Giurgiulesti International Free Port

Report on Carbon Footprint 2017

Chisinau – Giurgiulesti
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DANUBE LOGISTICS

Contents

I. INTRODUCTION

Starting with 2016 ICS Danube Logistics SRL (Danube Logistics) has developed Carbon Footprint Reports for its operational activities at the premises of Giurgiulesti International Free Port (GIFP) on yearly basis. Danube Logistics administrates and operates GIFP, whereas certain activities in the port are conducted by other residents and tenants. In order to calculate the carbon footprint Danube Logistics follows both control based and activity based approaches. The present inventory refers to the period from 1 January - 31 December 2017.

The Carbon Footprint Report is prepared in accordance with the Greenhouse Gas (GHG) Protocol, which is most widely used as an international carbon calculation methodology and is compatible with other GHG standards, such as ISO 14064, which can be integrated in national and international greenhouse gas (GHG) registries.

The data analyzed relate mostly to the energy production and consumption both in stationary and non-stationary emission sources. The emission sources included in the carbon footprint refer to generated CO2 emissions, respectively to the emissions equivalent to CO2. Carbon dioxide (CO2), Methane (CH4) and Nitrous Oxide (N2O) are emitted during combustion of fossil fuels by port equipment and transport means used by Danube Logistics, as well as electricity consumption within port activities. Emissions from technical gases as by-product of combustion and so called F-gases emitted by cooling installations were neglected.

II. BOUNDARIES OF THE CO2 FOOTPRINTING

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

1. Organizational boundaries

Danube Logistics used the control approach for the purpose of consolidating and reporting GHG emissions, i.e. all emissions which the company can control and influence are considered. These are the activities conducted by the legal entity of Danube Logistics on the territory of Giurgiulesti International Free Port.

Thus the CO2 footprinting calculation does not include the tenant companies that carry on their operations at the premises of GIFP, as their activity cannot be influenced by Danube Logistics and access to the necessary information is not ensured.

2. Operational boundaries

The total territory of GIFP currently under development comprises 55 ha. The operational activities conducted within following areas are included in the scope of this report (fig.1):

- Dry bulk and container storage area, General Cargo and Container Terminal;
- Oil Terminal area including tank farm, auto loading facility and railway facility; Office park;
- Danube Logistics workshop;
- Infrastructure at GIFP premises including roads, parking areas;

Following areas are excluded:

- Grain Terminal with access to Danube and Prut rivers;
- Grain storage facilities;
- Vegetable oil storage;
- Business park areas leased by third parties;

