Giurgiulești International Free Port

Report on Carbon Footprint 2024

April 2025

DANUBE LOGISTICS

Contents

I. INTRODUCTION

Since 2016, ICS Danube Logistics SRL (Danube Logistics) has championed sustainable business practices by producing an annual carbon footprint report for its operations at the Giurgiulesti International Free Port (GIFP). The current inventory, covering the period from 1 January to 31 December 2024, marks the ninth report and plays an important role in Danube Logistics' commitment to environmental protection. To ensure transparency and credibility, the Carbon Footprint Report Greenhouse Gas (GHG) Protocol, follows the well-established Greenhouse Gas (GHG) Protocol, an internationally recognized methodology for carbon calculation. This approach not only aligns with other GHG standards, such as ISO 14064 but also facilitates seamless integration into national and international GHG registries.

The Carbon Footprint Report conducts a thorough analysis that includes various data on energy production and consumption from stationery and mobile emission sources. These emission sources primarily include CO2 emissions and CO2 equivalent emissions. Danube Logistics' use of fossil fuels for the combustion of port and transport equipment, heating and electricity consumption for port operations results in emissions of carbon dioxide (CO2), methane (CH4) and nitrous oxide (N2O).

This report seeks to quantify the environmental impact of Giurgiulești Port by identifying primary emission sources (both direct and indirect) through an assessment of energy efficiency and modern transshipment practices. Implementing sustainable practices will not only strengthen its position as a regional leader but also attract international partners committed to environmental responsibility. This initiative reflects the Giurgiulești Port's commitment to a sustainable future, transforming climate challenges into opportunities for innovation and leadership in green logistics.

II. BOUNDARIES OF THE CO2 FOOTPRINTING

Greenhouse gas accounting involves the selection of the following two types of boundaries:

1. Organizational boundaries

Danube Logistics uses an audit approach to merge and report greenhouse gas emissions, which includes all emissions that the company can control and influence. This approach applies to all activities conducted by Danube Logistics at the Giurgiulesti International Free Port.

It is important to note that the calculation of the carbon footprint for 2024 includes the residential companies operating on the premises of GIFP. However, their activities are not under the control of Danube Logistics, and access to accurate information cannot be guaranteed. The data used for the calculations was obtained from the resident[1]s, and the CO2 emissions were calculated using the same methodology applied by Danube Logistics.

2. Operational boundaries

The total territory of GIFP currently under operation and development comprises 55.2 ha.

The operational activities conducted within the following areas are included in the scope of this report (fig.1):

[1] Resident of the International Port, can be any natural or legal person of the Republic of Moldova or of another state, registered in the Republic of Moldova as a subject of entrepreneurial activity, who leases goods or land on the territory of the International Port and who is registered by the Government Representative in the International Port.

- General cargo terminal, dry bulk storage area, container yard.
- Oil terminal area including oil jetty, tank farm, auto loading facility and railway facility.
- Office Park.
- Business Park areas under the control of Danube Logistics, e.g. workshop warehouse.
- Infrastructure at GIFP premises include roads and parking areas.

<u>The following areas are included in the report for the first time in 2024:</u>

- Grain terminals with access to the Danube and Prut rivers.
- Business Park areas leased by third parties include grain storage facilities, vegetable oil reservoirs, vegetable oil crushing plant and tanks for ethanol/spirits/fertilizer.

