EUROPEAN COMMISSION

Environmental Management System

Environmental Statement

2017 results

Annex B: Luxembourg

Final

For further information on environmental performance in Luxembourg please contact:

Functional mailbox: OIL-EMAS

Or see EMAS page on https://myintracomm.ec.europa.eu/staff/EN/buildings-transports/environment/emas/Pages/emas.aspx

Foreword

The Office for Infrastructure and logistics in Luxembourg (OIL) ensures that all activities associated with the housing of staff, the management of social welfare infrastructure and the logistics of the institution are well carried out. This includes building management, organising removals and space management, transport services for staff and goods for internal purpose, document distribution, administering office supplies as well as welfare facilities for staff (canteens, fit@work spaces…), providing services such as crèches and after-school childminding, ensure compliance and implementation of health and safety requirements in Commission buildings, including the guards contract.

In all aspects of this vast variety of activities, OIL strives to reduce its environmental impact, in accordance with the Commission general policy.

The environmental action plan for Luxembourg includes measures to enhance the energy efficiency, to reduce greenhouse gas emissions in buildings and transport activities, to reduce water and paper consumption…

A particular emphasis is put on measures promoting soft mobility, in a Commission seat where an important part of our staff comes daily from neighbouring countries.

Furthermore, the replacement of a part of the OIL fleet by hybrid and electric vehicles has started in 2018 and will continue in the future.

The ambition concerning the construction project of our future flagship building (JMO2), which will regroup most of the Commission services present in Luxembourg from 2023 on, is to have an environmentally highly performant building.

The present document summarizes the environmental performance for Luxembourg and the measures taken to mitigate the impact of our activities. OIL aspires to further improve this performance in the future.

e-Signed
Marc Becquet

Director
Office for Infrastructures and logistics Luxembourg

Contents

ANNEX B: LUXEMBOURG – ADMINISTRATIVE ACTIVITIES

Luxembourg is the European Commission's second largest site and in 2017 hosted 4 786 staff, an increase of 3% over 2016. They work at 20 Commission's Directorates Generals (DG) in 19 buildings[1]. The vast majority of buildings are located in Luxembourg City.

The activities are mainly of administrative nature, with some support and logistics services (like catering, offices supplies, childcare facilities, etc.). Luxembourg also hosts the main data centres of the Commission and a radio-toxicological laboratory.

The Office for Infrastructure and Logistics in Luxembourg (OIL) manages the Commission's buildings and logistics in Luxembourg and coordinates implementation of the Commission's Eco Management and Audit System (EMAS) for the site.

B1 Overview of core indicators at Luxembourg since 2011

Table B1: Historical data, performance and targets of core indicators used in Commission level reporting

Physical indicators:	Historic data values, all buildings since 2015					Performance trend (%) to 2017 (total) since:				Target	
(Number, desciption and unit)	2011 (1)	2014	2015	2016	2017	2011	2014	2015	2016	2014 to 2020	
	EMAS	EMAS	Total	Total	Total					Δ % (2)	value (2)
1a) Energy bldgs (MWh/p)	8,35	17,42	17,70	18,43	14,41	72,7	-17,3	-18,6	-21,8	-5,0	16,55
1a) Energy bldgs (KWh/m^2)	229	395	359	355	286	24,9	-27,7	-20,4	-19,6	-5,0	375
1c) Non ren. energy use (bldgs) %		27,8	53,7	53,2	54,8		96,9	2,0	3,0	0,0	27,8
1d) Water (m^3/p)	12,26	14,48	10,50	18,61	14,44	17,8	-0,3	37,5	-22,4	0,0	14,48
1d) Water (L/m^2)	352	329	213	359	286	-18,7	-12,9	34,4	-20,2	0,0	329
1e) Office paper (Tonnes/p)	0,034	0,024	0,018	0,017	0,015	-56,9	-38,7	-20,7	-12,1	0,0	0,024
1e) Office paper (Sheets/p/day)	32	24	19	17	15	-54,0	-38,7	-20,8	-12,1	0,0	24,1
2a) CO_2 buildings (Tonnes/p)	1,19	1,91	2,26	2,59	2,15	81,2	12,3	-5,0	-17,0	-5,0	1,8
2a) CO_2 buildings (kg/m^2)	32	43	46	50	43	31,1	-1,9	-7,2	-14,7	-5,0	41,2
2c) CO_2 vehicles (g/km, manu.)	191	171	167	161	158	-17,3	-7,6	-5,4	-2,1	-5,0	162
2c) CO_2 vehicles (g/km, actual)	240	260	258	263	256	6,7	-1,6	-0,7	-2,4	-5,0	247
3a) Non haz. waste (Tonnes/p)	0,245	0,103	0,194	0,222	0,179	-27,1	74,4	-7,6	-19,3	0,0	0,103
3b) Hazardous waste (Tonnes/p)	0,0017	0,0015	0,0013	0,0033	0,0047	170,4	223,5	269,5	43,9	0,0	0,001
3c) Separated waste (%)	38,2	44,7	49,9	61,8	59,3	55,3	32,7	18,8	-4,1	5,2	47,0
Economic indicators (Eur/p)											
Energy consumption (bldgs)		765	549	557	382		-50,1	-30,4	-31,5	0,0	765
Water consumption		61,54	44,64	79,09	61,38		-0,3	37,5	-22,4	0,0	61,54
Non haz. waste disposal		35,07	66,23	75,86	56,42		60,9	-14,8	-25,6	0,0	35,07

Notes: (1) Earliest reported data (2) compared to 2014, based on percentages identified in the EMAS annual action plan 2018

Table B1a: Historic data values for EMAS buildings only

	2011 EMAS	2014 EMAS	2015 EMAS	2016 EMAS	2017 EMAS
1a) Energy bldgs (MWh/p)	8,35	17,42	14,40	11,25	12,45
1a) Energy bldgs (KWh/m^2)	229	395	342	313	346
1c) Non ren. energy use (bldgs) %	0,00	27,83	64,6	51,0	53,6
1d) Water (m^3/p)	12,26	14,48	11,32	13,71	13,48
1d) Water (L/m^2)	352	329	269	381	375
2a) CO_2 buildings (Tonnes/p)	1,19	0,89	1,93	1,50	1,73
2a) CO_2 buildings (kg/m^2)	32	20	46	42	48
3a) Non haz. waste (Tonnes/p)	0,25	0,10	0,20	0,10	0,12
3b) Hazardous waste (Tonnes/p)	0,002	0,001	0,001	0,002	0,003
3c) Separated waste (%)	38,2	44,7	73,8	53,0	50,2

Until 2014, indicators were reported only for buildings included in the EMAS registration. Since 2015, indicators include all Commission buildings of the Luxembourg[2]. Figures prior to 2015 are therefore not really comparable with the ones of the 2015 – 2017 period.

[1] Including Publications Office, OIL, PMO, Chafea and EAS/EPSO.

[2] Reporting yearly only for buildings in the EMAS scope can make it difficult to analyse performance trends as the building(s) added in a given year can be very different from those already within the scope (for example data centres). In 2014, the year used to establish baseline for 2020 targets, reporting did however include data centres, which explains the large rise in energy consumption compared to 2011.

The evolution of indicators for all buildings since 2011 is shown in table B1, for EMAS registered buildings in table B1a.

All staff moved out of the Jean Monnet building (JMO), the Commission's main seat in Luxembourg, by August 2016. However, the JMO remained operational until 1st June 2017 – owing to the large amount of equipment and material that had to be removed – and is therefore included in the data reporting.

In 2016, the JMO decommissioning generated an increase in the waste quantities. Energy and water consumption increased because the staff was resettled in three new buildings (ARIA, LACC and T2) and a new Data Centre was rented in Betzdorf, while the JMO remained open.

In 2017, the trend is positive for most of the indicators, mainly because the JMO was empty. Per capita consumption decreased significantly compared with 2016 for energy (-21.8%), water (- 22.4%). and non-hazardous waste quantities (-19.3%).

Consumption measured per square metre also decreased but the fall is somewhat artificial because the figures include the empty JMO building (63,725 m²).

The paper consumption continues to decrease.

In 2017 three office buildings were rented to accommodate staff vacating JMO, while its replacement is under construction, the Ariane, Laccolith and T2 buildings, totalling 40 476 m², were successfully audited for inclusion in the EMAS registration. The childcare facility CPE3 (5 218 m²) will be included in 2018 and is therefore already incorporated into for reporting for EMAS buildings performance in 2017.

The evolution of the key parameters of the EMAS system in Luxembourg is shown below.

