EUROPEAN COMMISSION

Environmental Management System

2015 Environmental Statement

2014 results

Version 1.4

Final

FOREWORD

Over the last few years, the European Commission has sought to increase the coverage of EMAS, its environmental management system.

During 2014 the Commission further expanded the system at its main sites by including all occupied buildings in Brussels and by adding two data centres at Luxembourg.

It also extended the EMAS system to additional locations across the European Union, namely the JRC sites at Karlsruhe in Germany and Ispra in Italy together with DG SANTE's site at Grange in Ireland.

As a result, the Commission's environmental management system now covers eight sites, which are spread across seven countries and represent a combined useful surface area that has increased by nearly 30% in the last year to over 1.500.000 m^2.

While EMAS is implemented as a tool for managing environmental performance at individual sites, pooling data from the additional sites makes it possible to build a more complete picture of the encouraging trends towards reduced overall resource consumption achieved by the Commission as a whole, as demonstrated in the following pages.

Although economic constraints remain severe, we will continue to improve EMAS implementation, mainly focussing on existing sites.

We will therefore continue to realise the significant benefits of improving the Commission's environmental performance, and in so doing, continue to support the Commission's vision of a more sustainable European Union.

Irene Souka

Director-General
President of the EMAS Steering Committee

ENVIRONMENTAL STATEMENT VALIDATED BY

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EXECUTIVE SUMMARY

The European Commission's Environmental Statement is prepared under the Eco Management and Audit System (EMAS). The Commission achieved its first registration for the Brussels site in 2005 which covered four services and eight buildings with a useful surface area of 206.166m^2 and 4.043 staff.

EMAS implementation has since expanded within Brussels, and now also includes Luxembourg, the JRC sites, and one of DG SANTE's sites. On the basis of reporting for 2014, the Commission will seek to increase from five to eight the number of sites incorporated within its EMAS registration. This will include the 62 occupied buildings in Brussels[1], 6 of 14 buildings in Luxembourg, the Joint Research Centre (JRC) sites[2] of Petten (Netherlands), Geel (Belgium), Sevilla (Spain), Karlsruhe (Germany), Ispra (Italy) and DG SANTE's site at Grange (Ireland). While Luxembourg joined in 2011 and JRC Petten in 2012, JRCs Geel, and Sevilla started reporting in 2013. JRC Karlsruhe and Ispra's reporting are new in 2014. The registration will include buildings with a useful surface area totalling 1.513.075m^2 (accommodating 28.870 staff), and representing 92% of the EMAS sites.

EMAS is a rigorous system, requiring continuous improvement in environmental performance through the identification of environmental impacts, implementation of policy, setting objectives and monitoring performance, legal compliance, communication and training all verified through mandatory internal and external audit and certification delivered by public bodies. Indicators are defined in areas including energy and resource consumption, and waste generation. This report describes how the eight EMAS sites have performed, and combines and attempts to draw conclusions for the Commission's performance as a whole.

The Brussels site has reported under EMAS since 2005, and its size relative to other sites heavily influences the Commission's overall performance, along with the recently incorporated Ispra site. Brussels has achieved very significant reductions in resource consumption indicators since 2005, reducing per capita energy and water consumption (and CO_2 emissions[3]) by around 60%. Office paper consumption and non-hazardous waste generation has reduced by 45% and 30% respectively.

Improved environmental performance for Brussels EMAS area

Parameter and unit	Actual value		Reduction since 2005	
	2005	2014	Overall %	% per year
Energy for buildings (MWh/p)	19,057	6,634	65	7,2
Water use (m^3/p)	28,441	11,573	59	6,6
Office paper (sheets/p/d)	77,365	32,500	58	6,4
CO_2 emission from buildings (tonnes/p) [(a)]	4,770	0,590	88	9,7
Non hazardous waste (tonnes/p)	0,300	0,215	28	3,1

Note: (a) Assuming for 2014 that emissions from electricity generated by renewable sources are zero

Luxembourg has also recorded reduced consumption in most indicators in recent years although the incorporation of two data centres in 2014 has led to an increase in energy consumption. Year to year performance is also recorded under EMAS, together with the reaching (or not) of targets that are usually set annually. Among the sites, fifteen of the 23 targets set for 2014 performance

[1] Buildings managed by OIB, a figure that is subject to change and not including some Executive Agencies. Two unoccupied buildings (Overisje and Palmerston) are excluded.

[2] An EC site in this document is a geographical settlement per country, under a common infrastructure management, it is different from the notion of site in the EMAS regulation. The most important sites of the Commission are: Brussels, Luxemburg, Ispra (Italy), Geel (Belgium), Petten (Netherlands), Karlsruhe (Germany); Sevilla (Spain), Grange (Ireland).

[3] CO_2 emissions reduction exceeds that of energy consumption as electricity has been purchased from 95% renewable sources since 2009

in relation to the above parameters were met. These included three of the four targets for buildings energy consumption,

The JRCs at Geel and Petten require significantly more resources, particularly for energy and/or water consumption than the more administrative sites of Brussels and Luxembourg. JRC Geel has many laboratories and large experimental apparatus including multi megawatt Van De Graaff and Gelina nuclear accelerators while JRC Petten undertakes long duration fuel cell experiments. Despite higher energy consumption at these sites, their relatively small size in relation to Brussels and Luxembourg means that their impact on the overall Commission consumption is fairly small. Ispra is a much larger site, generating its own power, with infrastructure typical of a small town including water and wastewater treatment plants, fire stations, extensive water cooling networks. For this reason, Ispra heavily influences the Commission's overall water consumption.

Annual carbon dioxide emissions associated with business travel for staff at EMAS sites has been estimated at 1,0 tonnes per person, slightly less than the 2013 value (1.2 t),[4] and less than that for emissions from buildings energy consumption (1,7 t) assuming zero emissions from renewables. This is more than double the estimated figure for commuting of Brussels staff.

The Commission's vehicle fleet in the EMAS area reduced from 269 to 264 in 2014 and emissions reduced from 257 to 239 gCO_2/km. The sites also reported on refrigerant losses, as this contributes to global warming and have demonstrated improved management by reducing losses over several years. Emissions from vehicles and refrigerant leaks are approximately the same order of magnitude but much less than 5% of the CO_2 emissions due to buildings energy consumption.

Green procurement is being more actively practiced whether directly through the inclusion of specific criteria in procurement contracts or through purchasing "green" items in the office supply catalogues. In 2014, the direct cost of coordinating EMAS, comprising staff time and the value of supporting contracts, fell from 69 to 66 EUR/person in the EMAS area.

Savings in energy bills resulting from reduced energy consumption in buildings have been evaluated for Brussels using historical unit costs. In 2014 per capita costs were estimated at 497 EUR/person, less than half their value in 2005. **Assuming similar costs for non EMAS areas, Brussels annual energy bill is estimated to have fallen from around 25 Million EUR in 2005 to under 14 Million EUR in 2014,** a cumulative saving of 74 Million EUR over this period.

Buildings energy costs are by far the most expensive single resource cost. In Brussels per capita buildings energy consumption in 2014 was more than ten times greater than that for water consumption (43 EUR), office paper supply (33 EUR) and for general waste disposal (34 EUR). Paper costs vary heavily depending on whether offset printing is included. Although disposal of controlled waste has a high unit cost the low quantities generated result in low per capita costs.

In 2015/16, EMAS will continue to deliver improvements including:

1. The Commission taking a leading role in the Inter-institutional Group on Environmental Management and seek to better assess the carbon footprint, as required by the ECA
2. Promote EMAS implementation to Commission entities which are not centrally managed.

[4] However a larger proportion of the data was not exploitable in 2014, and JRC Ispra was not included

1 INTRODUCTION

1.1 This Environmental Statement

The production and annual updating of an Environmental Statement is required under the Eco Management and Audit System (EMAS) Regulations. EMAS incorporates the environmental management system under which the Commission achieved its first accreditation in 2005. EMAS is site based, and its scope expanded from five to eight sites in 2014 covering: Brussels, Luxembourg, JRC Petten (Netherlands), JRC Geel (Belgium), JRC Sevilla (Spain), JRC Karlsruhe (Germany), JRC Ispra (Italy) and Grange (Ireland).

The remainder of this chapter provides essential information on EC activities and its environmental management system. Chapter two provides an overview of the results reported across all sites. A separate report is provided for site presented in the order described above in Annexes A to H which also include data tables. The annexes containing the report for each site are structured broadly as follows:

1. Overview of core indicators;
2. Description of activities and site setting;
3. Environmental impacts;
4. More efficient use of natural resources (particularly energy, water, paper, CO2 and other emissions);
5. Reducing emissions of CO_2, other greenhouse gases and air pollutants;
6. Improving waste management and sorting;
7. Protecting biodiversity;
8. Green public procurement;
9. Demonstrating legal compliance;
10. Internal communication and training;
11. Transparent dialogue with external partners;
12. EMAS costs and savings; and
13. Data tables

1.2 European Commission

The European Commission[5] is the executive arm of the European Union. Alongside the European Parliament and the Council of the European Union, it is one of three main institutions that govern the Union. Following the enlargement of 1st July 2013, the Commission's activities were steered by 28 Commissioners, assisted by some 35.000 civil servants and other staff working in 33 directorates-general (DGs), 11 services/offices and departments all over the world. Each Commissioner takes responsibility for a particular area of policy and heads one or more entities that are generally known as DGs.

The Commission's primary role is to propose and enact legislation, and to act as 'Guardian of the Treaties', which involves responsibility for initiating infringement proceedings at the European Court of Justice against Member States and others whom it considers to be in breach of the EU Treaties and other Community law. The Commission also negotiates international agreements on behalf of the EU in close cooperation with the Council of the European Union.

5 A glossary of terms is provided in Annex J.

The Commission's headquarters are in Brussels (Belgium), but it also has offices in Luxembourg, Ispra (Italy), Grange (Ireland) and many other places, agencies in a number of Member States and representations in all EU countries. On 1st December 2009, the Treaty of Lisbon entered into force giving the Commission the institutional tools needed for the various enlargements and for meeting the challenges of an EU of 27 Member States (Croatia became the 28th Member State in 2013).

The EMAS III Regulation[6] pertaining to the Eco-Management and Audit Scheme also came into force in 2009, replacing the 2001 Regulation and improving EMAS by making it easier to administer for example by enabling multiple sites in different countries to be included under one over arching registration. The Commission's EMAS registration is coordinated from Brussels (HR COORD).

1.3 European Union policies

The Commission takes environmental issues into account when drafting and revising EU policies, through the impact assessment system. It provides financial support for environmental projects via the LIFE programme and has policies on combating global warming and on energy and transport.

The impact assessment system and its application to the myriad of EU policies are not considered in this document[7], but you can find information on these on the Commission's EUROPA website. The following pages are among those dedicated to particular policies and important initiatives:

Table 1.1 – Summary of important Commission policies and initiatives

No	Policy or initiative	Address
1	Impact assessment system	http://ec.europa.eu/governance/impact/index_en.htm
2	EU environment policy and evaluation	http://ec.europa.eu/environment/index_en.htm
3	LIFE+ programme	http://ec.europa.eu/environment/life/index.htm
4	Global warming policy	http://ec.europa.eu/climateaction/index_fr.htm
5	Energy policy	http://ec.europa.eu/energy/index_en.htm
6	Transport policy	http://ec.europa.eu/transport/index_en.htm

The environmental aspects of EU policies for Member States are therefore addressed by the impact assessment system that applies to each legislative initiative. The EMAS management system is not the appropriate tool for managing these policies. It is oriented towards the Commission's own operational activities.

6 Regulation (EC) No 1221/2009 of the European Parliament and of the Council of 25 November 2009 on the voluntary participation by organisations in a Community eco-management and audit scheme (EMAS), repealing Regulation (EC) No 761/2001 and Commission Decisions 2001/681/EC and 2006/193/EC.

7 In view of the information available on www.europa.eu, European Union policies are not described in detail in the environmental statement. This makes it possible to reduce the size of the document while referring the reader to sites which are more comprehensive and which are regularly updated.

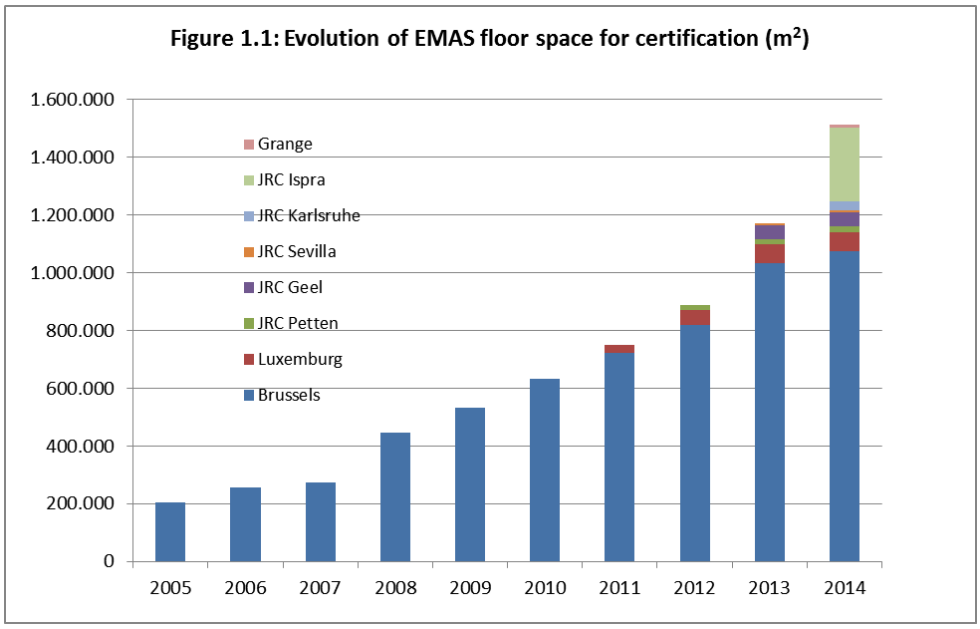
1.4 Environmental management at the Commission and EMAS

A chronology of main developments of implementing EMAS at the Commission is as follows:

Year	Action
2001	The Commission launches a pilot exercise to apply EMAS (Regulation (EC) No 761/2001) to the activities and buildings of a number of its departments.
2005	The Commission obtains the first EMAS registration for the activities of four Commission departments in Brussels, and covering eight buildings (based on data from 2002-4).
2005-9	More buildings were added to EMAS scope in Brussels.
2009	EMAS III Regulation[3] comes into force enabling the Commission to register sites in different Member States under one authority and with a single reference number.
2009	The Commission decides to extend EMAS to all its departments in Brussels and Luxembourg with effect from 1 January 2010. New buildings are to be added annually in accordance with a schedule agreed with the IBGE.
2011	The Commission's registration was extended to include all its departments in Brussels.
2012	The Commission's registrations are further extended to include all its departments in Luxembourg and first two buildings (based on data reported for 2011).
2013	The Commission decided to further extend the EMAS to the JRC sites in Europe and to Grange (Ireland). JRC Petten included in EMAS registration (based on data reported for 2012). Data is reported in this Environmental Statement for JRC sites at Geel and Sevilla in anticipation of their inclusion in the EMAS registration in 2014.
2014	JRC sites at Geel and Sevilla undergo succesful verification and are included in the Commission's EMAS registration. JRC Karlsruhe's verification is postponed until 2015 for administrative reasons. EMAS begins to address the findings of the European Court of Auditor's (ECA) report into how the European Institutions address their Carbon Footprint. The Environmental Statement is upgraded by incorporating i) a new standardised approach for reporting at site level to ensure consistency among sites and a first step towards analysing the Commission's performance by aggregate site level data, ii) estimating greenhouse gas emissions associated with missions, and for Brussels also emissions associated with commuting; and iii) incorporating unit cost information to track management costs and key resource expenditure such as energy, water, waste disposal.
2015	Verification audits are planned for JRC Karlsruhe, JRC Ispra, and Grange based on reporting for 2014. If successful the Commission's EMAS registration will include eight sites in seven countries. Responding to the findings contained in the ECA's Carbon Footprint report, HR COORD will also seek to make the Commission's agencies aware of EMAS. Longer term objectives for key parameters will be proposed and if adopted could result in a target of a 5% reduction over the period 2014 – 2020 at site level.

Historically and for operational reasons, the Commission separated the EMAS registration of its staff activities (departments) and buildings. While the system's communication aspects can be relatively quickly addressed enabling all staff across the Commission to be included, additional buildings must be inspected and certified by the national authorities. This is time consuming, and for this reason buildings at larger sites (Brussels and Luxembourg) have been added to EMAS each year according to resources available. Smaller sites, such as those of the JRC can be added whole.

Figure 1.1 shows how the "useful" surface area within the EMAS scope has evolved and reflects the progress made in incorporating new buildings individually at Brussels and Luxembourg, and new sites.



The Commission will be seeking certification of eight sites with over 1.500.000 square metres of useful floor space. The number of staff working in the EMAS scope has risen from 4.033 in 2005 to 33.542 in 2014.

1.5 How EMAS works in the Commission

EMAS is implemented under a decision taken by the college of Commissioners, ensuring its legitimacy at the institution's highest level. DG HR chairs the **EMAS Steering Committee**[8] which meets twice yearly. It defines environmental policy, adopts the global action plan and sets environmental objectives and monitors progress.

Day to day EMAS coordination is assured by a team based in Brussels at DG HR, (HR COORD). The team is led by the **EMAS Management Representative** who is responsible to management for EMAS implementation, and is the contact point for external organisations such as IGBE (Brussels Environment). It's two other staff members work predominantly on coordination and on communication and training.

8 The Steering Committee is made up of the following directorates-general and departments: BUDG, CLIMA, DIGIT, ENER, ENV, HR, JRC, MOVE, SG, SANTE, OIB and OIL.

EMAS ENVIRONMENTAL POLICY

In 1997, the European Commission started a program of green housekeeping and, subsequently in 2001, decided to pilot the environmental management system EMAS[1] which allows organisations to participate voluntarily in a Community based eco-management and audit scheme (EMAS).

In 2009, the Commission decided to extend the environmental management system to all its activities and buildings in Brussels and Luxembourg.[2] In making this commitment the Commission recognised the positive contribution it can make to sustainable development in the long-term, through its policy and legislative processes, as well as through its day-to-day operations and decisions.

In 2013, the Commission decided to progressively extend the EMAS to all the research centers of the Joint Research Centre located in Petten (the Netherlands), Geel (Belgium), Karlsruhe (Germany), Seville (Spain) and Ispra (Italy), and to the Commission services located in Grange (Ireland).[3] This extension includes all research activities.

Consequently, the Commission commits to minimising the environmental impact of its everyday work and to continuously improve its environmental performance by:

(1) Taking measures to prevent pollution and to achieve more efficient use of natural resources (mainly energy, water and paper);

(2) Taking measures to reduce overall CO2 emissions (mainly from buildings and transport);

(3) Encouraging waste prevention, maximising waste recycling and reuse, and optimising waste disposal;

(4) Integrating environmental criteria into public procurement procedures and into the rules for organising events;

(5) Complying with relevant environmental legislation and regulations;

(6) Encouraging the sustainable behaviour of all staff and subcontractors through training, information and awareness-raising actions;

(7) Progressively extending all the above to all its activities and buildings

And in relation to the Commission's core business by:

(8) Systematically assessing the potential economic, social and environmental impacts of major new policy and legislative initiatives and promoting the systematic integration of environmental objectives into Community policies;

(9) Ensuring the effectiveness of environmental legislation and funding in creating environmental benefits;

(10) Promoting transparent communication and dialogue with all interested parties, both internally and externally.

By virtue of the powers conferred on the Appointing Authorities, the European Commission's EMAS Steering Committee hereby approves this Policy Statement, commits to adopt the Commission's EMAS objectives, targets and action plan, to supervise the system's implementation and to monitor the use of its allocated human and financial resources in order to ensure that the environmental management system runs efficiently.

The Commission's EMAS-registered buildings are noted at the latest EMAS Environmental Statement available at: http://ec.europa.eu/environment/emas/emas_ec/index_en.htm

This document shall take effect on the date of its signature,
Brussels, 24th April 2014

On Behalf of the EMAS Steering Committee,

Irene Souka
Chairman

Owing to the Commission's size, HR COORD works with a network of over 35 **EMAS correspondents** (ECOR) within the directorates-general and departments. The network includes:

i) "operational" EMAS correspondents[9] from services with a greater role to play in system implementation such as OIB[10], and OIL[9], and:

ii) EMAS correspondents who provide a link between their directorate-general/department and HR COORD, particularly for communication. The correspondents participate in formal meetings on average three times a year, usually before the start of information campaigns. They are nominated by their services and EMAS responsbilities are included in their job descriptions.

OIL is implementing EMAS in Luxembourg through a dedicated EMAS coordinator with DG HR providing assistance as required. OIB is implementing in Brussels with HR COORD support. The Joint Research Centre (JRC) centralises some strategic aspects of EMAS coordination in ISPRA (Italy) for all its sites. The coordination office is supported by EMAS coordinators at individual JRC sites. JRC has EN ISO 9001/14001 certifications, in addition to OHSAS 18000, which provides a useful base for introducing EMAS.

In order to fully implement the site based approach to the Commission's EMAS regulation that was implemented over the last few years, the role of site coordinator was introduced and formalised as described in the EMAS handbook that was adopted by the EMAS Steering Committee (ESC) meeting on 16 September 2014. The site coordinator is a single point of contact at each site for the HR COORD team who is responsible for overseeing EMAS implementation at the site level.

9 Operational EMAS correspondents are those whose services fall under the remit of the EMAS Steering Committee; they also act as EMAS correspondents.

10 Office of Infrastructure in Brussels, and Office of infrastructure in Luxemburg

1.6 Key components of the EMAS system:

1.6.1 The Commission's environmental policy

The environmental policy is the starting point of the environmental management system. It is signed by Commission Management and sets out the Commission's political objectives in concise terms. It was updated in 2014.

1.6.2 Identification of significant environmental aspects

Each site identifies its **environmental aspects:** the elements of its activities, products and services which have or may have an impact on the environment. **Significant environmental aspects** are identified: those aspects for which associated impacts include a risk that the Commission may find itself in contravention of applicable legislation or if at least three of six assessment criteria are met. The environmental aspects are collated in a register.

The environmental impact of each of the significant aspects is identified along with the activities, products and services associated with them. The relevant legislation is identified and monitored to ensure legal compliance.

1.6.3 Legal compliance

The Commission has different registers of applicable legislation (European, national and, where relevant, regional) for its sites. The register of Brussels was updated in 2014 by internal auditors and by the legal officer of OIL in Luxembourg. JRC and Grange registers are established and updated on a regular basis.

The Commission applies host country legislation at each of the EMAS sites, and requires its contractors to do so, with particular attention paid to maintenance and inspection contracts. In addition to complying with general legislation applicable to its facilities, the Commission must meet the requirements of environmental permits granted by the authorities. Where the Commission is renting its facilities and is therefore not the permit holder, it seeks to ensure that the holder is compliant.

In 2014 HR COORD cancelled a centrally organised contract designed to provide and update legal registers specific to each EMAS site. Maintaining the legal register therefore remains a responsibility at site level. Each site is responsible for its own legal compliance.

In addition, legal compliance is controlled through sampling by the internal auditors and the external verifiers coordinated by HRCOORD who also continually monitors findings and follow-up of internal audits and external verifications on a corporate register. HRCOORD updates the EMAS Steering Committee twice yearly on its status thereby demonstrating the Commissions behaviour in terms of EMAS and legal compliance.

Furthermore, operational checks and corrective actions are carried out at each Commission site under normal operations (usually by infrastructure services and/or health and safety units). These ensure the Commission respects legal provisions for its installations and administrative activities.

1.6.4 Monitoring of indicators and setting of objectives

A fundamental requirement of EMAS is for organisations to strive for and demonstrate continual improvement. The Regulations therefore require them to monitor their performance through the identification of parameters to measure as indicators and by setting objectives. While indicator and

objective definition is determined following the review of significant environmental aspects conducted at each site and may therefore vary from site to site, Annex IV of the EMAS regulation nevertheless defines certain core indicators for which data is expected to be collected. These include energy efficiency, material efficiency, water, waste, biodiversity and emissions.

As an administrative organisation, the Regulations require the Commission's core indicators to be expressed in terms of output per person, therefore the total number of employees in the EMAS area is a common denominator of most indicator measurements. The Global Annual Action Plan records progress under the core indicators. It sets out objectives, and is updated and approved annually by the EMAS Steering Committee.

Indicators are defined in the data tables contained in the individual reports for each site in Annexes A to H. These are grouped under eight main headings that encompass the political objectives set out in the Environmental Policy and are as shown in Table 1.2:

Table 1.2: Summary of main policy objectives and indicators

No	Environmental Policy Objective	Indicators
I	More efficient use of natural resources	a) Total energy consumption (buildings), b) total energy consumption (site vehicles), c) renewable energy use, d) water consumption, e) office paper consumption and f) offset (professional printing) paper consumption,
II	Reducing CO_2 emissions, (including CO_2 equivalent of other gases) and other air pollutants	a) CO_2 emissions from buildings energy consumption, b), other greenhouse gas emissions (as CO_2 equivalent from buildings (ie refrigerants), c) vehicle CO_2 emissions (manufacturer) d) vehicle CO_2 emissions (actual), e) actual total air emissions including SO_2,NOx,PM
III	Improving waste management and sorting	a) Total waste, b) controlled waste, c) separated waste (as % of total)
IV	Protecting biodiversity	a) built surface area, total site surface area
V	Promoting "greener" procurement	a) Percentage of contracts over 60.000 EUR incorporating additional "green" criteria, b) Percentage, fraction and value of "green" products in the office supply catalogue
VI	Ensuring legal compliance	a) Risk prevention and management, b) progress in registering for EMAS, c) non-compliance in external EMAS audits
VII	Improving Communication (sustainable behaviour of staff; suppliers, and training)	a) Centralised formalised EMAS campaigns, b) environmental training for new colleagues, c) take up of e-learning, d) staff awareness (through two yearly external survey), e) register of training needs, f) response to internal questions
VIII	Enjoying transparent relations with external partners	a) Response to external questions, b) register of information sessions for main subcontractors and suppliers, c) register of local and regional stakeholders, d) dialogue with external partners

The parameters identified under policy objectives I to IV are largely physically based, usually requiring invoices and/or measurements for their definition. For several resource consumption

parameters, technical staff may also report results per square metre. This applies to "useful surface" areas which are often defined in lease or service contracts. Indicators under policy objectives V to VIII are more closely related to communication and training campaigns. Results obtained in these areas will ultimately be seen through improvements in the areas of policy objectives I to IV, and most parameters measured input based.

For consistency, this environmental statement incorporates reporting for each site together with a Commission wide summary based on the indicators and in the above order. This is consistent with the Global Annual Action Plan. Not all sites report on all parameters.

1.6.5 Benchmarking

The EMAS regulations require an organisation's environmental performance to be put into context through comparison with other organisations, i.e. benchmarking. Because implementation of EMAS has been incremental at the Commission, and reporting overall results as an organisation (as opposed to as individual sites) began in 2014, current efforts at benchmarking at an organisational level are limited to very recent data. However individual sites with a long history of reporting, such as Brussels, where EMAS data has been published since 2005 are more useful for benchmarking.

This report includes operational data from eight sites in seven countries, with activities ranging from office administration, to laboratory analysis to large specialist technical and even nuclear installations. Finding suitable organisations to benchmark against is therefore challenging, although in this report results for Brussels site are compared with those for the European Parliament.

1.7 The Commission: what was new in 2014

The major workload in 2014 was incorporating and preparing three new sites in different countries for incorpration in the Commission's EMAS registration. This required the various developments in reporting developed in the previous year to be fully implemented.

2 A COMMISSION OVERVIEW OF EMAS PERFORMANCE

This section presents an overview of the individual results for the eight sites participating in EMAS, each of which has a separate report in Annexes A to H, and presented in order of participation. In addition, the data available for individual sites has been used to derive, where possible, an overall value for the Commission.

2.1 Overview of performance relating to selected indicators

The evolution in average annual consumption of energy (for buildings), water, office paper, along with CO_2 emissions and non-hazardous waste generation are presented in Table 2.1. This covers the period 2005 to 2014 for Brussels and some parameters at Grange, but also presents changes recorded since each of the last three years at most sites, as well as performance in relation to the 2014 targets that were set at individual sites, where applicable.

Table 2.1: Average annual change in consumption up to 2014 (%)

Parameter and site	Since 2005	Since: 2011	2012	2013	2014 Target % change	Target met?
Energy consumption of buildings (MWh/person)						
Brussels	**-7,24**	-4,69	**-7,03**	**-11,64**	-1,0	Yes
Luxembourg			**36,23**	**62,63**	0,0	No
JRC Petten		**-8,99**	**-5,86**	**-5,39**	-1,0	Yes
JRC Geel			-3,62	-4,59	0,0	Yes
JRC Sevilla		-4,57	0,01	-4,34	Q	
JRC Karlsruhe		0,23	-2,40	1,99	NA	
JRC Ispra		-4,33	**-5,44**	-4,76	NA	
Grange	1,25	**6,98**	-1,32	0,49	NA	
Water consumption (m3/person)						
Brussels	**-6,59**	-1,27	1,51	-0,79	-1,0	No
Luxembourg			**6,04**	-5,00	0,0	Yes
JRC Petten		-0,80	**-20,29**	**-61,14**	0,0	Yes
JRC Geel			**-17,99**	**-30,87**	-1,0	Yes
JRC Sevilla		**-12,31**	**-12,39**	**-20,50**	0,0	Yes
JRC Karlsruhe		**11,17**	**10,91**	**20,14**	NA	
JRC Ispra		**-16,87**	**-17,07**	**-18,43**	NA	
Grange	3,46	**7,94**	**10,22**	**9,72**	NA	
Office paper (sheets/person/day)						
Brussels	**-6,44**	**-9,73**	**-9,52**	**-23,62**	-2,0	Yes
Luxembourg			**-8,32**	**-10,09**	-2,5	Yes
JRC Petten		**-15,09**	**-6,97**	**-44,98**	-1,0	Yes
JRC Geel			0,00	**22,47**	-5,0	No
JRC Sevilla		**-15,56**	**-16,53**	**29,13**	-5,0	No
JRC Karlsruhe		0,54	-3,11	**21,90**	NA	
JRC Ispra		-4,60	-4,41	3,29	NA	
Grange					NA	
CO_2 emissions from buildings						
Brussels	**-9,74**	-3,75	**-9,43**	**-19,84**	-1,0	Yes
Luxembourg			**19,07**	**63,35**	0,0	No
JRC Petten		**-8,11**	**-6,22**	4,10	0,0	No
JRC Geel			-3,69	-3,95	0,0	Yes
JRC Sevilla		**-8,02**	**-5,73**	**-17,81**	0,0	Yes
JRC Karlsruhe		**-11,46**	**-19,69**	**-39,25**	NA	
JRC Ispra		-4,75	**-5,57**	**-5,66**	NA	
Grange	2,02	**5,19**	-1,55	-0,45	NA	
Non hazardous waste (tonnes/person)						
Brussels	-3,14	-4,42	-2,09	2,56	0,0	No
Luxembourg			**-19,40**	**-17,53**	0,0	Yes
JRC Petten		**8,78**	**-6,91**	**-12,88**	-1,0	Yes
JRC Geel			**29,75**	**171,84**	0,0	No
JRC Sevilla		**NA**	**NA**		-5,0	
JRC Karlsruhe		**13,80**	-1,90	1,99	NA	
JRC Ispra		1,87	**10,47**	**-11,64**	NA	
Grange	**NA**	**NA**	**NA**	**NA**	NA	

Note: NA - not applicable, Q - Qualitative, rather than quantitive, target applies

Per capita **energy consumption** has fallen in the longer term at most sites, and in Brussels over the years since 2005, the average annual reduction has been 7%. And consumption fell by over 10% in 2014. The JRC sites have mostly registered large reductions in the last three years, and particularly Karlsruhe since last year. The significant increase recorded in Luxembourg is artificial; the site included for the first time in their energy reporting two data centres which have very high energy consumption relative to regular office activity. Grange however showed slight increase since 2011.[11] Three of the four sites setting quantitative targets for 2014 performance improvement were successful. As 2014 was generally milder than 2013[12], reductions in energy consumption could be expected, particularly for sites with substantial administrative activities.

Water consumption has also fallen significantly at most sites, and the decrease at JRC sites particularly noteworthy in recent years. Brussels again recorded a steady average annual reduction in consumption over the long term, although consumption was higher since 2012. With the exception of Brussels, all sites setting a target for consumption in 2014 met their target.

Office paper consumption has also reduced significantly at all sites in the longer term, although some recent increases particularly at some JRC sites are recorded in the last few years, but may be related to purchasing and distribution patterns rather than consumption.

CO_2 emissions resulting from buildings' energy consumption largely mirrors reductions in energy consumption with Brussels achieving nearly 10% average annual reduction since 2005, though this is partly due to the purchase of electricity from renewable sources since 2009, and more recent performance is patchy. JRC sites have also registered reductions in CO_2 emissions.

Non-hazardous waste generation has reduced at almost all sites with Brussels averaging over 3% reduction per annum since 2005. All sites other than JRC Geel have achieved some very good results in the last couple of years. In the medium term, most of the sites that have started to report data since 2010 or 2011 have experienced reduced resource consumption and waste generation.

2.2 Description of activities

Brussels is the main site, the Commission's administrative centre, with a range of buildings dominated by offices but including conference centres, catering facilities, storage depots, print shops, childcare facilities, and sports facilities. The Luxembourg site is of a similar nature, though smaller but also includes a small nuclear laboratory.

Two further JRC sites prepared to join EMAS in 2014: the Institute of Transuranium elements (ITU) at Karlsruhe, and the JRC's main site at Ispra in Italy. The ITU is a relatively modern self-contained site located in a research campus on the outskirts edge of Karlsruhe, with ongoing nuclear activities. Ispra is a large campus with offices and research facilities, encompassing in addition many of the activities of a small town with its own power plant, fire station and water treatment works, and over 400 buildings in total. Most of its nuclear activities (including reactors), are no longer operational. Nuclear plants and storage facilities are under a decommissioning programme which aims to restore "green field" status by 2033.

The NACE codes for the Commission's eight EMAS sites are presented in Table 2.2.

[11] Number of staff reported for 2014 assumed to apply to previous years, owing to lack of specific data.

[12] According to the total number of hot and cold degree days, (see section 2.4).

Table 2.2: NACE codes and descriptions of activities at the sites

Code	Description	Brussels	Lux'burg	JRC Petten (IET)	JRC Geel (IRMM)	JRC Sevilla (IPTS)	JRC Karlsruhe (ITU)	JRC Ispra(IPR)	Grange
99	Activities of extraterritorial organisations and bodies	X	X	X	X	X	X	X	X
84.1	Administration of the State and the economic and social policy of the community	X	X						X
71.2	Testing and techcnical analysis		X	X	X		X	X	
72.1	Research and experimental development in natural sciences and engineering			X	X		X	X	
72.2	Research and experimental development on social science and humanities					X			
35.11	Production of electricity							X	
35.30	Steam and air conditioning supply							X	
36.00	Water collection, treatment and supply							X	
37.00	Sewerage							X	

DG SANTE's site at Grange Ireland is a purpose built low level wooden clad structure dating from 2002 and set in countryside 40km north west of Dublin. It accommodates the Food and Veterinary Office (FVO). Many staff members are inspectors or auditors and travel frequently, and typically up to half may be away from the office at any one time.

The Institute of Energy and Transport at JRC Petten (Netherlands) accommodates experimental equipment notably conducting research on fuel cells. The Institute for Research Materials and Measurement at JRC Geel (Belgium) contains Van de Graaff and Gelina Nuclear Accelerators, large power hungry installations, and an array of laboratories. The Institute for Prospective Technological Studies at JRC Sevilla (Spain) has advanced computing infrastructure, but lacks experimental laboratories. From an EMAS perspective, it is more similar in nature to the administrative centres of Brussels and Luxembourg, than to the other JRC sites, with the added complexity of being in wholly rented accommodation. Characteristics of these sites relating to EMAS are shown below in Table 2.3.

Table 2.3: Basic characteristsics of the Commission EMAS sites (2014)

Site	Staff		Buildings seeking registratio		Useful surface (m^2)	
	EMAS	Total	EMAS	Total	EMAS	Total
Brussels (all EMAS buildings)	27.870	27.870	62	62	1.075.372	1.075.372
Luxemburg	1.492	4.043	6	14	65.759	198.205
JRC Petten	282	282	14	14	19.458	19.458
JRC Geel	359	359	15	15	48.815	48.815
JRC Karlsruhe	288	288	2	2	30.477	30.477
JRC Sevilla	289	289	1	1	7.017	7.017
JRC Ispra	2.767	2.767	419	419	256.077	256.077
Grange	195	195	3	3	10.100	10.100
Total	**33.542**	**36.093**	**522**	**530**	**1.513.075**	**1.645.521**

The Brussels site clearly dominates staff numbers with approximately three times more total staff than the other sites combined. Both Brussels and Luxembourg have buildings and facilities spread out throughout their respective cities and have implemented EMAS gradually. For the first time Brussels included all its occupied buildings[13] within EMAS reporting effectively completing a phased implementation that started with its first EMAS registration in 2005 which included eight buildings. The remaining three will be accommodated in 2015 reporting and should be registered in 2015.

Luxembourg started EMAS registration for its buildings in 2011 and by 2014 had over one third of staff in the scope, and a similar proportion of floor space. Luxembourg hopes to register the remaining buildings by 2020. As self-contained sites[14], each of the JRC sites as well as Grange is incorporated "whole" into EMAS.

2.3 Environmental impact of Commission activities

Each site undertakes its own review of environmental impact in order to identify those which are significant and determine how they should be managed. Details for each site are presented in the annexes to this report. There is no review for the Commission as a whole.

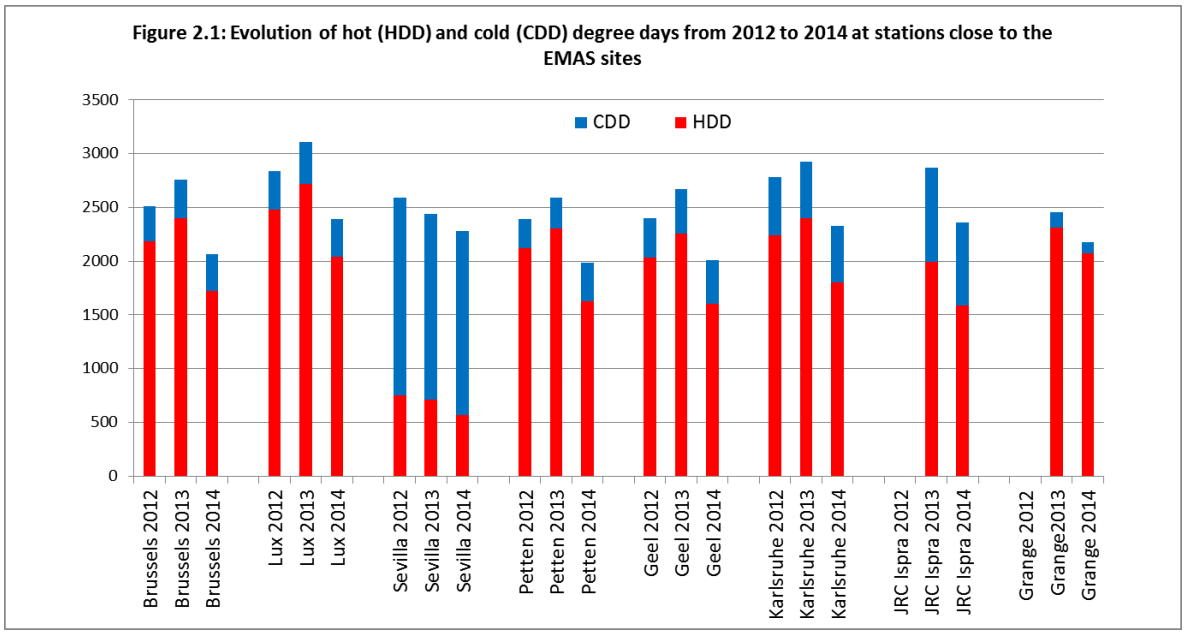
2.4 More efficient use of natural resources

Buildings' energy consumption is influenced by climate. Figure 2.1 shows the number of hot degree days (HDD, when heating is required in winter) and cold degree days (CDD, when cooling is required in summer) for meteorological stations near the Commission EMAS sites. Comparing the number of degree days from year to year therefore indicates whether a year was colder (more time with temperatures less than 15,5°C, therefore more HDDs), or hotter (more time with temperatures greater than 15,5°C, therefore more CDDs).[15]

[13] Buildings managed by OIB, not including some Executive Agencies. Note Overijse and Palmerston (both unoccupied) are not included.

[14] JRC Sevilla occupies part of a commercial building.

[15] Data from www.degreedays.net, station codes: EBAW (Antwerp for Geel), EBBR (Brussels), EDSB (Karlsruhe), ELLX (Luxembourg), INHALKMA1 (Alkmaar for Petten), LEZL (Sevilla), LIMC (Milan for Ispra), EIDW (Dublin for Grange), Reference temperature of 15.5°C.

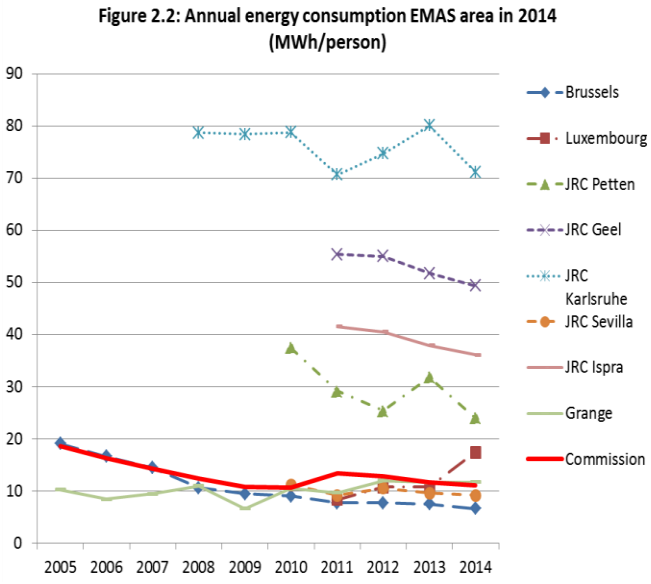


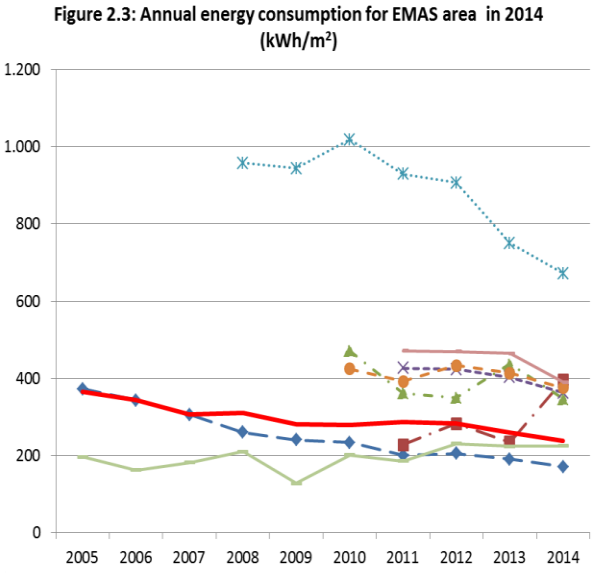
The data in Figure 2.1 shows that at all sites there were fewer total degree days recorded in 2014 than in 2013 and 2012, the reduction generally owing to the warmer winter, giving rise to fewer hot degree days. So sites may be expected to have consumed less energy for heating in 2014 than in the two previous years.

Sevilla's climate is different from that of the other sites, the hot summers requiring more energy for cooling than elsewhere, although less in 2014 than in previous years.

2.4.1 Energy consumption

Figures 2.2 and 2.3 show per capita and per square metre buildings energy consumption for the EMAS sites, together Commission value obtained by "weighting" the values for individual sites.





As expected the JRC sites with laboratory or heavy experimental apparatus (Karlsruhe, Geel, Ispra and Petten) have the highest per capita energy consumption from 20 to 80 MWh per annum with the predominantly office dominated sites of Brussels, Luxembourg, Grange and JRC Sevilla closer to 10 MWh. Most sites have shown a downwards trend in energy consumption, either over time or in

recent years. The marked increase in Luxembourg in 2014 is due to the inclusion of two data centres in the EMAS reporting in 2014. Karlsruhe has the highest consumption figures, and this is due to the legal requirement to continue full time circulation of air through the nuclear facilities.

The Commission values are heavily influenced by Brussels data, although from 2011 when more JRC sites are included, particularly Ispra, it rises significantly above that for Brussels. However even with the addition of the more energy intensive JRC sites the overall trend in per capita energy consumption has been downwards even following the rise in 2011. The Commission's energy consumption fell by nearly half from 2005 to 2014, the greatest reduction delivered before 2009.

Buildings' energy consumption per square metre displays broadly similar trends although the difference between the experimental and non-experimental sites is less and reducing. Several sites show a downward trend in recent years, particularly Karlsruhe. And this could continue as buildings are renewed, particularly on the JRC campuses such as Geel, Karlsruhe and Ispra.

The percentage of buildings metered energy consumption generated from renewable sources has been increasing as shown in Table 2.4.

Table 2.4: Percentage of buildings energy generated from renwable sources in the EMAS area

Year	2009	2010	2011	2012	2013	2014
Energy from renewable sources	28,1	42,3	28,4	30,0	31,2	35,1

Both Brussels and Luxembourg have been purchasing almost all of their electricity from renewable sources the former introducing its renewable energy contract in August 2009, which explains the large increase registered in 2010. The decrease in 2011 is due to the inclusion of data from JRC sites which did not have contracts for electricity supply from renewable sources. Several sites have developed photovoltaics to generate energy on site, and both Ispra (starting in 2015) and Petten use ground source heat pumps. Part of Luxembourg's electricity supply is generated by a wood chip boiler, served by sustainable forests in the immediate region.

2.4.2 Water consumption

Figures 2.4 and 2.5 show water consumption measured on a per capita and per square metre basis for the EMAS sites, and the Commission as a whole. These graphs are plotted on a log scale in order to include data for Ispra where water consumption far exceeds that of other sites. Ispra manages its own surface abstraction from a nearby lake, and as the Ispra site contains fire services, a water treatment works and has extensive water cooling circuits, sports centres and also supplies residential properties for Commission staff; its consumption is inevitably higher than that of other sites. It also supplies the local municipality although the quantities are in the order of 1.000 m^3

As with energy, consumption has fallen at most sites in recent years. Figure 2.4 shows that per capita water consumption in Brussels has more than halved since 2005. And the JRCs at Sevilla Geel and Ispra have recorded the largest reductions in consumption over the last three to four years, with Ispra introducing through several infrastructure related initiatives. JRC Petten suffered a major leak in 2011/2 resulting in a spike in water consumption.

