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Development of an integrated strategy for reducing the carbon footprint in the food industry sector

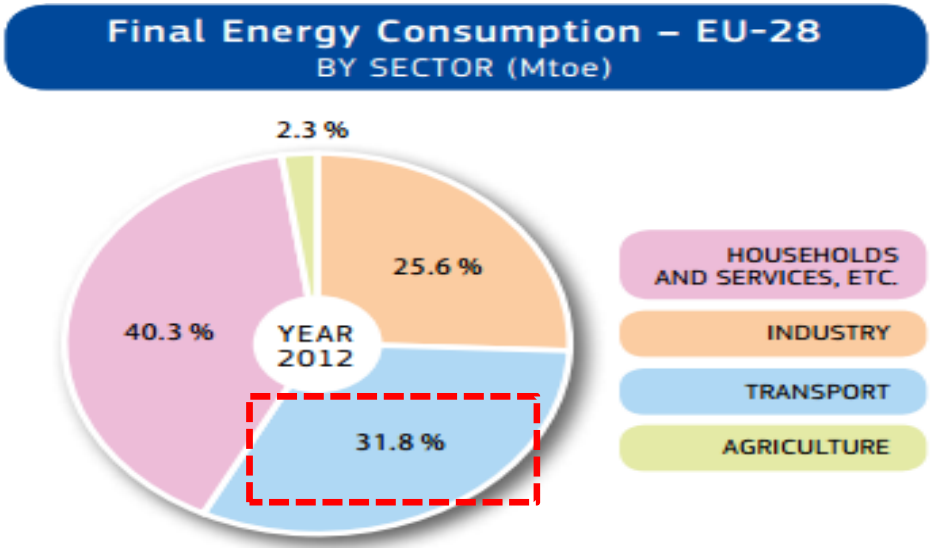
Sustainability and carbon footprint calculation in city logistics: The case of Kontzoglou Distribution Networks SA

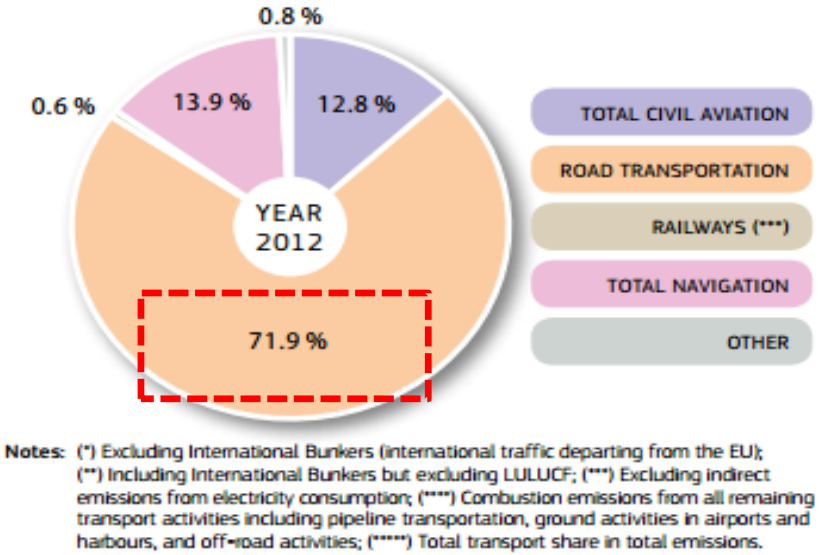
Vasileios Zeimpekis, Ph.D.
Managing Director
OPTILOG Advisory Services
vzeimp@optilog.gr

Agenda

- Carbon footprint in freight transport: Facts and figures
- Sustainable city logistics
- Methodologies and tools for calculating carbon footprint in freight transport operations
- Calculating carbon footprint in Kontzoglou Distribution Networks SA

