

ERDOĞANLAR ALUMINIUM SAN. VE TİC. A.Ş.

2022

Corporate Carbon Footprint Report



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Content

- Tables ii
- Figures ii
- 1. Introduction 1
 - 1.1. About the Report 1
 - 1.2. Goal and Scope 1
 - 1.3. About Erdoğanlar Aluminium 2
 - 1.4. Calculation Method 2
 - 1.5. ISO 14064 Standard Principles..... 4
- 2. Climate Change and the European Green Deal 4
 - 2.1. Carbon Border Adjustment Mechanism (CBAM) 5
- 3. Corporate Carbon Footprint 6
- 4. System Boundary 7
- 5. Corporate Carbon Footprint Results..... 11
 - 5.1. Erdoğanlar Aluminium Corporate Carbon Footprint Results 11
 - 5.2. Uncertainty Level..... 15
 - 5.3. Base Year Selection..... 16
 - 5.4. Recommendations for Improving Data Quality..... 17
- ANNEX I: Erdoğanlar Aluminium Calculation Details - Istanbul Plant..... 18
- ANNEX II: Erdoğanlar Aluminium Calculation Details - Kırklareli Plant..... 19

Tables

Table 1. ISO 14064 ve GHG Protocol Relationship.....	3
Table 2. Erdoğanlar Aluminium – System Boundaries for Istanbul	7
Table 3. Erdoğanlar Aluminium – System Boundaries for Kırklareli	9
Table 4. Erdoğanlar Aluminium Corporate Carbon Footprint.....	11
Table 5. Erdoğanlar Aluminium Corporate Carbon Footprint (ISO 14064-1).....	12
Table 6. Distribution of Total Emissions by Activity - GHG Protocol Compliant	13
Table 7. Distribution of Total Emissions by Activities – ISO 14064:2018 Compliant	13
Table 8. Internal Distribution of Scope 1 Emissions (GHG Protocol)	14
Table 9. Internal Distribution of Scope 2 Emissions (GHG Protocol)	14
Table 10. Internal Distribution of Scope 3 Emissions (GHG Protocol)	15
Table 11. Methodological Uncertainty Values	16
Table 12. Distribution of Istanbul Plant Total Emissions by Activities – GHG Protocol Compliant	18
Table 13. Distribution of Istanbul Plant Total Emissions by Activities - ISO 14064 Compliant	18
Table 14. Emission Breakdowns of Stationary and Mobile Combustion Sources at Istanbul Plant (IPCC-AR5)	19
Table 15. Distribution of Total Emissions of Kırklareli Plant by Activities – GHG Protocol Compliant	19
Table 16. Distribution of Total Emissions of Kırklareli Plant by Activities - ISO 14064 Compliant	19
Table 17. Emission Breakdowns of Stationary and Mobile Combustion Sources at Kırklareli Plant (IPCC-AR5)	20

Figures

Figure 1. Distribution of Total Emissions by Scope	11
Figure 2. Breakdown of Total Emissions by Category (ISO 14064-1)	12
Figure 4. Internal Distribution of Scope 1 Emissions	14
Figure 5. Internal Distribution of Scope 3 Emissions	15

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1. Introduction

1.1. About the Report

The data collected and analysed in this report adhere to the principles of conformity, integrity, consistency, transparency, and accuracy outlined by the World Resources Institute (WRI) Greenhouse Gas Protocol (GHG) – the globally recognized methodology for carbon accounting. Additionally, it aligns with the ISO 14064-1:2018 standard.

This report adheres to the International Organization for Standardization (ISO) standard 14064-1:2018, titled "Greenhouse Gases - Part 1: Guidelines and Specifications for Establishment-Level Calculation and Reporting of Greenhouse Gas Emissions and Removals," following the stipulations of Article 9 within this standard.

The ISO 14064-1 Corporate Carbon Footprint Standard delineates the principles and requirements governing the design, development, management, and reporting of greenhouse gas inventories at the organisational or company level. It encompasses provisions for establishing greenhouse gas emission limits, computing an organization's greenhouse gas emissions and removals, and identifying specific measures or activities aimed at enhancing greenhouse gas management.

1.2. Goal and Scope

Erdoğanlar Aluminium San. Ve Tic. A.Ş (Erdoğanlar Aluminium) conducted this study to calculate and measure greenhouse gas emissions resulting from its operations. Furthermore, the corporate carbon footprint analysis serves as a valuable tool for establishing and managing the company's climate change objectives, guiding climate-centric investments, fulfilling Carbon Disclosure Project (CDP) reporting requirements, and addressing greenhouse gas emission metrics outlined in sustainability reports.

The primary dataset used in this study was furnished by Erdoğanlar Aluminium, covering the period from January 1, 2022, to December 31, 2022. The Quality Department oversaw the process of compiling and reporting the Greenhouse Gas Emissions and Inventory. In the preparation of the greenhouse gas emissions inventory report, primary data were sourced from relevant department personnel. Secondary data utilized in the calculations included conversion factors from IPCC and DEFRA, along with the Life Cycle Assessment database Ecoinvent 3.9.1.

In accordance with ISO 14064-1 Standard, calculations conducted within the framework of Categories 1, 2, 3, 4, 5, and 6 encompass all direct and indirect activities of the company.

1.3. About Erdoğanlar Aluminium

Established in 1987 in Istanbul, Erdoğanlar Aluminium emerged as an aluminium extrusion company. From its inception, the company strategically consolidated its production and management units under a unified roof to enhance organizational efficiency and product quality. The overarching objective has been a continual expansion of product offerings and service excellence. In pursuit of international prominence, the company has targeted the European market, renowned for its demand for high-quality products.

