissions (Version 1)
Scope and definition of study unit	
Units in scope:	**Oil Palm Plantations (Estates)** **Palm Oil Mills (POM)** **Head Offices (HO)**
Evaluation period:	1 January 2023 – 31 December2 023
Date of Report:	8 February 2024
Level of Assurance	Limited Assurance
Materiality Threshold	5% Materiality

1.1 Claim of Conformity

This assessment has been carried out according to the requirements of ISO 14064-1:2018. The methodology used for this assessment is based on the Greenhouse Gas protocol: A Corporate Accounting and Reporting Standard, which include scope 3 calculation guidance from the following guidelines:

1) Corporate Value Chain (Scope 3) Accounting and Reporting Standard
2) Technical Guidance for Calculating Scope 3 Emissions (Version 1)

1.2 Functional Unit

The functional unit of this study is considered as tCO2eq – Tonnes of Carbon Dioxide equivalent for Scope 3 activities of Anglo-eastern Plantation PLC (AEP).

1.3 Scope of Reporting

The objective of this study is to consider relevant Scope 3 emissions relevant to AEP and its supply chain, as follows:

Table 1*: Emission types and categories*

Emission	Categories	Source
Scope 3	Cat 1 Purchased goods and services	GHG Protocol
	Cat 2 Capital goods	
	Cat 3 Fuel-and energy-related activities	
	Cat 4 Upstream transportation and distribution	
	Cat 5 Waste generated in operations	
	Cat 6 Business Travel	
	Cat 7 Employee commuting	
	Cat 8 Upstream Leased Assets	
	Cat 9 Downstream transportation and distribution	
	Cat 10 Downstream Processing of sold products	
	Cat 11 Downstream Use of sold products	
	Cat 12 Downstream End-of-life treatment of sold products	
	Cat 13 Downstream Leased Assets	
	Cat 14 Franchises	
	Cat 15 Investments	

2. Background to the Study

2.1 Scope 3 GHG

Scope 3 GHG emissions are emissions that are not produced by a company itself, but rather indirect emissions from across a company's value chain. These are emissions attributed to a company's activities, but are generated from sources that are not directly owned or controlled by the company. This includes all other indirect emissions that occur in a company's value chain, both for the upstream and downstream, such as emissions from the production of purchased goods, employee commuting, and waste generated by the company.

Scope 3 emissions are categorised into 15 different categories under the GHG Protocol, as shown in the figure below. The 15 categories in scope 3 are intended to provide companies with a systematic framework to measure, manage, and reduce emissions across a corporate value chain. The categories are designed to be mutually exclusive to avoid double counting. (*https://ghgprotocol.org/scope-3-calculation-guidance-2*)

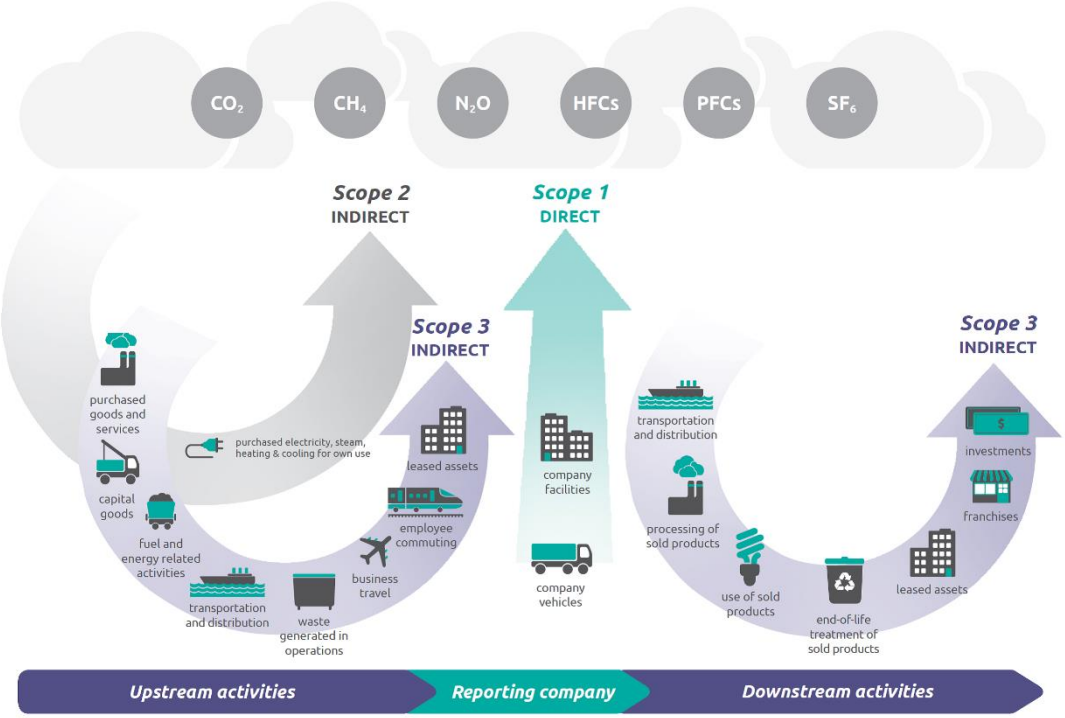

Figure 1: Overview of scopes and emissions across a value chain
(GHG Protocol, Revised edition)

2.2 About the Company

Anglo-Eastern Plantations Plc (AEP) is a United Kingdom-listed major producer of palm oil and rubber with plantations across Indonesia and Malaysia. The Company operates a planted area of approximately 128,000 hectares (ha) of oil palms and rubber trees. The Company also operates six palm oil mills in Indonesia, four of which are equipped with biogas facilities.

