ARKEM KIMYA SAN. VE TIC. A.S.

CORPORATE GREENHOUSE GAS INVENTORY REPORT FOR 2024

Address:

Valide Sultan Street. No:10 Bahcekoy – Sariyer/ ISTANBUL

Prepared by:

BSM Environmental Consultancy
Istanbul /TURKEY

Issue Date:

April 10, 2025

Content

APPENDIX:

List of Tables:

List of Pictures:

List of Figures:

1 ABOUT THE REPORT

1.1 Purpose and Scope

This report has been prepared in order to classify, calculate and report the greenhouse gas emissions related to the activities of Arkem Kimya Sanayi ve Ticaret A.S .'s wholesale and trade of chemical substances facility located at Arkem Center Valide Sultan Street. No:10 Bahcekoy – Sariyer/ ISTANBUL for the year 2024.

The study covers the quantification and management of direct (Scope 1), indirect energy-related (Scope 2) and other indirect (Scope 3) greenhouse gas emissions resulting from the activities of the facility.

This report aims to contribute to the following objectives:

- Establishment of the annual greenhouse gas (GHG) inventory of the facility,
- Identifying and categorising major emission sources,
- Providing data-driven insights to support strategic emission reduction decisions,
- Creating a benchmark for future performance comparisons,

Contributing to disclosures aligned with EcoVadis and CDP reporting frameworks,

- Transparent information sharing with stakeholders and strengthening sustainability disclosures

1.2 Reporting Period

This report covers the greenhouse gas emissions from the facility's operations between 1 January 2024 and 31 December 2024. The reporting period is defined as a calendar year and calculations are limited to this period.

1.3 Standards and Methods Used

This report is based on two internationally recognised standards for the calculation and reporting of greenhouse gas emissions.

- **GHG Protocol – Corporate Accounting and Reporting Standard**
  World Resources Institute (WRI) and World Business Council for Sustainable Development (WBCSD), this standard is based on the classification of greenhouse gas emissions as scope 1, 2 and 3 and their calculation at the corporate level.

- **ISO 14064-1:2018 – Standard for the Calculation and Reporting of Greenhouse Gas Emissions and Removals at Organisation Level**
  This international standard ensures the reporting of greenhouse gas emissions within the framework of the principles of accuracy, traceability, uncertainty management and transparency.

The GHG Protocol - Corporate Calculation and Reporting Standard methodology was taken as basis in the greenhouse gas inventory process. Emission sources were categorised as direct (Scope 1), indirect energy-based (Scope 2) and other indirect (Scope 3), and emission calculations were performed separately for each scope.

In addition, the report is structured in accordance with the ISO 14064-1:2018 standard.

1.4 Reporting Officers

1.4.1 Report Owner Organization

The person responsible for collecting the activity data used in the calculation of greenhouse gas emissions and ensuring coordination between the relevant units is Burce Ozturk.

Company Name: Arkem Kimya Sanayi ve Ticaret A.S.

Address: Valide Sultan Street. No:10 Bahcekoy – Sariyer/ ISTANBUL

Authorised Person: Burçe Ozturk

E-Mail: burce.ozturk@arkem.com.tr

Telephone: +90537 302 74 48

1.4.2 Report Preparing Organization

The greenhouse gas inventory study was carried out by BSM Environmental Consultancy in line with the information and documents obtained from the organisation responsible.

Company Name: BSM Environmental Consultancy

Address: Barbaros District. Begonya Street. Nidakule Atasehir Batı Apt. No:1/2

Atasehir / Istanbul

Yetkili Kişi: Elif Nezir, Seda Hatun Uluzlu

E-Mail: elif.nezir@bsmcevre.com, seda.ugur@bsmcevre.com

Telephone: +90 542 789 35 01, +90 530 664 13 97

2 ORGANISATIONAL BOUNDARIES

2.1 General Information About The Organization

Arkem Kimya operates in the supply, storage and distribution of bulk and packaged chemicals. The roots of the company date back to 1987 and it was renamed to its current name at the end of 1991. Arkem Kimya supplies approximately 500 chemicals including monomers, alcohols, aromatics/aliphatics, esters, glycols, glycol ethers, plastics, chlorinated compounds, amines, fatty acids and alcohols, ketones and surfactants. Today, with a total annual trade volume of 300,000 metric tonnes, the company's main supply products are paints, adhesives, inks, packaging, pharmaceuticals, polyester, polymer and cleaning materials, leather, cosmetics, construction, agriculture and textile industries.

2.2 Determination of Organizational Boundaries

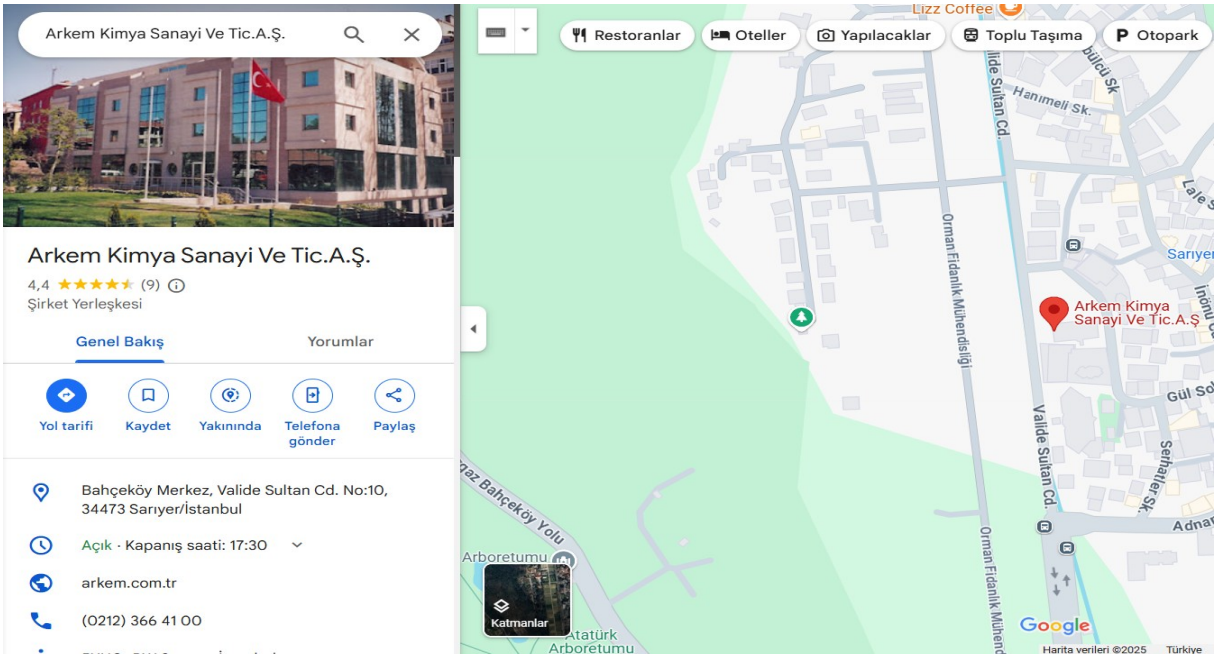
The determination of organisational boundaries is based on the "**operational control approach**", one of the three approaches defined in the GHG Protocol. In this approach, facilities and units where the organisation has full (100%) control over operational activities are included in the inventory.

