Greenhouse Gas Inventory

Scantago ApS

2013/2014

Prepared by EXIMA

30th December 2014

Contents

ABBREVIATIONS

GHG	Greenhouse gas
GHG Protocol	Report from the World Resource Institute http://www.ghgprotocol.org/
ICAO	International Civil Aviation Organization
Scope	Predefined set of boundaries for including/excluding GHG emissions in the inventory.
UIC	International Union of Railways
WRI	World Resource Institute

INTRODUCTION

This report is the Greenhouse gas inventory for Scantago ApS, company registration number DK29174881 located on Skullebjerg 9, Gevninge 4000 Roskilde, DENMARK. The inventory covers the company fiscal year 2013/2014 (2013.10.01 – 2014.09.30).

The applied methodology for the establishing the inventory of direct and indirect emissions related to Scantago ApS, is based on the World Resource Institute document "GHG Protocol" as well as the international standard ISO 14064.

Since 2010, EXIMA has been appointed by Scantago ApS for setting up its annual CO2 emission inventory. As an independent service provider within climate change, we have received all information requested and necessary for establishing a consistent, transparent and accurate inventory of the GHG emissions including identification and quantification of relevant emission sources.

Copenhagen 2014.12.30

Authored by:

Roberta De Palma

EXIMA ApS

EXECUTIVE SUMMARY

This is the GHG inventory report of Scantago ApS for the fiscal year 2013/14 (2013.10.01 – 2014.09.30). The inventory applies a materiality approach for identifying GHG emissions from both direct and indirect sources.

Scantago ApS is a service provider to the pharmaceutical industry offering advisory services and technical services to manufacturing sites. The majority of the activities relate to operations within Denmark, but the company has also some international activities, which have been included in this inventory under scope 3 reporting protocol.

The company is responsible for the emission of 30.5 tons of $CO_{2\text{-eqv}}$ during the fiscal year. The largest emission (68%) are within scope 1 (direct), equally distributed between two sources: transport with company owned service cars and gas consumption for heating of the premises. Emissions within scope 3 represents 23% of the total, while indirect emissions from electricity consumption (scope 2) represent 9% of the total.

Compared to the inventory of the previous fiscal year (2012/2013), the total GHG emissions of the organization have decreased by approx. 10% (3.3 tons/year). Most of this reduction (76%) comes from the avoided emissions from transportation by air and train (-41% compared to previous fiscal year). This is mostly due to the reduced company travels outside Denmark as well as to a shift toward more sustainable transportation mode (e.g. train) whereas feasible.

Emissions from electricity and the gas consumption have also decreased by 10% and 4% respectively. More significant reductions especially in gas consumption are expected during the next fiscal year. Indeed the heat demand of the premises should further decrease due to the replacement of the old windows and the installation of two doors to separate the warehouse and the workshop which are kept at different temperature levels. These projects were implemented in December 2013, but the related savings were not fully realized during the fiscal year, since the new premises have started to be used only in February 2013 toward the end of the cold winter season.

The company has a better performance with improved benchmarks for electricity and heating emissions while fuel intensity emission ratio is the same as last year. The carbon intensity per unit of turnover generated decreased significantly by 20%. Nevertheless, there is still a good potential to reduce GHG emissions, and the two areas with highest potential are: gas consumption and travels. As far

is concerning gas consumption a target of 15% reduction of associated emissions can be realistically achieved by replacing the gas fired boiler with a new condensing one.

The company has good performance measurement and tracking system for its CO2 emission sources, both direct and indirect, including monthly meter readings for electricity and gas consumption, records of travel and car fuel consumptions. It is important to continue with the current practices for monitoring performance to allow quantification of real savings related to the planned energy saving initiatives to ensure a positive impact on the development of the GHG emission profile.

METHODOLOGY

EMISSION SOURCES

Identified CO2 emission sources for Scantago are available in the table below categorized by scope:

ID	Scope	Source	Method
	Scope 1		
1		Consumption of natural gas for heating of offices, warehouse and workshop.	m/c
2		Consumption of fuels related to transport with service cars owned by the organization.	m/c
	Scope 2		
3		Consumption of electricity for offices, warehouse and workshop.	m/c
	Scope 3		
4		Emissions related to business trips undertaken by air and trains.	m/c
5		Consumption of fuels related to transport with cars not owned by the organization but used on behalf of the organization.	m/c

Table 1 - Emission sources for Scantago ApS.
c=Calculated; m=Measured

Emission sources have been identified by applying a materiality approach and the table above lists the sources included in the scope three accounting when taking into consideration CO_2 emissions related to business travels only as scope 3 emission sources.