AEP's primary activities are the production and processing of palm oil and some rubber. The weighted average age of the palm trees in the Group is approximately 14 years. The Group's fresh fruit bunches (FFB) production in 2022 reached 1.17 million metric tons (mt) of which 1.12 million mt was from continued operations. In 2022 the Group also purchased approximately 1.08 million mt of FFB from third party producers, comprising small plantations and local farmers, for processing through its mills.

As a responsible player in the industry AEP believes that stewardship of the environment is critical in benefiting consumers, employees, shareholders and society in general. One of the most significant ways to do this is by reducing their carbon footprint by monitoring and reporting on carbon emissions. As a premium-listed company on the London Stock Exchange, AEP has been disclosing its carbon emissions annually in line with the UK's Streamlined Energy and Carbon Reporting (SECR) guidelines. These reports cover the emissions from AEP's operational activity at its plantations and mills, which are classified under Scope 1 and 2 emissions. A few selected Scope 3 emissions have also been reported by AEP so far.

Based on the Task Force for Climate-related Financial Disclosures (TCFD) guidelines, organisations should provide their Scope 1 and Scope 2 emissions independent of a materiality assessment, and should also consider disclosing Scope 3 emissions where appropriate. These emissions should be calculated in line with the GHG protocol methodology to allow for aggregation and comparability across organisations and jurisdictions. Being a producer and also buyer of oil palm fresh fruit bunches (FFB), AEP is involved entirely in palm oil upstream activities. Therefore, most of the Scope 3 calculations for AEP will be focused on upstream activities.

3. Methodology

3.1 Organisational Boundary

The organisational boundary are limited to the 'operational control' of 3 main groups - *Head Offices (HO)*, *Palm Oil Mills (POM)* and *Oil Palm Plantations (Estates)* located in Malaysia and Indonesia. The system boundary is from raw material acquisition (mainly FFB) to the final product (mainly CPO) at factory gate of 6 mills of the AEP and the operational of Head office in scope.

Guidelines used to define organisational boundaries	*OPERATIONAL CONTROL*
Facilities/Areas in the reporting company	*2 HEAD OFFICES (HO)* 1. Medan, Indonesia (Pt Anglo-Eastern Plantations Management Indonesia) 2. Kuala Lumpur, Malaysia (Anglo-Eastern Plantations (M) Sdn Bhd) *6 PALM OIL MILLS (POM)* 1. Tasik Raja Palm Oil Mill 2. Mitra Puding Mas Palm Oil Mill 3. Blankahan Palm Oil Mill 4. Bina Pitri Jaya Palm Oil Mill 5. Sumindo Palm Oil Mill 6. Sawit Graha Manunggal Palm Oil Mill *22 OIL PALM PLANTATIONS (ESTATES)* 1. Sei Musam Estate (PT Musam Utjing) 2. Blankahan Estate (PT United Kingdom Indonesia Plantation) 3. Rambung Estate (PT Simpang Ampat) 4. Tanjung Selamat Estate (PT Anak Tasik) 5. Tasik Idaman Estate (PT Tasik Raja) 6. Tasik Estate (PT Tasik Raja) 7. Tasik Harapan Estate (PT Tasik Raja) 8. Marison Estate (PT Cahaya Pelita Andhika) 9. Hijau Pryan Perdana Estate (PT. Hijau Pryan Perdana) 10. Bina Pitri Jaya Estate (PT Bina Pitri Jaya) 11. Bangka Malindo Lestari Estate (PT Bangka Malindo Lestari) 12. Puding Mas Estate (PT Mitra Puding Mas) 13. Pangeran Estate (PT Alno Agro Utama I) 14. Sapta Buana Estate (PT Alno Agro Utama I) 15. Sumindo Estate (PT Alno Agro Utama II) 16. Air Ikan Estate (PT Alno Agro Utama III & IV) 17. Tamiang Indah Estate (PT Sawit Graha Manunggal) 18. Bumi Borneo I Estate (PT Sawit Graha Manunggal) 19. Bumi Borneo II Estate (PT Sawit Graha Manunggal) 20. Kap I Estate (PT Kahayan Agro Plantation) 21. Kap II Estate (PT Kahayan Agro Plantation) 22. Ladang Cenderung Putra South, Putra North and Manyvest (Anglo-Eastern Plantations (M) Sdn Bhd)

3.2 Operational Scope

3.2.1 GHGs considered

GHGs considered	• *Carbon dioxide (CO_2)* • *Methane (CH_4)* • *Nitrous oxide (N_2O)* • *Hydrofluorocarbons (HFCs)* • *Perfluorocarbons (PFCs)* • *Sulfur hexafluoride (SF_6)* • *Nitrogen trifluoride (NF_3)*
GHGs to be considered as add on for separate reporting	• *HCFC-22*
Global Warming Potential (GWP) Version	• *IPCC Fifth Assessment Report (AR5)*

3.2.2 Data Collection Procedure

Data collection was carried out by the representatives of AEP based in Malaysia and Indonesia based on a template provided by the consultant. The data collection covers all the processes within the scope of study, and data was collected for the year 2023.

Some key assumptions that were made in data collection were:

- The data provided by the company is considered as complete & final for the purpose of the report, and the same is assumed for assessing the corporate carbon footprint.
- In cases where exact information was not available, estimations were made for data input entry.
- For the calculation of the emission factors (EF), an equivalent EF will be selected for calculation should an exact EF is not available for a particular value.
- For emission factors in categories where data collected using the average-data method is deemed insufficient, spend-based emissions factors were considered.

The type of data were collected and calculated based on the average-data method, hybrid method, supplier-specific method, or spend-based method as described in Annex I.

3.2.3 Separate Reporting

There was no other emission (HCFC-22, Biogenic Carbon) to be considered for separate reporting.

4. Results

4.1 Total Scope 3 Emissions

The scope 3 emission inventory provides a broader understanding of AEP's impact on the environment and climate change along their supply chain. Among the 3 groups of facilities owned by AEP, the oil palm plantations were shown to indirectly emit the most Scope 3 carbon emissions in 2023. This was followed by the mills, while the head offices were responsible for comparatively minimal Scope 3 emissions among the three groups.