Table B2: EMAS baseline parameters

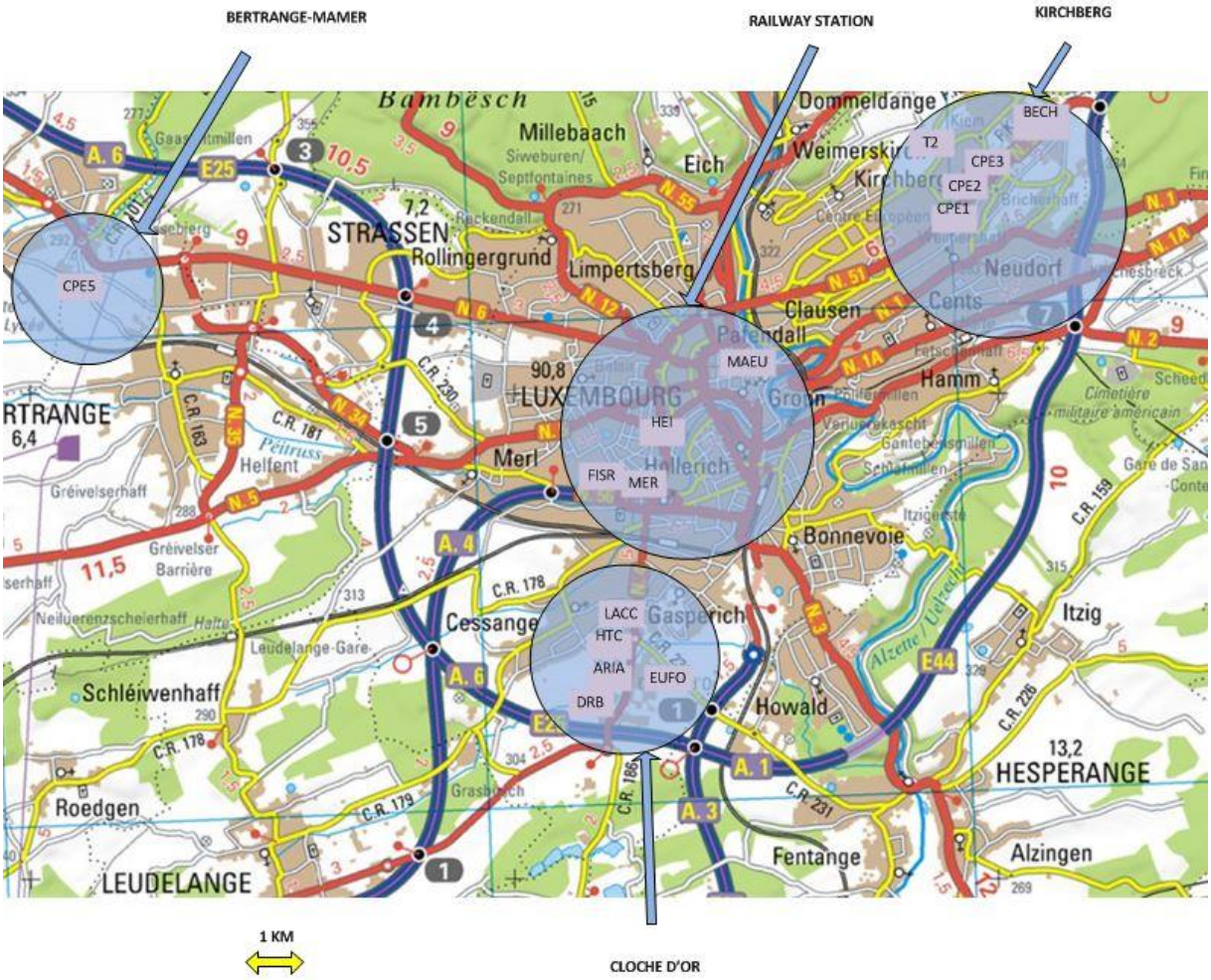
	2011	2012	2013	2014	2015	2016	2017
Population: staff in EMAS perimeter	759	1 315	1 422	1 492	2 378	3 912	4 059
Population: total staff	3 999	3 997	4 048	4 043	4 667	4 653	4 786
No. buildings for EMAS registration	2	3	4	6	7	10	11
Total no. operational buildings	13	14	14	14	17	19	19
Useful surface area in EMAS perimeter, (m^2)	27 710	49 938	64 703	65 759	100 221	140 697	145 915
Useful surface area for all buildings, (m^2)	180 818	191 713	191 713	198 205	230 124	241 464	241 464

B2 Description of Luxembourg activities and key stakeholders:

Most of the Commission's activities in Luxembourg are administrative and are supported by canteens, restaurants, cafeterias, archives, a print shop, a vehicle fleet, medical services, a day nursery and study centre. However, DG ENER also manages a radiation protection laboratory.

In addition to administration, the radiation protection laboratory and child care facilities, the fourth major Commission activity is composed of the three data and telecom centres in Windhof, Hitec and Betzdorf, the first two currently being registered under EMAS. Figure B1 shows the location of Commission buildings in Luxembourg.

Figure B1: Location of EMAS and other buildings in Luxembourg



Most buildings are located in the Kirchberg area in the centre of the City of Luxembourg or to the South of the city centre at Cloche d'Or. However, CPE 5 is 15 km West of Luxembourg in Bertrange-Mamer while Windhof is close to the Belgian border. The Hitec (HTC) data centre is located in the Cloche d'Or area and is situated in the basement of the Hitec office building. Betzdorf data centre is located North-East of Luxembourg City.

Commission services in the Cloche d'Or and Kirchberg area serve typical administrative functions. The Euroforum (EUFO) building also accommodates a radiation protection laboratory (DG ENER). CPEs cater entirely to children of staff with inter-institutional crèches, after school and study centres.

Other than the "Foyer Européen", which is owned by the European Union, and the EUFO, CPE3 and CPE5 buildings, for which the Commission has long-term leases with purchase options, all Commission buildings are leased. The buildings and the year when they were or are scheduled to be EMAS registered are listed in the table below.

Table B3: Commission buildings in Luxembourg

Number	Building	EMAS year	Surface (on the ground, m2)	% of EMAS surfac of total surface	Staff 2018*	Year of construction	Year of acquisition or leasing	Occupation type
1	DRB	2012	23.516	9,74	888	-	B: 2006; A: 2009; D: 2010	Rental
2	HITEC (office)	2012	4.194	1,74	101	-	2005	Rental
3	EUFO	2013	26.098	10,81	575	1995 and 2003	1995, 2003	Emphyteosis with purchase option
4	CPE5	2014	10.895	4,51	50	2011	2011	Emphyteosis with purchase option
5	eBRC HITEC (data centre)**	2015	252	0,10	8	-	2006	Rental
6	eBRC WIN (data centre)**	2015	1.206	0,50	5	-	2007, 2009	Rental
7	BECH	2016	34.060	14,11	887	-	1998, 2005	Rental
8	ARIANE	2017	13.624	5,64	549	-	2015	Rental
9	LACCOLITH	2017	11.292	4,68	428	-	2015	Rental
10	T2	2017	15.560	6,44	512	2016	2016	Rental
11	CPE1 & 2	Will be replaced	4.370	1,81	37	-	1984	Rental
12	CPE3	2018	5.218	2,16	46	-	1996, 2009	Rental with purchase option
13	FOYER	2019, TBC	1.192	0,49	7	1920	2009	Owner
14	FISCHER	TBC	3.526	1,46	120	-	2005	Rental
15	MERCIER	Will be replaced	19.953	8,26	571	1970, 1984	I: 1973, 1998; II: 1985	Rental
16	eBRC R11-70	2019, TBC	274	0,11	1	TBC	TBC	TBC
17	MAEU	Will be replaced	929	0,38	12	-	2005	Rental
18	JMO	Not relevant starting from 2016	63.725	26,39	1	1975-1978	1975	Location
19	DC BETZDORF	2019, TBC	1.580	0,65			2016	Rental
TOTAL			241.464	100,00	4798			

* Population on 23/03/2018

** Calculated surface : useful surface on the ground and underground

EMAS Surface
Non-EMAS Surface

The main real estate project for the Commission in Luxembourg is the construction of a new seat, the JMO2, in the Kirchberg area. Delivery of this building is scheduled in two phases, in February 2023 and March 2024.

JMO2 will replace most of the rented office buildings: DRB, HTC, BECH, ARIANE, LACC and T2.

The Mercier building presently hosting the Publications office will be replaced within 3-4 years as it will be destroyed in the medium-term. CPE 1 and 2 buildings will also be replaced by a new building to be built by the Luxembourg authorities. The European Parliament will launch a real estate procedure to find new premises for the “House of Europe”, presently hosted at MAEU. For these reasons, these buildings will not be included in the EMAS scope.

The major interested parties of the Commission at Luxembourg are:

- Contractors
- Commission services (OIL clients and counterparts)
- European Commission staff
- Local authorities
- Other European institutions
- Others occupants in shared buildings and landlords
- Neighbours with whom we share the same mobility issues
- General public

OIL stakeholders analysis focuses on two main issues:

Mobility
One of the main specificities of the Luxembourg site is the large number of commuters. 180 000 workers (half from France, a quarter each from Germany and Belgium)[3] commute daily to the country, with a high proportion to Luxembourg City. This is a very high proportion of the country's population (602 000), and exceeds that of the capital city (116 000).

Luxembourg is a very attractive work place located in the so-called "Grande Région" and this influences the real estate prices, including rental. The high prices force many workers, including Commission agents and external workers on lower salaries, to live outside the country.

The population is growing fast with 20% growth seen in 6 years in Luxembourg city. There are commercial and residential construction sites everywhere and there is huge public investment in the transport sector. Luxembourg City has witnessed the inauguration of the tram, two new railway stations and a funicular, all in 2017.

In this context, the Commission focuses many efforts in negotiations with local stakeholders – both public and private – in order to improve the mobility of its staff (see B4 below).

Real estate
The Luxembourg state's involvement in some Commission real estate projects influences where Commission sites are located. For example, when the Commission decided to leave the JMO, the authorities put the T2 office building and Betzdorf Data centres at its disposal, free of charge, for several years.

The Luxembourg state is also responsible as "Maître d'ouvrage" for the construction of the JMO2 building. The Luxembourg Public Building Administration and the Commission are in constant contact to implement this project ensuring that local legislation (for example concerning the number of parking places), the EU internal rules (manual of accommodation conditions, Manual of "Immeuble Type"…) and environmental considerations are addressed.

The Commission rents space in some buildings (Drosbach, Laccolith, Bech) that have other occupants. This can complicate the management of activities with an environmental impact such as the energy consumption, the waste sorting, the data collection.

B3 Environmental impact of Luxembourg activities

OIL reviews the site's environmental aspect analysis annually and updates its action plan as new buildings enter into the EMAS scope. Below is a summary of the main aspects and measures that were undertaken or ongoing in 2017.