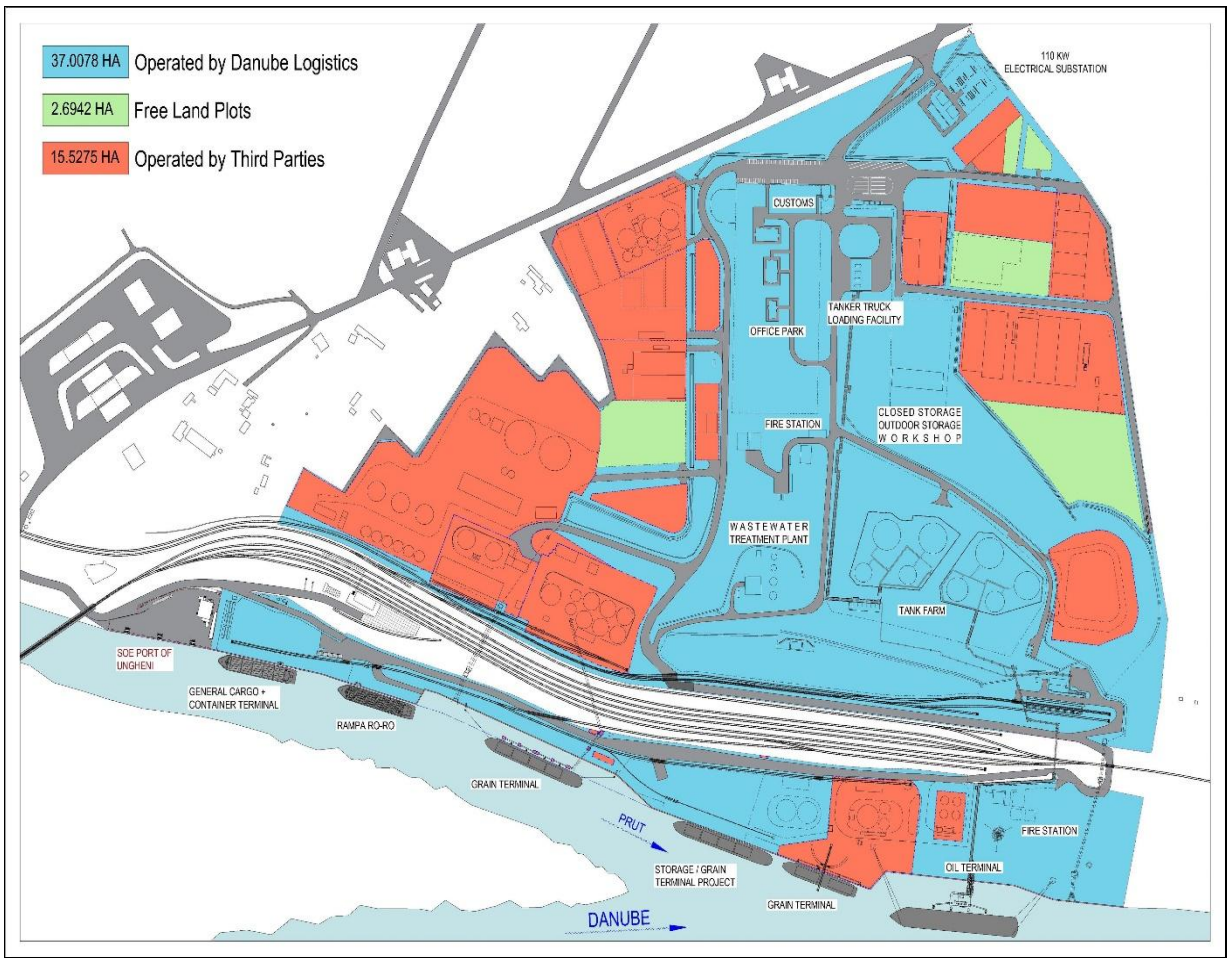

Figure 1. Port area that was considered for the calculation of CO2 emissions

Following the recommendation of the Guidance Document "Carbon Footprinting for Ports" issued by the World Ports Climate Initiative (WPCI) in 2010, the focus is on emissions within scope 1 and scope 2:

a) **Scope 1**- **Direct emissions** are emissions from sources that are owned or controlled by the company.

- Diesel and gasoline engines (kg CO2/liter).
  Fuel used by cargo handling equipment.
  Fuel used on road and non-road vehicles.
  Fuel used by harbor crafts (tugboat) within the port waters.
  Fuel used by stationary sources.

Fuel used by employee vehicles on the territory of GIFP.
Fuel used by resident companies within the GIFP territory.