CALCULATION APPROACH

Scope 1

Emission sources relate to the consumption of natural gas

purchased from the supplier OK. Based on meter readings for consumption of gas covering the accounting period, the actual demand for natural gas has been measured.

Emission factor for consumption of natural gas was not available from the gas supplier OK. Therefore an average data was extracted from the company Energy Net, a Danish energy distributor of gas and electricity (http://energinet.dk/DA/GAS/Gasdata-og-kvalitet/Gaskvalitet/Sider/Vis-gaskvalitet.aspx?Visning=aarsgennemsnit)

An average gas emission factor for the year 2013/2014 was calculated based on the monthly emission factors, corresponding to 56.7 kgCo2/GJ.

Scantago operates a fleet of service vehicles and this emission source is considered significant for the emission profile. The organization has a detailed log of the mileage for each vehicle within the period and the aggregated mileage of the fleet is measured.

Based on information about each vehicle, average emission factors have been identified, applying the Sustainable Energy Ireland Authority on-line carbon emission tool. For individual car emission factors, please refer to Annex 2 of this report.

The calculated GHG emission related to operation of the fleet of service vehicles is the aggregated multiple of the mileage of each vehicle with the specific emission factor per km.

Scope 2

Consumption of electricity is measured by a main electricity meter for the company. Based on information about the emission grid factor provided by the energy supplier OK in Annex 1, the GHG emissions have been calculated as the multiple of the consumption and the specific emission per kWh of consumed electricity. Compared to previous fiscal year 2013/2014, the emission grid factor of the electricity has increased by 18%.

Scope 3

Scope 3 emission sources consist of two contributors:

- Business travels by air and train;
- Travel by road in cars not owned by the organization.

The organization logs all travel activities by destination and mean of transport for all employees and during the accounting period a total of thirteen travels by train or air planes have been conducted.

Emissions related to travels by air is based on emissions calculated for each travel by applying the carbon emission calculator developed by the International Civil Aviation Organization ICAO (http://www2.icao.int/en/carbonoffset/Pages/default.aspx)

Carbon emissions related to travels by railroad is based on the carbon calculator developed by Carbon Foot Print initiative (http://www.carbonfootprint.com/calculator.aspx)

GHG INVENTORY FOR 2013/2014

The inventory covering the fiscal year 2013/14 provides a total emissions corresponding to 30.5 ton $CO_{2\text{-eqv}}$. The figure below illustrates the breakdown of the global emissions into the emission sources included in the GHG inventory.

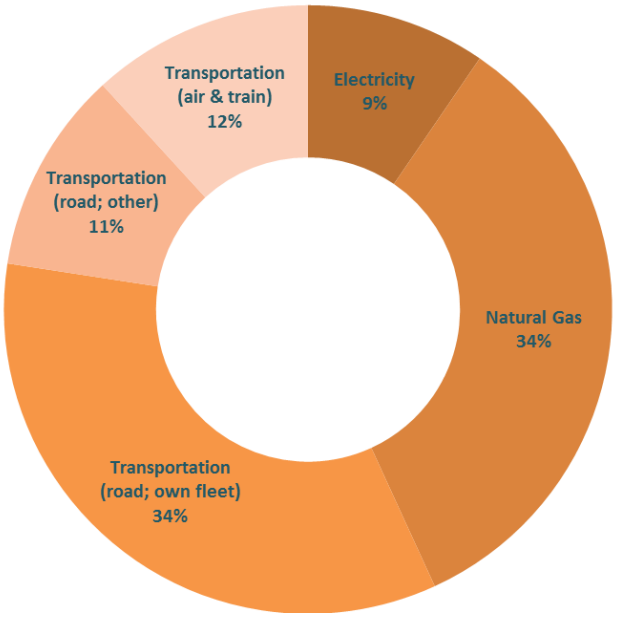


Figure 1 - Breakdown of GHG emissions 2013/14 by sources.

