IC ENTERRA
2023 GREEHOUSE GAS CALCULATION

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1 PURPOSE AND SCOPE

This report covers 9 different locations of IC Enterra, namely: Bağıştaş-1 Hydroelectric Power Plant (BGS), Çileklitepe Hydroelectric Power Plant (CLK), Kadıncık-1 Hydroelectric Power Plant (KAD-1), Kadıncık-2 Hydroelectric Power Plant (KAD-2), Kemerçayır Hydroelectric Power Plant (KMR), Niksar Hydroelectric Power Plant (NKS), Üçhanlar Hydroelectric Power Plant (UHN), Üçharmanlar Hydroelectric Power Plant (UHR), Yukarı Mercan Hydroelectric Power Plant (YKM), and Bağıştaş Hybrid Solar Power Plant (GES), and has been prepared to be shared with relevant stakeholders as a basis for achieving sustainability goals. The calculations were carried out for Scope 1 and Scope 2 greenhouse gas emissions by following the Greenhouse Gas Protocol ("GHG Protocol") and using 2023 operational data. Scope 3 greenhouse gas emissions are outside the scope of this Project. With the work conducted within the scope of this report, IC Enterra aims to reduce its environmental impacts and to provide a foundation for strengthening IC Holding's sustainability efforts.

2 GREENHOUSE GAS EMISSIONS ANALYSIS

Greenhouse gas emissions are categorized into Scope 1, Scope 2, and Scope 3.

Scope 1 (Direct Emissions): Refers to emissions released from sources that are owned or directly controlled by an organization.

- The Scope 1 calculation for BGS includes greenhouse gas emissions from the use of diesel generators, company vehicles consuming gasoline and diesel, cooling systems, circuit breakers and air conditioners, and fire suppression systems.
- The Scope 1 calculation for CLK includes greenhouse gas emissions from the use of diesel generators, company vehicles consuming gasoline and diesel, cooling systems and air conditioners, and fire suppression systems.
- The Scope 1 calculation for KAD-1 includes greenhouse gas emissions from the use of LPG, diesel generators, company vehicles consuming gasoline, cooling systems and air conditioners, and fire suppression systems.
- The Scope 1 calculation for KAD-2 includes greenhouse gas emissions from the use of diesel generators, company vehicles consuming gasoline, cooling systems and air conditioners, and fire suppression systems.
- The Scope 1 calculation for KMR includes greenhouse gas emissions from the use of diesel generators, company vehicles consuming diesel, cooling systems and air conditioners, and fire suppression systems.

- The Scope 1 calculation for NKS includes greenhouse gas emissions from the use of diesel generators, company vehicles consuming diesel, cooling systems and air conditioners, and fire suppression systems.
- The Scope 1 calculation for UHN includes greenhouse gas emissions from company vehicles consuming diesel, cooling systems and air conditioners, and fire suppression systems.
- The Scope 1 calculation for UHR includes greenhouse gas emissions from the use of diesel generators, company vehicles consuming diesel, cooling systems and air conditioners, and fire suppression systems.
- The Scope 1 calculation for YKM includes greenhouse gas emissions from the use of generators consuming diesel and gasoline, company vehicles consuming diesel and gasoline, cooling systems and air conditioners, and fire suppression systems.
- The Scope 1 calculation for GES includes greenhouse gas emissions from the use of diesel generators, company vehicles consuming diesel and gasoline, cooling systems and air conditioners, and fire suppression systems.

Scope 2 (Energy Indirect Emissions): Refers to emissions resulting from the generation of electricity, heat, or steam purchased from external sources. The Scope 2 calculation for IC Enterra locations includes greenhouse gas emissions arising from electricity purchased from the grid.

Scope 3 (Other Emissions): Refers to greenhouse gas emissions from activities that are purchased externally, not related to energy, and not directly controlled by the organization. These emissions occur at the source as a result of externally sourced activities. Scope 3 emissions have been excluded from this calculation.

The most common methodological approach for greenhouse gas calculation is to collect activity data for each scope and combine them with appropriate emission factors that quantify emissions per unit of activity. Accordingly, activity data are multiplied by emission factors to calculate the result as carbon dioxide equivalent (CO_2e). For other greenhouse gases such as methane (CH_4), nitrous oxide (N_2O), chlorofluorocarbons (CFCs), and hydrofluorocarbons (HFCs), activity data are also multiplied by the relevant emission factors to calculate the CO_2e value of each greenhouse gas.