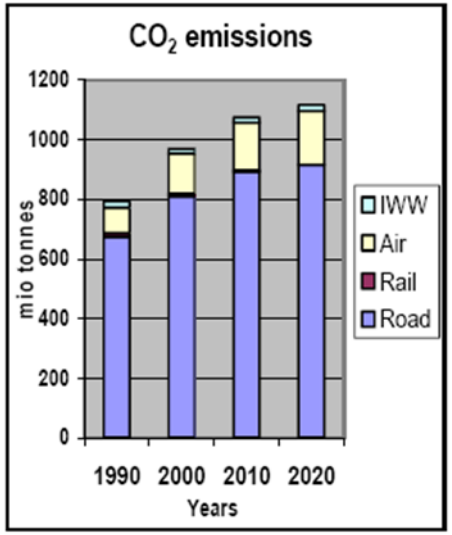
Carbon footprint in freight transport: Facts and figures





Notes: (*) Excluding International Bunkers (international traffic departing from the EU); (**) Including International Bunkers but excluding LULUCF; (***) Excluding indirect emissions from electricity consumption; (****) Combustion emissions from all remaining transport activities including pipeline transportation, ground activities in airports and harbours, and off-road activities; (*****) Total transport share in total emissions.

- 31.8% of the energy consumption in EU-28 comes from the transport sector
- 71.9% of the GHG emissions (from all transport modes) come from road transportation
- The carbon footprint will increase in the following years !



Source: European Commission, EU Transport in Figures, 2014

City logistics challenges

- Until 2020, 80% of the European population will live in cities
- Customers ask for less and more frequent deliveries
- E-commerce plays a significant role in the increase of city logistics operations (e.g. Home Delivery)
- EU asks for a reduction of CO_2 emissions of 60% that come from transport operations until 2050
- A significant number of EU cities have already implemented various green policies (e.g. Low Emission Zones, Tolls in city center, etc)

All the aforementioned requirements and constraints create a complex environment for city logistics operations and the need for actions towards sustainable urban mobility

Sustainable city logistics

- Reduction of traffic nuisance
- Less accident fatalities
- More friendly cities

- Less CO_2 emissions
- Noise reduction

- Transport pooling
- Synergies / Use of UCCs

Methodologies and tools for calculating carbon footprint in freight transport operations

Road	Road freight transport	-EN 16258 -EcoTransIT World -Carbon Footprint for Metro Group Logistics -Cenex -Bilan Carbone	-COPERT -LIPASTO -NTM -HBEFA -JEC Well-to-wheels analyses (WTW)	-ARTEMIS -Smartrans - Grønn godstransport (Green Freight Transport)
Rail	Rail freight transport	-EN 16258 -EcoTransIT World -Carbon Footprint for Metro Group Logistics	-Bilan Carbone -LIPASTO -NTM -ARTEMIS	-Smartrans - Grønn godstransport (Green Freight Transport)
Inland Waterways	IWW freight transport	-EN 16258 -EcoTransIT World	-Bilan Carbone -NTM	-ARTEMIS
Sea	Sea freight transport	-EN 16258 -EcoTransIT World -Carbon Footprint for Metro Group Logistics -Bilan Carbone	-LIPASTO -NTM -Clean Cargo Working Group (CCWG) -ARTEMIS	-Smartrans - Grønn godstransport (Green Freight Transport) -World Ports Climate Initiative (WPCI)
Ferry	Ferry transport	-EN 16258 -EcoTransIT World -Carbon Footprint for	Metro Group Logistics -Bilan Carbone -LIPASTO	-NTM -ARTEMIS
Air	Air freight transport	-EN 16258 -EcoTransIT World -Carbon Footprint for	Metro Group Logistics -Bilan Carbone -LIPASTO	-NTM

Source: *AUVINEN, Heidi; CLAUSEN, Uwe; DAVYDENKO, Igor; DE REE, Diederik; DIEKMANN, Daniel; EHRLER, Verena; LEWIS, Alan; TON, Jaurieke* (2013) "*Calculating Emissions Along Supply Chains – Towards the Development of a Harmonised Methodology" In the Proceeding of the 13th WCTR, July 15-18, 2013 – Rio de Janeiro, Brazil*

The EN 16258:2012 standard

- This European Standard establishes a common methodology for the calculation and declaration of energy consumption and greenhouse gas (GHG) emissions related to any transport service (of freight, passengers or both).