The two major emission sources are related to natural gas for heating of the premises (34%) and to business trips with company owned cars (34%), which in total represent 68% of the global company's emissions. The totality of business trips travels, including those undertaken with company cars as well as owned cars and flight/train generates 57% of the total emissions. Indirect emissions from the consumption of electricity represent 9% of the total.

The figure below provides a breakdown of the global GHG emissions by scope and indicates that scope one emissions are representing 68% of the total emissions in total volumes, while scope 3 and 2 represent respectively 23% and 9% of totals.

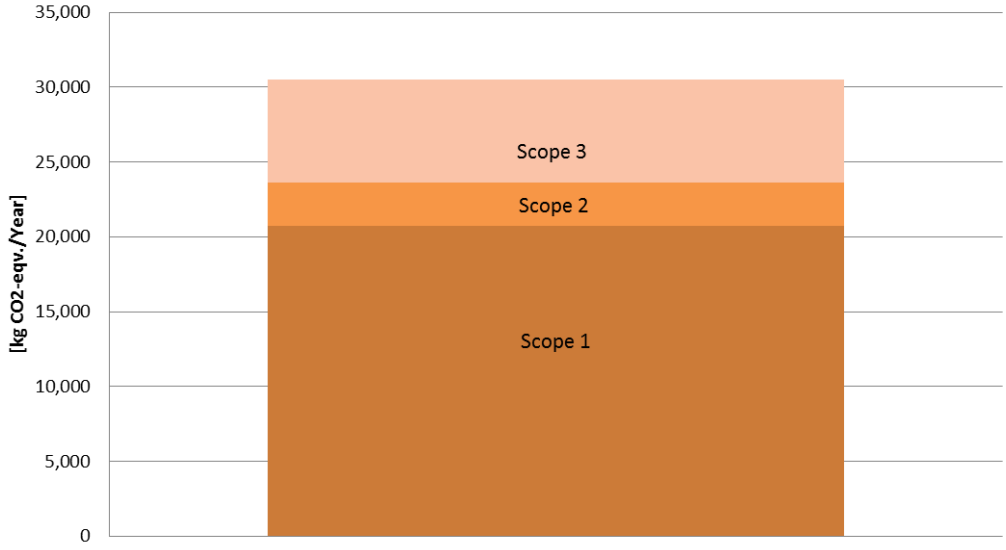


Figure 2 - Breakdown of GHG emission by scope 2013/2014.

GHG INVENTORY MANAGEMENT AND PERFORMANCE

The trend in GHG emissions by reporting scope and by source over the past 4 fiscal years is illustrated in the charts below.

Direct GHG emissions (scope 1) have been subject to a slight decrease of approximately 2% over the past year. This reduction is primarily related to gas consumption for heating, as the emissions due to transportation with company owned cars, are nearly the same as last year. Monthly gas and electricity profiles are reported in annex 3.

In particular the gas consumption for heating decreased by 4% in 2013/14. To a large extent this saving compared to last year baseline is due to the fact that the company did not required to keep two premises running during the cold season, as it was the case last year for renovation purpose of the new premises. The comparison of the monthly consumptions of gas of the new premises from February to September vs. previous year shows that the heating demand of the building has reduced (except for the month of July[1]). This was due to a more mild winter season compared to previous year with a 21% reduction in the degree days (see annex 4).