2.1 Key Assumptions

The activity data within the scope of the inventory for the 2023 operating period were provided by IC Enterra. The greenhouse gas emission inventory calculations were conducted using the GHG Protocol, IPCC Assessment Reports, and ISO 14064 standards.

The key assumptions used in the greenhouse gas calculation are presented below:

- In addition to CO_2, CH_4 and N_2O emissions, which are significant based on activity type, were also included in the emission calculations.
- The carbon dioxide equivalent of CH_4 was taken as 28, and that of N_2O was taken as 265.
- For the emission factor related to electricity-based greenhouse gas emissions, the national average electricity generation emission factor presented in the "Turkey National Electricity Grid Emission Factor Information Form" published by the Ministry of Energy and Natural Resources was taken as a reference.
- The sources included in the greenhouse gas inventory calculation and the greenhouse gases they cause are presented in Table 1.

Table 1: Sources Included in the Greenhouse Gas Inventory Calculation

Scope	Emission Sources	Greenhouse Gases
Scope 1	LPG	CO_2, CH_4, N_2O
	Generator (Diesel-Gasoline)	CO_2, CH_4, N_2O
	Company Vehicles (Diesel-Gasoline)	CO_2, CH_4, N_2O
	Cooling Systems, Circuit Breaker, and Air Conditioner (Refrigerant Gas)	HFC (s)
	Fire Extinguishers (Extinguishing Gas)	FM200, HFC (s), CO_2
Scope 2	Electricity Purchased from the Grid	CO_2, CH_4, N_2O

2.2 Greenhouse Gas Emissions

IC Enterra's 2023 greenhouse gas emissions for Scope 1 and Scope 2 are presented in Table 2 and Table 3. Scope 1 emissions, originating from stationary combustion (LPG and generator), mobile combustion (company vehicles), and cooling systems and air conditioners, as well as fire extinguishers (extinguishing gas), were determined as 273.842 tons of CO_2e. Scope 2 emissions from electricity consumption were calculated as 622.647 tons of CO_2e. As a result, the total emission amount for the year 2023 was calculated as 896.489 tons of CO_2e.

Table 2: Distribution of Greenhouse Gas Emissions by Source (ton CO_2e)

Scope	Activity Data	BGS (ton CO_2e)	CLK (ton CO_2e)	KAD-1 (ton CO_2e)	KAD-2 (ton CO_2e)	KMR (ton CO_2e)	NKS (ton CO_2e)	UHN (ton CO_2e)	UHR (ton CO_2e)	YKM (ton CO_2e)	GES (ton CO_2e)	Total (ton CO_2e)
Scope 1	Generator	2,462	8,185	3,759	8,139	6,663	0,575	-	7,503	0,965	20,421	58,672
	LPG	-	-	1,488	-	-	-	-	-	-	-	1,488
	Private Vehicle	16,282	17,134	12,032	2,672	1,591	14,791	9,535	2,796	10,507	10,493	97,833
	Refrigerant Gas and Circuit Breaker	7,282	0,372	0,856	0,203	0,152	0,467	0,356	0,152	0,108	0,001	9,949
	Fire Extinguishers	1,445	0,003	0,043	0,053	0,002	0,050	0,004	0,015	0,003	104,282	105,900
Scope 2	Electricity	-	84,431	80,835	53,360	93,767	124,125	74,150	111,546	0,433	-	622,647
TOTAL		**27,471**	**110,125**	**99,013**	**64,427**	**102,175**	**140,008**	**84,045**	**122,012**	**12,016**	**135,197**	**896,489**

Activity DataTable 3: Distribution of Greenhouse Gas Emissions by Source (%)

