

Interim report

# Greenhouse gas (GHG) accounting report

Dharma Satya Nusantara Group

For the reporting period 1 January 2022–31 December 2022

15 September 2023



## Details

### Prepared for:

Denys Collin Muang, Chief Sustainability Officer (CSO)  
**PT Dharma Satya Nusantara Tbk (DSNG)**  
Gedung Sapta Mulia · Jl. Rawa Galem · 13930 Jakarta · Indonesia  
[denys.munang@dsngroup.co.id](mailto:denys.munang@dsngroup.co.id) · [dsn.co.id](http://dsn.co.id)

### Prepared by:

**South Pole Carbon Asset Management Ltd. (South Pole)**  
Graha Iskandarsyah · Jl. Iskandarsyah Raya · 12160 Jakarta · Indonesia  
[southpole.com](http://southpole.com)

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### Project Manager:

Dwi Nurseptian, Associate Consultant  
[d.nurseptian@southpole.com](mailto:d.nurseptian@southpole.com)

### Project Leader:

Lyra Christina Pinto, Principal Consultant  
[l.pinto@southpole.com](mailto:l.pinto@southpole.com)

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### Contact person:

Chris Wei, Senior Business Development Associate  
[z.wei@southpole.com](mailto:z.wei@southpole.com)

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### In collaboration with:

Putri Shafira, Junior Associate Consultant  
[p.shafira@southpole.com](mailto:p.shafira@southpole.com)

Yuma Nagata, Consultant  
[y.nagata@southpole.com](mailto:y.nagata@southpole.com)

Amadeo Ardisa, Consultant  
[a.ardisa@southpole.com](mailto:a.ardisa@southpole.com)

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## Executive summary

This report provides an overview of PT Dharma Satya Nusantara Tbk's (DSNG) **greenhouse gas (GHG) emissions in the calendar year 2022**.

The report also includes an **updated calculation of DSNG's GHG emissions in the calendar year 2019**. The need for this update was driven by new guidelines for the agricultural sector released by the Science-Based Targets initiative (SBTi) and the draft GHG Protocol Land Sector and Removals Guidance (LSRG).

According to the Forest, Land, and Agriculture (FLAG) science based target (SBT) setting guidance, companies must account for FLAG and non-FLAG emissions separately. These FLAG emissions (in tonnes of carbon dioxide equivalent, tCO<sub>2</sub>e) must be calculated according to the GHG Protocol's draft Land Sector and Removals Guidance (LSRG). The calculations for the 2022 GHG inventory and the updated 2019 inventory have been carried out in alignment with these guidelines.

The system boundaries for the GHG accounting were defined using the 'control approach' and the operational boundary covers direct and indirect GHG emissions. The operational boundaries for the accounting were set to cover:

Scope 1: direct GHG emissions from stationary combustion, mobile combustion, process emissions, fertiliser application and land-use change (LUC)

Scope 2: indirect GHG emissions from the generation of purchased electricity and district heating

Scope 3: indirect GHG emissions from fuel and energy-related activities; purchased goods and services (PG&S); transportation and distribution; processing of sold products; use of sold products; waste generated in operations; employee commuting; business travel

- The total GHG emissions of DSNG's whole operations for 2022 was **3,532,742** tCO<sub>2</sub>e.
- The updated calculation of total GHG emissions of DSNG's whole operations for 2019 was **3,049,804** tCO<sub>2</sub>e.

Tables 1-10 provide overarching key performance indicators (KPIs) and main emissions by scope for each business unit (BU). It shall be noted that this corporate GHG accounting study does not consist of a product life-cycle analysis which takes into account allocation of emissions to by-products. The KPIs below represent the specified total emissions divided by the total unit of production, without consideration of allocation to by-products.



## Introduction

DSNG is an Indonesian conglomerate engaged in the manufacturing of wood products and palm oil, as well as the generation of RE. DSNG's palm oil business line owns and operates a number of estates and mills across Kalimantan, Indonesia.

DSNG is committed to the responsible use and protection of the natural environment through conservation, mitigation of climate change impacts and sustainable practices. The annual GHG accounting plays an important role in tracking emissions and understanding where reduction opportunities may lie.

This report provides

- an updated calculation of DSNG's GHG emissions from 1 January 2019 to 31 December 2019
- calculation of the GHG emissions from DSNG from 1 January 2022 to 31 December 2022.