[3] Figures from 2016 by STATEC, the Luxembourg National Institute of Statistics

Table B4: Summary of significant environmental aspects and mitigating measures in 2017 for the Luxembourg site

Aspect group	Environmental aspects	Environmental impact	Measures and actions
Resource consumption (Energy)	Building heating, lighting, wood chip heating generator, steam generators, data centres	Pollution, climate change, exploitation/ depletion of natural resources	• In-depth analysis of energy consumption in certain buildings (34) • EUFO: Replacement of last 2 cooling towers + replacement of the last cooling installation (33) • change incandescent bulbs with LED light bulbs in EUFO (72) • All buildings: Diminishing the temperature during the closing week of the offices at the end of the year (272)
Resource consumption (water)	Water for sanitation and installations, water consumption	Reduced potable water sources potable impact on aquatic diversity	• Technical measures and studies to reduce water usage in different buildings : DRB (73 and 282), ARIA (284), BECH (285)
Air	Emissions of CO_2, SOx, NOx, CO, VOC,	Air Pollution Risks for biodiversity and climate change- Destruction of the ozone layer	• OIL will analyse in cooperation with Luxembourg City the possibility of using the "Vel'oh" system in the Commission (403). • OIL will analyse the possibility of enlarging the scope of Jobkaart [4](120) • OIL will continue to participate in inter-institutional discussions on how to increase the scope of M-Pass[5] (121) • Check how contractors apply EP's and Council's regulation 517/2014 on fluorinated greenhouse gases (122) • Study - replacement of petrol cars with electric cars (118). At least two e-cars will be received in 2018
Air	Air emissions from the nuclear laboratories	Radioactivity	DG ENER's radiation protection laboratory ISO 17025 accredited since 2016. No specific measure in 2017
Waste	Generation of various household waste (for example packaging, paper, cardboards, metals)	Odours, greenhouse gases, pollution of the air, water and/or soil Impacts on biodiversity	• Since 2016, every new maintenance contractor of OIL takes care of its waste (147) + OIL.03 control (149) • Continuous information of cleaning contractor on the needs for better waste sorting (148) • Continue drafting yearly reports on waste for all buildings according to Lux legislation (if required sent to the Ministry of Environment) (154) • Since 2017, all restaurants and cafeterias have a centralised organic waste collection (135)
Waste (waste Water discharge)	Water discharged nuclear laboratories	Water pollution, risks of eutrophication reduced potable water sources potable-Impact on aquatic biodiversity	No waste water discharge by DG ENER in 2017

( ) = Number of action included in the Commission's EMAS Global Annual Action Plan (GAAP)

[4] Free transport ticket in Luxembourg city
[5] Subsidised transport card valid throughout the country

In the mid-term, the flagship project for OIL is the construction of the new JMO2 building. The ambition for the future main seat of the Commission in Luxembourg is to obtain the BREEAM Excellent label. OIL team strives to reach this objective.

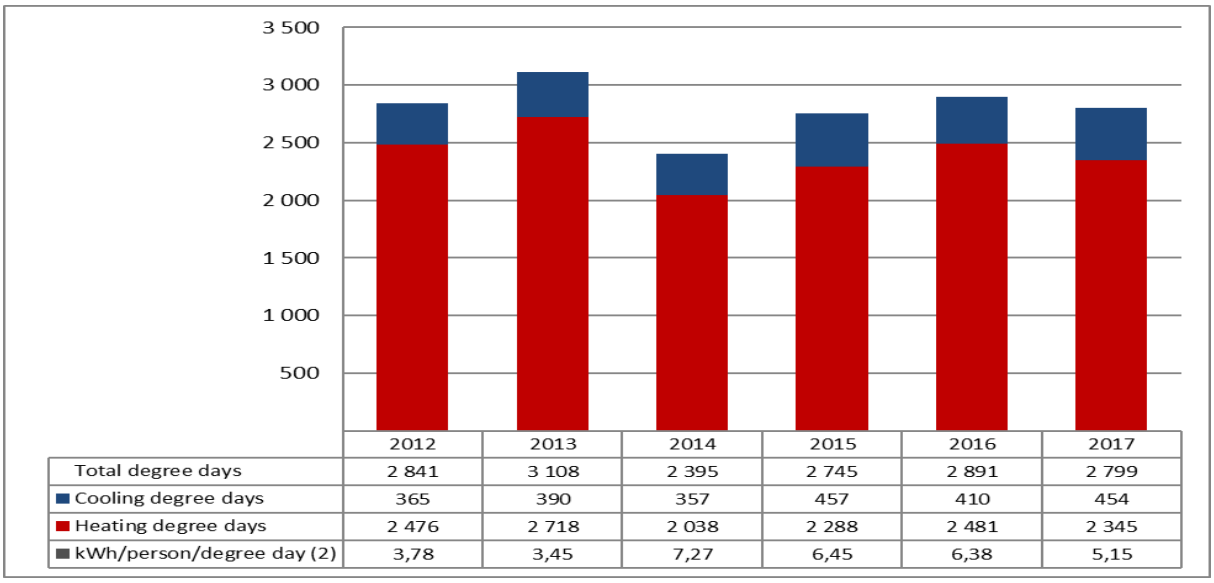
Other real estate projects like the relocation of the Publications Office (to replace the Mercier) or the construction of a new Child Care facility (to replace CPE 1 and 2) also intend to have buildings with a higher environmental performance than the present ones.

B4 More efficient use of natural resources

B4.1 Energy consumption

Buildings energy consumption data should be considered in the context of climatic conditions. Analysis of degree data presented below show that climatic conditions have been slightly milder in 2017 than in 2016 and that less energy is likely to have been required than the year before.

Figure B2: Total annual degree-days in Luxembourg, 2012-2017



	2012	2013	2014	2015	2016	2017
Total degree days	2 841	3 108	2 395	2 745	2 891	2 799
Cooling degree days	365	390	357	457	410	454
Heating degree days	2 476	2 718	2 038	2 288	2 481	2 345
kWh/person/degree day (2)	3,78	3,45	7,27	6,45	6,38	5,15

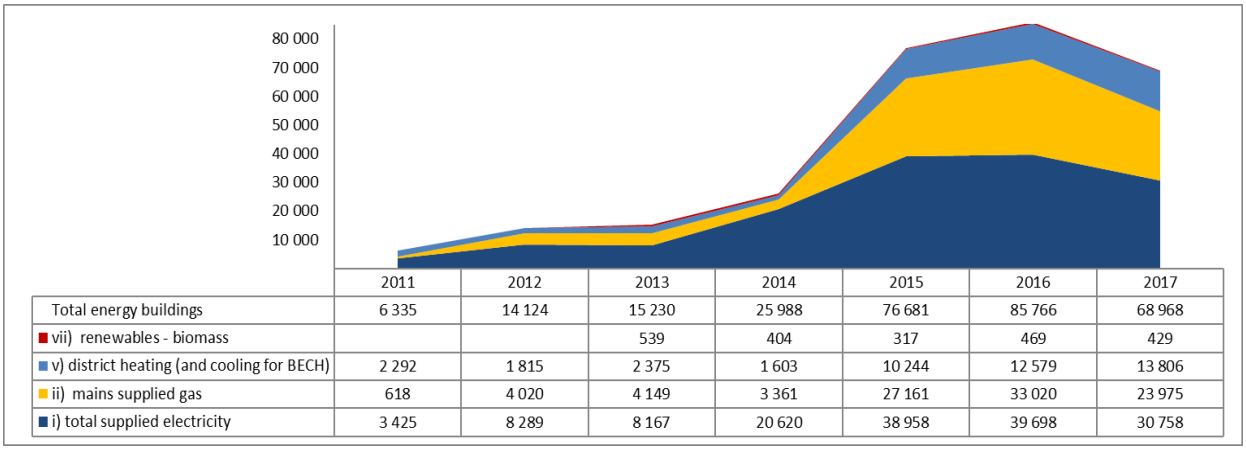
(1) www.degreedays.net; monthly data for ELLX station (15.5 C reference temperature)
(2) Using buildings energy consumption data for Luxembourg site

a) Buildings

The evolution of total annual energy consumption is presented in Figure B3. Up to 2015, it was influenced by the number of buildings incorporated in the EMAS perimeter. The peak in 2016 is mainly due to the rental of three new office buildings to replace the JMO end of 2015 and a new data centre in 2016.

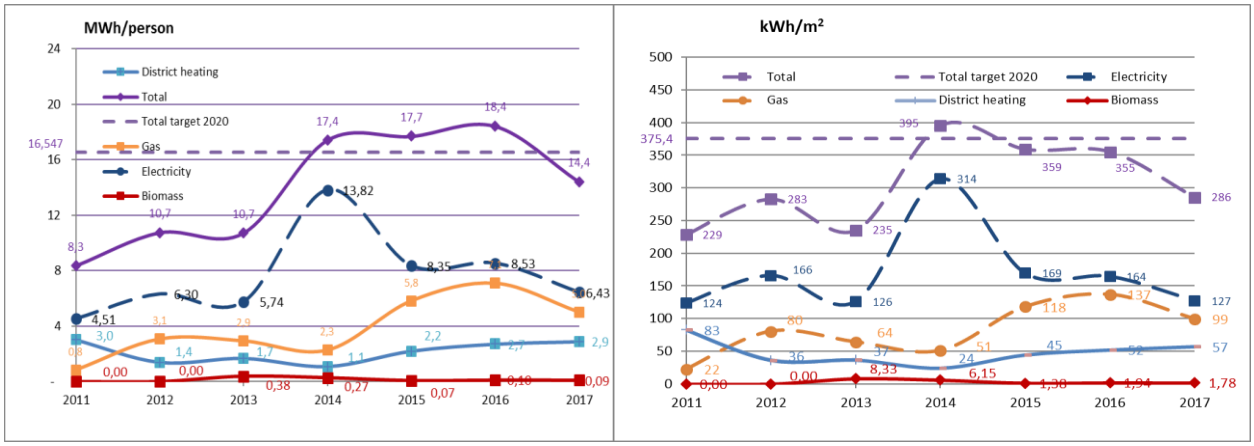
The decrease in 2017 is mainly due to staff leaving the JMO. The global consumption remains stable in the other buildings, except for T2 and DC Betzdorf, which are counted for the first time for a whole year (move in 2016).

