GREENHOUSE GAS EMISSIONS REPORT

RENAULT TRUCKS SAS

Reporting year: 2014
Reference year: 2011

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GREENHOUSE GAS EMISSIONS REPORT

In accordance with article 75 of law No. 2010-788 of 12 July 2010 on the national commitment to the environment (ENE)

1 Legal context

Article 75 of Law No. 2010-788 of 12 July 2010 on the national commitment to the environment (ENE) creates a new section in Chapter IX of Title II of Part II of the Environmental code under the title "Greenhouse gas emissions report and territorial climate-energy plan" (Bilan des émissions de gaz à effet de serre et plan climat-énergie territorial).

Article 75 is a reflection of the two commitments based on the Grenelle Law on the environment:

- Firstly, Commitment No. 51 lays down the principle of the **widespread use of greenhouse gas emission audits**. Greenhouse gas emissions reports are intended to diagnose the greenhouse gas emissions of public and private parties, with the aim of identifying and deploying means of reducing these emissions.
- Secondly, Commitment No. 50 lays down the principle of the widespread use of territorial climate-energy plans. The widespread use of these plans is implemented in parallel with the creation of the regional climate, air and energy schemes defined in Article 68 of the law of 12 July 2010, and which will serve as a strategic framework and assistance tool for the preparation of territorial climate-energy plans.

The greenhouse gas emissions report is made public and updated every 3 years. This report is mandatory for legal entities operating under private law and employing over 500 people in mainland France or over 250 people in overseas regions and departments.

The report must be transmitted electronically to the prefect for the region within whose scope the legal entity has its registered office or its main site before this date. The report focuses on the activities of the legal entity subject to tax on French territory.
A first report was transmitted in 2012; this document is the update required before 31 December 2015.

2 Identification of the legal entity

The legal entity is RENAULT TRUCKS SAS.

Company name: RENAULT TRUCKS SAS

NAF code: 2910Z

SIREN code: 954 506 077

Address: 99 route de Lyon, 69806 Saint-Priest Cedex

Workforce: 7696 employees

President: Olivier VIDAL de la BLACHE

Person responsible for follow-up: Sandrine THOMAS, Centre of Expertise for the Environment France

Consolidation mode: operational control

The following SIRET numbers are associated with the legal entity:

- ✓ BOURG-EN-BRESSE: SIRET 954 506 077 00377
- ✓ BLAINVILLE-SUR-ORNE: SIRET 954 506 077 00559
- ✓ LIMOGES Remanufacturing: SIRET 954 506.077.01201
- ✓ SAINT-PRIEST: SIRET 954 506 077 00120
- ✓ Saint-Priest AXLE plant: SIRET 954 506 077 01029

Address of website where the greenhouse gas emissions report can be accessed: http://corporate.renault-trucks.com/en/environnement/

RENAULT TRUCKS is a French company which develops, assembles and sells heavy and light commercial vehicles. The company also provides services relating to vehicles and transport (assistance, maintenance, fleet management tools, etc.). It has been part of the Volvo group since 2001. The company operates five sites located in France:

- **Lyon site** – 5,238[1] employees - It is based:
  - partly at Vénissieux, an industrial assembly site for two families of engines, 5- and 8-litre engines and 9- and 11-litre engines, a stamping plant and a spare parts store, and support services such as computer support, purchasing and real estate management;
  - partly at Saint-Priest, an administrative site with sales divisions, R&D and support functions such as finance, human resources, etc. The Vénissieux factory was constructed in 1915 and the Saint-Priest site dates back to the 1970s. The total surface area of the site is about 140 hectares, with approximately 100 buildings. Detailed breakdown:

  - **Entities supported** – 2,169 employees - The supported Entities consist of tertiary premises distributed across Saint-Priest and Vénissieux, in other words all the divisions and departments required for the operation of the site (technical, catering, medical, human resources, accounting, computing, maintenance, purchasing, etc.). They also include the offices in Paris XVI (commercial)

  - **Distribution Center Lyon (DC Lyon)** - Workforce: 560 employees - Receiving, storage, order preparation and dispatch of spare parts and consumables for the maintenance of commercial vehicles: stores and offices.

  - **Engine plant (UM)** - 607 employees - Machining and assembly of engines for commercial vehicles, industrial applications, marine applications, public construction works and the preparation of gearboxes (hub).

  - **Group Trucks Technology GTT** – 1,750 employees - Research and development for the group: Test workshops and Offices with departments, after-sales support. This entity also includes the Valbonne site in Ain (vehicle test tracks)

[1] Personnel numbers include workers on permanent, fixed-term and temporary contracts.

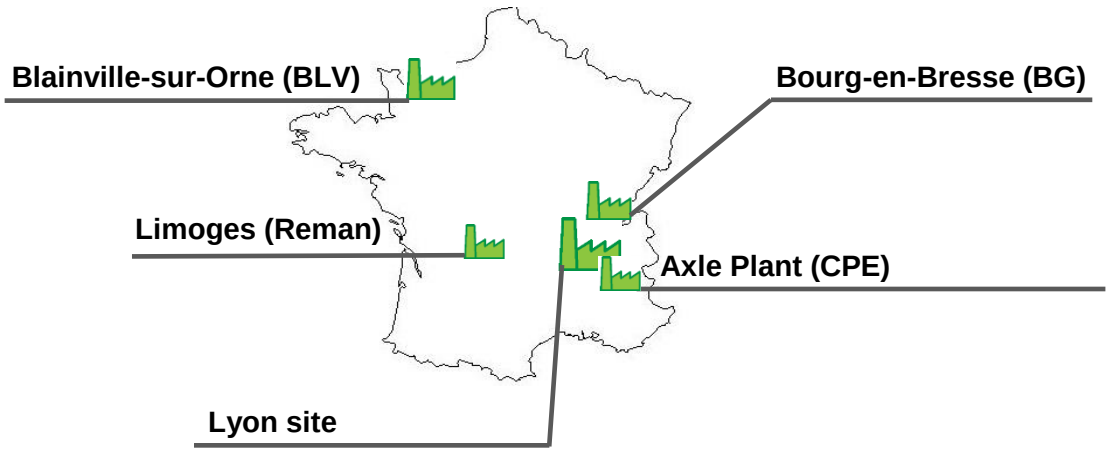
- **Stamping plant** - 152 employees - This centre develops and produces stamped metal parts for the cabs and chassis assembled in the commercial vehicle bodywork assembly plants. It also produces welded sub-assemblies.

- **Axle Plant (CPE)** at Saint Priest - 343 employees - Mounting and assembly of components on axles and drive axles. Painting of these components prior to dispatch to commercial vehicle assembly plants.

- **Bourg-en-Bresse site (BG)** - Workforce: 1,707 employees - The Bourg-en-Bresse site is an assembly and finishing site for commercial vehicles (heavy ranges)

- **Volvo Remanufacturing site at Limoges (Reman)** - Workforce: 140 employees – The site manages the service exchange activity. It specialises in the renovation of mechanical components: engines, gearboxes, sub-assemblies, heavy commercial vehicles and light commercial vehicles.

- **Blainville-sur-Orne site (BLV)** - Workforce: 1,796 employees - The Blainville-sur-Orne site produces cabs for heavy commercial vehicles, mechanical components and wiring harnesses, and assembles medium range vehicles. It is located across the municipalities of Blainville-sur-Orne, Colombelles and Hérouville-Saint-Clair.



Supported entities / GTT Lyon / Stamping / Engine plant / R&D / DC Lyon / Real Estate / Tertiary

The regulatory greenhouse gas emissions report (GHG report) therefore covers all RENAULT TRUCKS SAS activities over one reference year. The reporting year is 2014 and the reference year is still 2011, so the GHG report exclusively covers activities for the year 2014.