Figure 2.4: Evolution of annual water consumption for the EMAS area (m3/person)

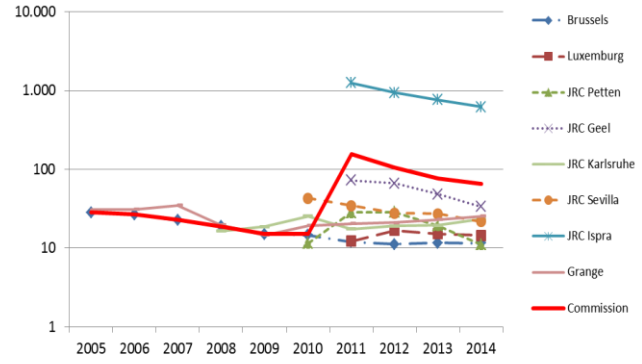
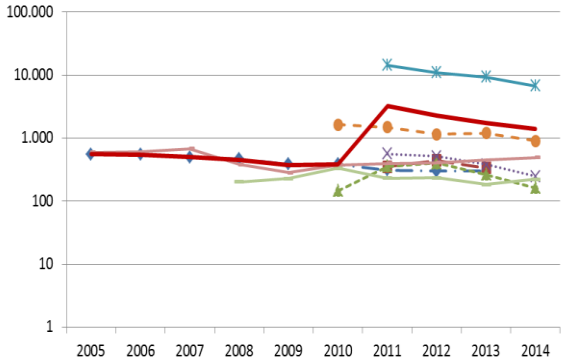


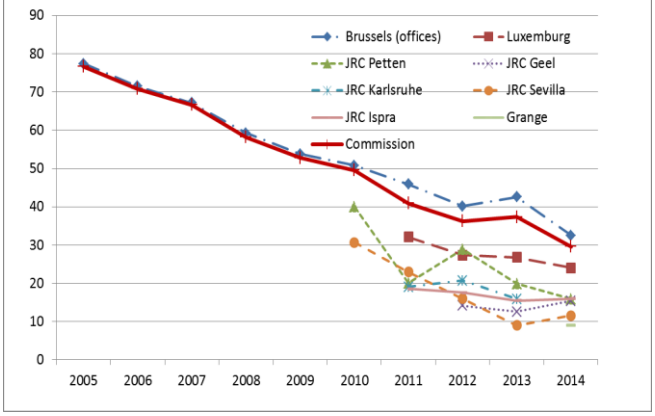
Figure 2.5 : Evolution of annual water consumption for the EMAS area (litres/m²)



Ispra's consumption heavily influences the weighted Commission value as indicated by the sudden increase in 2011. In this instance the weighted Commission value is quite unrepresentative of most of the Commission sites.

2.4.3 Office and offset paper

Figure 2.6: Evolution of office paper consumption (sheets/person/day)



Paper consumption data apply to the whole Commission site at both Brussels and Luxembourg (OIL data), and not just the buildings within the EMAS area.

a) Office paper

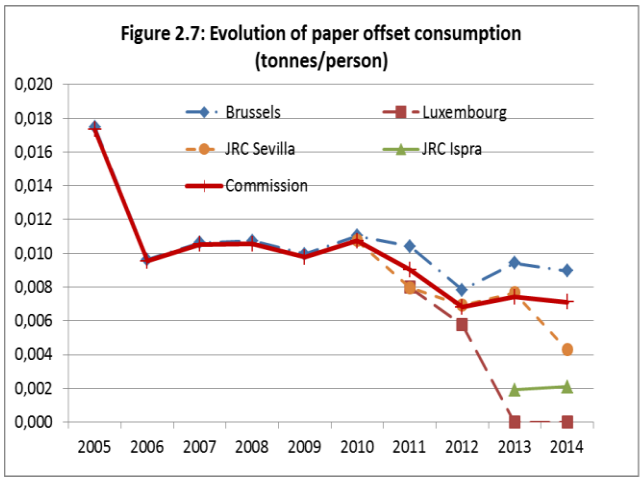
Figure 2.6 show the consumption of office paper which was recorded in kg/person and converted to an equivalent number of sheets per person per days[16]. OIB introduced a contract in July 2013 for office paper at 75g/m^2 to replace older supplies at 80g/m^2.

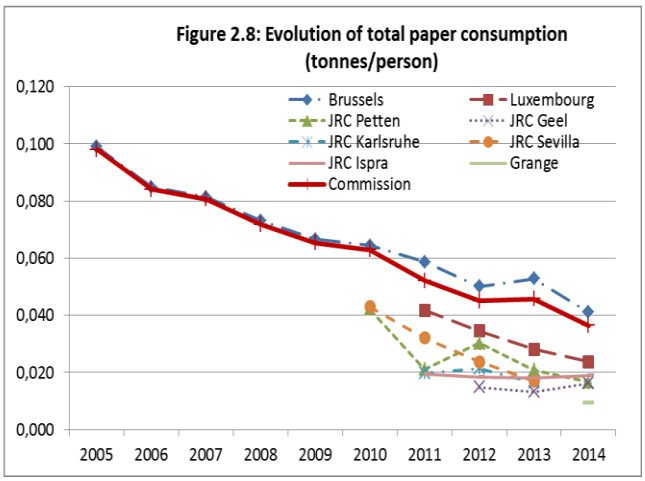
Office paper consumption has more than halved in Brussels since 2005, but is higher than recorded at other sites in recent years. The JRC sites have lower consumption than either Brussels or Luxembourg. Data is available for Grange since 2014. At JRC Petten, office paper is ordered in bulk, and the reported figures reflect purchase rather than consumption which may explain the "peaky" trend.

b) Offset (and total) paper consumption:

Offset paper is that used in high quality or large format printing typically undertaken in a print shop. JRCs Petten, Geel, Karlsruhe and Grange have no print shop and/or undertake a negligible amount of printing, and are therefore not included in Figure 2.7 which shows how offset paper consumption has evolved.

[16] using paper density and 211 working days per year,





Luxembourg switched from conventional offset printing to using digital presses in 2013. JRC Sevilla contracts a large amount of offset printing per capita compared to other sites. In 2011 OIB introduced a new parameter for measuring waste paper in the print shop in Brussels. The percentage of paper waste was nearly 26% in 2011, reducing to 13% in 2012, and 5% in 2013.

Annual total paper consumption, representing office plus offset paper in Figure 2.8 has decreased at most sites. It has nearly halved between 2005 and 2014 at Brussels. Luxembourg and JRC Sevilla have recorded particularly good reductions in total paper use from 2011 to 2013.

2.5 Reducing emissions of CO_2, other greenhouse gases and air pollutants

Reporting on Greenhouse gases emitted owing to its direct or indirect activities is an important part of establishing an organisation's Carbon Footprint. Emissions are typically defined under different "scopes":

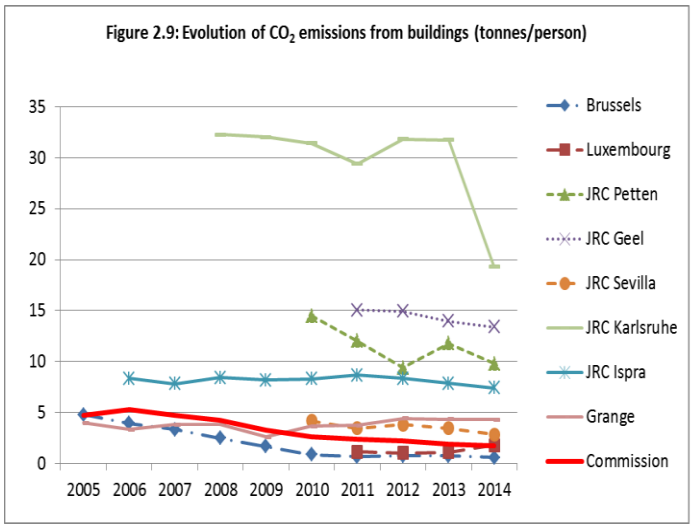
- Scope I: Direct Emissions typically arising from Fuels Combustion (e.g. boilers, furnaces), owned transport (Commission owned vehicles), process emissions and fugitive emissions (refrigeration and air conditioning leaks)
- Scope II: Indirect energy consumption (consumption of purchase electricity, heat, and steam cooling)
- Scope III: Other indirect emissions including, transport related activities (commuting and business travel, distribution), waste disposal (waste, recycling), leased assets franchising and outsourcing, purchased goods and services, purchased materials and fuels (e.g. extraction, processing and production).

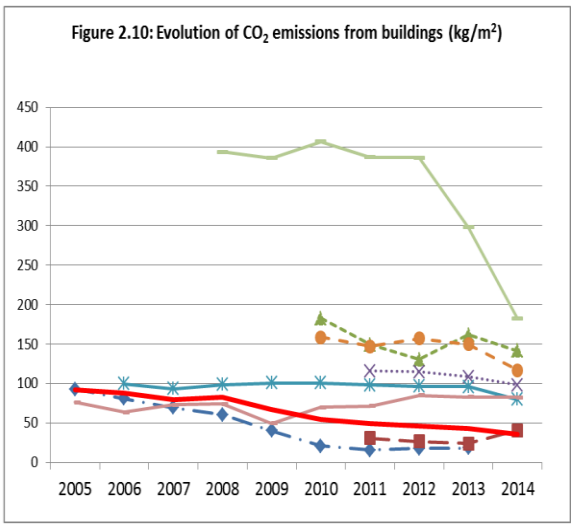
In this context, this report includes emissions under scopes I and II for each site. This includes gas (scope I) and electricity (scope II) consumption for buildings, refrigerants and cooling losses (scope I), and emissions Commission vehicle fleet, (scope I). Emissions from missions (scope III) are presented below for the Commission as a whole, and not for individual sites. There is some overlap between scopes I and III in relation to reporting at site level for buildings energy consumption and vehicle fleet emissions as some Commission buildings and vehicles are leased.

2.5.1 CO_2 emissions from buildings

a) Energy use in buildings

As expected, Figures 2.8 and 2.9 demonstrate similar trends for carbon dioxide (CO_2) emissions to those described above for energy consumption with JRCs Geel and Petten recording the highest per capita emissions.





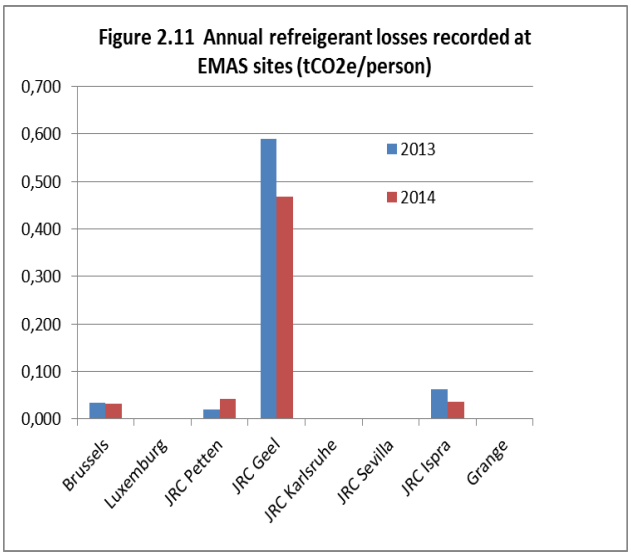
Brussels has reduced per capita emissions by over a half since 2005. Both Brussels and Luxembourg have the lowest emissions in recent years because they contract 95% and 100% respectively of their electricity from renewable sources. However, these lower emissions are balanced by higher emissions from the JRC sites, where energy is largely from non-renewable sources, resulting in almost constant overall Commission emission levels since the JRC sites started reporting (2010) by both types of measure. Karlsruhe has seen a significant reduction in emissions since 2012/13 and this is due largely to a new heating control system.

b) Loss of refrigerants

Refrigerants have Global Warming Potentials (GWP) typically between 1.000 and 10.000 meaning that a leak of just a few kilograms can have the equivalent atmospheric global warming impact of a few tonnes of CO_2. All sites have had programs to replace R22 as required by legislation, and in Brussels the total quantity of refrigerants, together with that of R22, and losses has been recorded under EMAS for many years.

Refrigerants typically account for less than 1 to 2% of buildings CO_2 emissions, although this may be higher if a site is contracting electricity from renewable sources. Per capita refrigerant losses at Geel were the highest in relation to buildings emissions falling from 4,2% in 2013 to 3,5% in 2014.

Figure 2.11 shows per capita annual refrigerant losses reported in 2013 and 2014 for Brussels, Petten, Geel and Ispra. While Karlsruhe experienced no losses during normal operations, the other sites did not report.



Individual sites have clearly demonstrated improved management of refrigerants since EMAS registration, and reduced losses, although reporting did not include all refrigerants.

High losses at Geel in relation to the other sites are due to the presence of large experimental installations requiring cooling..

Ispra's reporting includes the largest number of refrigerants (10), but the high per capita losses reported by JRC Geel largely comprised R404a.

2.5.2 CO_2 emissions from vehicles (at site level)

Summary vehicle fleet information is presented in Table 2.5 for the period 2012 to 2014.

Table 2.5: Site vehicle fleet characteristics

Site	Fleet vehicles (average)			Total kms		
	2012	2013	2014	2012	2013	2014
Brussels	160	120	114	2.638.992	2.603.297	2.456.406
Luxembourg	28	27	25	521.537	602.927	623.890
JRC Petten	5	5	5	NR	6.000	4.500
JRC Geel	4	4	4	NR	NR	NR
JRC Karlsruhe	8	8	10	NR	NR	183.400
JRC Sevilla	1	1	1	9.889	6.455	4.440
JRC Ispra	104	103	104	263.651	230.139	262.025
Grange	1	1	1	NR	NR	7.674
Commission	**311**	**269**	**264**	**3.440.069**	**3.448.818**	**3.542.335**

NR: Not reported

Brussels, Ispra and Luxembourg have by far the largest fleets, but the total number of fleet vehicles has fallen since 2012, mostly owing to a reduction in Brussels. The total number of kilometres driven has risen slightly, with increases in Luxembourg and Ispra indicating that each car is being used a little more. The exception was Sevilla's where the car has been used less each year since 2012.

Table 2.6 shows how emissions per kilometre have evolved since 2012, as defined by the manufacturers' specifications and also as estimated from actual fuel purchases.

Table 2.6 Site vehicle emissions per km

Site	gCO_2/km (manufacturer)			gCO_2/km (actual)		
	2012	2013	2014	2012	2013	2014
Brussels	160	155	148	227	217	213
Luxembourg	182	179	171	228	217	220
JRC Petten	NR	180	168	NR	242	219
JRC Geel	NR	NR	NR	NR	NR	NR
JRC Karlsruhe	NR	NR	NR	NR	NR	NR
JRC Sevilla	136	136	136	75	158	203
JRC Ispra	NR	NR	184	268	315	273
Grange	NR	NR	174	NR	NR	174
Commission	**163**	**159**	**165**	**241**	**257**	**239**

NR: Not reported

Both Brussels and Luxembourg have for many years sought to purchase or lease more efficient vehicles and this is shown by the reduction of manufacturer and actual emissions. Ispra has purchased 17 additional electric vehicles in 2015 to add to the numbers already used on site, and Brussels has installed electric charging points for four new service vehicles.

When annual vehicle CO_2 emissions are expressed on a per capita basis for sites reporting this data as shown in Table 2.7 we see that when expressed per person, they are very small in comparison to those for fore example emissions from heating buildings.

Table 2.7 site vehicle fleet emissions expressed as totals and per person

Site	Vehicles annual tCO_2			Vehicles annual tCO2/person		
				2012	2013	2014
Brussels	595	579	537	0,021	0,022	0,019
Luxembourg	119	131	137	0,030	0,032	0,034
JRC Petten	0,00	1,45	1,32	0,000	0,006	0,005
JRC Geel	0,00	0,00	0,00	NR	NR	NR
JRC Karlsruhe	NR	NR	41,9	NR	NR	0,146
JRC Sevilla	0,74	1,02	0,90	0,003	0,004	0,003
JRC Ispra	70,7	72,4	71,6	0,027	0,026	0,026
Grange	NR	NR	NR	NR	NR	NR
Commission	**785,24**	**784,70**	**790,36**	**0,0221**	**0,0232**	**0,0222**

NR: Not Reported

The overall Commission values of around 0,022 tCO_2/ person from 2012 to 2014 represent just over 1% of the per capita emissions generated by energy use in buildings, and are of a similar magnitude to refrigerant losses (CO2e).

2.5.3 Overall the EMAS sites' CO_2 emissions from missions

CO_2 emissions resulting from missions undertaken by staff at the EMAS sites have been estimated using data from the Commission's proprietary management system[17] along with data reported by the Commission's travel agency[18].

a) Emissions characteristics of missions booked through the travel agency

Tables 2.8a to c present a synthesis[19] of annual CO_2 emissions derived from quarterly figures for air, rail and hire car travel booked through the agency, with a breakdown by site achieved by matching traveller names and place of employment using the Commission's staff database[20].

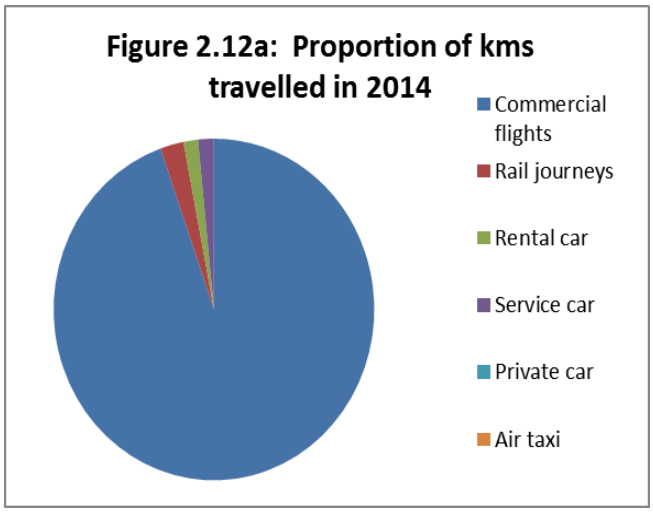
Overall missions booked through the travel agency are dominated by air travel, responsible for nearly 95% of the emissions, as shown in Figures 2.12a and b.

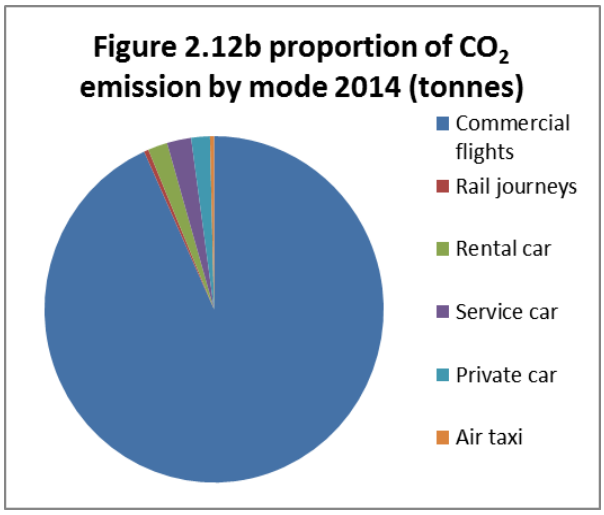
[17] Commonly known as MIPS

[18] American Express report CO_2 emissions for air train and hire cars, as calculated by Atmosfair who use an approach developed with the German environmental authorities. Note that travel arangements for Ispra staff are not generally made through this agency.

[19] Emissions for nearly 200.000 individual air, rail and hire car journey segments reported on an annual basis

[20] Approximately 11% of air travellers, and 5% of rail travellers were not recognised as Commission employees. Emissions data for 2014 was less complete than for 2013





Note: i) Air taxi data doesn't include "very light jets", ii) information on private car missions not available for 2014.

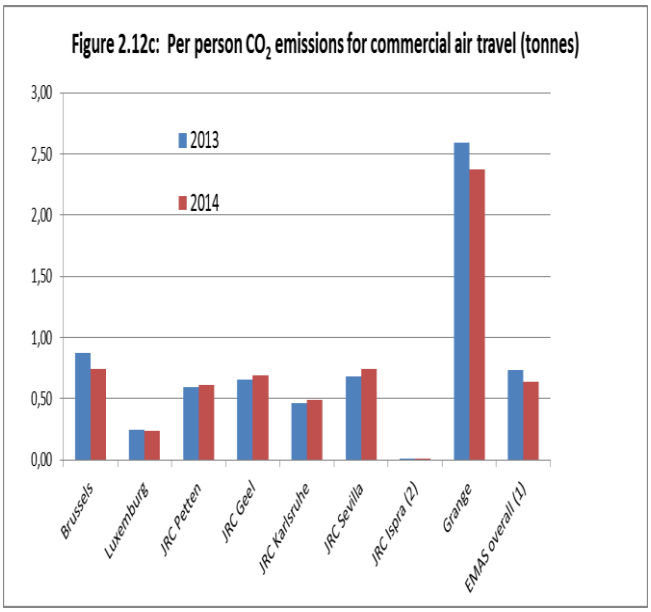


Figure 2.12c compares per capita emissions for air travel across the EMAS sites: Most sites are close to the Commission average. Luxembourg and Karlsruhe are slightly lower, as more travel from these sites is by train. Staff from Luxembourg take fewer and shorter flights. Grange has by far the highest per capita emissions, because their staff spend a large part of their time on missions.

JRC Ispra's emissions are largely not represented because most of their travel is contracted through a local travel agency, rather than through the main Commission agency. Therefore the data for Ispra in table 2.8 may not be representative.

Rail journey emissions represent less than 1% of those from air travel. JRC Petten staff use rail travel more frequently than the other sites, and the trips tend to be significantly longer at over 300 km per journey segment. There appears to be a sharp drop in rail travel in 2014 compared to 2013 particularly at Karlsruhe and Grange, but this may be due to a data glitch in the second quarter of 2014 which made it impossible to compare a large part of the data.

Table 2.8a: Total number of flights and distance flown, 2013 and 2014 booked through the Commission's travel agency

	Distance flown (km)		Number of flights		Kms/flight		tCO2		gCO2/km		tCO2/p	
Site	**2013**	**2014**	**2013**	**2014**	**2013**	**2014**	**2013**	**2014**	**2013**	**2014**	**2013**	**2014**
Brussels	153.213.107	138.204.743	90.167	78.897	1.699	1.752	23.088	20.793	151	150	0,87	0,75
Luxemburg	7.806.397	7.425.815	8.568	8.042	911	923	995	952	127	128	0,25	0,24
JRC Petten	1.218.077	1.268.516	888	793	1.372	1.600	156	173	128	137	0,59	0,61
JRC Geel	1.446.898	1.496.043	881	839	1.642	1.783	238	248	164	166	0,66	0,69
JRC Karlsruhe	990.577	1.127.214	910	974	1.089	1.157	131	140	133	124	0,46	0,48
JRC Sevilla	1.606.313	1.849.882	1.400	1.579	1.147	1.172	193	213	120	115	0,68	0,74
JRC Ispra [2]	185.822	234.278	137	168	1.356	1.395	27	36	145	153	0,01	0,01
Grange	3.349.583	3.143.750	1.760	1.651	1.903	1.904	506	462	151	147	2,59	2,37
unknown site	*18.906.012*	*28.860.081*	*13.879*	*20.040*	*1362*	*1.440*	*2.982*	*4.411*	*158*	*153*		
Total for EMAS sites [1]	**169.816.774**	**154.750.241**	**104.711**	**92.943**	**1.622**	**1.665**	**25.333**	**23.018**	**149**	**149**	**0,73**	**0,64**
Commission total [1]	173.895.672	158.379.442	107.754	95.788	1.614	1.653	25.836	23.455	149	148		

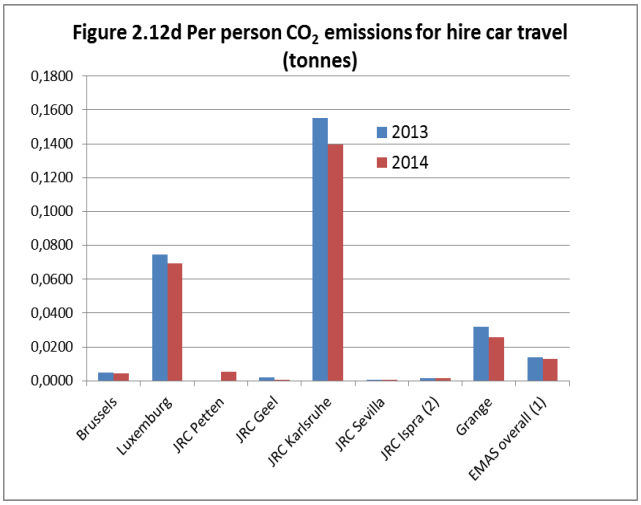
Table 2.8b: Total number of rail journeys and distance travelled in 2013 and 2014 booked through the Commission's travel agency

	Distance by train (km)		Number of journeys		Kms/journey		tCO2		gCO2/km		tCO2/p	
Site	**2013**	**2014**	**2013**	**2014**	**2013**	**2014**	**2013**	**2014**	2013	2014	**2013**	**2014**
Brussels	4.932.804	3.237.028	28.229	20.113	175	161	147	94,9	29,8	29,3	0,006	0,003
Luxemburg	480.342	364.508	3.146	2.225	153	164	7,61	6,33	15,8	17,4	0,002	0,002
JRC Petten	102.949	92.602	888	768	116	121	0,59	0,87	5,7	9,4	0,002	0,003
JRC Geel	35.590	33.764	204	196	174	172	1,13	1,39	31,8	41,2	0,003	0,004
JRC Karlsruhe	199.463	96.019	657	581	304	165	7,11	2,04	35,6	21,2	0,025	0,007
JRC Sevilla	26.429	20.011	92	104	287	192	1,06	0,76	40,1	38,0	0,004	0,003
JRC Ispra [2]	2.724	2.613	18	17	151	154	0,04	0,07	14,7	26,8	0,000	0,000
Grange	24.605	9.511	73	61	337	156	1,14	0,28	46,3	29,4	0,006	0,001
unknown site (3)	*304.053*	*1.751.361*	*1.687*	*10.533*	*180*	*166*	*8,4*	*49,1*	*27,6*	*28,1*		
Total for EMAS sites [1]	**5.804.906**	**3.856.056**	**33.307**	**24.065**	**174**	**160**	**165**	**106,3**	**28,5**	**27,6**	**0,0048**	**0,0029**
Commission total [1]	5.868.113	3.884.831	33.584	24.225	175	160	168	107,7	28,6	27,7		

Table 2.8c: Total number of car journeys and distance travelled in 2013 and 2014 booked through the Commission's travel agency

	Distance by hire car (km)		Number of journeys		Kms/journey		tCO2		gCO2/km		tCO2/p	
Site	**2013**	**2014**	**2013**	**2014**	**2013**	**2014**	**2013**	**2014**	2013	2014	**2013**	**2014**
Brussels	662.130	653.552	1.029	970	643	674	130	128	196	197	0,005	0,005
Luxemburg	1.583.500	*1.457.596*	2.172	*2.037*	729	716	302	281	191	193	0,075	0,070
JRC Petten	0	*7.464*	0	*18*	0	415	0	1,5	0	196	0,000	0,005
JRC Geel	3.980	*416*	10	*1*	398	416	0,7	0	176	192	0,002	0,000
JRC Karlsruhe	237.775	*211.199*	258	*212*	922	996	44	40	187	191	0,155	0,140
JRC Sevilla	324	*1.248*	2	*2*	162	624	0	0	185	192	0,000	0,001
JRC Ispra [2]	21.002	*19.849*	35	*33*	600	601	3,9	3,9	184	194	0,001	0,001
Grange	27.451	*21.421*	23	*20*	1.194	1.071	6,2	5,1	225	236	0,032	0,026
unknown site (3)	15.571	*63.654*	*31*	*94*	*502*	*677*	3,2	*12*	204	189		
Total for EMAS sites [1]	**2.536.162**	**2.372.745**	**3.529**	**3.293**	**719**	**721**	**487**	**460**	192	194	**0,0140**	**0,0128**
Commission total [1]	2.562.350	2.401.211	3.564	3.341	**719**	719	492	474	192	197		

Note: (1) Totals exclude unknown data, (2) Data is partial for Ispra who use a local travel agency for booking flights
(3) owing to Q2 data glitch



Car hire is prevalent at Luxembourg, JRC Karlsruhe and Grange, and in comparison on a per capita basis very little used at other sites.

However at these sites, and for the Commission overall there was a downward trend in per capita emissions usage in 2014.

b) Overall CO_2 emissions from missions for the EMAS sites

Table 2.8d presents the total estimated emissions for the year for all modes.

Table 2.8d Estimated CO_2 emissions from missions of staff at EMAS sites in 2014

Travel mode	Total CO2 (tonnes)	Total CO2/p (tonnes)	total CO2/p (as %)
Commercial flights	31.952	0,885	93,2
Train	148	0,004	0,4
Hire car	639	0,018	1,9
Service Car	791	0,022	2,3
Private car	611	0,017	1,8
Air taxi	132	0,004	0,4
Total	**34.272**		**100,0**
Per Capita tCO_2		**1,0**	

Commercial flights, rail journeys and rental car totals take into account an estimated 28% of journeys not booked through travel agency (2013 figure)
Note Private car data not available for 2014, assumed to be 0,773 of service car mileage (from 2013)

Air travel clearly dominates CO_2 emissions from missions. At 1,0 tCO_2 per year, per capita emissions from missions are less than emissions from buildings consumption (1,7 tCO_2) assuming for the latter that renewable energy sources do not generate emissions.

The quantity of CO_2 emissions estimated for missions in 2014 is slightly lower than those in 2013. But the data set for 2014 had a greater proportion that was not taken into account than in 2013. More confidence can therefore be placed on the data for 2013 than for 2014. In addition, another reason for caution in relation to the value derived for the Commission's EMAS area in 2014 is that data for Ispra missions was essentially lacking.

c) Estimating the contribution of high altitude aviation emissions to global warming

In the last few decades scientists have realised that emissions from aircraft engines at high altitude have a greater global warming effect than emissions at or near ground level as they eject not only CO_2 but nitrous oxides, soot, and other products of kerosene combustion and also form contrails. The overall warming effect of emissions at cruising altitude, for flights exceeding 400 - 500 km, is thought to be typically between two and four times that generated by CO_2 emissions alone.

Radiative forcing is a measure of man's contribution to disturbing the natural balance between incoming solar radiation and reflected outgoing radiation as measured at the top of the troposphere[21]. Although there is considerable uncertainty, and research is ongoing, a radiative forcing index (RFI) of 2,7 is commonly adopted to estimate the equivalent amount of CO_2 that would be needed to generate the warming observed.

Taking radiative forcing into consideration to describe the overall warming effect of aircraft emissions, and applying an RFI of 2,7 to CO_2 emissions, the per capita values are multiplied by about 2.2 and therefore rise to about 2.2 tonnes.

2.5.3 Total air emissions of other pollutants

Emissions of sulphur dioxide (SO_2), nitrous oxides (NOx) and particulate matter (PM), and in some instances volatile organic compounds (VOC) have been reported by some sites, and is summarised in Table 2.9.

Table 2.9: Emissions of SO2, NOx, PM, VOC (Total and tonnes/person)

Site	Total					Tonnes per person				
	2010	2011	2012	2013	2014	2010	2011	2012	2013	2014
Brussels (offices)	NR	NR	NR	21,12	17,86	NR	NR	NR	0,001	0,001
Luxemburg	NR	NR	NR	NR	1,99	NR	NR	NR	NR	NR
JRC Petten	0,81	0,54	0,69	0,80	0,61	0,003	0,002	0,003	0,003	0,002
JRC Geel	NR	NR	4,19	4,19	0,67	NR	NR	0,012	0,012	0,002
JRC Karlsruhe	0,00	0,00	0,00	0,00	0,00	0,000	0,000	0,000	0,000	0,000
JRC Sevilla	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
JRC Ispra	0,00	61,41	49,35	36,00	33,22	0,000	0,024	0,019	0,013	0,012
Grange	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR

NR: Not Reported

JRC Ispra figure includes NOx and CO

JRC Petten has reported since 2010 and includes physical measurements and calculations for NOx and whereas VOC data is based on purchase and consumption of solvents. SO_2 and PM_{10} are excluded, being considered negligible by the authorities.

The figures for Brussels are based on calculations using energy consumption data, and for Geel on diesel consumption only. Emissions on an annual per person basis were reported at between 0 and 12kg in 2014. The emissions for JRC Geel fell sharply in 2014. The Ispra site currently has the highest estimated per capita emissions largely due to the larger amount of industrial equipment and processes on site, and the total is represented by NOx and CO. Owing to the different approaches at site level, deriving an overall Commission figure is currently impractical.

2.6 Improving waste management and sorting

Waste management practices vary from site to site. Some, such as Geel, consider all waste that is generated on site to be the Commission's direct responsibility and therefore include all contractors' waste in their waste reporting system. In most other sites, the quantity of waste directly disposed by contractors may not be included in the site's figures.

[21] The layer of the atmosphere extending 10 to 18km from the earth's surface, where weather processes occur

2.6.1 Non hazardous waste

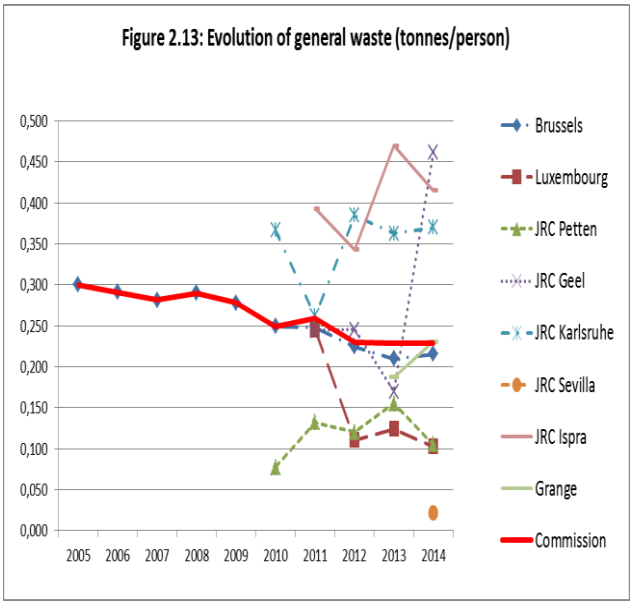
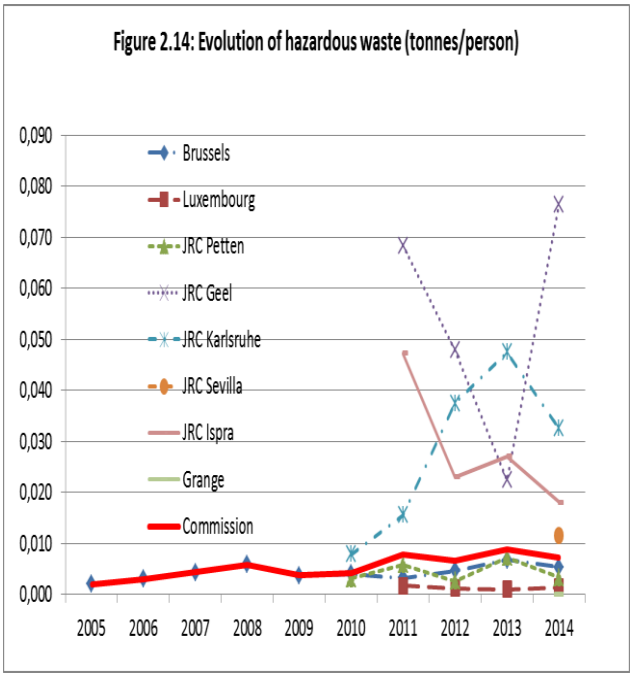


Figure 2.13[22] shows that overall the Commission generated 0.3 tonnes/person of non-hazardous waste in 2005, but had reduced this to a little over 0.2 tonnes/person in 2014. There is some fluctuation in recent years particularly of sites newer to EMAS.

JRC Sevilla is liaising with the landlord to put in place a new waste management plan. For this reason the first data point is for 2014. Luxembourg experienced a considerable reduction in per capita waste generation in 2012.

Ispra site's rate of waste generation has fluctuated in recent years owing to variable infrastructure works across the site.

2.6.2 Hazardous waste



The Commission weighted value for hazardous waste (Figure 2.14) in 2014 represented about 2.5% of that for non-hazardous waste.

For sites comprising predominantly office space, annual per capita generation of controlled waste has typically fluctuated between 0.001 and 0.003 tonnes. As expected the experimental JRC sites generate more waste, owing to the nature of the materials that are handled. Ispra has recorded a significant drop since 2011 due to a new site policy aimed at reducing the quantities of chemicals used and stored in laboratories, Karlsruhe achieve a significant drop in 2014.

Year to year comparisons for the research sites may not always be appropriate because some hazardous wastes may be stockpiled prior to disposal for months or even years.

[22] Waste figures for Brussels are for all Commission buildings for Luxembourg only EMAS scope is considered.

2.6.3 Waste sorting

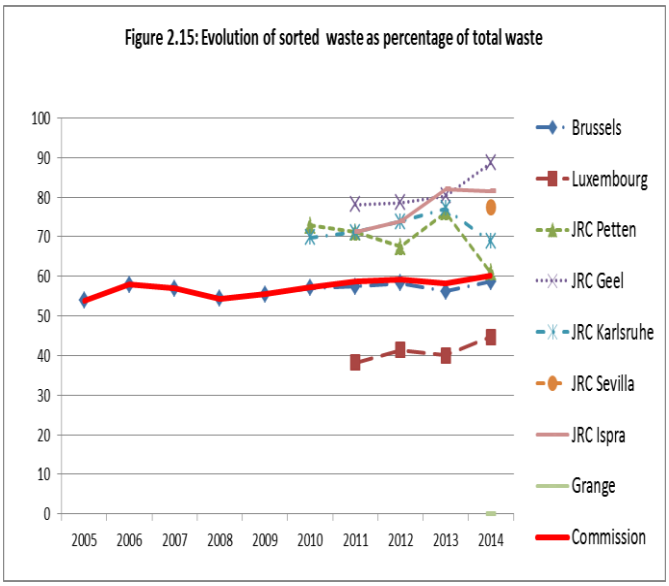


Figure 2.15 presents the percentage of waste that is sorted into different streams and represents all waste except that which is thrown away after all other sorting options have been exhausted. It can be thought of as everything except what is usually referred to as "domestic waste".

The overall Commission figure is almost identical close to that for Brussels and has fluctuated between 55% and 60% most of the last few years. The JRC sites have higher sorting rates than either Brussels or Luxembourg. Increased waste sorting has been demonstrated at Ispra, Geel and Luxembourg since 2011.

a) Recycling obselete IT and office equipment

DG DIGIT has a framework contract with Oxfam Solidarité (Oxfam), for the "removal and recycling, for humanitarian purposes", of goods no longer used by the Commission but still useful beyond their economic life, and thus providing a useful social outcome. The sales fund its humanitarian and welfare activities. Through the contract, DIGIT aims to reuse on average at least 70% of units collected from the Commission. Actual recycling rates have usually been far higher and within the range of 66% (2007) to 98% (2013) as shown in Table 2.10 which was compiled for IT collected in Brussels.

Table 2.10: Number of IT items collected and recycled

Parameter	2006	2007	2008	2009	2010	2011	2012	2013	2014
Collected items	8844	14004	16139	12014	15462	11147	19360	24744	25.656
Processed items	18273	10090	11175	7861	15301	12471	19251	5553	16.182
Items for second hand use	13157	6659	8381	5739	12509	10900	17469	5455	14.709
Second hand use (%)	72	66	75	73	82	87	91	98	91
Recycled or dismantled (%)	28	34	25	27	18	13	9	2	9
Weight of collected items (tonnes)	26,205	41,494	47,820	35,598	45,814	33,029	57,364	73,317	76,019

Note: Weight of collected items for 2014 from Oxfam Solaridarié report (Rapport d'activité matériaux déclassés 2014), supplied by DG DIGIT
Weight for previous years estimated by pro rata to 2014 figure

Since 2010 the re-use rate has exceeded 80%. Left over equipment is transferred to authorised operators on behalf of Recupel, the non-profit organisation responsible for recycling electrical and electronic waste in Belgium. During the annual audit of Oxfam Solidarity under its EMAS registration, the auditor verified that its recycling measures complied with environmental regulations and noted the generally good progress it had made in relation to legal requirements.

In 2012 there was a 74% increase in the number of items collected, coinciding with the signing of the new contract following a lull in activity after the previous one expired. The high re-use rates particularly since 2010 were achieved despite the falling cost of new IT goods, which make older IT equipment less attractive. This is due to the generally good quality of the collected items, and systematic recycling effort made by Oxfam Solidarity in the context of its EMAS registration.

The weight of IT material collected was reported by Oxfam for the first time in 2014 at 76 tonnes. This figure almost doubles the quantity of hazardous waste that is generated by Brussels, and has been incorporated into the Brussels waste reporting.

In 2014 DIGIT continued efforts to recycle and re-use obsolete equipment in Brussels and maintain a minimum of 80% re-use. It will also increase recycling of IT equipment from Luxembourg at the Oxfam Solidarity centre in Namur (Belgium) where recycling rates are expected to eventually match those achieved in Brussels.

2.7 Protecting biodiversity

In 2013, sites started collecting data for the EMAS biodiversity indicator: built surface area at ground level per person. The JRC sites have reported this figure, but both Brussels and Luxembourg, with more property, are progressing towards reporting in future.

Table 2.11: Biodiversity indicators in 2012, 2013, and 2014.

Site	Built surface (m^2)			Built surface (m^2/p)			Built surface (% of site)		
	2012	2013	2014	2012	2013	2014	2012	2013	2014
Brussels				Under development					
Luxembourg									
JRC Petten	13.365	13.365	13.248	50	51	47	4,4	4,4	4,3
JRC Geel	NR	83.934	86.359	NR	232	NR	NR	22,1	NR
JRC Karlsruhe	68.000	68.000	68.000	247	238	236	73,1	73,1	73,1
JRC Sevilla	7.073	7.073	7.073	29	25	24	60,6	60,6	60,6
JRC Ispra	n.a.	n.a.	692.984	NR	NR	250	NR	NR	42,7
Grange	0	0	10.100	0	0	52	0,0	0,0	11,8

NR: Not Reported

As shown in Table 2.11, per capita built surface area in 2014 was between 24m^2 and 250m^2. The JRC sites, with the exception of Sevilla, have larger footprints than both Brussels and Luxembourg owing to their extensive laboratories, technical installations and/or nuclear facilities.

Part of the JRC Petten site is located in a Natura 2000 protected habitat, and the site is one of the stakeholders involved in its management. A forestry management plan at JRC Geel aims to restore diversity in the surrounding forest which in recent years has become overwhelmingly dominated by pine at the expense of native broad leave species.

JRC Ispra recently conducted a study to record the main plant species and natural habitats and map the different types of green areas. A field survey recorded the population of different species of amphibians. The site used the BREEAM certification process for a new building under which it evaluated its ecological impact from construction to operation and designed mitigation measures for implementation.

2.8 Green Public Procurement (GPP)

2.8.1 Incorporating GPP into procurement contracts

Both Brussels and Luxembourg have worked to increase the number of their procurement contracts, managed by OIB and OIL respectively that include some form of "green" criteria in the contract or award process, in addition to the standard clauses. Brussels achieved this in 94% of contracts in 2013, and Luxembourg this was achieved in all contracts which marked an increase from 65% in 2012 and 32% in 2011.

One interesting example of green procurement at Brussels in 2013 was the new catering contract in which three vendors were awarded concessions, replacing a single incumbent. The JRC sites

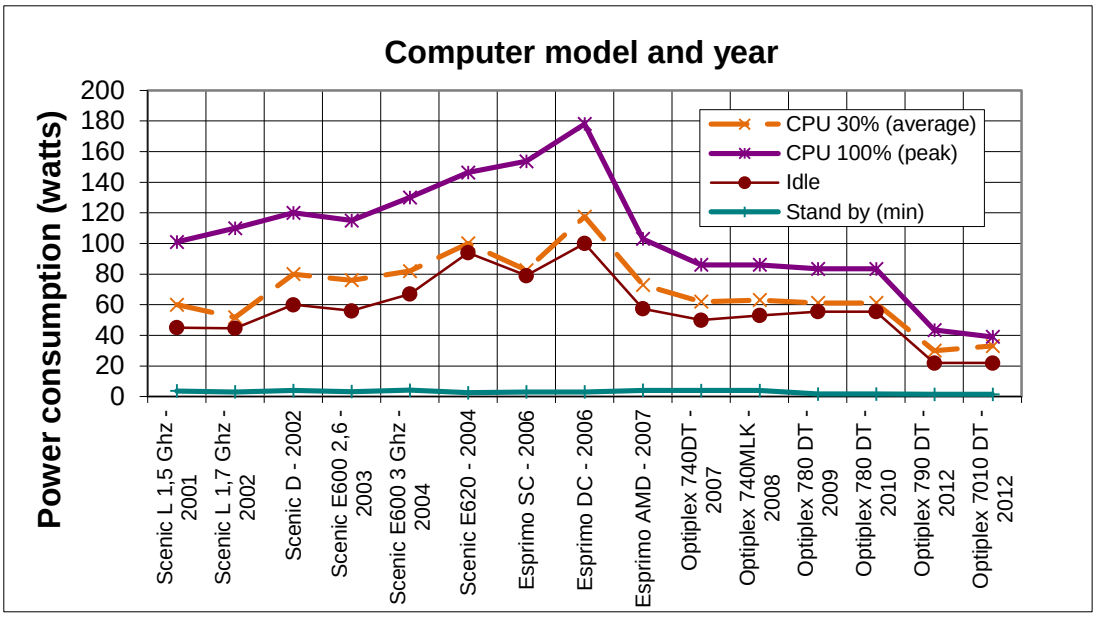
have not developed this theme so such a degree but set targets for 2014: 10% for Petten and Sevilla, and 5% for Geel which were not met.

a) IT procurement

DG DIGIT is responsible for IT in both Brussels and Luxembourg, and the JRC sites. It uses environmental criteria in the technical evaluation of all invitations to tender for the purchase of IT hardware and incorporates these criteria into the financial evaluation. Where pertinent the financial evaluation includes the cost of energy consumed by the equipment during its lifecycle.

In addition to continuing to include environmental criteria in various stages of a range of procurement contracts DIGIT provides information and training to staff who are involved in preparing calls for tender for the provision of equipment and services. Figure 2.16 is an example of how, as a result, computer power consumption has reduced since 2002.

Figure 2.16: Improved power consumption in Commission computers since 2001



No new PC models were introduced in 2013. In 2015, as for 2014, environmental criteria will continue to be included in the technical specifications of invitations to tender, and the energy saving data collection tool will continue to be implemented on individual PCs.

2.8.2 Office supply contracts

Data in Table 2.12 shows that Brussels and Luxembourg have increased the number of "green" products in the standard office supply catalogue, and Luxembourg has increased their value as a proportion of total sales.

Table 2.12: Proportion and value of "green" products in the office supply catalogue

	Percentage "green"			Value "green" (EUR)			Value of "green" as % of all purchases		
	2012	2013	2014	2012	2013	2014	2012	2013	2014
Brussels	26,7	36,2	36,2	NR	NR		NR	NR	NR
Luxembourg	18,4	22,5	26,3	NR	37.922	66.729	NR	14,0	34,5
JRC Ispra	26,1	26,1	24,2	NA	NA	NA	NA	NA	NA

NR: Not Reported
NA: Not available

Luxembourg reported purchases of "green" products of nearly 67 k EUR in 2014 representing over one third of the total, which was nearly double the amount in 2013. JRC Geel introduced an office furniture supply contract in 2013 including only items meeting ecological criteria.

2.9 Demonstrating legal compliance

2.9.1Prevention and risk management

Sites have their own standard operating procedures including internal and external audits that are required to demonstrate compliance with operating licenses and legislation. These take into account environmental compliance which is typically integrated with health and safety compliance. Sites also monitor the number of EMAS non conformities (NCs) identified through external verification audits as shown in Table 2.13.