Erdoğanlar Aluminium San. Ve Tic. A.Ş. has positioned itself as a key supplier of aluminium profiles in diverse industrial sectors, serving both domestic and foreign markets. Spanning 37,000 m² in Istanbul's core and an expansive 200,000 m² in Kırklareli, located two hours away from our Istanbul plant, our fully integrated systems enable us to significantly reduce lead times—from drawing to delivery—by up to three weeks.

Our production line seamlessly encompasses the entire spectrum, from raw materials to finished products, with integrated operations covering moulding, extrusion, fabrication, electrostatic and anodized surface treatments, heat barrier assembly, and various contemporary packaging systems.

With an annual capacity of 36,000 tonnes, Erdoğanlar Aluminium stands as one of Turkey's most advanced companies, boasting state-of-the-art production lines, a workforce of 400 employees, and over 30 years of invaluable experience in production, design, and research and development.

For a more in-depth understanding of our offerings, please refer to our [catalogue](#).

1.4. Calculation Method

The two prevailing methodologies employed for corporate carbon footprint assessments are the ISO 14064 Standard and the Greenhouse Gas Protocol (GHG Protocol). The evaluation of Erdoğanlar Aluminium's Greenhouse Gas Emissions aligns with the ISO 14064 Standard, and the outcomes from both methods are comprehensively presented in the report. This dual approach aims to establish a foundational framework for prospective global reports and declarations, including those for initiatives such as CDP, SBTi, and GRI.

Despite sharing a common foundational methodology, the terminologies employed to convey results differ between the ISO 14064 Standard and the GHG Protocol. The specific terminologies and groupings utilized in expressing the results are detailed in the table below for reference.

Table 1. ISO 14064 ve GHG Protocol Relationship

Scope	GHG -Protocol	Category	ISO 14064-1:2018
Scope 1	Direct Emissions	Category 1	Direct GHG emissions and removals
Scope 2	Emissions From Purchased Energy	Category 2	Indirect GHG Emissions from Imported Energy
Scope 3	04: Upstream Transportation and Distribution 05: Waste Generated in Operations 06: Business Travel 07: Employee Commuting 09: Downstream Transportation and Distribution	Category 3	Indirect GHG Emissions from Transportation
Scope 3	01: Purchased Goods and Services 02: Capital Goods 03: Fuel- and Energy-Related Activities (Not Included in Scope 1 or Scope 2) 05: Waste Generated in Operations 08: Upstream Leased Assets	Category 4	Indirect GHG Emissions from Products Used by Organization
Scope 3	10: Processing of Sold Products 11: Use of Sold Products 12: End-of-Life Treatment of Sold Products 13: Downstream Leased Assets 14: Franchises 15: Investments	Category 5	Indirect GHG Emissions Associated with the Use of Organisation's Products
Scope 3		Category 6	Indirect GHG Emissions from Other Sources

* Emissions Resulting from Production Wastes and Waste Transport to Disposal Facility (Divergence between GHG Protocol and ISO 14064)

Corporate carbon footprint calculations are structured into six categories as defined by ISO 14064-1:2018:

Category 1 - Direct GHG emissions and removals: Emissions originating from greenhouse gas sources that are owned or controlled by an organisation.

Category 2 - Indirect GHG emissions from imported energy: Greenhouse gas emissions are generated during the production of electricity, heat, or steam consumed by an organisation through external supply.

Category 3 - Indirect GHG emissions from transportation: Emissions arising from greenhouse gas sources owned or controlled by other organisations due to an organisation's activities, excluding energy indirect greenhouse gas emissions.

Category 4 - Indirect GHG emissions from products used by an organization: Emissions originating from sources external to institutional boundaries associated with the goods used by the organization, covering both stationary and mobile sources related to all types of purchased goods.

Category 5 - Indirect GHG emissions associated with the use of products from the organization: Emissions or reductions tied to the utilisation of the organization's products during their life stages after the production process. Scenarios for each life stage should be defined considering variations in after-sales product use.

Category 6 - Indirect GHG emissions from other sources: Encompasses activities not covered in the first five categories.

While ISO 14064-1 and the GHG Protocol share a common calculation foundation, terminologies differ. According to the GHG Protocol, emissions are categorised into three scopes. Scope 1 corresponds to emissions calculated in Category 1; Scope 2 corresponds to emissions calculated in Category 2; and Scope 3 corresponds to emissions calculated in Categories 3, 4, 5, and 6.

1.5. ISO 14064 Standard Principles

The Erdoğanlar Aluminium Greenhouse Gas Emissions Calculation and Verification report, along with its content, has been developed in adherence to ISO 14064 standards. The guiding principles for greenhouse gas emission calculation and reporting, as outlined in the ISO 14064-1 Standard, within the ambit of this Greenhouse Gas Emission Inventory Report, are as follows:

- **Relevance:** Select the GHG sources, GHG sinks, GHG reservoirs, data, and methodologies appropriate to the needs of the intended user.
- **Completeness:** Include all relevant GHG emissions and removals
- **Consistency:** Enable meaningful comparisons in GHG-related information
- **Accuracy:** Reduce bias and uncertainties as far as is practical
- **Transparency:** Disclose sufficient and appropriate GHG-related information to allow intended users to make decisions with reasonable confidence.

2. Climate Change and the European Green Deal

Global warming or climate change is the increase in average temperatures on the earth because of the greenhouse effect, which is caused by the increase of gases such as carbon dioxide in the atmosphere, and therefore the change in the climate of the world. Some of the sun's rays falling on the earth are reflected and directed towards the atmosphere. Atmosphere contains carbon dioxide, methane, nitrogen, etc., which are called greenhouse gases. Thanks

to these gases, the sun's rays go back to the earth. With the increase in density of greenhouse gases in the atmosphere, this event takes place more and the earth gets warmer.