To obtain the GHG report for RENAULT TRUCKS SAS, it was decided to produce a GHG report for each individual entity. The RENAULT TRUCKS GHG Report is thus a compilation of the GHG Reports for the various entities within the company.

Greenhouse gas emissions were quantified using a data collection file for each entity plus emission factors from the ADEME Carbon Database (ADEME: French environment and energy management

agency), using version 3d of the Method for compiling greenhouse gas emission reports (September 2015) issued by the Ministry of Ecology, Sustainable Development, and Energy.

The Renault Trucks SAS Centre of Expertise for the Environment in France organised and approved the different phases of the project for this purpose. When launching the project, the individuals assigned to the greenhouse gas emissions report for each entity were appointed.

In addition to the GHG report for each of the entities, compilations were produced for the Lyon site and for the Blainville site comprising seven centres.

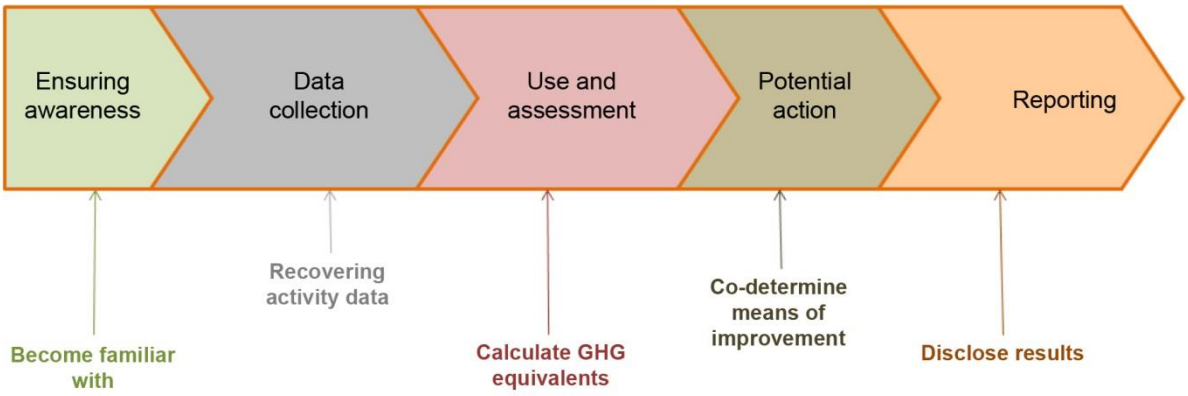
To ensure the continuing availability of the GHG report, a collaborative space has been reserved in a Team Place[2]. This space contains a set of documents such as the various CO_2 reports or regulations and access to the various spreadsheets used to calculate greenhouse gas emissions and action plans.

3 Changes in the company between 2011 and 2014

Between 2011 and 2014, the scope of the study has not changed (no new sites and no sites removed). The nature of the activities and operations has not changed. Notable changes affecting the results of the GHG report relate to the downward trend in the number of employees and production.

4 Key stages

The regulatory environment prompted RENAULT TRUCKS SAS to produce a Greenhouse Gas Emissions Report (GHG report). To produce the GHG report and the associated action plan, the following main principles are described below:



1. **Site management awareness** defined the context of the study, targets and the role of each player.

2. **Data collection** led to the finalisation of the scope of the study; i.e. all the flows taken into account to produce a GHG report meeting the regulatory requirements.

3. The **Use and assessment** phase is the stage where activity data are converted into CO_2 equivalents (referred to below as CO_2e).

4. After GHG diagnostics, working sessions were organised in order to identify the **Potential action** to reduce the CO_2 footprint of activities per topic. Priorities were decided and actions were costed.

[2] https://teamplace.volvo.com/sites/rt-Environment/GHGassessment (internal tool with access authorisation)

5. Finally, in the last stage, the action plan was presented to and approved by the Executive or Works Committee. The **Reporting** phase led to the drafting of the action plan to be submitted to the Prefecture and an internal action plan based on the proposals made in the previous phase.

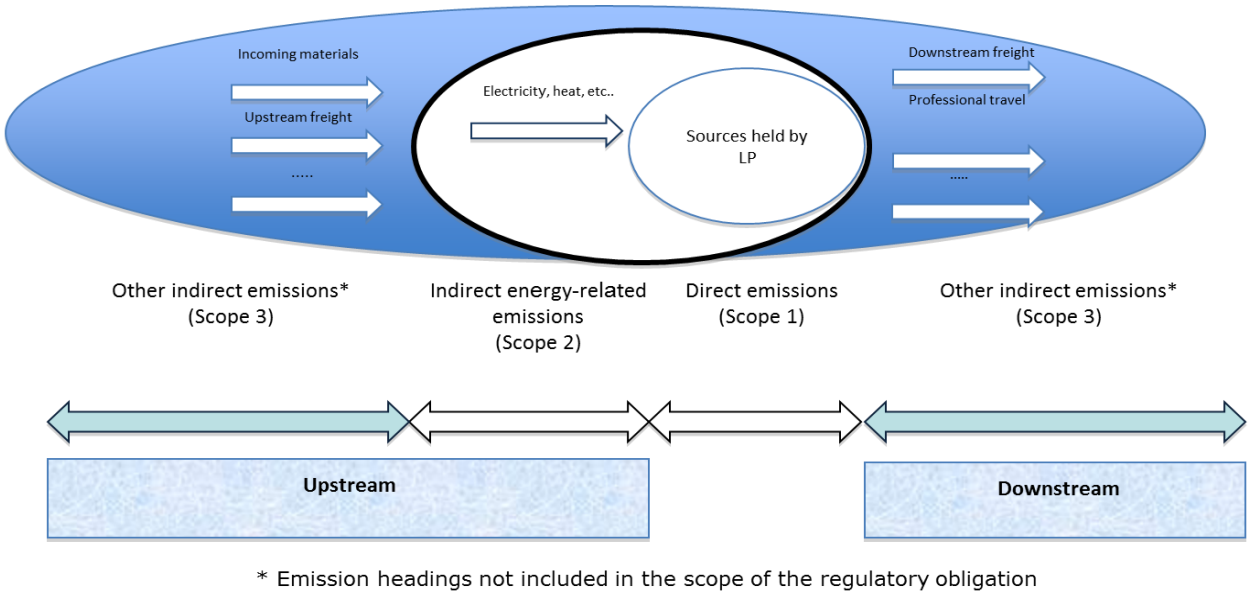
5 Definition of selected GHG emissions headings

As highlighted in the method description, the legal entity must specify **whether the selected auditing method is "financial[3]" or "operational[4]"**. Renault Trucks decided to opt for an operational auditing method since the company prefers to use all means of reducing CO2 in line with current environmental management systems on sites with ISO 14001 certification.

In order to determine GHG emissions, the sources must be identified. The method used to produce greenhouse gas emission reports in accordance with article 75 of law No. 2010-788 of 12 July 2010 on the national commitment to the environment (ENE) separates:

- Direct emissions, produced by the fixed and mobile sources required for the activities of the legal entity;
- Indirect emissions associated with the use of electricity, heat or steam, as required for the activities of the legal entity;
- A third category of emissions exists, which is all other indirect emissions produced in the activities of the legal entity. <u>This latter category is not subject to regulatory requirements, but application is recommended.</u>

By way of illustration, the diagram below shows these different scopes[5]:



* Emission headings not included in the scope of the regulatory obligation

[3] the organisation consolidates 100% of the emissions of the installations for which it provides financial control

[4] the organisation consolidates 100% of the emissions of the installations for which it provides operational control (i.e. which it operates)

[5] This diagram is based on ISO-TR 14069: Guidance for the application of standard ISO 14064-1 WD3, March 2011.