Table 2.13: EMAS verification non conformities

Site	2011	2012	2013	2014
Brussels	21	5	3	3
Luxembourg	19	3	0	0
Petten			1	1
Geel				3
Sevilla				1
Karlsruhe Ispra Grange	EMAS verification audits from 2015			

Comparing the number of NCs between sites (or from year to year) does not provide a precise measure of performance as this can be influenced among other things by the auditor's approach. The external verifier does however seek to ensure consistency. HR COORD encourages the external auditors to take into account the resources available to Commission staff when formulating their findings particularly in relation to non-conformities, and prioritise accordingly.

Each Commission site has structures and procedures for responding to all types of emergency situation. In 2015, a new page was created in the EMAS intranet corporate portal (MyIntracomm) to explain what the different emergency situations are in Brussels and Luxembourg and links to all pages related to the follow-up of incidents and emergencies. This was done because for these large centres the emergency preparedness and response is assured by multiple services and it is sometimes difficult to see exactly who does what (Security office, Health and Safety services, infrastructure services, etc.)

2.9.2 Registering more buildings in EMAS

Brussels and Luxembourg are both large urban sites with many buildings. Owing to the administrative workload associated with incorporating new buildings in EMAS (including system implementation, data preparation and reporting internal and external audits), its scope has expanded gradually by adding a "manageable" number of buildings every year.

EMAS reporting for Brussels in 2014 reached a milestone with all[23] occupied buildings (62) included for the first time. These have a combined useful floor space of 1.075.372 m^2, which compares with 206.166 m^2 for the first registration in 2005 that included eight buildings. In Luxembourg, EMAS reporting for 2014 included six out of 14 buildings (29%), and 65.579 m^2 out of 198.205 m^2 useful floor space (33%). The two new buildings included in 2014 in

[23] Excluding some Executive Agencies, and Overijse and Palmerston buildings (unoccupied)

Luxembourg are data centres. In contrast, owing to their smaller geographical size and previous Environmental Management System experience, each JRC site is entirely integrated within the EMAS scope (100% of buildings and useful floor space).

Overall for the Commission, referring to Table 2.3, 522 out of 530 buildings (98.5%)[24] are included in the EMAS scope in 2014, representing 92% of useful floor space (1.513.072. out of 1.645.521 m^2). Ispra's inclusion in reporting for 2014 however increases the total number of buildings by 421.

2.10 Internal Communication and training

This section describes the corporate communication and training actions common for all the Commission sites. Every year, HR COORD prepares detailed corporate communication and training action plans, sets up corporate internal communication campaigns, supports individual services in setting up local staff awareness campaigns, updates EMAS training material and delivers training and technical support to the EMAS Correspondents Network and to the EMAS Site Coordinators. The more important actions are outlined below.

2.10.1. Communication to management

In 2013, HR COORD launched an action entitled "EMAS Presentations to EC Management" starting with a presentation to the Network of the Directors of Resources in Brussels. There has been no specific demand for additional EMAS presentations during 2014, besides an EMAS presentation by the Director of Resources in JRC to the JRC management in Ispra on 10/09/2014.

Two articles were published in Management Matters, the e-Magazine for European Commission's senior and middle management on *"EMAS Ambassadors: how to give waste a second life"* and *"Teleworking as part of Flexible Working Models: the Managers' point of view"* (including interviews of Head of Units and Heads of Department from DG Translation).

2.10.2. Communication towards all staff

There were two main corporate communication campaigns on i) "Waste Reduction" (May-June 2014) and ii) "Sustainable Mobility" (September-October 2014). The main highlights were:

a) Campaign on Waste Reduction

[24] Not including Executive Agencies and Representations in Member States, the latter of which are shared with the European Parliament

(i) ***"Give your waste a second life!"*** **posters and videos:** Three less well-known best-practice examples on waste reuse and recycling by Commission's services and staff have been promoted firstly via posters and then further explained by short videos, produced by Commission's Communication Unit (HR.D.3) and DIGIT and shown via Commission's corporate intranet (My IntraComm), local intranets and flat-screens. These included: (a) the recycling and reuse of obsolete ICT equipment by DIGIT in collaboration with Oxfam; (b) the recycling of conference banners for the production of bags for the Commission's service bikes by OIB; (c) the recycling of bottle-tops by local groups of volunteers for the support of persons with disabilities in collaboration with G.E.H. a.s.b.l. (Groupe d'entraide pour hémiplégiques).

Furthermore, two additional thematic posters were created for the sites of Ispra and Luxembourg referring to local best-practices on food waste reuse and recycling, specifically: (a) the composting scheme of food waste from the restaurant and cafeteria in Ispra and (b) the production of biogas from the food waste in Luxembourg.

The reactions of staff have been very positive in all sites.

(ii) "Give your waste a second life!" photo competition and exhibition: A photo competition was launched aiming at the promotion of best-practices on waste reuse by EC staff, receiving 48 entries from 5 sites (Brussels, Luxembourg, Ispra, Geel and Seville). The winning photo tells the story on how a bike was reborn from waste.

In the framework of the European Week for Waste Reduction (22-30/11/2014) the winning photos were exhibited at Berlaymont between 14/11/2014 – 03/12/2014.

(iii) **Let's Clean up Europe initiative**: On 08/05/2014, Commission's staff and trainees participated for the first time in the Let's Clean Europe initiative by helping to clean up the areas surrounding Commission's buildings at three different locations in Brussels, in the city centre and around the Beaulieu area in Auderghem.

Commissioner Janez Potočnik[25], in charge of Environment, participated in one of the clean-up sessions in Beaulieu and together with members of his cabinet and other enthusiastic colleagues collected 143kg of waste. Other teams in Square Frère-Orban and Jardin de la valée de Maelbeek, despite the heavy rain, collected 59 kg of waste. This action was supported by EC-volunteers and trainees and visibly demonstrating EC-staff's interest to reach out to local communities in order to tackle together environmental challenges.

(ii) Lunch-time conferences on composting practices: Initially a lunch-time conference on *"How to value organic waste - in the office, at home, in your neighbourhood"* was organised 07/10/ 2014 to demonstrate specific composting techniques that could be applied by individual households or even at the office. Due to the high interest among staff (49 participants), an additional session was organised on 07/10/2014 (23 participants).

(iv) Mobile phones recycling action: In September 2014, the European Commission launched a mobile phones recycling action, in collaboration with JGI Belgium's Recycle4chimps campaign. Eighty collecting boxes were distributed to all official EC buildings in Brussels and following a period of 8 weeks. In total 340 kg of electronic waste was collected, enabling JGI Belgium to support the scholarship of young Congolese students via the Roots & Shoots Youth Club in the Democratic Republic of Congo.

(v) The EMAS Reflex – issue 1 (e-Newsletter): Following a demand expressed by the EMAS Staff Survey 2013, HR COORD initiated the first newsletter of Commission's EMAS team posted on the EMAS web pages on My IntraComm and advertised via the EMAS Network. This 1st newsletter includes references on EU policies and events (e.g. 7th Environment Action Programme and the EU Green Week), but mainly gives the floor to local success stories from different services across the Commission in view of the current *"Give your waste a second life!"* campaign on the circular economy and waste reduction. Feed-back received from colleagues was very positive and encouraging.

[25] See relevant press-release at: http://europa.eu/rapid/press-release_STATEMENT-14-152_en.htm

b) Campaign on Sustainable Mobility

(i) *"Do the Right Mix for yourself and the planet"* poster and video: The overall campaign was promoted by a common *"Do the Right Mix"* poster, also supported by a relevant new video produced by Commission's Communication Unit (HR.D.3), aiming to sensitize EC staff on their daily transport and commuting habits and, if possible, choose for greener alternatives both themselves (faster, easier and cheaper) and our planet (eco-friendlier).

(ii) A Corporate Alternative Mobility Day was organised on Friday 19 September 2014, and was promoted by a video-clip produced by TV MARKT. The action with the slogan *"On 19/09 leave your car a rest"* promoted "alternative" mobility options and was supported by several actions in all EC sites (see relevant sections).

(iii) Alternative Mobility photo competition: Commission's staff were invited to send or post on Yammer (Commission's Facebook) photos/videos demonstrating examples of alternative commuting habits, The winning entries represented a vast variety of eco-friendly alternatives, from car-pooling in electric car (in Grange), to cycling / using a scooter in Luxembourg up to roller-skiing in Brussels.

(iv) The EMAS Reflex – issue 2 (e-Newsletter): In this issue, the main sustainable mobility actions across the Commission were presented in detail, as reported by the network of the EMAS Correspondents and EMAS Site Coordinators in Brussels, Luxembourg, Geel, Petten, Ispra, Karlsruhe and Grange.

In addition, HR COORD published two articles in the monthly Commission's internal magazine "Commission en Direct" (Cend), as well as numerous announcements on the Commission's intranet (My IntraComm) and flat-screens. The EMAS webpages on My IntraComm web pages have been updated and further enriched.

2.10.3. Dialogue with internal stakeholders

The Commission has a corporate register of internal questions and suggestions that recorded 55 entries in 2014 (57 in 2013), all of which received responses. In addition, at a local level, EMAS Correspondents keep records of questions and suggestions from staff along with responses.

The Commission makes a two yearly EMAS on-line survey to know about its staff environmental behaviour and awareness, the next one is anticipated to take place in 2015. Meanwhile, the 965 staff suggestions of the EMAS Staff Survey 2013, is used as valuable resource for designing communication campaigns and actions.

2.10.4. Communication among the EMAS Correspondents' Network (ECOR)

In 2014 HR COORD repeated the annual evaluation on the participation of each service on a scale of 1 to 10, using objective criteria such as presence of ECORs at network meetings, and whether they rolled out centrally prepared campaigns. The average score was 5,5 (in relation to 5,3 in 2013). Lower scoring services have particularly been targeted to try and improve performance.

The main observed trends reveal a slight improvement in the overall performance of the EMAS Network, since there are no services in the inactive category in 2014 and there are more services perfoming very good (17 services in relation to 12 in 2013).

The in-depth analysis of the EMAS Correspondents' survey results also pointed towards a performance improvement of the ECOR Network with only one service "facing problems" compared with 6 in 2013 and 10 in 2012. HR COORD will continue to provide hands-on guidance and technical assistance for EMAS campaigns, and organise best-practise exchanges during network meetings. In general terms, the EMAS Network is generally functioning well, provided that the current human resources, technical support by HR COORD and EC management support remain constant.

2.10.5. Training

Individual services are responsible for aspects of training at site level, for example that for new colleagues. These are described further in the chapters for each site. At a corporate level the following EMAS trainings were organised during 2014:

a) EMAS training for all staff:

During 2014, 2.164 staff received an EMAS-training, either as part of i) an induction session for newcomers or ii) as a general-interest EMAS e-learning course.

(i) EMAS Presentations to EC Newcomers: A 10-15 minute presentation is included in the twice monthly introductory program for Commission newcomers in Brussels, Luxembourg and the JRC-sites[26]. In 2014, there were 1.781 attendees for the periodic trainings in Brussels and in Luxembourg. Additionally, "EMAS in EC" is included as a specific section in the EC newcomers' e-learning module[27], and is also mentioned in their official acceptance letter.

(ii) The EMAS e-learning course: The EMAS e-learning course has been available to all Commission's staff in both English and French since 20th February 2012 with 383 additional

[26]The periodicity of the newcomers' presentations for the JRC-sites depends on the number of new colleagues (at least twice per year).

[27]Available at: http://ec.europa.eu/dgs/human-resources/newcomers/WELCOME_EN/lws/euid_A7.htm

participants in 2014 (also including participation of other EU organisations), reaching up to 728 participants to date. The course was revised during 2014 and included in the list of highly recommended courses for all Commission's staff. This e-learning is also available for staff belonging to others Institutions such as the Committee of the Regions and the European Economic and Social Committee.

In addition a new EMAS section has been created in the new Commission's Training Portal by the Corporate Training Unit (HR.B.3), including useful reference documents, books, videos, podcasts, communities of practice, as well as tips and tricks.

b) EMS Training

During 2014, EMAS Correspondents and EMAS Site Coordinators received two introductory training sessions on EMAS, attended by 19 participants. One additional workshop benefited 24 ECORs and their volunteer teams in the preparation of their local communication campaigns.

In addition, a two-day workshop was organised by HR COORD from 27-28/03/2014 (14 participants), bringing together for the first time the EMAS Site Coordinators of all Commission premises currently covered or intended to be covered by EMAS, including Brussels, Luxembourg, the JRC sites (Petten, Geel, Karlsruhe, Sevilla and Ispra) and Grange. The idea is to maximise mutual learning while further harmonising the way EMAS is implemented locally.

c) Specialised courses

Selected staff whose activities may have potentially significant environmental impacts may benefit from externally provided environmental training sessions, although this is not managed by HR COORD. Examples are the energy counsellor's course by Brussels Environment (IBGE) and eco-driving training for Commission drivers.

Aiming to map the current situation regarding the special trainings offered by the services, HR COORD established a register of training needs for groups with significant environmental impact. In 2014, this register was gradually updated by the majority of the EMAS Site Coordinators.

In 2015, HR COORD will conduct a feasibility study on the creation of a corporate directory of EMAS-training offers, including supporting documentation, for staff with activities that may have significant environmental impact.

2.11 External communication

2.11.1 Environmental Statement

The Environmental Statement is published on the "EMAS in EC" section[28] at the official EMAS website managed by DG ENV and on DG ENV's "Library of Environmental Statements".

Moreover, additional "EMAS in EC" informational webpages have been created at:

- The main Europa homepage[29] under: "About the European Commission" / "An Eco-friendly Commission";
- The homepage of DG HR on Europa[30] under: "About us" / "A modern administration" / "Eco-friendly Commission (EMAS)";
- The homepage of DG ENV on Europa[31].

2.11.2 Parliamentary questions

The EMAS Coordination Team responded to three parliamentary questions in 2014 in collaboration with the ECORs in OIB/OIL, DG DIGIT and DG ENV.

2.11.3 Communication with external stakeholders

HR COORD responded to all 19 entries recorded during 2014 in the external register of questions and suggestions, compared with 20 in 2013. In 2014 exchanges were ongoing with EU or international organisations, including the United Nations (UN), the European External Assistance Service (EEAS) and the European Court of Auditors (CDCE).

Also in 2014 within the framework of the *Group Interinstitutionnel de Management Environnemental*, (GIME), chaired by the European Commission in 2014, there was (i) a common announcement by the European Commission, the European Parliament, the Council's General Secretariat, the Committee of the Regions, the European Economic and Social Committee relating to Earth Hour and (ii) a thematic Green Public Procurement (GPP) workgroup on 20/03/2014 – following the initiative of the Committee of the Regions and the European Economic and Social Committee- aiming to promote exchange of best-practice. During the workshop, GPP best-practice case-studies been presented by OIB (new catering contracts) and DIGIT (decommissioning of obsolete ICT equipment contract).

[28] http://ec.europa.eu/environment/emas/emas_ec/index_en.htm

[29] http://ec.europa.eu/about/index_en.htm#eco

[30] http://ec.europa.eu/civil_service/admin/green/index_en.htm

[31] http://ec.europa.eu/dgs/environment/index_en.htm

Lastly, HR COORD organised a parallel session during Green Week 2014 on 04/06/2014 on *"EMAS as a resource efficiency tool: EU Institutions' success stories"*[32], during which the EMAS teams of different EU Institutions presented their main environmental results and shared their success stories on "doing more with less". These institutions, such as the European Parliament, the Council of the European Union, the Economic and Social Committee and the Committee of the Regions, have joined forces in the framework of GIME in order to learn from each other's experiences and find new ways to continuously improve their environmental performance.

2.11.4 Information for suppliers and sub-contractors

To better understand how main EC suppliers and sub-contractors (>60.000 €) address environmental considerations, a register was established with a view to developing a Commission-wide communication procedure to implement Green Public Procurement (including guidelines, indicators and follow-up). During 2014, the register was gradually updated by the by the majority of the EMAS Site Coordinators.

In 2015, HR COORD will conduct a feasibility study on the introduction of common corporate EMAS-related terms of reference for EC suppliers/subcontractors in the framework of the GIME Green Public Procurement Workgroup.

2.11.5 Identification of "key" External Stakeholders at site level

To facilitate EMAS extension, in 2013 HR COORD established a local contacts register for all sites with details on local and regional contact-persons relevant to the system's implementation. In 2014, the register was gradually updated with information relevant to the majority of the EC-sites.

In 2015, HR COORD will create a common EMAS directory of external contacts across the EC sites, including supporting guidelines for the new sites.

2.12 EMAS costs and savings

This is the Commission's second Environmental Statement to use unit cost information to evaluate the costs of implementing EMAS and identify savings that can be associated with reduced resource consumption. The availability of data varies considerably from site to site[33],

2.12.1 Costs for staff and contracts implementing EMAS

Table 2.14 summarises the estimated direct cost of human resources of Commission staff[34]along with those of consultancy, and other contracts directly linked with coordinating EMAS

[32] http://ec.europa.eu/environment/archives/greenweek2014/ss-1.html

[33] Some sites were not able to provide as comprehensive unit cost data for 2014 as for 2013.

[34] Using standard gobal rate for fonctionnaires:, 132.000 EUR (Note Circulaire au RUF du 08.08.2013)

implementation. The per capita costs for central coordination of EMAS (DG-HR) and the network of correspondents are evaluated using staff numbers for the different EMAS sites.

Table 2.14: Direct cost of implementing EMAS (EUR/per person and total) for each site

Site	Per person costs in:			Savings in	Total costs in:			Savings in
	2012	2013	2014	2013-4	2012	2013	2014	2013-4
HRCOORD+ECOR network	33,2	29,2	30,4	-1,2	1.122.884	928.052	1.007.252	-79.200
Brussels	5	5	5	0,2	132.000	132.000	132.000	0
Luxembourg	99	114	114	-0,1	396.000	462.000	462.000	0
JRC Petten	248	251	234	16,9	66.000	66.000	66.000	0
JRC Geel	0	182	184	-1,5	0	66.000	66.000	0
JRC Karlsruhe	0	283	281	2,0	0	81.000	81.000	0
JRC Sevilla	541	538	457	81,7	132.000	151.840	132.000	19.840
JRC Ispra	0	178	139	39,1	0	486.799	383.760	103.040
Grange	0	0	243	-243,1	0	0	47.400	-47.400
Commission	**55,7**	**68,8**	**65,9**	**3,0**	**1.848.884**	**2.373.691**	**2.377.411**	**-3.721**

Note: Includes all staff at Luxembourg and Brussels sites, per person costs based sites participating in verification

The average Commission value decreased by nearly three euros to 65,9 EUR per person and the overall cost was largely unchanged. There was significant variation in cost between the sites, the figure for Brussels and Luxembourg being significantly lower than for the JRC sites. This is expected because the JRC sites, other than Ispra typically have 200 and 400 staff compared with thousands at Brussels or Luxembourg. Both Ispra and Sevilla reduced their EMAS management costs in 2014. As new sites are added to EMAS, total costs of implementation should increase initially but per capita costs should not vary significantly.

2.12.2 Savings from reduced energy consumption in buildings

Reduced costs for buildings energy consumption represent by far the greatest savings associated with reduced resource use. Unit costs supplied by sites, together with total energy consumption within the EMAS area has been used to evaluate per capita buildings energy costs as shown in Table 2.15.

Table 2.15: Total buildings energy cost (EUR/person)

Site	Costs in:						Reduction in annual costs in 2014 since:				
	2005	2010	2011	2012	2013	2014	2005	2010	2011	2012	2013
Brussels	1.213	623	579	550	541	497	672	82	39	10	44
Luxembourg	NR	NR	NR	NR	692	1.354	NA	NA	NA	NA	-663
JRC Petten	NR	1.858	1.510	1.221	1.520	1.225	NA	338	-10	-299	295
JRC Geel	NR	NR	4.676	4.592	3.694	3.716	NA	NA	982	898	-22
JRC Karlsruhe	NR	3.502	3.426	3.797	3.513	3.641	NA	-11	-86	285	-128
JRC Sevilla	NR	NR	NR	1.211	1.177	1.142	NA	NA	NA	34	35
JRC Ispra	NR	NR	NR	NR	1.699	1.499	NA	NA	NA	NA	200
Grange	NR	NR	NR	NR	NR	631	NA	NA	NA	NA	NA
Commission	**1.213**	**693**	**717**	**674**	**724**	**704**	**488**	**-31**	**-7**	**-50**	**20**

NR: Not Reported, NA Not applicable

Note unit cost data for Brussels in 2014 assumed similar to 2013

These vary widely, and as expected the JRC sites, owing to their energy intensive experimental activities, have far higher than either Brussels or Luxembourg. Luxembourg's costs nearly doubled in 2014 because two data centres were included in EMAS reporting. Since first EMAS registration in 2005, Brussels has reduced its per capita energy costs by an estimated 715 EUR to 497 EUR. JRC Geel has recorded the greatest per capita savings in recent years, spending 982 EUR less per person in 2014 than in 2011.

A more detailed account of reducing annual expenditure on energy for office buildings in the Brussels EMAS area is presented in Section 3.12. If per capita expenditure in the EMAS area were assumed to be similar to that in the non EMAS areas, then it would have been nearly 26 Million EUR in 2005, compared with 14 Million in 2014. Cumulative savings in 2014 (since 2005) are estimated to amount to about 74 million EUR.

The savings in annual expenditure for JRC Geel between 2011 and 2014 was nearly 360.000 EUR.

2.12.3 Savings from reduced water consumption

Table 2.16: Water consumption costs (EUR/person)

Site	Costs in:						Reduction in annual costs in 2014 since:				
	2005	2010	2011	2012	2013	2014	2005	2010	2011	2012	2013
Brussels	NR	NR	NR	40	42	43	NA	NR	NR	-2	-1
Luxembourg	NR	NR	NR	NR	30	29	NA	NA	NA	NA	2
JRC Petten	NR	23	57	57	39	22	NA	-16	18	19	16
JRC Geel	NR	NR	77	71	52	38	NA	NA	24	18	15
JRC Karlsruhe	NR	48	35	38	43	51	NA	6	-8	-4	-9
JRC Sevilla	NR	NR	NR	49	48	38	NA	NA	NA	1	9
JRC Ispra	NR	NR	NR	NR	137	137	NA	NA	NA	NA	0
Grange	NR	NR	NR	NR	NR	31	NA	NA	NA	NA	NA
Commission		**37,2**	**57,7**	**41,6**	**50,6**	**50,3**	**NA**	**-13,4**	**7,1**	**-9,0**	**0,3**

Per capita water consumption data is less complete than that for energy consumption but points to broadly similar costs across the EMAS sites typically between 20 and 45 EUR. Ispra's costs are far higher however and this pushes the Commission average up to 50 EUR.

Ispra's relatively high costs arise because, unlike other sites, it maintains infrastructure related to water supply including pumping and filter stations, and a waste water treatment plant and its costs therefore include routine and unscheduled maintenance of these structures. It also has extensive cooling networks related to the technical facilities, and a fire station and mains. Overall per capita costs fell by 0,3 EUR in 2014.

2.12.4 Savings from reduced office paper consumption

Table 2.17 shows that overall within the EMAS area there has been a saving of nearly eight EUR on per capita paper consumption in the last year. Overall data for the Commission prior to 2011 are not reliable because data is lacking for Brussels and Luxembourg. JRC Petten and JRC Sevilla have achieved reductions between 2010 and 2014, of over a half and over two thirds respectively.

Table 2.17: Office paper costs (EUR/person)

Site	Costs in:						Reduction in annual costs in 2014 since:				
	2005	2010	2011	2012	2013	2014	2005	2010	2011	2012	2013
Brussels	NR	NR	NR	52	33	25	NA	NA	NA	18	8,7
Luxembourg	NR	NR	NR	NR	20	17	NA	NA	NA	NA	3,2
JRC Petten	NR	67	34	49	33	27	NA	34	0	15	6,8
JRC Geel	NR	NR	NR	NR	NR	16	NA	NA	NA	NA	NA
JRC Karlsruhe	NR	NR	23	25	19	24	NA	NA	4	6	-4,7
JRC Sevilla	NR	33	27	19	11	10	NA	23	16	8	0,5
JRC Ispra	NR	0	n.a.	n.a.	n.a.	21	NA	NA	NA	NA	NA
Grange	NR	0	0	0	0	NA	NA	0	0	0	NA
Commission		**51**	**27**	**51**	**31**	**24**	**NA**	**20**	**-4**	**20**	**7,8**

NR= Not reported, NA= Not applicable

2.12.5 Costs of offset paper consumption

JRC sites other than Sevilla do not have print shops or do a negligible amount of offset printing. Per capita costs for JRC Sevilla were 11,2 EUR in 2010, decreasing to 3,9 EUR in 2014.

2.12.6 Costs of non hazardous waste disposal

JRC Petten's per capita cost has risen from 7 EUR to 9 EUR between 2010 and 2014, although in the last year the cost dropped by 5 EUR. Luxembourg also recorded a reduction in waste management costs from 42 to 35 EUR in the last year. JRC Ispra costs are over double those for Petten and Luxembourg and increased slightly since 2013. The average Commission cost

calculated from those sites reporting data remained unchanged at nearly 39 EUR.

Table 2.18: Non hazardous waste costs (EUR/person)

Site	Costs in:						Reduction in annual costs in 2013 since:				
	2005	2010	2011	2012	2013	2014	2005	2010	2011	2012	2013
Brussels	NR	NR	NR	NR	34,2	35,1	NA	NA	NA	NA	NA
Luxembourg	NR	NR	NR	NR	41,6	35,1	NA	NA	NA	NA	NA
JRC Petten	NR	7,0	11,9	10,8	14,0	9,4	NA	-7,0	-2,1	-3,2	4,5
JRC Geel	Under development										
JRC Karlsruhe											
JRC Sevilla											
JRC Ispra	NR	NR	99,6	95,3	82,6	86,2	NA	NA	17,0	12,6	-3,6
Grange	NR	NR	NR	NR	NR	NR	NA	NA	NA	NA	NA
Commission					**38,9**	**38,9**					**0,0**

NR= Not reported, NA= Not applicable

2.12.7 Costs for disposing hazardous waste

Table 2.19 shows the evolution of hazardous waste costs:

Table 2.19: Hazardous waste costs (EUR/person)

	Costs in:						Reduction in annual costs in 2013 since:				
	2005	2010	2011	2012	2013	2014	2005	2010	2011	2012	2013
Brussels	NR	NR	NR	NR	5,31	4,24	NA	NA	NA	NA	NA
Luxemburg	NR	NR	NR	NR	3,78	4,58	NA	NA	NA	NA	NA
JRC Petten	NR	2,36	4,41	2,04	5,51	2,51	NA	-3,15	-1,10	-3,48	3,00
JRC Geel	Under development										
JRC Karlsruhe											
JRC Sevilla	NR	0,01	0,01	0,00	0,01	0,48	NA	-0,01	0,00	-0,01	-0,47
JRC Ispra	NR	NR	35,43	67,61	34,80	30,74	NA	NA	NA	32,81	4,07
Grange	NR	NR	NR	NR	NR	NR	NA	NA	NA	NA	NA
Commission					**4,66**	**3,90**					**0,8**

NR= Not reported, NA= Not applicable, JRC Sevilla includes medical waste only

Although the unit costs for disposal of hazardous waste are far higher than for non-hazardous waste, the quantities generated are much lower, and consequently per capita costs are therefore less, around four to five EUR, just above 10% of those for general waste on a Commission wide basis. These costs could fluctuate significantly from year to year as some sites stockpile hazardous waste and undertake disposal relatively infrequently.

2.13 Benchmarking

Table 2.20: Benchmarking: European Commission against other Institutions

		European Parliament				Commission (Brussels)			
	Unit	2011	2012	2013	2014	2011	2012	2013	2014
Buildings energy	MWh/FTE or staff	14,672	15,830	14,526	12,815	7,720	7,719	7,508	6,634
Paper	tonnes/FTE	0,048	0,047	0,052	0,043	0,059	0,050	0,053	0,041
Water consumption	m3/FTE	18,0	17,7	18,1	17,7	12,0	11,2	11,7	11,6
Waste (office and kitchen)	tonnes/FTE	0,1653	0,18256	0,1616	0,1868	0,248	0,225	0,210	0,215
Waste recycled	%	61,9	63,1	61,1	68,9	57,5	58,2	56,2	58,6

Note: Parliament and EEA reportfull time equivalent (FTE), Commission by number of staff
Buildings energy for the Parliament is taken by adding a) electricity plus b) gas oil and district heating
Waste (office and kitchen) for the Parliament is compared to non hazardous waste for the Commission, and total waste EEA
For the Commission, paper figure includes offset paper, for EEA data is expressed only in sheets but refers to printed paper (publications, therefore large number)
NB EESC and CoR reduced water consumption from 17.3 to 12.1 m3/year from 2011 to 2013, waste generation around 0,26 tonnes/person

Table 2.20 provides a comparison between results reported by the European Parliament[35] and those calculated for the Commission. Although the two institutions differ in their approach to estimating the parameters, for example the Parliament takes into account visitors; it would appear that the Commission consumes considerably less energy and water, but that the Parliament is ahead on waste management, while paper consumption appears quite similar. The EP also reports on carbon footprint with values far higher than those for the Commission, but their calculation methodology is more complete, and so the figures are not comparable.

Studies undertaken while updating the EMAS regulation also identified improvement in performance of EMAS organisations, but results are yet to be published.

[35] Source: European Parliament Environmental Statement for 2014, pp22-30 (signed by EP on 03/08/2015, not dated by verifier)

ANNEX A: BRUSSELS – ADMINISTRATIVE ACTIVITIES

The Office for Infrastructure and Logistics in Brussels (OIB) manages buildings and logistics in Brussels and thus plays a key role in the collation and administration of pertinent data for EMAS.

A1 Overview of core indicators at Brussels since 2005

OIB has been collecting data on core indicators for the Brussels site since 2005. A summary of their variation since 2005, over the last three years and the last year is shown in Table A1.

Table A1: Percentage changes in core indicators at Brussels over long, medium and short term

Parameter and units	From: 2005 Overall	To: 2014 % per year	From: 2011 Overall	To: 2014 % per year	From: 2012 Overall	To: 2014 % per year	From: 2013 %	Target 2014 %
Energy bldgs (MWh/p)	-65,2	-7,24	-14,1	-4,69	-14,1	-7,03	-11,64	-1,00
Energy bldgs (MWh/m^2)	-53,9	-5,99	-14,5	-4,82	-16,5	-8,27	-10,16	-1,00
Water use (m3/p)	-59,3	-6,59	-3,8	-1,27	3,0	1,51	-0,79	-1,00
Water use (L/m^2)	-46,1	-5,12	-3,9	-1,29	0,3	0,15	0,87	-1,00
Office paper (Tonnes/person)	-60,6	-6,74	-33,6	-11,20	-24,1	-12,05	-26,09	-2,00
Office paper (Shts/person/day)	-58,0	-6,44	-29,2	-9,73	-19,0	-9,52	-23,62	-2,00
CO_2 bldgs (Tonnes/p)	-87,6	-9,74	-11,3	-3,75	-18,9	-9,43	-19,84	-1,00
CO_2 bldgs (Tonnes/m^2)	-83,5	-9,28	-5,7	-1,90	-16,5	-8,27	-18,49	-1,00
Refrigerants lost (tonnes)	-63,8	-7,09	-31,1	-10,36	-5,0	-2,52	-13,37	
of which R22 (tonnes)	-93,3	-10,36	-54,9	-18,29	0,0	0,00	0,00	
Non haz.waste (tonnes/p)	-28,2	-3,13	-13,2	-4,41	-4,1	-2,06	2,63	0,00

Note: Energy, water, CO_2 reported for all buildings in the EMAS area

It is evident that since EMAS registration in 2005 all parameters have reduced considerably, averaging 7% annually except non-hazardous waste. This trend is generally replicated over the period 2011 to 2014. In 2014, year energy consumption and consequently CO_2 emissions have highly reduced, and office paper consumption fell markedly (+/- 20%).

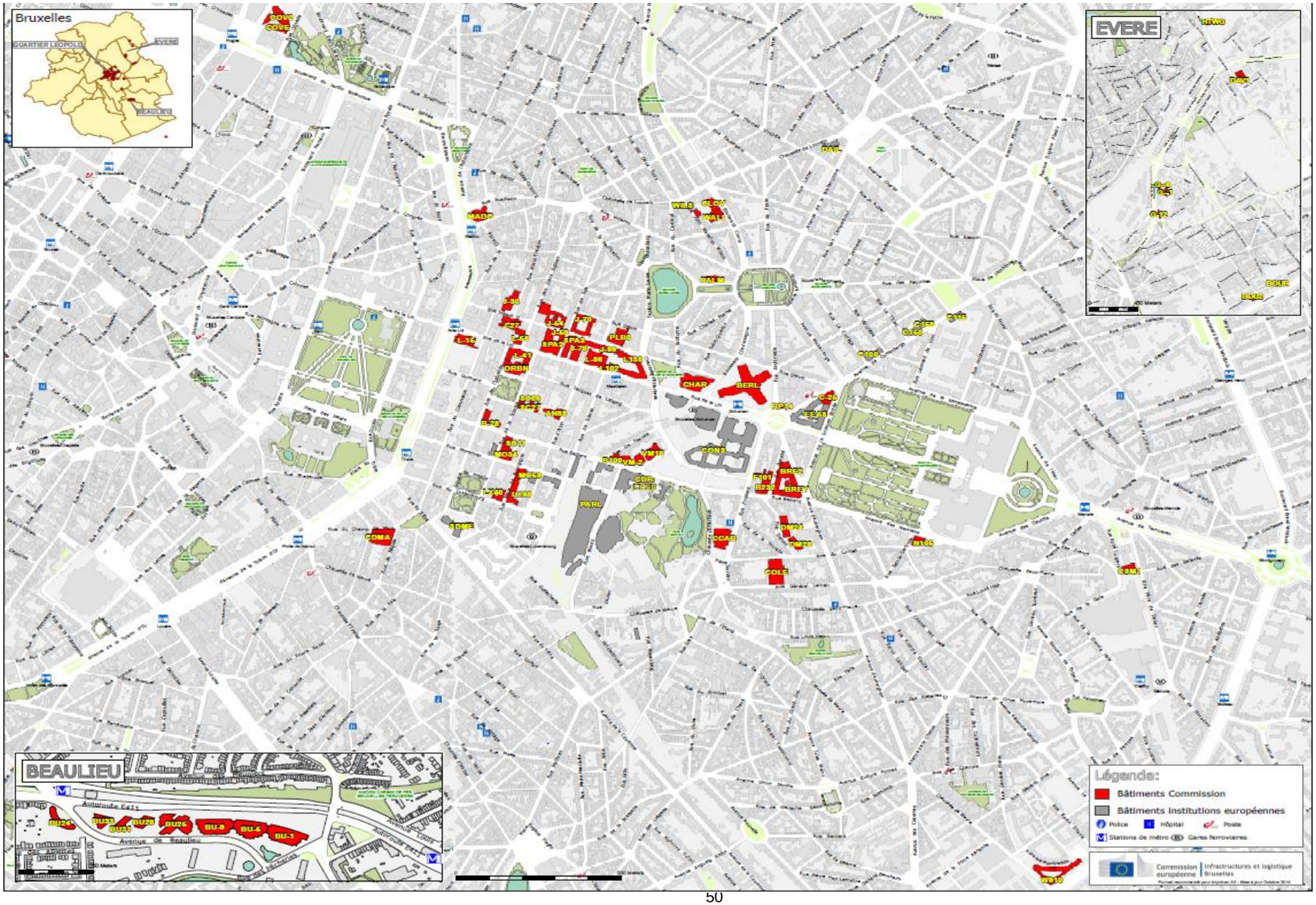
Construction works are responsible for increased total water consumption in 2013. The increase in refrigerants lost reflects different reporting adopted for 2013.

A2 Description of Brussels activities

Most of the Commission's activities in Brussels are classic administrative tasks. But there are also other services including cafeterias, canteens, restaurants, archives, print shops, a car fleet, a medical service, crèches and after school day care centres. The distribution of buildings is shown in the following figure.

Many of the buildings are located around the European quarter on the Eastern side of Brussels. A cluster of 10 buildings are located further afield in the south east of the city at Beaulieu, the Commission having found more affordable rented accommodation than was available in the more central "European quarter". A further few buildings are located outside the centre to the north and the south of Brussels including a sport centre at Overijse[36], and Houtweg.

[36] The sport centre is undergoing renovation and data for the site is not included in EMAS reporting.


Bruxelles
QUARTIER LEOPOLD
EVERE
BEAULIEU
EVERE
BEAULIEU
Légende:
Bâtiments Commission
Bâtiments institutions européennes
Police
Hôpital
Poste
Stations de métro
Gares ferroviaires
Commission européenne
Infrastructures et logistique Bruxelles

A3 Environmental impact of Brussels activities

The Commission undertook a full update of the environmental aspects in 2010, the results of which are summarised in the table below. A recently produced draft update (2015) is under review. This applied a new methodology and will determine whether the table still valid for the site. Further periodic checks are planned.

Table A2 – Summary of significant environmental aspects for the Brussels site

Aspect group	Environmental aspect	Environmental impact	Activity, product or service	Indicator/Action Plan
Air	CO_2, SO_x, NO_x, CO, VOC emissions	Air pollution, climate change	Buildings: HVAC and equipment maintenance Transport: work-related travel and journeys to and from work (organisation and personal)	Indicators 2a, 2c,-2d,
	HCFC gas emissions	Depletion of the ozone layer	Used in refrigerators	Indicator 2b; action plans
Local aspects	Dust and noise	Noise and air pollution, health risks	Generated by building renovation/repairs, staff travel and Commission car fleet	Indicator 2c / mobility plan
Bio- diversity	Choice of ingredients and their origin	Destabilisation of ecosystems	For catering	Indicator 5a, "green catering contract"
	Choice of sites and type of buildings	Destruction of natural habitat, relief, visual pollution	In the context of the Commission's buildings policy	Indicator 4a
Waste	(Hazardous) waste production	Air, water and/or soil pollution, biodiversity risks	Medical and research laboratories, sanitary installations, cleaning, maintenance and office activities	Indicator 3b
Water	Wastewater discharge	Risk of eutrophication, water pollution	Sanitary and technical installations	Not addressed
Resources	Fossil fuel consumption	Reduction in natural resources	Heating, cooling, ventilation, electrical equipment and transport	Indicator 1a, 1b
	Paper consumption		For office activities, printing, training and communication requirements	Indicator 1e, 1f
	Water consumption		For catering, sanitary and technical installations	Indicator 1d
Environmental risks	Load losses, malfunctions, leakages, spills of chemicals, gas, waste, etc.	Air, water and/or soil pollution, health risks	In the context of delivery, storage and use of chemicals/fuel used for maintenance of the technical installations, waste	Emergency planning, legal compliance: Indicator 6a

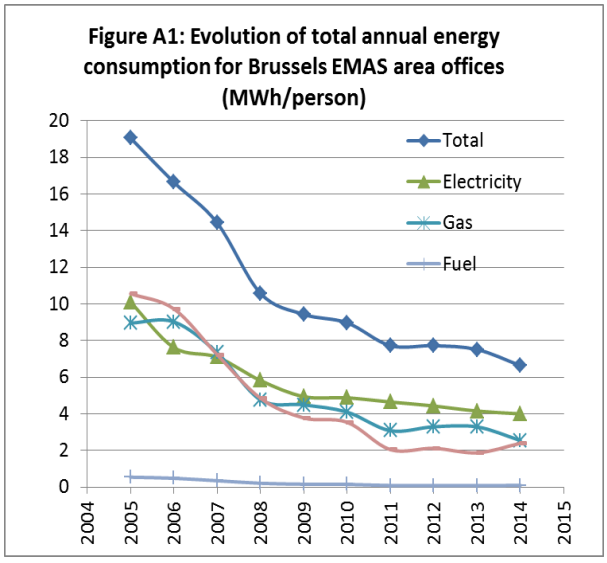
Aspect group	Environmental aspect	Environmental impact	Activity, product or service	Indicator/Action Plan
			management and storage	
(Indirect) financing	Indirect environmental aspects linked to programmes to be financed[37]	Environmental impact caused by third parties	Taking the environment into account in project selection and evaluation*	Indicator 5a; green procurement policy
(Indirect) public procurement	Environmental performance of contractors. Sustainability and impact of products and services selected[38].	Environmental impact caused by third parties	Integration of environmental clauses in contracts: influence of contract through 'sustainable' purchases	Indicator 5a; green procurement policy

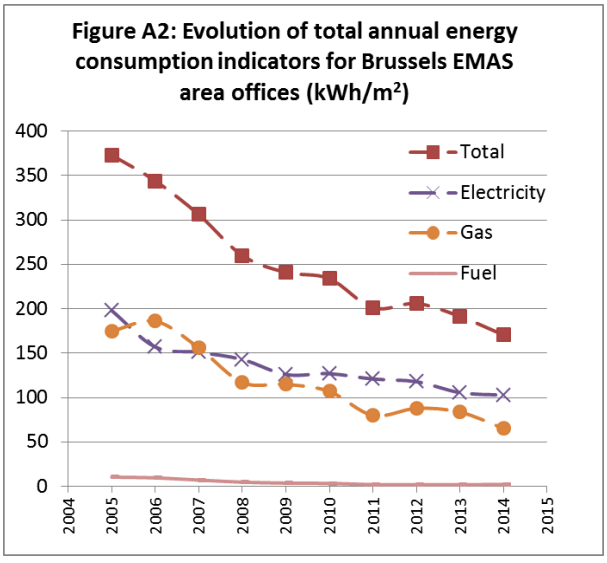
* These indirect aspects are managed via a series of specific mechanisms, including impact analysis (see point 2.1), and regulatory measures. As EMAS is not appropriate for dealing with these subjects, these activities have not been included in the scope of the environmental management system at the Commission.

A4 More efficient use of natural resources

A4.1 Energy consumption

a) Buildings





Figures A1 and A2 illustrate that total energy consumption for EMAS buildings (indicator 1a) fell by 60% and 46% (per person and per square metre respectively) since the first EMAS registration in 2005. Per capita consumption fell most rapidly between 2005 and 2009, with smaller, but continuous gains recorded since. The reduction in per metre consumption has

37 These may include damage to local biodiversity and natural resources and emissions relating to construction/development projects, etc.

38 For example: transport, use of natural resources, the lifecycle of the product, recycling, waste management, etc.

been more steady. Fuel consumption is minor in comparison to that of electricity and gas. In 2014 only three buildings used heating oil, and this represented around 2% of the total energy used for the Commission buildings.

The **2014 target** of a 1% energy consumption reduction was achieved. The **target for 2015** is a further 1% reduction. Initiatives for continued improvement identified in the Commission's EMAS annual management plan are summarised below:

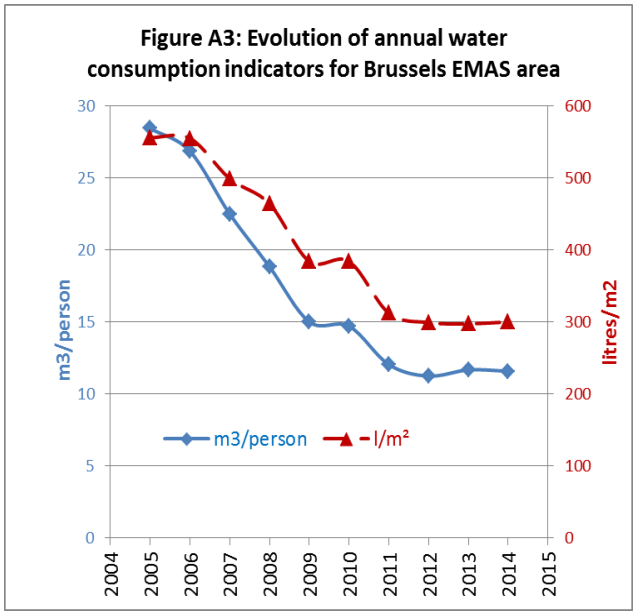
Annual Action plan no	Year since	Improvement measures description)	Progress in 2014	Expectations in 2015 (and end date)
3	2011	Optimisation of comfort hours in office buildings	Implemented	Completed
7	2011	Upgrade of lighting systems and installation of sensor detectors for higher energy efficiency	Ongoing	Measure implemented in EC owned buildings
2	2012	Energy audits to identify energy efficiency improvement measures	8 buildings audited	3 more buildings to audit
5	annual	Comfort hours reductions during summer, winter holidays	Ongoing	
1	2014	Detailed energy action plan for 10 buildings (to respond to Commission obligation under the Energy Efficiency Directive (EED)	Completed in 2014	Implementation started
90	2014	Setup of the Task Force Energy – analyse of returno on investment and energy savings of potential measures to be applied on the majority of buildings – inventory of implemented measures	Study completed for 3 main measures in 10 buildings (owned by the EC)	Implementation of measures realized and definition of further measures to implement in 2015. Analyse of energy savings realised.

b) Renewable energy use in buildings and vehicles

Overall renewable energy use of buildings (indicator 1c) represented 53% of total buildings energy consumption, and this was due to purchase of 95% renewable electricity from the supplier (since August 2009). No additional renewable energy sources were installed on site in 2014. The **2015 target** is to maintain this percentage of renewable energy in the mix.

A4.2 Water consumption

Figure A3 shows that water consumption has also reduced considerably since initial EMAS registration in 2005, with the 2014 value representing only 41% and 54% of the 2005 figure when measured on a per capita and per square metre basis.



The global trend for water consumption remains similar since 2011. The increased water consumption observed in 2013 and 2014 was due to construction works in the Schuman area, close to the BERLAYMONT building.

Performance for water consumption is also affected by changes in the EMAS scope which now covers more space and more employees. Initiatives undertaken in 2014 include water management, water leak detection system and water loss prevention mechanisms. Initiatives planned in 2015 aims at continued improvements including implementation of *ad hoc* technical measures in specific buildings.

It must also be underlined that one ot two "big consumer buildings" can wipe out gains in many other smaller buildings.

A4.3 Office and offset paper

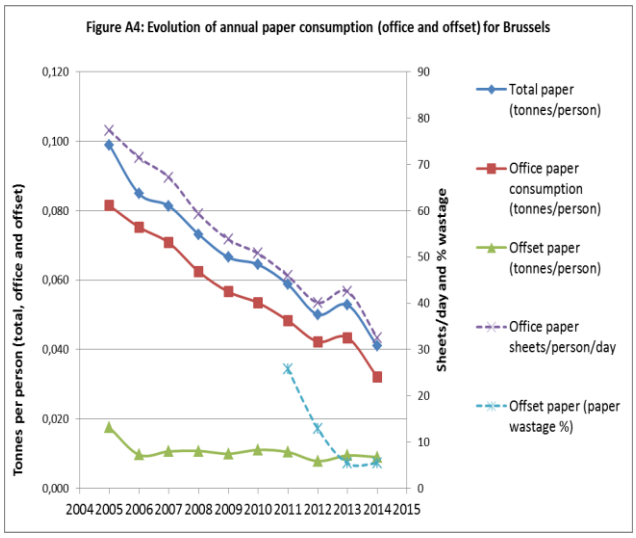


Figure A4 shows that paper consumption (kg/person) was reduced by more than 50% since 2005, with a steep reduction in 2014 in office paper consumption: measured in sheets/person/day, 2014 accounted for a 26% reduction.

The 2014 target of -2% was therefore achieved by a large margin. The objective for 2015 should be to try to keep the total consumption well under the 1.000 tonnes threshold (894 in 2014 against 1.154 in 2013).

Concerning offset paper (used in the print shop), consumption remains largely unchanged since 2006. The value for "chutes de papier", introduced in 2010 as an indicator of paper waste was maintained around 5% in 2014. The overall consumption is likely to increase, in response to the increasing interest shown by the Commission's DGs in the services rendered by the print shop.

