



DEME

**Dredging, Environmental
& Marine Engineering**

Carbon footprint report 2018

For DEME activities in Belgium and the Netherlands;

in accordance with the CO₂ Performance ladder v3.0

in Ton CO₂



Table of Contents

LIST OF ABBREVIATIONS	3
1. INTRODUCTION	4
2. BASIC DATA	4
2.1 DESCRIPTION ORGANISATION.....	4
2.2 RESPONSIBILITY	4
2.3 BASE YEAR.....	4
2.4 REPORTING PERIOD	4
2.5 VERIFICATION.....	4
3. BOUNDARIES	5
3.1 OPERATIONAL BOUNDARIES	5
3.2.1 <i>Definition of operational control (GHG Protocol, ISO 14064-1)</i>	5
3.2.2 <i>DEME's operational control for Joint Operations</i>	5
3.2.3 <i>CO2 Performance ladder</i>	6
3. QUANTIFICATION METHODOLOGY	7
3.1 QUANTIFICATION METHODOLOGY	7
3.2 CHANGES IN QUANTIFICATION METHODOLOGY OR BASE YEAR	7
3.3 EXCLUSION OF CO2 EMISSION SOURCES	7
3.4 CO2 EMISSION FACTORS	8
3.5 CO ₂ SINKS & REMOVALS	8
3.6 COMBUSTION OF BIOMASS.....	8
3.7 ASSESSING AND REDUCING UNCERTAINTIES	8
4. CO2 SOURCES AND EMISSIONS	9
4.1 CO2 EMISSION SOURCES	9
4.2 CO2 EMISSIONS	9
4.2.1 <i>Company level</i>	9
4.2.2 <i>Project level</i>	11
5. ISO 14064-1 CROSS REFERENCE	12

LIST OF ABBREVIATIONS

CH ₄	Methane
CO	Carbon monoxide
CO ₂	Carbon dioxide
DBM	Deme Building Materials
DEFRA	UK Department for Environment, Food and Rural Affairs
DEME	Dredging, Environmental & Marine Engineering
EU	European Union
GHG	Greenhouse gas
HFC	Hydrofluorocarbons
HFO	Heavy Fuel Oil
IMO	International Marine Organization
MGO	Marine Gas Oil
N ₂ O	Nitrous oxide
NO _x	Nitrogen oxides
PFC	Perfluorocarbons
QHSE-S	Quality, Health, Safety, Environment & Security
SKAO	Stichting Klimaatvriendelijk Aanbesteden en Ondernemen
SO _x	Sulphur oxides
SF ₆	Sulphur hexafluoride
VOC	Volatile Organic Compound



1. INTRODUCTION

This report describes the DEME CO₂ emission inventory of 2017 for its activities in Belgium and the Netherlands which is prepared in accordance to the ISO 14064-1 standard, the requirements of CO₂ performance ladder (version 3.0) and the GHG protocol (Corporate accounting and reporting standard).

2. BASIC DATA

2.1 Description Organisation

DEME's group activities consist of following activities:

- a) Dredging and land reclamation
- b) Marine and offshore Solutions
- c) Environmental Solutions
- d) Infra Marine Solutions
- e) Fluvial and marine Resources
- f) Concessions

For a detailed insight in the group structure, reference is made to the DEME annual report and the DEME financial statements. DEME's headquarter is located in Zwijndrecht, Belgium.

2.2 Responsibility

The CO₂ emission inventory is compiled under the responsibility of the DEME QHSE-S Manager.

2.3 Base year

The base year of the CO₂ emission inventory of DEME spans from January the 1st of 2011 till December the 31st of 2011. The carbon footprint for 2011 has been restated because of new CO₂ conversion factors for electricity and natural gas. The recalculated carbon footprint for 2011 amounts 154.610 ton CO₂.

2.4 Reporting period

The CO₂ emission inventory described in this report spans from January the 1st of 2018 till December the 31st of 2018.

2.5 Verification

The CO₂ emission inventory of 2018 was not verified according to ISO 14064-1 by an external party.

3. BOUNDARIES

3.1 Operational boundaries

To define the operational boundaries, the carbon footprint is reported in different scopes:

- **Scope 1** contains all direct CO₂ emissions. Direct CO₂ emissions occur from sources that are owned or controlled by the company such as the consumption of fuel and natural gas.
- **Scope 2** accounts for CO₂ emissions from the consumption of purchased electricity by DEME. Scope 2 emissions physically occur at the facility where electricity is generated. The CO₂ performance ladder differs from ISO 14064 on the subject of scopes and adds business travel (i.e. business air travel, public transport and the use of private cars for business purposes) to scope 2, whereas ISO 14064 accounts business travel to scope 3.
- **Scope 3** is a reporting category that allows for the inventory of other indirect emissions. Scope 3 emissions are a consequence of the activities of the company, but occur from sources not owned or controlled by the company. DEME has identified its most material scope 3 emissions in accordance with the Corporate Value Chain Accounting and Reporting Standard and reports only its most material emissions occurring in Belgium and the Netherlands.