With the increase in human activities since the Industrial Revolution, global warming has gradually increased, and this increase causes climate change. Reducing the effects of climate change is directly proportional to the decrease in greenhouse gas emissions, and for this purpose, it is necessary to monitor and manage the greenhouse gases released. The first step in greenhouse gas emissions/carbon management starts with an accurate calculation. As a result of the calculation made, hot spots should be determined and targets for reduction should be set. In this sense, there are also international regulations that companies try to comply with. The most important of these regulations is the European Green Deal.

The Paris Agreement is an agreement signed in 2015 on climate change mitigation, adaptation, and financing, and entered into force in 2016, under the United Nations Framework Convention on Climate Change (UNFCCC). Türkiye signed the agreement with representatives of 175 countries in New York in 2016. According to the agreement, At the end of the 21st century, the global temperature increase will be limited to 2 °C starting from the pre-industrial period, and efforts will be made to reduce this value below 1.5 °C. In line with these targets, Türkiye announced the “Intention for National Contribution” (INDS) statement, which is expected to be realized by 2030, September 20, 2015, as a reduction of up to 21%. For the same purpose, the European Union (EU) has committed to reducing its greenhouse gas emissions by 40% by 2030, compared to 1990, in its Statement of National Intent for Contribution. As a result of scientific studies, it has been revealed that even if all declared national contribution intentions are achieved, the 2 °C temperature rise limitation target cannot be reached. On December 11, 2019, the European Union (EU) published the European Green Deal, which sets new micro-targets and draws a roadmap to achieve the goals set by the Paris Climate Agreement. With the Green Deal, the EU Commission increased its greenhouse gas emission reduction targets from 40% to 50-55% until 2030, which it took in line with the Paris Agreement, and made it more ambitious. Moreover, it set a target to become the world’s first climate-neutral continent with no greenhouse gas emissions in 2050. It is emphasized that the way to achieve this target is the necessity of moving from a linear economic model, which can be expressed as a build-sell, buy-sell to a sustainable and circular economic model in today’s economic order. EU Commission officials describe the Green Deal as a path to growth that gives much more than it takes.

2.1. Carbon Border Adjustment Mechanism (CBAM)

The Carbon Border Adjustment Mechanism (CBAM) came into effect on 1 January 2023 and has been considered a transitional period from 2023 to 2026. While importers do not have to obtain CBAM certification during the transition period, emissions in imported products are expected to be calculated and reported. In the current regulation, it is stated that although only Scope 1 direct emissions are included in the taxation process, Scope 2 indirect emissions in the short term and Scope 3 other indirect emissions in the long term will also be included.

The first five sectors covered by CBAM are defined as aluminium cement, electricity, fertilizer, iron, and steel. In the second regulation, organic chemical, plastic/polymer, and hydrogen production are also included in the scope of CBAM. In the ceramic industry, where scope 1 emissions such as process emissions and fixed combustion constitute a high share of total emissions, institutions need to measure their carbon footprints, to realise risks and turn them into opportunities.

3. Corporate Carbon Footprint

The carbon footprint is a measure of the damage done by human activities to the environment with regards to greenhouse gas emissions produced, in terms of unit carbon dioxide equivalent. It is determined by calculating the effect of greenhouse gases such as carbon dioxide (CO₂), methane (CH₄), nitrogen oxide (NO₂), hydrofluorocarbons (HFC), perfluorocarbons (PFC), and sulphur hexafluoride (SF₆).

Greenhouse gas emissions are determined and calculated at Scope 1, Scope 2 and Scope 3 levels for institutions. The corporate carbon footprint is expressed in terms of carbon dioxide equivalent (CO₂ eq.) and is calculated and published within the framework of the ISO 14064 standard. The titles and activities covered are as follows.

Scope 1:

- Stationary Combustion
 - Natural gas
 - Diesel fuel (Generator, machine, etc.)
 - Other fuels
- Mobile Combustion
 - Company-owned vehicles
 - Leased vehicles
 - Forklift etc.
- Process Emissions
 - Emissions from oxidation and high-low temperature units
 - Fire extinguishers
 - Cooling gases

Scope 2:

- Purchased Electricity
- Purchased Heating/Cooling

Scope 3:

- 1: Purchased Goods and Services
- 2: Capital Goods
- 3: Fuel- and Energy-Related Activities
- 4: Upstream Transportation and Distribution

- 5: Production Waste
- 6: Business Travel
- 7: Employee Commuting
- 8: Upstream Leased Assets
- 9: Downstream Transportation and Distribution
- 10: Processing of Sold Products
- 11: Use of Sold Products
- 12: End-of-Life Treatment of Sold Products
- 13: Downstream Leased Assets
- 14: Franchises
- 15: Investments

4. System Boundary

The functional unit used in the calculation is Erdoğanlar Aluminium’s activities for the year 2022 and the emissions resulting from these activities have been calculated. In the table below, the activities considered in the calculation and explanations about their calculations are given.

Table 2. Erdoğanlar Aluminium – System Boundary for Istanbul

Scope	Activity	Considerations
Scope 1	Stationary Combustion	Erdoğanlar Aluminium utilizes natural gas in both its processing and heating operations. The environmental impacts stemming from the use of natural gas, as well as the effects associated with the consumption of diesel fuel in the generator activated during power outages, are meticulously calculated, and accounted for.
	Refrigerant Gas	During the reporting year, Erdoğanlar Aluminium consumed R22, R134A, R410A, and R600A gases as cooling agents. The emissions arising from the annual theoretical leaks and refuelling processes related to these cooling gases have been systematically calculated. It is noteworthy that the calculation excludes cooling gases utilized in vehicles, as they fall below the significance level in the overall emission assessment.
	Fire Extinguishers	During the reporting year, Erdoğanlar Aluminium utilised fire extinguishers containing CO ₂ , ABC, ACT, and foam. A detailed analysis of emissions arising from their use and maintenance has been conducted. It's important to note that the calculation specifically includes emissions associated with the use of fire extinguishers containing CO ₂ .
	Process Emissions	The calculation considers process emissions resulting from the use of the mixed gas consumed in the activities of the plant.