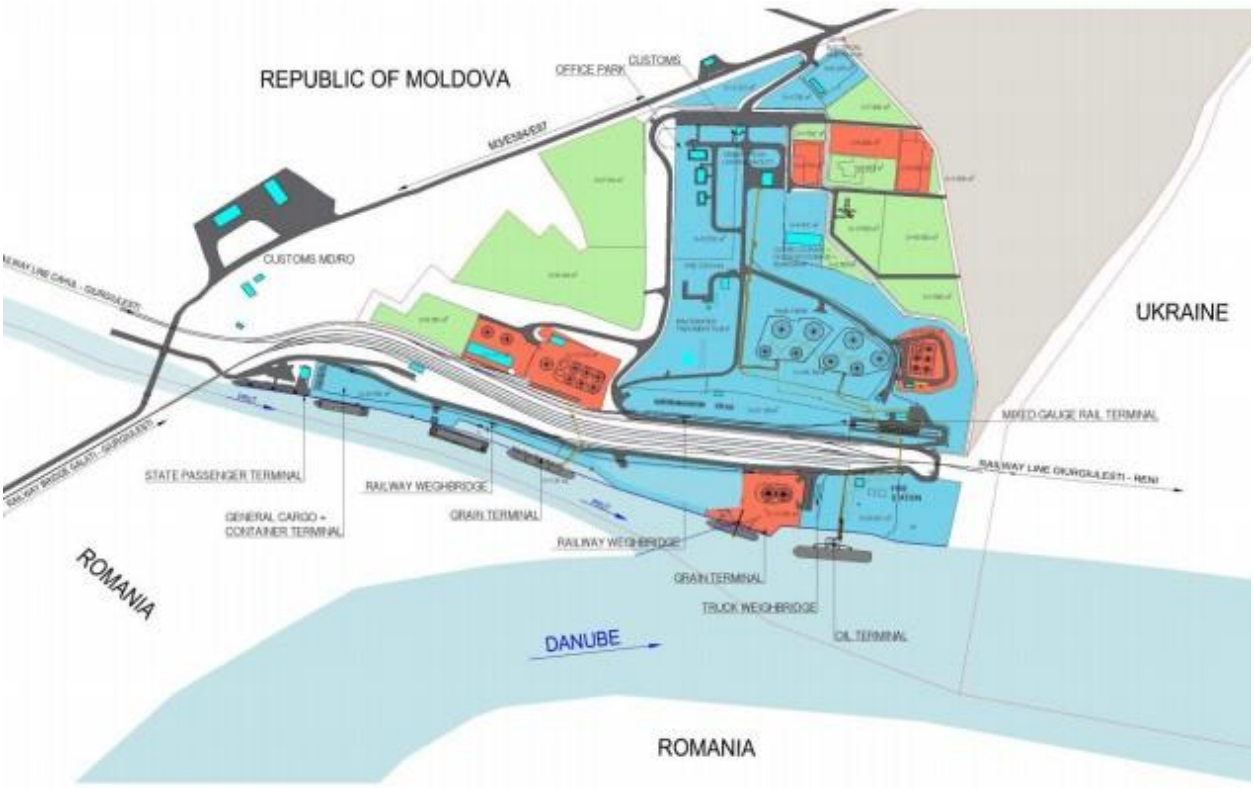

Figure 1. Port area that was taken into account for the calculation of CO2 emissions (shown in blue)

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

a) Direct emissions (scope 1)
   - Diesel and gasoline engines (kg CO2/liter);
     Fuel used by cargo handling equipment;
     Fuel used by on-road and non-road vehicles;
     Fuel used by harbor crafts (tug boat) and feeder vessel at the berth;
     Fuel used by stationary sources;
     Fuel used by employee vehicles on the territory of GIFP;

   - Burning of natural gas (kg CO2/m3)
     Natural gas used for heating within buildings and GIFP' Office Park;

b) Energy indirect emissions (scope 2)
   - Consumption of electricity imported to GIFP (kg CO2/kWh);
     Electricity used by oil jetty, dry bulk and general cargo and container terminal;
     Electricity used by oil terminal, office park and the warehouse owned by Danube Logistics;

III. CALCULATION OF GHG EMISSIONS

1. Activity-based approach

Danube Logistics applied an activity-based approach for the calculation of GHG emissions. The total GHG emissions are calculated through each type of fuel/energy used:

- The amount of natural gas and electricity consumption is measured using calibrated and certified meters.
- The amount of diesel is calculated by summing up the recorded amounts of fuel used by each piece of equipment used on the territory of GIFP. The supply of fuel for each piece of equipment is measured using a meter installed on the pump of the bunkering truck.

More than 95% of the data used for the calculation of emissions is based on real measurements of fuel and energy consumption reaching a high level of accuracy of the calculated emissions.

2. Selection of GHG emission factors

The energy consumption quantities were converted into GHG emissions by multiplying these figures with emission factors. The used emission factors comply with national and international standards of emissions for the selected types of resources. The emission factors are specific for each energy source and serve for the conversion of the quantities consumed by each energy source into GHG emissions. Table 1 shows the emission factors used for the calculation of the carbon footprint.

Table 1. Emission factors

ITEM	Emission factors (EF)	Units
EF diesel	2.68	kg CO2/litre
EF natural gas	1.87	kg CO2/m³
EF electricity	0.521	kg CO2/kWh

IV.RESULTS

In 2017 the total estimated GHG emissions at the premises of Giurgiulesti International Free Port of activities generated by Danube Logistics amount to 899.5 t CO2e increasing by 4.4% compared to 2016 (table 2). Most of the emissions result from diesel and gas combustion, however despite of increasing transshipment volumes the share of diesel and gas combustion of total GHG emissions decreased by 4.0% to 56.8% (table 3). Emissions from CH4 and N2O are negligible.

Table 2. Total estimated GHG emissions

CO2e in tons	Factor	2016	2017
CO2	1	858.1	896.7
CH4	25	1.7	1.7
N2O	298	1.2	1.1
Total CO2e		**861.0**	**899.5**

Table 3. Share of CO2 Emissions by Scope

Scope	CO2 emissions in tons	2017
Scope 1	509.1	56.8%
Scope 2	387.6	43.2%
Total CO2	**896.7**	**100%**

a) Diesel consumption (scope 1):

The total consumption of fuel amounts to 169,470 liters corresponding to CO2 emissions of 454.2 tons, which is 4.8% less than in the previous year. This decrease is mainly due to the extensive use of fuel for equipment used for construction activities in 2016. Just as in 2016 the major consumers of diesel are the mobile harbor crane and the reach stacker accounting for 82% of cargo handling equipment (fig. 2).