- Burning of natural gas (kg CO2/m3)
  Natural gas used for heating buildings in GIFP's office park, including the residents' offices.

b) **Scope 2 - Indirect emissions** generated by production of purchased energy, calculated from meter electricity consumption.

- Consumption of electricity imported to GIFP (kg CO2/kWh).
  Electricity used by the pumps for the oil terminal auto loading facility.
  Electricity used for the office park, the workshop, outside lighting and railway facility pump.
  Electricity used for the terminal area including lighting.
  Electricity used by residents of GIFP.

III. CALCULATION OF GHG EMISSIONS

1. Activity-based approach

Danube Logistics has adopted an activity-based approach to calculate its greenhouse gas (GHG) emissions, which involves finding the total emissions for each type of fuel or energy used. To calculate diesel emissions, Danube Logistics records the amount of fuel consumed by each piece of equipment used at GIFP and measures the fuel supply to each piece of equipment using a meter installed on the pump of the bunkering truck. Danube Logistics uses calibrated and certified meters to measure the consumption of natural gas and electricity, enabling exact and reliable tracking of energy use at GIFP.

By relying on measured fuel and energy consumption data for more than 95% of emissions calculations, Danube Logistics ensures a high level of accuracy in its reporting. This approach enables Danube Logistics to identify areas of high emissions intensity and develop targeted measures to reduce the impact of its carbon footprint.

Through its commitment to accurate measurement and reporting of GHG emissions, Danube Logistics is taking proactive steps to promote sustainable business practices. By focusing on accurate measurement, Danube Logistics can develop effective strategies to minimize the environmental impact of its operations.

2. Selection of GHG emission factors

Selecting appropriate greenhouse gas (GHG) emission factors is a crucial step in accurately estimating and reporting GHG emissions. The emission factor represents the average emissions produced per unit of activity and can vary based on various factors, including location, technology, and fuel type.

To convert energy consumption quantities into GHG emissions, Danube Logistics multiplied the former by emission factors in line with national and international emission standards for the selected resource types. The emission factors used were specific to each energy source and facilitated the conversion of energy consumption quantities into corresponding GHG emissions. Table 1 shows the Emission factors used to calculate the Carbon Footprint.

Table 1. Emission factors

Item	Emission factors (EF)	Units	Source
EF diesel	**2.68**	kg CO2/ liter	Carbon Footprinting for ports' issued by the World Ports Climate Initiative (WPCI). Page. 63 Equation 5.17. https://sustainableworldports.org/wpcontent/uploads/Carbon Footprinting_Guidance_Docu ment.pdf
EF petrol	**2.31**	kg CO2/ liter	https://www.drivingtests.co.nz/resources/fuel-co2-calculator-carbon-dioxide-emissions-in-kg
EF natural gas	**1.87**	kg CO2/m³	Conversion Guidelines - Greenhouse gas emissions - https://www.eeagrants.gov.pt/media/2776/conversionguidelines.pdf
EF electricity	**0.521**	kg CO2/kWh	Electricity Emission Factors Review by EBRD review for countries https://www.ebrd.com/downloads/about/sustainability/cef.pdf

An emission factor is defined as the average emission rate of a pollutant (usually expressed in terms of mass per unit of activity, such as kilograms of CO2 per megawatt-hour for electricity generation). These factors provide a basis for estimating emissions when direct measurements are not feasible. They are essential for conducting greenhouse gas inventories, assessing air quality, and identifying opportunities for reducing emissions. The Emission Factor reflects the average emissions associated with specific level of activity.

IV. Danube Logistics CO2e emissions

In 2024, the total estimated GHG emissions from Danube Logistics activities at the Giurgiulești International Free Port site amounted to 1,253.5 t CO2e, a reduction of 22.9% compared to 2023 (Table 2). As in previous years, most emissions in 2024 come from Scope 1 - diesel and gas combustion (Table 3). Emissions from CH4 and N2O are negligible with a cumulative share of 0.4% of total CO2e emissions.