Figure B3: Annual buildings energy consumption (MWh) (EMAS registered buildings to 2014, all buildings from 2015 (indicator 1a)



	2011	2012	2013	2014	2015	2016	2017
Total energy buildings	6 335	14 124	15 230	25 988	76 681	85 766	68 968
vii) renewables - biomass			539	404	317	469	429
v) district heating (and cooling for BECH)	2 292	1 815	2 375	1 603	10 244	12 579	13 806
ii) mains supplied gas	618	4 020	4 149	3 361	27 161	33 020	23 975
i) total supplied electricity	3 425	8 289	8 167	20 620	38 958	39 698	30 758

Figures B4 and B5: Evolution of total annual energy consumption (per capita and per square metre)



The large peak in 2014 in both graphs is due to the inclusion of data centres in the scope. After the removal of staff from the JMO, the overall trend for both indicators is in the right direction.

Actions prioritising the reduction of energy consumption (indicator 1a) are included in the annual action plan (see table B4). The majority of actions focus on technical improvements for the heating system where possible, such as changing thermostatic valves, and measures relating to lightning.

b) Vehicles

At the end of 2017, the Luxembourg site has a fleet of 30 vehicles (including DG ENER vehicles), of which eight are owned and the remainder leased. Four owned vehicles use petrol, all other cars use diesel. These include:

- 13 sedans (3 allocated to director generals, and 10 for missions, mostly to Brussels and Strasbourg)
- 8 people carriers
- 7 small vans
- 2 refrigerated trucks.

The vehicles are used to transport people and goods within Luxembourg City, for longer missions mainly between to Brussels or Strasbourg, but also throughout EU countries. DG ENER made 30 missions in 2017 transporting equipment to nuclear premises across Europe.

The majority of OIL's missions cover longer distances and relatively few kilometres are accumulated in Luxembourg.

Table B5 Summary vehicle energy consumption (indicator 1b)

	2013	2014	2015	2016	2017
Total (MWh/yr)	535	560	592	698	645
MWh/person	0,38	0,38	0,13	0,15	0,13
Diesel used, (m^3)	48,5	50,5	53,3	62,8	58,6
Petrol used, (m^3)	0,7	1,0	1,3	1,5	0,7

In 2017, the per capita consumption of Commission service vehicles decreased to 2015 levels (0,13 MWh per person). The cars travelled 731,060 km, which is 5% less than in 2016 (769 874 km).

OIL has worked with the European Parliament to enable Commission staff to use the shuttle between Luxembourg and Brussels which contributes to the reduction of the total number of missions.

c) Renewable and non-renewable energy use in buildings and vehicles

Table B6: Renewable and non-renewable energy use in the buildings (indicator 1c)

Source of renewable and non renewable energy	2011	2012	2013	2014	2015	2016	2017
Electricity from renewables (%)	100	100	100	89	97	100	100
Electricity from renewables (MWh)	3 425	8 289	8 167	18 352	37 945	39 698	30 758
Site biomass (% renewable)			100	100	100	100	100
Site biomass (MWh)			539	404	317	469	429
Renewables (MWh)	**3 425**	**8 289**	**8 706**	**18 756**	**38 262**	**40 167**	**31 187**
Renewables (% of total energy)	**54**	**59**	**57**	**72**	**46**	**47**	**45**
Electricity from non-renewables (%)				11	3		
Electricity from non-renewables (MWh)				2 268	1 013		
Mains supplied gas (% non renewable)	100	100	100	100	100	100	100
Mains supplied gas (MWh)	618	4 020	4 149	3 361	27 161	33 021	23 975
District heating and cooling (% non renewable)	100	100	100	100	100	100	100
District heating and cooling (MWh)	2 292	1 815	2 375	1 603	10 244	12 579	13 806
Non renewables (MWh)		**5 835**	**6 524**	**7 232**	**44 347**	**45 600**	**37 784**
Non renewables (% of total energy)		**41**	**43**	**28**	**54**	**53**	**55**

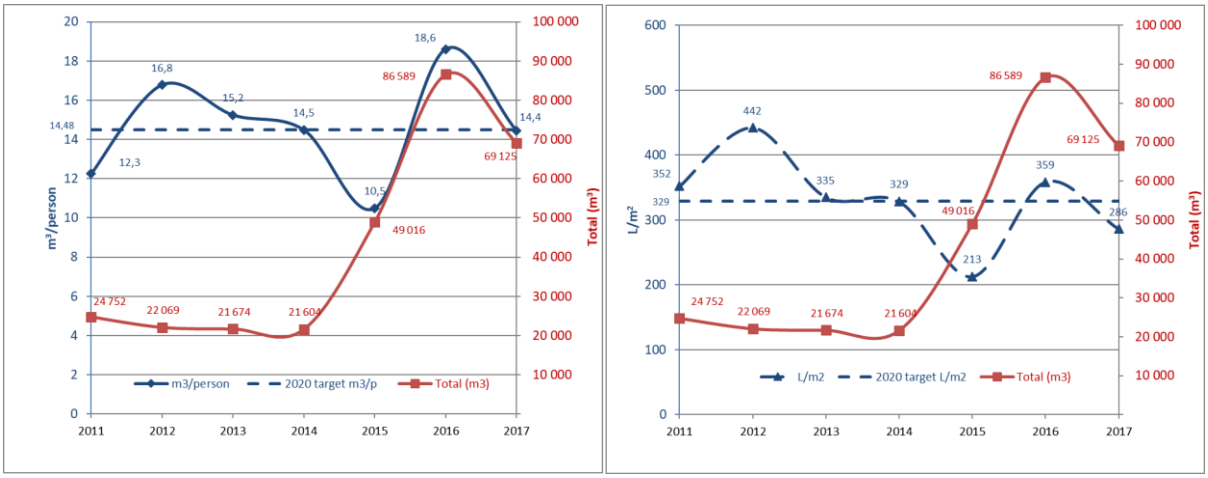
Renewable electricity (indicator 1c) accounted for 100% of total supplied electricity. The Commission has a contract for electricity derived from 100 % renewable sources since 2013. The electricity supply for all data and telecom centres – directly purchased by the property owners to the energy companies – comes also from 100 % renewable sources. The biomass is used in the wood-fuelled boiler at CPE5.

In 2017, the proportion of renewable energy decreased slightly due to staff leaving the JMO, where electricity was from renewable resources. The total electricity and gas consumptions have decreased for the same reasons.

The proportion of renewable energy should increase in future, as district heating and cooling systems will increasingly be supplied by renewable energy sources (bio-waste in Cloche d'Or, wood pellets in Kirchberg).

B4.2 Water consumption

Figures B6 and B7: Evolution of total annual water consumption for buildings (indicator 1d)



The total water consumption is shown by the red line of figures B6 and B7. The steady increase in 2015 and 2016 is due to the rental of three additional office buildings in this period. After removal from the JMO, consumption per person and m² (blue lines) decreased in 2017 and are close to the 2020 target.

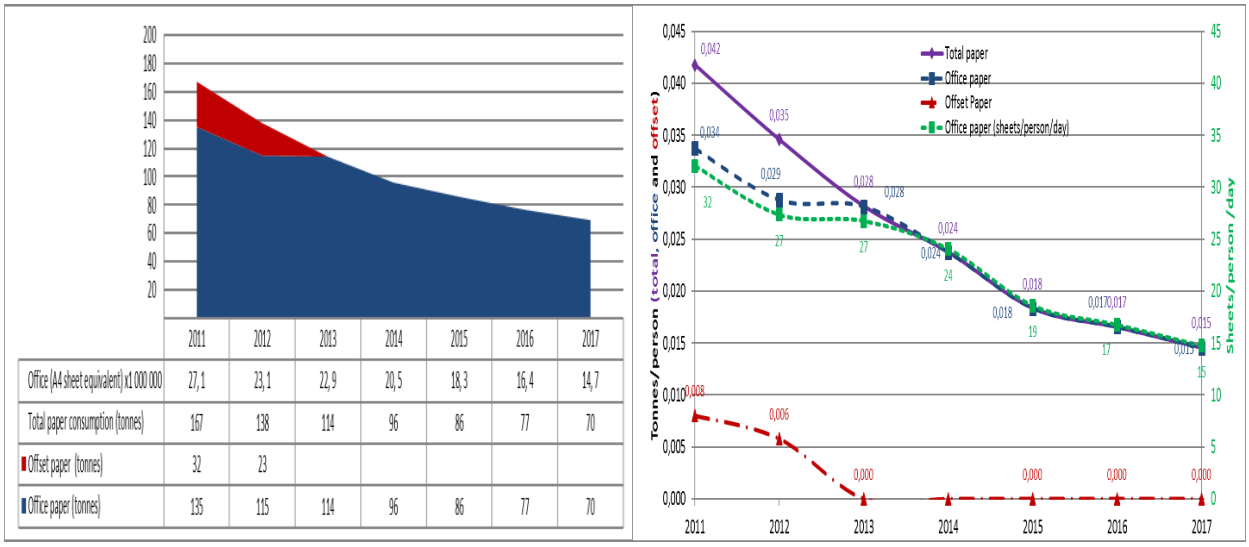
OIL has taken technical measures to mitigate the water consumption as for example replacing taps or decreasing water pressure.

Replacing the cooling towers in the EUFO building in June 2017 resulted in 3 500 m^3 of water savings in only 6 months. The building's consumption decreased by 60 %.

B4.3 Office and offset paper

The evolution of office paper in Luxembourg and per capita breakdown is presented below.

Figures B8 and B9: Evolution of paper consumption (totals, and per capita)



	2011	2012	2013	2014	2015	2016	2017
Office (A4 sheet equivalent) x1 000 000	27,1	23,1	22,9	20,5	18,3	16,4	14,7
Total paper consumption (tonnes)	167	138	114	96	86	77	70
Offset paper (tonnes)	32	23					
Office paper (tonnes)	135	115	114	96	86	77	70

Figure B8 shows how office paper use has reduced over time. It should be noted that these figures do not include the activities of the Publications Office print shop. As the OIL print shop uses special paper, it is considered for the total paper consumption in tons but not for the number of office sheets.