The following initiative for continued improvement was identified in an approved action plan:

Annual Action plan no	**Since**	**Description of the improvement measures**	**Progress in 2014**	**Expectations in 2015 (and end date)**
4	2013	Paperless working group: monitoring of paper consumption, optimisation of existing circuits	Ongoing	To be continued

Performance in 2014 in relation to office paper exceeded expectations mainly for the following initiatives i) first full year of the new inter-institutional contract for office paper establishing 75 g/m^2 office paper density as a standard ii) paperless working group within OIB, including promoting paperless financial circuits; iii) continuing the phasing-out of individual printers and the rationalisation of the number of network printers.

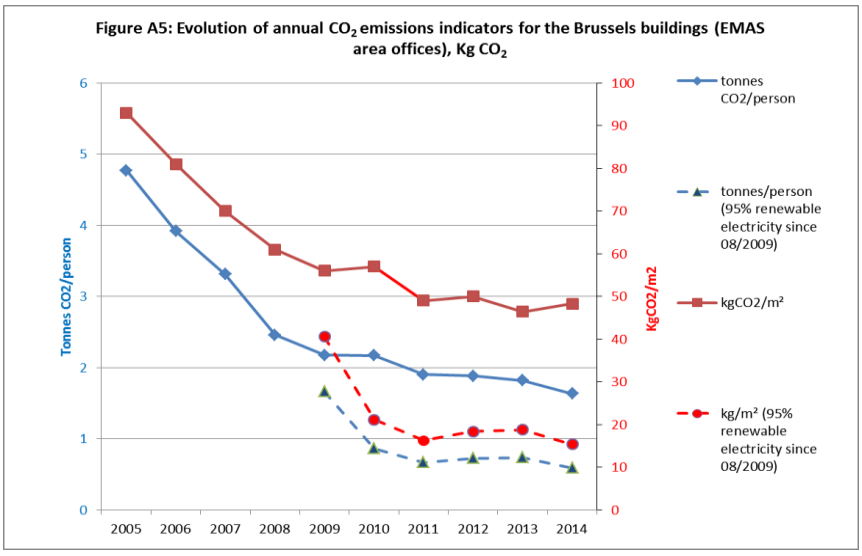
For offset paper, the following initiatives were undertaken in 2014 (continued from 2012): i) raising awareness of the quantities printed in the departments responsible, ii) using more environmentally-friendly paper; iii) continued advising Commission services to opt for default print layouts that consume less paper.

A5 Reducing emissions of CO2, other greenhouse gases and air pollutants

A5.1 CO_2 emissions from buildings

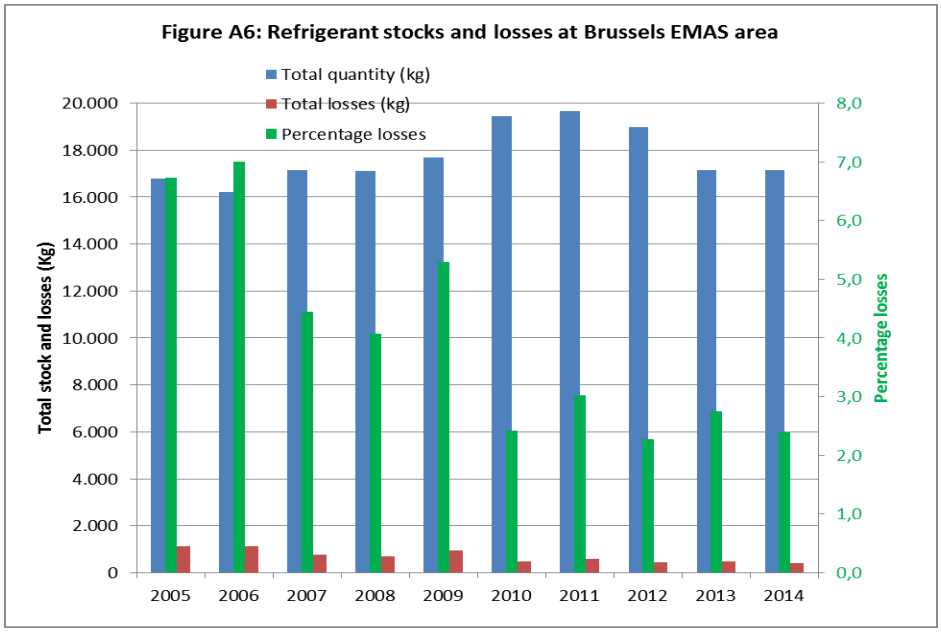
a) Buildings (energy consumption)

Figure A5 below shows that CO_2 emissions have reduced considerably since initial EMAS registration in 2005. If the true value of emissions is taken into account since the contracting of 95% renewable electricity in August 2009 then the reduction since 2005 is even greater, (assuming that renewable electricity does not generate CO_2 emissions). However since 2011, under this scenario emissions have increased slightly which is consistent with Figures A1 and A2 that show gas consumption having increased during this period on a per person and square metre basis.



There are no management approved action plans specifically for reducing buildings CO_2 emissions as measures introduced to reduce energy consumption, particularly from gas, described in section A3.1 will consequently also reduce CO_2 emissions.

b) Buildings -other greenhouse gases (refrigerants)



OIB has monitored the total quantity of refrigerants in technical installations (excluding catering), and losses since 2005. Figure 3.6 shows that although the quantity of refrigerants has risen until 2011 (but fallen slightly since) total losses have fallen to 472kg in 2013 and 409kg (from over 1.000kg in 2005). Each kilogram of refrigerant lost may be equivalent to between 1.000 and 5.000 kg of CO_2. Before 2013 only R22 was specifically identified for reporting as CO_2 equivalent, which explains why the total CO2e for refrigerants reported jumps from 127 tonnes in 2012 to 914 tonnes in 2013.

There were no specific targets relating to reducing refrigerant losses in 2013 or 2014. A **2014 objective** was to define the substances responsible for losses (in addition to R22) so that their CO_2 equivalence can be evaluated. However management approved action plan has been in place since 2011 to phase out certain HFC and HCFC installations as follows:

Annual action plan no	Year since	Description of the measures	Progress in 2014	Expectations for 2015 (and finish date)
32	2011	Phase out of insitallations with HCFC (including R22), and HFC (hydroflourocarobs; R134a, R404a, R407c, R410a, R417a)	R22 suppressed from all technical installations	Implementing of the diagnostic control for cooling installations

Performance in 2014 met expectations. and all installation conatining R22 where phased out according to the planning.

Other initiatives undertaken in relating to buildings emissions in 2014 included preparing to more fully report on the remaining pertinent parameters required under the EMAS regulation.

A5.2 CO_2 emissions from vehicles (indicator 2c)

a) Commission vehicle fleet

Brussels operates a vehicle fleet of 120 owned and leased cars which has reduced in size in recent years. Figure A7 shows how vehicle emission and average vehicle use have evolved.

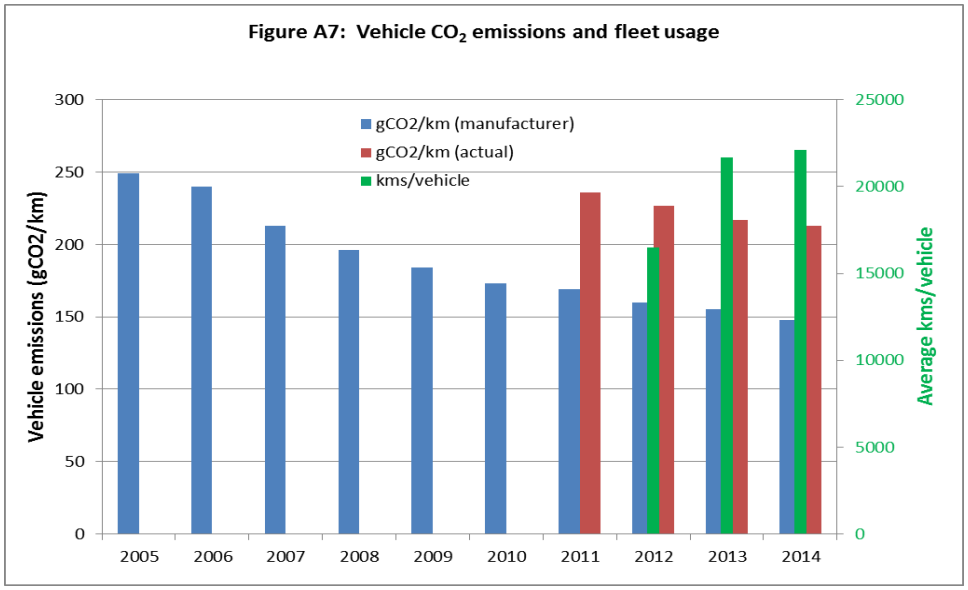


Figure A7 shows that OIB has reduced the Commission's vehicle fleet emissions (measured as gCO_2/km using manufacturer's technical specifications) by nearly 40% since 2005, by buying or leasing more efficient cars. Actual gCO_2/km emissions, measured using fuel consumption data, have reduced by almost 10% between 2011 and 2014. Vehicles average 22.698km per year, suggesting the smaller number of vehicles is being used more intensively, as this figure was 16.494km in 2012.

Initiatives undertaken in 2014 included systematically replacing vehicles in the Commission's car fleet that have reached the end of their economic life-cycle with more environmentally friendly models (lower engine capacity, hybrid technology, electric vehicles, etc.), and providing Commission drivers with 'eco-driving' training.

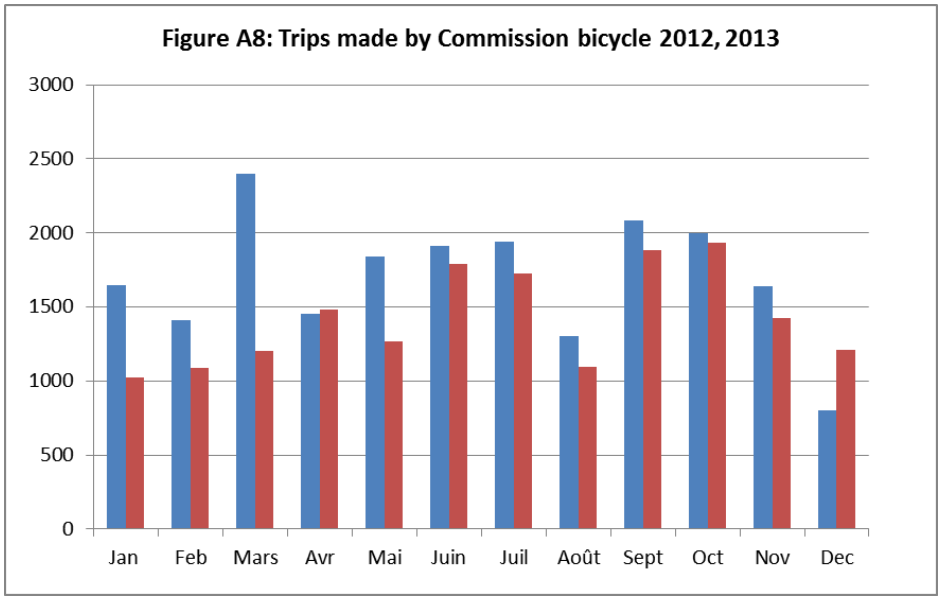
b) Missions (excluding Commission vehicle fleet)

There were no specific targets in 2014 or 2015 or management approved action plans to reduce CO_2 emissions from missions.

Initiatives undertaken in 2014 to encourage staff to consider less energy intensive alternatives for mission travel include i) the evaluation of the use of videoconferencing within the Commission; the results of this evaluation ii) promoting videoconferencing in DGs other than DG DIGIT and encouraging them with a monthly utilisation report; iii) continuing to promote the use of service bicycles; and iv) continuing to distribute tickets for the public transport network for journeys within Brussels and to make free travel available to staff on presentation of their service card on STIB bus routes 21 and 2.

c) Commuting (and mobility)

There were no specific targets in 2014 or 2015 or management approved action plans to reduce CO_2 emissions from missions. The Commission makes bicycles available for staff at several buildings to a provide a quick option for moving between offices and attending external meetings, and the number of trips undertaken using these bikes is presented in Figure A8.



The total number of recorded journeys fell by around 15% from 20.434 in 2012, to 17.139 in 2013.

Initiatives undertaken in 2014 concerning commuting included i) continued financial support to public transport season tickets; ii) providing buildings with bicycle parking and showers for staff who cycle to work; iii) promoting the "Bike to Work" and "Bike Experience" schemes; iv) promoting car-pooling, and assisting staff in finding car-pooling partners via a dedicated Intranet site v) exploring options for joint schemes with local bike partners such as "Villo", and vi) drafting the new multi-annual Mobility Plan.

Data from a staff mobility survey conducted in 2014 indicated a potential reduction in the number of staff driving to work .indicating that actions aimed at reducing private vehicle use may be more effective than in previous years.

A5.3 Total air emissions of other air pollutants ($S0_2$, NO_2, PM)

Brussels is one of several European cities experiencing high levels of airborne pollution, and Belgium is one of the European countries on the Commission's "watch list" for lack of compliance with the 2010 Air Quality Directive. With around 60 buildings each with two to three boilers, and a fleet of over 120 predominantly diesel vehicles; the Commission must ensure that it is not unduly contributing to this problem.

These pollutants are typically released into the air as products of combustion, therefore boilers and vehicle engines are a potential source. In order to develop improved reporting on these atmospheric pollutants, OIB started to collect data in 2013.

Because combustion of natural gas releases less airborne pollution than that of oil; the Commission is proceeding to phase out oil heating installations. Studies concerning the future of the three building still heated by oil are ongoing.

There were no specific quantitative targets identified in 2014 (other than assessing the impact of other greenhouse gases (…to include atmospheric emissions of SO_2, NO_x and PM), the **2015 target** will be to define the method to report on 2014 data.

A6 Improving waste management and sorting

A6.1 Non hazardous waste

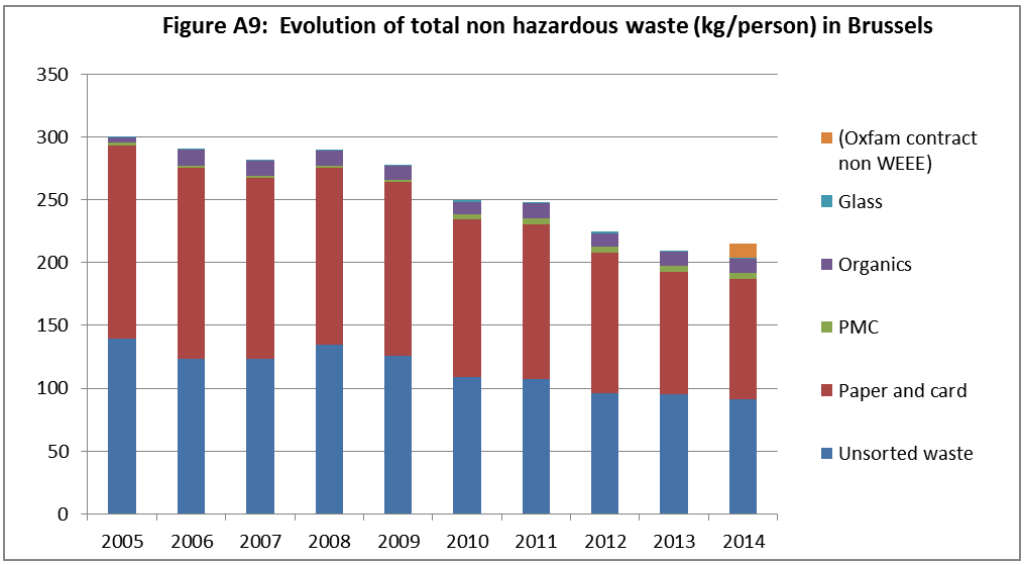


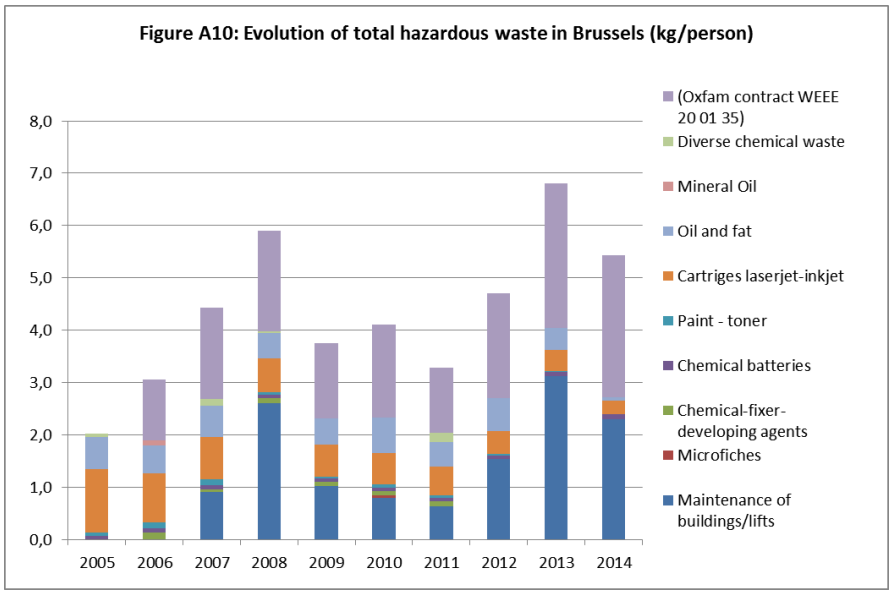
Figure A9 indicates that waste generated per person has reduced by nearly one third since 2005. Unsorted waste and paper/carton make up a large percentage. From 2014, data includes the weight of office furniture recovered by Oxfam under a contract which is also used for disposing of obsolete IT equipment. The **2014 target** was to maintain the 2013 performance, but the **longer term target** is to achieve a 5% reduction by 2018.

There are no specific management approved **actions** for continued improvement. Other initiatives undertaken in 2014 include i) improving the selective sorting of waste using sorting bins in areas and buildings for public use; and ii) exploring ways of reducing transport distances to reduce the environmental impact of vehicles used by staff engaged in waste transport.

A6.2 Controlled Waste

For the first time in 2014, data supplied by DG DIGIT relating to the weight of IT material collected by Oxfam has been incorporated in the hazardous waste data , and the data series extrapolated back to 2006.

As shown in Figure A10. total controlled waste (excluding IT) has typically been in the range of 2kg to 3kg per person since 2005 but this figure approximately doubles when disused IT is taken into consideration.



Printer cartridges have become a smaller proportion of the total, as various paperless strategies have been implemented; showing that such strategies can result in reduced use of other consumables. There was no **2013 target** for controlled waste reduction; however the **2014 target** was 2%.

Other initiatives undertaken in 2014 include i) replacing the containers for hazardous products; ii) improving storage of oil and other drums of hazardous products; all drums will be placed in a collection container iii) reducing the capacity of drums used for oil to make them easier to handle; and iii) taking steps to reduce the risk of accidental spillage and the risk of affecting the health of staff transporting the drums.

A6.3 Waste sorting

OIB seeks to maximise the sorting of waste into potentially useful streams, and minimise the amount of unsorted, typically general waste.

Table A3 Percentage of waste sorted at the Commission in Brussels

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Percentage of waste sorted	53,9	57,9	56,9	54,4	55,5	57,1	57,5	58,2	56,2	58,6

Table A3 shows that the proportion of total waste that is sorted typically fluctuates between 54 and 58%. The **2014 target** of 62% has not been achieved; the **long term objective** is 65% by 2018.

A7 Protecting biodiversity

Brussels started collecting data for this indicator in 2013, and there was no **specific 2014 target.**

OIB generally strive to continuously improve the environmental impact in the building sector, including adopting several measures contributing, directly or indirectly, to protect biodiversity and including i) integrating and managing several green areas in its buildings; ii) managing a green park in the Overijse site, outside the EMAS scope, but with an area of 13.000 m² with around 60 trees, iii) introducing infrastructure measures such as green roofs in building

projects such as that at Overijse (roof 1.800 m²); iv) opting for green procurement of goods and services: (e.g. where possible integrating environmental considerations in the selection of construction materials); and v) introducing the BREEAM assessment in recent projects (ORBAN building: BREEAM very good; L-15 building BREEAM-in-use assessment).

A8 Green Public Procurement

A8.1 Incorporating GPP into procurement contracts

OIB aims to incorporate green public procurement principles into its contracts exceeding 60.000 EUR and has increased the number of contracts including "green" criteria in the last few years. The target was to incorporate green criteria into all relevant contracts over 60.000 EUR, and the actual amount was 80% in 2014. The **2015 target** is to achieve 100%. The following management approved action has been identified to achieve the target.

Annual action plan no	Year Since	Description (and reference)	Progress in 2014	Expectations in 2015, and end date
54	2012	Integrate GPP criteria in the call for tenders and technical specification	Ongoing	Systematic implementation

Other initiatives undertaken in 2015 include implementing:

- follow up of the evaluation of GPP criteria – remarks should be recorded in the "debriefing note";
- updating of the GPP indicator ; and
- contribution to the revision of "EU GPP Criteria" on food and catering services.

A9 Demonstrating legal compliance

A9.1 Prevention and risk management

OIB records statistics relating to the findings of buildings audits and inspections of health, safety and environment. These audits and inspections are based on permits and legal requirements for each building and technical installation. There are normally over 1.500 reports per year and as shown in the table below, the number of reports with minor non conformities has hovered around 40%, and those with major non conformities at around 1 to 2%.

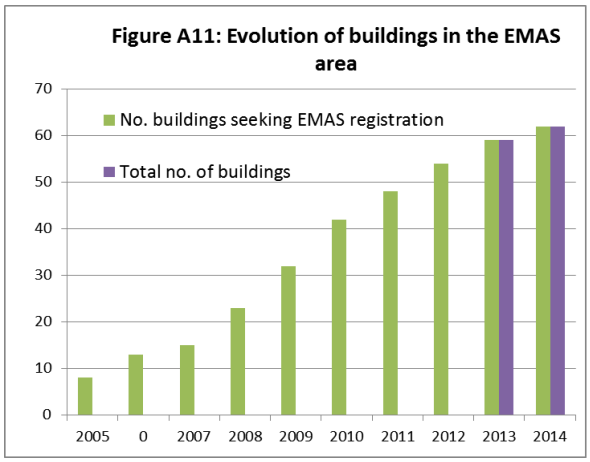
The major non conformities noted in 2014 by integrated audits at OIB although none were EMAS related. A major initiative undertaken during 2013 and 2014 was the preparation and tendering of a new multi annual contact for the external technical inspection service that started in 2014. Detailed technical specifications included several new technical controls which are relevant from an environmental management systems perspective.

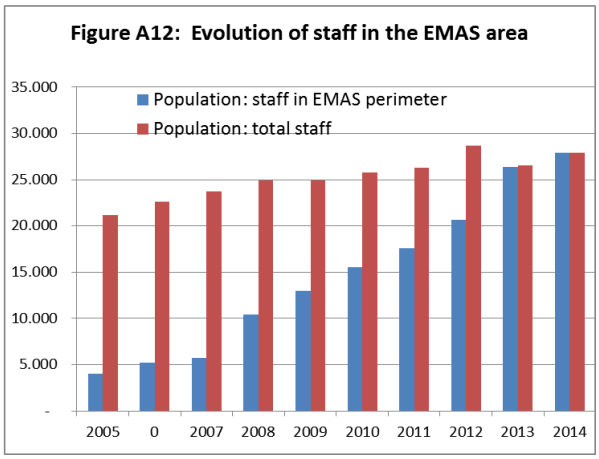
These include i) Diagnosis of boiler installations of more than 15 years old – in line with the energy performance of building directive (ref. 6D), ii) Diagnosis of air conditioning installations of more than 15 years old - in line with the energy performance of building directive (ref. 6E), iii) Periodic controls of cogeneration systems and associated air analysis (ref 6G) and iv) Periodical control of generators and associated air analysis (ref 6H). In

addition a number of previous controls (ref. 6A, 6B, 7B, 7C) have been have been updated to better answer to the environmental needs.

A9.2 Registering more buildings in EMAS

Figures A11 and A12 show the increase in the number of EMAS registered buildings since 2005, and also in the number of staff who work in them.





The number of buildings and staff in the EMAS area has grown rapidly since first registration in 2005. The EMAS area in Brussels included 27.870 staff in 2014 representing an increase of over 1.500 since 2013. At first registration in 2005, the EMAS staff population was 4.033.

Each building proposed for EMAS registration undergoes a systematic legal compliance inspection by the Brussels' authorities (IBGE inspectors). This ensures further legal compliance in addition to internal audits and external verification done on a yearly basis.

The **2013 target** was to increase the number of EMAS registered buildings from 48 to 54, and this was achieved. The **2014 target was** to further increase the number to 59 based on data reported in 2013. In 2015 the EMAS reporting includes all the occupied buildings in Brussels (62)[39]. The 2016 is to complete the registration of all buildings managed by OIB, knowing that the building portfolio is changing regularly.

Annual action plan no	Since	Description (and reference)	Progress in 2014	Expectations in 2015, and end date
	2014	**EMAS registration of all buildings managed by OIB in Brussels**	**Ongoing**	**Complete by 2015**

[39] Unoccupied buildings not considered in 2014 are Overisje (inter-institutional sports facilility undergoing renovation), and Palmerston (former crèche)

A9.3 Legal register

Legal register for Brussels was udpated in 2014 (and in 2015). In 2015, HR COORD requested to the Brussels (OIB and DIGIT) to check and inform on the legal compliance status for each legislation.

A10 Internal communication and training

A10.1 Welcome Office INFO DAY

HR COORD participated in the Welcome Office's INFO DAY on 19th March 2014 at Berlaymont Piazza, presenting EC-Newcomers with an overview of the Commission's environmental management system and practical eco-tips. There were approximately 800 participants.

A10.2 Waste Reduction Campaign

Local actions organised in 11 DGs/services (SG, DG AGRI, DG COMM, DG COMP, DG DGT, DG DEVCO, DG EMPL, EPSO, DG JRC and DG RTD) included: the collection and recycling of old mobile phones in collaboration with Jane Goodall Institute Belgium, the collection of plastic bottle tops for the support of the association G.E.H (Groupe d'Entraide pour Hémiplégiques), "switch off" campaigns, the promotion of waste sorting, and the collection and re-use of old office supplies and stationary (spring/summer cleaning up initiatives).

Special notion may be given to the "Green Pledge" initiative among local volunteers in DG RTD and the inclusion of Green Procurement Provisions (GPP) in the EC Representations' tenders by DG COMM.

A10.3 Sustainable Mobility Campaign

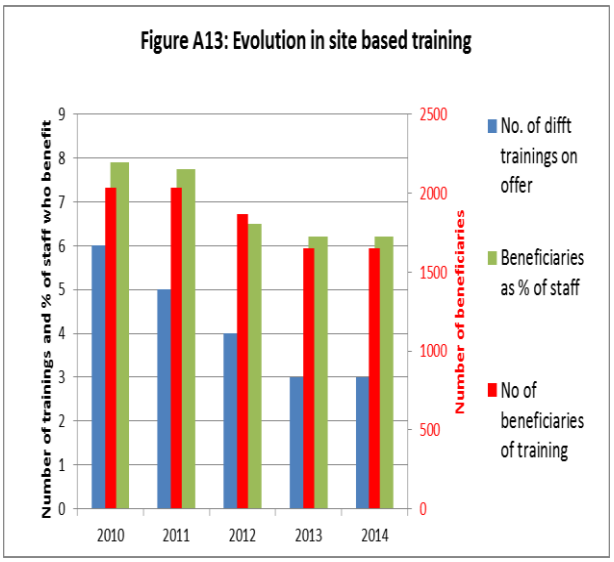
During European Mobility Week (16th to 22nd September 2014), OIB organised: (a) technical bike controls in five different locations, (b) lunchtime guided bike tours, starting from five different Commission buildings and which attracted about 100 participants (c) breakfast for the participants to the bike tours, (d) mobility info-stands informing Commission staff on mobility issues, also promoting new actions such as the "Bike to Work" initiative to EC-staff and a regional car-pooling platform[40], (e) 1.000 free passes to public transport for two weeks were offered to EC-staff (TRY-PASS) in collaboration with STIB, and (f) a pilot project for new service bikes was launched at MADO and BERL buildings (including electric bikes).

This year's EU Mobility Week was another opportunity to reflect upon our daily transport and commuting habits and if possible, opt for "greener" alternatives for both ourselves (faster, easier, and cheaper) and the planet (eco-friendlier). The EMAS team organised a

40 http://www.carpool.be/index/choose

Commission-wide "Alternative Mobility Day for EC staff" on Friday 19 September 2014 also across the Brussels site.

A10.4 Other specific actions at site level



All the parameters associated with site specific EMAS related training have reduced, owing largely to the reduction of EMAS dedicated staff.

There were three specific training packages available in 2014, and the **2015 target** is to maintain this number.

OIB ensures ongoing communication with staff in Brussels through OIB's Annual Management Plan.

Since	Description (and reference)	Progress in 2014	Expectations in 2015, and end date
2011	Environmental communication actions (Concrete electronioc newsletter)	Ongoing	Yearly action

A11 Transparent dialogue with external partners

The EU Open Day 2014 event was held in the Berlaymont on 9th May 2014, as part of the EU Institutions' Open Day for the general public. Informational posters on EMAS in the Commission were displayed. More specifically OIB has designed a poster on EMAS-results in 2013. Approximately 25.000 attended the Berlaymont building the Open Day.

HR COORD and OIB participated in several local and regional conferences or meetings, for example the EMAS Regional and Federal Network Meetings in Brussels.

OIB conduct regular dialogue with national and regional environmental authorities in order to share best practices and identify potential synergies.

A12 EMAS Costs and saving

The direct administrative cost of implementing EMAS (costs of OIB EMAS coordination) specifically for the Brussels site is estimated at 5 Euros per person. This excludes central EMAS coordination (DG HR) and the EMAS network of correspondents who are based in several DGs and services.

The major savings that have been identified since EMAS implementation relate to energy, for which unit costs have been identified dating back from 2013 to 2006. In conjunction with per capita consumption, this permits estimations of energy costs as shown in Table 3.6[41].

Table 3.6: Reduction in energy costs for office buildings in EMAS area

Parameter	2005 (1)	2006	2007	2008	2009	2010	2011	2012	2013	2014
Total Staff (EMAS Office Buildings)	4.033	5.238	5.702	10.393	13.014	15.527	17.586	20.663	26.336	27.870
Total Staff (Commission)	21.203	22.635	23.760	24.936	24.937	25.750	26.305	28.681	26.499	27.870
Total energy cost for EMAS office buildings (EUR)	4.890.160	5.208.710	4.811.358	9.983.417	8.250.799	9.672.907	10.189.417	11.372.153	14.242.833	13.852.477
Total enegy cost for all Commission buildings (2) (EUR)	25.709.412	22.507.934	20.048.308	23.953.285	15.809.911	16.041.563	15.241.249	15.784.964	14.330.986	13.852.477
Total per capita energy cost for EMAS office buildings	**1.213**	**994**	**844**	**961**	**634**	**623**	**579**	**550**	**541**	**497**
Electricity (Eur/person)	889	670	576	737	456	465	452	415	401	386
Gas (Eur/person)	307	309	251	214	171	150	122	130	135	104
Fuel (Eur/person)	16	14	17	9	8	8	5	5	5	6

Notes

1) Unit costs: Assume 2005 same as 2006, 2008 still under review

2) Assuming non EMAS area have similar costs for energy as EMAS area

3) 2013 unit costs for electricity, gas fuel assumed to apply for 2014

According to Table 3.6, the per capita cost of energy used in the EMAS area office buildings has fallen from around 1000 EUR/person 2005/6 to around 500 EUR in 2014. Assuming (conservatively) that similar consumption rates apply both inside and outside the EMAS perimeter, these figures suggest that the Commission's annual energy bill has fallen from around 25.3 Million EUR in 2005 to 13.9 Million EUR in 2013.

In comparison per capita expenditure related to other resources is far more modest. Data from 2012 and 2013 reveal that:

- Water consumption in the EMAS area offices amounted to 43 EUR/person in 2013 compared with 40 EUR/person in 2012; and

- Total paper consumption (of which offset paper is responsible for a large part of the costs) reduced from 52 to 36 EUR/person between 2012 and 2014.

- Waste consumption figures are under review but suggest general waste in the order of 34 EUR/person and controlled waste about one tenth of this amount.

A13 Brussels data tables:

Line	Objective/ indicator	Parameter and units	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
2	Basic EMAS	Population: staff in EMAS perimeter	4.033	5.238	5.702	10.393	13.014	15.527	17.586	20.663	26.336	27.870
4		Population: total staff	21.203	22.635	23.760	24.936	24.937	25.750	26.305	28.681	26.499	27.870
6		No. buildings seeking EMAS registration	8	13	15	23	32	42	48	54	59	62
8		Total no. of buildings									59	62
10		Useful surface area in EMAS perimeter, (m^2)	206.166	257.557	272.324	446.562	533.285	633.228	721.038	820.028	1.033.183	1.075.372
12		Useful surface area for all buildings, (m^2)									1.051.557	1.075.372
16	Objective I) Efficient use of resources											
19	Ia	Total energy buildings, (MWh)	76.856	87.169	82.220	109.920	122.669	139.218	135.761	159.499	197.731	184.886
23		MWh/person	19,057	16,642	14,420	10,576	9,426	8,966	7,720	7,719	7,508	6,634
27		kWh/m²	373	344	306	260	241	234	201	206	191	172
29		i) supplied electricity, (MWh)	40.749	39.909	40.427	60.445	64.247	75.666	81.656	91.498	109.254	111.392
31		MWh/person	10,104	7,619	7,090	5,816	4,937	4,872	4,643	4,428	4,148	3,997
33		kWh/m²	198	157	151	143	126	127	121	118	106	104
35		renewables in electricity mix, (%)	0	0	0	0	60	95	95	95	95	95
37		from renewables, (MWh)	0	0	0	0	38.548	71.883	77.573	86.923	103.791	105.822
39		MWh/person	0	0	0	0	2,962	4,630	4,411	4,207	3,941	3,797
41		kWh/m²	0	0	0	0	72	114	108	106	100	98
43		non renewables in electricity in mix, (%)	100	100	100	100	40	5	5	5	5	5
45		from non renewables, (MWh)	40.749	39.909	40.427	60.445	25.699	3.783	4.083	4.575	5.463	5.570
47		MWh/person	10,104	7,619	7,090	5,816	1,975	0,244	0,232	0,221	0,207	0,200
49		kWh/m²	198	155	148	135	48	6	6	6	5	5
53		ii) supplied gas, (MWh)	33.931	44.754	39.824	47.309	56.410	61.311	52.633	66.264	86.501	70.881
55		MWh/person	8,953	9,023	7,330	4,760	4,489	4,094	3,077	3,291	3,285	2,543
57		kWh/m²	175	186	156	117	115	107	80	88	84	66
59		iii) supplied diesel, (MWh)	2.176	2.506	1.969	2.166	2.011	2.240	1.471	1.737	1.933	2.570
61		MWh/person	0,540	0,478	0,345	0,208	0,155	0,144	0,084	0,084	0,073	0,092
63		kWh/m²	10,6	9,7	7,2	4,8	3,8	3,5	2,0	2,1	1,9	2,4
65		iv) district heating, (MWh)	0	0	0	0	0	0	0	0	0	0
67		MWh/person	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
69		kWh/m²	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
71		v) site generated renewables - biomass, (MWh)	0	0	0	0	0	0	0	0	0	0
73		MWh/person	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
75		kWh/m²	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
77		vi) site generated renewable - PV, (MWh)								43,4	43,4	43,4
79		Installed peak capacity, (kWhp)									10	10
81		Assumed output, (% of kWh/p)									50	50
83		MWh/person								0,0021	0,0016	0,0016
85		kWh/m²								0,053	0,042	0,040

89	**1b**	**Total energy used by service vehicles, (MWh/yr)**								**2.535**	**2.468**	**2.292**
93		**MWh/person**								**0**	**0,094**	**0,082**
97		**kWh/m²**								**3,1**	**2,388**	**2,131**
99		**Diesel used, (m^3)**								**219,371**	**215,396**	**200,988**
101		kWh of energy provided by one litre diesel								11,1	11,1	11,1
102		**Petrol used, (m^3)**								**10,629**	**8,156**	**6,456**
104		kWh of energy provided by one litre petrol								9,4	9,4	9,4
110	**1c**	**Total renewable energy use, (MWhr/yr)**								**86.967**	**103.835**	**105.866**
114		**renewable energy as part of total, (%)**								**54,52**	**52,51**	**57,26**
118		**Onsite generated renewables as part of total energy, (%)**								**0,03**	**0,02**	**0,02**
122	**1d**	**Water usage in EMAS perimeter, (m^3)**	**114.702**	**140.616**	**133.791**	**195.664**	**195.186**	**227.907**	**211.568**	**232.114**	**307.188**	**322.527**
126		**m^3/person**	**28,441**	**26,845**	**22,493**	**18,827**	**14,998**	**14,700**	**12,030**	**11,233**	**11,664**	**11,573**
130		**l/m²**	**556**	**555**	**499**	**464**	**384**	**384**	**312**	**299**	**297**	**300**
134	**1e**	**Office paper consumption, (tonnes)**	**1.727**	**1.703**	**1.681**	**1.557**	**1.412**	**1.376**	**1.271**	**1.212**	**1.150**	**894**
138		**Office paper consumption (tonnes/person)**	**0,081**	**0,075**	**0,071**	**0,062**	**0,057**	**0,053**	**0,048**	**0,042**	**0,043**	**0,032**
140		**Paper Density (g/m^2)**	80	80	80	80	80	80	80	80	77,5	75,0
142		**Sheets/kg**	200	200	200	200	200	200	200	200	207	214
144		**Total No. of sheets**	346.119.929	341.309.925	336.900.754	312.049.062	282.928.491	275.773.609	254.729.838	242.905.243	237.914.216	191.117.524
146		**Sheets/person**	16.324	15.079	14.180	12.514	11.346	10.710	9.684	8.469	8.978	6.857
148		**Working days in the year**	211	211	211	211	211	211	211	211	211	211
151		**Office paper sheets/person/day**	**77**	**71**	**67**	**59**	**54**	**51**	**46**	**40**	**43**	**32**
155	**1f**	**Offset paper consumption (tonnes)**	**370,7**	**217,8**	**252,3**	**268,0**	**248,0**	**284,6**	**274,1**	**224,2**	**249,9**	**249,9**
159		**Offset paper (tonnes/person)**	0,017	0,010	0,011	0,011	0,010	0,011	0,010	0,008	0,009	0,009
161	**Objective II) Reduction in CO2 (including CO2 equivalent of greenhouse gases) and other air pollutants**											
164	**2a**	**Total office building emissions from energy, (tonnes CO_2)** ***not considering green electricity***	**19.238**	**20.514**	**18.897**	**25.531**	**28.285**	**33.723**	**33.424**	**38.931**	**47.942**	**45.558**
168		**tonnes CO_2/person**	**4,770**	**3,916**	**3,314**	**2,457**	**2,173**	**2,172**	**1,901**	**1,884**	**1,820**	**1,635**
172		**kgCO_2/m²**	**93**	**81**	**70**	**61**	**56**	**57**	**49**	**50**	**46**	**48,3**
174		**i) from electricity, (CO_2 tonnes) -** ***not considering zero emissions for green contract***	**11.206**	**10.975**	**11.117**	**16.622**	**17.668**	**20.808**	**22.455**	**25.162**	**30.045**	**30.633**
176		Kgs CO2 from 1 kWh of electricity	0,275	0,275	0,275	0,275	0,275	0,275	0,275	0,275	0,275	0,275
177		**tonnes CO2/person**	**2,779**	**2,095**	**1,950**	**1,599**	**1,358**	**1,340**	**1,277**	**1,218**	**1,141**	**1,099**
179		**kgCO2/m²**	**54**	**43**	**41**	**37**	**33**	**33**	**31**	**31**	**29**	**28**
181		**ii) from gas (tonnes/yr)**	**6.820**	**8.996**	**8.005**	**9.509**	**11.338**	**12.324**	**10.579**	**13.319**	**17.387**	**14.247**

183		Kgs CO2 from 1 kWh natural gas	0,201	0,201	0,201	0,201	0,201	0,201	0,201	0,201	0,201	0,201
184		**tonnes CO2/person**	**1,691**	**1,717**	**1,404**	**0,915**	**0,871**	**0,794**	**0,602**	**0,645**	**0,660**	**0,511**
186		**kgCO2/m²**	**33**	**35**	**29**	**21**	**21**	**19**	**15**	**16**	**17**	**13**
188		**iii) from diesel (tonnes/yr)**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**459**	**510**	**678**
190		Kgs CO2 from 1 kWh diesel								0,264	0,264	0,264
191		**tonnes CO2/person**						**0**	**0**	**0**	**0,019**	**0,024**
193		**kgCO2/m²**						**0**	**0**	**0**	**0**	**1**
195		**iv) from district heating (tonnes/yr)**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
197		Kgs CO2 from 1 kWh								0,264	0,264	0,264
198		**tonnes CO2/person**						**0**	**0**	**0**	**0,000**	**0,000**
200		**kgCO2/m²**						**0**	**0**	**0**	**0**	**0**
202		**Total quantity of refrigerants (tonnes)**									**18,805**	**1,805**
204		**Total refrigerant losses (tonnes)**									**0,540**	**0,409**
208	**2b**	**Emissions of other gases as CO_2 equivalent (tonnes)**	**1.777,1**	**1.822,5**	**1.369,8**	**995,0**	**770,7**	**154,0**	**268,2**	**127,0**	**914,1**	**871,8**
212		**tonnes CO2equiv/person**	**0,084**	**0,081**	**0,058**	**0,040**	**0,031**	**0,006**	**0,010**	**0,004**	**0,034**	**0,031**
216		**kgCO2equiv/m2**	**0,009**	**0,007**	**0,005**	**0,002**	**0,001**	**0,000**	**0,000**	**0,000**	**0,001**	**0,001**
218		**inventory R22, (kg)**										*1804,75*
219		**i) losses R22, (kg)**	**982**	**1.007**	**757**	**550**	**426**	**85**	**148**	**70,3**	**46,80**	**0,00**
220		GWP	1810	1810	1810	1810	1810	1810	1810	1810	1810	1810
221		**as tCO2equiv**	1777,1	1822,5	1369,8	995,0	770,7	154,0	268,2	127,2	84,7	0,0
223		**inventory R410A, (kg)**										
224		**ii) losses R410A, (kg)**								0,00	**12,50**	**99,00**
225		GWP									2090	2090
226		**as tCO2equiv**								0,00	26,13	206,9
228		**inventory R134A, (kg)**										
229		**iii) losses R134A, (kg)**								0,00	**227,78**	**65,2**
230		GWP									1430	1430
231		**as tCO2equiv**								0,00	325,73	93,24
233		**inventory R404A, (kg)**										
234		**iv) losses R404A, (kg)**								0,00	**69,50**	**64,10**
235		GWP									3920	3920
236		**as tCO2equiv**								0,00	272,44	251,27
238		**inventory R407C, (kg)**										
239		**v) losses R407C, (kg)**								0,00	**115,90**	**181,00**
240		GWP									1770	1770
241		**as tCO2equiv**								0,00	205,14	320,37
243		**inventory R507A, (kg)**										
244		**vi) losses R507A, (kg)**								0,00	**0,00**	**0,00**
245		GWP									3300	3300

246		**as tCO2equiv**								0,00	0,00	0,00
248		**inventory R422D, (kg)**										
249		**vii) losses R422D, (kg)**								0,00	**115,90**	**0,00**
250		GWP									3300	3300
251		**as tCO2equiv**								0,00	382,47	0,00
255	**2c**	**Site vehicle CO_2 emissions (tonnes)**								**594,9**	**578,8**	**537,4**
257		**tonnes CO_2/person**								**0,021**	**0,022**	**0,019**
259		**i) from diesel (tonnes)**									**560**	**523**
261		Kgs CO2 from one litre of diesel									2,6	2,6
262		**ii) from petrol**									**18,8**	**14,8**
264		Kgs CO2 from one litre of petrol									2,3	2,3
270		**gCO2/km (manufacturer)**	**249**	**240**	**213**	**196**	**184**	**173**	**169**	**160**	**155**	**148**
272		Vehicle kms travelled								2.638.992	2.603.297	2.456.406
274		**Internal fleet efficiency (litres/100km)**								**8,72**	**8,59**	**8,45**
278		**gCO2/km (actual)**							**235,7**	**226,6**	**217**	**213**
280		**Number of vehicles (avg. fleet size)**								**160**	**120**	**114**
286	**2d**	**Total air emissions buildings (tonnes), as mimimum NOx, SO_2, PM_{10}**								**NR**	**21,1**	**17,9**
288		**tonnes/person**									0,0008	0,0006
290		NOx, (kg)									18.254	15.135
292		SO2, (kg)									673	860
294		PM10, (kg)									125	118
296		…..others (VOC), (kg)									2.068	1.748
300	**Objective III) Waste management**											
303	**3a**	**Total non hazardous waste, (tonnes)**	**6.358,5**	**6.580,6**	**6.692,1**	**7.229,7**	**6.935,7**	**6.423,2**	**6.528,8**	**6.442,9**	**5.561,5**	**5.998,9**
307		**Total non haz.waste (tonnes/person)**	**0,300**	**0,291**	**0,282**	**0,290**	**0,278**	**0,249**	**0,248**	**0,225**	**0,210**	**0,215**
309		**Unsorted waste**	2.950,9	2.799,0	2.929,5	3.366,4	3.126,9	2.803,8	2.813,4	2.746,7	2.515,6	2.545,5
311		**Paper and card**	3.264,6	3.437,6	3.420,3	3.500,0	3.453,6	3.237,5	3.248,6	3.219,3	2.590,4	2.675,1
313		**PMC**	46,9	35,8	42,0	49,8	54,5	101,7	121,5	126,9	120,6	116,1
315		**Organics**	83,7	292,7	281,3	292,0	273,2	247,7	314,0	312,7	301,6	311,2
317		**Glass**	12,5	15,5	19,1	21,5	27,4	32,5	31,4	37,4	33,3	29,4
332	**3b**	**Total hazardous waste (tonnes)**	**42,888**	**69,240**	**105,372**	**147,110**	**93,486**	**105,685**	**86,506**	**134,825**	**180,420**	**151,597**
336		**Total hazardous waste, (tonnes/person)**	**0,0020**	**0,0031**	**0,0044**	**0,0059**	**0,0037**	**0,0041**	**0,0033**	**0,0047**	**0,0068**	**0,0054**
338		**Maintenance of buildings/lifts**	**0,000**	**0,000**	**21,600**	**65,000**	**25,304**	**20,566**	**16,590**	**43,950**	**82,595**	**64,230**
340		**Microfiches**	**0,004**	**0,000**	**0,001**	**0,115**	**0,000**	**1,330**	**0,000**	**0,000**	**0,000**	**0,000**
342		**Chemical-fixer-developing agents**	**0,002**	**3,195**	**1,244**	**2,378**	**2,059**	**1,855**	**2,446**	**0,150**	**0,126**	**0,000**
344		**Chemical batteries**	**1,470**	**1,589**	**1,836**	**1,563**	**1,913**	**1,927**	**2,002**	**1,748**	**2,120**	**2,350**