Table 2. Total estimated GHG emissions at Danube Logistics

CO2e in tonnes	Factor	2016	2017	2018	2019	2020 *	2021	2022	2023	2024
CO2	1	858.1	851.3	942.1	906.7	864.3	1,160.4	1,381.0	1,638.1	1,248.8
CH4	25	1.7	1.5	1.9	2.0	1.9	2.6	3.2	3.7	2.7
N2O	298	1.2	1.0	1.3	1.4	1.3	1.8	2.3	2.6	1.9
Total CO2e		**861.0**	**853.9**	**945.3**	**910.1**	**867.6**	**1,164.8**	**1,386.8**	**1,644.5**	**1,253.5**

* To ensure consistency, adjustments were made to the data for 2020.

Table 3. Share of CO2 Emissions by Scope

Scope	Danube Logistics CO2 emissions in tons	2024
Scope 1: Fuel and gas consumption	820.5	65,7%
Scope 2: Electricity consumption	428.3	34,3%
Total CO2	**1248.8**	**100%**

- Fuel consumption (scope 1)

Total fuel consumption reached 271,924 liters, leading to CO2 emissions of 805.5 tons. This marks a significant decrease of 24% compared to the previous year, primarily attributed to reduced fuel usage, particularly at the cargo terminal. This improvement is largely due to the implementation of an electrically powered mobile conveyor belt purchased by DL for grain loading. At the same time the procurement of new cargo handling equipment led to a slight increase of fuel consumption by 2.3%. Overall, fuel consumption accounted for 65.1% of total CO2 emissions in 2024 (see Figure 2).

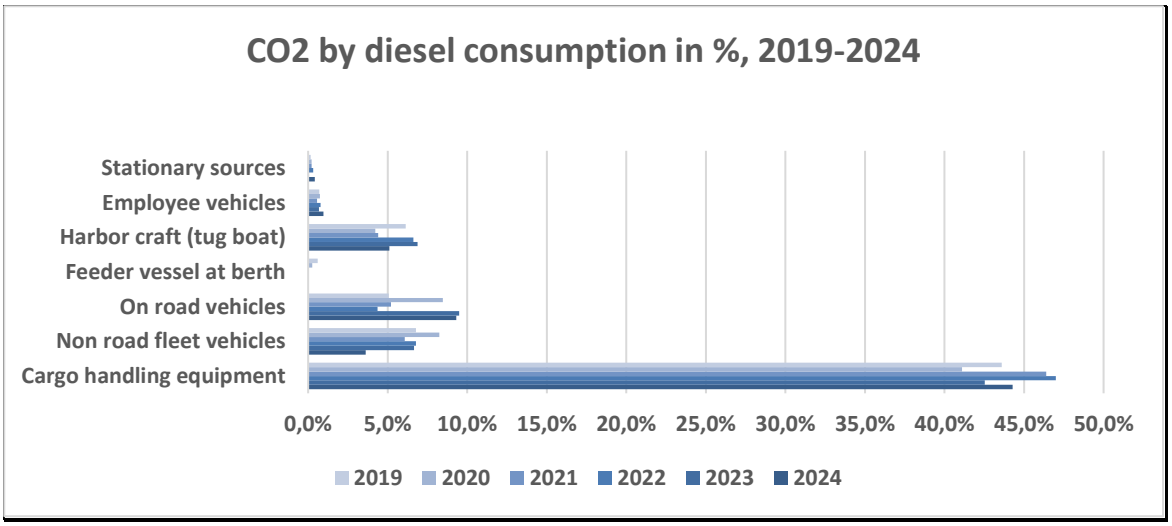

Figure 2. Share of diesel consumption of total CO2 emissions of Danube Logistics in 2019 - 2024

The fuel consumption of the vessels, including the tugboat operated by Danube Logistics to facilitate safe navigation, totaled 24,100 tons, accounting for 5.1% of the overall fuel consumption. Notably, this figure represents a substantial decrease of 42.6% compared to the previous year. It's important to recognize that fuel consumption for vessels can fluctuate annually due to various factors, including the number and size of vessels serviced in the port.