Table 2: Overview of AEP's Total Scope 3 GHG emissions 2023

Scope 3 Emissions	Head office (HO)	Palm Oil Mills (POM)	Oil Palm Plantations (Estates)	Total
Tons CO2 eq	193.78	674,162.56	834,520.08	1,508,876.43
%	0%	45%	55%	100%

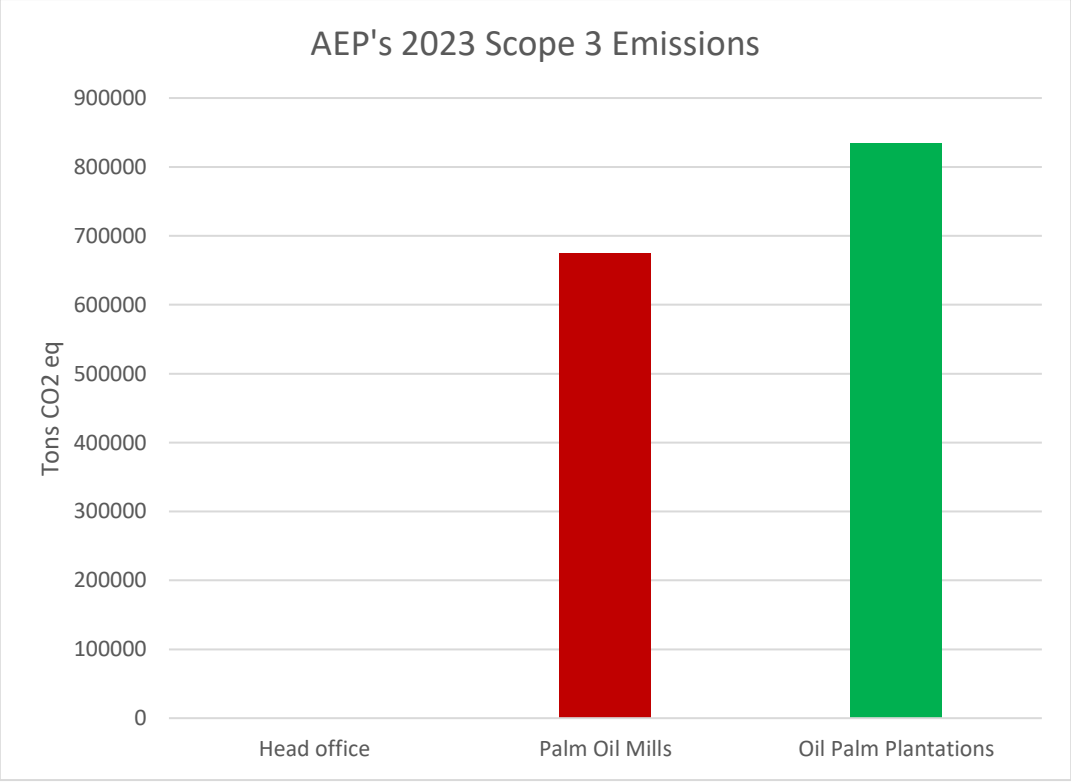

Figure 2: Overview of AEP's Scope 3 GHG emissions 2023

Table 3: Breakdown of AEP's Overall Scope 3 GHG emissions 2023

Emission Category		tCO2eq	% Total
Cat 1	Purchased goods and services	924,137.76	61.25%
Cat 2	Capital goods	2,245.55	0.15%
Cat 3	Fuel-and energy-related activities	80.80	0.01%
Cat 4	Upstream transportation and distribution	66,645.18	4.42%
Cat 5	Waste generated in operations	244,086.82	16.18%
Cat 6	Business Travel	171.96	0.01%
Cat 7	Employee commuting	1,771.13	0.12%
Cat 8	Upstream Leased Assets	192,091.52	12.73%
Cat 9	Downstream transportation and distribution	10,064.12	0.67%
Cat 10	Downstream Processing of sold products	67,308.95	4.46%
Cat 11	Downstream Use of sold products	272.63	0.02%
Cat 12	Downstream End-of-life treatment of sold products	Not relevant	-
Cat 13	Downstream Leased Assets	Not relevant	-
Cat 14	Franchises	Not relevant	-
Cat 15	Investments	Not relevant	-
	Total	**1,508,876.43**	**100.00%**