346		**Paint - toner**	**1,466**	**2,456**	**2,514**	**1,075**	**0,772**	**1,369**	**1,207**	**1,194**	**0,271**	**0,000**
348		**Cartriges laserjet-inkjet**	**25,720**	**21,217**	**19,231**	**16,190**	**15,287**	**15,625**	**14,331**	**12,526**	**11,100**	**7,346**
350		**Oil and fat**	**13,038**	**12,123**	**14,393**	**11,874**	**12,554**	**17,200**	**12,200**	**17,824**	**10,751**	**1,653**
352		**Mineral Oil**	**0,000**	**2,121**	**0,015**	**0,003**	**0,000**	**0,000**	**0,000**	**0,000**	**0,000**	**0,000**
354		**Diverse chemical waste**	**1,188**	**0,334**	**3,044**	**1,092**	**0,000**	**0,000**	**4,701**	**0,071**	**0,140**	**0,000**
372	**3c**	**Percentage of waste sorted**	**53,90**	**57,91**	**56,90**	**54,36**	**55,52**	**57,06**	**57,47**	**58,24**	**56,19**	**58,61**
374	**Objective IV) Protecting biodiversity**											
377	**4a**	**Built surface area, (m^2)**									NA	
381		**Built surface area, (m^2/person)**									NA	
385		**Built surface area as part of site, (%)**									NA	
387	**Objective V) Green procurement**											
389	**5a**	**Contracts >60k with "eco" criteria (%)**									94	80
392	**5b**	**Green products in office catalogue (%)**							**26,8**	**26,7**	**36,2**	**36,2**
394		**Green products in catalogue, (No)**							**171**	**169**	**186**	**186**
395		**Products in catalogue, (No)**							**639**	**633**	**514**	**514**
400	**Objective VI) Legal conformity**											
402	**6a**	**EMAS registered buildings (%)**									**100,0**	**100,0**
405	**6b**	**EMAS registered useful floorspace (%)**									**98,3**	**100,0**
407		**EMAS verification non conformities**							**21**	**5**	**3**	**3**
409	**Objective VII) Communication**											
411	**7b**	**No. of difft trainings on offer**						**6**	**5**	**4**	**3**	**3**
413	site training	**No of training beneficiaries**						**2036**	**2037**	**1866**	**1648**	**1648**
415		**Staff benefiting from training (%)**						**7,9**	**7,7**	**6,5**	**6,2**	**5,9**
417	**Objective VIII) Promoting dialogue with external partners**											
420	**Estimating EMAS costs and virtual value of identified savings**											
421	**Direct costs**	**Total Direct EMAS Cost (EUR)**	**0**							**132.000**	**132.000**	**132.000**
422		Total Direct Cost per employee								5	5	5
423		**i) Annual direct staff costs**	**0**							**132.000**	**132.000**	**132.000**
424		Annual direct staff costs (time FTE)								1	1	1
425		Annual cost of one FTE								132.000	132.000	132.000
426		**ii) Annual contract costs**	**0**							**0**	**0**	**0**
430		**iii) Annual misc costs**	**0**							**0**	**0**	**0**
433	**Energy (Bldgs)**	**Electricity unit cost (Eur/MWh)**	88,00	88,00	81,20	126,80	92,30	95,40	97,40	93,70	96,70	96,70
434		**Gas (Eur/MWh)**	34,30	34,30	34,30	44,90	38,00	36,70	39,70	39,50	41,00	41,00
435		**Fuel (Eur/MWh)**	30,20	30,20	48,30	45,10	50,00	55,00	60,00	65,00	68,00	68,00
436		**Total buildings energy cost (Eur/person)**	**1.212,54**	**994,41**	**843,80**	**960,59**	**633,99**	**622,97**	**579,41**	**550,36**	**540,81**	**497,04**
437		Electricity (Eur/person)	889	670	576	737	456	465	452	415	401	386

438		Gas (Eur/person)	307	309	251	214	171	150	122	130	135	104
439		Fuel (Eur/person)	16,30	14,45	16,67	9,40	7,73	7,93	5,02	5,47	4,99	6,27
440		**Total buildings energy cost (Eur)**	**4.890.160**	**5.208.710**	**4.811.358**	**9.983.417**	**8.250.799**	**9.672.907**	**10.189.417**	**11.372.153**	**14.242.833**	**13.852.477**
447	**Water**	Water unit cost (Eur/m3)								3,59	3,63	3,72
448		Water (Eur/person)								**40,33**	**42,34**	**43,05**
449		**Total water costs (Eur)**								**833.289**	**1.115.092**	**1.199.800**
450	**Paper**	Paper (office) - unit cost/kg								1,22	0,77	0,77
452		Paper (office) - Eur/person								51,55	33,42	24,70
453		Paper (offset) - Eur/person								0,00	0,00	0,00
454		Total paper (office) cost (Eur)								62,90	25,73	19,02
455		Total paper cost (Eur/person)								51,55	33,42	24,70
456		**Total paper cost (Eur)**								**1.478.640**	**885.500**	**688.380**
457	**Waste**	Waste disposal (general) - unit cost/tonne									163,00	163,00
458		**Waste disposal (general) - Eur/person**									**34,21**	**35,09**
459		Waste disposal (hazardous) - unit cost/tonne									780,00	780,00
460		**Waste disposal (hazardous) - Eur/person**									**5,311**	**4,243**
461		**Total waste cost (Eur)**									**906.525**	**977.828**
462	**Other site specific data**											
464	**Paper wastage**	**Offset paper (paper wastage %)**							25,8	12,9	5,4	5,4
465	**Population**	**EMAS population (offices)**	4033	5238	5702	10393	13014	15527	17586	20663	25818	25818
467	**Surfaces used:**	**EMAS surface (offices)**	**206.166**	**253.525**	**268.292**	**421.965**	**508.688**	**599.725**	**677.078**	**776.068**	**982.810**	**1.000.963**
469		**EMAS surfaces (non offices)**		**4.032**	**4.032**	**24.597**	**24.597**	**33.503**	**43.960**	**43.960**	**50.373**	**74.409**
470		**evolution %**			*0,0*	*510,0*	*0,0*	*36,2*	*31,2*	*0,0*	*14,6*	*47,7*
471	**Refrigeration**	**A) Loss of refrigerant gases in all buildings (except catering)**										
472	**continued**	**Total quantity (kg)**	16.807	16.222	17.156	17.109	17.681	19.432	19.680	18.973	17.164	17.164
474		**Total losses (kg)**	1.130	1.135,0	762,0	696,0	937,0	470,0	594,0	431,0	472,5	409,3
476		**of which losses of R22**	965	974	741	543	414	80	144	65	65	65
478		**B) Phase out of equipment containing HCFC (excluding catering)**										
479		**Pieces of equipment to replace (at end of year)**					153	138	119	85	65	65
481		**Losses of R22 (kg)**					414,0	80,0	144,0	65,0	46,8	46,8
483		**C) Phase out of equipment containing HCFC (catering)**										
484		**Pieces of equipment to replace (at end of year)**	211	133	79	40	35	31	28	3	0	0
486		**Losses of R22 (kg)**	17	32,9	15,8	6,7	11,8	5,1	4,2	5,3	0,0	0,0
488	**Mobility**	**Bike trips on Commission bikes**								**20.434**	**17.139**	**17.139**
489	**bikes**										*-16,1*	*0,0*
490		Jan								1.650	1.026	1.026
491		Feb								1.414	1.087	1.087
492		Mars								2.401	1.206	1.206
493		Avr								1.455	1.485	1.485
494		Mai								1.838	1.266	1.266
495		Juin								1.909	1.787	1.787

496		Juil								1.938	1.729	1.729
497		Août								1.303	1.099	1.099
498		Sept								2.086	1.885	1.885
499		Oct								1.999	1.935	1.935
500		Nov								1.637	1.422	1.422
501		Dec								804	1.212	1.212
510	**2a**	**Total building emissions CO2 (tonnes/yr)**	**19.238**	**20.514**	**18.897**	**25.531**	**21.618**	**13.364**	**11.702**	**15.036**	**19.399**	**16.457**
514		**tonnes/person (95% renewable electricity since 08/2009)**	**4,770**	**3,916**	**3,314**	**2,457**	**1,661**	**0,861**	**0,665**	**0,728**	**0,737**	**0,590**
518	**with no emissions**	**kg/m² (95% renewable electricity since 08/2009)**	**93**	**81**	**70**	**61**	**41**	**21**	**16**	**18**	**19**	**15**
520	**energy since**	**of which from electricity (tonnes/yr)**	**11.206**	**10.975**	**11.117**	**16.622**	**10.280**	**1.040**	**1.123**	**1.258**	**1.502**	**1.532**
522		**Kgs CO_2 from 1 kWh of electricity**	**0,275**	**0,275**	**0,275**	**0,275**	**0,16**	**0,014**	**0,014**	**0,014**	**0,014**	**0,014**
523		**tonnes CO2/person**	**2,779**	**2,095**	**1,950**	**1,599**	**0,790**	**0,067**	**0,064**	**0,061**	**0,057**	**0,055**
525		**kg/m²**	**54**	**43**	**41**	**37**	**19**	**2**	**2**	**2**	**1**	**1**
527	**Gas plus fuel**	**Total gas +fuel - (MWh/yr) to 2012**	**36.107**	**47.260**	**41.793**	**49.475**	**58.421**	**63.551**	**54.104**	**68.001**		
528	**Evolution**	% de rapports en Non conformité				36,0	40,0	38,0	38,0	43,0	48,0	48,0
530	**non conformities**	% de rapports avec Non-conformité majeur				2,0	1,0	0,0	1,0	2,0	4,0	4,0

Annex A bis: Buildings characteristics for Brussels site											
Building [3]	Area (m²)	Occup. staff on 31/12/13	Address	Occupying Services	Activities [2]					
					a	b	c	d	e	f
Office Buildings										
MO34	12.820	333	Rue Montoyer 34	DIGIT, HR		X				
SC11	9.002	182	Rue de la Science 11	HR	X					
GUIM	10.810	111	Rue Guimard 10	HR, DIGIT, COMM	X					
BRE2	18.747	537	Avenue d'Auderghem 19	HR, BUDG	X				X	
BU-5	11.843	275	Avenue de Beaulieu 5-7	ENV, REGIO	X	X				
BU-9	13.039	430	Avenue de Beaulieu 9-11	ENV, OIB					X	
BERL	151.410	2.156	Rue de la Loi 200	Collège, SG, SJ, COMM, OIB, CA, BEPA, HR	X	X				
BU-1	13.911	429	Avenue Beaulieu 1-3	REGIO					X	
B-28	14.987	607	Rue Belliard 28	DIGIT	X					
J-54	19.739	505	Rue Joseph II 54	DIGIT, DEVCO, EMPL	X					
L-86/L-84	13.355	417	Rue de la Loi 86	ECHO, DIGIT	X					
BREY (2009)	35.198	963	Avenue d'Auderghem 45	BUDG, ENTR, HR	X	X				
B232 (2009)	11.584	428	Rue Breydel 4	SANCO						
CDMA (2009)	19.096	633	Rue du Champ de Mars 21	RTD, JRC	X					
DM24 (2009)	15.827	518	Rue Demot 24	MOVE, ENER, EAS, SANCO, EPSO	X					
J-27 (2009)	13.265	477	Rue Joseph II 27	EMPL	X					
J-30 (2009)	18.157	472	Rue Joseph II 30	OLAF	X					
J-79 (2009)	16.134	316	Rue Joseph II 79	CDP-OSP , MARE, TAXUD	X					
L-41 (2009)	27.864	851	Rue de la Loi 41	DEVCO	X	X				
LX46 (2010)	17.478	493	Rue de Luxembourg 46	HOME, JUST						
MO59 (2010)	8.671	248	Rue Montoyer 59	JUST	X					
N105 (2010)	9.546	291	Avenue des Nerviens 105	ECFIN, ENTR, TRADE						
B100 (2010)	5.952	191	Rue Belliard 100	ENTR, SCIC						
VM18 (2010)	9.330	134	Rue Van Maerlant 18	EAC, SCIC, OIB	X		X			
J-70 (2010)	20.082	673	Rue Joseph II 70	EAC	X					
J-59 (2010)	9.396	301	Rue Joseph II 59	DEVCO, MARKT						
F101 (2010)	8.351	221	Rue Froissart 101	SANCO	X					
AN88 (2011)	7.815	240	Rue d'Arlon 88	PMO						
SC27/29 (2011)	9.533	209	Rue de la Science 27-29	PMO,	X	X				
BU29 (2011)	6.131	248	Avenue de Beaulieu 29	REGIO	X					

BU31 (2011)	6.185	253	Avenue de Beaulieu 31	CNECT						
BU33 (2011)	6.843	227	Avenue de Beaulieu 33	CNECT						
G--1 (2011)	12.580	295	Avenue de Genève 1	DGT, OIB			X			
G--6 (2011)	17.240	450	Avenue de Genève 6	DGT	X	X				
G-12 (2011)	16.946	491	Avenue de Genève 12	DGT	X					
C-25 (2011)	8.574	156	Avenue de Cortenbergh 25	EPSO						
DM28 (2012)	11.277	409	Rue Demot 28	MOVE						
L-56 (2012)	9.666	274	Rue de la Loi 56	COMP ,Galileo						
SPA3(2012)	12.288	435	Rue de Spa 3	TAXUD, EMPL						
BU24 (2012)	6.425	208	Avenue de Beaulieu 24	CLIMA						
BU25 (2012)	18.130	612	Avenue de Beaulieu 25	CNECT, RTD						
SPA2 (2012)	19.567	537	Rue de SPA 2	MARKT	X					
CSM1 (2013)	12.276	356	Rue Père de Deken 23	OIB	X					
CHAR (2013)	55.342	1.139	Rue de la Loi 170	ECFIN, COMM, TRADE	X	X				
CCAB (2013)	18.634	578	Rue Froissart 36	SCIC	X	X				
LX40 (2013)	7.803	228	Rue de Luxembourg 40	TAXUD						
L102 (2013)	4.935	142	Rue de la Loi 102	AGRI						
L-15(3) (2013)	16.877	388	Rue de la Loi 15	ELARG	X					
COVE-COV2 (2014)	50.968	1.700	Placer Rogier 16	RTD + Agencies	X	X				
J-99 (2014)	8.281	277	Rue Joseph II 99	MARE						
L130 (2014)	37.043	984	rue de la Loi, 130	AGRI	X	X				
MADO (2014)	40.716	1.070	Place Madou, 1	DIGT, COMP, IAS	X	X				
ORBN (2014)	25.141	720	square Frère Orban, 8	RTD	X	X				
PLB3	18.153	137	Philippe Le Bon 3	EMPL, HR et Formation	X	X				
Total	**1.000.963**	**25.955**								
Non office buildings										
HTWG (2)	4.145	Depot	Houtweg, 23	DIGIT (?)						X
CLOV (2)	6.274	Crèche	Boulevard Clovis 75	OIB	X	X	X		X	
DAV1 (2)	12.600	Printing/ mail	Avenue de Bourget 1-3	OIB	X			X		
WILS (2)	2.544	Child care	Rue Wilson 16,	OIB			X			
VM-2 (2010) (2)	15.960	Café Restaurant	Rue Van Maerlant 2	Cercles de Loisirs, le Foyer, Brasserie	X	X				
COLE (2011) (2)	8.850	Crèche – child care	Rue G.Leman 60	OIB	X		X		X	

KORT	21.070	Depot	Industriepark Gullendelle, Vinkstraat 3 3070 KORTENBERG	Archives Historiques						X
WALI	2.966	Crèche – child care	Bouvevard Clovis 53	OIB	X	X	X		X	
Total	**74.409**									
Overal total	**1.075.372**		**Office and non office building**							

(1) A technical modification has been applied to the ES data for 2010, concerning , J-70, F101 and VM-2) F101 et VM-2).

(2) other than office activities: a) cafés, b) restaurants-selfs, c) crèches-child care, d) printing and central mail, e) medical service et f) depot.

(3) and year of EMAS registration, buildings registered from 2009 only

ANNEX B: LUXEMBOURG — ADMINISTRATIVE ACTIVITIES

The Office for Infrastructure and Logistics in Luxembourg (OIL) manages the buildings and logistics in Luxembourg and plays a key role in the collection and management of the majority of data relevant to EMAS and related to the Commission's buildings in Luxembourg.

The Commission has in total 19[42] DGs present in Luxembourg with a total of 4.043 staff in 14 buildings. This chapter contains information relating to OIL's activities in Luxembourg

B1 Overview of the main indicators in Luxembourg since 2011

OIL has collected data on its activities since 2011. Their evolution is shown in table B1:

Table B1: Percentage changes in core indicators at Luxembourg

	From 2005 Overall	To 2014 % per year	From 2011 Overall	To 2014 % per year	From 2013 %	To 2014 Target %
Energy bldgs (MWh/p)			108.69	36.23	62.63	0.00
Energy bldgs (KWh/m^2)			72.87	24.29	67.90	0.00
Water use (m3/p)			18.13	6.04	-5.00	0.00
Water use (l/m^2)			-6.67	-2.22	-1.92	0.00
Office paper (tonnes/person)			-29.66	-9.89	-15.71	0.00
Office paper (Shts/person/day)			-24.97	-8.32	-10.09	-2.50
CO_2 bldgs (tonnes/p)			57.21	19.07	63.35	0.00
CO_2 bldgs (kg/m^2)			30.23	10.08	68.64	0.00
Non haz.waste (kg/p)			-58.19	-19.40	-17.53	0.00

The large increase in energy parameters recorded in 2014, is due to two data centres being added to the list of buildings included in the scope of EMAS. These are large consumers of energy, and represent the Commission's fourth main type of activity in Luxembourg (in addition to administration, nuclear laboratories and child care). As a result energy consumption for the buildings within EMAS perimeter has increased by over 60% per person and per square metre. Unsurprisingly, CO_2 emissions rose by a similar amount. OIL is working on the use of more appropriate measures for the energy efficiency of this type of buildings.

Excluding the new data centres, buildings that were already in the scope of EMAS (DRB, Hitec, EUFO, CPE5), recorded a total energy consumption decrease of 14.3 % between 2013 and 2014, the weather conditions in 2014 having been rather mild.

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

Table B2: Total energy consumption of buildings in EMAS scope

	2013	2014
Total energy consumption of buildings in EMAS scope (DRB, HTC, EUFO, CPE5) (MWh)	15 230	13 055
Change in %		-14.3

The quantity of non-hazardous waste generated fell (as did the proportion of unsorted wasted in 2014), owing to the introduction of organic waste collection in buildings, and ongoing efforts to inform staff about recycling and better waste sorting. The percentage of waste sorted increased from 40 % to almost 45 %.

In 2014 the Commission decided to move its services out of the Jean Monnet building (JMO) into several other buildings. This should significantly reduce the Commission's carbon footprint in Luxembourg since JMO is very inefficient to heat. For 2016, OIL is planning to include BECH in the EMAS scope and to examine if the new buildings that OIL is going to rent can be included in EMAS rapidly.

B2 Description of OIL activities in Luxembourg

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

As mentioned above, the fourth major activity for the Commission in Luxembourg is the data centres. For 2014, OIL seeks the EMAS certification for two of those data centres – Windhof and Hitec. The map below shows the location of the Commission buildings in Luxembourg.

Figure B1: Location of EMAS and other buildings in Luxembourg

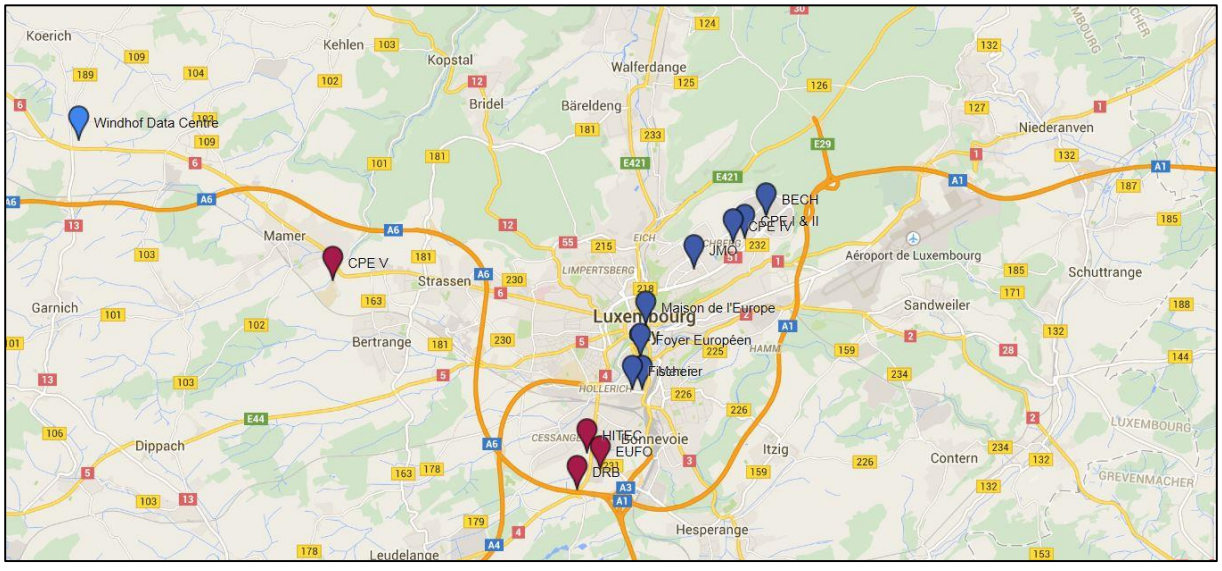


Table B3: Addresses of selected Commission buildings in Luxembourg

Building	Address
BECH	5, rue A. Weicker L-2721
CPE I, II III	Rue A. BorschetteL-1246
CPE V	Rue G. Thorn, Bertrange L-8268
DrosbachDRB	12, rue G. Kroll L-1882
Euroforum (EUFO)	10, rue R. Stumper L-2557 Luxembourg/Gasperich
Fischer	135, rue A. Fisher, L-1521 Luxembourg
Foyer européen	10, rue H. Heine L-1720 Luxembourg.
HITEC	11, Rue E. Ruppert L-2557 Luxembourg/Gasperich
HITEC Data Centre	11, Rue E. Ruppert L-2557 Luxembourg/Gasperich
Jean Monet (JMO)	Rue A. de Gasperi L-2920 Luxembourg
Maison de l'Europe	7, rue Du- Marché aux- herbs
Mercier	2, rue Mercier L-2895 Luxembourg
Windhof Data Centre	3, rue P. Flammang-8399 Windhof-Luxembourg

Most of the Commission buildings are located in the Kirchberg area in the centre of the City of Luxembourg or south of the city centre. CPE 5 is located 15 km west of Luxembourg in Bertrange-Mamer.

Windhof is located close to the Belgian border and is run by European Business Reliance Centre (eBRC). The building is a *tier IV* data centre with ISO 27001, 20000, 9001, 14001 and 5001 certificates. The Commission has rented 1206 m^2 from eBRC since 2007.

The HITEC data centre (252 m^2) is located in the Cloche d'Or area and is situated in the basement of the HITEC office building that was EMAS-certified already in 2012 (data centre not included). Commission services in the Drosbach and Hitec buildings serve exclusively classical administrative purposes. The Euroforum building accommodates administrative services, and the research laboratory for radiation protection (DG ENER). CPE 5 however caters entirely to children of staff with a inter-institutional crèche, after school and study centres.

Other than the "Foyer Européen", which is owned by the European institutions, and the Euroforum, CPE3 and CPE5 buildings, for which the Commission has a long-term lease with a purchase option, all Commission buildings are leased. The buildings and the year when they were / will be EMAS certified are listed in the table below.

Table B4: Commission buildings in Luxembourg

BUILDING	EMAS YEAR	Surface (HS, m2)	%EMAS surface of total surface	Staff 2013*	Year of construction	Year of acquisition or leasing	Occupational type
DRB	2012	23.516	11,86%	764		B - 2006; A - 2009; D - 2010	Lease
HITEC (bureaux)	2012	4.194	2,12%	97		2005	Lease
EUFO	2013	26.098	13,17%	506	1995 and 2003	1995 and 2003 (new contract)	Long terme lease with purchase option
CPE5	2014	10.895	5,50%	45	2011	2011	Long terme lease with purchase option
eBRC HITEC (data) SS(-3 and -4)****	2015	252	0,13%	n/a		2006	Lease
eBRC WIN (data) HS/SS (0 and -1)****	2015	1.206	0,61%	2		2007 and 2009	Lease
BECH	2016	34.060	17,18%	858		1998 and 2005	Lease
CPE1+ CPE2	2017	4.370	2,20%	42 **		1984	Lease
CPE3+ext	2017	5.218	2,63%	43	1996	1996 and 2009 (extension)	Long terme lease with purchase option
FOYER	2017	1.192	0,60%	4	1920	2009	Owned
Fischer	2018	3.526	1,78%	143		1.4.2005	Lease
Mercier	2019	19.953	10,07%	526	1970, 1984	old part: 1973, 1998 (new contract); new part: 1985	Lease
JMO	not relavant starting from 2016	63.725	32,15%	1629	1975-1978	1975	Lease
		198.205	**100%**				

* ComRef 28.02.2014
** CPE1 and CPE2 are considered as one building
*** Data not yet available in ComRef
**** Calculated surface: soil and underground (HS - SH)

Updated: 09/12/2014 Author: OIL 01, EMAS Coordination Team

B3 Environmental impact of activities in Luxembourg (OIL)

OIL reviews the site's environmental aspect analysis annually and updates its action plan as new buildings enter into EMAS's scope. Below is a summary of the main aspects and measures taken in 2014 in OIL.

Table B5: Summary of significant environmental aspects and measures in 2014 in OIL

Aspect group	Environmental aspects	Environmental impact	Related action in action plan	Measures and actions
Air	Emissions of CO_2, SOx, NOx, CO, VOC,	Air Pollution Risks for biodiversity and climate change- Destruction of the ozone layer	• - • - • 157 • - • 163	• Favour systematically green electricity • Gradual phasing out of installations with R22 • Check by the landlords the installations that use HFC • Analyse legally required reports submitted by the contractors • Accentuation on checks done by contractors
Air	Air emissions from the nuclear laboratories	Radioactivity		
Water	Waste Water discharge, water for	Water pollution, risks of	•	Replacement of two cooling towers with

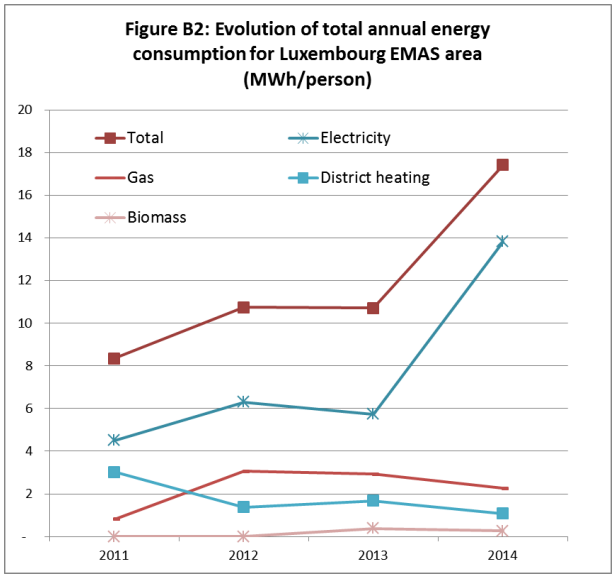
Aspect group	Environmental aspects	Environmental impact	Related action in action plan	Measures and actions
	sanitation and installations, water consumption	eutrophication reduced potable water sources potable-Impact on aquatic biodiversity	• 91	water in EUFO with cooling towers using air
Water	Water discharged nuclear laboratories	Water pollution, risks of eutrophication reduced potable water sources potable-Impact on aquatic biodiversity		
Energy	Building heating, lighting, wood chip heating generator, steam generators, data centres	Pollution, climate change, exploitation/depletion of natural resources	• - • - • 91 • 8 • 92	• Setting up a plan for ventilation installation and extracting installation in the underground parkings • Reduction of private electric heaters • Putting in place new installations: air conditioners, replacement of cooling towers, boilers. • Replacement of halogen lamps by LED • In-depth analyse of energy consumption in certain buildings
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	• 41, 126 • 132 • - • 133, 134	• Collection of organic waste • Draft modification of the contract for waste management • Validation of new waste procedure • Continuous establisment of PPGDs (Plan de prévention et de gestion des dèchets) and annual waste reports for several buildings
Waste	Generation of controlled waste	Odours, greenhouse gases, pollution of the air, water and/or soil Impacts on biodiversity		

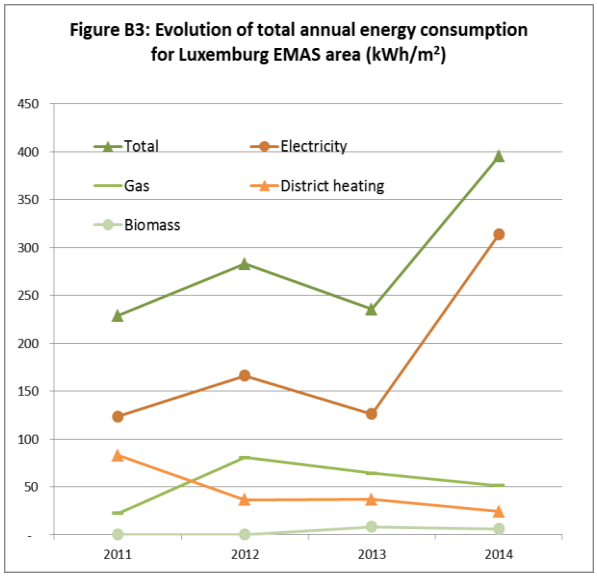
B4 More sustainable use of natural resources

The data in the following sections apply only to the buildings within the EMAS scheme.

B4.1 Energy consumption

a) Buildings





Data centres consume significant amounts of energy but have very few staff and a relatively small surface. This explains the large increase in energy consumption per m^2 and per capita in 2014, the first year data centres were included in the EMAS scope. However the Commission only has data on energy consumption relating to server operation. The contractor is responsible for cooling in the server rooms. Currently the rental contracts have a PUE (power usage effectiveness) ratio of two meaning that the Commission pays the contractor double the price of electricity consumed by the servers, and this covers all the contractor's costs (and profit). The real PUE is estimated by OIL to be around 1,5 or 1,6.

The energy consumption of buildings already in the EMAS scope (DRB, HITEC, EUFO and CPE5) decreased by 14,3 % in 2014. The decrease can be explained by the rather mild winter and the measures taken over the years to reduce energy consumption.

b) Site vehicles

OIL has a 25 vehicle fleet, of which eight are owned and the remainder leased. These include:

- 12 sedans (three allocated to director generals, and nine for missions, mostly to Brussels and Strasbourg);
- 4 people carriers;
- 5 small vans; and
- 4 bigger vans.

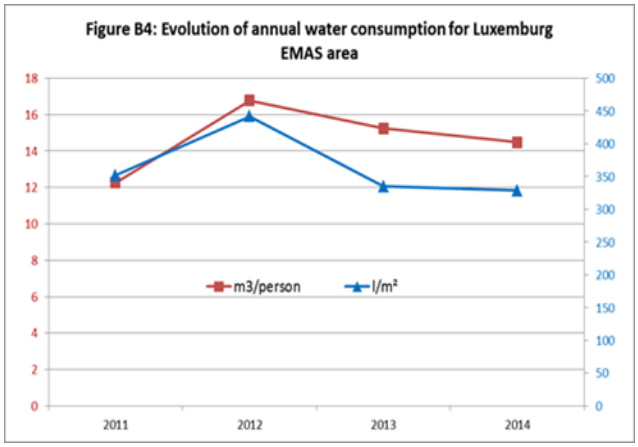
The vehicles are used for various purposes: shorter trips inside Luxembourg City to transport people and goods, longer missions between Luxembourg and mainly Brussels and Strasbourg, but also other countries. The majority of OIL's missions are long missions and we have relatively few kilometres inside town. In 2014, Commission service vehicles consumed 0,375 MWh per person which almost the same as in 2013 (0,376 MWh per person) and therefore the 2014's objective of achieving stability was met.

c) Renewable energy use in buildings and vehicles

Renewable energy in buildings (indicator 1c) accounted for 72,2 % of total energy consumption in 2014. The Commission has a contract for electricity from 100 % renewable sources. In addition, the wood-chip boiler in CPE5 uses wood chips from a sustainably managed forest. The electricity for the Windhof data centre is also from 100 % renewable sources which explains why the figure for 2014 is so much higher than the 2013 value of 57,2 %. For Hitec data centre, the electricity is not considered as green.

B4.2 Water consumption

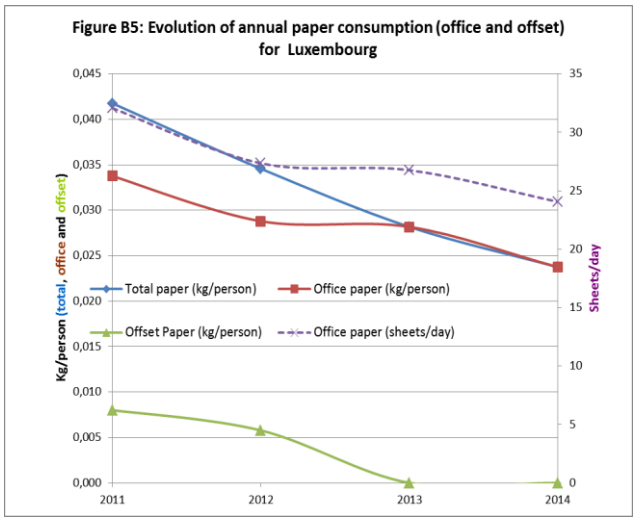
Figure B4 shows the water consumption since 2011. Total water consumption per m^2 and per person decreased between 2013 and 2014 by 5 % and 1,9 % respectively.



The decrease in water consumption per m^2 can be explained by the inclusion of the data centres into EMAS.

The objective for 2014 was not to exceed 2013 levels, which was achieved. The objective for 2015 is to remain stable.

B4.3 Office and offset paper consumption



a) Office paper

Figure B5 shows how office paper use has reduced over time. In 2014, the office paper consumption was around 20,5 million A4 pages.

In January 2014, the Commission started using a lighter type of paper (75 g/m^2) which decreased paper consumption per person per day by 10%: in 2014, Commission staff used 24 pages per person

per working day. The objective for 2015 is to not to exceed per capita consumption in 2014.

b) Offset paper

OIL ceased to use offset machines in its print shop since 2013.

B5 Reduction of CO_2 and other greenhouse gases, air pollutants

Table B6 provides a breakdown of CO_2 emissions by source.

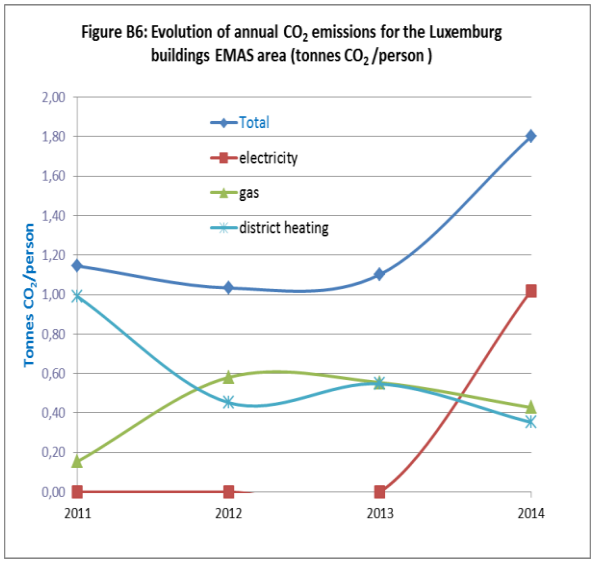
Table B6: Percentage of CO_2 emissions from different sources in 2014(tonnes/person)

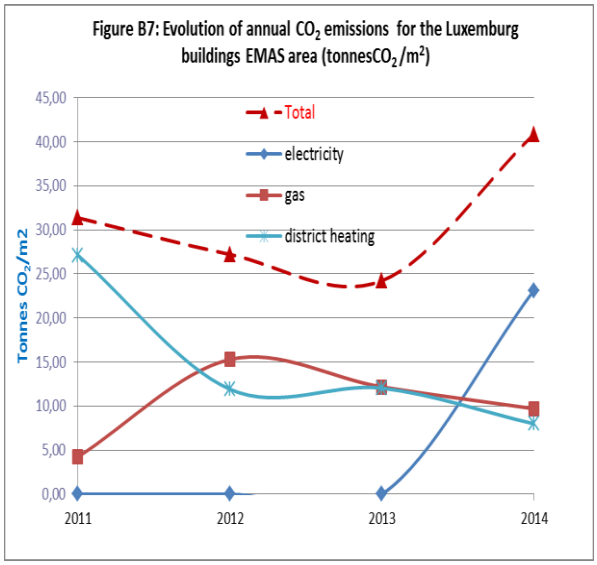
Source	Quantity	% of total
Buildings (EMAS)	1,10	97,15
Refrigerants loss (R22 only), all Commission	0,00	0,00
Vehicles, all Commission	0,03	2,85
Missions (excluding vehicles)	Not included	
Total	**1**	**100,00**

CO_2 emissions are clearly dominated by emissions resulting from buildings' energy consumption (97%). Commission vehicles represent 3% of these emissions. An estimation of Commission wide emissions from missions is presented in Chapter 2. They are currently not reported for individual EMAS sites.

B5.1 CO_2 emissions from buildings

a) Emissions due to energy consumption





As shown in Figures B6 and B7 CO_2 emissions increased by over 60% on a per capita basis and per square metre in 2014. The 63% increase in CO_2 emissions per capita in 2014 was because only one of the new data centres included in EMAS reporting uses electricity from 100 % renewable sources. Both graphs show that CO_2 emissions from electricity were zero before 2014. There was a 69% increase in emissions per m^2 from 24 kg CO_2 in 2013 to 41 kg

CO_2. Owing largely to the warm winter, CO_2 emissions from gas and district heating were lower in 2014.

There was no target for 2014. There is no specific approved action plan to reduce CO_2 emissions from buildings. However, measures taken to reduce energy consumption will inevitably also reduce emissions.

b) Emissions due to release of other greenhouse gases (refrigerants) in buildings

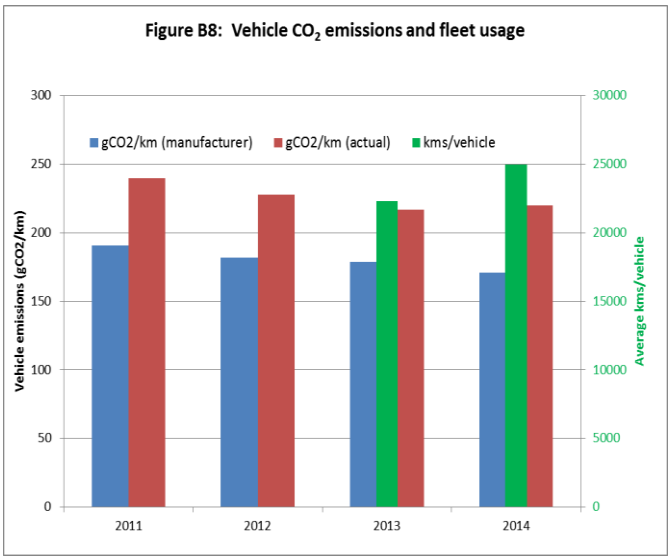
In 2014, there was no loss of refrigerants from installations and machines managed by OIL. The total quantity of refrigerants increased in 2014 to 173,3 kg: OIL installed a new machine in the Hitec building with 8,6 kg of R410A.

A 2014 objective was to establish refrigerant inventories so that losses expressed as CO_2 equivalence can be assessed. Another target was to progressively phase out all installations operating with R 22 which was achieved.

Commission does not have refrigerant data for buildings in Luxembourg prior to 2013. The HVAC installations containing HFCs are managed by the building owners, who at the Commission's request provide inspection results relating to refrigerants.

B5.2 CO_2 emissions from vehicles

a) Emissions from Commission vehicles



In 2014, the Luxembourg fleet comprised 25 owned or leased vehicles.

Total fuel consumption of the fleet was 51,54 m^3 of fuel for a total distance travelled of 623.890 km. There were fewer vehicles but each, according to Figure B8, on average was used more. The average actual CO_2 emissions was 220 g/km in 2014, not quite meeting the 2014 objective which was not to exceed the 2013 value of 217 g/km.

The measures taken in 2014 were the following:

- Continued enrolment of all OIL's drivers in eco-driving courses
- Leasing new vehicles with the best CO_2 emission performance in their class

b) Missions

There were three actions related to mobility for Luxembourg included in the Commission's 2014 EMAS Annual Action Plan, but not specifically targeting missions. However corporate activties related to missions include promting videoconferencing.

c) Staff mobility

There were no specific objectives in 2014 or approved action plans to reduce CO_2 emissions resulting from staff mobility. Owing to a rather rainy summer, there were 955 bicycle journeys in 2014, less than the 1.033 recorded in 2013. In 2014, 90 % of staff had a Jobkaart and together with the Publications Office, the Translation Centre and the Consumers, Health, Agriculture and Food Executive Agency, the Commission had 169 requests for M-Pass (annual ticket for the transport network within the Grand-Duchy of Luxembourg). 2014 was the first year Commission staff had the possibility to request an M-Pass.

Measures taken in 2014 to promote more environmentally friendly transport means for staff included the following:

- Free distribution of the Jobkaart in Luxembourg City public transport networks and the subsidised 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.
- Providing buildings with bicycle parking and showers to encourage staff to cycle to work.

At the end of 2014 the Commission decided to relaunch OIL's interinstitutional carpooling portal.

B5.3 Total emissions of other air pollutants ($S0_2$, NO_2, PM)

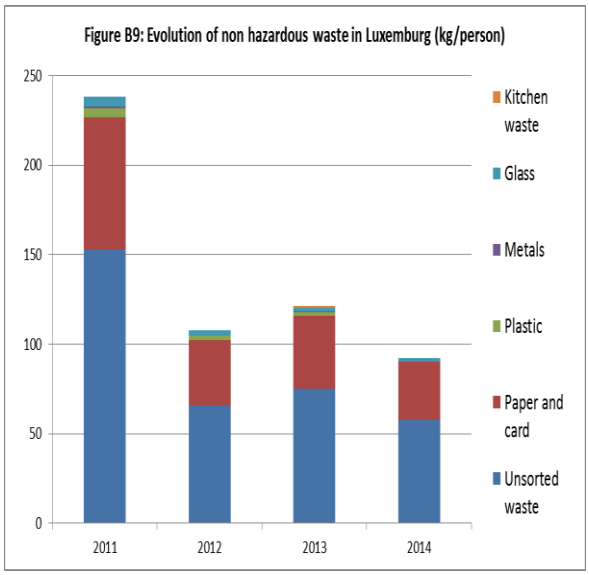
In 2014, Commission in Luxembourg reported 1.992 kg of NO_x emissions. This was the first time this figure had been calculated.

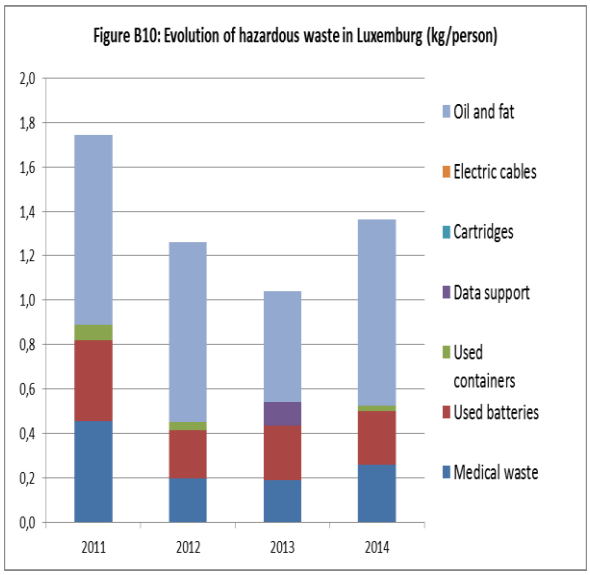
B6 Improving waste management and sorting

In September 2014, OIL started the collecting organic waste in all of its restaurants. It is collected by Luxembourg City to produce gas. For the reporting period 2014, it is too early to say if this type of additional recycling has a lasting effect on the general quantity of waste.

In 2015, the Commission services in JMO will move into three new buildings. This will involve approximately 1.600 people and will likely lead to more waste being created because people tend to discard unused items when moving, therefore OIL expects the quantity of general waste to increase in 2015.

Figures B9 and B10 show the evolution of non hazardous (general) waste and hazardous (controlled waste) in Luxembourg.





B6.1 Non hazardous waste

The quantity of non hazardous waste measured on a per per capita basis decreased in 2014 by 17,5 %. This decrease can be explained by the implementation of separate organic waste collection and measures taken over the years to improve waste sorting. Total waste measured in kg/person also reduced by a similar amount as the total is almost entirely composed of non hazardous waste. Figure B9 does not take into account 3,409 tonnes of office furniture which Oxfam reports was collected from the Commission in 2014 for recycling.

B6.2 Hazardous waste

There was an increase in the quantity of controlled waste, in particular fat and oil and used containers. Figure B10 does not take into account the 7,087 tonnes of IT material which Oxfam report were collected from the Commission in 2014 for recycling.[43]

B6.3 Recycling

In 2014, the percentage of waste sorted increased from 40 % to almost 45 %.

B7 Protection of biodiversity

No particular activities are reported for 2014.

[43] Reference: Rapport D'activité Matériaux Déclassés 2014, Oxfam Solidarité

B8 Green public procurement (GPP)

B8.1 Integrating GPP into contracts

OIL aims to integrate green criteria in its contracts and has increased the number of contracts incorporating such criteria in recent years. In 2014, OIL signed 11 contracts worth more than 60 000 euros and all of them included following EMAS clause:

> La Commission européenne est particulièrement attentive aux aspects environnementaux et applique le règlement EMAS 1221/2009. Elle exige que ses contractants respectent la politique environnementale de l'Institution et la législation environnementale en vigueur au Grand-Duché de Luxembourg.
>
> Le contractant doit mettre en œuvre des procédures et pratiques respectueuses de l'environnement et participer à l'amélioration de la performance environnementale de la Commission. Il fournit sans délai tout document nécessaire afin que la Commission puisse remplir ses obligations EMAS.

The target for 2014, of including environmental criteria in all contracts signed was achieved.

B8.2 Office supplies

Office supplies are provided by a single provider. Approximately 26,3 % of products in the catalogue were labelled "green". The target of 2014 was reached.

B9 Demonstrating legal compliance

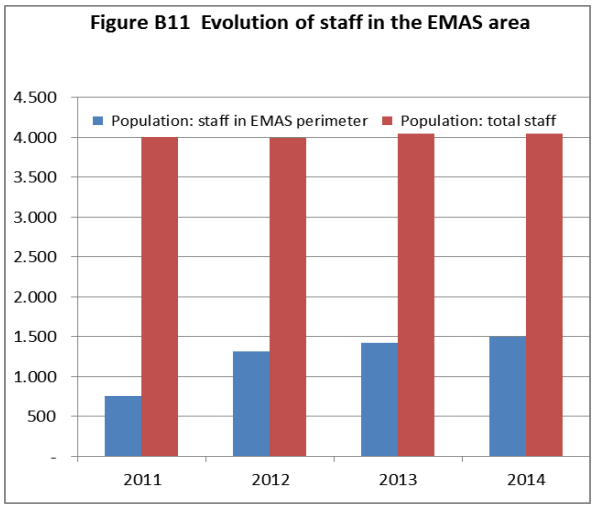
B9.1 Risk prevention and management

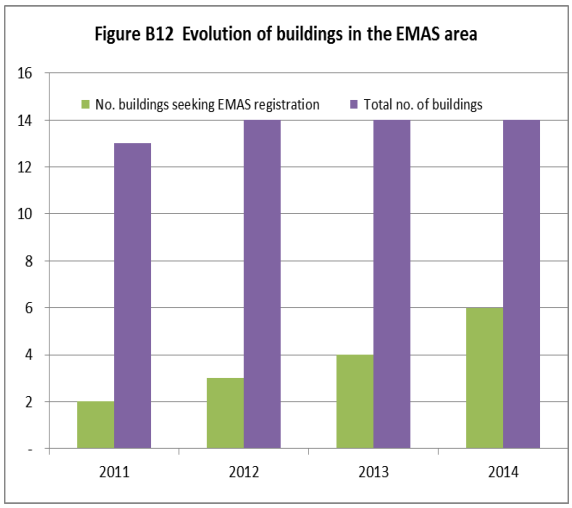
For risk prevention and management, OIL takes several measures, the most important being the following:

- Regular evacuation exercises: in 2014, 8 evacuation exercises were organised.
- Trainings on fire prevention: in 2014, 76 half-day trainings for 461 participants were organised.