Scope	Activity Data	BGS (%)	CLK (%)	KAD-1 (%)	KAD-2 (%)	KMR (%)	NKS (%)	UHN (%)	UHR (%)	YKM (%)	GES (%)	Total (%)
Scope 1	Generator	8,963	7,432	3,796	12,633	6,521	0,411	-	6,149	8,031	15,105	6,545
	LPG	-	-	1,503	-	-	-	-	-	-	-	0,166
	Private Vehicle	59,269	15,559	12,152	4,147	1,557	10,564	11,345	2,292	87,442	7,761	10,913
	Refrigerant Gas and Circuit Breaker	26,508	0,338	0,865	0,315	0,148	0,334	0,424	0,125	0,899	0,001	1,110
	Fire Extinguishers	5,260	0,003	0,043	0,082	0,002	0,036	0,005	0,012	0,025	77,133	11,813
Scope 2	Electricity	-	76,668	81,641	82,822	91,771	88,656	88,226	91,422	3,604	-	69,454
TOTAL		**100,000**	**100,000**	**100,000**	**100,000**	**100,000**	**100,000**	**100,000**	**100,000**	**100,000**	**100,000**	**100,000**

The pie chart in Figure 1, prepared for IC Enterra's 2023 greenhouse gas emissions, visually presents the distribution by source. While 69.454% of total emissions originated from electricity consumption, this was followed by emissions from fire extinguishers at 11.813%. Private vehicles consuming gasoline and diesel accounted for 10.913% of emissions, whereas generators contributed 6.545%. Emissions from refrigerant gases, including circuit breakers, and LPG use were significantly lower, realized at 1.110% and 0.166% respectively. This distribution clearly indicates that electricity consumption is the main contributor to emissions.