In 2017, the office paper consumption was around 14,7 million equivalent A4 pages. The A4 paper density has been decreased from 80 to 75g/m² since 2014 contributing to the reduction of the global tonnage. OIL is considering the possibility of further reducing the paper density.

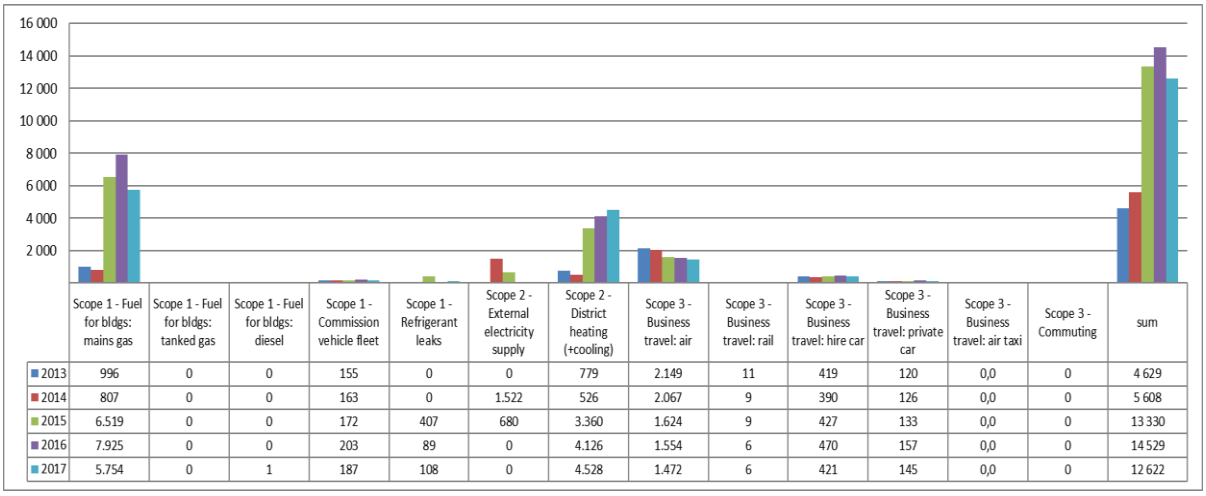
The reduction of the tonnage can also be partially explained by the fact that after the JMO removal, the activities of the OIL print shop have for a big part been transferred to the Parliament until a relocation in a Commission building, planned for mid-2018. OIL ceased to use offset machines in its print shop in 2013.

The number of pages per person per day shown in figure B9 decreased from 17 to 15 in one year. As in other Commission sites, a reduction in paper consumption follows ongoing efforts to increase circulation and saving of documents in digital format, scanning, email and e-signing signing to replace paper signataires along with the widespread use of double sided printing when paper is necessary.

B5 Reducing air emissions and carbon footprint

B5.1 Carbon footprint

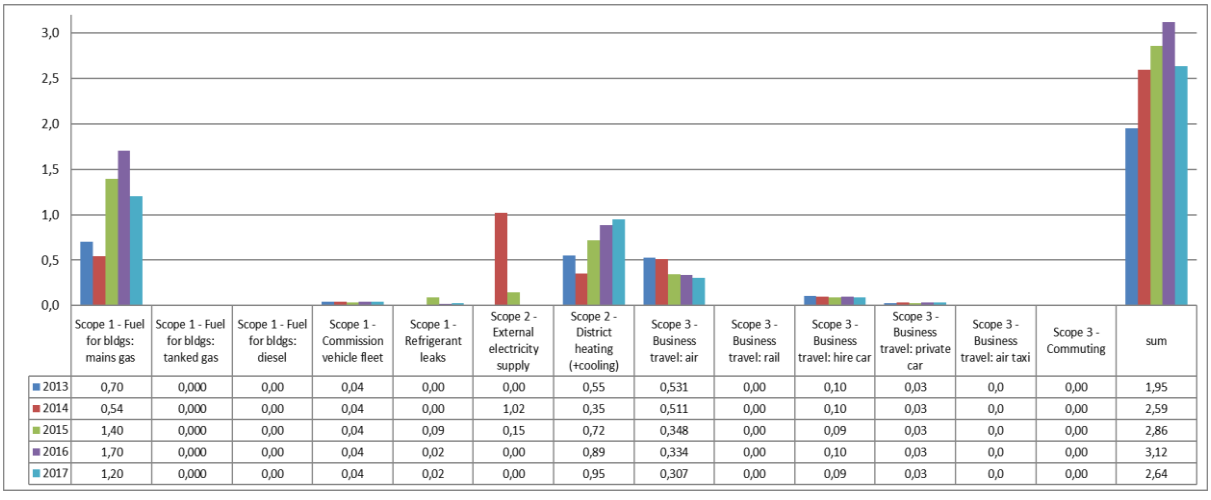
Figure B10: Carbon footprint contributors for Luxembourg (Tonnes CO_2)



	Scope 1 - Fuel for bldgs: mains gas	Scope 1 - Fuel for bldgs: tanked gas	Scope 1 - Fuel for bldgs: diesel	Scope 1 - Commission vehicle fleet	Scope 1 - Refrigerant leaks	Scope 2 - External electricity supply	Scope 2 - District heating (+cooling)	Scope 3 - Business travel: air	Scope 3 - Business travel: rail	Scope 3 - Business travel: hire car	Scope 3 - Business travel: private car	Scope 3 - Business travel: air taxi	Scope 3 - Commuting	sum
2013	996	0	0	155	0	0	779	2.149	11	419	120	0,0	0	4 629
2014	807	0	0	163	0	1.522	526	2.067	9	390	126	0,0	0	5 608
2015	6.519	0	0	172	407	680	3.360	1.624	9	427	133	0,0	0	13 330
2016	7.925	0	0	203	89	0	4.126	1.554	6	470	157	0,0	0	14 529
2017	5.754	0	1	187	108	0	4.528	1.472	6	421	145	0,0	0	12 622

Note: RFI 2 used for air travel emissions

Figure B11: Carbon footprint contributors for Luxembourg (Tonnes CO_2/person)



	Scope 1 - Fuel for bldgs: mains gas	Scope 1 - Fuel for bldgs: tanked gas	Scope 1 - Fuel for bldgs: diesel	Scope 1 - Commission vehicle fleet	Scope 1 - Refrigerant leaks	Scope 2 - External electricity supply	Scope 2 - District heating (+cooling)	Scope 3 - Business travel: air	Scope 3 - Business travel: rail	Scope 3 - Business travel: hire car	Scope 3 - Business travel: private car	Scope 3 - Business travel: air taxi	Scope 3 - Commuting	sum
2013	0,70	0,000	0,00	0,04	0,00	0,00	0,55	0,531	0,00	0,10	0,03	0,0	0,00	1,95
2014	0,54	0,000	0,00	0,04	0,00	1,02	0,35	0,511	0,00	0,10	0,03	0,0	0,00	2,59
2015	1,40	0,000	0,00	0,04	0,09	0,15	0,72	0,348	0,00	0,09	0,03	0,0	0,00	2,86
2016	1,70	0,000	0,00	0,04	0,02	0,00	0,89	0,334	0,00	0,10	0,03	0,0	0,00	3,12
2017	1,20	0,000	0,00	0,04	0,02	0,00	0,95	0,307	0,00	0,09	0,03	0,0	0,00	2,64

For both tables, figures from previous years have risen due to the application of new conversion factors (see note under table B11), though these are applied retrospectively.

As can be seen in figures B10 and B11, energy used in buildings is by far the main component of the carbon footprint. As the buildings portfolio evolves each year (two Datacentre incorporated in 2014, one in 2016, three new office buildings in 2015, JMO abandon in 2017), figures are difficult to compare.

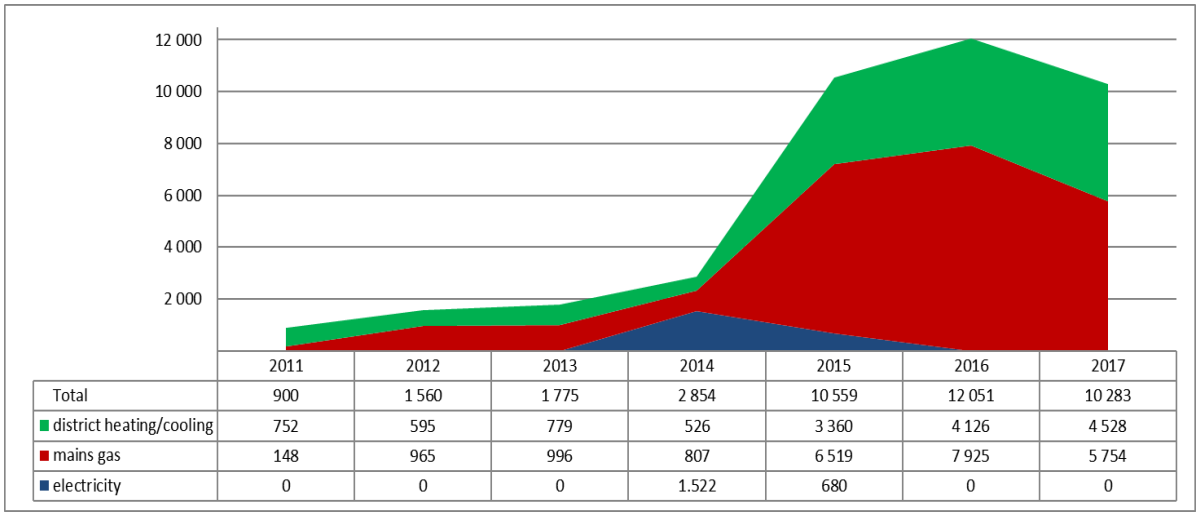
CO_2 emissions due to commuting is not calculated but OIL investigates the possibility to evaluate this in the coming years.