B9.2 Integrating more buildings in EMAS

Figures B11 and B12 represent the evolution of the EMAS buildings, and employees.





The number of buildings and staff in the EMAS perimeter has increased since 2011. In 2013 it included 1.422 employees, almost double the 2011 figure (759 employees), whereas the total number of buildings doubled to four. In 2014, the planned EMAS scope covers 1492 staff, 6 buildings and 65.759 m^2.

B9.3 Conformity with the EMAS system

OIL monitors the EMAS internal audit and verification audit findings in collaboration with DG HR. OIL is responsible for following up on minor and major non-conformities covering its activities identified by the audits. In 2014, considerable progress was made in closing non-conformities. During 2014, 40 non-conformities were closed.

B9.4 General compliance

The Luxembourg authorities issue environmental permits for each Commission building. In 2014 OIL was able to demonstrate compliance with all permits that have been issued for the Commission owned buildings, and demonstrate that compliance was ensured by the owners of the leased buildings. OIL has also set up a procedure for building permit management which is currently under validation.

B10 Internal communication and training

B10.1 Communication campaigns

a) Communication campaign in the end of March 2014

In 2014, Luxembourg participated at the campaign "Earth Hour" which took place on the 29th of March.

b) Communication campaign on waste "Give your waste second life"

Between 19th of May and 6th of June, OIL organised exhibitions in JMO and BECH buildings with 14 exhibitors in the field of waste management in Luxembourg. The idea behind the campaign was to show European Institution staff the different types of everyday waste and explain how to sort it better. Additionally, OIL wanted to show that certain types of waste have intrinsic value and industries today are capable of reusing a greater amount of waste and increasing resource efficiency.

In addition, OIL produced a video explaining the problems related to treating used batteries at the end of their lifecycle and published an article about how a biomethanisation installation works.

On the 5th of June, OIL organised a round table with Mr Camille Gira, Luxembourgish Secretary of State for Sustainable Development and Infrastructure.

c) Communication campaign on mobility from the 16th to 22nd of September

OIL produced and disseminated three videos on topics related to public transport in general in Luxembourg. In the first, Mrs Sam Tanson, Alderman for Luxembourg City, explained the city's mobility policy. The second focused on the new tramway project and the third showed an animation of the future railway station at the red bridge.

In cooperation with other institutions, in the framework of EcoNet, OIL organised several activities, for example a bike tour, a walking tour and a jogging tour.

In cooperation with other institutions, OIL organised several activities, for example a bike tour, a walking tour and a jogging tour. DG DGT and DG ESTAT also promoted and supported the initiatives at local level.

d) Communication campaign in CPEs on waste management

OIL, together with an organisation created by the Ministry of Sustainable Development and Infrastructure to carry out the waste management strategy in Luxembourg (SuperDrecksKëscht), organised several information events for the children and personnel of Centre Polyvalent de l'Enfance interinstitutionnel (CPE) in November.

B10.2 Interinstitutional cooperation via EcoNet

The Commission maintains close working relationships with other institutions in Luxembourg – particularly the European Parliament, European Court of Justice, Court of Auditors and European Investment Bank via inter-institutional working group EcoNet. The group met seven times in 2014 and campaign on waste and of the mobility were organised together (for details see point B10.1).

B10.3 Training

Training is a big part of the EMAS system. EMAS training sessions for newcomers at the Commission are performed twice a month and organised by DG HR in full cooperation with OIL.

Other specific courses managed by OIL were also held during the year 2014:

- Training "Exigences légales en matière d'environnement et de sécurité et santé au travail pour les établissements administratifs et commerciaux": the two day training was given by Luxcontrol during attracting around 15 participants.
- Training "Principes de base d'un système de management Sécurité et Santé-Environnement selon les normes BS-OHS": a one day course also delivered by Luxcontrol with around 15 participants.
- Eco-driving training for drivers: eco-driving is part of specific two-day training course on road safety, attended by each new driver and repeated on a regular basis (roughly every four years for each driver). In 2014, there were 6 participants.

In addition, various awareness-raising activities like videos, communication, newsletters, surveys, meetings were organised, and specific information was exchanged with:

- Office supplies managers: on cartridge management and on the new office supplies' contract in which new green products have been introduced and are chosen more systematically.
- Cleaning service managers: on sorting waste, on the use of cleaning products (dilution and ecoproducts) and on collecting organic waste from restaurants.
- Cafeteria and restaurant managers: on the collecting of organic waste
- Day-care centre managers: on recycling and waste reduction.

B11 Transparent dialogue with stakeholders

OIL has regular contacts with the Luxembourg authorities, such as the Ministry of Sustainable Development and Infrastructure and Luxembourg City.

In addition to regular contact with Luxembourgush authorities, OIL has regular contacts with associations who play an important role in the field of waste management, energy efficiency or mobility. Organisations such as ECOTREL, ECObatterien, SuperDrecksKëscht, MyEnergy, and Luxtram have participated at Commission's events.

B12 Estimation of EMAS running costs and savings

The change from 2013 to 2014 in EMAS related annual costs is summarised below:

- Total direct EMAS coordination costs remained unchanged at 114 euros per person.
- Total energy costs almost doubled from 691 euros per person to 1354 euros per person, the greatest "contributer" being electricity due to the inclusion of data centres
- Water costs remained unchanged at 29 euros per person.
- Total paper costs decreased slightly to 17 euros per person.
- Non-hazardous waste costs decreased from 41 euros per person to 35 euros per person, but hazardous waste cost increasing slightly from 3.8 euros per person to 4,6 euros per person.

Unit cost data are not available for years before 2013.

B13 Luxembourg data tables:

Line	Objective/ indicator	Parameter and units	2011	2012	2013	2014 Total
2	Basic EMAS	Population: staff in EMAS perimeter	759	1.315	1.422	1.492
4		Population: total staff	3.999	3.997	4.048	4.043
6		No. buildings seeking EMAS registration	2	3	4	6
8		Total no. of buildings	*13*	*14*	14	14
10		Useful surface area in EMAS perimeter, (m^2)	27.710	49.938	64.703	65.759
12		Useful surface area for all buildings, (m^2)	180.818	191.713	191.713	198.205
14		Total site area, (m^2)				
16	Objective I) Efficient use of resources					
19	Ia	Total energy buildings, (MWh)	6.335	14.124	15.230	25.988
23		MWh/person	8,347	10,741	10,710	17,418
27		kWh/m²	229	283	235	395
29		i) supplied electricity, (MWh)	3.425	8.289	8.167	20.620
31		MWh/person	4,513	6,303	5,743	13,820
33		kWh/m²	124	166	126	314
35		renewables in electricity mix, (%)	100,00	100,00	100,00	89,00
37		from renewables, (MWh)	3.425	8.289	8.167	18.352
39		MWh/person	4,513	6,303	5,743	12,300
41		kWh/m²	124	166	126	279
43		non renewables in electricity in mix, (%)	0	0	0	11,00
45		from non renewables, (MWh)	0	0	0	2.268
47		MWh/person	0,000	0,000	0,000	1,520
49		kWh/m²	0	0	0	34
53		ii) supplied gas, (MWh)	618	4.020	4.149	3.361
55		MWh/person	0,814	3,057	2,918	2,253
57		kWh/m²	22	80	64	51
59		iii) supplied diesel, (MWh)	0	0	0	0
61		MWh/person	0,000	0,000	0,000	0,000
63		kWh/m²	0,0	0,0	0,0	0,0
65		iv) district heating, (MWh)	2.292	1.815	2.375	1.603
67		MWh/person	3,020	1,380	1,670	1,074
69		kWh/m²	82,7	36,3	36,7	24,4
71		v) site generated renewables - biomass, (MWh)	0	0	539	404
73		MWh/person	0,000	0,000	0,379	0,271
75		kWh/m²	0,0	0,0	8,3	6,1
77		vi) site generated renewable - PV, (MWh)		0,0	0,0	0,0
79		Installed peak capacity, (kWhp)			0	0
81		Assumed output, (% of kWh/p)			50	50
83		MWh/person		0,0000	0,0000	0,0000
85		kWh/m²		0,000	0,000	0,000
89	1b	Total energy used by service vehicles, (MWh/yr)			535	560
93		MWh/person		0	0,376	0,375
97		kWh/m²		0,0	2,789	2,824
99		Diesel used, (m^3)			48,472	50,498
101		kWh of energy provided by one litre diesel			10,89	10,89
102		Petrol used, (m^3)			0,713	1,046

104		kWh of energy provided by one litre petrol			9,42	9,42
105		**Other fuel (optional)**		**0,0**	**0,0**	**0,0**
110	**1c**	**Total renewable energy use, (MWhr/yr)**		**8.289**	**8.706**	**18.756**
114		**renewable energy as part of total, (%)**		**58,69**	**57,16**	**72,17**
118		**Onsite generated renewables as part of total energy, (%)**		**0,55**	**4,04**	**1,85**
122	**1d**	**Water usage in EMAS perimeter, (m^3)**	**24.752**	**22.069**	**21.674**	**21.604**
126		**m^3/person**	**12,258**	**16,783**	**15,242**	**14,480**
130		**l/m²**	**352**	**442**	**335**	**329**
134	**1e**	**Office paper consumption, (tonnes)**	**135**	**115**	**114**	**96**
138		**Office paper consumption (tonnes/person)**	**0,034**	**0,029**	**0,028**	**0,024**
140		**Paper Density (g/m^2)**	80	80	80,0	75,0
142		**Sheets/kg**	200	200	200	214
144		**Total No. of sheets**	27.056.277	23.063.973	22.853.535	20.522.687
146		**Sheets/person**	6.766	5.770	5.646	5.076
148		**Working days in the year**	211	211	211	211
151		**Office paper sheets/person/day**	**32**	**27**	**27**	**24**
155	**1f**	**Offset paper consumption (tonnes)**	**32,0**	**23,1**	**0,0**	**0,0**
159		**Offset paper (tonnes/person)**	0,008	0,006	0,000	0,000
161	**Objective II) Reduction in CO2 (including CO2 equivalent of greenhouse gases) and other air pollutants**					
164	**2a**	**Total office building emissions from energy, (tonnes CO_2)**	**869**	**1.359**	**1.567**	**2.686**
168		**tonnes CO_2/person**	**1,145**	**1,034**	**1,102**	**1,800**
172		**kgCO_2/m²**	**31**	**27**	**24**	**40,8**
174		**i) from electricity, (CO_2 tonnes)**	**0**	**0**	**0**	**1.522**
176		Kgs CO2 from 1 kWh of electricity	0	0	0	0,671
177		**tonnes CO2/person**	**0,000**	**0,000**	**0,000**	**1,020**
179		**kgCO2/m²**	**0**	**0**	**0**	**23**
181		**ii) from gas (tonnes/yr)**	**117**	**764**	**788**	**639**
183		Kgs CO2 from 1 kWh natural gas	0,190	0,190	0,190	0,190
184		**tonnes CO2/person**	**0,155**	**0,581**	**0,554**	**0,428**
186		**kgCO2/m²**	**4**	**15**	**12**	**10**
188		**iii) from diesel (tonnes/yr)**	**0**	**0**	**0**	**0**
190		Kgs CO2 from 1 kWh diesel	0,264	0,264	0,264	0,264
191		**tonnes CO2/person**	**0**	**0**	**0,000**	**0,000**
193		**kgCO2/m²**	**0**	**0**	**0**	**0**
195		**iv) from district heating (tonnes/yr)**	**752**	**595**	**779**	**526**
197		Kgs CO2 from 1 kWh	0,328	0,328	0,328	0,328
198		**tonnes CO2/person**	**0,990**	**0,453**	**0,548**	**0,352**
200		**kgCO2/m²**	**27,1**	**11,9**	**12,0**	**8**
202		**Total quantity of refrigerants (tonnes)**			**0,165**	**0,173**
204		**Total refrigerant losses (tonnes)**			**0,000**	**0,000**
208	**2b**	**Emissions of other gases as CO_2 equivalent (tonnes)**	**NR**	**NR**	**0,0**	**0,0**
212		**tonnes CO2equiv/person**			**0,000**	**0,000**
216		**kgCO2equiv/m2**			**0,000**	**0,000**
218		**inventory R22, (kg)**				
219		**i) losses R22, (kg)**		**0,0**	**0,00**	**0,00**
220		GWP			1810	1810

221		**as tCO2equiv**			0,0	0,0
223		**inventory R410A, (kg)**				*75,6*
224		**ii) losses R410A, (kg)**		0,00	**0,00**	**0,00**
225		GWP			2090	2090
226		**as tCO2equiv**			0,00	0,00
228		**inventory R134A, (kg)**				
229		**iii) losses R134A, (kg)**		0,00	**0,00**	**0,00**
230		GWP			1430	1430
231		**as tCO2equiv**			0,00	0,00
233		**inventory R404A, (kg)**				*8,0*
234		**iv) losses R404A, (kg)**		0,00	**0,00**	**0,00**
235		GWP			3260	3260
236		**as tCO2equiv**			0,00	0,00
238		**inventory R407C, (kg)**				*89,7*
239		**v) losses R407C, (kg)**		0,00	**0,00**	**0,00**
240		GWP			1526	1526
241		**as tCO2equiv**			0,00	0,00
243		**inventory R507A, (kg)**				
244		**vi) losses R507A, (kg)**		0,00	**0,00**	**0,00**
245		GWP			3300	3300
246		**as tCO2equiv**		0,00	0,00	0,00
248		**inventory R422D, (kg)**				
249		**vii) losses R422D, (kg)**		0,00	**0,00**	**0,00**
250		GWP			3300	3300
251		**as tCO2equiv**		0,00	0,00	0,00
255	**2c**	**Site vehicle CO_2 emissions (tonnes)**	**132**	**118,9**	**131,0**	**137,2**
257		**tonnes CO_2/person**	**0,033**	**0,030**	**0,032**	**0,034**
259		**i) from diesel (tonnes)**		0,00	**129**	**135**
261		Kgs CO2 from one litre of diesel		*2,7*	2,67	2,67
262		**ii) from petrol**		0,00	**1,6**	**2,4**
264		Kgs CO2 from one litre of petrol		*2,3*	2,28	2,28
265		**from other fuel (eg propane)**		*0,0*	0,00	0,00
270		**gCO2/km (manufacturer)**	**191**	**182**	**179**	**171**
272		Vehicle kms travelled	548.074	521.537	602.927	623.890
274		**Internal fleet efficiency (litres/100km)**		**0,00**	**8,16**	**8,26**
278		**gCO2/km (actual)**	**240,0**	**228,0**	**217**	**220**
280		**Number of vehicles**	*29,0*	**28**	**27**	**25**
282		**kms/vehicle**			**22.331**	**24.956**
286	**2d**	**Total air emissions buildings (tonnes), as mimimum NOx, SO_2, PM_{10}**		**NR**	**NR**	**2,0**
288		**tonnes/person**				0,0013
290		NOx, (kg)			NR	1.992
292		SO2, (kg)			NR	NR
294		PM10, (kg)			NR	NR
296		…..others (VOC), (kg)			NR	NR
300	**Objective III) Waste management**					
303	**3a**	**Total non hazardous waste, (tonnes)**	**186,1**	**145,1**	**176,8**	**153,0**
307		**Total non haz.waste (tonnes/person)**	**0,245**	**0,110**	**0,124**	**0,103**
309		**Unsorted waste**	115,9	86,0	106,8	85,8
311		**Paper and card**	56,2	48,5	57,6	48,6
313		**Plastic**	3,9	3,1	3,0	1,7
315		**Metals**	0,7	0,4	0,5	0,4
317		**Glass**	4,1	3,6	3,4	3,2
319		**Storage tins**	1,1	0,8	0,6	0,4
321		**Wood**	3,1	1,5	1,4	0,8

323		**Metal drinks cans**	0,1	0,2	0,4	0
325		**Valorlux**	1,2	1,0	2,0	2,5
327		**Kitchen waste**			1,2	9,5
332	**3b**	**Total hazardous waste (tonnes)**	1,322	1,658	1,477	2,172
336		**Total hazardous waste, (tonnes/person)**	**0,0017**	**0,0013**	**0,0010**	**0,0015**
338		**Medical waste**	**0,3**	**0,3**	**0,3**	**0,4**
340		**Used batteries**	**0,3**	**0,3**	**0,3**	**0,4**
342		**Used containers**	**0,1**	**0,0**	**0,0**	**0,04**
344		**Data support**	**0,0**	**0,0**	**0,2**	**0,0**
346		**Cartridges**	**0,0**	**0,0**	**0,0**	**0,0**
348		**Electric cables**	**0,0**	**0,0**	**0,0**	**0,1**
350		**Oil and fat**	**0,6**	**1,1**	**0,7**	**1,3**
372	**3c**	**Percentage of waste sorted**	**38,19**	**41,41**	**40,08**	**44,70**
374	**Objective IV) Protecting biodiversity**					
377	**4a**	**Built surface area, (m^2)**				NR
381		**Built surface area, (m^2/person)**				NR
385		**Built surface area as part of site, (%)**				NR
387	**Objective V) Green procurement**					
389	**5a**	**Contracts >60k with "eco" criteria (%)**	32	65	92	100
392	**5b**	**Green products in office catalogue (%)**	**19,4**	**18,4**	**22,5**	**26,3**
394		**Green products in catalogue, (No)**	**89**	**99**	**88**	**94**
395		**Products in catalogue, (No)**	**458**	**537**	**391**	**357**
396		**Total value of products purchased from catalogue (EUR)**			270.182	193.508
398		**Value of green products purchased (EUR)**			37.922	66.729
400	**Objective VI) Legal conformity**					
402	**6a**	**EMAS registered buildings (%)**	15	**21,43**	**28,6**	**42,9**
405	**6b**	**EMAS registered useful floorspace (%)**	**15,3**	**26,0**	**33,7**	**33,2**
407		**EMAS verification non conformities**	**19**	**3**	**0**	**0**
409	**Objective VII) Communication**					
411	**7b**	**No. of difft trainings on offer**	**4**	**3**	**5**	
413	site training	**No of training beneficiaries**	**201**	**351**	**408**	
415		**Staff benefitting from training (%)**	**26,5**	**26,7**	**28,7**	**0,0**
417	**Objective VIII) Promoting dialogue with external partners**					
420	**Estimating EMAS costs and virtual value of identified savings**					
421	**Direct costs**	**Total Direct EMAS Cost (EUR)**		**396.000**	**462.000**	**462.000**
422		Total Direct Cost per employee		99	114,13	114,27
423		**i) Annual direct staff costs**		**396.000**	**462.000**	**462.000**
424		Annual direct staff costs (time FTE)		3	3,5	3,5
425		Annual cost of one FTE		132.000	132.000	132.000
426		**ii) Annual contract costs**		**0**	**0**	**0**
430		**iii) Annual misc costs**		**0**	**0**	**0**
433	**Energy (Bldgs)**	**Electricity unit cost (Eur/MWh)**			87,40	87,40
434		**Gas (Eur/MWh)**			65,00	65,00
435		**Fuel (Eur/MWh)**			100,00	100,00
436		**Total buildings energy cost (Eur/person)**			**691,62**	**1.354,325**
437		Electricity (Eur/person)			502	1208
438		Gas (Eur/person)			190	146
439		Fuel (Eur/person)			0,00	0,00
440		**Total buildings energy cost (Eur)**			**983.481**	**2.020.653**
441	**Energy (vehic.)**	**Diesel unit cost- (Eur/m3)**			**1.300**	**1.300**
442		**Petrol unit cost- (Eur/m3)**			1.500	1.500
443		Total cost Diesel (Eur)			63.014	65.647
444		Total cost petrol (Eur)			1.070	1.568
445		Total energy costs (Eur/person)			**15,83**	**16,63**
446		**Total fuel costs (vehicles) (Eur)**			**64.083**	**67.215**

447	**Water**	Water unit cost (Eur/m3)			2,00	2,00
448		Water (Eur/person)			**30,48**	**28,96**
449		**Total water costs (Eur)**			**43.348**	**43.208**
450	**Paper**	Paper (office) - unit cost/kg			0,72	0,72
451		Paper (offset) - unit cost/kg				
452		Paper (office) - Eur/person			20,28	17,10
453		Paper (offset) - Eur/person			0,00	0,00
454		Total paper (office) cost (Eur)			14,60	12,31
455		Total paper cost (Eur/person)			20,28	17,10
456		**Total paper cost (Eur)**			**82.102**	**69.120**
457	**Waste**	Waste disposal (general) - unit cost/tonne			334,81	342,05
458		**Waste disposal (general) - Eur/person**			**41,63**	**35,07**
459		Waste disposal (hazardous) - unit cost/tonne			3640,67	3146,12
460		**Waste disposal (hazardous) - Eur/person**			**3,781**	**4,580**
461		**Total waste cost (Eur)**			**59.198**	**52.330**
462	**Other site specific data**					
464		**Année**	**2011**	**2012**	**2013**	**2014**
465		**Imprimante local couleur**	24	0	0	0
467		**Imprimante locale N&B**	5	0,0	0,0	0,0
469		**Reseau N&B**	30	20	20	19
471		**Reseau couleurs**	9	14	17	17
473		**Photocopier N&B**	10	8	8	8
475		**Photocopier Couleur**	1	1	1	1
477		**Fax**	5	3	3	3

ANNEX C JRC PETTEN – INSTITUTE FOR ENERGY AND TRANSPORT (IET)

JRC-Petten (hereafter referred to as IET) conducts scientific and technical activities in the domains of energy technology, renewable energy, energy efficiency, security of energy supply and nuclear reactor safety, some of which require experimental facilities and laboratories.

Figure 1: Research Campus Petten - North Holland, with the Joint Research Centre located in the north part of the campus.

The JRC in Petten is located in an extensive dune area south of Callantsoog that extends to Petten ("Zwanenwater en Pettemerduinen"). The northern part of this area is an almost untouched landscape of predominantly calcareous dunes with damp and swampy valleys including some large dune lakes.

The JRC is located right in the middle of one of those areas; about 12 ha (40%) of the JRC terrain has since 2013 been designated as NATURA 2000 area. JRC is currently in dialogue with the Province of Noord-Holland for the realisation of Management Plan, in order to ensure that the existing rights and obligation of the JRC site are respected alongside with the conservation objectives. The existing requirements are stipulated in the environmental license which already meets the highest level of environmental protection.

C1 Overview of core indicators at Petten since 2005

IET has been collecting site data on core indicators since 2010 and the variation in some of the main indicators is shown in Table C1.

Table C1: Percentage changes in certain core indicators at JRC Petten since 2010

Parameter	From: 2010 Overall	To: 2014 % per year	From: 2011 Overall	To: 2014 % per year	From: 2013 %	Target 2014 %
Energy bldgs (KWh/p)	-35,9	-8,99	-17,6	-5,9	-24,6	-1,00
Energy bldgs (KWh/m^2)	-26,3	-6,58	-3,9	-1,3	-20,5	-1,00
Water use (l/p)	-3,2	-0,80	-60,9	-20,3	-42,2	0,00
Water use (l/m^2)	11,3	2,82	-54,4	-18,1	-39,0	0,00
Office paper (kg/person)	-60,4	-15,09	-20,9	-7,0	-20,2	-1,00
Office paper (Shts/person/da	-60,4	-15,09	-20,9	-7,0	-20,2	-1,00
CO_2 bldgs (kg/p)	-32,4	-8,11	-18,7	-6,2	-17,0	0,00
CO_2 bldgs (kg/m^2)	-22,3	-5,58	-5,3	-1,8	-12,4	0,00
Non haz.waste (kg/p)	23,5	5,87	-19,3	-6,4	-22,7	-1,00

All 2010 core indicators showed very good progress compared with 2014. This tendency towards a smaller ecological footprint is significant, but is due to a lack of energy intensive research programs. The energy efficiency of our buildings is increasing and awareness is growing. Plans to further improve building energy efficiency have been made and should result in further decreases in energy usage. Therefore financial support should prioritise future energy efficiency improvement plans.

C2 Description of JRC IET activities and setting

The site is continuously adapting to changes to meet future needs. Current core competences are in the domains of energy technology, renewable energy, energy efficiency, security of energy supply and nuclear reactor safety. IET has research laboratories for the testing, characterisation and analysis of different products, components, materials and processes. As a reference laboratory, IET is also validating several types of testing methods.

One of IET's important activities is the training of EU Member State and candidate country scientists. The IET disseminates scientific results by organising scientific events, participating in conferences and workshops and by writing articles for publication in scientific journals. Through research networks, the results are disseminated to national authorities and research centres, industry, and other interest groups. Furthermore, the Institute represents the EC in several energy issue-related committees. Information on the research projects' objectives and results is available on the internet pages of the Commission, JRC and IET.

The site location and layout of buildings is presented below in Figure C1. The EC owns the High Flux Reactor (HFR) located at the site. However it is operated by Dutch company NRG which also holds the operational licence and consequently is outside the EMAS scope. Buildings 113 (the radiographic laboratory), the process of transferring building 113 under the license to NRG is still ongoing.

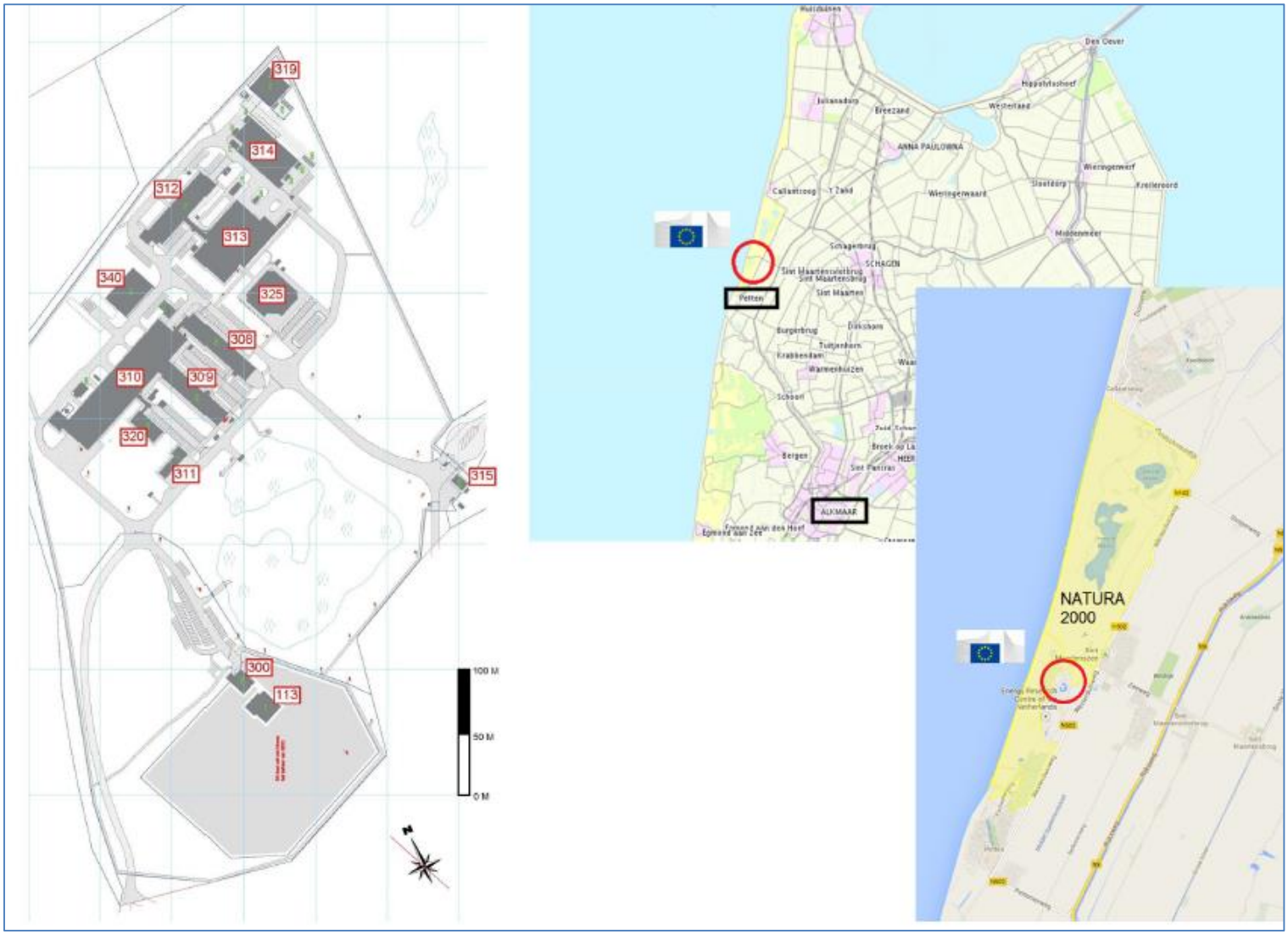


Figure C1: JRC IET: Site location and layout

For 2015 we hope to transfer the license and building to NRG. A description of the buildings is presented below:

Building(s)	Description (and/or status)
308, 309	Office buildings
310	Large experimental hall
312, 325	Office building with some smaller laboratories
313	Offices, central store, mechanical workshop, storage, library, gym
314/319	Office, laboratory, workshop
320	Offices
300	Security, entrance to HFR, operated by the Dutch company NRG, located on HFR
315	Security
340	Storage (maintenance, cars, workshop)
113	Laboratory, to be transferred to NRG, located on the HFR site

C3 Environmental impact of JRC IET activities

The results of the analysis of environmental aspects at IET are summarised in the table below, which is reviewed and updated every year.

Table C2 – Summary of significant environmental aspects for the IET site

Aspect Group	Environmental Aspect	Environmen-tal Impact	Location/Activity/Product/Service
Air, Energy (gas, electricity, fuel)	Emission of gases (argon, carbon monoxide, etc.)	Pollution of the air, climate change, exploitation/ depletion of natural sources	FCTEST (fuel cell testing)
	Emissions of combustion gases (CO2 and NOx)		General, Hydrogen Production, Transport and mobility (missions, commuting, service cars)
	Emissions of testing gases		HySaST SolTeF (Hydrogen Safety for Storage and Transport, SolTef-laboratory). AMALIA lab (Ageing of Materials under the effect of environmentally assisted stress corrosion cracking).
	Welding (smoke), emission of aerosols to the air (VOC, volatile organic compounds)		Assembly Room, workshop
	Cleaning chemicals, emissions of solvents to the air (VOC)		Workshop
	Energy for building heating, climate control, steam generator, machines, household utilities, lightning etc.		General
	Energy saving measurements taken into account for putting up new buildings or rebuilding existing buildings		Infrastructure
	Energy consuming hardware: purchase of materials, equipment and machines		IT-service, Infrastructure
	Geothermal cooling, use of groundwater for cooling process with Fuel cell testing	Warming of groundwater	FCTEST
	H(C)FC emissions	Destruction of the ozone layer	Climate control buildings
External Safety	Hydrogen in production/testing facilities, adequate ventilation and gas detection	Disturbing / pollution of	FCTEST, HySaST SolTeF, Hydrogen

Aspect Group	Environmental Aspect	Environmen-tal Impact	Location/Activity/Product/Service
(hydrogen, storage dangerous substances, pressure, radiation)	equipment	living environment. Health risks.	Production
	Storage of hazardous substances		Micro Structured Analysis (MAS), Sample Preparation, Central Store
	Use and storage of gas bottles and (high) pressure equipment		FCTEST, AMALIA lab, Assembly Room, Workshop, HySaST SolTeF
	Radioactive material		Assembly Room, Commissioning area
Local aspects	Noise, dust (PM), soil (prevention and history)	Noise, air and soil pollution, health risks	FCTEST, Hydrogen Production, HySaST SolTeF, Laboratory , grinding room, workshop
Waste	Various waste (e.g. packaging material, paper and cardboard, metals)	Exploitation of renewable materials, producing waste	General
Waste (chemical, dangerous)	Chemical Waste, 'Klein Chemisch Afval' (e.g. batteries), scrap from material used, hazardous waste mainly from Metallography, TEM and SEM		Grinding room, Wire-erosion, HySaST SolTeF, MAS, Sample Preparation, Central Store
Waste water	Waste water (housekeeping: cleaning, sanitation and installations)	Risk of eutrophicatio n, pollution of water	General
	Salted water, production of deionized water by reversed osmoses		FCTEST, Hydrogen Production
	Cleaning / rinsing water, cleaning of testing materials and equipment		Micro Structured Analysis (MAS)
	Heavy metals, waste water contains heavy metals due to grinding		Grinding room, wire-erosion
Water (use of)	Water for Sanitation and installations, water consumption	Drying of ground, waste water	General
Bio - diversity	Choice of ingredients and their origin	Weakening of ecosystems	Research and process/activities on site
	Site selection and type of buildings	Destruction of the natural habitat of the relief. Visual pollution	The (real estate/environmental) policy of the EC and JRC IET site
Resources	Fossil fuel consumption (heating, cooling, ventilation, electrical equipment and transportation)	Decrease in natural resources	General
	Use of paper (office, printing, communication needs)		
	Water consumption (health and technical equipment. i.e. Geothermal installation)		
Procureme nt, funding (indirect)	Indirect environmental aspects of programs to finance. Environmental performance of contractors. Sustainability and impacts of products and services selected.	Impacts on the environment caused by third parties, products and in the 'chain'	'Sustainable' purchasing: taking account of the environment in the selection and evaluation of projects. Integration of environmental clauses in contracts.

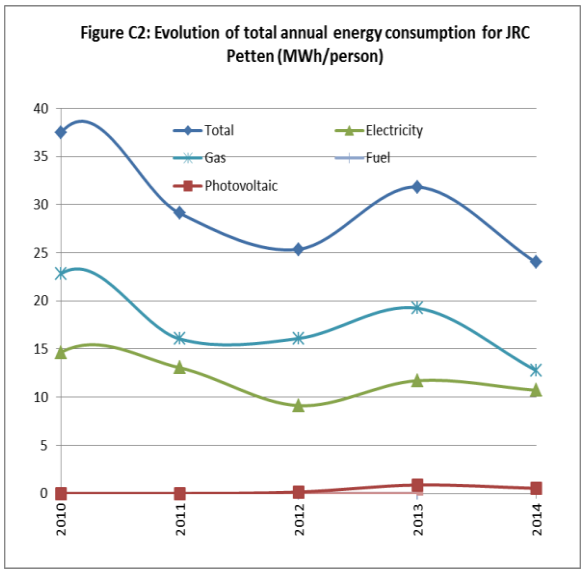
The results of the environmental analysis show that the environmental aspects in the table above are significant. IET is taking measures to prevent pollution and to achieve more efficient use of natural resources (mainly energy, water and paper). A majority of the impacts are followed through the monitoring of indicators.

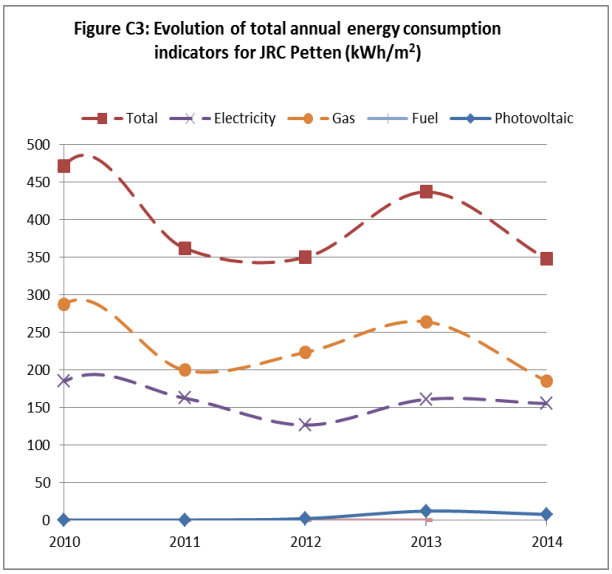
C4 More efficient use of natural resources

C4.1 Energy consumption

a) Buildings

Because IET is a scientific site the consumption of energy and water depends to a significant extent on laboratory activities. Energy-intensive experiments in one year may be followed by less energy-demanding experiments in the following year. This can result into sharp increases or decreases from year to year. Currently no distinction is made between energy and water consumption in offices and in laboratories.





Figures C2 and C3 illustrate that total energy consumption for buildings (indicator 1a) fell considerably between 2010 to 2014. In 2013 it increased by approximately 20% per person and per square metre as a result of an unusually cold period from January to May 2013. 2014 was a very warm year and there were no energy-intensive research projects. Overall there were a significantly larger number of hot degree days in 2014 as discussed in Section 2.4.

This year we report the measured value of on-site generated PV energy rather than the estimated value which had shown us too positive a picture. In 2015 we plan to install more solar panels and we expect, on sunny days in the spring and summer, to have some energy independent buildings.

The **2014 target** to maintain 2013 levels was met. Initiatives for continued improvement identified in the Commission's EMAS annual action plan for 2015 are summarised below.

Annual action plan no	Since	Description (and reference)	Progress in 2015	Expectations in 2015, and end date (if app)
12	2015	Photovoltaic installation at JRC IET. Installation of photovoltaic panels on the roof of building 309, 308 - 61Kwp.	Started, Installation of 61Kwp	Installation of 61Kwp to be complete in 2015
94	2015	Insulation of outside walls and roof building; 310 and ,314	Started	To be complete in 2015 builings 313 and 320 also insulated

b) Site vehicles

IET has a fleet of one diesel, three petrol and one electrical vehicle. The total energy consumption for vehicles (new indicator 1b) was equivalent to 23 kWh/person, approxiamtely 0.001 % of that for buildings. The **2014 target** was to reduce fleet consumption by 2% which was met.

c) Renewable energy use in buildings and vehicles

The **2014** onsite genegration of renewable energy as part of total energy (indicator 1c) was 2.18% of total energy consumption. This onsite generated energy is done with photovoltaic cells installed onsite. The **2014 target** was 2,3% based on estimations. Due to improved reporting(since 2013 actual measuring of PV generated energy) the numbers show less progress as assumed. The total onsite generated renewable energy was 147.598,0 kWh. For 2015 we expect to see an increase in solar generated energy due to the installation off 61kWhp solar panels on the buildings 308 and 309.

C4.2 Water consumption (indicator 1d)

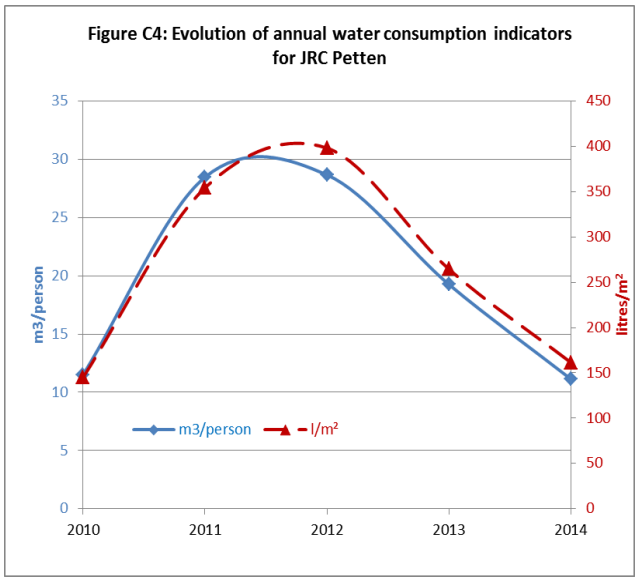
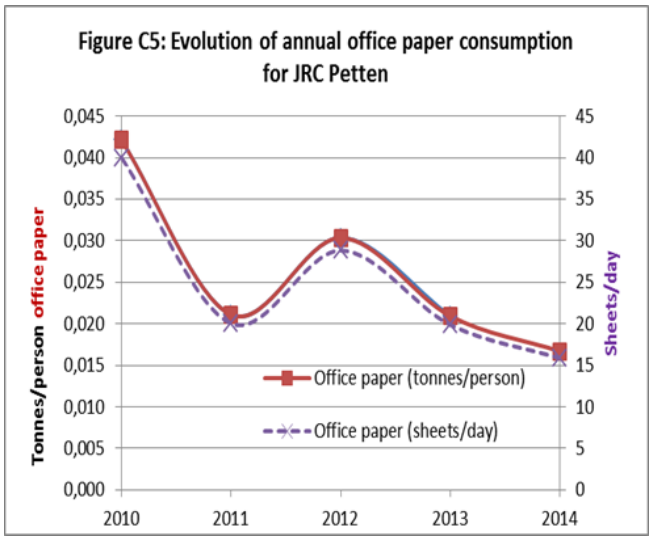


Figure C4 illustrates that water consumption after increasing in 2011, has reduced in 2013. The peak observed in 2011 and 2012 was due to faulty valve control in the water treatment plant of the Fuel cell laboratory in building 310. The Fuel cell laboratory required less water in 2014 leading to lower overall water consumption than in the three previous years. Site water consumption is strongly influenced by activities in building 310, where it is used as process water in technical installations.

The **2014 target** was not to exceed the 2013 consumption levels was easily achieved with an actual reduction of 35,5%. The **2015 target** is to not exceed 2014 levels.

C4.3 Office paper (indicators 1e)

Figure C5 shows that paper consumption has reduced considerably since 2010, with the 2013 value representing only 50% of the initial figure. The apparent peak in 2012 may not be real, as paper is purchased infrequently and in large quantities.



The **2014 target** of reducing office paper consumption by 1% was met with an actual reduction of 20%, although as mentioned above this may be due to purchasing patterns rather than those of usage. The **2015 target** is not to exceed the 2014 level of consumption.

The following initiative was identified in a management approved action to more accurately determine paper consumption:

Annual action plan no	Since	Description (and reference)	Progress in 2014	Expectations in 2015, and end date
16	2013	Implement a plan to more accurately measure paper inventory	Started	To finish in 2015

C5 Reducing emissions of CO_2, other greenhouse gases and air pollutants

C5.1 CO_2 emissions from buildings

The following table shows the breakdown of CO_2 emissions by source. These are mainly the result of the reduction of buildings emissions. Refrigerants losses and vehicles emissions, expressed as CO_2 equivalent, are minor in relation, accounting for less than 1% of buildings emissions.

Table C3: Percentage of CO_2 emissions from different sources in 2014 (tonnes/person)

Source	Quantity	% of total
Buildings (EMAS)	9,79	99,52
Refrigerants loss	0,042	0,43
Vehicles, all Commission	0,005	0,05
Missions (excluding vehicles)		0,00
Total	**9,84**	**100,00**

a) Buildings (energy consumption)

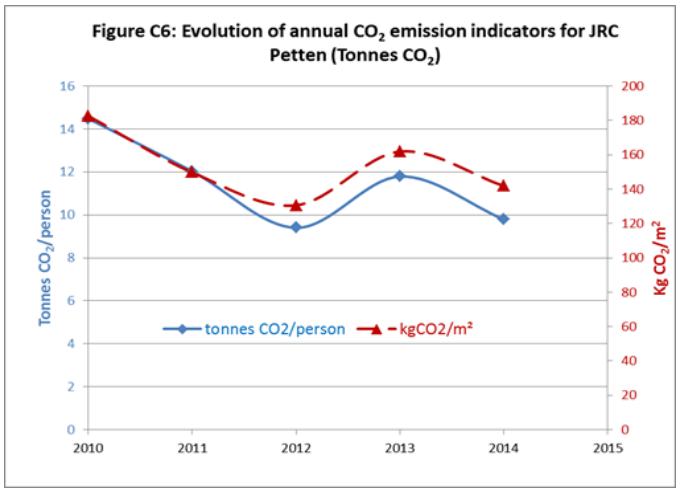


Figure C6 illustrates that CO_2 emissions have reduced since 2010; the 2014 per capita value representing 81% of the initial figure. This is in line with the reduction in energy consumption and therefore to be expected.

The **2014 target** of a 1% reduction in CO_2 emissions was met with an actual decrease of 17% /person, mostly due to decreased gas and electricity use in the

cold period from January to May 2014. The **2015 target** is to maintain the 2014 level of emissions.

b) Buildings other greenhouse gases (refrigerants)

The **2014 target** under the IET environmental plan was to reduce GHG emissions by 1%, and this was not achieved. The **2015 objective** is for these emissions not to exceed the 2014 levels. The following action identified in the Commission's 2015 EMAS action plan is as follows:

Annual action plan no	Since	Description	Progress in 2014	Expectations in 2015, and end date
33	2014	Phase out all the R22 containing air conditioning units located within the institute before end of 2014	Finished	Not applicable

Under this (and previous action plans) the number of equipment units to phase out was as follows:

Table C4: Phase out of equipment (with HCFC, R22), number of units left at end of year

	2010	2011	2012	2013	2014
Total	15	10	7	4	0

C5.2 CO_2 emissions from vehicles

a) JRC IET vehicle fleet

The **2014 target** of reducing emissions from its five vehicles by 1% was met. The actual reduction in CO_2 emission per kilometer is 9,6%. The main reason for the reduced emissions is the switch from a petrol vehicle to an electrical vehicle. This electric vehicle is used for post item transport and short trips on the campus.

b) Missions (excluding Commission vehicle fleet)

There were no specific targets in 2014 or 2015 or management approved action plans to reduce CO_2 emissions from missions.

c) Commuting (and mobility)

There were no specific IET targets in 2014 or management approved action plans to reduce CO_2 emissions from commuting.

C5.3 Total air emissions of other air pollutants ($S0_2$, NO_2, PM, VOC)

The **2014 target** was to reduce atmospheric emissions of SO_2, NO_x and PM expressed in kg/year by 1%. The **objective for 2015** is to not exceed the 2014 emissions levels. Both PM10 and SO_2 were below the limit of detection in 2014, in common with 2013. VOC emissions were 50 kg in 2014, up from 21 kg in 2013 due to expanded use of solvents.

NOx emissions from heating installations were 564 kg in 2014 compared with 779 kg in 2013. This represented a 28% decrease due to lower gas consumption of heating installations

during the cold period lasting from January to May 2014. The NO_x emission factors of the gas heating equipment of buildings 310, and 320 are based on technical documentation and account for about 50% of total NOx emissions as was the case in 2012. The NOx emission factors of the gas heating equipment of all other buildings are based on NOx measurements. The logbooks record measured emissions as being within the legal limits.

For emissions to air of NO_x, PM, VOC and SO_2, there were no actions implemented in 2014 and no specific actions planned for 2015. The targeted reductions will be achieved through campaigns of general awareness reminding staff of the importance of reducing resource consumption.