Arkem directly manages the operational processes in all management units and provides full control of all environmental performance data under control. Therefore, the use of operational control approach while determining organisational boundaries is considered as the most appropriate option in terms of data accuracy and manageability.

The activities of the organisation that cause GHG emissions do not involve any joint venture or external investment structure and are carried out entirely under the operational control of the company. Therefore, the "**equal share approach**", which is one of the alternative methods, is not included in the scope of the assessment.

2.3 Facilities Included In The Reporting Scope

This report covers the facility (Office building) of Arkem Kimya Sanayi ve Ticaret A.S. located at Valide Sultan Street. No:10 Bahcekoy – Sariyer.



Picture 1 Location of Arkem Center (Source: Google Maps)

3 OPERATIONAL BOUNDARIES

Within the scope of this study, GHG emissions were assessed within the framework of Scope 1, Scope 2 and upstream Scope 3 activities in line with the GHG Protocol. The issues excluded from the scope are given **in Section 4.5.**

3.1 Scope 1 – Direct Emissions

Direct GHG emissions occur from sources owned or controlled by the organisation, e.g. emissions from combustion in owned or controlled boilers, furnaces, vehicles, etc.; emissions from chemical production in owned or controlled process equipment. (WRI, GHG Protocol)

The classification of direct emissions is as follows:

- **Stationary Combustion:** Emissions resulting from the combustion of fuels in stationary equipment such as boilers, furnaces, burners, etc.
- **Mobile Combustion:** Emissions resulting from the combustion of fuels in transport vehicles such as cars, trucks, buses, etc.
- **Process Emissions:** Emissions from chemical production in process equipment.
- **Fugitive Greenhouse Gas Emissions:** Emissions from intentional and unintentional releases, such as equipment leaks.

3.1.1 Stationary Combustion Sources

Stationary combustion sources refer to direct greenhouse gas (GHG) emissions resulting from the combustion of fossil fuels in fixed equipment (e.g., boilers or generators) located within the boundaries of the building facility.

In this case, the stationary combustion sources primarily involve the use of natural gas for heating and cooking purposes. The natural gas is supplied to the Arkem by the external provider IGDAS (Istanbul Gaz Dağıtım Sanayi ve Ticaret A.S)

Natural gas is consumed in various facility operations, including space heating and kitchen cooking activities. Consumption data for the year 2024 was obtained from purchase invoices, and emissions were calculated in terms of carbon dioxide equivalent (tCO_2e) using the relevant emission factors.

Diesel fuel is purchased periodically for the generator, which is used to meet electricity needs in emergency situations. The annual operating hours of the generator are monitored by the maintenance personnel and are reported to the Ministry accordingly.

Additionally, a limited amount of LPG (liquefied petroleum gas) is utilized in the kitchen in cylinder form.

3.1.2 Mobile Combustion Sources

Mobile combustion sources refer to direct greenhouse gas emissions resulting from the combustion of fossil fuels in motor vehicles under the control of the facility.

There are diesel and gasoline fuelled vehicles in the vehicle fleet operating under the Arkem operation. These vehicles are under the operational control of the organisation.

2024 diesel and gasoline consumption data were obtained from vehicle identification system records. These consumption amounts were calculated in terms of carbon dioxide equivalent (tCO_2e) using the relevant emission factors.

The organization owns one gasoline-powered lawn mower. The maintenance personnel records the operating hours of the lawn mower. Greenhouse gas emissions have been calculated based on the operating hours and the technical specifications provided in the equipment’s documentation.

3.1.3 Fugitive Emission Sources

Fugitive emissions refer to greenhouse gases resulting from controlled or uncontrolled releases to the atmosphere from equipment used within the facility.

There are two main equipment groups with potential for fugitive emissions in building facility:

- **Fugitive Emissions from Refrigerant Gases**

In the context of office/building operations, the following refrigerant gases are used in split-type air conditioning units, refrigerators, and cooling rooms located throughout the facility: R410a, R32, R600a, R134a, and R404a.

Fugitive emissions may originate from two primary sources:

-Uncontrolled leaks (e.g., annual system leakage), and

-Controlled processes (e.g., refrigerant charging or evacuation during maintenance operations).

In the year 2024, no refrigerant charging or evacuation operations were conducted on the facility's air conditioning or cooling systems. Therefore, only uncontrolled leaks were considered in the emissions calculation.

The estimation of fugitive emissions was carried out in accordance with the IPCC 2006 Guidelines (Volume 3, Chapter 7 – HFCs and PFCs Emissions). The total emission was estimated based on the following parameters:

- The refrigerant charge amount per equipment unit,
- The total number of active refrigeration units in operation at the facility, and
- The annual leakage rates defined by the IPCC.