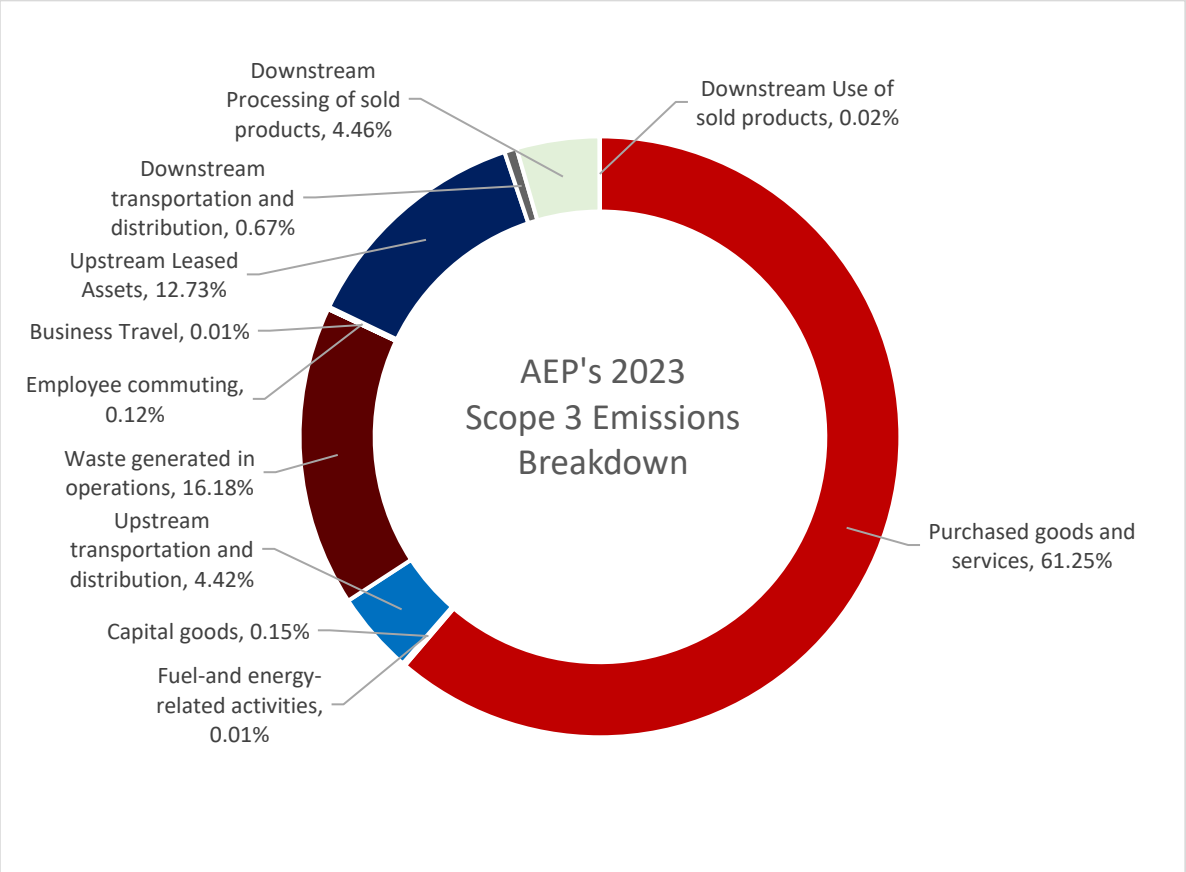

Figure 3: Breakdown of AEP's Scope 3 GHG emissions 2023

Taken as a whole, more than 90% of AEP's scope 3 emissions came from three categories – purchased goods and services (61%), waste generated (16%) and upstream leased assets (13%). More details on each category is provided under Annex II.

4.2 Head Office Scope 3 Emissions

Table 4: Head Office Scope 3 GHG Emissions Breakdown 2023

Emission Category		tCO2eq	% Total HO	% Total Overall
Cat 1	Purchased goods and services	4.27	2.20%	0.00%
Cat 2	Capital goods	1.55	0.80%	0.00%
Cat 3	Fuel-and energy-related activities	0.17	0.09%	0.00%
Cat 4	Upstream transportation and distribution	0.00	0.00%	0.00%
Cat 5	Waste generated in operations	0.00	0.00%	0.00%
Cat 6	Business Travel	109.94	56.73%	0.01%
Cat 7	Employee commuting	77.85	40.17%	0.01%
Cat 8	Upstream Leased Assets	4.27	2.20%	0.00%
Cat 9	Downstream transportation and distribution	Not relevant	-	-
Cat 10	Downstream Processing of sold products	Not relevant	-	-
Cat 11	Downstream Use of sold products	Not relevant	-	-
Cat 12	Downstream End-of-life treatment of sold products	Not relevant	-	-
Cat 13	Downstream Leased Assets	Not relevant	-	-
Cat 14	Franchises	Not relevant	-	-
Cat 15	Investments	Not relevant	-	-
	Total	193.78	100.00%	100.00%

In the head offices, business travels and employee commuting make up almost all of AEP's Scope 3 emissions.

4.2 Palm Oil Mills Scope 3 Emissions

Table 5: Palm Oil Mills (POM) Scope 3 GHG Emissions Breakdown 2023

Emission Category		tCO2eq	% Total POM	% Total Overall
Cat 1	Purchased goods and services	333,700.15	49.50%	22.12%
Cat 2	Capital Goods	0.0	0.0%	0.00%
Cat 3	Fuel-and energy-related activities	6.41	0.00%	0.00%
Cat 4	Upstream transportation and distribution	18,894.74	2.80%	1.25%
Cat 5	Waste generated in operations	243,873.96	36.17%	16.16%
Cat 6	Business Travel	7.40	0.00%	0.00%
Cat 7	Employee commuting	34.19	0.01%	0.00%
Cat 8	Upstream Leased Assets	Not relevant	-	-
Cat 9	Downstream transportation and distribution	10,064.12	1.49%	0.67%
Cat 10	Downstream Processing of sold products	67,308.95	9.98%	4.46%
Cat 11	Downstream Use of sold products	272.63	0.04%	0.02%
Cat 12	Downstream End-of-life treatment of sold products	Not relevant	-	
Cat 13	Downstream Leased Assets	Not relevant	-	
Cat 14	Franchises	Not relevant	-	
Cat 15	Investments	Not relevant	-	
	Total	674,162.56	100.00%	100.00%

In the palm oil mills, half of the Scope 3 emissions came from purchased goods and services, including FFB from outgrowers; while another 36% came from waste generated, mainly in the form of palm kernel shells.