As in previous years, 98% of Scope 1 CO2 emissions were attributed to fuel consumption. The remaining 2% of Scope 1 emissions resulted from the use of natural gas for heating purposes within the port.

- Natural gas consumption (scope 1)

In 2024, the GIFP Business Park consumed 15.984 m^3 of natural gas for building heating, marking an 18.8% decrease compared to gas usage in 2023. Half of this consumption is consumed in offices of Danube Logistics while the other half is consumed by residents in rented offices. The total reduction is primarily attributed to the replacement of old gas heating systems with newer, more efficient models. Notably, the average winter temperature in 2023 was 4.7°C, and in 2024 it was 4.2°C., however the effect of lower average temperatures was overcompensated by the upgrade of the heating system.

- Electricity imported (scope 2)

In 2024, the electricity consumption reached 822.156 kWh, resulting in 428.3 tons of CO2 emissions. The decrease of 17.2% in electricity consumption compared to the previous year is mainly due to the reduction in truck loading activities at the oil terminal due to lower volume of fuel handling.

- CO2 emission indicator

In order to gain a better understanding of the impact of operational activities on CO2 emissions and to establish a benchmark for further GHG emissions, the following CO2 emissions indicator has been calculated (Table 4):

Table 4. CO2 Emissions indicator

CO2e indicator	2016	2017	2018	2019	2020 *	2021	2022	2023	2024
t CO2e	858.1	853.9	945.3	911.9	867.6	1,164.8	1,386.8	1,644.5	1,253.5
t DL transshipments	437.142	473.404	567.106	556.082	609.350	962.620	1,220.281	1,491.524	1,302.336
kg CO2e/ t transshipped	**1.97**	**1.80**	**1.67**	**1.70**	**1.42**	**1.21**	**1.14**	**1.10**	**0.96**

* The year 2020 has been adjusted to ensure consistency.

In 2024, Danube Logistics reduced its GHG emissions at the Giurgiulești International Free Port by 23.8%, totalling 1,253.5 t CO2e. The decrease was mainly due to reduced fuel consumption, particularly at the cargo terminal, following the procurement of several electrically powered conveyor belts and more fuel efficient handling equipment. Fuel consumption of cargo handling decreased by 22.8%, accounting for 64.5% of total emissions. Vessel fuel consumption also dropped by 42.6%.

The GIFP Business Park saw an 18.8% decrease in natural gas usage for heating, thanks to the replacement of old systems with more efficient ones. Electricity consumption (Scope 2) decreased by 17.2%, largely due to reduced truck loading activities.