- **Fire Extinguishing Systems:**

Carbon dioxide (CO_2) and HFC-236fa gases are used in portable fire extinguishers located throughout the facility. Fugitive emissions are caused by both uncontrolled leaks (e.g. device pressure drops, valve leaks) and controlled processes (e.g. gases entering the atmosphere during filling operations).

For cylinders that were filled during the year, controlled emission calculation was made based on the net CO_2 amount included in the invoices related to the filling. For the cylinders that were not filled, the assumed annual leakage rate defined in the IPCC Guidelines was used.

3.2 Scope 2 - Energy Indirect Greenhouse Gas Emissions

Energy indirect GHG emissions are emissions from the generation of electricity, steam, heating or cooling consumed by the reporting organisation. (WRI, GHG Protocol)

Electricity used in building facility is supplied from the national grid and consumed for general operating needs such as lighting and cooling.

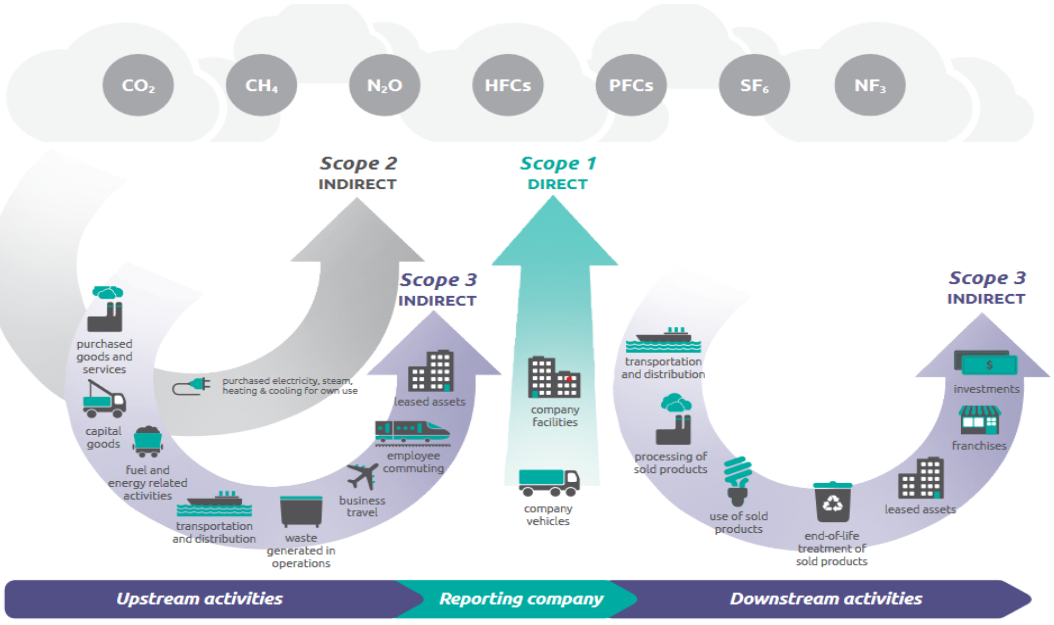
Electricity consumption data for 2024 is obtained from monthly electricity bills. GHG emissions are calculated in carbon dioxide equivalent (tCO_2e) using the national electricity grid emission factor (location-based).

In addition, I-REC certificates are purchased for electricity consumption. Market-based Scope 2 greenhouse gas emissions for 2024 have been calculated by taking into account the I-REC certificates purchased.

During the reporting year, there was no energy such as steam, heat, etc. purchased from external suppliers.

3.3 Scope 3 – Other Indirect Greenhouse Gas Emissions

Other indirect greenhouse gas emissions include other greenhouse gas emissions that are not under the direct control of the organisation but arise from processes linked to its activities. These emissions arise from processes such as supply chain and waste management.



Picture 2 Scopes According To The GHG Protocol And Emissions In The Value Chain

This study covers only the upstream Scope 3 Categories 5, 6, and 7, in accordance with the GHG Protocol. The Scope 3 summary table with explanations is given in **Table 1.**

3.3.1 Category 5 – Waste Generated In Operations

This category includes the indirect greenhouse gas emissions resulting from the treatment or disposal of waste generated in the reporting year by facilities owned or controlled by the company, but managed by third-party facilities. The organisation may optionally include emissions from the transport of waste.

Disposal and transport of solid wastes delivered to third parties at the building facility during 2024 are considered under this category. Emission calculations are based on emission factors in internationally recognised databases on disposal methods. Emissions of the transport process were estimated by taking into account the amount of waste transported, transport distance and transport vehicle characteristics and using the emission factors in internationally recognised databases.

Wastewater related emissions are excluded from the scope of this study as wastewater management is carried out through direct discharge to the municipal sewerage system and no third party treatment service is directly provided in this process.

3.3.2 Category 6 – Business Travel

This category covers greenhouse gas emissions from employees' business travel. According to the GHG Protocol, this category includes indirect emissions from business travel by vehicles (aircraft, trains, buses, etc.) not owned or operated by the organisation.

Within the scope of this study, only business air travel of employees in 2024 was evaluated. **Since travel data for other modes of transport are not available, they are not included in the calculation.**

Greenhouse gas emissions from flights were estimated using emission factors from internationally recognised databases, taking into account flight distances and class (economy/business) information.

3.3.3 Category 7 – Employee Commuting

This category includes GHG emissions from the transport of employees from their homes to their workplaces. According to the GHG Protocol, this category only includes indirect emissions from personnel transport in vehicles not owned or operated by the organisation.

In 2024, employees commuted to work using a personnel shuttle vehicle rented from a third-party company. Although the vehicle is not owned or operated by Arkem. Greenhouse gas emissions have been calculated using distance and vehicle type information specified in the contracts, along with emission factors obtained from internationally recognized databases.

Due to the lack of available data regarding the use of personal vehicles or public transportation by employees, these transportation modes are excluded from the boundary of this report.