4.2 Palm Oil Plantations Scope 3 Emissions

Table 6: Oil Palm Plantations (Estates) Scope 3 GHG Emissions Breakdown 2023

Emission Category		tCO2eq	% Total Estates	% Total Overall
Cat 1	Purchased goods and services	590,433.34	70.75%	39.13%
Cat 2	Capital goods	2,244.00	0.27%	0.15%
Cat 3	Fuel-and energy-related activities	74.22	0.01%	0.00%
Cat 4	Upstream transportation and distribution	47,750.43	5.72%	3.16%
Cat 5	Waste generated in operations	212.86	0.03%	0.01%
Cat 6	Business Travel	54.61	0.01%	0.00%
Cat 7	Employee commuting	1,659.09	0.20%	0.11%
Cat 8	Upstream Leased Assets	192,091.52	23.02%	12.73%
Cat 9	Downstream transportation and distribution	Not relevant	-	-
Cat 10	Downstream Processing of sold products	Not relevant	-	-
Cat 11	Downstream Use of sold products	Not relevant	-	-
Cat 12	Downstream End-of-life treatment of sold products	Not relevant	-	
Cat 13	Downstream Leased Assets	Not relevant	-	
Cat 14	Franchises	Not relevant	-	
Cat 15	Investments	Not relevant	-	
	Total	834,520.08	100.00%	100.00%

In the plantations, purchased goods and services made up 71% of the Scope 3 emissions. This includes raw materials such as seeds, fertilisers, chemicals and tools. Upstream leased assets, usually in the form of vehicles and machines used by contractors constituted about a quarter of the Scope 3 emissions in the plantations.

5. Conclusion

5.1 Summary

By identifying and understanding its Scope 3 emissions, AEP can begin to take steps where necessary to reduce future emissions. Having better visibility across the full value chain will allow AEP to identify emissions hotspots that they may have been unaware of. This will enable them to target the possible reduction opportunities and therefore work towards a more sustainable supply chain in a more proactive and effective manner.

As Scope 3 emissions are indirect, most companies face limitations in addressing how to effectively reduce them. However, some of the many ways to address Scope 3 emissions include choosing which products or raw materials to purchase and which suppliers to purchase them from, as well as making informed transportation decisions, or encouraging their suppliers to reduce their own emissions.

5.2 Data Collection

The Carbon Discloure Project (CDP) has estimated that Scope 3 emissions account for an average of three-quarters of a company's emissions. It is well-understood that data for Scope 3 emissions is highly complicated, and perfect information is very hard to come by. This complexity poses difficulties in data collection, analysis, and supervision, as these emissions often occur beyond a company's direct control. Accurate reporting on Scope 3 is difficult and usually also require long-term engagement with stakeholders across the supply chain.

Apart from the lack of regulation and clear guidance, there are also no binding rules on Scope 3 emissions disclosures. The measurement and disclosure of Scope 3 can therefore be inconsistent and unsystematic across different firms, with the quality and accuracy of firms' voluntary disclosures remaining unclear.

Since this was the first exercise in Scope 3 data collection and calculation for AEP, some data was not available and/or was limited. Annex III describes AEP's ability in gathering all relevant information to capture and compute carbon footprint of the facilities and areas under the current reporting scope. Given the complexity in data collection, an incremental approach to data collection over a few years might therefore be a more appropriate expectation for the company.

6. References

- Department for Environment Food & Rural Affairs (DEFRA); Conversion Factors 2023, Version 1.0, Full Set,
  https://assets.publishing.service.gov.uk/media/649c5358bb13dc0012b2e2b7/ghg-conversion-factors-2023-full-file-update.xlsx.

- GHG Protocol, Revised Edition A corporate Accounting and Reporting Standard
  https://ghgprotocol.org/sites/default/files/standards/ghg-protocol-revised.pdf

- GHG Protocol, Technical Guidance for Calculating Scope 3 Emissions (Version 1)
  https://ghgprotocol.org/sites/default/files/standards/Scope3_Calculation_Guidance_0.pdf

- ISO 14064-1:2018 Greenhouse gases — Part 1: Specification with guidance at the organization level for quantification and reporting of greenhouse gas emissions and removals

- U.S. Environmental Protection Agency, Supply Chain Greenhouse Gas Emission Factors v1.2 by NAICS-6.
  https://catalog.data.gov/dataset/supply-chain-greenhouse-gas-emission-factors-v1-2-by-naics-6/resource/fbc78d3c-49bd-40c0-9dac-2ed16c07a305

Annex I: Calculation Methods

Calculation Methods	Details
Average Data Method	Estimates emissions for goods and services by collecting data on the mass (e.g., kilograms or pounds), or other relevant units of goods or services purchased and multiplying by the relevant secondary (e.g., industry average) emission factors (e.g., average emissions per unit of good or service).
Hybrid Method	Uses a combination of supplier-specific activity data (where available) and secondary data to fill the gaps. This method involves: • collecting allocated scope 1 and scope 2 emission data directly from suppliers; • calculating upstream emissions of goods and services from suppliers' activity data on the amount of materials, fuel, electricity, used, distance transported, and waste generated from the production of goods and services and applying appropriate emission factors; and • using secondary data to calculate upstream emissions wherever supplier-specific data is not available.
Supplier specific Method	Collects product-level cradle-to-gate GHG inventory data from goods or services suppliers
Spend-based Method	Estimates emissions for goods and services by collecting data on the economic value of goods and services purchased and multiplying it by relevant secondary (e.g., industry average) emission factors (e.g., average emissions per monetary value of goods)
Data unavailable	No data available for the reporting year
Not relevant	Not relevant to the company profile

Category	2023	2024	2025
Category 1	Average Data Method	Average Data Method	Average Data Method
Category 2	Spend-based Method	Spend-based Method	Spend-based Method
Category 3	Average Data Method	Average Data Method	Average Data Method
Category 4	Average Data Method	Average Data Method	Average Data Method
Category 5	Average Data Method	Average Data Method	Average Data Method
Category 6	Average Data Method	Average Data Method	Average Data Method
Category 7	Average Data Method	Average Data Method	Average Data Method
Category 8	Data unavailable	Average Data Method	Average Data Method
Category 9	Average Data Method	Average Data Method	Average Data Method
Category 10	Average Data Method	Average Data Method	Average Data Method
Category 11	Average Data Method	Average Data Method	Average Data Method
Category 12	Data unavailable	Average Data Method	Average Data Method
Category 13	Not relevant	Not relevant	Not relevant
Category 14	Not relevant	Not relevant	Not relevant
Category 15	Not relevant	Not relevant	Not relevant