- EN 16258:2012 standard relies on an energy-based methodology (i.e. fuel consumption) for carbon footprint calculation

- Potential users of this standard are any person or organisation who needs to refer to a standardised methodology when communicating the results of the quantification of energy consumption and GHG emissions related to a transport service

Methodology for calculating carbon footprint

Step 1

Collection of primary data

Step 2

Carbon footprint calculation

Step 3

Recommendations for carbon footprint reduction

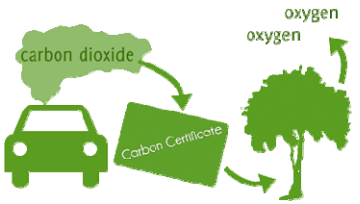
Phase A

Step 4

Recalculation of carbon footprint

Step 5

Carbon offsetting



Phase B

Indicative results from carbon footprint calculation (1/2)

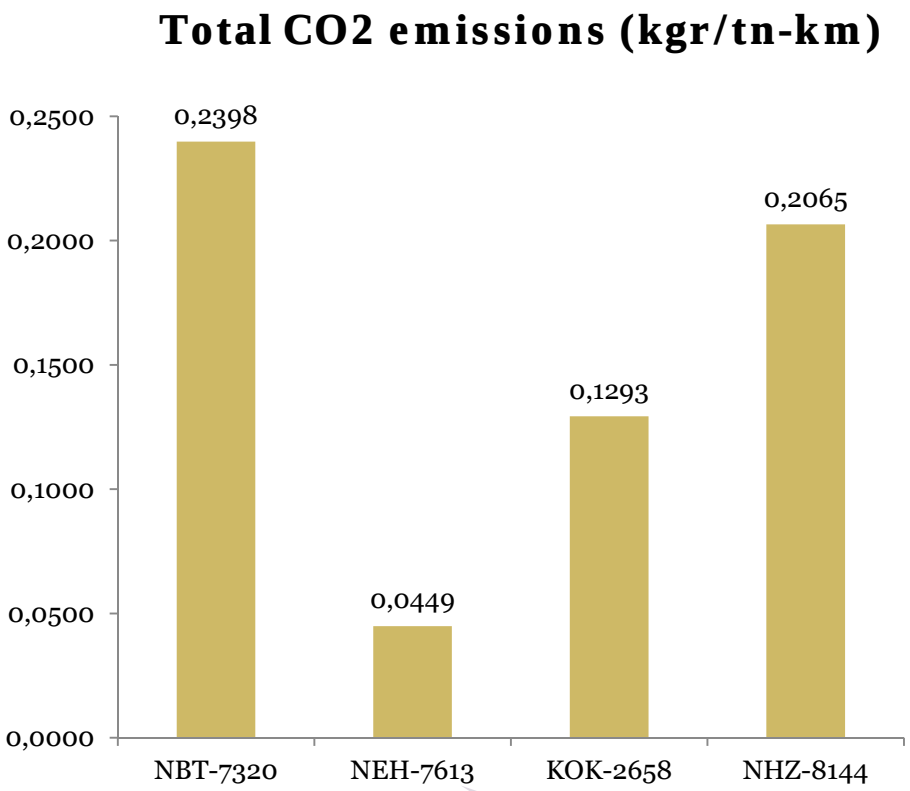
- **Area of delivery operations:** Thessaloniki
- **Primary data collection time**: 6 months
- **Number of trucks:** 4