Table 1 Summary of Scope 3 Emission Sources Included

Category No	Category Name	Calculated ?	Description
5	Waste Generated In Operations	✓	Emissions from the disposal and transport of solid waste by third parties are included in this category. **(Wastewater excluded).**
6	Business Travel	✓	Only emissions from business trips made by employees by aircraft are included in this category. **Since travel data for other modes of transport are not available, they are not included in the calculation.**
7	Employee Commuting	✓	Personnel transportation services are outsourced to an external provider. In this context, the shuttle vehicles used have been included under this emission category. **Due to the lack of available data regarding the use of personal vehicles or public transportation by employees, these transportation modes are excluded from the boundary of this report.**

4 METHODOLOGY

4.1 Data Collection Process

The person responsible for collecting the activity data used in the calculation of greenhouse gas emissions and ensuring coordination between the relevant units is Burce Ozturk from Sustainability Departmant.

The activity data used in this study were obtained through interviews with the organisation, official records and statements from third party service providers. Information on data sources for each type of activity is summarised in **Table 2.**

Google Maps and third-party agreements are used for road transport distance estimates.

Table 2 Information on Data Sources

Emission Type	Activity Data	Activity Data Unit	Data Source	Data Collection Frequency
Stationary Combustion	Natural Gas	M^3 and Kwh	Invoices	Monthly
Stationary Combustion	LPG	Kg	Invoices	Annual
Stationary Combustion	Operating Hours	Hour	Maintenance Records / Generator Usage Declaration To Ministry	Annual
Mobile Combustion (on-road)	Diesel	Liter	Vehicle Recognition System Records	Monthly
Mobile Combustion (on-road)	Motor Gasoline	Liter	Vehicle Recognition System Records / Catalog Information / Maintenance Records	Monthly
Mobile Combustion (off-road) (gasoline-powered lawn mower)	Operating Hours	Hour	Maintenance Records	Annual
Fugitive Emissions	Refrigerant Gas	Kg	Inventory List, Gas Filling / Change Invoices /Service Records	Annual
Fugitive Emissions	Fire Extinguishing Gas	Kg	Inventory List, Gas Filling / Change Invoices	Annual
Electricity Consumption	Grid Electricity	Kwh	Electricity Invoices	Monthly
Waste Disposal	Waste Amount	Kg	Waste Records / 2024 Waste Declaration Form	Annual
Waste Disposal	Amount of Domestic Waste	kg	**1.03 kg waste/person*day, over 300 days* (TUIK Waste Statistics 2022)	Annual
Waste Transport	Distance	Km	Waste Records / Distance Estimated	Annual
Business Travel	Flight Distance	Km	Declaration of Organisation / Flight Records	Annual
Employee Commuting	Road Distance	Km	Thirt-Party Agreement	Annual

4.2 Constants and Assumptions Used In Calculations

4.2.1 Density Values

The vehicles belonging to the organization have a vehicle identification system and diesel and gasoline fuels are supplied from Shell fuel stations. Density values for diesel and gasoline used in vehicles are taken from safety data sheets.

The density of diesel fuel used in generators has been accepted as 0,83 kg/L, in accordance with the TEP (Ton of Oil Equivalent) conversion factor table published by the Ministry of Energy and Natural Resources.

Table 3 Density of Fuels

Fuel Type	Density (kg/m^3)	Reference
Diesel V-Power (for vehicles)	840	Shell Fuel supplier SDSs
Unleaded 95 V-Power (for vehicles)	730	
Diesel (for generator)	830	TEP Conversion Table Published by the Ministry of Energy and Natural Resources

4.2.2 Net Calorific Values

Information on the net calorific values used in the calculations is given in **Table 4.**

Table 4 Net Calorific Values

Fuel Type	Net Calorific Values (TJ/Gg)	Reference
Natural Gas	48	IPCC 2006 Vol 2, Chapter 1 Table 1.2
LPG: Liquefied Petroleum Gas	47,3	
Diesel	43	
Motor Gasoline	44,3	

4.2.3 Refrigerant Gas Leakage Rates

The leakage rates used in the calculation of fugitive emissions from cooling systems and fire extinguishers are given in **Table 5.**

Table 5 Refrigerant Gas and Fire Extinguisher Leakage Rates

Equipment Type	Leakage Rate	Reference
Air conditioning	5,5 %	IPCC (2006), Vol 3, Chapter 7, Table 7.9
Refrigerator and Deep freezer	8,0 %	IPCC (2006), Vol 3, Chapter 7, Table 7.9
Cold Storage Room	16,0 %	IPCC (2006), Vol 3, Chapter 7, Table 7.9
Fire Extinguisher Tubes	%4	IPCC/TEAP Special Report: Safeguarding the Ozone Layer and the Global Climate System, Table 9.2

4.2.4 Global Warming Potential Values (GWP)

Fugitive emissions from air conditioning and fire extinguishing systems are included in the inventory. GWP values for the gases included in the inventory are given in **Table 6.**

Table 6 Global Warming Potential (GWP) Values

Gas Type	GWP Value (100 years, CO_2e)	Reference
CO_2	1	IPCC, Sixth Assessment Report (AR6)
CH_4	29,8	
N_2O	273	
R134a	1530	
R32	771	
R600a	3	
R404a	4728	
R410a	2555,5	

4.3 Emission Factors

The emission factors used in this report were obtained from different sources according to the types of activities and data accessibility. In cases where national sources are not sufficient in the selection of emission factors, internationally valid databases were used. The emission factors used and related sources are given in **Table 7 and Table 8** on the basis of activity type.