C6 Improving waste management and sorting

C6.1 Non hazardous waste

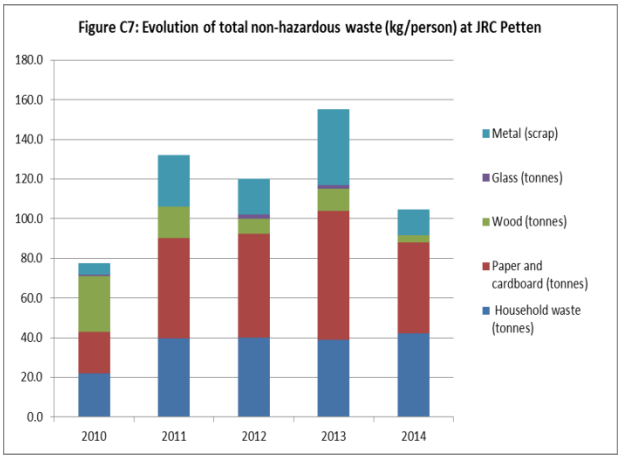


Figure C7 shows that household and paper/carton waste make up a large percentage of the waste and with quantities generated remaining almost stable over the last four years. There has been a greater than 20% increase in the total amount of general waste generated in each of the last four years compared with 2011. This is due to the collection of large amounts of scrap (particularly in 2013), as several installations reached the end of their life span. Though some waste electrical equipment was gathered throughout the year, this was placed into temporary warehouse storage in 2014 this equipment is disposed.

The **2014 target** of a 1% reduction in total waste generation was met with an actual decrease of 23%. The **2015 target** is not to exceed the 2014 waste generation levels. There are no specific management approved **actions** for continued improvement.

C6.2 Hazardous Waste

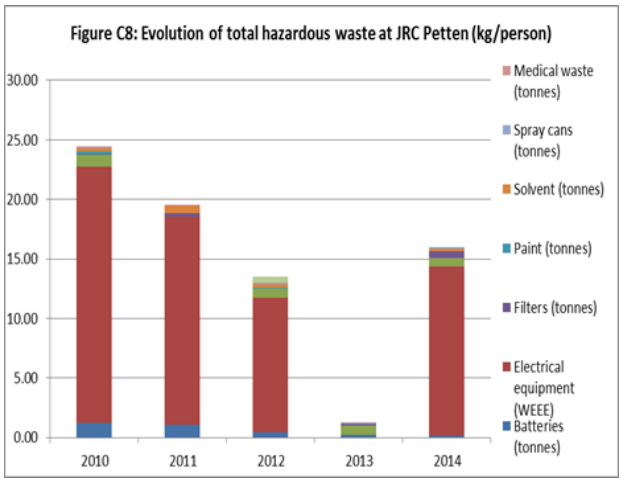


Figure C8 indicates total hazardous waste. The **2014 target** was to reduce 1% in hazardous waste, the increase was 139% in 2014. This increase is caused by the different way the category hazardous waste is composed. Electrical equipment is added to this category and has a great influence. The **2015 target** is to maintain the level of 2014.

C6.3 Waste sorting

Table C5 shows that the proportion of total

waste sorted, has declined from 76,1% in 2013 to 65.5% in 2014.

Table C5: Percentage of waste sorted at JRC Petten

	2010	2011	2012	2013	2014
Percentage of waste sorted	72.9	71.2	67.5	76.1	65.5

This decline is the result of a reduction in the overall amount of waste generated throughout the year, mainly owing to reduced research activities. The proportion of household or "unsorted" waste is therefore larger in 2014. The quantity "unsorted" or household waste was only slightly higher in 2014 than in 2013. There was no specific **2014 target** for sorting waste, and the **2015 target** is to achieve the 2014 level of performance.

a) Discharges to wastewater

IET discharges wastewater under its Environmental Permit and is required to undertake sampling on a regular basis, results of which are shown in Table C6.

Table C6 Control of discharges to wastewater		Concentration (mg/m3)			
Substance	Limit mg/m3	Inorganic emissions to the sewer system			
		2011	**2012**	**2013**	**2014**
Chloride (Cl-)	-	200	170	210	200
Evolution %		-23.1	-15	24	-5
Release of heavy metals to the sewer system	**0**				
Mercury (Hg) - Limit 10mg/m3	10	0.14	<0.1	<0.1	<0,1
Δ %		0	0	0	0
Cadmium (Cd) - Limit 20mg/m3	20	<0,4	0.71	<0.4	<0,4
Δ %	0	0	0	0	0
Zinc (Zn)	The sum of 5 metals: 5,000	140	300	300	120
Δ %		-22	114	0	-60
Copper (Cu)		220	130	160	180
Δ %		16	-41	23	12,5
Nickel (Ni)		<5,0	11	5	<5
Δ %		0	0	-55	0
Chromium (Cr)		6.3	5	5	5,8
Δ %		-58	-21	0	16
Lead (Pb)		<5,0	14	5	<5
Δ %		0	0	-64	0
Arsenic (As)		<1,5	1.7	1.5	1,5
Δ %		0	0	-12	0
Metals: the sum of the 5 highest values - 5000 mg/m3	0	366	462	475	315,8
Δ %		-8	26	3	-34

The data indicate that concentrations in wastewater are below license limits. Therefore IET demonstrates that IET complies with the license requirements (which form a part of the environmental licence). Although the wastewater permit requires sampling once per year, in order to establish a more complete data series and to be able to evaluate and react more quickly IET carries out extra measurements twice per year. These extra measurements are in designated sampling pits witch are located in areas where contamination is possible due the activity's carried out (labs and workshop).

C7 Protecting biodiversity

The constructed area of buildings (footprint at ground level) in IET is 19.458 m^2, equivalent to 69 m^2 for each staff member. The total area of the site is 305.554 m^2, so the "natural" proportion of the site represents approximately 97% of the total.

There was no specific **2014 target** in relation to biodiversity at the IET site: the objective in 2012 was to report on the Natura 2000 site in the Environmental Statement. The **2015 target** is to develop a Natura 2000 Control Plan with the Dutch authorities according to the following management approved action as indicated in the Commission's EMAS annual action plan.

Annual action plan no	Since	Description (and reference)	Progress in 2014	Expectations in 2015, and end date
52	2014	Development and implementation of a NATURA 2000 Control Plan with the Dutch authorities	The devolpment of the natura 2000 plan is postponed by the province	Discussion and update on the nitrogen deposition issue

C8 Green Public Procurement

C8.1 Incorporating GPP into procurement contracts

No specific actions have been undertaken in 2014 but environmental criteria have systematically been considered when defining selection and award criteria, mandatory technical requirements, etc. for every relevant tender procedure. The **2015 target** will be to apply GPP measures developed for the EC and all JRC activities as identified in the following management approved action:

Annual action plan no	Since	Description (and reference)	Progress in 2014	Expectations in 2015, and end date
56	2014	Green Public Procurement will be developed for the EC and all JRC activities. JRC IET will implement the GPP procedure when ready.	NA	Systematic implementation

C8.2 Office supplies contract

There was no specific **2014 target** and no 2015 target for the number of "green" products in the office supply catalogue.

C9 Demonstrating legal compliance

C9.1 Prevention and risk management

IET conducts active risk and compliance control on analysis, verification planning, execution, registration and carries out a yearly task oriented full review of all legal requirements. The result is an overview of KPIs, results, effects and the status of compliance along with an appreciation of what is and isn't working well. Employee involvement is important, and several instruments are used including:

- Register of (legal) requirements and obligations;
- Annual licence compliance checks (self-assessments);
- Overview legal maintenance and inspections;
- Assurance matrix (implementation in 2014);
- Safety and Environmental Unit Tours (inspection by Unit Head and Site Safety Officer);
- Inspection, by site fire brigade, of the facilities for fire prevention, detection and of fire fighting equipment;
- Internal and external audits; and
- EMAS overview of accountability (checking that the quantitative and qualitative presented data and information in the EMAS Environmental Statement is correct).

C9.2 Maintaining the site's EMAS registration

The **2014 target** was re-certification of the existing ISO 14001 and EMAS verification for the second time, both of which were achieved. The 2015 target is to maintain the EMAS certification for the entire site. The following actions were included in the Commission's EMAS Annual Action Plan for 2015.

Annual action plan no	Since	Description (and reference)	Progress in 2014	Expectations in 2015, and end date
62	2013	Revision of the site's environmental license	Ongoing	finished
63	2013	Development and implementation of an overview of all legal requirements and other obligations, and translation of the legal requirements/obligations towards assurance measurements and implement it in the organization.	Finished	Continue to update in 2015
New*	2013/14	Environmental tours: include environmental aspects in the safety and environmental tours	Finished	Continue to mention environmental aspects during safety tours in 2015

Annual action plan no	Since	Description (and reference)	Progress in 2014	Expectations in 2015, and end date
New*	2013/14	Environmental programme 2015-17: review the achievement of the environmental programme 2012-14 and prepare of the new 3 year programme (2015-17).	Finished	Continue in 2015

* Inserted after the Commission's 2015 EMAS annual action plan was validated by the Steering Committee.

C9.3 Compliance with EMAS

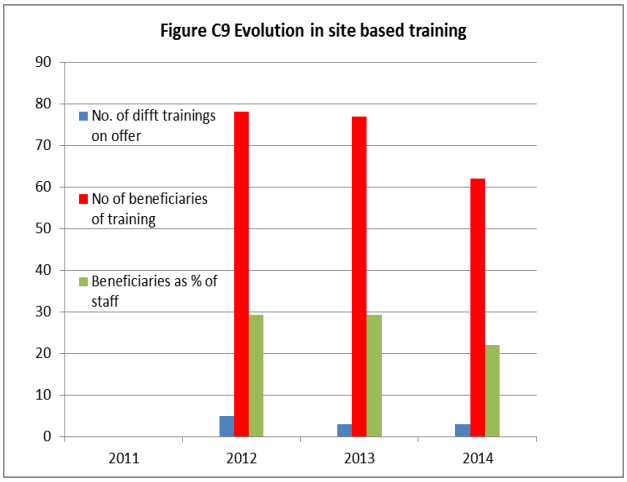
The number of (minor) non-conformities generated through EMAS external verifications reduced to one in 2014. IET monitors the findings of EMAS internal audits and verification audits, and in cooperation with HR COORD ensures that non conformities as well as "scopes for improvement" are followed up.

C10 Internal communication (and training)

C10.1 Internal communication

There have been several internal communication actions including an EMAS newsletter to all staff in JRC-IET, presentation of EMAS system during Unit and Management meetings and EMAS poster campaigns in accordance with the corporate communication campaigns. During the safety tours specific environmental issues are discussed with heads of unit. The main topic of recent tours is how to reduce the percentage of pc stations that are active overnight and over the weekend. The percentages are provided by the IT department with a break down by unit and provide good input for discussion on behaviour.

At JRC Petten — despite the heavy mist in the morning — 67% of staff took part in sustainable mobility competition on 19/09/2014. The winning units had staff participation rates higher than 78%.



C10.2 Internal trainings

Figure C9 shows the evolution in site based training. There were specific awareness and training packages available in 2014, and the **2015 target** is to maintain these.

Specifically: (a) Newcomers' training (half-day on Environment, Safety, Security, Quality): 62 participants; (b) SES (safety, environment, security) presentations during unit meetings: 6 presentations addressing 200 participants; (c) Safety and environmental tours (2,5 hours). In addition, a number of specific training courses targeted to specific groups (often also linked to safety) such as: storage of dangerous substances, preparing laboratory risk assessments,

radiation protection, fire extinguishers, first aid, company emergency preparedness and ergonomics.

Regarding promoting awareness, in 2014, the SES (safety, environment, security) unit participated in one Management meeting, eight Unit meetings, eight newcomers' training sessions and four Health and Safety Committee meetings.

C11 Transparent dialogue with external partners

IET enters into regular external communications, where environmental issues are on the agenda, including participating in meetings with the following stakeholders, contractors and suppliers as indicated in Table C7:

Table C7: Stakeholders, meeting purpose and frequency

Stakeholder	Purpose
Gemeente Schagen	In the context of the environmental permit (Omgevingsvergunning)
Provincie Noord-Holland,	In the context of groundwater en 'koude warmte opslag', Natura 2000
Hoogheemraadschap Hollands Noorderkwartier	In the context of wastewater pollution measurements and levy
AMART	Wastewater pollution measurements 'afvalwaterputten'
GEA Grenco	Maintenance contractor for cooling equipment
Cofely	Maintenance of heating and ventilation equipment
SITA/van Ganzewinkel	Waste contractor
GOM	Cleaning contractor
NUON	Energy supplier
ECN + PWN	Water supply

C12 EMAS costs (and savings)

Table C8 indicates how costs have evolved for running EMAS and for expenditure on energy, water, paper consumption and waste disposal.

Table C8 EMAS costs (and savings)	Costs				Cost savings in 2014 compared to
	2010	2011	2013	2014	2013
Total Direct EMAS Cost (EUR)	0	0	66,000	66,000	0
Total Direct Cost per employee	0	0	251	234	17
Total buildings energy cost (Eur)	430,950	345,762	399,680	345,359	54,321
Total buildings energy cost (Eur/person)	1,858	1,510	1,520	1,225	295
Total fuel costs (vehicles) (Eur)	0	0	957	821	136
Total energy costs (Eur/person)	0	0	4	3	1
Total water costs (Eur)	5,338	13,040	10,130	6,282	6,758
Water (Eur/person)	23	57	39	22	16
Total paper cost (Eur)	15,632	7,731	8,805	7,531	1,274
Total paper cost (Eur/person)	67	34	33	27	7
Waste disposal (general) - unit cost/tonne	90	90	90	90	0
Waste disposal (general) - Eur/person	6.98	11.90	13.98	9.43	4.55
Waste disposal (hazardous) - unit cost/ton	750	750	750	750	0
Waste disposal (hazardous) - Eur/person	2.36	4.41	2.04	5.51	-3.48

Costs associated with running EMAS include consultancy contracts which are recorded since 2012. In 2014 these were equivalent to 234 EUR per person, little changed from 2013 due to a light increase in staff.

Energy expenditure in 2014 was 285 EUR less per person than in it had been in 2011. There had been a larger reduction in energy expenditure between 2010 and 2012 (over 500 EUR per person), but energy costs were significantly higher in 2013 when an additional 299 EUR per person was spent compared with the previous year. Vehicle fuel expenditure in 2014 was 1 EUR per person less than in 2013.

Water and paper costs were both lower in 2014 than they had been in 2013, with water costing 6 EUR less per person. Savings per employee for paper over the same period was greater, with paper cost per employee in 2013 being 40 EUR less than it had been in 2010, and 7 EUR less than in 2013.

Per capita costs for general waste disposal have declined to under 10 EUR, and remain far higher than those for hazardous waste disposal equivalent to approximately 6 EUR.

C13 Petten data tables:

Line	Objective/ indicator	Parameter and units	2010	2011	2012	2013	2014
2	Basic EMAS	Population: staff in EMAS perimeter	232	229	266	263	282
4		Population: total staff	232	229	266	263	282
6		No. buildings seeking EMAS registration	14	14	14	14	14
8		Total no. of buildings	*14*	*14*	*14*	14	14
10		Useful surface area in EMAS perimeter, (m^2)	18.400	18.400	19.150	19.150	19.458
12		Useful surface area for all buildings, (m^2)	18.400	18.400	19.150	19.150	19.458
14		Total site area, (m^2)	*305.554,0*	*305.554,0*	*305.554,0*	305.554	305.554
16	Objective I) Efficient use of resources						
19	Ia	Total energy buildings, (MWh)	8.690	6.665	6.746	8.373	6.766
23		MWh/person	37,457	29,105	25,360	31,836	23,991
27		kWh/m²	472	362	350	437	348
29		i) supplied electricity, (MWh)	3.400	2.990	2.426	3.082	3.020
31		MWh/person	14,655	13,057	9,120	11,719	10,709
33		kWh/m²	185	163	127	161	155
35		renewables in electricity mix, (%)	0	0	0	0	2
37		from renewables, (MWh)	0	0	0	0	60
39		MWh/person	0,000	0,000	0,000	0,000	0,214
41		kWh/m²	0	0	0	0	3
43		non renewables in electricity in mix, (%)	100	100	100	100	98
45		from non renewables, (MWh)	3.400	2.990	2.426	3.082	2.960
47		MWh/person	14,655	13,057	9,120	11,719	10,495
49		kWh/m²	185	163	127	161	152
51		(electricity to primary energy conversion)					2,5
52		(electricity as primary energy - MWh/yr)					*7.550*
53		ii) supplied gas, (MWh)	5.290	3.675	4.281	5.061	3.598
55		MWh/person	22,802	16,048	16,094	19,243	12,759
57		kWh/m²	288	200	224	264	185
59		iii) supplied diesel, (MWh)	0	0	0	0	0
61		MWh/person	0,000	0,000	0,000	0,000	0,000
63		kWh/m²	0,0	0,0	0,0	0,0	0,0
65		iv) district heating, (MWh)	0	0	0	0	0
67		MWh/person	0,000	0,000	0,000	0,000	0,000
69		kWh/m²	0,0	0,0	0,0	0,0	0,0
71		v) site generated renewables - biomass, (MWh)	0	0	0	0	0
73		MWh/person	0,000	0,000	0,000	0,000	0,000
75		kWh/m²	0,0	0,0	0,0	0,0	0,0
77		vi) site generated renewable - PV, (MWh)	0	0	38,7	230,0	147,6
79		Installed peak capacity, (kWhp)	0	0	24,5	146	209
81		Assumed output, (% of kWh/p)	18	*18,0*	*18,0*	18	18
83		MWh/person	0	0	0,1453	0,8744	0,5234
85		kWh/m²	0	0	2,0	12,0	7,6
89	1b	Total energy used by service vehicles, (MWh/yr)	0	0	6,2	6,0	5,4
93		MWh/person	0	0	0,023	0,023	0,019
97		kWh/m²	0	0	0,3	0,314	0,279
99		Diesel used, (m^3)			0,400	0,000	0,097
101		kWh of energy provided by one litre diesel	11	10,9	10,9	10,89	10,89
102		Petrol used, (m^3)			0,200	0,638	0,463
104		kWh of energy provided by one litre petrol	9	9,4	9,4	9,42	9,42
105		Other fuel (optional)	0	0	0,0	0,0	0,0
107		kWh of energy provided by one……					
110	1c	Total renewable energy use, (MWhr/yr)	0	0	39	230	208
114		renewable energy as part of total, (%)	0	0	0,57	2,75	3,07
118		Onsite generated renewables as part of total energy, (%)	0	0	0,57	2,75	2,18
122	1d	Water usage in EMAS perimeter, (m^3)	2.669	6.520	7.625	5.065	3.141
126		m^3/person	11,504	28,472	28,665	19,259	11,138
130		l/m²	145	354	398	264	161
134	1e	Office paper consumption, (tonnes)	9,770	4,832	8,070	5,503	4,707
138		Office paper consumption (tonnes/person)	0,0421	0,0211	0,0303	0,0209	0,0167
140		Paper Density (g/m^2)	80	80	80	80,0	80,0
142		Sheets/kg	200	200	200	200	200
144		Total No. of sheets	1.958.073	968.414	1.617.364	1.102.894	943.362
146		Sheets/person	8.440	4.229	6.080	4.194	3.345
148		Working days in the year	211	211	211	211	211
151		Office paper sheets/person/day	40	20	29	20	16
155	1f	Offset paper consumption (tonnes)	0,0	0,0	0,0	0,0	0,0
159		Offset paper (tonnes/person)	0,000	0,000	0,000	0,000	0,000
161	Objective II) Reduction in CO2 (including CO2 equivalent of greenhouse gases) and other air pollutants						

164	**2a**	**Total office building emissions from energy, (tonnes CO_2)**	**3.361**	**2.756**	**2.501**	**3.100**	**2.760**
168		**tonnes CO_2/person**	**14,485**	**12,035**	**9,403**	**11,789**	**9,789**
172		**kgCO_2/m²**	**182,6391304**	**149,7820652**	**130,6093995**	**162**	**141,9**
174		**i) from electricity, (CO_2 tonnes)**	**2.281**	**2.006**	**1.628**	**2.068**	**2.026**
176		Kgs CO2 from 1 kWh of electricity	0,671	0,671	0,671	0,671	0,671
177		**tonnes CO2/person**	**9,834**	**8,761**	**6,120**	**7,863**	**7,186**
179		**kgCO2/m²**	**124**	**109**	**85**	**108**	**104**
181		**ii) from gas (tonnes/yr)**	**1.079**	**750**	**873**	**1.032**	**734**
183		Kgs CO2 from 1 kWh natural gas	0,204	0,204	0,204	0,204	0,204
184		**tonnes CO2/person**	**4,652**	**3,274**	**3,283**	**3,926**	**2,603**
186		**kgCO2/m²**	**59**	**41**	**46**	**54**	**38**
188		**iii) from diesel (tonnes/yr)**	**0**	**0**	**0**	**0**	**0**
190		Kgs CO2 from 1 kWh diesel	0,264	0,264	0,264	0,264	0,264
191		**tonnes CO2/person**	**0**	**0**	**0**	**0**	**0**
193		**kgCO2/m²**	**0**	**0**	**0**	**0**	**0**
195		**iv) from district heating (tonnes/yr)**	**0**	**0**	**0**	**0**	**0**
197		Kgs CO2 from 1 kWh			0,264	0,264	0,264
198		**tonnes CO2/person**	**0**	**0**	**0**	**0**	**0**
200		**kgCO2/m²**	**0**	**0**	**0**	**0**	**0**
202		**Total quantity of refrigerants (tonnes)**				**0,382**	**0,000**
204		**Total refrigerant losses (tonnes)**				**0,003**	**0,007**
208	**2b**	**Emissions of other gases as CO_2 equivalent (tonnes)**	**26,0**	**26,0**	**2,0**	**5,3**	**12,0**
212		**tonnes CO2equiv/person**	**0,112**	**0,114**	**0,008**	**0,020**	**0,042**
216		**kgCO2equiv/m2**	**0,001**	**0,001**	**0,000**	**0,000**	**0,001**
218		**inventory R22, (kg)**					
219		**i) losses R22, (kg)**			**0,0**	**0,00**	**0,00**
220		GWP			1810	1810	1810
221		**as tCO2equiv**	0,0	0,0	0,0	0,0	0,0
223		**inventory R410A, (kg)**					
224		**ii) losses R410A, (kg)**			1,20	**0,00**	**0,00**
225		GWP			2.090	2090	2090
226		**as tCO2equiv**			2,51	0,00	0,00
228		**inventory R134A, (kg)**					
229		**iii) losses R134A, (kg)**			0,00	**0,00**	**0,00**
230		GWP			1.430	1430	1430
231		**as tCO2equiv**			0,00	0,00	0,00
233		**inventory R404A, (kg)**					
234		**iv) losses R404A, (kg)**			0,00	**0,00**	**0,00**
235		GWP					
236		**as tCO2equiv**			0,00	0,00	0,00
238		**inventory R407C, (kg)**					
239		**v) losses R407C, (kg)**			0,00	**3,00**	**6,75**
240		GWP			1.000,00	1775	1775
241		**as tCO2equiv**			0,00	5,33	11,98
243		**inventory R507A, (kg)**					
244		**vi) losses R507A, (kg)**			0,00	**0,00**	**0,00**
245		GWP				3300	3300
246		**as tCO2equiv**			0,00	0,00	0,00
248		**inventory R422D, (kg)**					
249		**vii) losses R422D, (kg)**			0,00	**0,00**	**0,00**
250		GWP				3300	3300
251		**as tCO2equiv**			0,00	0,00	0,00
255	**2c**	**Site vehicle CO_2 emissions (tonnes)**	**16**	**16**	**2,0**	**1,5**	**1,3**
257		**tonnes CO_2/person**	**0,069**	**0,070**	**0,008**	**0,006**	**0,005**
259		**i) from diesel (tonnes)**			**1,07**	**0,00**	**0,26**
261		Kgs CO2 from one litre of diesel			*2,7*	2,67	2,67
262		**ii) from petrol**			**0,456**	**1,455**	**1,057**
264		Kgs CO2 from one litre of petrol			*2,3*	2,28	2,28
265		**from other fuel (eg propane)**			*0,0*	0,00	0,00
267		**Kgs CO2 from one X of Y**			*2,3*	2,28	2,28
270		**gCO2/km (manufacturer)**				**180,0**	**167,6**
272		Vehicle kms travelled			6.000	6.000	4.500
274		**Internal fleet efficiency (litres/100km)**			**10,00**	**10,63**	**12,45**
278		**gCO2/km (actual)**			**333,3**	**242**	**219**
280		**Number of vehicles**			**5**	**5**	**5**
282		**kms/vehicle**			**1.200**	**1.200**	**900**
286	**2d**	**Total air emissions buildings (tonnes), as mimimum NOx, SO_2, PM_{10}**	**0,8**	**0,5**	**0,7**	**0,8**	**0,6**
288		**tonnes/person**				0,0030	0,0022

290		NOx, (kg)	772	540	660	779	564
292		SO2, (kg)	NM	NM	NM	NM	NM
294		PM10, (kg)	NM	NM	NM	NM	NM
296		…..others (VOC), (kg)	33		25	21	50
298		….others CO, (kg)					
300	**Objective III) Waste management**						
303	**3a**	**Total non hazardous waste, (tonnes)**	**18,0**	**30,3**	**32,0**	**40,8**	**29,5**
307		**Total non haz.waste (tonnes/person)**	**0,078**	**0,132**	**0,120**	**0,155**	**0,105**
309		**Household waste (tonnes)**	5,1	9,1	10,6	10,2	11,9
311		**Paper and cardboard (tonnes)**	4,9	11,6	13,9	17,1	12,9
313		**Wood (tonnes)**	6,5	3,6	2,1	2,9	1,1
315		**Glass (tonnes)**	0,2	0,0	0,6	0,5	0,0
317		**Metal (scrap)**	1,3	6,0	4,8	10,1	3,7
332	**3b**	**Total hazardous waste (tonnes)**	**0,731**	**1,346**	**0,722**	**1,933**	**0,944**
336		**Total hazardous waste, (tonnes/person)**	**0,003**	**0,006**	**0,003**	**0,007**	**0,003**
338		**Batteries (tonnes)**	**0,278**	**0,253**	**0,113**	**0,055**	**0,051**
340		**Laboratory mixed waste (tonnes)**	**0,000**	**0,216**	**0,080**	**0,365**	**0,104**
344		**Waste oil (tonnes)**	**0,235**	**0,000**	**0,210**	**0,207**	**0,201**
346		**Filters (tonnes)**	**0,007**	**0,056**	**0,015**	**0,035**	**0,164**
348		**Paint (tonnes)**	**0,060**	**0,001**	**0,018**	**0,010**	**0,000**
350		**Solvent (tonnes)**	**0,064**	**0,144**	**0,072**	**0,000**	**0,050**
352		**Spray cans (tonnes)**	**0,014**	**0,000**	**0,014**	**0,003**	**0,040**
354		**Medical waste (tonnes)**	**0,012**	**0,007**	**0,011**	**0,006**	**0,000**
356		**Flourescent lamps (tonnes)**	**0,000**	**0,000**	**0,134**	**0,000**	**0,000**
358		**Fire extinguisher (tonnes)**	0,043	0	0	0	0,000
360		**Lead-acid battery (tonnes)**	0,018	0	0,032	0,477	0,125
362		**Mercury containing objects (tonnes)**	0	0,004	0	0,006	0,009
364		**Asbestos material (tonnes)**	0	0	0,023	0	0,000
366		**Developer (tonnes)**	0	0,665	0	0,769	0,200
368		**Cleanser (tonnes)**	0	0,03	0	0,017	0,000
370		**Contractor/supplier haz waste (tonnes)**					*4,944*
372	**3c**	**Percentage of waste sorted**	**72,86**	**71,15**	**67,50**	**76,14**	**60,98**
374	**Objective IV) Protecting biodiversity**						
377	**4a**	**Built surface area, (m^2)**		13.365	13.365	13.365	13.248
381		**Built surface area, (m^2/person)**		58	50	51	47
385		**Built surface area as part of site, (%)**		4	4	4,4	4,3
387	**Objective V) Green procurement**						
389	**5a**	**Contracts >60k with "eco" criteria (%)**			NR	NR	NR
392	**5b**	**Green products in office catalogue (%)**			**NR**	**NR**	**NR**
394		**Green products in catalogue, (No)**			**NR**	**NR**	**NR**
395		**Products in catalogue, (No)**			**NR**	**NR**	**NR**
396		**Total value of products purchased from catalogue (EUR)**			NR	NR	NR
398		**Value of green products purchased (EUR)**			NR	NR	NR
400	**Objective VI) Legal conformity**						
402	**6a**	**EMAS registered buildings (%)**				**100,0**	**100,0**
405	**6b**	**EMAS registered useful floorspace (%)**				**100,0**	**100,0**
407		**EMAS verification non conformities**				**1**	**1**
409	**Objective VII) Communication**						
411	**7b**	**No. of difft trainings on offer**			**5**	**3**	**3**
413	site training	**No of training beneficiaries**			**78**	**77**	**62**
415		**Staff benefiting from training (%)**			**29,3**	**29,3**	**22,0**
417	**Objective VIII) Promoting dialogue with external partners**						
418							
419							
420	**Estimating EMAS costs and virtual value of identified savings**						
421	**Direct costs**	**Total Direct EMAS Cost (EUR)**			**66.000**	**66.000**	**66.000**
422		Total Direct Cost per employee			248	251	234
423		**i) Annual direct staff costs**			**66.000**	**66.000**	**66.000**
424		Annual direct staff costs (time FTE)			0,5	0,5	0,5
425		Annual cost of one FTE	132000	132000	132.000	132.000	132.000
426		**ii) Annual contract costs**	0	0	**0**	**0**	**0**
430		**iii) Annual misc costs**	0	0	**0**	**0**	**0**
433	**Energy (Bldgs)**	**Electricity unit cost (Eur/MWh)**	73,85	73,85	73,85	73,85	73,85
434		**Gas (Eur/MWh)**	34,00	34,00	34,00	34,00	34,00
435		**Fuel (Eur/MWh)**	100,00	100,00	100,00	100,00	100,00
436		**Total buildings energy cost (Eur/person)**	**1.858**	**1.510**	**1.221**	**1.520**	**1.225**
437		Electricity (Eur/person)	1082	964	674	865	791
438		Gas (Eur/person)	775	546	547	654	434
439		Fuel (Eur/person)	0,00	0,00	0,00	0,00	0,00
440		**Total buildings energy cost (Eur)**	**430.950**	**345.762**	**324.714**	**399.680**	**345.359**
441	**Energy (vehic.)**	Diesel unit cost- (Eur/m3)	1.300	1.300	1.300	1.300	1.300
442		Petrol unit cost- (Eur/m3)	1.500	1.500	1.500	1.500	1.500

443		Total cost Diesel (Eur)	0	0	520	0	126
444		Total cost petrol (Eur)	0	0	300	957	695
445		**Total energy costs (Eur/person)**	**0**	**0**	**3,08**	**3,64**	**2,91**
446		Total fuel costs (vehicles) (Eur)	0,00	0,00	820	957	821
447	**Water**	Water unit cost (Eur/m3)	2,00	2,00	2,00	2,00	2,00
448		Water (Eur/person)	**23,01**	**56,94**	**57,33**	**38,52**	**22,28**
449		**Total water costs (Eur)**	**5.338**	**13.040**	**15.250**	**10.130**	**6.282**
450	**Paper**	Paper (office) - unit cost/kg	1,60	1,60	1,60	1,6	1,6
451		Paper (offset) - unit cost/kg	8,00	8,00	8,00	8,00	8,00
452		Paper (office) - Eur/person	67,38	33,76	48,54	33,48	26,71
453		**Paper (offset) - Eur/person**	**0,00**	**0,00**	**0,00**	**0,00**	**0,00**
454		Total paper (office) cost (Eur)	107,81	54,02	77,67	53,57	42,73
455		Total paper cost (Eur/person)	67,38	33,76	48,54	33,48	26,71
456		Total paper cost (Eur)	15.632	7.731	12.912	8.805	7.531
457	**Waste**	Waste disposal (general) - unit cost/tonne	90,00	90,00	90,00	90,00	90,00
458		**Waste disposal (general) - Eur/person**	**6,98**	**11,90**	**10,82**	**13,98**	**9,43**
459		Waste disposal (hazardous) - unit cost/tonne	750,00	750,00	750,00	750,00	750,00
460		**Waste disposal (hazardous) - Eur/person**	**2,36**	**4,41**	**2,04**	**5,51**	**2,51**
461		Total waste cost (Eur)	1.619	2.724	2.879	3.676	2.659
462	**Other site specific data**						
463		**Staff .....statutory**	**197**	**185**	**157**	**182**	**0**
464		*Δ %*		*-6,1*	*-15,1*	*15,9*	*-100,0*
465		**Staff .....non statutory**	**35**	**44**	**109**	**81**	**0**
466		*Δ %*		*25,7*	*147,7*	*-25,7*	*-100,0*
468	**Phase out of equipment (with HCFC, R22), number of units left at end of year**						
469		Phase out of equipment by the end of the year	15	10	7	4	0
470	**Notes**	**NM: Not Measured**					

ANNEX D: JRC GEEL – INSTITUTE FOR REFERENCE MATERIALS AND MEASUREMENTS (IRMM)

JRC-Geel (hereafter referred to as Geel) hosts several facilities including laboratories that conduct scientific and technical activities in multidisciplinary areas including aviation security, health diagnostics, food and feed safety, food authenticity, advanced materials, nuclear safeguards, nuclear safety and security. Geel is a recognised provider of quality assurance tools such as certified reference materials, validated analytical methods, proficiency testing and guidelines; thereby helping to improve the measurement capabilities not only of laboratories in EU Member States but also worldwide. The institute leads the market in the provision of Genetically Modified Organisms (GMO) reference materials. It is also the second largest producer of matrix certified reference materials worldwide. The IRMM was the first European reference material producer to obtain accreditation according to ISO Guide 34 and it is accredited by the Belgian Accreditation Body (BELAC) for measurement benchmarks according to ISO guidelines.

Among other activities, Geel staff also contribute significantly to the work of standardisation bodies, amongst those the European Committee for Standardisation (CEN) and the International Organization for Standardization (ISO). Many testing methods validated by Geel together with its collaborators have been approved as standards of CEN and ISO. The Institute's work in the field of metrology and standardisation is widely recognised. For instance, various technical committees of ISO use expert advice from Geel on reference materials for their specific application fields.

The EC owns the Geel Linear Nuclear Accelerator (GELINA) as well as the Van de Graaff (VDG) accelerator, both hosted at the Geel site. The energy consumption of both accelerators varies according to the work programme and activities programmed throughout the year. During periods when neither accelerator is used, the site consume less energy. However, when both are active, significant more energy is needed in order to perform the nuclear data measurements; essential for environmental monitoring activities, safety, security and healthcare.

D1 Overview of core indicators at JRC Geel since 2011

Geel has been reporting on EMAS parameters since 2013 with data mostly dating back to 2011. The variation in indicators is shown below:

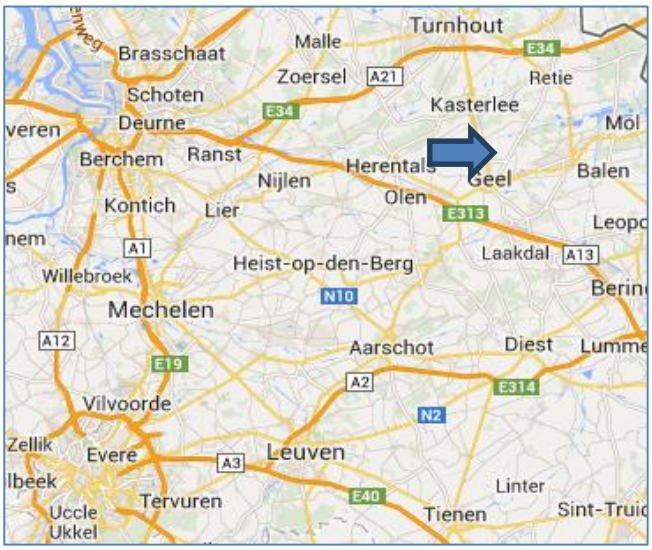
Table D1: Percentage changes in core indicators at JRC Geel since 2011

Parameter	From: 2011	To: 2014	From 2013	To: 2014	Target 2014
	Overall	% per year	Overall	% per year	%
Energy bldgs (KWh/p)	-10.8	-3.62	-4.6	-4.6	0
Energy bldgs (KWh/m^2)	-14.9	-4.96	-10.1	-10.1	0
Water use (l/p)	-54.0	-17.99	-30.9	-30.9	-1
Water use (l/m^2)	-56.1	-18.68	-34.8	-34.8	-1
Office paper (kg/person)		No data	22.5	22.5	-5
Office paper (Shts/person/day)			22.5	22.5	-5
CO_2 bldgs (kg/p)	-11.1	-3.69	-3.9	-3.9	0
CO_2 bldgs (kg/m^2)	-15.1	-5.03	-9.5	-9.5	-1
Total refrigerant losses (kg/p)		No data	-33.1	-33.1	
Total refrigerant losses (kg/m²)			-36.9	-36.9	
Non haz.waste (kg/p)	89.3	29.75	171.8	171.8	

It is evident that there have been significant reductions since 2011 in specific energy consumption, water use, CO_2 emissions and refrigerant losses. The decrease of these first three parameters in 2014 was higher than the average annual decrease over the period 2011 to 2014. Information on the refrigerant losses is only available for 2013 and 2014. On the other hand, office paper use and non-hazardous waste has increased. Further explanation on each indicator is given in the individual chapters.

D2 Description of JRC Geel activities and setting

Figure D1: Location of JRC Geel (North of the city of Geel)



The site is located in Belgium, 80 km to the north east of Brussels as shown in Figure D1.

The facility has grown over the years to suit the changing requirements of the research world and IRMM's role. In general site development was organised around the existing infrastructure. Buildings were expanded to meet immediate needs. Parts of the research units were located in existing buildings subject to available space at the time. This led to the accumulation of a "historical deficit" in infrastructure which is now a major hindrance in achieving the vision and objectives for the 2020 strategy. The facilities are spread throughout the site as shown in Figure D2.

Figure D2: IRMM site, main access street and surroundings

D2.1 Analytical laboratories

Geel has more than 100 analytical laboratories carrying out state-of-the-art chemical, biochemical, microbiological, biotechnological, and physical analytical work on fields such as food safety and quality, environment, clinical measurements, aviation and nuclear safety and security. The laboratories include a clean chemical laboratory for analysis of trace amounts. For biotechnological research, the institute has laboratories operating at biosafety level 2 (BSL 2) allowing work with hazardous materials. A biosafety level 3 (BSL 3) laboratory is currently undergoing commissioning.

Instruments cover the full range of spectrometric including isotopic mass spectrometric, chromatographic and hyphenated techniques in addition to state-of-the-art sample preparation techniques. The IRMM also has mass metrology instrumentation enabling ultra-precise weighting.

D2.2 Reference materials processing and storage facility

There is increasing worldwide demand for new reference materials for a broadening range of applications and sampling requirements. The IRMM is the second largest certified reference material (CRM) provider worldwide and is the market leader in provision of GMO reference materials. The range of materials analysed at Geel varies from pure chemicals (including nuclear materials) to agricultural, food and environmental samples. In 2006, IRMM renewed its reference materials production facilities and created a scientific and technical facility bridging the gap between laboratory and industrial scale with specialised laboratories and a versatile pilot plant for material processing. Four different reference materials can be processed simulataneously without any risk of cross-contamination. This facility is unique amongst the major producers of reference materials worldwide.

Geel has state-of-the-art storage facilities for reference materials with rooms catering for temperatures ranging from 18°C to -150°C. Storage conditions in the IRMM and at its five authorised distributors are monitored constantly. The IRMM has currently over half a million reference material samples from the 700 different types of materials produced.

D2.3 Nuclear laboratories

Measurements of neutron-induced reactions and cross-section standards, and absolute measurements of radiation i.e. radionuclide metrology, have been key activities at Geel since it started operations in 1960. It focuses on neutron data for standards, safety of operating reactors, handling of nuclear waste and waste transmutation and investigating alternative reactor systems and fuel cycles. The work includes the preparation of certified nuclear reference materials that are produced in dedicated laboratories.

GELINA, the linear electron accelerator facility, has the best time resolution of its type combining i) a high-power pulsed linear electron accelerator, ii) a post-accelerating beam compression magnet system, iii) a mercury-cooled uranium target, iv) and very long flight paths. It is a multi-user facility serving up to 12 different experiments simultaneously. IRMM hosts a vertical 7 MV Van de Graaff (VDG) accelerator. Furthermore, it operates a laboratory for ultra-sensitive radioactivity measurements inside the 225 m deep underground laboratory HADES, located close by at the premises of the Belgian Nuclear Research Centre (www.sckcen.be), although this shared facility is outside the EMAS scope.

D2.4 Aviation security laboratory

A new facility to test aviation security detection technologies was opened in 2014 and is equipped with state-of-the-art aviation screening equipment such as that typically found at EU airport security check-points. This includes X-ray screening equipment, body scanners, liquids bottle scanners and trace detectors. In 2015 an additional laboratory for research in aviation security will be commissioned.

D3 Environmental impact of JRC Geel activities

An analysis of environmental aspects has been made and based on this analysis significant environmental aspects have been identified (Table D2). The IRMM is taking measures to prevent pollution (emissions, waste production) and to achieve more efficient use of natural resources (mainly energy, water and paper).

Regular reporting and monitoring of parameters takes place according to the requirements of the EMAS regulation. Actions are identified and updated where appropriate on an annual basis in the Commission's EMAS Annual Action Plan to help address and mitigate the impacts. Actions are identified in Table D2, and progress on specific actions is given in the following chapters.

Table D2 Significant environmental aspects at JRC Geel

Aspect group	Environmental aspect	Environmental impact	Location/activity	Indicator(s)	Actions in Annual Action Plan 2014-2015
Air and energy	Energy use in accelerators, buildings, machines, equipment etc.	Air pollution, climate change, disturbing of living environment and health risks, destruction of ozone layer (HCFC emissions)	All site but in particular: GELINA; VDG; nuclear controlled areas; non-nuclear scientific laboratories; diesel generators and gas burners, storage of reference materials, site management and infrastructure	(1a) Total energy buildings (elec + gas + fuel+ hot water) (MWh/yr) (kWh/person) (kWh/m²) (1c) Total renewable energy use (MWhr/yr) (Renewables as % of total energy use) (Onsite generated renewables as % of total energy use)	(1a) Undertake a detailed energy study (1a)(1c) Moving of part of the staff to a new, more energy-efficient building. This new building will also run partially on renewable (geothermal) energy. (1a)(2a) Emergency generators which operated nearly constantly were no longer used since the beginning of 2014, therefore reduced fuel consumption and CO2 emissions expected (1a) Refurbishment of IRMM lighting system to achieve higher energy efficiency (1a) Energy monitoring at building level (electricity) (1a) Insulation building 060 17, 18, 19, 20, 95, 97
	Air emissions and gas releases			(2a) Total building emissions CO_2 (tonnes/yr)(kg/person) (kg/m²) (2b) Refrigerants CO_2equiv ($kgCO_2equiv/person$) ($kgCO_2equiv/m^2$)	(1a)(2a) Emergency generators which operated nearly constantly were no longer used since the beginning of 2014, therefore reduced fuel consumption and CO2 emissions expected (2b) Phasing out all the R22-containing air conditioning units located within the institute before 2015 (2b) Implement a monitoring system for cooling units located within the Institute
	Chemical atmospheric release Radioactive atmospheric release (accidents)			(2d) Total air emissions bldgs (kg)	
Waste	Various household-like waste (e.g. packaging, paper, PMD[44])	Exploitation of renewable materials, waste production, disturbing of living	All site, especially central store and administration resource management	(3a) Total general waste (tonnes) (kg/person) (3c) Percentage of waste sorted (%)	99 (1e)(3a) Promotion of paperless financial circuits in the financial administration and recruitment procedures (3b) Monitor the production of hazardous waste produced by the

[44] Plastic bottles and flasks, metal packaging and drinks cartons

Aspect group	Environmental aspect	Environmental impact	Location/activity	Indicator(s)	Actions in Annual Action Plan 2014-2015
		environment and health risks			different Units, especially laboratory waste (3a) Construct a new covered and fenced waste storage area (container park) (3b) Evacuate radioactive waste backlog (3a) Reduce the number of the waste bins (3b) Increase the staff awareness on the sources of origin of hazardous waste (breakdown on process level) (1e)(3a) Raise awareness of paper consumption through communication
	Hazardous non-nuclear waste (chemical, biologic, batteries etc.) Nuclear waste		Non-nuclear scientific laboratories; site management and infrastructure GELINA; VDG; nuclear controlled areas;	(3b) Total dangerous waste (tonnes)(kg/person)	
Waste water	Water emissions Chemical liquid release Soil and groundwater contamination	Water and soil pollution, disturbing of living environment and health risks	Scientific laboratories, site management mechanical services	Emissions to wastewater (Concentration (mg/m^3))	
Resources	Use of chemicals and consumables, incl. paper	Exploitation and decrease in natural resources	Scientific laboratories, site management mechanical services, administration resource management	(1e) Paper consumption (tonnes)(kg/person) (Number of sheets total) (Number of sheets per person) (No. of sheets per person/ per day)	(1d) The new building will partially use rain water (1e) Monitoring paper consumption of different units (1d) Better monitoring of water consumption to reconcile differences between measurements at individual building level and at site level (1e)(3a) Promotion of paperless financial circuits in the financial administration and recruitment procedures (1d) Remove cooling towers
	Use of water	Drying of ground		(1d) Water consumption (m^3) (l/person) (l/m^2)	(1e)(3a) Raise awareness of paper consumption through communication

D4 More efficient use of natural resources

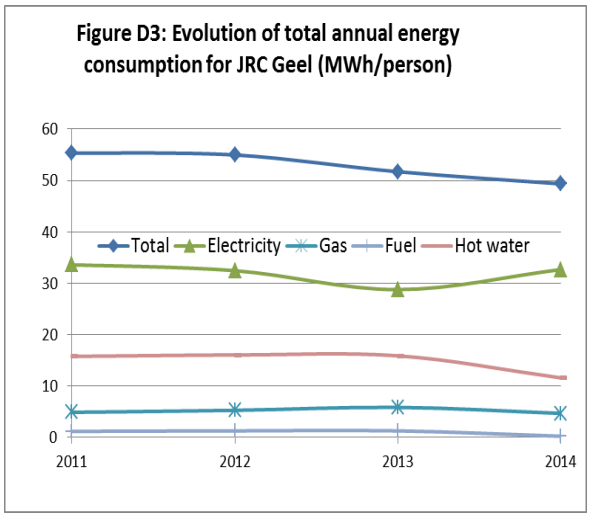
D4.1 Energy consumption

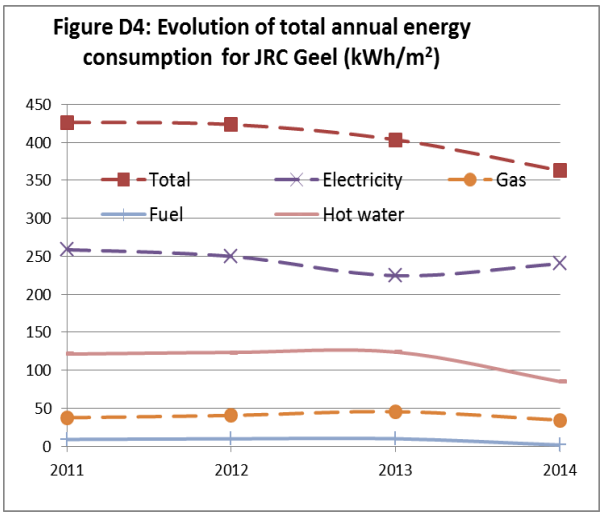
a) Buildings

Geel started renovating its facilties in 2004, and has completed multiple refurbishments and built two new structures: i) the CRM storage buildings, and ii) the reference materials production building. In 2012 Geel established a "Site Development Plan 2012-2020" to gradually refurbish and renew the infrastructure (buildings and technical installations). A new office building (210) was opened in 2014. Currently there are 15 buildings on the site. In early 2015 a new entrance building 222 was completed.