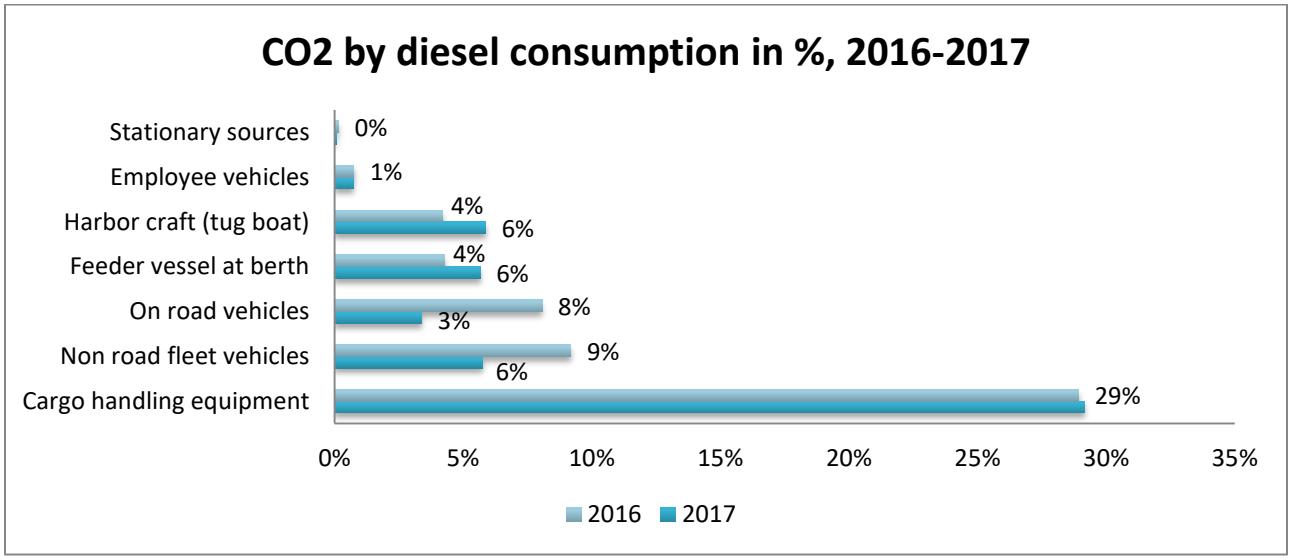

Figure 2. Share of CO2 emissions by diesel consumption of Danube Logistics in 2016- 2017

The fuel consumption of vessels considered in this report (scope 1) includes the tug boat chartered by Danube Logistics and used for navigation. Further Danube Logistics operates a regular container transportation service between GIFP and the port of Constanta. For the feeder vessel the fuel consumption during stationary time at the container terminal berth is considered.

89% of the CO2 emissions within scope 1 refer to the consumption of fuel, the remaining 11 % refers to the consumption of gas.

b) Natural gas consumption (scope 1)

The consumption of natural gas used for heating of the buildings within GIFP Business Park amounted to 29,234 m^3 in 2017 representing an increase of 22.6% comparing to the previous year. This increase results from extended heating due to a longer period with cold temperatures. The share of natural gas from all CO2 emissions amounted to 6%.

c) Electricity imported (scope 2)

Only the electricity used by the units owned and controlled by Danube Logistics was taken into consideration. In 2017 the electricity consumption reached 743,939 kWh corresponding to 387.6 tons of CO2 emissions. The increase by 15.3% compared to previous year is to a large extent the result of increased transshipment volumes in the oil terminal leading to increased pumping activities for loading of trucks and unloading and loading of railway wagons. .

d) CO2 emission indicator

In order to better understand the impact of operational activities on CO2 emissions and to establish a baseline for further GHG emissions a CO2 emission indicator was calculated (table 4).

Table 4. CO2 Emissions indicator

CO2e indicator	2016	2017	change
t CO2e	861.0	899.5	4.5%
t DL transshipments	437,142	473,404	8.3%
kg CO2e/ t transshipped	**2.0**	**1.9**	**-3.5%**

The indicated transshipments of Danube Logistics do not include the transshipments of grain conducted at the terminals of residents and the transshipment of vegetable oil but include the weight of cargo transported in containers. In 2017 the emissions amounted to 1.9 kg CO2e per 1 ton of cargo transshipped. The slightly increased efficiency is a result of finalizing intense construction activities in 2016 and a decrease of container transshipments in 2017.

V. CONCLUSIONS

The total estimated GHG emissions equivalent to CO2 emissions generated by Danube Logistics activities at the premises of Giurgiulesti International Free Port increased by 4.5% from 861.0 to 899.5 t CO2e. As relevant transshipment volumes increased by 8.3% the CO2e emissions per ton cargo transshipped slightly decreased. The analysis shows that on one hand the use of equipment and machines for construction activities had a large impact on CO2 emissions. On the other hand from an operational point of view naturally the transshipment of cargo in bulk generates significantly less emissions per ton as transshipment of cargo in containers.

As fossil fuel used for internal combustion engines is the major source of CO2 emissions the control and optimization of diesel use for port equipment is essential for both environmental and economic reasons.

For the future Danube Logistics will further refine the recordings in order to elaborate in more detail the relation between emissions and type of operational activity in the port.

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