Table 7 Scope 1 and 2 Emission Factors

Emission Type	Emission Source	Emission Factor	Reference
Scope 1 Emissions			
Stationary Combustion	Natural Gas	56,10 tonnes CO_2 / TJ 0,005 tonnes CH_4 / TJ 0,0001 tonnes N_2O / TJ	IPCC 2006 Vol 2, Chapter 2 Table 2.4
	LPG: Liquefied Petroleum Gas	63,10 tonnes CO_2 / TJ 0,005 tonnes CH_4 / TJ 0,0001 tonnes N_2O / TJ	IPCC 2006 Vol 2, Chapter 2 Table 2.4
	Diesel	74,10 tonnes CO_2 / TJ 0,0030 tonnes CH_4 / TJ 0,0006 tonnes N_2O / TJ	IPCC 2006 Vol 2, Chapter 2 Table 2.3
Mobile Combustion (on-road)	Diesel	74,10 tonnes CO_2 / TJ 0,0039 tonnes CH_4 / TJ 0,0039 tonnes N_2O / TJ	IPCC 2006 Vol 2, Chapter 3, Table 3.2.1 and 3.2.2
	Motor Gasoline	69,3 tonnes CO_2 / TJ 0,025 tonnes CH_4 / TJ 0,008 tonnes N_2O / TJ	
Scope 2 Emissions			
Energy Indirect	Electricity	0,442 tonnes CO_2e/MWh	Republic of Turkey Ministry of Energy and Natural Resources - Turkey Electricity Generation and Electricity Consumption Point Emission Factors Information Form" Publication Date: 06.12.2024

Table 8 Scope 3 Emission Factors

Emission Type	Emission Source	Emission Factor	Reference
Scope 3 Emissions			
Category 5 – Waste Generated In Operations			
Waste Disposal	Packaging Wastes	6,41061 kg CO_2e/tonne waste	DEFRA GHG Conversion Factors 2024 full set Waste Disposal
Waste Disposal	Hazardous Waste	6,41061 kg CO_2e/tonne waste	
Waste Disposal	Landfill (domestic-household wastes)	497,04416 kg CO_2e/tonne waste	
Transport of Waste	Transport of Waste (Hazardous Waste)	0,09752 kg CO_2e / tonne.km	DEFRA GHG Conversion Factors 2024 full set Freighting goods All HGVs
Transport of Waste	Transport of Waste (Packaging and Household Wastes)	0,17853 kg CO_2e / tonne.km	DEFRA GHG Conversion Factors 2024 full set Freighting goods All Rigids
Category 6 – Business Travel			
Business Travel	Aircraft Usage (Long haul /International Average Passenger)	0,15423 kg CO_2e / passenger.km (Without RF)	DEFRA GHG Conversion Factors 2024 full set Business Travel-Air
Category 7 – Employee Commuting			
Personel Shuttle	Diesel	74,10 tonnes CO_2 / TJ 0,0039 tonnes CH_4 / TJ 0,0039 tonnes N_2O / TJ	IPCC 2006 Vol 2, Chapter 3, Table 3.2.1 and 3.2.2

4.4 Calculation Method

In this greenhouse gas inventory study, emissions were calculated based on the following basic formula in line with the GHG Protocol and ISO 14064-1:2018:

Emission (kg CO_2e) = Activity Data × Emission Factor × GWP (if applicable)

4.5 Excluded Emission Sources

- Fugitive emissions of SF_6 (sulphurous hexafluoride), which is used as a cutting gas in transformers, are not included in the calculations since data on the amount of filling/charging could not be obtained. This source has been excluded in the current reporting period and will be considered in future periods when data availability is possible.
- Wastewater related emissions are excluded from the scope of this study as wastewater management is carried out through direct discharge to the municipal sewerage system and no third party treatment service is directly provided in this process.
- Within the scope of this study, only business air travel of employees in 2024 was evaluated. Since travel data for other modes of transport are not available, they are not included in the calculation.
- Since there is no data on the use of personal vehicles or public transport services by employees, these issues are excluded from the scope of the study.

5 GREENHOUSE GAS EMISSION CALCULATION RESULTS

5.1 Results Related To Scope 1 Emissions

The distribution of Scope 1 greenhouse gas emission calculation results by activities is given in **Table 9.**

Table 9 Summary of Scope 1 Emissions Results

Activity	Sub-Activity	Activity Data	Activity Data Unit	Emissions (tonnes CO_2e)	Total Emissions (tonnes CO2e)
Greenhouse Gas Emissions from Stationary Combustion					
Stationary Combustion	Natural Gas Consumption	20.556,83	Stdm3	43,63	49,33
Stationary Combustion	Diesel Consumption	2092,80	Liter	5,55	
Stationary Combustion	LPG Consumption	50	Kg	0,15	
Greenhouse Gas Emissions from Mobile Combustion					
Company Vehicles Fuel Usage	Diesel Consumption	21.092,30	Liter	57,35	153,02
Company Vehicles Fuel Usage	Motor Gasoline Usage	40.677,38	Liter	95,01	
Lawn Mower Fuel Consumption	Motor Gasoline Usage	360	Annual Using/sa	0,65	
Other Direct Greenhouse Gas Emissions (Fugitive Greenhouse Gas Emissions)					
Fire Extinguisher Cyclinders	CO_2	7,28	Kg	14,60	29,18
Air Conditioner Use Gas Leakage Amount	R410a	1,79	Kg	4,04	
	R32	0,05	Kg	0,04	
	R600a	0,009	Kg	0,000028	
	R134a	5,62	Kg	8,60	
	R404a	0,4	Kg	1,89	
TOTAL					**232**

5.2 Results Related To Scope 2 Emissions

Electricity used in building facility is supplied from the national grid and consumed for general operating needs such as lighting and cooling. I-REC certificates are purchased for 100% of electricity consumption. In this context, considering the market-based approach, zero emission is accepted for the electricity consumption corresponding to this ratio. Location-based and market-based total emission amounts are given in **Table 10.**

I-REC Certificates are provided in **Annex-1.**

Table 10 Summary of Scope 2 Emissions Results

Activity	Activity Data	Activity Data Unit	Location Based Total Emissions (tCO_2e)	Market Based Total Emissions (tCO_2e)
Energy Indirect Greenhouse Gas Emissions				
Electricity Consumption	231494,04	KWh	102	0
TOTAL			**102**	**0**

5.3 Results Related To Scope 3 Emissions

The distribution of Scope 3 greenhouse gas emission calculation results by activities is given in **Table 11.**