The work carried out relates to SCOPE 1 and SCOPE 2, i.e. the mandatory scope for all sites. The table below lists the sources of emissions according to the headings mentioned in the regulatory Greenhouse Gas Emissions Report:

Category	Heading		Sources
GHG direct emissions (Scope 1)	1	Direct emissions from fixed sources of combustion	Natural gas for the heating of industrial and tertiary buildings Natural gas for industrial tools Fuel oil for mobile heating devices
	2	Direct emissions from mobile sources with combustion engines	Petrol/Diesel for company cars (service, sales and incentive vehicles) or owned trucks. Diesel for testing industrial vehicles and engines LPG for handling machinery (forklift trucks) Fuel oil and petrol for various combustion engines
	3	Direct emissions from non-energy processes	Burnt VOC Acetylene burned by welding stations and other sources generating CO_2 in their processes (e.g. argon/CO_2 welding shielding gas)
	4	Direct fugitive emissions	SF6 for High-voltage electrical substations Refrigerant gas leaks in comfort air conditioning systems
	5	Biomass emissions (soils and forests)	None
Indirect emissions associated with energy (Scope 2)	6	Indirect emissions from the use of electricity	Electricity for various specific uses
	7	Indirect emissions from the use of steam, heat or cold	None

The table below summarises the sources of the data with their units.

Category	Sources		Source of data/unit
GHG direct emissions	1	Natural gas for the heating of industrial and tertiary buildings	Fluid meter/kWh
		Natural gas for industrial tools	Fluid meter/kWh
		Fuel oil for mobile heating devices	Fluid purchased/litres
	2	Petrol/Diesel for company cars	Fluid purchased/litres
		Diesel for testing industrial vehicles	Fluid purchased/litres
		LPG for handling machinery (forklift trucks)	Fluid purchased/litres
		Fuel oil and petrol for various combustion engines	Fluid purchased/litres
	3	Burnt VOC	/kg
		Acetylene burned by welding stations	Purchasing of bottles of acetylene[6]/m^3
	4	SF6 for High-voltage electrical substations	Maintenance and Surveillance plan/kg
		Refrigerant gas leaks in comfort air conditioning systems	Maintenance and Surveillance plan/kg
	5	None	/
Indirect emissions associated with energy	6	Electricity for various specific uses	Fluid meter/kWh
	7	None	/

In most cases, GHG emissions from any given action cannot be measured directly. The only way to estimate these emissions is therefore to calculate them on the basis of physical data for the activity:

[6] Acetylene is supplied in bottles and measured in m3. We use the value of 1.1 kg/m3 to convert bottle volumes into mass.

energy consumption in kWh, road traffic data with number of vehicles and distances driven, number of tons of materials purchased, etc.

The tool used is an internal tool (based on the ADEME Carbon Database method designed to collect the data and calculate the emissions based on carbon database factors.

Activity data (kWh,…) **X** Emission factor **=** GHG emission (tCO2e)

Emission factors, prepared using various scientific and technical sources, can therefore be used to determine the total quantity of GHGs emitted by human and physical flows. Their GWP (Global Warming Potential) can be used to identify their CO_2 equivalent. For this reason, it is important to remember that the GHG report will provide **approximate values** for GHG emissions, with a view to reaching practical conclusions. We must therefore take into account uncertainties regarding the emission factor and also the data itself.

Note that the impact on global warming of one kilogram of GHG in the atmosphere depends on the type of gas, the temperature, how long it remains in the atmosphere and/or its concentration. All these factors will affect "the impact on the climate" of any given GHG gas.

By convention, and in order to ensure consistent results, we compare "the impact on the climate" of one kilogram of GHG with one kilogram of CO_2 over a period of 100 years; this is the definition of the Global Warming Potential (or GWP). Thus the GWP of CO_2 is defined to be 1, and the higher the GWP of a GHG, the greater the additional greenhouse effect caused by the release of one kilogram of this gas into the atmosphere.

This approach allows us to compare GHGs and to use a common unit, the CO_2 equivalent (CO_2e). This unit will be used throughout the document.

Gas	Formula	GWP[7] relative to the GWP of CO_2 (over 100 years)
Carbon dioxide	CO_2	1
Methane (fossil)	CH_4	30
Nitrous oxide	N_2O	265
Perfluorocarbons	PFC	7,349 to 12,340
Hydrofluorocarbons	HFC	167 to 13,856
Sulphur hexafluoride	SF_6	26 100

In the specific case of this study, the following Base Carbone® emission factors were used with the associated uncertainties:

Data	Data uncertainty[8]	ADEME Carbon Database emission factor	EF uncertainty
Natural gas	5%	204 g CO_2-eq./kWh LHV	5%
Fuel oil	5%	272 g CO_2-eq./kWh LHV	5%
Diesel	5%	256 g CO_2-eq./kWh	5%
Petrol	5%	253 g CO_2-eq./kWh	5%
LPG	5%	233 g CO_2-eq./kWh	5%
Electricity	5%	60 g CO_2-eq./kWh	10%
R410a	30%	2,250 g CO_2-eq./kg	30%

[7] Source: IPCC Fifth Assessment Report (2013)
[8] We have set a default uncertainty of 5% for the meter readings taken.

R404a	30%	2,260 g CO_2-eq./kg	30%
R407c	30%	1,920 g CO_2-eq./kg	30%
R134a	30%	1,550 g CO_2-eq./kg	30%
R22	30%	2,110 g CO_2-eq./kg	30%
R427a	30%	2,371 g CO_2-eq./kg	30%

Some of the emission factors (EF) used differ from the Base Carbone®. They come from an additional study. The additional EFs are shown in the table below:

EF modifications	
Modified EF	**Documentary source or calculation method**
Acetylene 3.38 kg CO_2e/kg	When acetylene is used, the following chemical reaction occurs: $C_2H_2 + 5/2\ O_2 \rightarrow H_2O + 2\ CO_2$ To convert a mass of acetylene into CO_2 equivalent, we assume total combustion. According to the stoichiometric ratios of the chemical reaction, we conclude that 1 kg of acetylene is equivalent to the emission of 3.38 kg CO_2e.
VOC 4.5 kg CO_2e/kg	In 2011, specific work on GHG emissions was ordered and carried out at the Blainville site with the assistance of CITEPA (Interprofessional Technical Centre for Studies on Air Pollution). DREAL (Regional Directorates for the Environment, Planning and Housing) confirmed the following figures: 10 t of non-metal VOC or 45 t CO_2e. We therefore conclude that 1 kg of VOC is equivalent to the emission of 4.5 kg CO_2e.
Shielding gas 1.87 kg CO_2e/m^3	RENAULT TRUCKS SAS uses mixtures to protect weld areas. According to the manufacturer, the CO_2 content per m^3 of this mixture is 1.87 kg CO_2e. This value has been used to calculate the GHG emissions associated with this source.

The uncertainty of these emission factors is set arbitrarily at 30%.

6 Consolidated results of the GHG report for Renault Trucks SAS

We recall that in 2011 the emissions produced by Renault Trucks SAS (Blainville, Bourg-en-Bresse, Limoges and Lyon) accounted for **56,690 tonnes of CO_2** equivalent (or 56,690 tCO_2e). For this new GHG emissions updating exercise, we have had to recalculate the reference year (2011) to take into account significant changes in the data.