Annex II: Activity Data Management

- Life Cycle Inventory (LCI) Management (Head Office)

GHG Source	Type of Activity data Measurement	Source of Activity data			EF Source
		Measurement	Evidence of payment	Estimation	
Cat 1-Purchased goods and services					
Paper	Purchased Qty. (Tons)		√		Defra 2023
Stationery	Purchased QTY. (Tons)		√		Defra 2023
Digital hardware, software (laptops, computers, mobilephone)	Purchased QTY. (Tons)		√		Defra 2023
Pantry food items (coffee, tea, mineral water)	Purchased QTY. (Tons)		√		Defra 2023
Cat 2-Capital goods					
Housing	Spend based budget ($/year)		√		EF US EEIO (2021)
Facilities (mosques, churches, etc)	Spend based budget ($/year)		√		EF US EEIO (2021)
Road & Bridges	Spend based budget ($/year)		√		EF US EEIO (2021)
Facility maintenace and Repair	Spend based budget ($/year)		√		EF US EEIO (2021)
Vehicles (trucks, tractors, pick-ups, bikes)	Spend based budget ($/year)		√		EF US EEIO (2021)
Vehicle maintenance & repair	Spend based budget ($/year)		√		EF US EEIO (2021)
Cat 3 - Fuel-and energy-related activities)					
Electricity T and D (Electricity - National Grid) Mill	Energy use (kWh)		√		https://www.climatiq.io/data/emission-factor/fda47dde-736f-408c-ba61-625419423c52
Cat 4 - Upstream transportation and distribution)					
Transportation of Raw materials 1	Loading and distance (kg, km)			√	Defra 2023
Cat 5 - Waste generated in operations					

GHG Source	Type of Activity data Measurement	Source of Activity data			EF Source
		Measurement	Evidence of payment	Estimation	
Hazardous waste	Weight (kg)	√			Defra 2023
Domestic waste	Weight (kg)	√			Defra 2023
Cat 6 - Business Travel					
Emission from Flight travelling records of employee at HO (For business)	No. of person, Origin and Destination point/ Distance (Person-km)		√	√	ICAO and Defra 2023
Emission from Hotel stay overnight	No. Of Night stay (Night-Person)		√	√	Defra 2023
Cat 7 - Employee commuting				√	
Transportation of employees between their homes and their worksites.	Type of Vehicle and distance (km)			√	Defra 2023

- Life Cycle Inventory (LCI) Management - Palm Oil Mills

GHG Source	Type of activity data Measurement	Source of Activity data			Source of EF
		Measurement	Evidence of payment	Estimation	
Cat 1-Purchased goods and services					
Outgrower FFB	Purchased qty. (Tons)		√		IPCC 2021 GWP100 V1.01 and Eco-invent 3.8
Biomass	Purchased qty. (Tons)		√		IPCC 2021 GWP100 V1.01 and Eco-invent 3.8
Raw materials 1 - Lubricating oil at mill area	Purchased qty. (Tons)		√		IPCC 2021 GWP100 V1.01 and Eco-invent 3.8
Raw materials 2 - Diesel for energy at Mill (production emissions)	Purchased qty. (Litres)		√		Defra 2023
Raw materials 3 - Diesel for vehicle at Mill (production emissions)	Purchased qty. (Litres)		√		Defra 2023
Chemicals					
Cycle-hexane	Purchased qty. (kg)		√		IPCC 2021 GWP100 V1.01 and Eco-invent 3.8
Sulphuric acid	Purchased qty. (kg)		√		IPCC 2021 GWP100 V1.01 and Eco-invent 3.8
Sodium carbonate	Purchased qty. (kg)		√		IPCC 2021 GWP100 V1.01 and Eco-invent 3.8
Sodium hydroxide	Purchased qty. (kg)		√		IPCC 2021 GWP100 V1.01 and Eco-invent 3.8
Hydrochloric acid	Purchased qty. (kg)		√		IPCC 2021 GWP100 V1.01 and Eco-invent 3.8
Tools					
Lab Testing Equipment (desiccator, beaker glass, oven, analyical balance, etc.)	Spend based budget ($/year)		√		EF US EEIO (2021)
Personal Protective Equipment (boots, helmets, etc)	Spend based budget ($/year)		√		EF US EEIO (2021)
Office Stationery & Tools					
Paper	Purchased qty. (Tons)		√		Defra 2023
Stationery	Purchased QTY. (Tons)		√		Defra 2023

GHG Source	Type of activity data Measurement	Source of Activity data			Source of EF
		Measurement	Evidence of payment	Estimation	
Digital hardware, software (laptops, computers, mobilephone)	Purchased qty. (Tons)		√		Defra 2023
Pantry food items (coffee, tea, mineral water)	Purchased qty. (Tons)		√		Defra 2023
Cat 2-Capital goods					
Housing	Spend based budget ($/year)		√		EF US EEIO (2021)
Facilities (mosques, churches, etc)	Spend based budget ($/year)		√		EF US EEIO (2021)
Road & Bridges	Spend based budget ($/year)		√		EF US EEIO (2021)
Facility maintenace and Repair	Spend based budget ($/year)		√		EF US EEIO (2021)
Vehicles (trucks, tractors, pick-ups, bikes)	Spend based budget ($/year)		√		EF US EEIO (2021)
Vehicle maintenance & repair	Spend based budget ($/year)		√		EF US EEIO (2021)
Cat 3 - Fuel-and energy-related activities)					
Electricity T and D (Electricity - National Grid) Mill	Energy use (kWh)		√		https://www.climatiq.io/data/emission-factor/fda47dde-736f-408c-ba61-625419423c52
Cat 4 - Upstream transportation and distribution)					
Transportation of Raw materials 1	Loading and distance (kg, km)			√	Defra 2023
Cat 5 - Waste generated in operations					
Hazardous waste	Weight (kg)	√			Defra 2023
Domestic waste	Weight (kg)	√			Defra 2023
Cat 6 - Business Travel					
Emission from Flight travelling records of employee at HO (For business)	No. of person, Origin and Destination point/ Distance (Person-km)		√	√	ICAO and Defra 2023
Emission from Hotel stay overnight	No. Of Night stay (Night-Person)		√	√	Defra 2023