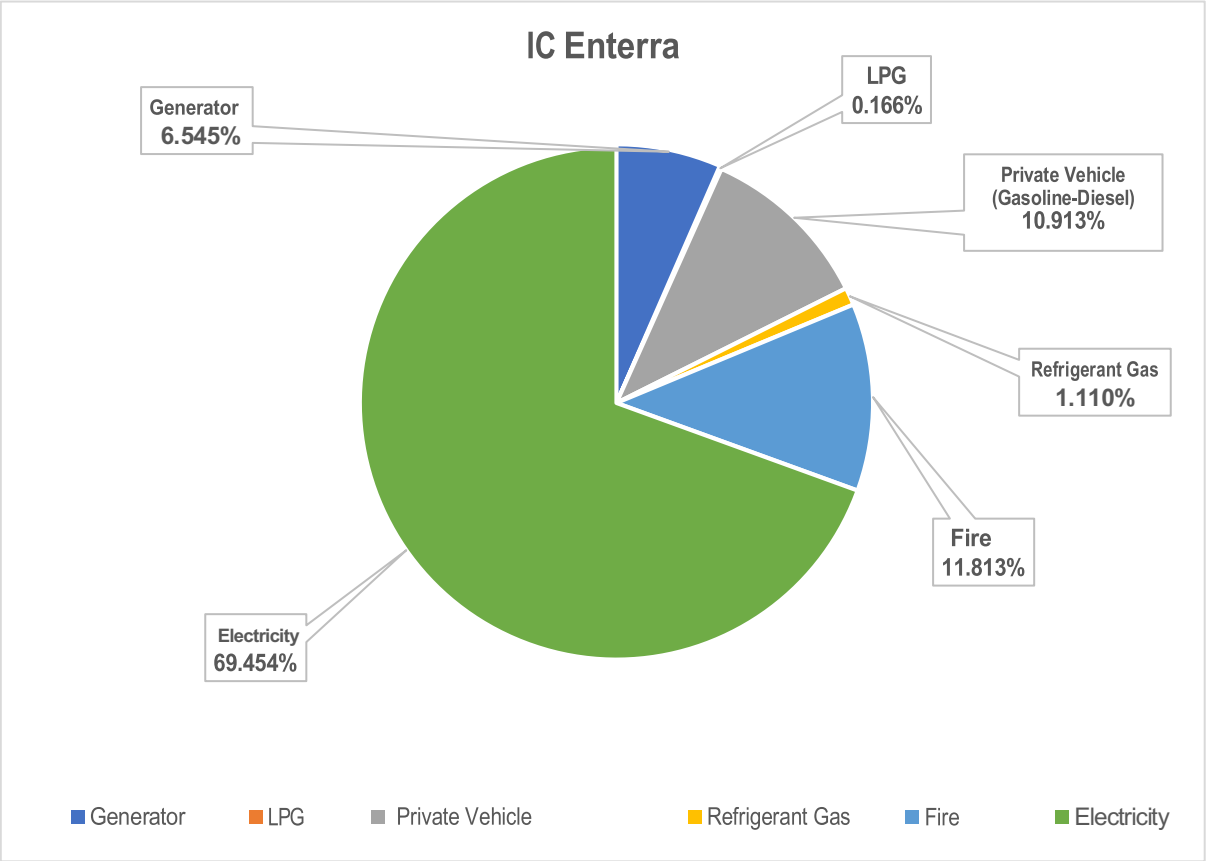

Figure 1: Distribution of Greenhouse Gas Emissions

The category-based comparison of IC Enterra's 2022 and 2023 emissions is presented in Table 4. Within Scope 1 and Scope 2, the most notable reduction in 2023 occurred in electricity consumption due to the increased use of renewable energy at locations, which led to a decrease in electricity drawn from the grid. During the year, 13,783,301.00 kWh of renewable energy was procured, preventing 6,133.569 tons of CO_2e emissions. The greatest increase was observed in emissions from fire extinguishers, and the primary reason for this sharp change was the calculation based on the filling of HFC 236FA at the solar power plant (GES) location. Increases in generator usage and in the amount of fuel consumed by company vehicles also led to rises of 34.823% and 12.306%, respectively. Emissions from refrigerant gases rose by 5.232% due to equipment procurement, disposal, and additional fillings. Other observed

changes over the years generally stem from variations in data quantity and emission factors. When comparing the total greenhouse gas emissions of 2022 and 2023, a 49.027% decrease is evident.

Table 4: Source-Based Greenhouse Gas Emissions Distribution for 2022 and 2023

Scope	Activity Data	2022	2023	Change (%)
Scope 1	Generator	38,241	58,672	34,823%
	LPG	-	1,488	100%
	Private Vehicle	87,113	97,833	12,306%
	Refrigerant Gas and Circuit Breaker	9,454	9,949	5,232%
	Fire Extinguishers	1,420	105,900	7.356,724%
	Scope 1 Total	136.228	273,842	101,017%
Scope 2	Electricity	1.622,511	622,647	-61,624%
	Scope 2 Total	1.622,511	622,647	-61,624%
TOTAL		**1.758,739**	**896,489**	**-49,027%**

3 CONCLUSION

In line with the calculations made, the total emission value for IC Enterra's 2023 operational period has been calculated as 896.489 tons of CO_2e.

4 REFERENCES

Scope	Category	Emission Sources	Sources Used for Calculation
1	1.1	Direct Emissions from Stationary Combustion Sources	
		LPG	2006 IPCC Guidelines for National Greenhouse Gas Inventories -Volume 2-Chapter 2 Stationary Combustion (Table 2.3) Lower Heating Value: 2006 IPCC Guidelines for National Greenhouse Gas Inventories – Volume 2 – Chapter 1 Introduction
		Generator (Diesel)	
	1.2	Direct Emissions from Mobile Combustion Sources	
		Diesel Private Vehicles	2006 IPCC Guidelines for National Greenhouse Gas Inventories -Volume 2-Chapter 3 Mobile Combustion Lower Heating Value: 2006 IPCC Guidelines for National Greenhouse Gas Inventories – Volume 2 – Chapter 1 Introduction
		Gasoline Private Vehicles	
		Diesel Forklifts and Off-road Machinery	
		Gasoline Forklifts and Off-road Machinery	

Scope	Category	Emission Sources	Sources Used for Calculation
	1.4	Leakage Emissions from Anthropogenic Systems (Refrigerant Gases, Fire Extinguishers)	
		HFC 134 A	IPCC AR6: https://ghgprotocol.org/sites/default/files/2024-08/Global-Warming-Potential-Values%20%28August%202024%29.pdf
		R 410A	
		HFC 22	
		R 600A	
		SF6	
		HFC 32	
		HFC 236FA	
		CO_2	
		HFC 227EA (FM200)	
2	2.1	Electricity	Republic of Türkiye Ministry of Energy and Natural Resources – Emission Factor for Consumption Point Connected to Transmission Line: https://enerji.gov.tr//Media/Dizin/EVCED/tr/%C3%87evreVe%C4%B0klim/%C4%B0klimDe%C4%9Fi%C5%9Fikli%C4%9Fi/EmisyonFaktorleri/TEUVETN_Emisyon_Fakt%C3%B6rleri_Bilgi_Formu.pdf