6.1. Recalculation for Renault Trucks SAS reference year 2011

After checking the data for 2011, it became apparent that some modifications were required. These modifications related firstly to errors (problems with conversions, units, data omission or optimisation of our internal data collection system) and secondly to the updating of the emission factors (modification of carbon database, modification of methodology relating to change in scope of the electricity emission factor, etc.).

Error detection:

In total, a further 1,248 tCO_2e were detected (table 1).

Table 1: Change in emissions for 2011 after error detection

Emissions 2011 (tCO_2e)	Emissions 2011 after error detection (tCO_2e)
56,690	57,938
+ 1,248 tCO2e	

Change in emission factors

The updating of the emission factors (table 2) accounts for a reduction in emissions compared to 2011 of 1,602 t CO_2e.

Table 2: change in emission factors for Renault Trucks SAS between 2011 and 2014

Emission sources	2011-EF eq CO_2 (kg eq CO2/unit)	2014-EF eq CO_2 (kg eq CO2/unit)	Change
Electricity	0.084	0.060	-
Natural gas	0.198	0.204	+
Fuel oil	0.272	0.272	=
Diesel	0.255	0.256	+
Petrol	0.231	0.253	+
Liquefied petroleum gas (LPG)	0.233	0.233	=
Refrigerant gas R407c	1653	1920	+
R410a refrigerant gas	1975	2250	+
R134a refrigerant gas	1430	1550	+
R404a refrigerant gas	3784	2260	-
R22 refrigerant gas	1810	2110	+
R427a refrigerant gas	2138	2370	+
Acetylene	3.380	3.380	=
VOC	4.500	4.500	=

- **Change in electricity emission factor:**

The emission factor (EF) used for the 2011 report included the production of electricity and upstream operations (consistent with the old Bilan Carbone® methodology. Now thefactor associated with production must be used for scope 1 of the GHG report. So the emission factor for the year 2011 associated solely with production was 0.084 kg eq CO_2/kWh (source: Base Carbone®). In 2014, the

electricity EF is 0.060 kg eq CO_2/kWh accounting for a reduction of - 2,877 t CO_2e compared to the 2011 report.

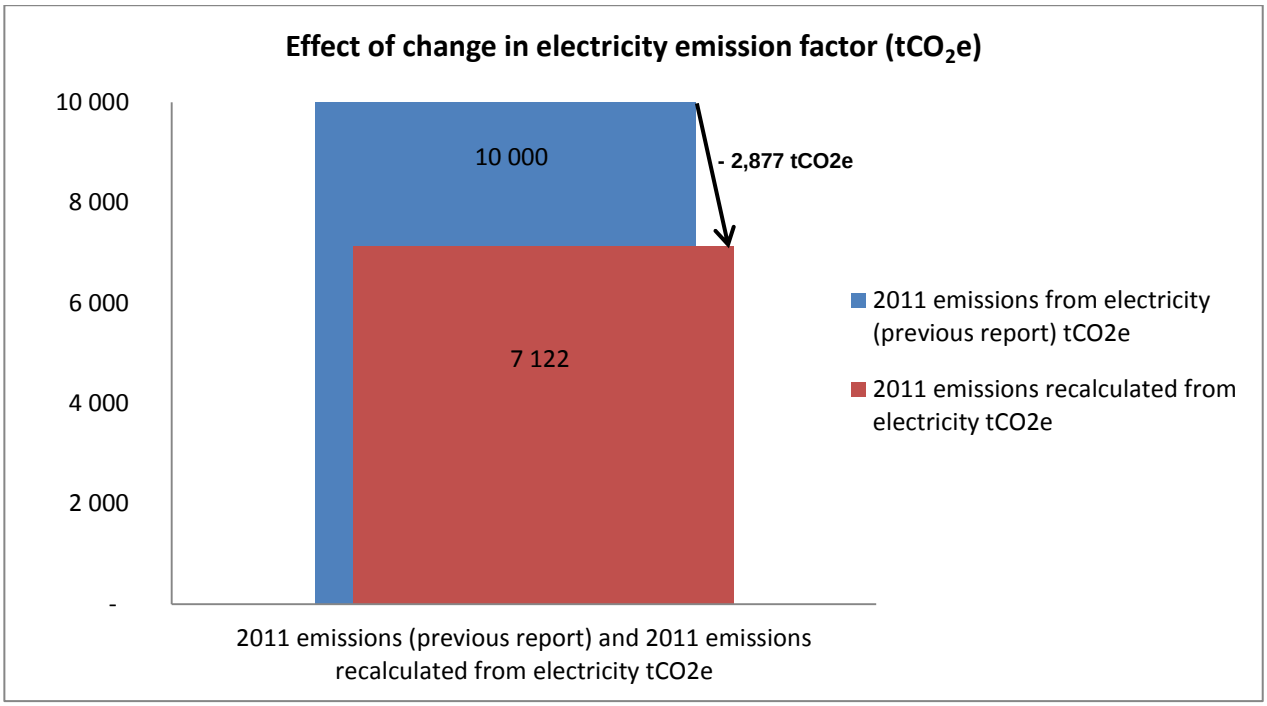


Figure1: effect of change in electricity emission factor (tCO2e)

- **Change in natural gas emission factor:**

The natural gas emission factor has increased (0.198 kg eq CO2/unit → 0.204 kg eq CO2/unit) accounting for an increase of + 1,080 tCO_2e.

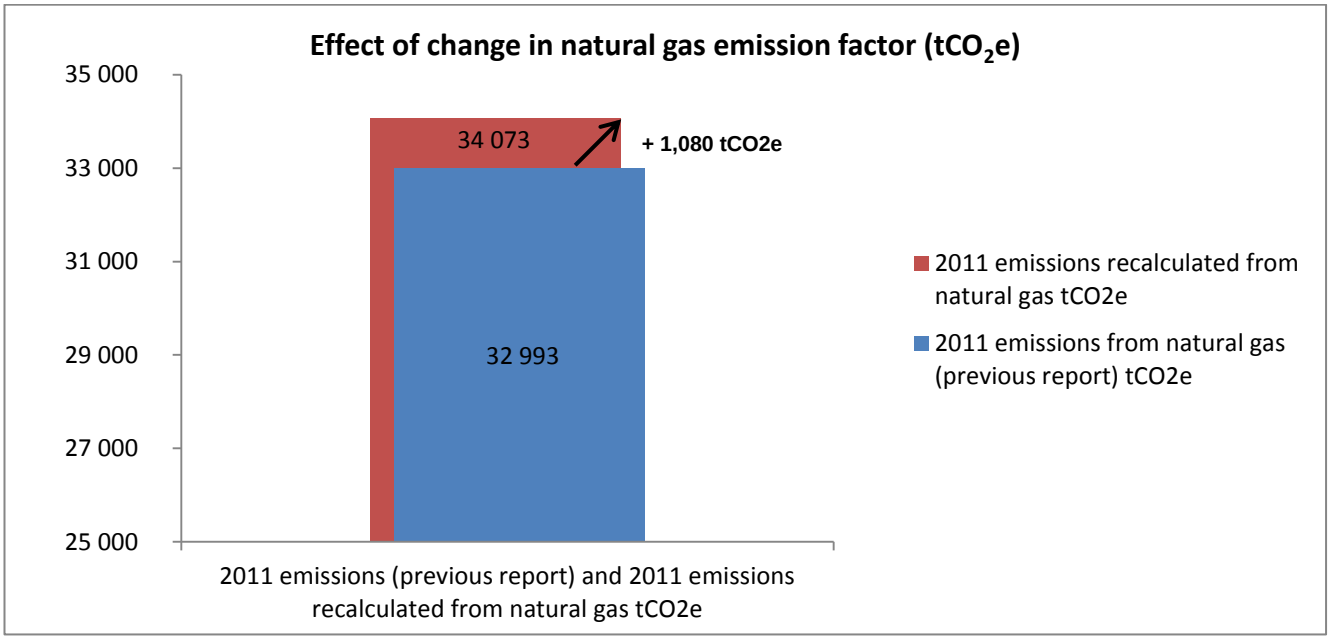


Figure 2: effect of change in natural gas emission factor (tCO_2e)