	Mobile Combustion	Emissions stemming from the fuel consumption of vehicles owned and rented under the control of the company are systematically calculated.
Scope 2	Purchased Electricity	Emissions resulting from the electricity consumption of Erdoğanlar Aluminium have been calculated.
	Purchased Heating/Cooling Steam	There is no heat/cooling/steam purchased during the calculation year.
Scope 3	01: Purchased Goods and Services	The impacts originating from the raw materials and services procured by Erdoğanlar Aluminium, with a particular focus on raw materials, have been systematically calculated. Notably, raw materials and services falling below the 96% significance level are excluded from the calculation.
	02: Capital Goods	Emissions arising from the capital goods acquired by the facility during the calculation year have been calculated.
	03: Fuel- and Energy-Related Activities	For every consumed fuel, the calculation includes emissions from the well to the pump, as well as indirect emissions resulting from electricity grid leakages.
	04: Upstream Transportation and Distribution	Emissions arising from the transportation of purchased raw materials to Erdoğanlar Aluminium are taken into consideration in the calculation.
	05: Waste Generated in Operations	Emissions resulting from the disposal of wastes generated in the factory during production, as well as the transportation of wastes to the disposal facility, have been calculated.
	06: Business Travel	Emissions stemming from business travels undertaken by the company's employees during the reporting year have been calculated. This calculation encompasses emissions from air transport and hotel accommodation.
	07: Employee Commuting	Emissions resulting from employees travelling to and from the company are calculated, with consideration given to the emissions from the individual vehicles used by the employees.
	08: Upstream Leased Assets	There are no upstream leased assets in the reporting year.
	09: Downstream Transportation and Distribution	Emissions originating from the transportation of products manufactured at Erdoğanlar Aluminium's Istanbul plant to customers have been calculated.
	10: Processing of Sold Products	The products sold are considered final products and are not subjected to any processing after their production.
	11: Use of Sold Products	The calculation does not incorporate energy and raw material consumption associated with the use of Erdoğanlar Aluminium products, as these variables vary across different sectors.

12: End-of-Life Treatment of Sold Products	Emissions arising from the disposal of the products sold and their packaging are calculated.
13: Downstream Leased Assets	There are no downstream leased assets in the reporting year.
14: Franchises	Franchising is not available in the Erdoğanlar Aluminium business model.
15: Investments	Investments are not related to the company within the scope of the study.

Table 3. System Boundary for Kırklareli Plant

Scope	Activity	Considerations
Scope 1	Stationary Combustion	Erdoğanlar Aluminium utilises natural gas in its processes and heating. The environmental impacts resulting from natural gas consumption, as well as the impacts caused by the diesel fuel consumed in the generator, fire pump, and other machines activated during power outages, have been systematically calculated.
	Refrigerant Gas	In the fiscal year under consideration, refrigerant gases such as R32, R134A, R410A, R513A, and R600A were consumed. The emissions arising from the annual theoretical leaks and refuelling processes related to these cooling gases have been systematically calculated. It is noteworthy that the calculation excludes cooling gases utilized in vehicles, as they fall below the significance level in the overall emission assessment.
	Fire Extinguishers	In the fiscal year under review, fire extinguishers containing CO ₂ , ABC, ACT, and foam were consumed. Emissions arising from their usage and maintenance are examined under this category, with a particular focus on the inclusion of CO ₂ -containing fire extinguishers in the emissions calculation.
	Process Emissions	The calculation incorporates process emissions derived from the mixed gas utilised in the plant's activities.
	Mobile Combustion	The calculation encompasses emissions resulting from the fuel consumption of vehicles owned and leased under the purview of the company.
Scope 2	Purchased Electricity	Emissions from electricity consumption of Erdoğanlar Aluminium are calculated.
	Purchased Heating/Cooling/ Steam	No heat, cooling, or steam was purchased during the calculation year.

Scope 3	
01: Purchased Goods and Services	The impacts stemming from the procurement of raw materials and services by Erdoğanlar Aluminium, with a specific emphasis on raw materials, are computed. All raw materials and services are incorporated into the calculation.
02: Capital Goods	Emissions originating from the fixed assets acquired by the facility within the calculation year have been quantified.
03: Fuel- and Energy-Related Activities	For every fuel consumed, emissions are calculated comprehensively, encompassing emissions from the well to the pump and indirect emissions resulting from electricity grid leakages.
04: Upstream Transportation and Distribution	Emissions arising from the transportation of purchased raw materials to Erdoğanlar Aluminium are considered in the assessment.
05: Waste Generated in Operations	Emissions resulting from the disposal of wastes generated in the factory during production and the transportation of these wastes to the disposal facility have been quantified.
06: Business Travel	Emissions emanating from business travels undertaken by employees of Erdoğanlar Aluminium have been computed. This includes the emissions associated with air transport and hotel accommodation.
07: Employee Commuting	Emissions resulting from employees commuting have been assessed. However, emissions from the consumption of personal vehicles used by the personnel were not calculated due to the unavailability of relevant data.
08: Upstream Leased Assets	There are no upstream leased assets in the reporting year.
09: Downstream Transportation and Distribution	Emissions resulting from the transportation of products manufactured at the Erdoğanlar Aluminium Kırklareli plant to the Istanbul plant have been calculated.
10: Processing of Sold Products	The products sold are not subject to any processing.
11: Use of Sold Products	The calculation does not incorporate energy and raw material consumption associated with the use of Erdoğanlar Aluminium products, as these variables vary across different sectors.
12: End-of-Life Treatment of Sold Products	Emissions arising from the disposal of the products sold and their packaging are calculated.
13: Downstream Leased Assets	No assets were leased after production in the reporting year.
14: Franchises	Franchising is not available in the Erdoğanlar Aluminium business model.
15: Investments	Investments are not related to the company within the scope of the study.