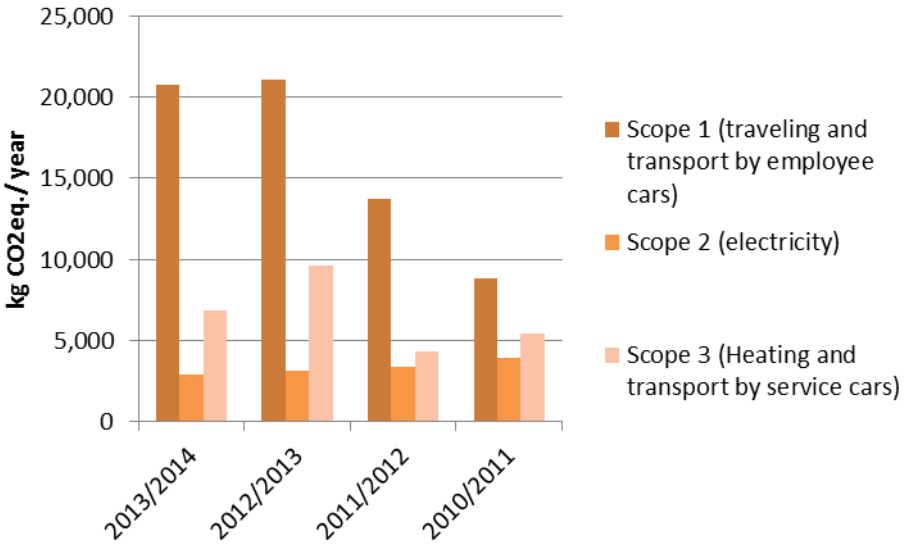


Figure 3 – Trend of GHG emissions by reporting scope over past four fiscal years.

[1] *The consumption of gas in July 2014 was 3 times higher compared to the same month of 2013 since the company kept the boiler operating to generate hot tap water for use at the office facility.*

Indirect emissions (scope 2) from electricity have been decreasing by 8% in line with the trend from the previous reporting periods. While electricity consumption reduced by 21%, the grid factor increased by 18% offsetting most of the savings made. As for gas consumption, the reduced electricity consumption was made since the company did not need to keep two premises running during the cold season. In addition, the characteristics of the new premises enable longer use of day-light compared to previous office space, contributing to the electricity reduction for lighting purposes. Finally the company implemented electricity conservation projects in early 2014 such as:

- Replacement of 3 circulation pumps with more energy efficient ones
- Partly replacement of the lighting system with LED new lamps

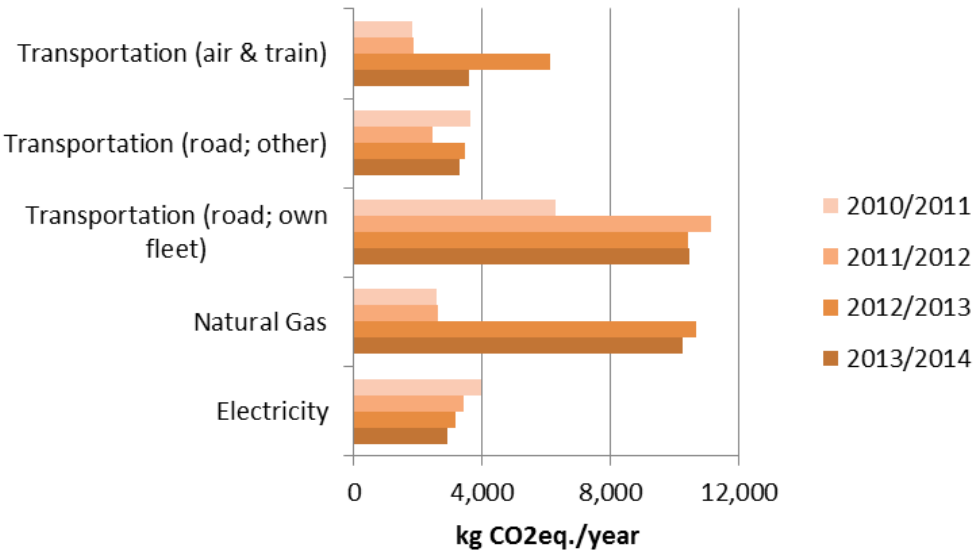


Figure 4 –GHG emissions by source over the four past fiscal years.

The emissions within scope 3 have decreased by 28%: while the business trips mileages traveled with employees owned cars are more or less the same as last year, business trips by flight have reduced.

The trend of the carbon intensity of the company's activities, measured as CO2 emissions per unit of generated turnover is represented in the following chart. The carbon intensity index for the fiscal year 2013/2014 has decreased significantly showing higher performance in terms of emissions per unit of turnover generated compared to previous fiscal year.