Summary of change between 2011 emissions (previous report) and recalculated 2011 emissions

Error detection in the 2011 audit and the updating of the emission factors give a reduction of 354 tCO_2e between the 2011 value calculated in the previous report and the recalculated value for 2011 (figure 3). The recalculation for the year 2011 for Renault Trucks SAS is **56,336 tCO_2e**

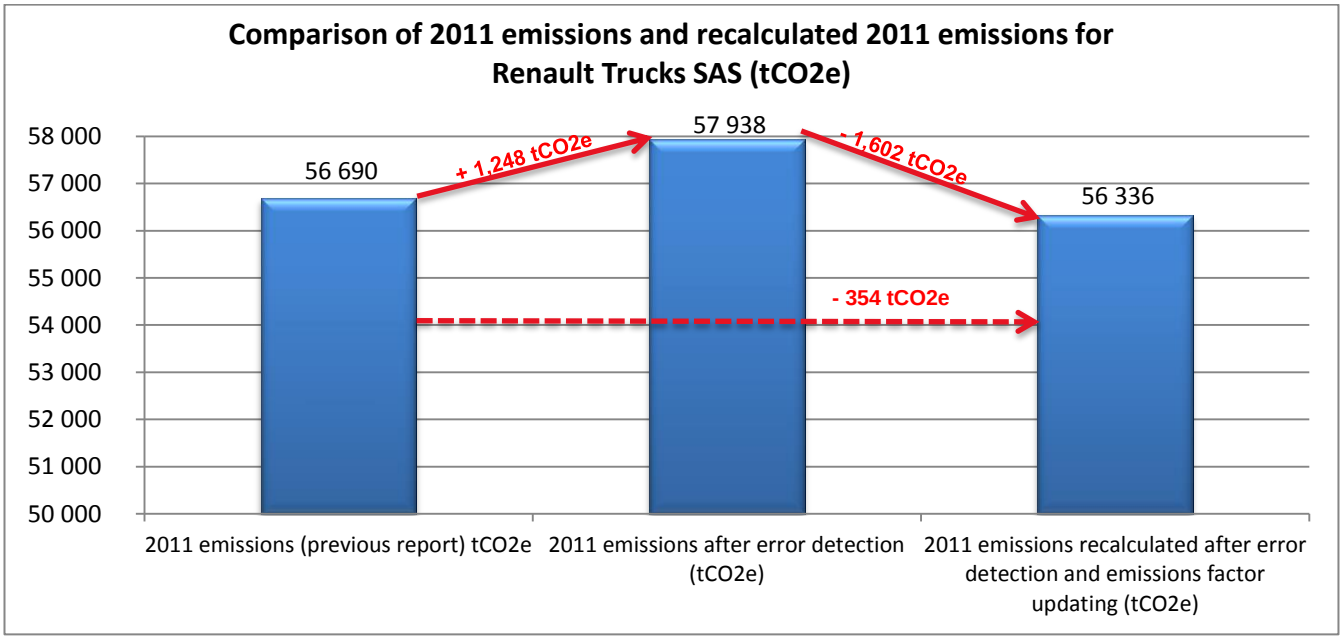


Figure 3: comparison of 2011 emissions and recalculated 2011 emissions for Renault Trucks SAS (tCO_2e)

6.2. Details of greenhouse gas emissions 2014 for Renault Trucks SAS

During the year 2014, the activities of the Renault Trucks SAS sites accounted for total emissions of approximately **40,842 tCO_2e**.

Table 3 details the GHG emission sources for each regulatory heading with the corresponding activity data, the associated equivalent CO_2 and its relative share.

Table 3: details of GHG emissions per regulatory heading for Renault Trucks SAS for the year 2014

Source	RT SAS (2014)	tCO_2e (2014)	Relative share (2014)
GHG direct emissions from fixed sources			
Natural gas	126,235,173 kWh LHV	25,752	63%
Domestic fuel	535,968 kWh LHV	146	<1%
GHG direct emissions from mobile sources			
*Diesel for engine and product tests**	17,368,376 kWh LHV	4,446	11%
LPG for forklifts	6,299,590 kWh LHV	1,468	4%
Diesel for vehicles	10,785,615 kWh LHV	2,761	7%
Diesel for forklifts	30,451 kWh LHV	8	<1%
Petrol for vehicles	5,450 kWh LHV	1	<1%
Natural gas for product tests	0 kWh LHV	0	0%
GHG direct emissions from non-energy processes			
Incinerated VOC	104,265 kg	469	1%
Welding shielding gas and acetylene	15,591 kg	16	<1%
Direct GHG fugitive emissions			
Refrigerant gases	494 kg	1,001	2%
GHG indirect emissions from fixed sources			
Electricity	79,570,569 kWh	4,774	12 %

**quantification based on the average consumption of the vehicles and the distance covered during the tests*

The main sources of GHG emissions in 2014 are natural gas at 63%, electricity at 12% and diesel for engine and product tests at 11% (figure 4).

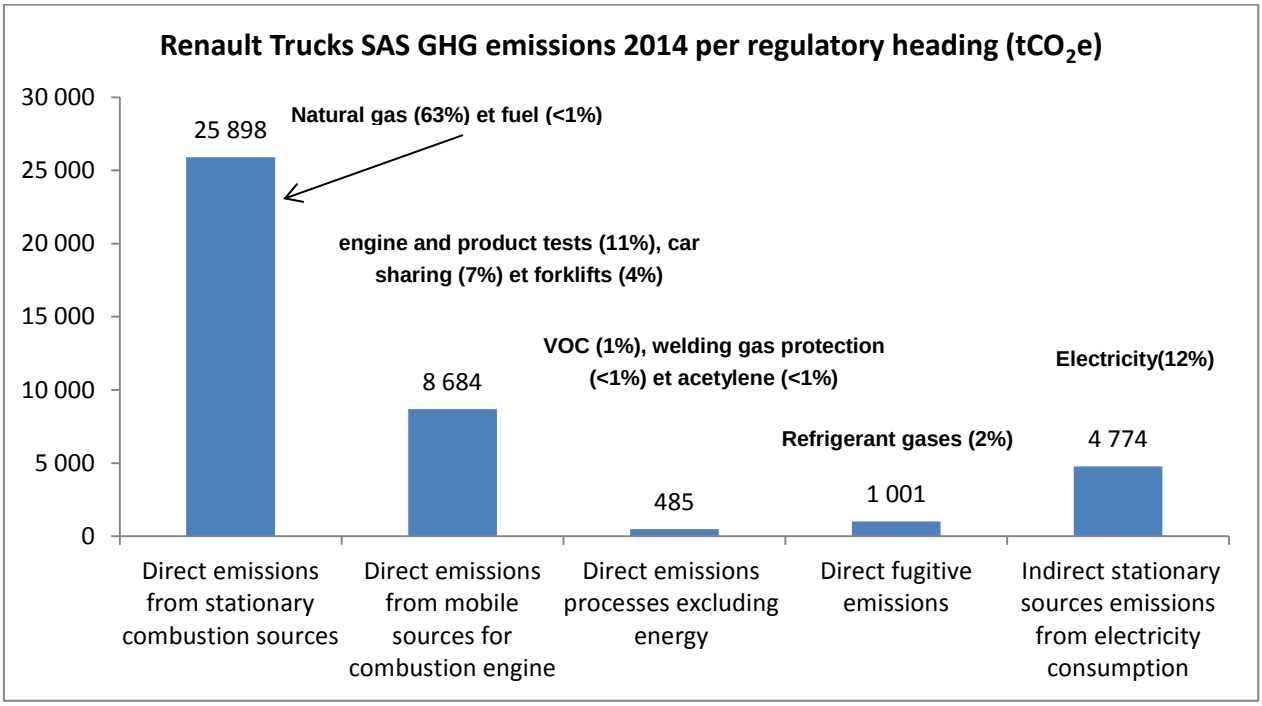


Figure 4: Renault Trucks SAS GHG emissions 2014 per regulatory heading

GHG emissions for Renault Trucks SAS can be broken down by site. The graphs below show results as absolute values (figure 5) and as percentages (figure 6).