5. Corporate Carbon Footprint Results

5.1. Erdoğanlar Aluminium Corporate Carbon Footprint Results

The corporate carbon footprint of Erdoğanlar Aluminium's activities in 2022 is as follows, according to scopes.

Table 4. Erdoğanlar Aluminium Corporate Carbon Footprint

Scope	tonnes of CO ₂ eq.	%
Scope 1	5,199	1%
Scope 2	9,553	2%
Scope 3	444,390	97%
Total (Scope 1-2)	14,752	3%
Total (Scope 1-2-3)	459,142	100%

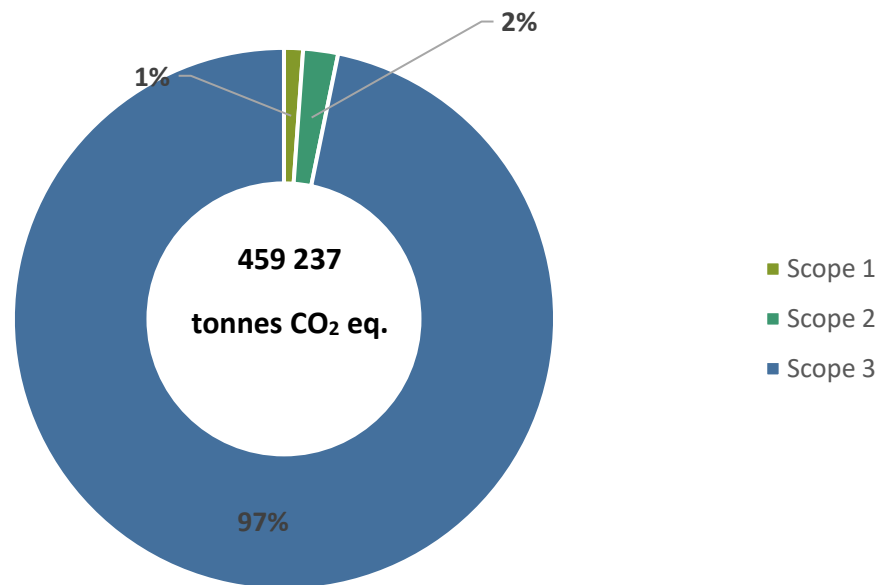


Figure 1. Distribution of Total Emissions by Scope

Following the corporate carbon footprint calculation, it has been observed that Scope 3 emissions, encompassing Erdoğanlar Aluminium's value chain emissions both upstream and downstream production, constitute approximately 97% of the total emissions. Within the overall corporate carbon footprint, it is determined that energy indirect emissions in Scope 2 account for a 2% share, while direct emissions contribute 1%.

The corporate carbon footprint for Erdoğanlar Aluminium’s activities in 2022, as per ISO 14064-1 scopes, is as follows:

Table 5. Erdoğanlar Aluminium Corporate Carbon Footprint (ISO 14064-1)

Category	Value, tonnes CO ₂ eq.	%
Category – 1	5,199	1%
Category – 2	9,553	2%
Category – 3	15,854	3%
Category – 4	426,569	93%
Category – 5	649	<1%
Category – 6	1,318	<1%

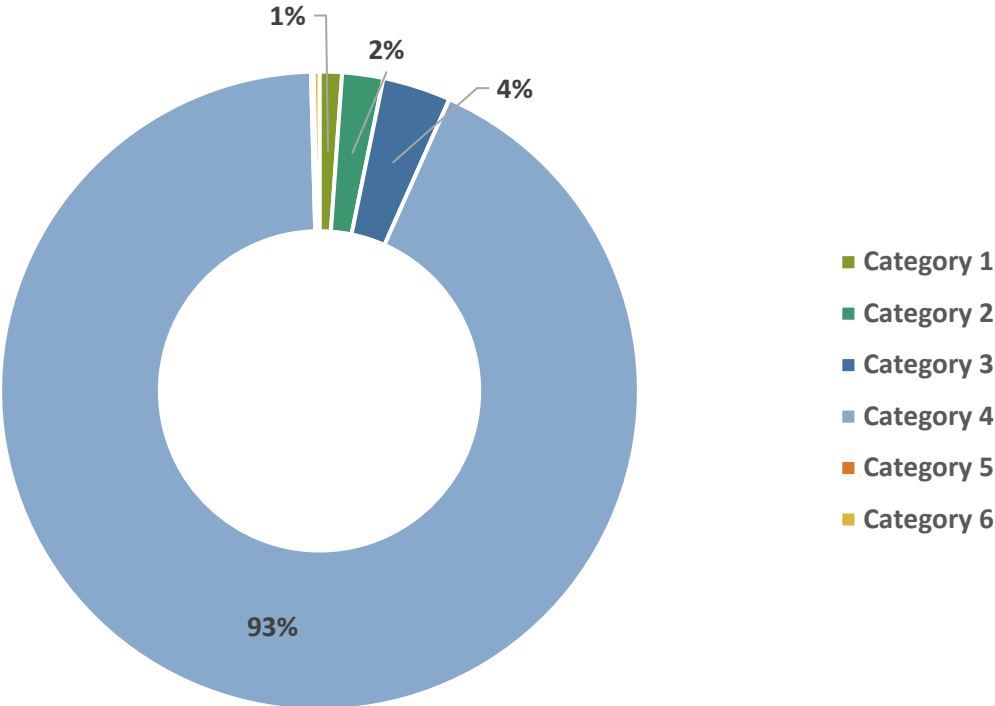


Figure 2. Breakdown of Total Emissions by Category (ISO 14064-1)