Table 11 Summary of Scope 3 Emissions Results

Activity	Sub-Activity	Activity Data	Activity Data Unit	Emissions (tonnesCO2e)	Total Emissions (tonnes CO_2e)
Category-5 Waste Generated In Operations					
Waste Disposal	Packaging Waste	2340	Kg	0,015	**14**
	Domestic Waste	27810	Kg	13,82	
	Hazardous Waste	254	Kg	0,002	
Waste Transport	Packaging Waste	128,7	Tonne.km	0,023	
	Domestic Waste	417,95	Tonne.km	0,075	
	Hazardous Waste	21,40	Tonne.km	0,002	
Category 6-Business Travel					
Business Travel-Air	Flight Distance	243314,53	Km	38	**38**
Category 7- Employee Commuting					
Personel Shuttle	Fuel Consumption	14033,68	Litre	38	**38**
TOTAL					**90**

The comparison of Scope 1,2 and 3 emissions is given in **Table 12 and 13.**

Table 12 Comparison of Scope 1,2,3 Emissions

Scope	Location Based	Market Based
	Emission (tCO_2e)	Emission (tCO_2e)
Scope 1 Emissions	232	232
Scope 2 Emissions	102	0
Scope 3 Emissions	90	90
TOTAL	**424**	**322**

Table 13 Percentage of Location-Based Carbon Emissions by Scope

Scope	Emissions ($tonnesCO_2e$) Location-Based	Percentage of Emissions
Scope-1 Emissions	232	55 %
Scope-2 Emissions	102	24 %
Scope-3 Emissions	90	21 %
TOTAL	**424**	**100 %**

Figure 1 shows the distribution of total GHG emissions for the reporting year 2024 under Scope 1 (direct emissions), Scope 2 (indirect energy-related emissions) and Scope 3 (other indirect emissions).

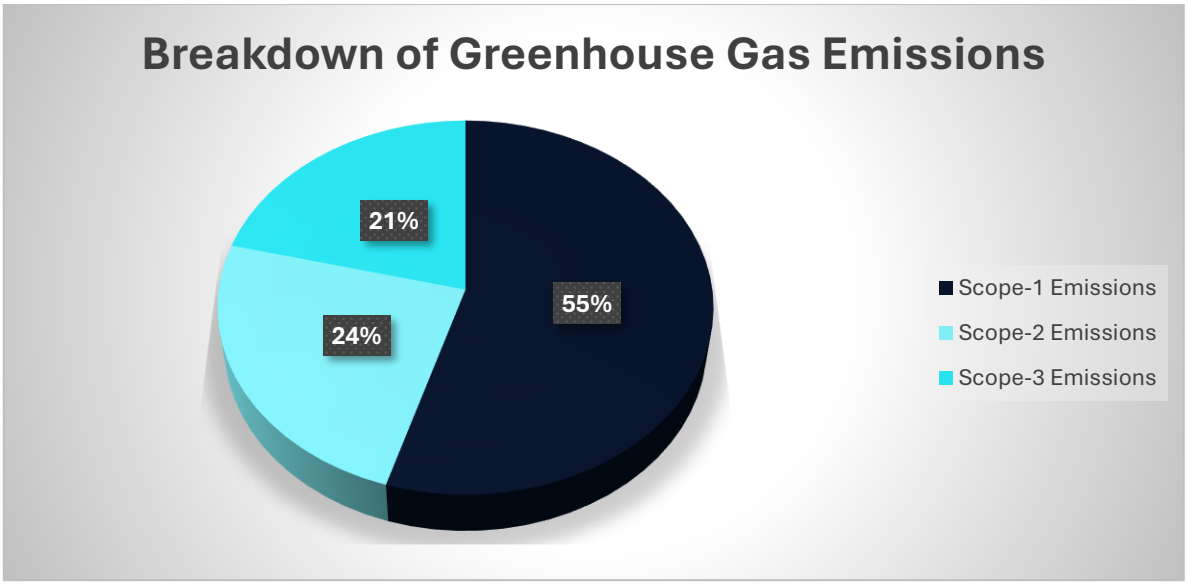


Figure 1 Breakdown of Greenhouse Gas Emissions By Scopes

6 UNCERTAINTY ASSESSMENT

"Confidence level" determines the probability that the actual value of the emission is within the specified uncertainty interval. IPCC recommends 95% confidence level as an appropriate level for range definition and in this report, the confidence level is taken as 95%.

A quantitative uncertainty analysis of Scope 1 and Scope 2 emissions was performed using the uncertainty procedure and uncertainty calculation tool published by the GHG Protocol. Scope 3 emissions were not included in the uncertainty calculation. While evaluating the results obtained from the quantitative part of the uncertainty assessment, the scaling given in **Table 14** was used.

Table 14 Data Accuracy Classification

Data Accuracy	Range as a Percentage of Average Value
High	+/- 5%
Good	+/- 15%
Reasonable	+/- 30%
Weak	More than +/- 30%

6.1 Uncertainties of Activity Data

Uncertainty rates of activity data were determined according to the reliability of the data source. Low uncertainty rates (2%) were accepted when consumption data were obtained directly from reliable sources such as invoices and vehicle identification systems. For refrigerant gases in fire extinguisher cylinders and air conditioners, gas exchange / filling invoices were taken into consideration. At the same time, calculations were made within the scope of the accepted leakage rates and included in the inventory, considering that leakage may occur from these equipment even if they are not filled. The uncertainty of activity data for these gases is accepted as 5%. An uncertainty analysis was conducted for the natural gas meter, and the meter's uncertainty was calculated as 1.7%. An uncertainty of 3% was assumed for the activity data related to the generator, and 7% for the lawn mower.

6.2 Uncertainties of Emission Factors

Within the scope of this study, since it is not possible to analyse the uncertainty values for emission factors obtained from different sources in detail, the emission factor uncertainty for all sources is accepted as 5% as standard. However, for the lawn mower, the emission factor was provided directly by the manufacturer, and therefore an uncertainty value of 2% was assumed.

