

Istanbul Gedik University

2024 Carbon Footprint Calculation

This document was prepared to calculate the greenhouse gas (GHG) emissions of Istanbul Gedik University for the year 2024, based on the university's energy consumption, transportation, and waste data.

The calculation follows the **Greenhouse Gas Protocol (GHG Protocol)** and classifies emissions under **Scope 1, Scope 2, and Scope 3**.

Activity Data and Emissions Factors

Category	Data Type	Amount	Unit	Emission Factor
Natural Gas	53,227	m ³	1.90 kg CO ₂ /m ³	IPCC (2006), DEFRA (2024)
Electricity	238,395	kWh	0.50 kg CO ₂ /kWh	IEA (2024, Turkey Grid Average)
Gasoline	5,817.37	L	2.31 kg CO ₂ /L	DEFRA (2024)
Diesel	549.44	L	2.68 kg CO ₂ /L	DEFRA (2024)
Waste (Mixed)	45,426	kg	0.497 kg CO ₂ /kg	IPCC (2006) landfill default

Emissions Calculations

GHG Protocol Scope	Source Type	Emission (kg CO ₂)	Emission (ton CO ₂)
Scope 1 – Direct Emissions			
Natural Gas Consumption	101,131.3	101.13	
Gasoline Consumption	13,438.1	13.44	
Diesel Consumption	1,472.5	1.47	
Total Scope 1		116,041.9	116.04
Scope 2 – Indirect Emissions (Electricity)	Electricity Consumption	119,197.5	119.20
Scope 3 – Other Indirect Emissions	Waste Generation (Mixed)	19,097.7	19.10
TOTAL		254,337.1	254.34 tons CO₂e / year

Emission Distribution

Total: 254.34 tons CO₂e

- Scope 1: **45.6%**
- Scope 2: **46.9%**
- Scope 3: **7.5%**

Electricity consumption represents nearly half of the total carbon footprint. Electricity use (Scope 2) accounts for 47% of total emissions and should be the primary focus for reduction measures. Natural gas (Scope 1) is the second-largest contributor ($\approx 40\%$). Waste emissions (Scope 3) make up less than 8% of the total and can be further reduced through improved waste segregation and recycling. Transportation fuels (gasoline + diesel) represent around 6% of total emissions. Transitioning to electric or shared vehicles can reduce this category.

The total carbon footprint of Istanbul Gedik University for 2024 is estimated at **approximately 254.34 tons of CO₂e**.

This value establishes a baseline for developing policies and actions to reduce the university's overall environmental impact and move toward carbon neutrality.

References

1. IPCC (2006). *Guidelines for National Greenhouse Gas Inventories*.
2. DEFRA (UK Department for Environment, Food and Rural Affairs). *Greenhouse Gas Conversion Factors, 2024*.
3. IEA (2024). *CO₂ Emissions from Fuel Combustion Highlights*.
4. Ministry of Energy and Natural Resources of Türkiye (2024). *National Grid Emission Factor: 0.50 kgCO₂/kWh (average)*.
5. World Resources Institute (2023). *The Greenhouse Gas Protocol*.