Table 6. Distribution of Total Emissions by Activities - GHG Protocol Compliant

Activities	Scope	Value, tonnes CO ₂ eq.	%
Stationary Combustion	Scope 1	4,933	1%
Refrigerant Gas	Scope 1	8.32	<1%
Fire Extinguishers	Scope 1	0.049	<1%
Mobile Combustion	Scope 1	257	<1%
Electricity Consumption	Scope 2	9,553	2%
Purchased Goods and Services	Scope 3	416,768	91%
Capital Goods	Scope 3	8,726	2%
Fuel- and energy-related Activities	Scope 3	2,237	<1%
Raw Material Transportation	Scope 3	7,490	2%
Waste	Scope 3	252	<1%
Business Travel	Scope 3	68.6	<1%
Employee Commuting	Scope 3	235	<1%
Product Transportation	Scope 3	7,965	2%
Use of Sold Products	Scope 3	-	0%
End-of-Life Treatment of Sold Products	Scope 3	649	<1%
Total	-	459,142	100%

Table 7. Distribution of Total Emission by Activities - ISO 14064:2018 Compliant

Activities	Category	Value, tonnes CO ₂ eq.	%
Stationary Combustion	Category 1	4,933	1%
Fugitive Emission	Category 1	8	<1%
Process Emission	Category 1	0.049	<1%
Mobile Combustion	Category 1	257	<1%
Electricity Consumption	Category 2	9,553	2%
Upstream Transportation and Distribution	Category 3	7,490	2%
Business Travel	Category 3	69	<1%
Employee Commuting	Category 3	235	<1%
Downstream Transportation and Distribution	Category 3	8,061	2%
Purchased Goods and Services	Category 4	416,768	91%
Capital Goods	Category 4	8,726	2%
Fuel- and Energy-related Activities	Category 4	919	<1%
Waste	Category 4	156	<1%
Use of Sold Products	Category 5	-	0%
End-of-Life Treatment of Sold Products	Category 5	649	<1%
Network Losses	Category 6	1,318	<1%
Total		459,142	100%

The distribution of Scope 1/Category 1 emissions by activities is as follows.

Table 8. Internal Distribution of Scope 1 Emissions (GHG Protocol)

Activities	Value, tonnes CO ₂ eq.	%
Stationary Combustion	4,933	94.9%
Fugitive Emission	8.32	0.2%
Process Emission	0.049	0.0%
Mobile Combustion	257	4.9%
Total	5,199	100%

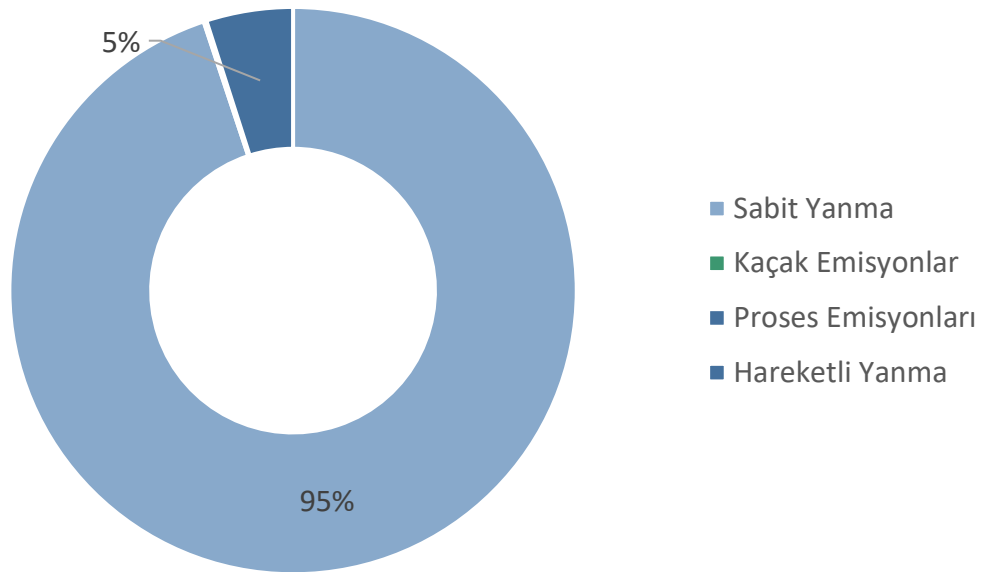


Figure 3. Internal Distribution of Scope 1 Emissions

Emission breakdowns of stationary and mobile combustion sources according to IPCC methodology are given in annex for each plant. CO₂ eq.: It represents the sum of carbon dioxide (CO₂), methane (CH₄) and nitrous monoxide (N₂O) gases.

Scope 2 emissions constitute indirect emissions stemming from imported energy. For Erdoğanlar Aluminium, Scope 2 emissions primarily encompass electricity consumption. Notably, it has been noted that Scope 2 emissions contribute to approximately 2% of the total corporate carbon footprint.

Table 9. Internal Distribution of Scope 2 Emissions (GHG Protocol)

Activity	Value, tonnes CO ₂ eq.	%
Purchased Electricity	9,553	100%

Scope 3 emissions represent the sum of indirect emissions in the entire value chain before and after production. The distribution of Erdoğanlar Aluminium's Scope 3 emissions by activities is as follows.