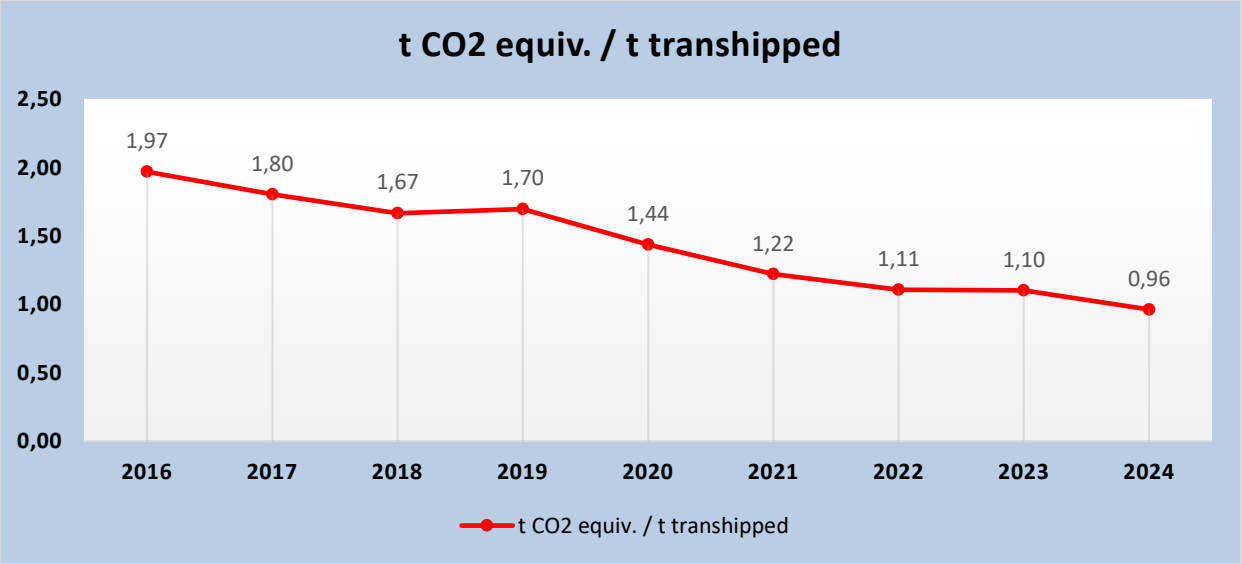

Figure 3. The trend of t CO_2e emissions per tonne of transshipped cargo

In consequence, the emissions indicator has shown a steady decrease from 1.9 kg CO2e per tonne of cargo handled in 2016 to 0.97 kg CO2e per tonne in 2024 (fig.4). The transshipments carried out by

Danube Logistics do not consider the transshipments of grain carried out by other terminal operators, the transshipments of vegetable oil or liquid fertilizer.

V. Port Residents CO2 emissions

As part of the broader analysis of the environmental impact of the entire port operations and in order to estimate the total carbon footprint of GIFP's activities, the carbon emissions generated by the residents located in PILG need to be included.

The aggregated CO2 emissions data for all the residents of the port area is presented below. The information is compiled without identifying individual residents, maintaining confidentiality and focusing solely on the collective impact.

Below is a summary of the CO2 footprint for all residents in the area, which encompasses various factors such as gas and energy consumption, fuel combustion for transportation, and other company activity related emissions. Specifically, electricity consumption data is based on the usage of 10 residents and fuel consumption is based on 6 residents. In order to maintain confidentiality, the information is presented in a manner that does not identify individual residents, focusing instead on the collective impact of the community as a whole.

In 2024, the total CO2e of GIFP third party residents amounted to 2,853.8 tons. Table 5 demonstrates that the major driver of CO2 emissions of the residents is the consumption of electricity which is dominated by the electricity consumption of the sunflower oil crushing plant.

Table 5. Share of CO2 Emissions of GIFP third party residents 2024

Scope	Resident's CO2 emissions in tons	Share in %
Scope 1: Fuel and gas consumption	**247.9**	**8.7%**
Scope 2: Electricity consumption	**2,604.5**	**91.3%**
Total CO2	**2,852.4**	**100 %**

Table 6. Conversion to CO2 Equivalents (CO2e) of the residents emissions**.**

CO2 equivalents	tons	factor	t CO2e
CO2	2.852,4	1	2.852,4
CH4	0,033	25	0,8
N2O	0,002	298	0,5
Total CO2e			**2.853,8**

VI. Total Giurgiulești International Free Port' Carbon Footprint

The following table summarizes the carbon emissions for both Danube Logistics and the residents in the GIFP port area for the year 2024:

Table 7. Total CO2 Emissions for GIFP: Scope 1 and Scope 2

	Danube Logistics	Residents	Total CO2 in GIFP
Scope 1: Fuel and gas consumption	820.5	247.9	**1,068.4**
Scope 2: Electricity consumption	428.3	2,604.5	**3,032.8**
Total CO2	**1,248.8**	**2,852.4**	**4,101.2**

Based on table 7, the carbon footprint of Danube Logistics comprises 30.4% of total CO2 emissions of GIFP. The relative high share of Danube Logistics of 76.8% of total fuel and gas consumption in the port is related to the use of large cargo handling equipment. In addition, it needs to be elaborated further whether all fuel consumers of the residents are included. On the other hand, the electricity consumption is heavily dominated by the residents mainly due to the production facility operated by one of the residents. In future, it makes sense to differentiate the fuel consumption between cargo handling and transportation and to differentiate electrical consumption for cargo handling and production activities.