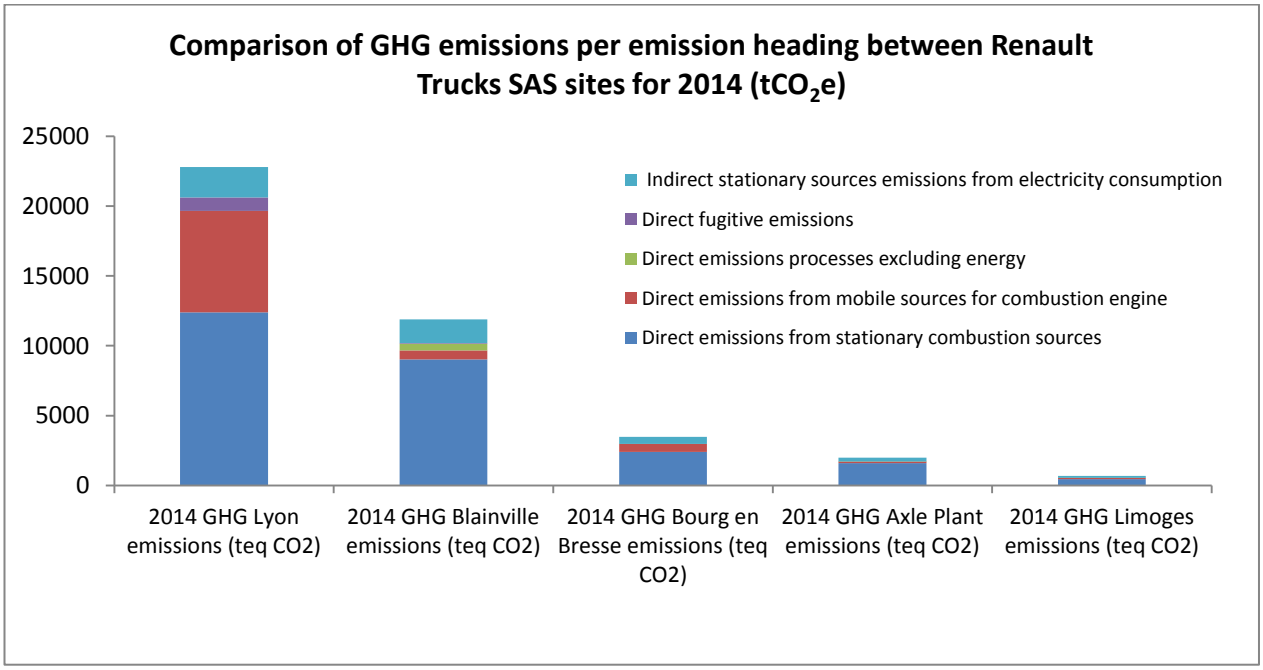


Figure 5: comparison of GHG emissions per emission heading between Renault Trucks SAS sites for 2014

The main emitter of GHG is the Lyon site which represents 56% of total emissions with **22,788 tCO_2e** and next comes Blainville with 29% of the total, i.e. **11,900 tCO_2e** (figure 6).

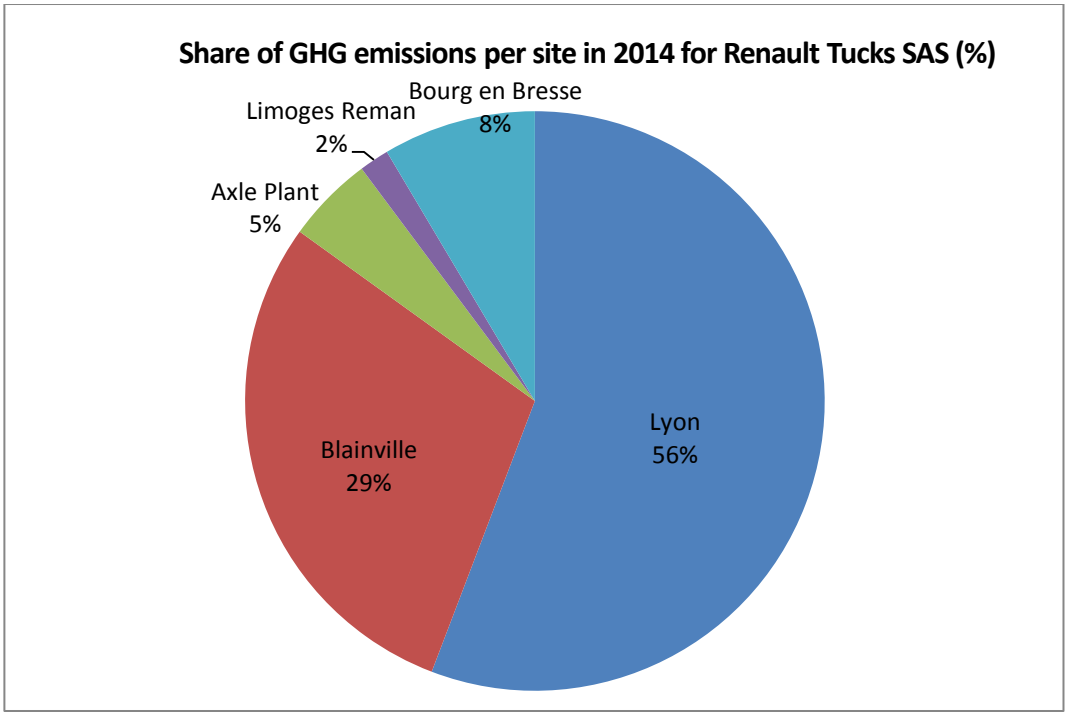


Figure 6: share of GHG emissions per site in 2014 for Renault Trucks SAS

6.3. Comparison and analysis of GHG emissions for Renault Trucks SAS between 2011 and 2014

Table 4 itemises and compares the sources of the recalculated GHG emissions for 2011 and the data for 2014 with the corresponding activity data, the associated equivalent CO_2 and their relative share.