The accounting covers the HO, agro, wood (TKPI and TMG) and the RE BUs. Company information and the reporting period are presented in Table 11, and a list of estates and mills in Table 12 and Table 13. This report does not give a detailed overview of recommendations and next steps.

**Table 11: Company information**

Company Information	
Website	www.dsn.co.id
Business area	Palm oil and wood
Reporting period	01 January 2019 - 31 December 2019 (recalculation) 01 January 2022 - 31 December 2022

(Source: South Pole, based on DSNG's data, 2022)

## Methodology

The GHG accounting and reporting procedure is based on the 'The Greenhouse Gas Protocol: GHG Protocol: A Corporate Accounting and Reporting Standard - Revised Edition' (GHG Protocol) and the complementary 'Corporate Value Chain (Scope 3) Accounting and Reporting Standard'. These are the most widely used international accounting tools for government and business leaders to understand, quantify and manage GHG emissions. The standards were developed in partnership between the World Resources Institute and the World Business Council for Sustainable Development. The accounting methodology also follows guidelines from the Science-based Targets Initiative on separation of FLAG and non-FLAG emissions, and is aligned with the draft GHG Protocol Land Sector and Removal Guidance (LSRG).

The GHG accounting approach was based on the principles of the GHG Protocol:

- **relevance:** an appropriate inventory boundary that reflects the GHG emissions of the company and serves the decision-making needs of users;
- **completeness:** accounting includes all emission sources within the chosen inventory boundary. Any specific exclusion is disclosed and specified;
- **consistency:** meaningful comparison of information over time and transparently documented changes to the data;

### Scope 3

Scope 3 includes other indirect emissions, such as emissions from the extraction and production of purchased materials and services, vehicles not owned or controlled by the reporting entity, outsourced activities, waste disposal, etc.

According to the GHG Protocol, companies shall separately account for and report on emissions from Scopes 1 and 2. Scope 3 has historically been an optional reporting category but is increasingly reported on by companies in line with best practice approaches for accounting and target setting. Table 16 provides the overview of Scope 3 emission sources for 2019 and 2022.

**Table 16: Overview of Scope 3 emission sources for 2019 and 2022**

Category	Emission sources	Boundary
PG&S	Purchased goods (raw materials) and services	Included
Capital goods	Production of capital goods (e.g. machinery, IT equipment, etc.)	Included
Fuel and energy-related activities	Upstream life cycle emissions from fuel and electricity extraction, generation and distribution, including transmission and distribution losses	Included
Upstream transportation and distribution	Transportation and distribution of goods and services to the company	Included
Waste generated in operations	Waste management of operational waste (landfilling, recycling, etc.)	Included
Business travel	Travel and accommodation of employees/contractors	Included
Employee commuting	Employee travel between home and work	Included
Upstream leased assets	Operation of assets leased by the organisation (lessee) in the reporting year and not included in Scope 1 or 2	Not applicable
Downstream transportation and distribution	Transportation and distribution of products sold by the organisation	Included
Processing of sold products	Processing of intermediate products sold by the organisation	Included
Use of sold products	Use of sold products that require energy to operate	Included
End-of-life treatment of sold products	Waste disposal and treatment of sold products	Included
Downstream leased assets	Operation of assets owned by the company (lessor) and leased to other entities, not included in Scope 1 or 2	Not Applicable
Franchises	Operation of franchises not included in Scope 1 or 2	Not Applicable



Category	Emission sources	Boundary
Investments	Operation of investments not included in Scope 1 or 2	Included

(Source: South Pole, based on DSNG data 2019 and 2022 )

### Outside of Scope emissions

In addition to the Scope 1, 2 and 3 emission sources listed above, Outside of Scope emissions are also calculated. Outside of Scope emissions refer to CO<sub>2</sub> emissions associated with the combustion of biogenic materials such as wood, crops or other organic matter. These biogenic emissions are considered part of the natural carbon cycle, meaning that the CO<sub>2</sub> released during their combustion or decay is roughly balanced by the CO<sub>2</sub> absorbed by the growth of new biomass. Therefore, the GHGP suggests that they should be calculated and reported separately from a company's Scope 1, 2 and 3 emissions. DSNG's Outside of Scope emission sources are mainly CO<sub>2</sub> emissions from the combustion of biomass in the mills as an energy source and sold biomass (kernel shells) in the use phase.