Table 10. Internal Distribution of Scope 3 Emissions (GHG Protocol)

Activities	Value, tonnes CO ₂ eq.	%
Purchased Goods and Services	416,768	94%
Capital Goods	8,726	2%
Fuel- and Energy-related activities	2,237	1%
Raw Material Transport	7,490	2%
Waste	252	<1%
Business Travel	68.6	<1%
Employee Commuting	235	<1%
Product Transportation	7,965	2%
Use of Sold Products	-	0%
End-of-Life Treatment of Sold Products	649	<1%
Total	459,142	100%

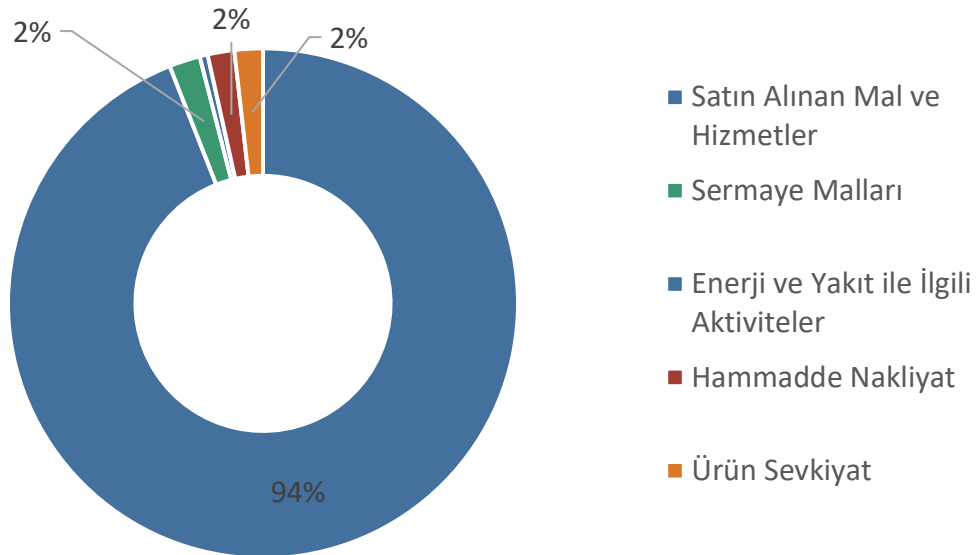


Figure 4. Internal Distribution of Scope 3 Emissions

5.2. Uncertainty Level

The uncertainty level aims to provide a technical contribution to decision-making by quantifying the uncertainties in the relevant variables within the calculation. Within the scope

of Erdoğanlar Aluminium corporate carbon footprint study, uncertainty calculation was made for 2022; Scope 1 and Scope 2 total uncertainty:

It was found to be +-1.6% for the Istanbul plant and the data precision was categorised as "High". Scope 1, Scope 2 and Scope 3 combined uncertainty value was calculated as +-4.8%. In this context, it has been observed that reasonable confidence level values have been worked within.

It was found as +-1,6% for the Kırklareli plant and the data sharpness was classified as "High". Scope 1, Scope 2 and Scope 3 cumulative uncertainty value is calculated as +-4.7%. In this context, it has been observed that reasonable confidence level values have been worked within.

In the uncertainty level calculation, an uncertainty matrix was used, and the matrix and evaluation criteria are shown in the table below. In the uncertainty level calculation, to determine the uncertainty value at a percentage rate, firstly, the data acquisition method and the uncertainty value (%) of this method and the emission factor acquisition method and the uncertainty value (%) of this method were selected. The uncertainty value (%) is determined by selecting the method that is higher than the uncertainty values and belongs to this value.

Table 11. Methodological Uncertainty Values

Data Supply Method	Emission Factor Supply Method	Uncertainty Value (%)
Measuring Device Subject to Legal Metrological Control	IPCC, DEFRA	1.5
Calibration Date Current Meter	Internationally Accepted Data (Ecoinvent 3.8)	1.5
Calibration Date Not Valid / No Calibration	National inventories of countries	2.5
Labelled Supplier Data (Gas Filling Capacity etc.)	Labelled Supplier Data (MSDS etc.)	3.5
Supplier Data / Statement to the Ministry	Supplier Data	5
Distance Measurement Programs (Google Maps etc.)	Assumptions	7

5.3. Base Year Selection

The Greenhouse Gas Emissions Calculation and Reporting of Erdoğanlar Aluminium is carried out for the year 2022, and the base year covers the period from 01.01.2022 to 31.12.2022.

The greenhouse gas inventory determined by this report will constitute an input to Erdoğanlar Aluminium's annual activity reports.

5.4. Recommendations for Improving Data Quality

Throughout the calculations, it has been established that enhancing data quality holds significant importance. Below, measures to enhance data quality in the upcoming years, based on activities, are outlined with illustrative examples. (Note: The examples provided are for illustrative purposes and do not represent actual data.)

- Organising fixtures within the **Capital Goods** section into categories such as equipment, vehicles, infrastructure, electronics, furniture, etc., will prove beneficial for both data security and consistency.

Sample Data Format

No	Fixtures	Quantity Purchased/Unit	Product Category	Product Value, \$/Unit	Transportation Type	Transportation Vehicle Owner
1	CABINET	1	Furniture	11,144.59	Road	Transportation Company
2	NATURAL GAS FURNACE	1	Machine	41,655.28	Road	Transportation Company
3	LAPTOP	1	Electronics	11,447.92	Road	Transportation Company

- In the **Purchased Goods and Services** section, aside from primary raw materials, items like catering, cleaning, and stationery materials are included in total purchases. In the calculation process, it is recommended to categorise products to exclude purchases below a certain significance threshold. Alongside categorisation, incorporating the unit weight of each product and its components into the data template is advised for weight-based calculations.

Sample Data Format: Chemical Purchase

Material	ABC 100 Paint
Supplier	ABC Kimya A.Ş.
Supplier Location	İzmir
Material Category	Auxiliary Material - Paint
Purchase Quantity	5 boxes
Present Value	10 USD /box
Material Unit Weight	15 kg /box
Transportation Method	Road
Transportation Vehicle Owner	Transportation Company

- A primary factor contributing to the elevated **uncertainty** is the absence of data from meters. To enhance data quality and mitigate uncertainty, it is advisable to conduct

regular maintenance and calibration of natural gas, electricity, and water meters, with a concurrent recording of uncertainty values.