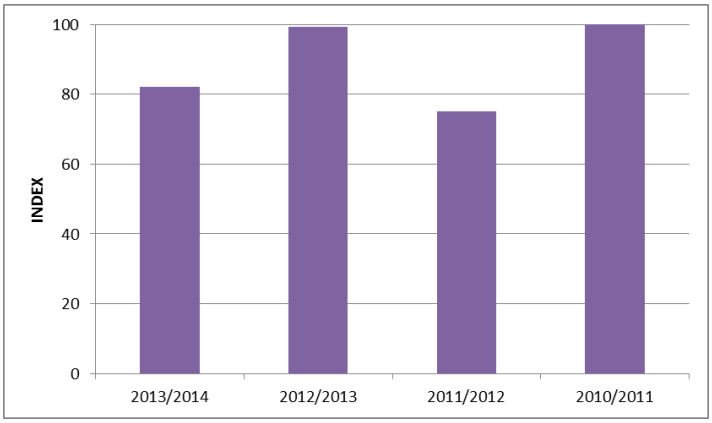


Figure 5 – Trend of carbon intensity index [CO2 emissions/turnover].

BENCHMARKS

The chart below compares the specific energy consumptions for electricity, gas (heating of premises) and the fuel CO2 intensity from car usage, over the past 4 fiscal years. These benchmarks are measured per m² of office space in the case of electricity and gas and per km for business trips by cars (both company cars and cars of employees used on behalf of the company) for the fuel intensity indicator. The positive reduction trend for specific electricity consumptions is confirmed also for this year. Gas specific consumption has also decreased while fuel intensity ratio is nearly the same as of the past year.

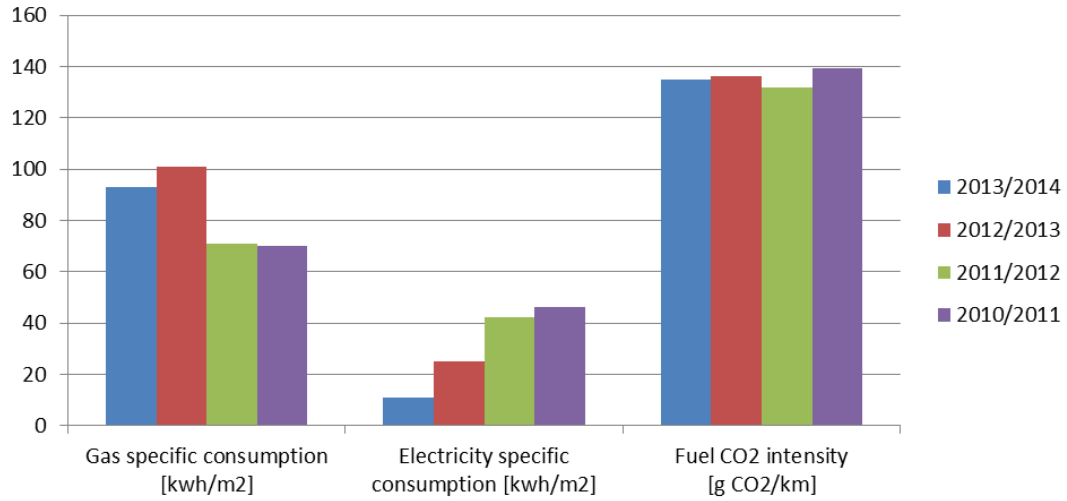


Figure 6 – Benchmarking of specific energy consumption indicators within the four past fiscal years.

ENERGY CONSERVATION INITIATIVES AND TARGETS

The company did not reach the target to reduce 20% thermal energy during 2013/2014, despite two energy conservation projects were implemented as following:

1. Separation of the warehouse from the workshop by two doors: the workshop is kept at the comfort temperature of +18°c while the warehouse is kept at +5°c. Previously both areas were one single ambient equally heated at +18°c.

2. Refurbishment of the old windows and doors with more energy efficient ones.

In addition the company has installed an innovative air conditioning unit based on renewable sources (solar) manufactured by Purix. This equipment should enter in operation by summer 2015, improving the indoor comfort level.

The priority area for intervention to minimize the associated CO2 emissions with potential for savings is confirmed to be the gas consumption for heating. A new project was identified by the company consisting in the replacement of the existing un-efficient gas fired boiler with condensed boiler for heating the premises. This initiative alone can bring 15% savings on the gas bill. The cumulative savings on gas emissions can reach up to 30% summing up the benefits from the new boiler and the two above mentioned measures (new windows and warehouse separation from workshop).