## Data inventory and assumptions

DSNG provided primary data from its BUs, including estates and mills. The selection of emission factors and assumptions are based on the GHG Protocol, which provides requirements and guidance for corporate-level GHG emissions inventory.

The GHG Protocol does not provide specific values of emission factors as part of its framework. Instead, it provides matrices to be used when selecting emission factors from various databases to apply to a company's inventory. The GHG Protocol also provides a non-exhaustive list of emission factor databases that corporates may use on its website (<https://ghgprotocol.org/life-cycle-databases>). The list includes several databases that were used in this report, such as Ecoinvent, CEDA, and Defra (or, UK BEIS).

Multiple databases from various sources can be used when developing a company's inventory as long as they come from reputable sources. This is a likely occurrence, as databases usually offer emission data for specific emission sources or activity units. As an example, the Ministry of Energy and Mineral Resources published Indonesia's grid electricity emission factors, which can be used for electricity emissions calculation. However, the Government of Indonesia has not published the emission factor for PG&S (e.g. purchased chemicals); therefore a different database, Ecoinvent, was used for the calculation of purchased chemicals. Ecoinvent is one of the world's most consistent and transparent life cycle inventory databases, covering products, materials, and processes in its library. More details of emission factor databases used for each emission source are listed in Annex I.

The choice of assumptions and emission factors followed a conservative approach. Unless otherwise specified, all emission values in this report are given in tCO<sub>2</sub>e.

Where the activity data of the inventory was lacking, extrapolations and estimations were made. The complete overview of activity data, extrapolations and estimations are summarised in Annex II.

## Global warming potential

Global warming potential (GWP) is a measure of the climate impact of a specific GHG, compared to the impact of CO<sub>2</sub> over a given time horizon. Different GHGs have different GWP values depending on their global warming 'strength' - i.e. their efficiency in absorbing longwave radiation and the atmospheric lifetime of the gas. The GWP values used in GHG accounting include the six GHGs

## Annex I

### Emission factors

**Table 34: Sources of emission factors**

Activity	Emission factor reference <sup>(1)</sup>
Stationary and mobile combustion	<b>Diesel, Petrol, Fuel oil:</b> Department for Business, Energy and Industrial Strategy (BEIS), 2022 <b>Biofuel:</b> Department for Business, Energy and Industrial Strategy (BEIS), 2023
Process emissions	<b>POME:</b> Environment and Natural Resources Journal 2022 <b>Nitrous oxide:</b> IPCC
Land management	<b>Fertiliser:</b> Albanito et al. 2017 and IPCC 2006
Electricity	Ministry of Energy and Mineral Resources Indonesia, 2022
PG&S	Comprehensive Environmental Data Archive (CEDA), 2022; Ecoinvent 3.8; BEIS, 2023; World Food Land Database (WFLDB) 3.5
Capital goods	CEDA, 2022; Dell 2018-2022; Ecoinvent 3.8; Ecoinvent 3.9.1; Lenovo 2021; LCA by Casio, 2006; Google, 2012; Google, 2021; Microsoft, 2021; IPCC, 2014; Amazon, 2021; Schneider Electric, 2015
Upstream transportation and distribution	BEIS, 2023
WTT	<b>Diesel, Petrol, Fuel oil, Electricity:</b> BEIS, 2022 <b>Biofuel:</b> BEIS, 2023
Waste generated in operation	BEIS, 2023
Business travel	BEIS, 2022; CEDA, 2022; CHSB, 2021.
Employee commuting	BEIS, 2022.
Downstream transportation and distribution	BEIS, 2023.
Processing of sold products	Ecoinvent 3.8.
Use of sold products	BEIS, 2022.
End-of-life treatment of sold products	BEIS, 2022.
Investment	Quantis 2016

<sup>(1)</sup> South Pole derives its emission factors from reliable and credible sources. South Pole is not responsible for inaccuracies in emission factors provided by third parties.



potassium fertilisers, and other components published by Ecoinvent in 2021. Emission factors were multiplied by the proportion of each respective component.

Emissions from the production of Empty Fruit Bunch (EFB) were assumed to be captured in the estates' accounting before being used as fertiliser. As a result, purchased EFB emissions were nullified as EFB were produced onsite.

### Chemicals

Chemicals were provided as a sum in kg and litre. Emissions were calculated using emission factors for each respective chemical published by Ecoinvent in 2021.