ANNEX I: Erdoğanlar Aluminium Calculation Details - Istanbul Plant

In addition to the consolidated outcomes for Erdoğanlar Aluminium, the summaries and emission breakdowns specific to the Istanbul plant are provided in the tables below.

Table 12. Distribution of Istanbul Plant Total Emissions by Activities – GHG Protocol Compliant

Activities	Scope	Value, tonnes CO ₂ eq.	%
Stationary Combustion	Scope 1	4,407	1.5%
Fugitive Emission	Scope 1	8	<1%
Process Emission	Scope 1	0.04	<1%
Mobile Combustion	Scope 1	152	<1%
Electricity Consumption	Scope 2	8,317	2.80%
Purchased Goods and Services	Scope 3-01	271,038	91.2%
Capital Goods	Scope 3-02	1,456	<1%
Fuel- and Energy-related Activities	Scope 3-03	1,949	<1%
Raw Material Transportation	Scope 3-04	1,487	<1%
Waste	Scope 3-05	249	<1%
Business Travel	Scope 3-06	69	<1%
Employee Commuting	Scope 3-07	159	<1%
Product Transportation	Scope 3-09	7,519	2.5%
Use of Sold Products	Scope 3-11	0	0%
End-of-Life Treatment of Sold Products	Scope 3-12	435	<1%
Total		297,242	100%

Table 13. Distribution of Istanbul Plant Total Emissions by Activities - ISO 14064 Compliant

Activities	Category	Value, tonnes CO ₂ eq.	%
Stationary Combustion	Category 1	4,407	1%
Fugitive Emission	Category 1	7.6	<1%
Process Emission	Category 1	0	<1%
Mobile Combustion	Category 1	152	<1%
Electricity Consumption	Category 2	8,317	3%
Upstream Transportation and Distribution	Category 3	1,487	1%
Business Travel	Category 3	69	<1%
Employee Commuting	Category 3	159	<1%
Downstream Transportation and Distribution	Category 3	7,614	3%
Purchased Goods and Services	Category 4	271,038	91%
Capital Goods	Category 4	1,456	<1%
Fuel- and Energy-related Activities	Category 4	802	<1%
Waste	Category 4	154	<1%

Use of Sold Products	Category 5	0	0%
End-of-Life Treatment of Sold Products	Category 5	435	<1%
Network Losses	Category 6	1,148	<1%
Total		297,242	100%

Table 14. Emission Breakdowns of Stationary and Mobile Combustion Sources at Istanbul Plant (IPCC-AR5)

Activities	tonnes CO₂	tonnes CH₄	tonnes N₂O	tonnes CO₂ eq.
Stationary Combustion	4,394	11	2.07	4,407
Mobile Combustion	149	0.5	2.58	152
Total	4,542	11	4.65	4,558

ANNEX II: Erdoğanlar Aluminium Calculation Details - Kırklareli Plant

In addition to the consolidated results for Erdoğanlar Aluminium, the summaries and emission breakdowns specific to the Kırklareli plant are presented in the tables below.

Table 15. Distribution of Total Emissions of Kırklareli Plant by Activities - GHG Protocol Compliant

Activities	Scope	Value, tonnes CO₂ eq.	%
Stationary Combustion	Scope 1	527	<1%
Fugitive Emission	Scope 1	0.71	<1%
Process Emission	Scope 1	0.005	<1%
Mobile Combustion	Scope 1	105	<1%
Electricity Consumption	Scope 2	1,236	<1%
Purchased Goods and Services	Scope 3-01	145,730	90.0%
Capital Goods	Scope 3-02	7,270	4.5%
Fuel- and Energy-related Activities	Scope 3-03	288	<1%
Raw Material Transportation	Scope 3-04	6,003	3.7%
Waste	Scope 3-05	2.50	<1%
Business Travel	Scope 3-06	-	0%
Employee Commuting	Scope 3-07	76.6	<1%
Product Transportation	Scope 3-09	447	<1%
Use of Sold Products	Scope 3-11	-	0%
End-of-Life Treatment of Sold Products	Scope 3-12	214	<1%
Total		161,900	100%

Table 16. Distribution of Kırklareli Plant Total Emissions by Activities - ISO 14064 Compliant

Activities	Category	Value, tonnes CO₂ eq.	%
Stationary Combustion	Category 1	527	<1%

Fugitive Emission	Category 1	0.715	<1%
Process Emission	Category 1	0.005	<1%
Mobile Combustion	Category 1	105	<1%
Electricity Consumption	Category 2	1,236	1%
Upstream Transportation and Distribution	Category 3	6,003	4%
Business Travel	Category 3	-	0%
Employee Commuting	Category 3	76.6	<1%
Downstream Transportation and Distribution	Category 3	447	<1%
Purchased Goods and Services	Category 4	145,730	90%
Capital Goods	Category 4	7,270	4%
Fuel- and Energy-related Activities	Category 4	117	<1%
Waste	Category 4	2.43	<1%
Use of Sold Products	Category 5	-	0%
End-of-Life Treatment of Sold Products	Category 5	214	<1%
Network Losses	Category 6	171	<1%
Total		161,900	100%

Table 17. Kirklareli Plant Emission Breakdown of Stationary and Mobile Combustion Sources (IPCC-AR5)

Activities	tonnes CO₂	tonnes CH₄	tonnes N₂O	tonnes CO₂ eq.
Stationary Combustion	525	1.32	0.26	527
Mobile Combustion	104	0.22	1.57	105
Total	629	1.54	1.83	632