GHG Source	Type of activity data Measurement	Source of Activity data			Source of EF
		Measurement	Evidence of payment	Estimation	
Cat 7 - Employee commuting					
Transportation of employees between their homes and their worksites.	Type of Vehicle and distance (km)			√	Defra 2023
Cat 9- Downstream transportation and distribution					
Transportation/Distribution of sold products	Loading and distance (kg, km)			√	Defra 2023
Cat 10 -Downstream Processing of sold products					
CPO sell in 2023	Sale qty. (Tons)		√		IPCC 2021 GWP100 V1.01 and Eco-invent 3.8
Palm kernel sell in 2023	Sale qty. (Tons)		√		Defra,2023 (WTT-bioenergy)
Palm Kernel shell (PKS)	Sale qty. (Tons)		√		Defra,2023 (WTT-bioenergy)
Cat 11 - Downstream Use of sold products					
POME	Sale qty. (kwh)		√		Defra,2023 (WTT-bioenergy)-Biogas

- Life Cycle Inventory (LCI) Management - Oil Palm Plantations

GHG Source	Measurement Unit	Source of Activity data			EF Source
		Measurement	Evidence of payment	Estimation	
Cat 1-Purchased goods and services					
Raw materials 1 - Young seeds	Tons		√		IPCC 2021 GWP100 V1.01 and Eco-invent 3.8
Raw materials 2 - Diesel for energy at plant area (production emissions)	Litre		√		Defra 2023
Raw materials 3 - Diesel for vehicle at plant area (production emissions)	Litre		√		Defra 2023
Outgrower land clearance	Ha			√	-
Outgrower peat soil cultivation	Ha			√	-
Fertilizers (production emissions)					
Compound (NPK)	Kg		√		IPCC 2021 GWP100 V1.01 and Eco-invent 3.8
Phosphate	Kg		√		IPCC 2021 GWP100 V1.01 and Eco-invent 3.8
MOP (K)	Kg		√		IPCC 2021 GWP100 V1.01 and Eco-invent 3.8
LSD/Limestone	Kg		√		IPCC 2021 GWP100 V1.01 and Eco-invent 3.8
ZA /SA	Kg		√		IPCC 2021 GWP100 V1.01 and Eco-invent 3.8
CuSO4	Kg		√		IPCC 2021 GWP100 V1.01 and Eco-invent 3.8
ZnSO4	Kg		√		IPCC 2021 GWP100 V1.01 and Eco-invent 3.8
Kiserite	Kg		√		IPCC 2021 GWP100 V1.01 and Eco-invent 3.8
Borate	Kg		√		IPCC 2021 GWP100 V1.01 and Eco-invent 3.8
Ammonium chloride NH4Cl	Kg		√		IPCC 2021 GWP100 V1.01 and Eco-invent 3.8
Ammonium nitrate NH4NO3	Kg		√		IPCC 2021 GWP100 V1.01 and Eco-invent 3.8
Double Ammonium Phosphate DAP	Kg		√		IPCC 2021 GWP100 V1.01 and Eco-invent 3.8

GHG Source	Measurement Unit	Source of Activity data			EF Source
		Measurement	Evidence of payment	Estimation	
Dolomite	Kg		√		IPCC 2021 GWP100 V1.01 and Eco-invent 3.8
Kieserite MgSO4·H2O	Kg		√		IPCC 2021 GWP100 V1.01 and Eco-invent 3.8
Triple super phosphate TSP	Kg		√		IPCC 2021 GWP100 V1.01 and Eco-invent 3.8
Urea	Kg		√		IPCC 2021 GWP100 V1.01 and Eco-invent 3.8
Sulphate of ammonia	Kg		√		IPCC 2021 GWP100 V1.01 and Eco-invent 3.8
Empty Fruit Bunch (EFB)	Kg		√		IPCC 2021 GWP100 V1.01 and Eco-invent 3.8
Oil Palm seeds (production emissions)			√		
Seed	tons		√		IPCC 2021 GWP100 V1.01 and Eco-invent 3.8
Chemicals (production emissions)			√		
Glyphosate	kg		√		IPCC 2021 GWP100 V1.01 and Eco-invent 3.8
Glufosinate ammonium	kg		√		IPCC 2021 GWP100 V1.01 and Eco-invent 3.8
Triclopyr	kg		√		IPCC 2021 GWP100 V1.01 and Eco-invent 3.8
2,4-Dimenshylamine	kg		√		IPCC 2021 GWP100 V1.01 and Eco-invent 3.8
Metsulfuron methyl	kg		√		IPCC 2021 GWP100 V1.01 and Eco-invent 3.8
Cypermethrin	kg		√		IPCC 2021 GWP100 V1.01 and Eco-invent 3.8
Brodifacoum	kg		√		IPCC 2021 GWP100 V1.01 and Eco-invent 3.8
Flocoumafen	kg		√		IPCC 2021 GWP100 V1.01 and Eco-invent 3.8
Total GHG for Other Chemicals	kg		√		IPCC 2021 GWP100 V1.01 and Eco-invent 3.8
Tools			√		
Lab Testing Equipment (desiccator, beaker glass, oven, analyical balance, etc.)	Spend based budget ($/year)		√		EF US EEIO (2021)
Personal Protective Equipment (boots, helmets, etc)	Spend based budget ($/year)		√		EF US EEIO (2021)