B5.2 CO_2 emissions from buildings

a) Buildings (energy consumption)

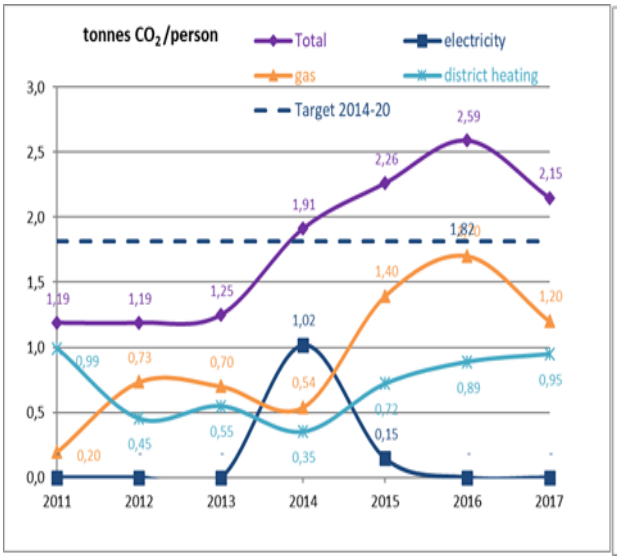
Figures B12, B13, B14: CO_2 emissions from buildings heating, tonnes and tonnes/person, kg/m^2, (indicator 2a)

B12

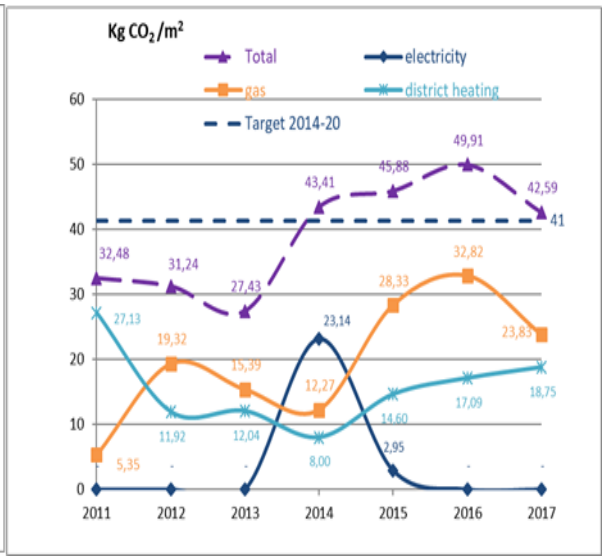


	2011	2012	2013	2014	2015	2016	2017
Total	900	1 560	1 775	2 854	10 559	12 051	10 283
district heating/cooling	752	595	779	526	3 360	4 126	4 528
mains gas	148	965	996	807	6 519	7 925	5 754
electricity	0	0	0	1.522	680	0	0

B13



B14



Following the JMO removal, the per capita and square meter consumption decreased, compared to 2016. The newly rented buildings are heated by gas, resulting in increased in gas consumption and CO_2 emissions in 2016. But emissions fell in 2017 to a level below that for 2015 suggesting overall site level improvement.

CO_2 emissions reductions are generally considered a consequence of actions targeting a reduction in energy consumption. It is likely that more renewable energy sources will be used to provide district heating and cooling generated, therefore probably decreasing CO_2 emissions.

b) Buildings - other greenhouse gases (refrigerants)

The HVAC[6] installations containing Hydrofluorocarbons (HFCs) are managed by the building owners, who at the Commission's request provide inspection results relating to refrigerants[7]. Losses have been registered for five types of gases.

Table B7: Total losses from gases in 2017

Losses per gas type	As kg	As tCO2 equiv
R410A	13,65	26,21
R134A	4,21	5,47
R404A	18,40	72,5
R407C	2,60	4,21
R417A	0,00	0,00
Sum	**38.86**	**108,39**

All equipments with other HFCs gases like R22 have been decommissioned.

B5.3 CO_2 emissions from vehicles (indicator 2c)

a) Commission vehicle fleet

Table B8: Total emissions from the Luxembourg vehicle fleet

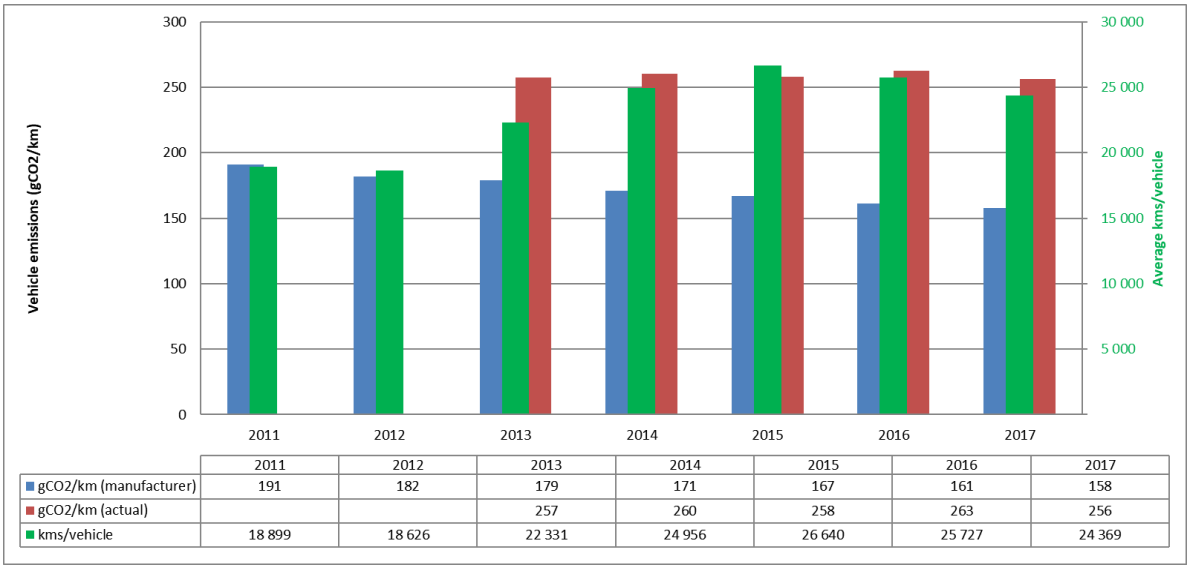
	2013	2014	2015	2016	2017
Site vehicle CO2 emissions (tonnes)	155	163	172	203	187
tonnes CO2/person	0,038	0,040	0,037	0,044	0,039
i) from diesel (tonnes)	153	160	168	198	185
ii) from petrol (tonnes)	2,0	2,9	3,6	4,1	2,0

After a peak in 2016, emissions from the vehicle fleet decreased in 2016. The global increase since 2013 is due to a larger number of vehicles included in the fleet (from 25 to 30).

Coefficients have been updated in 2017, including for the previous years. This allows emissions from our vehicles to include, in addition to fuel consumption, a small additional upstream component representing emissions generated in extracting the diesel and petrol and transporting it to where it is used.

[6] HVAC : Heating Ventilation Air Conditioning
[7] Data for Hitec and Mercier buildings were not available for 2017. They will be included when available

Figure B15 Emissions per km and distance travelled per vehicle



	2011	2012	2013	2014	2015	2016	2017
gCO2/km (manufacturer)	191	182	179	171	167	161	158
gCO2/km (actual)			257	260	258	263	256
kms/vehicle	18 899	18 626	22 331	24 956	26 640	25 727	24 369

There has been a relatively steady downward trend in manufacturer emissions, reflecting the improved performance of newer vehicles (with the best performance in their class) replacing old ones. Amongst the leased cars 18 cars had the EUFO 6 emission standard, up from 12 in 2016. The advantage of leasing fleet vehicles is that newer, less polluting, vehicles can regularly replace older cars.

The decision has been to gradually replace all Commision owned fleet cars by less polluting leased cars. The first hybrid and electric cars will be integrated into the fleet in 2018.

Actual emissions per km, calculated from fuel consumption, have remained relatively stable since 2013, with a small decrease in 2017. Figures for 2011 and 2012 have been removed has the way they were calculated is considered to be not relevant.

b) Missions and local work based travel (excluding Commission vehicle fleet)

There were no specific Luxembourg actions targeting mobility for missions. However, corporate activities related to missions include promoting videoconferencing in order to reduce the number of missions.

c) Commuting

Measures taken in 2017 to promote more environmentally friendly transport means for staff included:

- Free distribution of more than 3,000 Jobkaart to Commission staff. This card can be used throughout the public transport networks of Luxembourg City and is subsidised by the Commission and the city.
- Subsidised annual M-Pass card for the transport network within the Grand Duchy of Luxembourg. OIL has continuously worked with other institutions to enlarge the coverage of M-Pass. There are possibilities to combine the M-Pass with regional railway and bus tickets from neighbouring countries. 268 M-Pass have been ordered and distributed in 2017, for Commission staff, but also for staff of the Publications Office, the Translation Centre and the Consumers, Health, Agriculture and Food Executive Agency.
- Providing buildings with bicycle parking and showers to encourage staff to cycle to work.
- Providing and ensuring the regular maintenance of a fleet of service bikes to be used between Commission buildings. There were 1.110 service bicycle journeys in 2017, 46% more than in 2016.
- Participating in campaigns to promote public transport use and soft mobility (for more details, please see below).

In 2018 the Commission will, in relation to commuting in/to Luxembourg, continue its excellent cooperation with public authorities and other European institutions in promoting the use of public transport. Information sessions have been organised early 2018 following the new offer of public transport proposed in Luxembourg City since the end of 2017 (tram…).