Table 8 summarizes the greenhouse gas emissions in terms of carbon dioxide equivalents (CO2e) with a focus on three key gases: CO2, CH4 (methane), and N2O (nitrous oxide).

Table 8. Conversion to CO2 Equivalents (CO2e) of total GIFP area.

CO2 equivalents	tons	factor	t CO2e
CO2	4.102,6	1	4.102,6
CH4	0,142	25	3,6
N2O	0,008	298	2,5
Total CO2e			**4.108,7**

CO2 emissions dominate total CO2e emissions of 4,108.7 tons in GIFP with 99.8%.

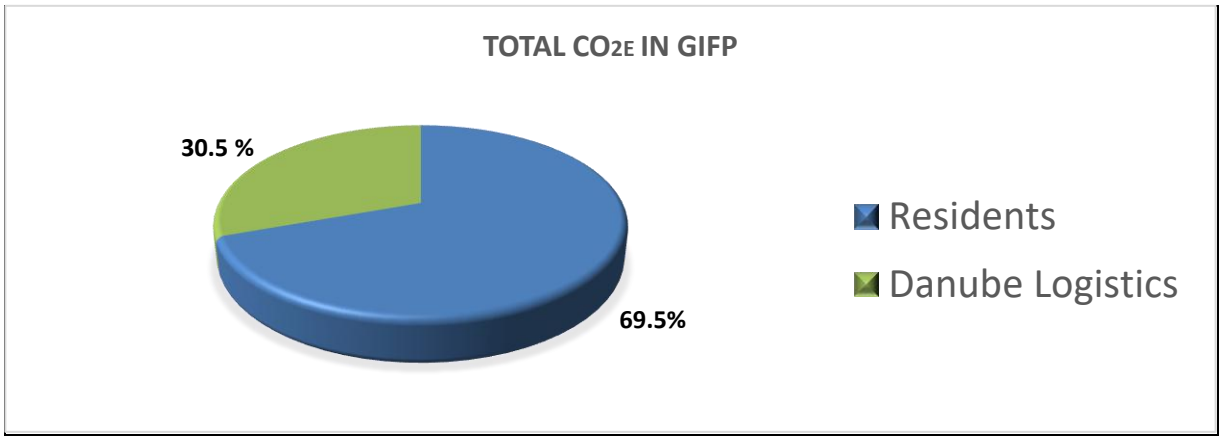

Figure 4. CO2e by GIFP residents

VII. CONCLUSIONS

Since 2016, Danube Logistics has proved its commitment to environmental protection by producing an annual carbon footprint report for its GIFP operations. Adherence to internationally recognized standards, such as the Greenhouse Gas (GHG) Protocol, ensures transparency and credibility in reporting.

The report shows a significant reduction of CO2e emissions for Danube Logistics activities at GIFP by 22.8% from 1,644.5 tons in 2023 to 1,253.5 tons in 2024. This decrease was achieved by procurement of energy efficient cargo handling equipment and the switch of grain cargo handling equipment from fuel-based handlers to electrical-powered high-capacity conveyor belts. Consequently, the CO2e per ton handled further decreased by 15% to 0.96 kg CO2e per handled ton.

In 2024, we attempted to include CO2e emissions from other resident companies of GIFP in order to estimate the carbon footprint of the entire port activities. The total CO2e for GIFP amounted to 4,108.7 tons including Danube Logistics and the residents. The main consumer is the vegetable oil crushing plant operated by one of the residents. For future reporting it will be necessary to differentiate CO2e emissions for main port activities cargo handling, internal transportation and production activities.

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