6.3 Uncertainty Calculation

The result of uncertainty calculation is given in **Table 15.**

Table 15 Uncertainty Calculation

Total Uncertainty	Total Uncertainty Ratio	Uncertainty Rating
Total Uncertainty	**+/- 2,6%**	**High**

7 GREENHOUSE GAS MITIGATION ACTIVITIES

7.1 Renewable Energy Certificate Usage

- As part of the greenhouse gas mitigation efforts, I-REC (International Renewable Energy Certificate) certificates were purchased to match 100% of the company’s electricity consumption. Through this, market-based Scope 2 emissions were reduced to zero. I-REC Certificates for the year 2024 are provided in **Annex 1.**

7.2 Scope 3 Offset Activities (Tree Donation via ÇEKUD)

- Tree donations were made to the ÇEKUD (Environmental Organizations Solidarity Association) Association to offset Scope 3 emissions resulting from air travel activities. The corresponding certificate is presented in **Picture 2** and **Annex 2**.

Picture 3 ÇEKUD Certificate To Offset Scope 3 Emissions Resulting From Air Travel

7.3 Emission Reduction Targets and Monitoring

In alignment with the company's long-term climate strateg the established emission reduction targets and monitoring practices are given in **Table 16**.

Table 16 Emission Reduction Targets

Goal	KPI / Target (2024)	Time Horizon	Baseline (2024)	Progress
Combat climate change by reducing emissions with developed strategies	By 2030, we aim to reduce gross Scope 1 and Scope 2 greenhouse gas emissions by 50% compared to the 2024 baseline.	Medium (6-10 years)	2024 Scope 1+2 (Location-Based): 334 tCO_2e 2024 Scope 1+2 (Market-Based): 232 tCO_2e	Will be evaluated at the end of the year 2025.
	Reduction of gross Scope-1 operational emissions by %20 compared to the 2024 baseline.	Medium (6-10 years)	2024 Scope 1 Emissions: 232 tCO_2e	
	Provide 100% of electricity consumption by renewable energy sources (I-REC, GOs etc.)	Short (1-5 years)	Fully achieved in 2024.	
	Calculate downstream and upstream transportation and distribution Scope-3 GHG emissions	Short (1-5 years)	Category 5,6 & 7 are calculated in 2024.	
Improve data quality and have advanced analytical capabilities	Use of digital tools to improve data collection, analysis and reporting processes	Long (>10 years)	Not started.	
Being on prestigious sustainability scoring platforms and constantly improving sustainability performance	Setting SBTi based targets	Medium (6-10 years)	Not started.	
	Sign the SME Climate Commitment (Climate Change, Energy)	Short (1-5 years)	Not started.	

8 OPPORTUNITIES FOR IMPROVEMENT AND RECOMMENDATIONS

8.1 Strengthening Data Management and Monitoring Systems

- Filling and leakage data for SF_6 gas used in transformer systems could not be obtained. A periodic control and recording system should be established to monitor the filling/leaking data of high GWP gases such as SF_6.
- Automated data collection systems for all data sources (e.g. TTS, invoice integration) should be expanded and a single-centre digital data archive should be established for annual inventory.
- Standardised data collection forms and digital recording templates should be established for all Scope 3 categories (e.g. material transported, distance, vehicle type, material type).

8.2 Reducing Energy Consumption and Carbon Intensity

The following strategies are suggested for the energy sources used in management processes:

8.2.1 Establishment of Energy Management System

The establishment of ISO 50001 Energy Management System in the facility is important in terms of monitoring, analysing and managing energy consumption with the principle of continuous improvement.

Thanks to this system:

- Energy data is digitally monitored,
- Monthly/annual consumption analyses are made,
- Areas for improvement are prioritised.

The Energy Management System also complies with ASC, ISO 14001 and GRI standards and enables the systematic management of emission reduction targets.

8.2.2 Reducing Electricity Consumption

Reducing Electricity Consumption.

For energy-intensive electrical equipment, it is recommended to select energy-efficient and certified products, preferably those with an A-class energy rating.

For lighting systems, the following low-cost solutions can be implemented:

- Transition to LED lighting
- Installation of daylight and motion sensors
- Use of time-controlled panels
- Ensuring that printers and computers do not consume electricity when turned off through optimal power settings is recommended.

8.3 Reducing Employee Commuting Emissions

Emissions from personnel shuttle transport and company vehicles stem from both in-plant fleet operations and outsourced shuttle services. The following best practices are recommended to reduce emissions in this area:

For company-owned vehicles:

- Organize fuel-efficient driving trainings
- Implement driving performance monitoring systems
- Develop a transition plan to electric vehicles
- Carpooling / Shared vehicle use

For outsourced personnel shuttle operations:

- Optimize routes
- Increase vehicle occupancy rates
- Prefer suppliers certified in green logistics practices
- Promoting the use of public transportation.

9 REFERENCES

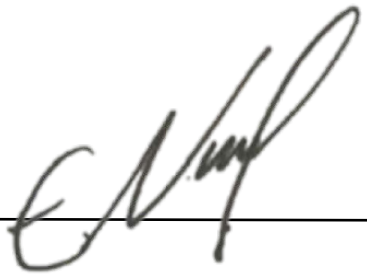
- IPCC (2006). 2006 IPCC Guidelines for National Greenhouse Gas Inventories. Volume 1–5. **https://www.ipcc-nggip.iges.or.jp/public/2006gl/index.html**
- IPCC (2019). 2019 Refinement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories. **https://www.ipcc-nggip.iges.or.jp/public/2019rf/index.html**
- GHG Protocol, A Corporate Accounting and Reporting Standard **https://ghgprotocol.org/corporate-standard**
- GHG Protocol Corporate Value Chain (Scope 3) Standard **https://ghgprotocol.org/corporate-value-chain-scope-3-standard**
- GHG Protocol, Scope 3 Calculation Guidance **https://ghgprotocol.org/scope-3-calculation-guidance-2**
- GHG Protocol Calculation Uncertainty Tool **https://ghgprotocol.org/calculation-tools-and-guidance**
- Turkey Electricity Generation and Electricity Consumption Point Emission Factors Information Form (2024) **https://enerji.gov.tr//Media/Dizin/EVCED/tr/%C3%87evreVe%C4%B0klim/%C4%B0klimDe%C4%9Fi%C5%9Fikli%C4%9Fi/EmisyonFaktorleri/2022_Uretim_Tuketim_EF.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.