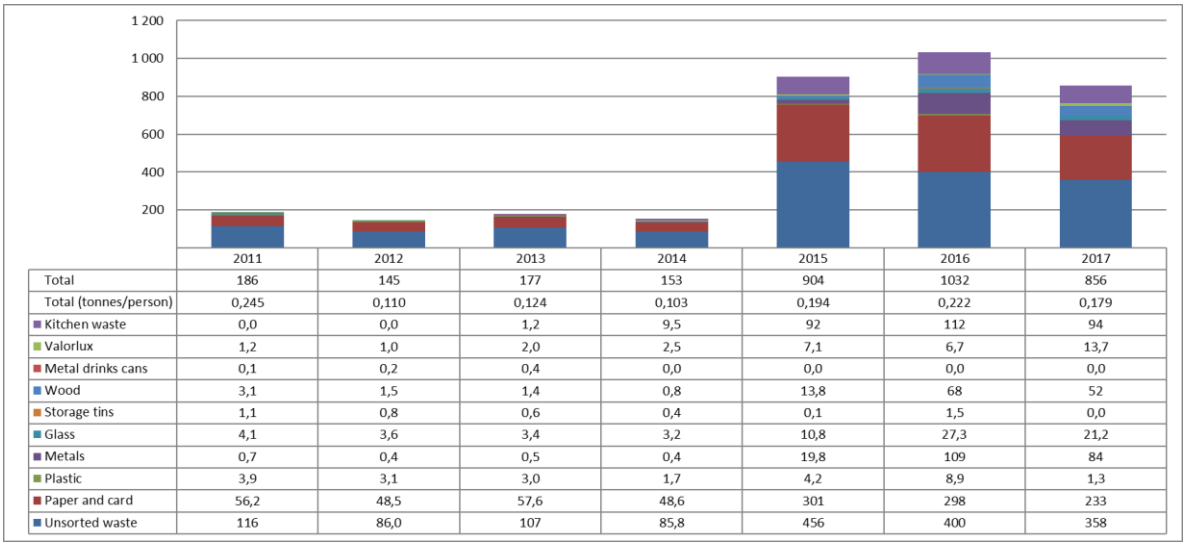
B5.4 Total air emissions of other air pollutants (SO2, NO2, PM)

These are currently not evaluated.

B6 Improving waste management and sorting

B6.1 Non-hazardous waste

Figure B16: Evolution of total non-hazardous waste in Luxembourg (tonnes)



	2011	2012	2013	2014	2015	2016	2017
Total	186	145	177	153	904	1032	856
Total (tonnes/person)	0,245	0,110	0,124	0,103	0,194	0,222	0,179
Kitchen waste	0,0	0,0	1,2	9,5	92	112	94
Valorlux	1,2	1,0	2,0	2,5	7,1	6,7	13,7
Metal drinks cans	0,1	0,2	0,4	0,0	0,0	0,0	0,0
Wood	3,1	1,5	1,4	0,8	13,8	68	52
Storage tins	1,1	0,8	0,6	0,4	0,1	1,5	0,0
Glass	4,1	3,6	3,4	3,2	10,8	27,3	21,2
Metals	0,7	0,4	0,5	0,4	19,8	109	84
Plastic	3,9	3,1	3,0	1,7	4,2	8,9	1,3
Paper and card	56,2	48,5	57,6	48,6	301	298	233
Unsorted waste	116	86,0	107	85,8	456	400	358

The evacuation of the JMO was completed in 2017. As in 2015 and 2016, this still generated a high quantity of waste (22% of the total) even if the global waste quantity has decreased. For example, the secured destruction of archives generated 22 tons of paper waste.

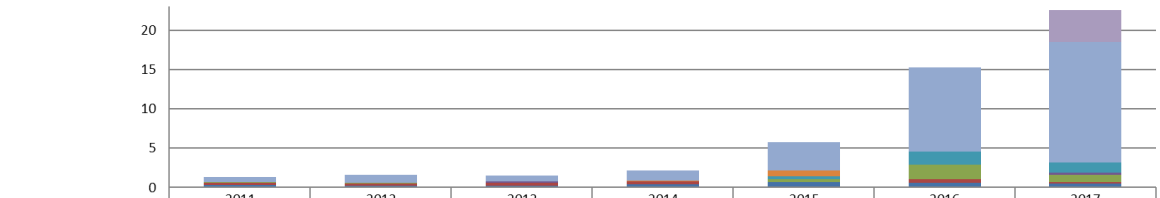
Some furniture and equipment including old cupboards and machines from the print shops remain in the JMO building and will be evacuated by the Fonds d'Urbanisation du Kirchberg, the public body to which the keys of the building were returned on June 1st, 2017.

Waste data collection has become more precise in 2017, as more items are counted directly rather than being estimated - Valorlux bags for example. Nevertheless, quantities for unsorted waste, which is collected by the City of Luxembourg is estimated from the number of waste containers per building, except in BECH and EUFO where there is a waste compactor and accurate weighing. In order to have more accurate figures in the future, OIL is considering installing new waste compactors in buildings where there is enough space, and to equip the buildings with weighing balances and to further reduce the proportion of unsorted waste.

The quantity of non-hazardous waste measured on a per capita basis decreased from 222 kg in 2016 to 179 kg in 2017.

B6.2 Hazardous Waste

Figure B17: Evolution of total hazardous waste in Luxembourg (tonnes)



	2011	2012	2013	2014	2015	2016	2017
Total	1,32	1,66	1,48	2,17	5,95	15,22	22,54
Total (tonnes/person)	0,002	0,001	0,001	0,001	0,001	0,003	0,005
Other Hazardous waste							4,01
Oil and fat	0,65	1,07	0,71	1,25	3,67	10,7	15,3
Electric cables	0,00	0,00	0,00	0,14	0,69	0,00	0,00
Cartridges	0,00	0,00	0,00	0,00	0,38	1,69	1,31
Data support	0,00	0,00	0,15	0,00	0,00	0,00	0,27
Used containers	0,05	0,05	0,00	0,04	0,34	1,78	0,97
Used batteries	0,28	0,29	0,35	0,36	0,02	0,48	0,12
Medical waste	0,35	0,26	0,27	0,38	0,70	0,62	0,53

The rise in hazardous waste generation is due to more complete data recording and reallocation of some categories between hazardous and non-hazardous waste. Fat, for example, was previously recorded in non-hazardous waste.

The hazardous waste quantities remain very low, representing 2,5% of the total.

B6.3 Waste sorting

Table B9: Percentage of waste sorted at the Commission in Luxembourg

	2011	2012	2013	2014	2015	2016	2017
Percentage of waste sorted	38,2	41,4	40,1	44,7	49,9	61,8	59,3
Percentage of waste not sorted	61,8	58,6	59,9	55,3	50,1	38,2	40,7

There has been a slight decrease in the waste recycling rate in 2017 despite the controls on waste sorting in place during cleaning and decommissioning of the JMO building.

Awareness raising of Commission and contractor staff, especially those in the cleaning and kitchen teams, will be reinforced. Another factor is the fact that in some rented buildings, the waste management is under the owner's responsibility. OIL intends, subject to feasibility, to bring waste management back under its own responsibility. This should improve waste sorting rates and save money. The recent hand-over of the Publications Office building management to OIL should also have a positive impact on waste sorting.

B7 Protecting biodiversity

In the contract for maintenance of lawns, patios and outdoor plantings, the contractor is encouraged to use eco-friendly products. The present contractor is ISO-14001 certified.

The BREEAM Excellent label that OIL and the Luxembourg authorities want to reach for the new JMO2 building also include criterias concerning the biodiversity.

B8 Green Public Procurement (GPP)

B8.1 Incorporating GPP into procurement contracts

OIL aims to integrate environmental criteria into its contracts, with 15 out of 18 contracts signed in 2017, each worth more than 60 000 euros, including such criteria.

B8.2 Office supplies

Office supplies are delivered by a single provider. Approximately 36% of products in the catalogue carried a "green" designation. The promotion of eco-friendly products will be reinforced, amongst others during the 2018 Green week.

B9 Demonstrating legal compliance and emergency preparedness

The EMAS regulation requires EMAS-organisations to provide evidence of legal compliance with environmental legislation, including permits. Such compliance is necessary for the release of the environmental permits from the Luxembourgish authorities for each building of the European Commission in Luxembourg.

In 2017, OIL conducted actions in the following fields:

- Continued to work on the extension of the modules to be implemented in the GEPI software (software to manage the buildings - different modules on Operating permit / Energy / waste / Green building EMAS) – and put in place a working group on the best improvements/customization to be implemented in the GEPI.

- Continued to develop a network of contact persons within the various accredited bodies and control offices in Luxembourg.

- Attended the Conference on EMAS & Eco-labels, organised by the Luxembourg Institute of Science and Technology (LIST) that took place in Luxembourg on 5 September 2017.

B9.1 Management of the legal register and checking/establishing legal compliance

OIL used an external contractor to put in place a legal compliance system. Changes in legislation are communicated to relevant parties to follow up.

DG ENER has its own regulatory monitoring.

B9.2 Prevention, risk management and emergency preparedness

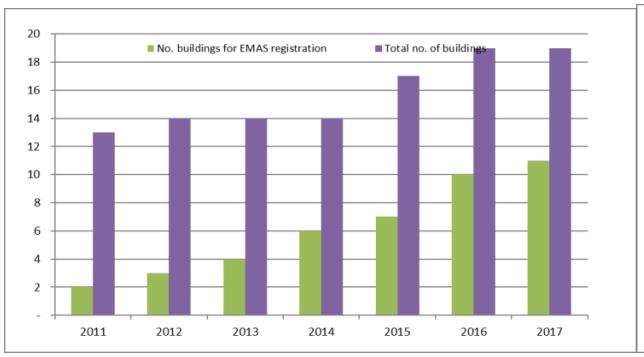
OIL has several measures in place to prevent and manage risks, the most important in 2017 being:

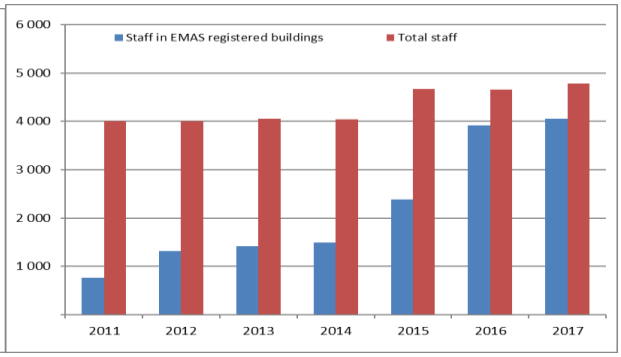
- Regular evacuation exercises: 16 evacuation exercises were organised by OIL plus one by the owner of Maison de l'Europe.
- Interinstitutional trainings for EPI/ECI[8]: 64 half-day trainings for 354 participants were organised.
- First aid and fire prevention trainings for Commission staff : 42 half-day trainings for 263 participants.