3.2 Organisational boundaries

3.2.1 Definition of operational control (GHG Protocol, ISO 14064-1)

The boundary determination is based on the GHG protocol method – operational control. A company has operational control over an operation if the company (or one of its subsidiaries) has the full authority to introduce and implement its operating policies at the operation.

Under the operational control approach, 100 % of scope 1 (direct emissions) and scope 2 company emissions from operations over which the company has operational control are accounted for.

3.2.2 DEME's operational control for Joint Operations

To eliminate double counting and allow cross verifications with the operational parameters of DEME's fleet under its control, joint operations (mainly joint venture projects) require a specific approach. A difference is made between emissions due to mutually operated equipment and emissions due to separate equipment.

If DEME has operational control over an entity; all the mutual emissions are taken up into DEME's carbon footprint, in addition to the emissions from DEME equipment used. If DEME has no operational control only emissions from DEME equipment are taken up in the DEME inventory.

3.2.3 CO₂ Performance ladder

The companies included in the certification process are as following:

- Dredging International NV (BE)
- Baggerwerken Decloedt en Zoon NV (BE)
- DEME Infra Marine Contractors NV (BE)
 - DEME Infra Marine Contractors BV (NL)
- DEME Blue Energy NV (BE)
- DEME Building Materials NV (BE)
 - DEME Building Materials BV (NL)
 - Paes Maritiem BV (NL)
- DEME Environmental Contractors NV (BE)
- De Vries & Van de Wiel Beheer BV (NL)
 - Aannemingsmaatschappij De Vries & van de Wiel BV
 - De Vries & van de Wiel Kust & Oeverwerken BV
 - Milieutechniek De Vries & van de Wiel BV
 - Zandexploitatie Maatschappij De Vries & van de Wiel BV
- Geosea NV (BE)
 - EverSea NV (BE)
 - GeoSea Maintenance NV (BE)



3. QUANTIFICATION METHODOLOGY

3.1 Quantification methodology

The identification of CO₂ sources provides the basis for the quantification of carbon dioxide. Multiplying the data from the emission sources each with their relevant CO₂ emission factor results in the carbon footprint (in T CO₂).

3.2 Changes in quantification methodology or base year

The emission inventory or base year will only be recalculated in case of changes to operational boundaries or fixed emissions factors.

No changes required for the base year for 2011 because no new CO₂ conversion factors were published in 2018.

3.3 Exclusion of CO₂ emission sources

According to ISO 14064-1; direct or indirect CO₂ sources that are immaterial or whose quantification would not be technically feasible or cost effective, are excluded from quantification.

The following CO₂ sources were excluded from the DEME carbon footprint.

a) Cutting & welding gases

Gases such as acetylene and oxygen are occasionally used on worksites and on ships for cutting and welding purposes when repairing equipment. The research on the significance of cutting and welding gases indicates that the data collection would not be proportional with the significance in the carbon footprint report at this time.

b) Lubricants

Various sorts of lubricants are used in normal conditions i.e. to protect internal combustion engines and reduce friction between moving surfaces. Waste oil is processed according to IMO MARPOL requirements. Lubricants are not included in the CO₂ emission inventory at this time.

c) Air conditioning refrigerants

The leakage of air conditioning gases is minimal and is therefore excluded from the carbon footprint.

d) Train travel

The CO₂ emissions originating from train travel are immaterial and are therefore excluded from the carbon footprint.



3.4 CO₂ emission factors

The CO₂ Performance ladder utilises (total direct & indirect i.e. incl. extraction, refinery and transport) CO₂ emission factors, specifically determined for the Dutch market. To meet with the needs of the intended users the CO₂ emissions factors as mentioned in the ladder manual version 3.0 were used. All CO₂ emission factors are available on www.CO2emissiefactoren.nl.

3.5 CO₂ sinks & removals

Not applicable

3.6 Combustion of biomass

Not applicable

3.7 Assessing and reducing uncertainties

The qualitative influences of uncertainty on the DEME GHG emission inventory (or in this case CO₂ - carbon footprint) for 2016 are the following:

- (1) Source data consists of invoices and delivery records. If the source data on purchased quantities is not available, actual or estimated energy consumption data is used. Estimations are always conservative. It may occur that fuel supply to third (non-DEME) equipment is not separately registered when the fuel is included in the invoice/delivery record of the DEME equipment or DEME project reported figure.
- (2) Vessels in co-ownership are considered as subcontracted, however accounted for in scope 1 when their consumption could not be separately identified.
- (3) Energy supplied to third equipment is not registered separately when shared fuel tanks are used on site.
- (4) The quantity of gas consumed is reported in GCV (higher or gross calorific value), not NCV (lower or net calorific value).
- (5) For each flight, the total of air miles is provided by the travel agency.
- (6) The fuel consumption of cars is based on the data provided by the fuel supplier (invoices). Here, all invoices from the fuel supplier are taken into account (i.e. including use of the car for private purposes).
- (7) The use of private cars for business purposes is compiled from the reimbursed expenses for employees.
- (8) The fuel consumption for the ships of DEME Building Materials includes the total energy consumption of all their activities throughout Europe.