GHG Source	Measurement Unit	Source of Activity data			EF Source
		Measurement	Evidence of payment	Estimation	
Office Stationery & Tools			√		
Paper	Purchased qty. (Tons)		√		Defra 2023
Stationery	Purchased qty. (Tons)		√		Defra 2023
Digital hardware, software (laptops, computers, mobilephone)	Purchased qty. (Tons)		√		Defra 2023
Pantry food items (coffee, tea, mineral water)	Purchased qty. (Tons)		√		Defra 2023
Cat 2-Capital goods			√		
Housing	Spend based budget ($/year)		√		EF US EEIO (2021)
Facilities (mosques, churches, etc)	Spend based budget ($/year)		√		EF US EEIO (2021)
Road & Bridges	Spend based budget ($/year)		√		EF US EEIO (2021)
Facility maintenace and Repair	Spend based budget ($/year)		√		EF US EEIO (2021)
Vehicles (trucks, tractors, pick-ups, bikes)	Spend based budget ($/year)		√		EF US EEIO (2021)
Vehicle maintenance & repair	Spend based budget ($/year)		√		EF US EEIO (2021)
Cat 3 - Fuel-and energy-related activities)					
Electricity T and D (Electricity - National Grid) Mill	Energy use (kWh)		√		https://www.climatiq.io/data/emission-factor/fda47dde-736f-408c-ba61-625419423c52
Cat 4 - Upstream transportation and distribution)					
Transportation of Raw materials 1	Loading and distance (kg, km)			√	Defra 2023
Cat 5 - Waste generated in operations					
Hazardous waste	Weight (kg)	√			Defra 2023
Domestic waste	Weight (kg)	√			Defra 2023
Cat 6 - Business Travel					

GHG Source	Measurement Unit	Source of Activity data			EF Source
		Measurement	Evidence of payment	Estimation	
Emission from Flight travelling records of employee at HO (For business)	No. of person, Origin and Destination point/ Distance (Person-km)		√	√	ICAO and Defra 2023
Emission from Hotel stay overnight	No. Of Night stay (Night-Person)		√	√	Defra 2023
Cat 7 - Employee commuting					
Transportation of employees between their homes and their worksites.	Type of vehicle and distance (km)			√	Defra 2023
Cat 8 - Upstream Leased Assets					
Vehicles & machinery leased	$/year		√		EF US EEIO (2021)
Storage areas were leased by AEP	$/year		√		EF US EEIO (2021)

Annex III: Data Completeness

HEAD OFFICE	CAT 1	CAT 2	CAT 3	CAT 4	CAT 5	CAT 6	CAT 7	CAT 8	CAT 9	CAT 10	CAT 11
Kuala Lumpur	50%	33%	100%	0%	0%	100% (41)	100%	N/A	N/A	N/A	N/A
Medan	67%	0%	0%	100%	0%	100% (17)	93%	N/A			

PALM OIL MILL	CAT 1	CAT 2	CAT 3	CAT 4	CAT 5	CAT 6	CAT 7	CAT 8	CAT 9	CAT 10	CAT 11
Tasik Raja	89%	N/A	100%	50%	96%	N/A	100%	N/A	100%	100%	100%
Mitra Puding Mas	80%	N/A	67%	100%	75%	100% (3)	30%	N/A	100%	100%	100%
Blankahan	83%	N/A	83%	100%	96%	N/A	100%	N/A	75%	75%	75%
Bina Pitri Jaya	86%	N/A	50%	83%	88%	N/A	98%	N/A	100%	100%	100%
Sumindo	100%	N/A	0%	100%	75%	N/A	100%	N/A	100%	100%	100%
Sawit Graha Manunggal	86%	N/A	83%	67%	75%	100% (2)	100%	N/A	75%	75%	75%

PALM OIL PLANTATION	CAT 1	CAT 2	CAT 3	CAT 4	CAT 5	CAT 6	CAT 7	CAT 8	CAT 9	CAT 10	CAT 11
Sei Musam	56%	83%	100%	100%	23%	100% (2)	100%	N/A	N/A	N/A	N/A
Blankahan	45%	100%	100%	70%	57%	100% (39)	100%	N/A			
Rambung	57%	50%	100%	76%	100%	100% (2)	100%	N/A			
Tanjung Selamat	54%	100%	100%	100%	57%	100% (3)	100%	N/A			
Tasik Idaman	48%	100%	100%	100%	14%	100% (1)	100%	N/A			
Tasik TR	46%	83%	100%	100%	17%	100% (9)	97%	N/A			
Tasik Harapan	48%	83%	100%	100%	29%	100% (4)	100%	N/A			
Marison	59%	100%	100%	100%	86%	N/A	99%	50%			
HPP	56%	100%	100%	86%	100%	N/A	98%	N/A			
BPJ	41%	100%	100%	100%	86%	100% (2)	99%	100%			
BML	49%	50%	100%	100%	43%	100% (4)	100%	N/A			
Puding Mas	60%	100%	100%	96%	43%	100% (2)	100%	100%			
Pangeran	47%	83%	0%	100%	57%	100% (1)	97%	N/A			
Saptabuana	49%	83%	0%	96%	71%	100% (2)	100%	N/A			
Sumindo	59%	83%	0%	96%	100%	100% (8)	100%	N/A			
Air Ikan	49%	100%	100%	100%	71%	100% (2)	100%	50%			
Tamiang Indah	64%	83%	100%	100%	57%	100% (11)	100%	N/A			
Bumi Borneo I	64%	83%	100%	96%	71%	100% (2)	72%	N/A			
Bumi Borneo II	54%	100%	0%	90%	65%	100% (2)	98%	N/A			
KAP I	41%	100%	100%	100%	71%	100% (33)	100%	N/A			
KAP II	59%	100%	0%	96%	71%	100% (6)	100%	50%			
Cenderung	23%	50%	0%	100%	71%	N/A	66%	N/A			