Table4: Details of the emissions sources, activity data, associated equivalent CO_2 and its relative share for Renault Trucks SAS in 2011 and 2014

Sources	RT SAS (2011)	tCO_2e (2011) recalculated	Relative share (2011)	RT SAS (2014)	tCO_2e (2014)	Relative share (2014)	Difference in tCO_2e (2014-2011)
GHG direct emissions from fixed sources							
Natural gas	167,026,332 kWh LHV	34,073	60%	126,235,173 kWh LHV	25,752	63%	- 8,321
Fuel oil	1,264,035 kWh LHV	344	<1%	535,968 kWh LHV	146	<1%	- 198
GHG direct emissions from mobile sources							
Diesel for engine and product tests*	25,707,074 kWh LHV	6,581	12%	17,368,376 kWh LHV	4,446	11%	- 2,135
LPG for forklifts	12,223,290 kWh LHV	2,848	5%	6,299,590 kWh LHV	1,468	4%	- 1,380
Diesel for vehicles	11,845,577 kWh LHV	3,032	5%	10,785,615 kWh LHV	2,761	7%	- 271
Petrol for vehicles	280,465 kWh LHV	71	<1%	5,450 kWh LHV	1	<1%	- 70
Natural gas for product tests	269,500 kWh LHV	55	<1%	0 kWh LHV	0	0%	- 55
Diesel for forklifts	31,062 kWh LHV	8	<1%	30,451 kWh LHV	8	<1%	0
GHG direct emissions from non-energy processes							
Incinerated VOC	192,666 kg	867	<1%	104,265 kg	469	1%	- 398
Welding shielding gas and acetylene	23,274 kg	23	<1%	15,591 kg	16	<1%	- 7
Direct GHG fugitive emissions							
Refrigerant gases	649 kg	1311	1%	494 kg	1,001	2%	- 310

GHG indirect emissions from fixed sources							
Electricity	118,707,957 kWh	7,122	13%	79,570,569 kWh	4774	12 %	- 2,348

*quantification based on the average consumption of the vehicles and the distance covered during the tests

From 2011 to 2014, GHG emissions went down from 56,336 tCO_2e to 40,842 tCO_2e, in other words 15,494 tCO_2e or 27.5% less (figure 7).

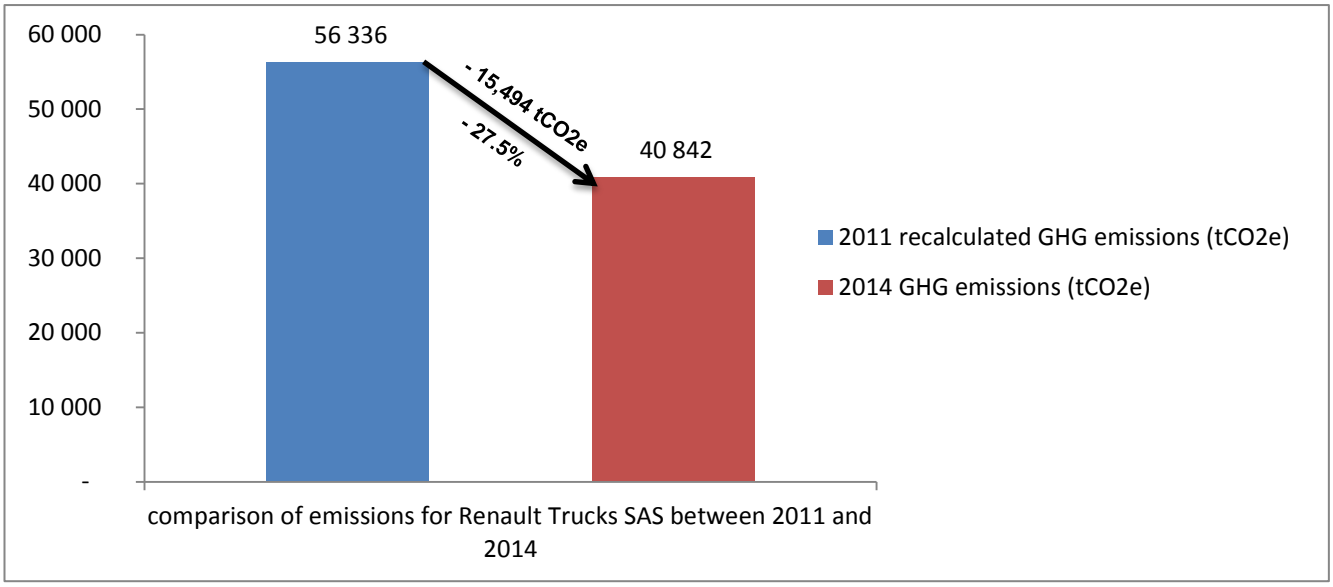


Figure 7: comparison of emissions for Renault Trucks SAS between 2011 and 2014

To understand this important reduction, analysis of emission sources is required. Table 5 and the figure 8 show that emissions from fixed sources of combustion (natural gas for the most part) represent 55% (8,519 tCO2e) of the total reduction in emissions. Next come emissions from mobile sources with combustion engines (fuels for product and engine tests and vehicles) at 25% and emissions associated with electricity (15%). The analysis should therefore focus on these emissions.

Table 5: comparison of GHG emissions between 2011 and 2014 for Renault Trucks SAS and the share represented by the emissions in the total reduction in the GHG report 2014

Emission types	2011 (tCO_2e)	2014 (tCO_2e)	Difference 2014-2011 (tCO_2e)	Relative share of difference
Fixed sources of combustion	34,417	25,898	- 8,519	55%
Mobile sources with combustion engines	12,595	8,684	- 3,911	25%
Non-energy processes	890	485	- 405	3%
Fugitive emissions	1,311	1,001	- 310	2%
Electricity	7,122	4,774	- 2,348	15%
Total	**56,336**	**40,842**	**- 15,494**	**100%**

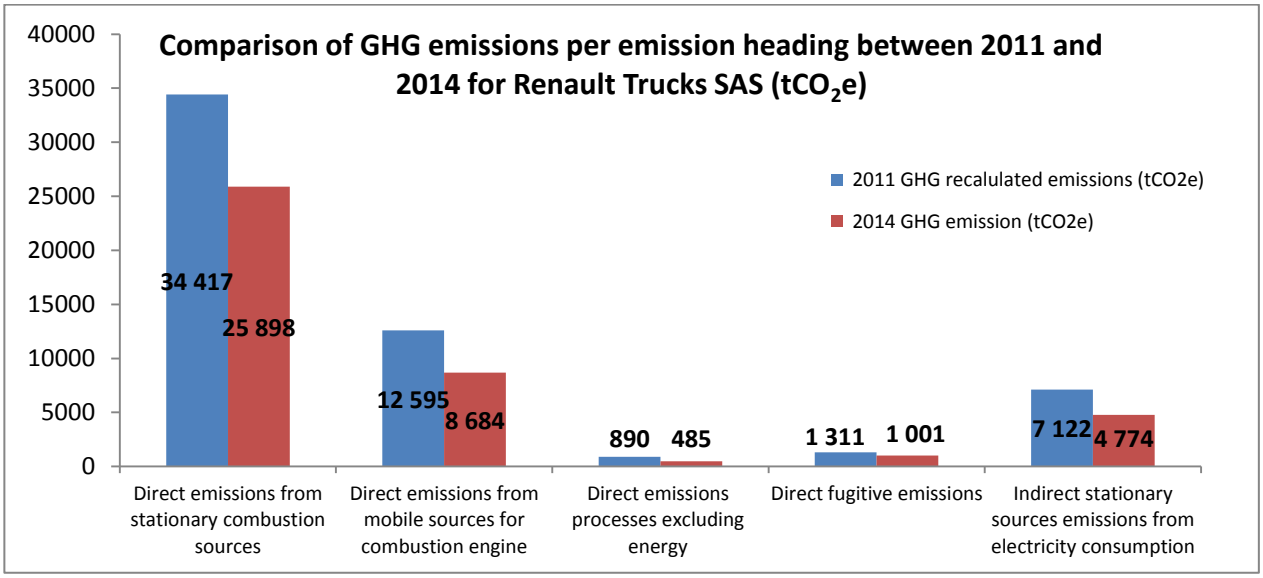


Figure 8: comparison of GHG emissions per emission heading between 2011 and 2014 for Renault Trucks SAS

Analysis of change in direct emissions from fixed sources of combustion

Direct emissions from fixed sources of combustion come almost exclusively from natural gas. Natural gas is used for heating buildings and in some manufacturing processes. In 2011, this represented 34,073 tCO_2e against 25,752 tCO_2e in 2014, or a reduction of 24%. We consider that the reduction in natural gas is associated with:

- **The change in industrial activity:** Between 2011 and 2014, factory production fell; some industrial processes were stopped or were optimised
- **Change in heating:** On average, 2014 was warmer than 2011. The number of Renault Trucks SAS employees decreased and office space fell by 7% while workshop space fell by 2% between 2011 and 2014.
- **With the implementation of the 2011 action plan,** some buildings were insulated, consumption monitoring was improved in some sectors, some boiler regulations were optimised and better-performing equipment was purchased.