Another area for intervention and possible savings is the emission from company owned cars. The existing cars (vans) have CO2 specific emission factors between 0.138 and 0.133 kg CO2/km. It is recommended that when replacing existing car fleet, the company buy new van with a fuel efficiency of not less than 0.110 kg CO2/km.

ANNEX 1 – EMISSION FACTOR ELECTRICITY

Supplier: OK 2013

OK a.m.ba.
Åhave Parkvej 11, 8260 Viby J
Telefon 70 10 20 33
www.ok.dk

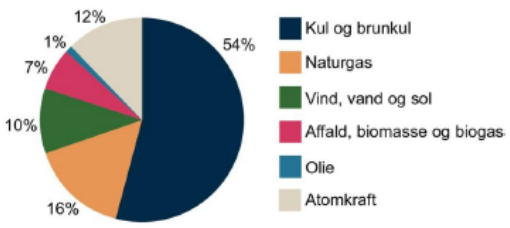
Generel deklaration 2013

Deklarationen viser brændselsfordelingen samt de tilhørende miljøpåvirkninger ved almindeligt salg af elektricitet i Danmark. Den generelle deklaration er beregnet ud fra elproduktionen i Danmark og er korrigeret for udvekslingen af el med nabolandene samt el-salget til de elkunder, der har købt individuelt deklareret elektricitet, fx vindmøllestrøm.

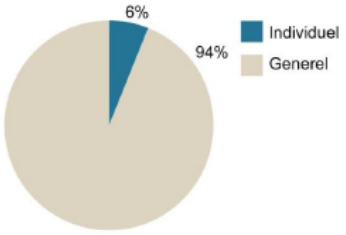
Figuren nedenfor til højre viser hvor stor en del af elforbruget i Danmark i 2013, der er købt som individuelt deklareret elektricitet. Det resterende elsalg er deklareret ved hjælp af den generelle deklaration.

Brændselsfordeling og el-salg ifølge individuelle deklarationer

Brændselsfordeling 2013



El-salg ifølge individuelle deklarationer 2013



Miljøforhold ved forbrug af 1 kWh

Elproduktion fra vedvarende energikilder, der omfatter el produceret fra vind, vand, sol, biogas, biomasse og den bionedbrydelige andel af affald, er kendetegnet ved ikke at medføre CO_2-emission.

Elproduktion fra vind, vand og sol er helt emissionsfri, mens der ved brug af biogas, biomasse, affald og fossile brændsler (kul, olie og naturgas) dannes en række emissioner til luften og restprodukter.

Emissioner til luften sker bl.a. som drivhusgasser (kuldioxid, metan og lattergas) og som forsurende gasser (svovldioxid og kvælstofilter).

Restprodukter kan ofte anvendes, fx afsvovlingsproduktet gips til byggematerialer og kulasker til cementindustrien. Bioasker bruges ofte til gødskning.

Ved forbrug af 1 kWh fremkommer	Deklaration 2013	Deklaration 2012
Emissioner til luften	**g/kWh**	
CO_2 (Kuldioxid - drivhusgas)	482	410
CH_4 (Metan - drivhusgas)	0,15	0,21
N_2O (Lattergas - drivhusgas)	0,005	0,005
Drivhusgasser (CO_2-ækv.)	488	416
SO_2 (Svovldioxid)	0,06	0,08
NO_x (Kvælstofilte)	0,25	0,30
CO (Kulilte)	0,10	0,15
NMVOC (Uforbrændte kulbrinter)	0,03	0,04
Partikler	0,02	0,01
Restprodukter	**g/kWh**	
Kulflyveaske	16,4	12,9
Kulslagge	5,2	1,7
Afsvovlingsprodukter (Gips m.v.)	7,4	5,7
Slagge (affaldsforbrænding)	5,9	6,3
RGA (røggasaffald)	0,9	1,0
Bioaske	0,3	1,0
Radioaktivt affald (mg)	0,3	0,5

Beregning af miljøforhold og brændselsfordeling er baseret på retningslinjer fra Energinet.dk.