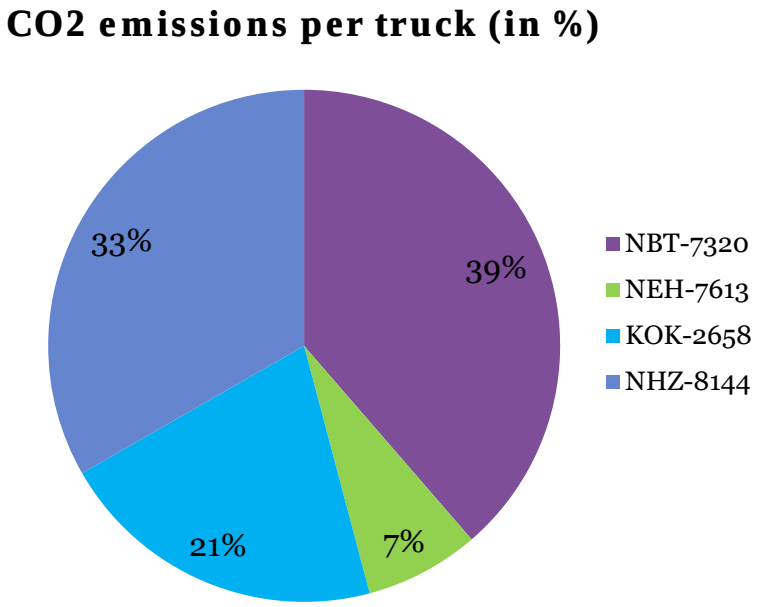
Truck ID	Load (Tn)	Distance traveled (Km)	Fuel consumption (lt)	Total CO_2 (Tn)	Emissions gr CO2/Tn-Km
Mercedes 510 NBT-7320	44.6	10544	1540.42	3.06	239.8
Mercedes 814 NEH-7613	263.0	13683	2473.16	3.90	44.9
Mercedes Daimler 413 KOK-2658	85.41	11478	1763.02	3.30	129.3
Mercedes Daimler 413 NHZ-8144	53.46	9297	1536.79	2.68	206.5
Total	**446.40**	**45002**	**7313.39**	**12.94**	-

Most efficient and environmental friendly truck !

Results from carbon footprint calculation (2/2)

- **Average CO2/tn-Km:** 155.1 gr CO2/tn-km

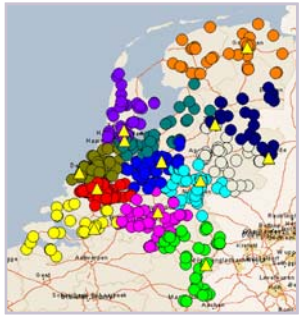




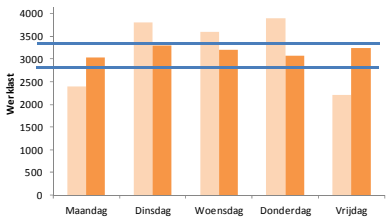
The most efficient and environmental friendly truck

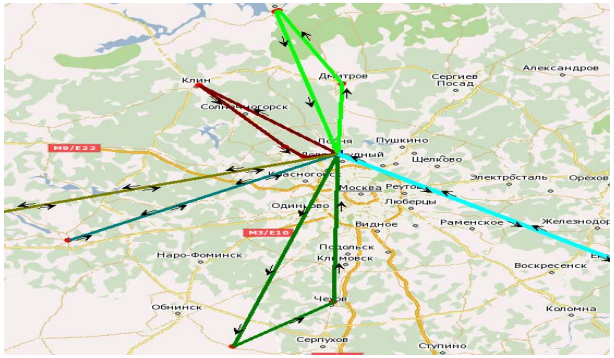
Recommendations for minimizing carbon footprint

- **In distribution management level**
  - Redesign of weekly delivery plan (per vehicle) - clustering
  - Vehicle routing via an intelligent vehicle routing system
  - More drop points per delivery trip



Schuit	Freq	Mo	Tu	We	Th	Fr	Sa
A	2	50%			50%		
B	2		45%			55%	
C	2			50%			50%
D	3	30%		30%		40%	
E	3		30%		40%		30%





- **In order fulfilment level**
  - Insert the policy of “Minimum order” (for certain customers)

- **In drivers’ level (soft skills)**
  - Eco Driving seminars

Carbon footprint offsetting via afforestation

Each tree offsets annually approximately 250 kg of CO_2

Main results and conclusions

- Increase of loading factor: **19%**
- Reduction of distances travelled: **28%**
- Reduction of CO_2 emissions: **35%**

12 % reduction of operational cost in 1 year !

Thank you very much for your attention !

Vasileios Zeimpekis, Ph.D.
Managing Director
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vzeimp@optilog.gr