Were possible, data is cross-checked with energy consumption estimates based on activity to reduce errors, omissions and double accounting.



4. CO₂ SOURCES AND EMISSIONS

4.1 CO₂ emission sources

The following CO₂ sources can be identified:

a) **Marine operations:**

Main production vessels (Trailer Suction Hopper Dredgers, Cutter Suction Dredgers, Backhoe Dredgers...) and auxiliary vessels (tugs, crew boats, launches ...) use Marine Gas Oil (MGO) or Heavy fuel Oil (HFO).

b) **Land-based operations:**

Dry equipment (such as fix installations, utility vehicles, and generators) can use diesel, petrol, electricity and natural gas.

c) **Office equipment:**

Office related energy consumption: e.g. office heating diesel, electricity and natural gas.

d) **Various:**

Business related activities such as business air travel, use of business cars and personal cars.

4.2 CO₂ emissions

4.2.1 Company level

The carbon footprint consist of scope 1 and 2 emissions. The energy consumed by DEME in 2018 within Belgium and the Netherlands, including head office related emissions such as electricity use, lease cars and business air travel, is equivalent to **134.531Ton CO₂**. Most of the CO₂ emissions are due to fuel consumption, at the core of DEME's equipment and activities, therefore attributable to its largest share of emissions. An overview of the CO₂ emissions is given in table 1.

42,8% of the scope 1,2 emissions can be contributed to dredging and land reclamation, 35% to fluvial activities, 6,5% to environmental services, 6% to marine and offshore activities, 0,2% to Infra Marine works and 9,5% to overhead (head office related energy use & business travel). An overview is given in figure 1.

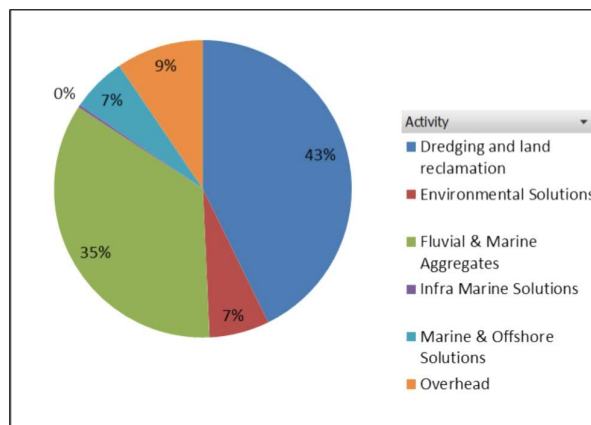


Figure 1: Overview carbon footprint 2018 per activity



Overview DEME CO₂ emissions:

Emission category	tons CO ₂	% of total
Scope 1	130.487	97%
Marine Operations		
MGO	112.423	
Land-based Operations		
Diesel off road	10.758	
Business Cars		
Diesel cars	4.995	
Unleaded cars	626	
Office		
Diesel for heating ⁽¹⁾	1.237	
Natural gas	240	
Scope 2	4.044	3%
Site		
Electricity	1.321	
Office		
Electricity ⁽¹⁾	1.429	
Business travel		
Air Travel ⁽²⁾	1.117	
Km reimbursements private cars	177	
Grand Total	134.531	100%

Table 1: Overview carbon footprint 2017 per emission source

Note:

(1) The total DEME head office related emissions are taken into account.

(2) Only air travel from project people working on projects in Belgium or the Netherlands.



4.2.2 Project level

The CO₂ emission figures for the DEME projects with CO₂ related award advantage for 2018 are published on the [DEME website](#).

Project budget nb.	Project description	Status project
5589	Land make middle island Ijburg	New project in 2018
5264	Maintenance dredging of rivers NL	On-going
5311	Renovation of weir and lock complex in Nederrijn /Lek	On-going
5547 5548	Blankenburgverbinding	New project since last reporting,
5447 5453	Rijnlandroute	On-going
5509 5512 5513	Lock Terneuzen	On-going



5. ISO 14064-1 CROSS REFERENCE

Aspect in ISO 14064-1 § 7.3	Description	Section in GHG inventory
a	Description organisation	2.1
b	Persons responsible	2.2
c	Period covered	2.4
d	Organisational boundaries	3.2
e	Scope 1 emissions	4.2
f	Combustion of biomass	3.6
g	GHG removal	3.5
h	Exclusion of GHG sources	3.3
i	Scope 2 emissions	4.2
j	Base year	2.3
k	Base year changes	3.2
l	Quantification methodology	3.1
m	Changes in quantification methodology	3.2
n	GHG emission factors used	3.4
o	Uncertainties in accuracy	3.7
p	ISO 14064 statement	1.
q	Verification statement	2.5

Table 2: ISO 14064-1 cross reference