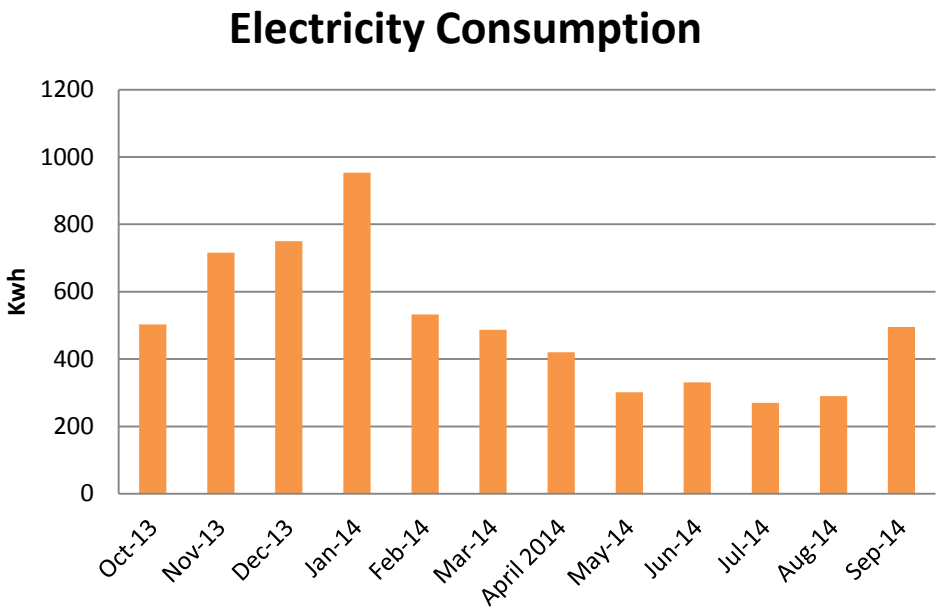
Besøg www.energinet.dk/eldeklaration og læs mere om forudsætningerne.

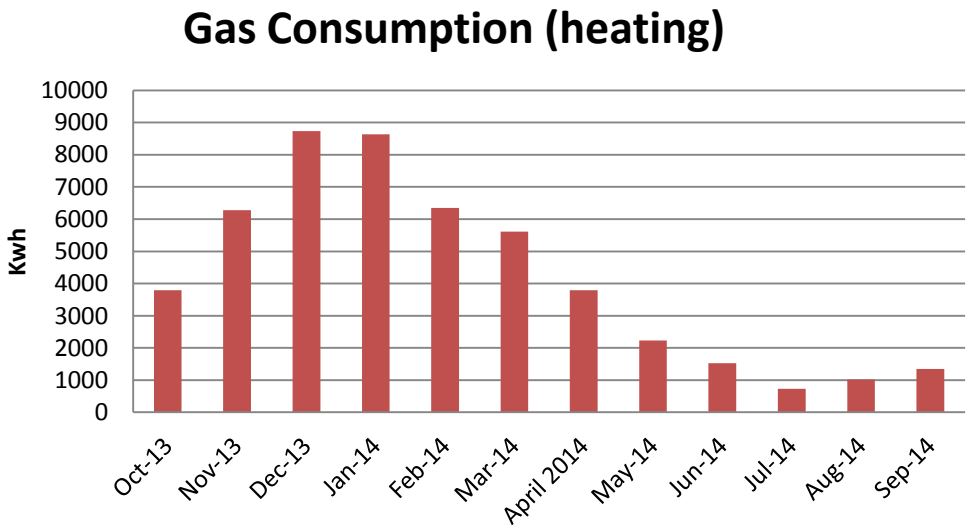
ANNEX 2 – FLEET EMISSION FACTORS

Vehicle Number	Registered	Producer	Model	Fuel	kg CO2/km
3	2010	FIAT	Doblo Cargo 1.6	Diesel	0,138
4	2011	FIAT	Doblo Cargo 1.6	Diesel	0,133
5	2011	FIAT	Doblo Cargo 1.6	Diesel	0,133

Source of information:
http://www.seai.ie/Power_of_One/Getting_Around/HCIYC/

ANNEX 3 – ENERGY CONSUMPTION PROFILES





ANNEX 4 – COMPARISON OF DEGREE DAYS 2013/2014 VS. 2012/2013