Analysis of direct emissions from mobile sources with combustion engines:

Between 2011 and 2014 emissions from mobile sources with combustion engines fell by 3,911 t CO_2e (or 25% of the total reduction in emissions). These emissions are associated with the use of forklifts, pool vehicles and tests of engines and industrial vehicles.

- **Forklifts: 1,380 tCO_2e lower**

  Reduction in industrial activity: the flow of forklifts fell because of a reduction in general activity.
  The action plan drafted in 2011 optimised the electric forklift fleet and flows and increased the number of electric forklifts.

- **Diesel for vehicles: 341 t CO_2e lower**

  Reduction in industrial activity: the number of km covered by service vehicles went down
  The action plan drafted in 2011 enabled the purchase of electric vehicles.

- **Product and engine tests: 2,190 tCO_2e lower**

  The new range of vehicles developed by the Renault Trucks brand (Euro VI standard) is more fuel-efficient (a saving of at least 5%); testing these vehicles on test tracks uses less fuel. In addition, modifications in the engine test processes on test benches bring a reduction in fuel consumption.

Analysis of indirect emissions from fixed sources associated with the consumption of electricity:

In 2011, GHG emissions associated with electricity represented 7,122 tCO_2e against 4,774 tCO_2e in 2014, or a reduction of 33%. The consumption comes mainly from heating, lighting and manufacturing processes. We consider that the reduction in electricity is associated with:

- **The change in industrial activity**:
  Between 2011 and 2014, factory production fell. Some activities ceased (machining, stamping centre painting) and some industrial processes and equipment were optimised. Note that new activities (new production line at the engine plant) increased GHG emissions.

- **Change in heating and lighting:**
  On average, 2014 was warmer than 2011, and between 2011 and 2014 the number of Renault Trucks SAS employees decreased, leading to a fall in emissions. Office space fell by 7% and workshop space fell by 2% between 2011 and 2014.

- **With the implementation of the 2011 action plan,** some buildings were insulated, consumption monitoring was improved in some sectors, some boiler regulations were optimised and better-performing equipment was purchased (pumps, lighting, geothermal heating, etc.).

6.4. Regulatory table

The production of the greenhouse gas emissions report in accordance with article 75 of law No. 2010-788 requires direct and indirect GHG emissions to be assessed separately by heading and for each GHG in tonnes and in equivalent CO2. Table 6 below meets this requirement.

Table 6: regulatory table

		GHG emission (tCO2e)												
		2011						2014						Difference between reference year and reporting year
Emission heading	Emission types	CO2 (tCO2e)	CH4 (tCO2e)	N2O (tCO2e)	Other gas : (tCO2e)	Total (tCO2e)	CO2 b (tCO2e)	CO2 (tCO2e)	CH4 (tCO2e)	N2O (tCO2e)	Other gas : (tCO2e)	Total (tCO2e)	CO2 b (tCO2e)	Total (tCO2e)
Direct emissions	GHG direct emissions from fixed sources	33 914	90	491	-	34 496		25 518	68	371		25 957		- 8 539
	GHG direct emissions from mobile sources	12 482	11	107		12 599		8 609	6	73		8 688		- 3 911
	GHG direct emissions from non-energy processes	820	-	-		820		485				485		- 335
	Direct GHG fugitive emissions	1 311			1	1 312		1 001			0	1 001		- 310
	GHG geissions from biomass (soil and forests)													
	Subtotal	**48 527**	**101**	**598**	**1**	**49 227**		**35 613**	**74**	**444**	**0**	**36 131**		- 13 095
Indirect emissions from energy	Indirect fixed sources emissions from electricity consumption					7 122						4 774		- 2 348
	Indirect emissions from the consumption of steam, heat or cold					-								
	Subtotal					**7 122**						**4 774**		**- 2 348**

7 Action plan

This section meets the legal requirement of providing a summary of the actions of the submitting parties with the report of the legal entity.

First of all a review of the actions from the previous GHG report was prepared in order to estimate the CO_2e gains costed in 2012.

In 2012, 108 actions were identified and approved by the management of each Renault Trucks SAS entity.

Of the 108 actions identified, 76 actions have been implemented and 10 actions are in progress (over 50% adopted as of today). The action plans are an integral part of the environmental management system of the entities and periodic reviews take place (all the sites of the legal entity are certified to standard ISO 14001).

The actions taken focus mainly on the following areas:
- The complete renovation of some buildings
-Controlling and reducing heat loss for buildings (insulation of walls, roofing, pipes, installation of sun shades, etc.)
- Purchase of better-performing heating equipment or processes (boilers, air conditioning, motors, geothermal heating, etc.)
- Controlling and reducing energy requirements for heating/air conditioning/processes
- Reducing and optimising lighting requirements (better-performing lighting, walls painted to give light)
- Reducing CO_2 emissions for on-site and inter-site travel (development of video-conferencing, purchase of electric vehicles for maintenance and employees, company car policy)
- The design and use of sustainable buildings
- Reducing CO2 emissions for engine tests by means of a change in the process
- Awareness and involvement of employees in energy savings

It is difficult to assess the reduction in CO_2e emissions associated with the action plan but, according to the costing presented in 2012, the actions taken represented a reduction of 2,220 tCO_2e at the time.

Summary of action plan:
To prepare the new 3-year action plan, we have carried over some actions from the previous plan, integrated actions from the statutory energy audits, and added some other actions not previously identified. These actions focus on the areas previously mentioned, namely:
- Renovation of buildings or improvements to insulation (roofing, walls, pipes, etc.)
- Improvements to existing buildings or processes by better regulation and the purchase of better-performing equipment.
- Improvements to lighting
- Reduction in emissions for business travel
- Personnel awareness campaigns

Actions were quantified when all the data required for calculations had been collected. Failing this, it was decided to not quantify the actions.

Thus 84 actions were identified, of which 22 were not costed.

The table below combines the reduction in GHG emissions, investment and the expected economic savings over the coming 3-year period, based on the type of emissions in the mandatory regulatory scope:

Emissions type	Savings MWh élec. /an	Savings MWh combust. /an	Savings Liters / an	GHG savings t CO2e	Estimated investisment estimated k€ HT	Economic savings k€ HT /an
GHG direct emissions from fixed sources	0	6 421	0	1 494	109	151
GHG direct emissions from mobile sources			65 628	167	0	0
Direct GHG fugitive emissions	0	0	0	0	0	0
GHG indirect emissions from fixed sources (electricity)	3 655	0		230	247	285
Total	**3 655**	**6 421**	**65 628**	**1 891**	**356**	**437**

<u>Understanding the above table:</u> the "Economic savings" column shows the costing of annual savings after investment, gain compared to the reference year. The "GHG reduction" column shows the total annual reduction in GHG after investment, compared to the initial situation.

For Renault Trucks SAS, the actions taken could lead to a reduction in GHG emissions **close to 1,891 t CO_2e or approximately 5%** over the next three years.