[8] Acronyms (in French) : EPI = Equipier de première intervention / ECI = Equipier chef d'intervention

B9.3 Integrating more buildings in the EMAS registration

Figures B18 and B19 below represent respectively the evolution in the number of buildings in Luxembourg that will be included in the next update of the EMAS and the number of staff they accommodate.





The buildings included in the EMAS registration (including CPE3) account for 60 % of the surface area (with JMO still included and 82% with JMO excluded) and 84% of staff in Luxembourg (see tables B2 and B3).

B9.4 Conformity with the EMAS system

OIL monitors the EMAS internal audit and verification audit findings in collaboration with DG HR and is responsible for addressing them (non-conformities, scopes for improvement, observations). In 2017, continued efforts were made in closing non-conformities.

B9.5 Compliance with environmental and other permits

The Luxembourg authorities issue environmental permits for each Commission building. In 2017, continuous improvements were made in the following topics:

- OIL continued improvements to further review and track permits and legal requirements while managing the new legislation for a good legal monitoring and improvements of the technical and legal controls. OIL finalised the file concerning the updating of the operating permit for the Euroforum building.

- Compliance was ensured by the owners of the leased buildings, for example by setting up and validating a building permit management procedure.

- A procedure concerning environmental incidents and accidents is under preparation and will be finalised in 2018.

- DG ENER has its own operating authorisation issued by the Ministry of health for nuclear activities in EUROFORUM.

B10 Communication

B10.1 Internal communication

The main communication events and messages during 2017 were the following:

Earth Hour: participation and promotion of the action held on March 25.

Positive drive campaign: in May, colleagues working in Cloche d'Or area could participate in a campaign on recording their commuting habits through a mobility app tool with the aim to better know traffic behaviour in this area known for its congestion. The next step is to set up a dialogue with the Luxembourgish authorities in order to identify the gaps in the mobility offer and try to remedy them. One of the probable solutions that will be looked at will be the promotion of carpooling.

Mobility survey in Kirchberg: In May, staff working in Kirchberg were invited to fill in an online questionnaire on mobility as part of the interinstitutional and inter-company mobility plan. The aim of the project - set up with the support of Luxembourg's Verkéiersverbond and covering all of the European Institutions in Kirchberg - was to make mobility easier for staff of the Institutions by identifying those areas of their daily commute where there is room for improvement. Results of the survey were published on OIL site and further discussed with the other EU institutions and the Luxembourgish authorities.

VeloMai: participation and promotion of this campaign organised in Luxembourg by DG HR, to promote the bicycle as a mean to come to work. OIL distributed "VEL'OH" (rented bicycles of Luxembourg City) passes that could be used throughout the entire campaign, free of charge.

Mam Velo OP d'Schaff: promotion of this bike to work campaign organized by the Luxembourg authorities (+ participation of an OIL team).

Interinstitutional Green Day: participation and promotion of this event organised on 21 June by the European Parliament, with the participation of different stakeholders: Enovos (energy supply), Verkéiersverbond and Luxtram (transport), SuperDreckskëscht and Valorlux (waste), Eco Batteries (eco-friendly products). OIL held its own stand during this event.

Green@work: promotion of the Green@work pledge (July).

Green Public Procurement: promotion of the seminar held in Parliament on October 16 and promotion of the GPP helpdesk.

Greening the end of the year parties: promotion of tips to organize more eco-friendly events.

Volunteering in Nature: promotion of events organized by DG HR.

Energy saving mode in buildings: the temperature in most of the buildings has been lowered during end of year's holidays.

In addition to this, OIL provided regular information on transport issues: road and train works, inauguration of the new tram, reorganisation of bus lines, etc.

OIL continues to manage the OIL EMAS and OIL MOBILITY functional mailboxes to respond to staff enquiries on environment and mobility topics.

B10.2 External communication and stakeholder management

The Commission has regular contacts with the Luxembourg authorities, particularly the Ministry of Sustainable Development and Infrastructure and Luxembourg City. In addition, there have been regular contacts with associations playing an important role in the field of waste management, energy efficiency and mobility. These include the following organisations:

- Verkéiersverbond (VKVB) – the body founded by Luxembourgish Ministry of Transport and who is responsible for the bargaining strategy, development of alternative kinds of mobility, coordinated activities of the responsible actors in the public transport sector as well as promotion and development of alternative transport technologies. The VKVB manages the M-Pass subscriptions and has organised the mobility study in Kirchberg.

- SuperDreckskëscht (SDK) – a body that operates for the Luxembourgish Ministry of Sustainable Development and Infrastructures in fields of information and awareness, regarding issues related to waste management and prevention, and disposal of dangerous substances. SDK delivers a quality label for buildings of bodies respecting their specifications concerning waste management. The Commission is labelled SDK since 2007 for most of its office buildings. In 2018, OIL will seek to further obtain the label for new buildings rented after the JMO removal and for CPE's.

- Inspiring More Sustainability – the non-profit association that organizes amongst others the positive drive campaigns

The Commission maintains close working relationships with other institutions in Luxembourg via the inter-institutional working group EcoNet. Main participants are the European Parliament, European Court of Justice, Court of Auditors and European Investment Bank. The group shares experiences, coordinates actions, organises common events (green days), tries to have a common approach towards the local authorities on environmental issues. It has for example been decided that OIL would coordinate negotiations with the Luxembourg City on the Jobkaart, the Court of Justice being the lead institution for the M-Pass. Six EcoNet meetings were held in 2017, with the main focus on mobility.

B11 Training

B11.1 Internal training

An EMAS training for OIL staff was organised on April 4th by the EMAS central coordination with OIL support. There were 25 participants. The training was meant to give an overview of what is EMAS, why it is important and to explain how the OIL staff can directly or indirectly contribute to the EMAS objectives.

An information session with approximtaely 60 participants from the DG Translation was given by the OIL waste manager. Further info-sessions will take place in 2018.

Training sessions for newcomers at the Commission, held by DG HR in full cooperation with OIL, have started again in 2018[9].

B11.2 External training

Eleven OIL drivers have benefited from an eco-drive training, organised by an external contractor.

Information sessions of Commission and contractors staff working in the kitchen will be provided in 2018 by the new contractor who is supplying the laundry products.

[9] A first session took place on April 27, 2018

B12 EMAS Costs and saving

Table B10: EMAS administration and energy costs for buildings in the EMAS area

Parameter	2 012	2 013	2 014	2 015	2 016	2 017
Total Direct EMAS Cost (EUR)	396 000	462 000	462 000	469 000	469 000	483 000
Total Direct Cost per employee	99	114	114	100	101	101
Total buildings energy cost (Eur)		1 755 676	3 091 906	2 559 940	2 590 576	1 826 572
Total buildings energy cost (Eur/person)		434	765	549	557	382
Total fuel costs (vehicles) (Eur)		49 328	51 752	54 780	64 574	59 496
Total energy costs (Eur/person)		12	13	12	14	12
Total water costs (Eur)		92 115	91 817	208 318	368 001	293 782
Water (Eur/person)		65	62	45	79	61
Total paper cost (Eur)		82 102	69 120	61 690	59 521	58 784
Total paper cost (Eur/person)		20	17	13	13	12
Waste disposal (general) - unit cost/tonne		335	342	342	342	315
Waste disposal (general) - Eur/person		42	35	66	76	56

Unit fuel cost estimations have been revised downwards for the whole 2013 – 2017 period.

The total direct EMAS coordination costs remains stable.

Other costs linked to energy and water consumptions in buildings, to paper use and to waste decreased because of lower quantities already explained in the different chapters.

B13 Conversion factors

Table B11: Conversion factors used in calculations for Luxembourg reporting

Parameter and units	2011	2012	2013	2014	2015	2016	2017
kWh of energy provided by one litre diesel [1]	0	0	10,89	10,89	10,89	10,89	10,89
kWh of energy provided by one litre petrol [1]	0	0	9,42	9,42	9,42	9,42	9,42
Paper Density (g/m^2)	80	80	78	75	75	75	75
Kgs CO_2 from 1 kWh of electricity [2]			0,000	0,671	0,671	0,000	0,000
Kgs CO_2 from 1 kWh natural gas [3]	0,240	0,240	0,240	0,240	0,240	0,240	0,240
Kgs CO2 from 1 kWh tanked gas			0,000	0,000	0,204	0,204	0,204
Kgs CO2 from 1 kWh diesel	0,330	0,330	0,330	0,330	0,330	0,330	0,330
Kgs CO_2 from 1 kWh district heating	0,328	0,328	0,328	0,328	0,328	0,328	0,328
GWP of R22			1 760	1 760	1 760	1 760	1 760
GWP of R410A			1 920	1 920	1 920	1 920	1 920
GWP of R134A			1 300	1 300	1 300	1 300	1 300
GWP of R404A [4]			3 940	3 940	3 940	3 940	3 940
GWP of R407C [4]			1 620	1 620	1 620	1 620	1 620
GWP of 417A					2 346	2 346	2 346
GWP of R600A					3	3	3
Kgs CO_2 from one litre of diesel (car fleet) [5]		3,16	3,16	3,16	3,16	3,16	3,16
Kgs CO_2 from one litre of petrol (car fleet) [5]		2,81	2,81	2,81	2,81	2,81	2,81

Conversion factors have been revised since 2016 and applied retroactively, for diesel and petrol, in order to better reflect upstream emissions. New factors have also been applied for GWP of gases following the EMAS central coordination recommendations[10].

[10] Source: ADEME, Base Carbone 2017