Some of the purchased chemicals data was provided as a sum in spending. Emissions with this activity were calculated using emission factors published by CEDA in 2022.

### Agrochemicals

Agrochemicals were provided as a sum in kg and litre. For agrochemicals which quantity was provided in litre, it was assumed it had a density of 1 kg/litre. Where quantity was provided in a pack, it was assumed a pack of glufosinate ammonium contains 500 g of material and a pack of pheromone contains 1 ml of material.

Emissions were calculated using emission factors for each respective agrochemical, published by Ecoinvent in 2021. For agrochemicals that were not specifically listed in the Ecoinvent database, the emissions were calculated using unspecified pesticide emission factors published by Ecoinvent in 2021.

### Motor oil

Motor oil was provided as a sum in litre. The density of motor oil was assumed to be 0.825 kg/litre as reported by Noria Corporation, 2021. Emissions were calculated using lubricating oil emission factors published by Ecoinvent in 2021.

Some of the purchased motor oil data was provided as a sum in spending. Emissions with this activity were calculated using emission factors published by CEDA in 2022.

### FFB

FFB was provided as a sum in kg. Emissions were calculated using palm oil fruit emission factors from Indonesia, published by the WFLDB in 2020.

### Water

Water was provided as a sum in m<sup>3</sup> and litre. Emissions were calculated using water supply and treatment emission factors published by BEIS in 2023.

### Factory parts

Factory goods were provided as a sum in spending. Emissions were calculated using emission factors published by CEDA in 2022.

### Farm parts



## Annex III

## Greenhouse gas emissions by scope and activity for SBU

Table 35: DSNG's greenhouse gas emissions by scope and activity for 2022

Activity	Consumption	Unit	Emissions (tCO2e)	Percentage of total (%)	
<b>Scope 1: Direct GHG emissions</b>			<b>1,182,568</b>	<b>33%</b>	
<b>Stationary combustion</b>			<b>34,334</b>	<b>&lt;1%</b>	
Biofuel	521,884	tonne	21,179	<1%	
Diesel	4,775,364	Litre	12,868	<1%	
Petrol	122,863	Litre	287	<1%	
<b>Mobile combustion</b>			<b>76,662</b>	<b>2%</b>	
Diesel	18,814,271	Litre	50,699	1%	
Petrol	11,096,053	Litre	25,963	<1%	
<b>Land use change</b>			<b>286,120</b>	<b>8%</b>	
Linear discounting	286,120	tCO2e	286,120	8%	
<b>Process emissions</b>			<b>671,683</b>	<b>19%</b>	
Nitrous oxide		50 kg	13	<1%	
POME	141,946	tCOD	671,669	19%	
<b>Fertiliser Application</b>			<b>113,769</b>	<b>3%</b>	
Direct nitrous oxide emissions	661,098,584	kg	84,222	2%	
Indirect nitrous oxide emissions from leaching and run-off	660,123,101	kg	18,831	<1%	
Indirect nitrous oxide emissions from volatilization	670,058,853	kg	10,716	<1%	
<b>Scope 2: Energy indirect GHG emissions</b>			<b>27,483</b>	<b>&lt;1%</b>	
<b>Purchased electricity</b>			<b>27,483</b>	<b>&lt;1%</b>	
Grid	34,409,807	kWh	27,483	<1%	
<b>Scope 3: Other indirect GHG emissions</b>			<b>2,322,691</b>	<b>66%</b>	
<b>Cat 01 - purchased goods &amp; services</b>			<b>1,204,778</b>	<b>34%</b>	
Raw material	Fresh fruit bunch (FFB)	618,566,550	kg	974,861	27.6%
Raw material	Fresh fruit bunch (FFB)	668	tonne	1,053	<1%
Raw material	Wood	325,218,022,639	IDR	9,632	<1%
Raw material	Wood	30,963,329	USD	9,954	<1%
Supporting material	Agrochemicals - Herbicides	582,979	Kg	5,684	<1%
Supporting material	Agrochemicals - Herbicides	3,944,723	Litre	4,182	<1%
Supporting material	Agrochemicals - Hormones	397	Litre	4	<1%
Supporting material	Agrochemicals - Pesticides	333,947	Litre	3,256	<1%
Supporting material	Chemicals	1,610,806	Kg	996	<1%
Supporting material	Chemicals	115,854	Litre	103	<1%