10 REPORT APPROVAL AND SIGNATURE

This report has been prepared by BSM Environmental Consultancy based on the data and documents provided by Arkem Kimya Sanayi ve Ticaret A.S.

The prepared content is presented to be used only for the assessment of GHG emissions for the specified reporting period. The report is based on available data and accepted assumptions; the consulting organisation is not responsible for the results that may arise from data deficiencies or changes to be made in the future periods.

Any third reproduction or use of the report for other purposes requires the approval of BSM Environmental Consultancy.



10 April, 2025

Elif Nezir

10 April, 2025

Seda Hatun Uluzlu

THE INTERNATIONAL REC STANDARD

This Redemption Statement has been produced for

ARKEM KİMYA SANAYİ VE TİCARET A.Ş.

by

SEPAS AKILLI COZUMLER A.S.

confirming the Redemption of

230.000000

I-REC Certificates, representing 230.000000 MWh of electricity generated from renewable sources

This Statement relates to electricity consumption located at or in

Valide Sultan Caddesi No:10 34473 Bahçeköy /Sarıyer / İstanbul Turkey

in respect of the reporting period

2024-08-01 to 2025-07-31

The stated Redemption Purpose is

'Scope 2 Reporting'

sepaş AKILLI ÇÖZÜMLER

Ev.

QR Code Verification

Verify the status of this Redemption Statement by scanning the QR code on the left and entering in the Verification Key below

Verification Key

2 5 8 9 5 2 7 7

https://api-internal.evident.app/public/certificates/en/Oh8alvww68HkSOKYfuoECUw2KYLlC6CXBbIMWnGTaEl%2BfByaatXTKyr0X9WpCBHK

Redeemed Certificates

Production Device Details

Device	Country of Origin	Energy Source	Technology	Supported	Commissioning Date	Carbon (CO_2 / MWh)
Pamuk Reg ve HES	Turkey	Hydro-electric	Run of river	No	2003-10-10	0.000000

Redeemed Certificates

From Certificate ID	To Certificate ID	Number of Certificates	Offset Attributes	Period of Production	Issuer
0000-0219-8538-6956.000000	0000-0219-8538-7185.999999	230.000000	Incl	2023-07-01 - 2023-12-31	Foton

Auditor Notes

This statement is proof of the secure and unique redemption of the I-RECs stated above for the named beneficiary to be reported against consumption in the country during the reporting year stated. I-RECs are assigned to a beneficiary at redemption and cannot be further assigned to a third party. No other use of these I-RECs is valid under the I-REC Standard.

Where offset attributes are 'incl' the device registrant, who exclusively holds the environmental attribute rights, has undertaken never to release carbon offsets in association with these MWh; 'excl' means carbon offsets relating to these MWh may be traded independently at some point in the future.

Thermal plants emit carbon as part of the combustion process. While this is not zero carbon, it is generally recognised as carbon neutral where the source is recent biomass.

THE INTERNATIONAL REC STANDARD

This Redemption Statement has been produced for

ARKEM KİMYA SANAYİ VE TİCARET A.Ş.

by

SEPAS AKILLI COZUMLER A.S.

confirming the Redemption of

230 MWh

I-REC Certificates, representing 230 MWh of
electricity generated from renewable sources

This Statement relates to electricity consumption located at or in

Valide Sultan Caddesi No:10 34473 Bahçeköy /Sarıyer / İstanbul Turkey

in respect of the reporting period

2023-08-01 to 2024-07-31

The stated Redemption Purpose is

'Scope 2 Reporting'

sepaş AKILLI ÇÖZÜMLER

Ev.

QR Code Verification

Verify the status of this Redemption Statement by scanning the QR code on the left and entering in the Verification Key below

Verification Key

2 6 4 8 0 8 2 9

https://api.evident.app/public/certificates/en/gKilrUspFJCbLpz439VnC05gxmDsCvVhS9r8KGbova0hGb19uK4J6TCwqj2Cu70b

Redeemed Certificates

Production Device Details

Device	Country of Origin	Energy Source	Technology	Supported	Commissioning Date	Carbon (CO_2 / MWh)
MUTLULAR ENERJİ BİYOKÜTLE SANTRALİ	Turkey	Biomass Solid: Forestry by-products & waste	Steam turbine with condensation turbine (closed cycle): CHP	Yes	2016-09-29	Neutral

Redeemed Certificates

From Certificate ID	To Certificate ID	Number of Certificates	Offset Attributes	Period of Production	Issuer
0000-0003-6517-9475.000000	0000-0003-6517-9704.999999	230 MWh	Incl	2022-07-01 - 2022-12-31	Foton

Auditor Notes

This statement is proof of the secure and unique redemption of the I-RECs stated above for the named beneficiary to be reported against consumption in the country during the reporting year stated. I-RECs are assigned to a beneficiary at redemption and cannot be further assigned to a third party. No other use of these I-RECs is valid under the I-REC Standard.

Where offset attributes are 'inc' the device registrant, who exclusively holds the environmental attribute rights, has undertaken never to release carbon offsets in association with these MWh; 'excl' means carbon offsets relating to these MWh may be traded independently at some point in the future.

For labelling scheme information please refer to the scheme's website. Labelling scheme listing may not be exhaustive.

Thermal plant emit carbon as part of the combustion process. Whilst this is not zero carbon, it is generally recognised as carbon neutral where the source is recent biomass.

Dikili Ağacım Var

ARKEM KİMYA SANAYİ VE TİCARET A.Ş.

2024 yılı yurt içi ve yurt dışı seyahatlerinize istinaden bağışladığınız 200 adet fidan Şanlıurfa'da toprakla buluşturulmuştur.

Fidanlarınızın umutlarınızla beraber yeşerip büyümesini dileriz.

ÇEKUD
ÇEVRE KURULUŞLARI DAYANIŞMA DERNEĞİ

/ DikiliAgacimVar