Total energy consumption is subject to annual fluctuation of the work programme according to the type of on-going projects and experiments. Both accelerators consume a substantial fraction of the total energy; thus in periods when the accelerators are not running due to maintenance periods, the site consumes less energy. The main energy sources are electricity, hot water for heating, gas (three buildings) and fuel for the emergency generators (two small generators are permanently running). Two large and one medium sized generators run in emergencies and during annual maintenance of the energy distribution network.

The heating building is owned and managed by VITO, the neighbouring Flemish Institute for Technological Research, who plan to leave the Geel site in 2019/2020 and IRMM will therefore need to find a new source of heat energy. Hot water generated in the building is distributed throughout the site to serve exchangers installed in the plant rooms of the various buildings. Since the building is not owned by JRC-IRMM it is out of scope for EMAS.





Figures D3 and D4 show that total energy consumption per person and per square metre has decreased since 2011. The decrease in 2014 is pronounced and is mainly the result of using less hot water for heating. Electricity consumption increased again in 2014 having declined in 2012 and 2013. The data for supplied electricity in 2012 and 2013 were corrected for this report owing to problems with the data on the supplier's website that was used to calculate consumption. Since February 2015 the consumption of fuel is based on real measurements.

The 2014 targets was not to exceed the 2013 consumption for all energy vectors with one exception for fuel of which the 2014 consumption should be reduced with 70% compared

with the 2013 consumption. All targets have been met with the exception of electricity consumption which has increased with 12,7%.

Initiatives for continued improvement identified in the Commission's 2015 EMAS Annual Action Plan (or from the Site Development Plan) are summarised below:

Annual action plan no	**Since**	**Description**[45]	**Status in 2014**	**Expectations in 2015, and end date (if app)**
17	2013	Perform an in-depth energy study (action 1.1.)	Finalised	
19	2013	Emergency generators which were required to run nearly constantly have been discontinued at the beginning of 2014, therefore a reduction in consumption and CO_2 emissions is expected (action 1.3.)	Started in 2013, continued in 2014	
18	2013	Moving of part of the staff to a new, more energy-efficient building (building 210). This new building will also run partially on renewable (geothermal) energy (action 1.5.)	Finalised (People moved in March 2014)	
95	2014	To implement energy monitoring on building level: Power meters are installed in different buildings. They will be connected to a BMS. This will allow constant monitoring and recording of the electricity consumption in the buildings at a central location (action 1.2)	Ongoing	Expected to be finalised in 2015
New	2014	To stop operation of the UCCL: The Ultra Clean Chemical Laboratory (UCCL) is no longer needed and will stop operation by mid-2014. The stop of the dedicated air-handling unit will lead to a reduction in electricity needs (action 1.6)	Started	To continue in 2015

Action 97 aimed at insulating building 060 will commence in 2015 with a study (action 1.2).

b) Site vehicles

Geel doesn't operate any service cars, but maintains some vehicles exclusively for use on site (fork lift, small tractor, guard's vehicle and a fire truck). The total combined consumption of petrol and diesel is below 500 litres per year. There is no **2014 target** relating to fuel consumption of site vehicles.

c) Renewable energy use in buildings and vehicles

Geel's electricity supply contract does not specify a minimum amount of renewable energy in the mix. This will change when the contract is renewed. When the heating building stops producing hot water, Geel may consider using geothermal energy supplied by VITO instead who are in the design phase of a geothermal energy plant which could be operational within a few years. A new development in 2014 was the use of renewable energy (heatpump) for the new administration building 210 (action 1.7). The **2014 target** to generate the equivalent of

[45]reference: EMAS Objectives, Performance targets and Actions 2014, Ref. Ares(2014)1110123 - 09/04/2014), as with all other actions in this chapter

1% of the total site energy consumption from geothermal energy used for heating the new administration building was nearly met. It amounted to 0.5% of the total energy consumption, less than expected, because the heat pump was fully operational for only part of 2014.

D4.2 Water consumption

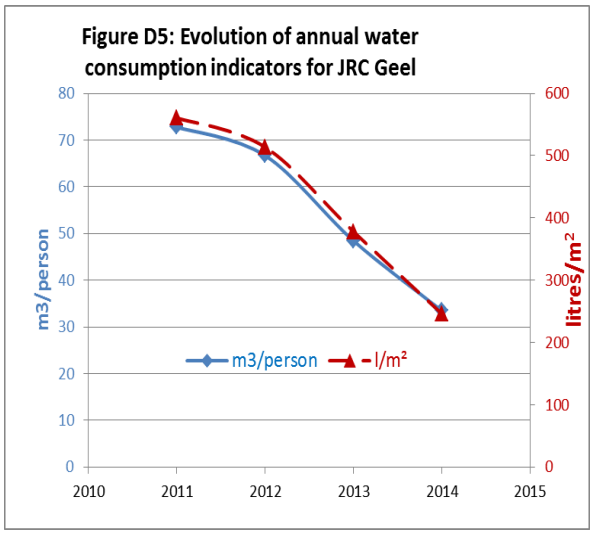


Figure D5 shows that water consumption continuously decreases. This large reduction is a result of the decommissioning of cooling towers (removed or replaced by dry ones).

New invoice data allowed correcting the 2012 and 2013 water consumption figures in this EMAS report compared to the previous one. The 2014 target is to not exceed 2013 per capita consumption and for a 1% reduction in consumption per square metre; these targets are largely met.

Actions appearing in the Commission's EMAS Action Plan 2015 include the following:

Annual action plan no	Since	Description	Status in 2014	Expectations in 2015, and end date (if app)
21	2013	Rainwater recycling in the new administrative building (action 2.1.)	Completed (rainwater system operational)	
98	2013, 2014	Further improvement of the water monitoring system on building level to better control water consumption (action 2.2.)	Ongoing in 2014	Should be finalised in 2015
120	2014	Removal of cooling installations (action 2.1)	Ongoing	

D4.3 Office paper

Paper is mainly used for everyday printing in the offices. A very small print shop only produces a few dozen posters per year, and no brochures, and therefore offset paper is not considered further. Paper consumption was monitored based on purchase orders until 2013. In 2014 a new method was introduced in which the paper consumption in each building is recorded using the number of packs of A3 and A4 paper delivered. The old method yielded an equivalent of 12,6 sheets per person per day in 2013 based on orders; in 2014 the new method gave rise to an equivalent of 15,4 sheets per person per day based on consumption.

The following initiative for continued improvement were identified in the Commission's EMAS 2015 Annual Action Plan:

Annual action plan no	Since	Description	Status in 2014	Expectations in 2015, and end date
22	2013	Monitoring paper consumption by different units (action 3.1.)	Monitoring system by counting the consumed packs per building is implemented in 2014.	Monitoring will be continued permanently (action itself can be closed)
138	2014	To raise awareness by communications on paper consumption and printing behaviour (action 3.2)		To be continued
99	2014	To promote paperless financial circuits (action 3.3.)		To be continued

In 2015 awareness raising and communication actions will continue.

D5 Reducing emissions of CO_2, other greenhouse gases and air pollutants

D5.1 CO_2 emissions from buildings

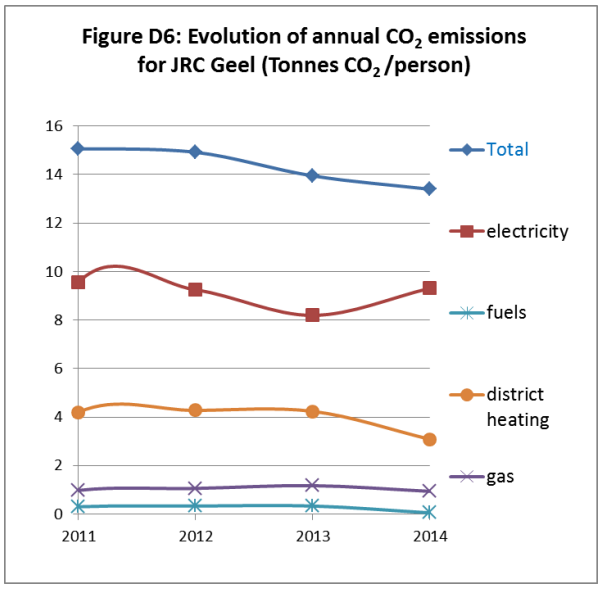
Table D3: Percentage of CO_2 emissions from different sources in 2014 (tonnes/person)

Source	Quantity	% of total
Buildings (EMAS)	13,40	96,62
Refrigerants loss	0,47	3,38
Vehicles, not included	0,00	0,00
Missions (excluding vehicles)		0,00
Total	**13,86**	**100,00**

Table D3 illustrates that buildings account for over 95% of CO_2 emissions in 2014.

a) Buildings (CO_2 from energy consumption)

Annual emissions of CO_2 expressed per person and per square metre are shown in Figures D6 and D7. CO_2 emissions are generated through combustion of the main energy sources i) electricity, ii) district heating (hot water), iii) gas (three buildings) and iv) fuel for the emergency generators (two small generators run permanently, two large and one medium sized generators run during emergencies and maintenance of the energy network).



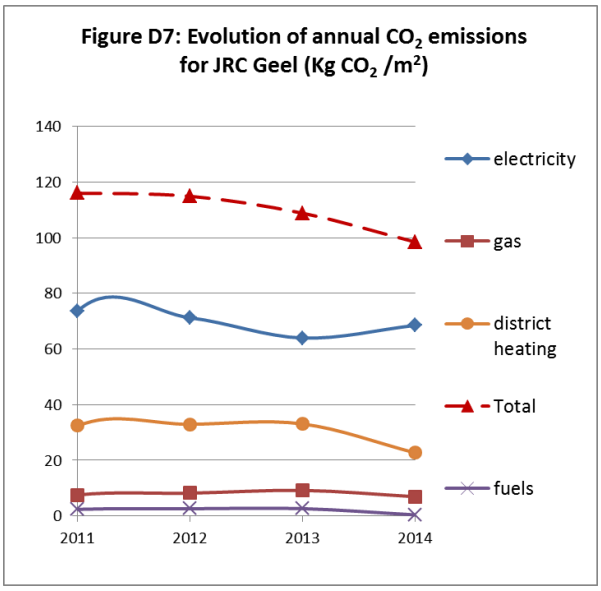


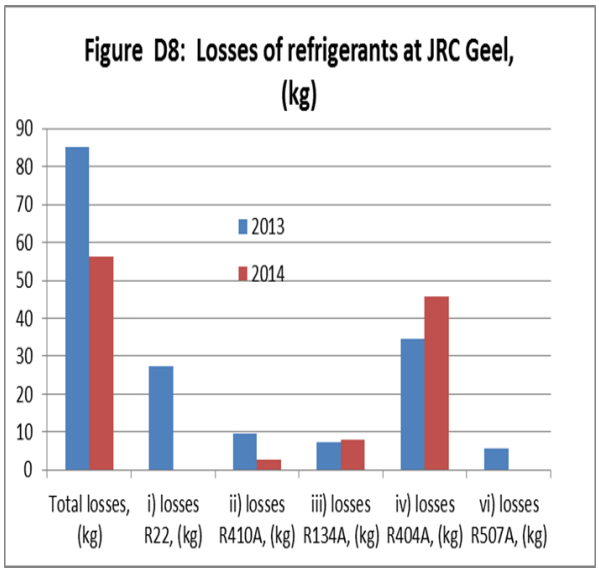
Figure D6 shows that, as for energy consumption, total per capita emissions fell in 2014, meeting the 2014 target of not exceeding the 2013 emissions. This inevitably coincided with a decrease in the CO_2 emissions per square meter, a reduction that was greater than the 2014 target of 1%. Again as with energy consumption, there was an increase in the CO_2 emissions generated through electricity.

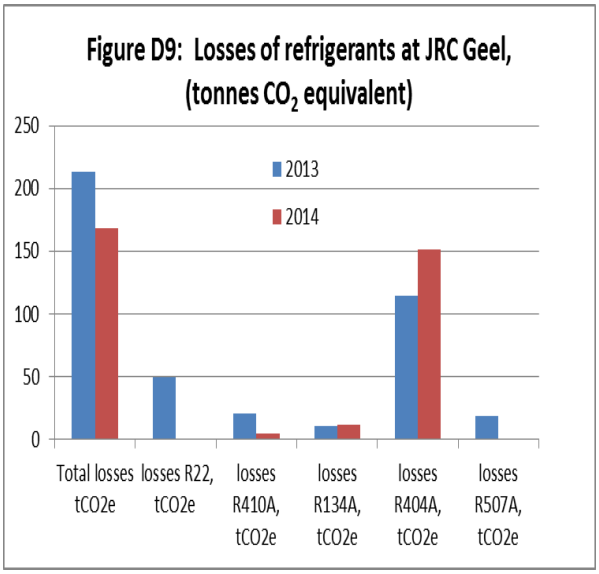
There are no management approved action plans specifically for reducing buildings CO_2 emissions however measures introduced to reduce energy consumption described in section D4.1 will inevitably also reduce emissions.

An important **2014 performance target** that was achieved was reducing total fuel (diesel) consumption by 70% by discontiuing use of the two small diesel generators (action 1.3. and 4.1.)

b) Buildings other greenhouse gases (cooling gases)

Figures D8 and D9 show Geel's recorded losses of cooling gases (in kg, and tonnes CO_2 equivalent). Almost 170 tonnes of CO_2 were lost, most of it comprising R404A.





A refrigerant inventory was established in 2013 that systematically records data on losses. Losses in 2014 by both measures were lower than in 2013, and therefore the 2014 objective was met. R404A was the greatest single source of losses. The second most important source of losses in 2013 was R22 but this was phased out and there were no losses in 2014. as indicated in the following action:

Annual action plan no	**Since**	**Description**	**Status in 2014**	**Expectations in 2015, and end date**
34	2014	Phase out all the R22 containing air conditioning units located within the institute before 2014 (action 4.2.)	Ongoing	To be continued in 2015

Phasing out R22 may lead to its replacement by other coolants with potentially higher global warming potential (GWP), but with less impact on the ozone layer. The procurement procedure for the removal of R22 is not yet concluded, although no R22 has been refilled since the beginning of 2015, according to legislation. In 2015 a monitoring system will be implemented of the cooling units located within the Institute: The monitoring of the refills of the cooling installations should lead to the identification of leaks in the circuits, and those with high leaking rates will be repaired or replaced.

D5.2 CO_2 emissions from vehicles

a) Commission vehicle fleet

There are no specific action plans relating to the site vehicle fleet.

b) Missions and travel within the site (excluding Commission vehicle fleet)

There were neither specific targets in 2013 or 2014 nor management approved action plans to reduce CO_2 emissions from missions. Geel will promote video conferences whenever possible to replace vehicle travel, and make bicycles available for movement within the site boundaries.

Due to Geel's remote location, public transport is practically non-existent and staff predominantly drive or carpool to work. Around 10% of staff living in the neighbourhood commute by bike every day, and others walk.

c) Commuting (and mobility)

There were no specific targets in 2013 or 2014 or actions identified in the Commission's EMAS 2015 Annual Action Plan to reduce CO_2 emissions from missions. IRMM conducted a staff survey on commuting by alternative ways of coming to work other than by car in 2014. As a result a pilot study will be launched in 2015 with a shuttle bus connecting IRMM with the public transport system.

D5.3 Total air emissions of other air pollutants ($S0_2$, NO_2, PM)

Geel estimated the quantity of the above air pollutants on the basis of diesel consumed by the emergency generators. In 2013, 45.040 litres of diesel were consumed, which reduced to 7 200 litres in 2014. The emissions reduced accordingly in 2014 to 521 kg nitrous oxides (NO_x), 112 kg sulphur dioxides (SO_2), and 37 kg particulate matter (PM).

The 2014 target was a 70% reduction of the SO_2, NOx and PM emissions, in line with the planned decommissioning of two small diesel generators. In the course of 2014 the diesel generators were gradually taken out of use. The actual reduction achieved was 84%.

D6 Improving waste management and sorting (including wastewater)

Geel produces many different waste streams which fluctuate according to site activities, and which are sorted as much as possible. Some special waste is not always dispatched in the year of production but collected over several years: some radioactive waste must decay for several years prior to dispatch. Therefore data reported for some waste quantity categories may not necessarily represent annual production.

D6.1 Non hazardous waste

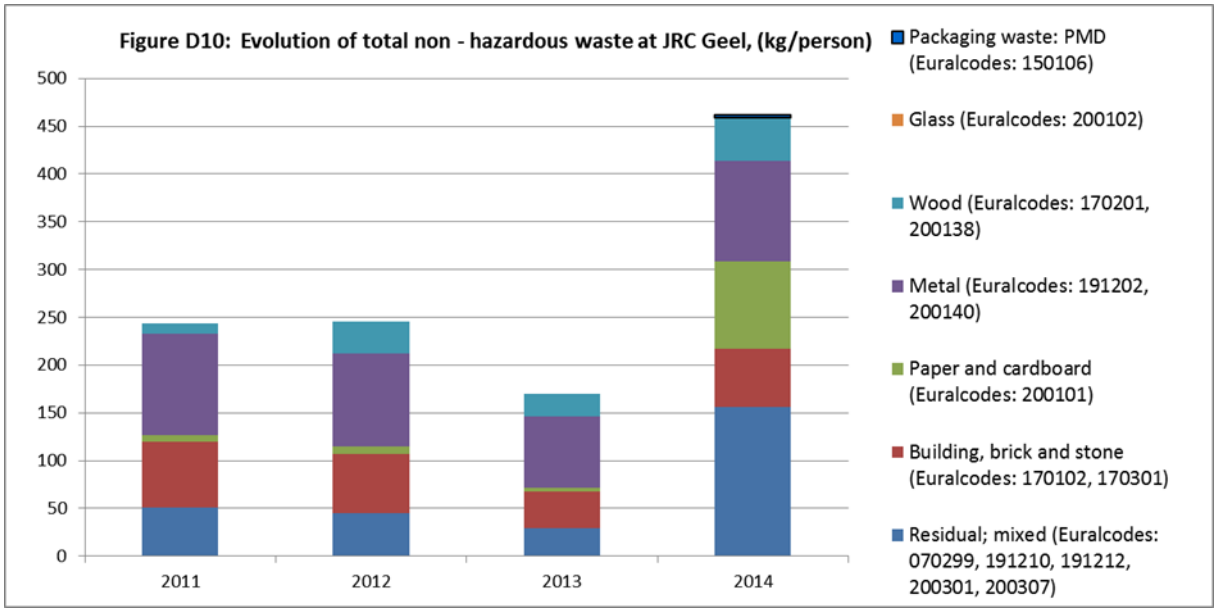


Figure D10 shows a significant increase in total non- hazardous waste production in 2014 and consequently the 2014 target for a further reduction was not met, largely because non routine cleaning should have been anticipated when setting the target.

There were many non-routine clean-up activities in 2014. Buildings were refurbished, and departments moved into the new administration building which required a cleaning out of the paper archives. This created large peaks in the conventional waste streams; with residual mixed waste increasing by a factor of five; and paper and cardboard by a factor of 20; building, brick and stone waste with 60%; metal with 40% and wood with 90%. In 2014, packaging waste was monitored for the first time; the amounts (3,2 kg PMD/person) are minimal. The status of approved actions for non-hazardous waste management are as follows:

Annual action plan no	Since	Description	Status in 2014	Expectations in 2015, and end date
44	2013	Construction of a new waste storage area (container park) covered and fenced (action 5.4.)	Ongoing	Construction completed and in operation in April 2015
137	2013	Increase awareness of waste management (reduction and separation) by means of dedicated notes updated 3-4 times a year on IRMM intranet	3-4 notes on intranet not reached	To be continued in 2015

In 2014 the action to reduce the number of individual waste bins in the new administration building (action 5.3.) was finalised.

D6.2 Hazardous Waste

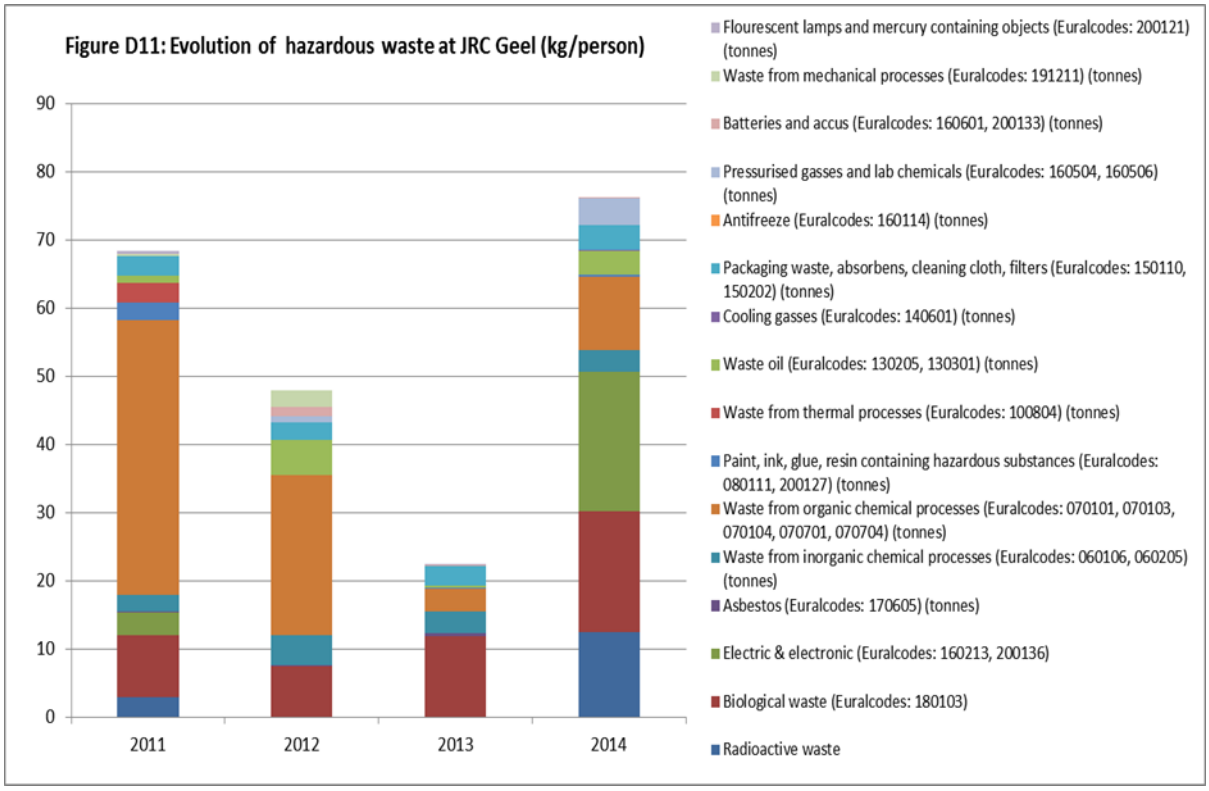


Figure D11 shows an increase in the total hazardous waste produced in 2014 after declining steadily from 2011 to 2013. As with non-hazardous waste, the 2014 target to continue a declining trend in waste generation was not met.

Many non-routine clean-up activities have taken place in the course of 2014, including the refurbishment of buildings, laboratories and service rooms (e.g. removal of a thermal disinfection system for biosafety laboratories.("kill tank Biotech") and disposal of expired chemicals. These activities caused large peaks in all hazardous waste streams. Important peaks come from i) the planned removal of 4,5 tonnes of radioactive waste (action 5.2), ii) nearly 50% more biological waste; iii) 7,3 tonnes of old electric and electronic waste devices, iv) and more than doubling of the waste from organic chemical processes (comprising organic

solvents, halogenated or not) There were also increases for pressurised gases (fire extinguishers) and laboratory chemicals and waste oil.

Specific management approved actions for controlled waste were as follows:

Annual action plan no	Since	Description	Status in 2014	Expectations in 2015, and end date
43	2013	Monitor the production of hazardous waste produced by the different Units, especially laboratory waste (action 5.1.)	System implemented	System review by end 2015
135	2014	To evacuate the backlog of radioactive waste	Finalised	

D6.3 Waste sorting

In 2014 a higher than normal amount of residual (mixed) waste was produced. This unsorted waste stream constituted a much larger proportion of total waste in 2014 than in previous years and therefore the proportion of sorted waste decreased to 71%. The 2014 target to maintain the sorted proportion at 85% was not met. There were no specific management approved actions related to waste sorting.

D6.4 Wastewater discharges

Wastewater from household activities (sanitary, cleaning, kitchen) and wastewater from laboratories is combined and discharged to sewer with the resulting mixture considered as industrial waste water.

Twice a year this wastewater is sampled on site, before discharge to sewer, to check that it is within the threshold limits for water discharges. Parameters including pH, temperature, biological and chemical oxygen demand and the concentration of some heavy metals (Ag, As, Cd, Cr, Cu, Pb, Ni, Zn) are measured against the Flemish limits. For concentrations of nitrogen, phosphorus and mercury there are specific limits in the environmental permit.

Nuclear wastewater is collected separately in tanks and transported to a nuclear waste water treatment facility. Residues of chemicals are collected as hazardous waste and are not poured into the sink.

Table D4 shows the evolution of the discharged amounts for some important parameters within the industrial waste water since 2012. The measured parameters were always under the thresholds, although there was a peak for silver observed in September 2013 (see Environmental Statement 2014).

Table D4: Evolution of the annual discharged amounts

Substance	Treshold limit (kg)	2012	2013	2014
absolute discharge (kg/year)				
Suspended solids	**10000**	1,992	2,620	2,137
Mercury (Hg)	**0.2**	0.023	0.035	0.004
Cadmium (Cd)	**0.5**	0.02	0.02	0.02
Zinc (Zn)	**50**	8.8	13.3	5.0
Copper (Cu)	**5**	0.9	1.2	0.6
Nickel (Ni)	**10**	0.2	0.2	0.2
Chromium (Cr)	**5**	0.2	0.2	0.1
Lead (Pb)	**10**	0.2	0.3	0.1
Arsenic (As)	**5**	0.2	0.2	0.1
Silver (Ag)	**10**	0.2	0.2	0.005
Kjeldahl-nitrogen	**NA**	1,473	1,322	941
Nitrite	**NA**	0.5	0.4	0.2
Nitrate	**NA**	2.7	1.8	1.2
Total nitrogen	**3500**	1,473	1,322	941
Total phosphorus	**400**	216	243	192

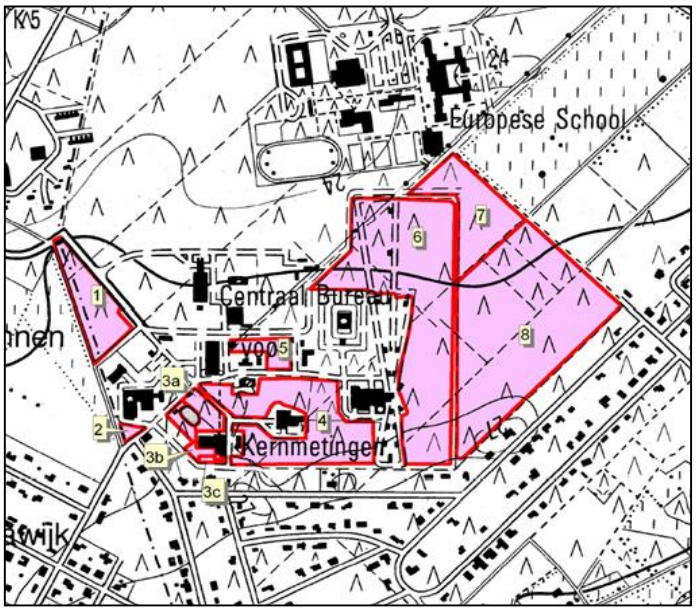
NA = Not applicable

D7 Protecting biodiversity (Indicator 4a)

The Geel site covers 380.316m², of which 86.359m^2 is built up area. In 2009 IRMM established a forest management plan starting with a clear definition of existing conditions (forest type, species, relationship with nature etc…). Corsican pine is a dominant species in the IRMM forests as is typical for forests in the Kempen area. Such forests are usually created by planting pine trees for exploitation. Subdominant species were removed, resulting in a very high density forest where the trees, typically having with small crowns, (less than 20% of the total height of the tree), are too close together. There are practically no shrubs or herbs, due to the lack of light in the canopy.

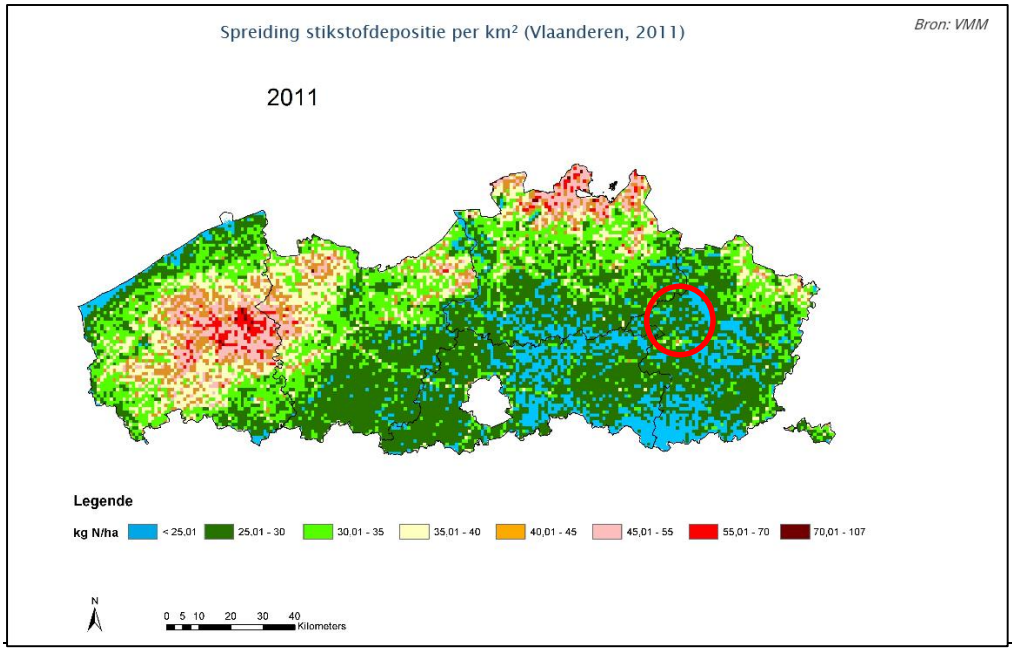
Development of the IRMM site started in the late 1950s, resulting in buildings and associated infrastructure that reduced the forest to a few isolated forest-plots, highlighted in Figure D12, which were not actively managed. However in most of these, leaf trees established themselves, although pine trees still dominate. The main risk to the forest is fire as the Campaign summers can be warm and dry. The Flemish Waste Agebcy (OVAM) has developed a certification scheme on compost in which factors such as nuturient content, production process and origin of the organic fraction are evaluated

Figure D12: Location of the forest lots (forest management plan) (scale 1:7500)



The risk of flooding is negligible as there are no big rivers nearby. Deposition of nitrogen is low in this area as shown in Figure D13 the chart below from the Flemish Environmental Agency (VMM) (in nitrogen sensitive habitats amounts of nitrogen (e.g. from agriculture) above critical deposition values can lead to contamination of the soil of the habitat which has effect on plant species). There is no risk of entrance of wild animals as the site is surrounded by double fencing. The forest can suffer from the invasive species *Prunus serotina.*

Figure D13: Nitrogen concentrations in across Flanders (2011)



In 2014 some conifer trees around the buildings were removed for fire safety as requested during a risk audit (stress test) for nuclear installations and communicated to Flemish authorities LNE (action 6.1). As part of this action, four wells were bored for supply of water for firefighting in early 2015. Action 6.1 was recorded in the Commission's EMAS action for 2015 as indicated below.

Annual action plan no	Since	Description	Status in 2014	Expectations in 2015, and end date
53	2013	Implement the "Bosbeheersplan" (forest management plan) coordinating with the local authorities (action 6.1.)	Cutting of pine trees around two buildings in a 16 m perimeter finalised	

IRMM has implemented a forest management plan since 2009. Its aim is to have a gradual shift from a monotonous pine forest dominated by *Prunus serotina* (an invasive species) towards a mixed forest based on oak, birch and pine. The expectation is that in the long term more native deciduous trees will be re-introduced.

There is a green management plan for the non-developed areas between the buildings that stipulates that the contractor responsible for their management must not use pesticides and is obliged to use compost that has been certified.

There was a complaint in 2014 from a neighbour about persistent noise. The source found of the noise was a broken installation on the roof of a building close to the fence. Repaired and noise immission measurements were executed later that year showing improvement (nice example of win-win situation).

D8 Green Public Procurement

D8.1 Incorporating GPP into procurement contracts

GPP has not been systematically incorporated into procurement procedures at IRMM, but this is under review. The **2014 target** was to incorporate GPP criteria into more than 5% of contracts exceeding € 60.000. In previous years this information was not systematically recorded. However implementation has been delayed to 2015. Progress on related actions identified in the annual action plan is summarised below.

Annual Action plan no	Since	Description	Status in 2014	Expectations in 2015, and end date
58	2013	Environmental criteria cannot always be included in all procurement procedures. The procedures will be reviewed to ensure if environmental (green) criteria are relevant and if so: is (green) procurement happening in a systematic way or is there a need to change the procedure (action 7.1.)	Ongoing	Further implementation of GPP and reach of 5% of high value contracts (>€ 60k)
59	2013	Training courses on GPP are being organised for OIAs (action 7.1.)	Ongoing	Two training organised
60	2013	Insertion of GPP criteria in tenders will start to be monitored	Ongoing	Monitoring implemented

Action on training is mentioned in D10 Internal communication (and training).

D9 Demonstrating legal compliance

D9.1 Legal compliance

Geel is operated under environmental licence No. MLAV1/1100000514 granted by the Province of Antwerp, Department of Environmental licenses. It was renewed in 2012 and is valid until 28 June 2032. Geel has a service contract with an external environmental coordinator to provide assistance on legal compliance issues. He assists IRMM to keep the environmental licence up to date every time there are structural changes to IRMM's installations. In 2013 IRMM also passed the external ISO 14001 recertification audit with the new certificate valid until 20 January 2017. It also was recertified as a radioactive waste producer by the Federal authorities (NIRAS).

Legal compliance is covered by the internal procedure PR-D-00035 "Identification of SHES legal requirements". It defines the organisation and responsibilities for the identification of legal requirements applicable at IRMM in the fields of Safety, Health, Environment and Security. The applicable legislation allows IRMM: (1) to obtain required authorisations/permits for activities, (2) to organise required inspections of equipment, (3) to submit the necessary reports to authorities and (4) to follow up non conformities. This procedure was revised in September 2014 (see also action 8.3).

Management approved actions for improved performance include the following:

Annual action plan no	**Since**	**Description**	**Status in 2014**	**Expectations in 2015, and end date**
64	2013	Compliance check. Update of the processes for checking environmental legal compliance and consolidation of these processes in a single procedure (action 8.3)	Procedure finalised in September 2014	
65	2013	Audits and certification (actions 8.1 and 8.2.)	Audits and inspections excecuted	
New	2014	Improvement of the legal register with respect to environmental legislation: To conclude a service contract with an external supplier to monitor the environmental legislation and to receive continuous information on changes and upcoming new regulations (Contract on Commission level) (action 8.4)	Can not be executed on Commission level. Continued on local level.	To be continued in 2015

Other actions for 2014 included an action for the environmental coordinator to undertake monthly inspections or audits (action 8.3.), and in relation to internal inspection and audits, to organise on a regular basis internal (legal compliance) inspections either by the environmenal

coordinator and internal ISO 14001 and EMAS audits (internal JRC.D auditors) or the internal EC EMAS auditors (action 8.1).

D9.1 EMAS registration

In 2012 and 2013 there were 362 full time permanent staff on site occupying 14 buildings with a useful floor space of 44.535 m^2. The **2014 target** is to achieve EMAS registration for the entire site (except VITO's heating building).

D9.2 Compliance with EMAS

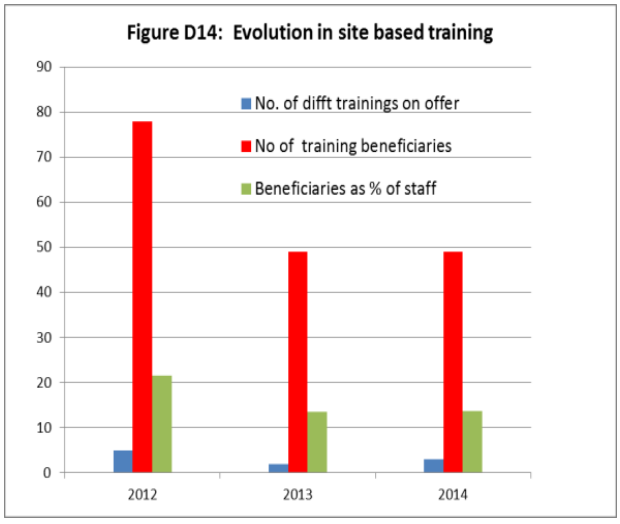
The number of non-conformities generated through EMAS related audits was reduced.

D10 Internal communication (and training)

D10.1 Internal communication

In 2014 there was an increase in internal communications: The intranet pages were updated and EMAS was included in the Director's address. Banners have been placed at various places across the site. An article relating to JRC Geel was published in the Commission's EMAS newsletter. Short before the EMAS verification audit in September 2014, the EC EMAS policy was published on the screens in the buildings (before EMAS verification audit Sept. 2014) (action 9.1). Also the EMAS section of the intranet was updated then with links to inform staff on the EMAS policy, action plan 2014 and links to related information. On 2014's World Environment Day an initiative was send to staff to promote the reuse of filling material for transport boxes which turned out to be very appreciated.

D10.2 Internal training



There was a lot of internal training in 2012 when EMAS was introduced at the site.

There were two specific training packages available in 2013, and the **2014 target** was to maintain this number (action 9.2.), which was achieved.

Environmental training is provided to newcomers and contractors, the former being included in the general newcomers training package. Three training sessions were held in 2014 (on GPP, monitoring hazardous waste and radioactive waste).

D11 Transparent dialogue with external partners

Geel's policy is to communicate openly with its neighbours (mostly nearby residents of the "Europesewijk) on activities and impacts. Since 2013 further information on EMAS has been provided by installing information posters at the site entrance.

D12 EMAS costs (and savings)

Unit costs for some core parameters such as energy consumption (specifically electricity, gas and fuel) and water consumption have also been used to identify expenditure in 2013 to compare with previous years, as shown in Table D4.

Table D4: EMAS costs and savings (EUR)

	Costs				Savings in 2013 compared to:	
	2011	**2012**	**2013**	**2014**	**2011**	**2013**
Total Direct EMAS Cost (EUR)	0	0	66.000	66.000	-66.000	0
Total Direct Cost per employee	0	0	182	184	-184	-2
Total buildings energy cost (Eur)	1.692.845	1.662.261	1.337.322	1.334.089	358.756	3.233
Total buildings energy cost (Eur/person)	4.676	4.592	3.694	3.716	960	-22
Total water costs (Eur)	27.807	25.607	19.005	13.491	14.316	5.514
Water (Eur/person)	77	71	52	38	39	15

Energy costs (including hot water) have fallen by 20%, from nearly 5.700 EUR/person in 2011 to just over 3.700 EUR/person in 2014, although the cost slightly increased in the last year. Total energy expenditure for the buildings in 2014 was nearly 400.000 EUR less than it was in 2011, and over 300.000 EUR less than in 2012. Expenditure on water consumption has also fallen, from the equivalent of 77 EUR/person in 2011 to 52 EUR/person in 2014 and remains modest in comparison to that for energy consumption.

The EMAS costs and virtual savings from waste have not been systematically recorded in 2014. The target for 2015 is to systematically report these costs.

D13 JRC Geel Data tables:

Line	Objective/ indicator	Parameter and units	2011	2012	2013	2014
2	**Basic EMAS**	**Population: staff in EMAS perimeter**	**362**	**362**	**362**	**359**
4		**Population: total staff**	**362**	**362**	**362**	**359**
6		**No. buildings seeking EMAS registration**	**14**	**14**	**14**	**15**
8		**Total no. of buildings**	**14**	**14**	**14**	**15**
10		**Useful surface area in EMAS perimeter, (m^2)**	**46.996**	**46.996**	**46.390**	**48.815**
12		Useful surface area for all buildings, (m^2)	46.996	46.996	46.390	48.815
14		**Total site area, (m^2)**	**380.316**	**380.316**	**380.316**	**380.316**
16	**Objective I) Efficient use of resources**					
19	**Ia**	**Total energy buildings, (MWh)**	**20.034**	**19.901**	**18.720**	**17.713**
23		**MWh/person**	**55,342**	**54,976**	**51,714**	**49,339**
27		**kWh/m²**	**426**	**423**	**404**	**363**
29		i) supplied electricity, (MWh)	12.158	11.745	10.411	11.730
31		**MWh/person**	**33,586**	**32,446**	**28,760**	**32,675**
33		**kWh/m²**	**259**	**250**	**224**	**240**
35		renewables in electricity mix, (%)	0	0	0	0
37		from renewables, (MWh)	0	0	0	0
39		**MWh/person**	**0,000**	**0,000**	**0,000**	**0,000**
41		**kWh/m²**	**0**	**0**	**0**	**0**
43		non renewables in electricity in mix, (%)	100	100	100	100
45		from non renewables, (MWh)	12.158	11.745	10.411	11.730
47		**MWh/person**	**33,586**	**32,446**	**28,760**	**32,675**
49		**kWh/m²**	**259**	**250**	**224**	**240**
53		ii) supplied gas, (MWh)	1.759	1.902	2.108	1.673
55		**MWh/person**	**4,860**	**5,253**	**5,822**	**4,660**
57		**kWh/m²**	**37**	**40**	**45**	**34**
59		iii) supplied diesel, (MWh)	416	455	455	73
61		**MWh/person**	**1,150**	**1,257**	**1,257**	**0,203**
63		**kWh/m²**	**8,9**	**9,7**	**9,8**	**1,5**
65		iv) district heating, (MWh)	5.700	5.799	5.747	4.153
67		**MWh/person**	**15,746**	**16,020**	**15,876**	**11,567**
69		**kWh/m²**	**121**	**123**	**124**	**85**
71		v) site generated renewables - heat pump (MWh)	0	0	0	84
73		**MWh/person**	**0,000**	**0,000**	**0,000**	**0,234**
75		**kWh/m²**	**0,0**	**0,0**	**0,0**	**1,7**
77		vi) site generated renewable - PV, (MWh)	0	0,0	0,0	0,0
79		**Installed peak capacity, (kWhp)**	**0**	**0,0**	**0**	**0**
81		**Assumed output, (% of kWh/p)**	50,0	50,0	50	50
83		**MWh/person**	0	**0,0000**	**0,0000**	**0,0000**
85		**kWh/m²**	0	**0,000**	**0,000**	**0,000**
89	**1b**	**Total energy used by service vehicles, (MWh/yr)**		**Not avail**	**Not avail**	**Not avail**
93		**MWh/person**		**Not avail**	**Not avail**	**Not avail**
97		**kWh/m²**		**Not avail**	**Not avail**	**Not avail**
99		**Diesel used, (m^3)**				
101		kWh of energy provided by one litre diesel	10,9	10,9	10,89	10,89
102		**Petrol used, (m^3)**				
104		kWh of energy provided by one litre petrol	9,4	9,4	9,42	9,42
105		**Other fuel (optional)**	**Not avail**	**Not avail**	**Not avail**	**Not avail**
107		kWh of energy provided by one……	**5,0**	**5,0**	**5,0**	**5,0**
110	**1c**	**Total renewable energy use, (MWhr/yr)**	0	**0**	**0**	**84**
114		**renewable energy as part of total, (%)**	0	**0,00**	**0,00**	**0,47**
118		**Onsite generated renewables as part of total energy, (%)**	0	**0,00**	**0,00**	**0,47**

122	**1d**	**Water usage in EMAS perimeter, (m^3)**	**26.339**	**24.139**	**17.537**	**12.023**
126		**m^3/person**	**72,760**	**66,682**	**48,445**	**33,490**
130		**l/m²**	**560**	**514**	**378**	**246**
134	**1e**	**Office paper consumption, (tonnes)**		**5,400**	**4,800**	**5,830**
138		**Office paper consumption (tonnes/person)**		**0,015**	**0,013**	**0,016**
140		Paper Density (g/m^2)	80	80	80,0	80,0
142		Sheets/kg	200	200	200	200
144		Total No. of sheets		1.082.251	962.001	1.168.382
146		Sheets/person		2.990	2.657	3.255
148		Working days in the year	211	211	211	211
151		**Office paper sheets/person/day**	**0**	**14,2**	**12,6**	**15,4**
155	**1f**	**Offset paper consumption (tonnes)**	**0,0**	**0,0**	**0,0**	**0,0**
159		**Offset paper (tonnes/person)**	0,000	0,000	0,000	0,000
161	**Objective II) Reduction in CO2 (including CO2 equivalent of greenhouse gases) and other air pollutants**					
164	**2a**	**Total office building emissions from energy, (tonnes CO_2)**	**5.453**	**5.401**	**5.049**	**4.809**
168		**tonnes CO_2/person**	**15,065**	**14,921**	**13,947**	**13,396**
172		**kgCO_2/m²**	**116,0**	**114,9**	**108,8**	**98,5**
174		**i) from electricity, (CO_2 tonnes)**	**3.465**	**3.347**	**2.967**	**3.343**
176		Kgs CO2 from 1 kWh of electricity	0,285	0,285	0,285	0,285
177		**tonnes CO2/person**	**9,572**	**9,247**	**8,196**	**9,312**
179		**kgCO2/m²**	**74**	**71**	**64**	**68**
181		**ii) from gas (tonnes/yr)**	**355**	**384**	**426**	**338**
183		Kgs CO2 from 1 kWh natural gas	0,202	0,202	0,202	0,202
184		**tonnes CO2/person**	**0,982**	**1,061**	**1,176**	**0,941**
186		**kgCO2/m²**	**8**	**8**	**9**	**7**
188		**iii) from diesel (tonnes/yr)**	**111**	**121**	**121**	**19**
190		Kgs CO2 from 1 kWh diesel	0,267	0,267	0,267	0,267
191		**tonnes CO2/person**	**0,307**	**0,336**	**0,336**	**0,054**
193		**kgCO2/m²**	**2,4**	**2,6**	**2,6**	**0**
195		**iv) from district heating (tonnes/yr)**	**1.522**	**1.548**	**1.534**	**1.109**
197		Kgs CO2 from 1 kWh	0,267	0,267	0,267	0,267
198		**tonnes CO2/person**	**4,204**	**4,277**	**4,239**	**3,088**
200		**kgCO2/m²**	**32**	**33**	**33**	**23**
202		Total quantity of refrigerants (tonnes)			0,000	1,641
204		**Total refrigerant losses (tonnes)**			**0,0850**	**0,0564**
208	**2b**	**Emissions of other gases as CO_2 equivalent (tonnes)**	**0,0**	**0,0**	**213,6**	**168,0**
212		**tonnes CO2equiv/person**	**0,000**	**0,000**	**0,590**	**0,468**
216		**kgCO2equiv/m2**	**0,000**	**0,000**	**0,005**	**0,003**
218		**inventory R22, (kg)**				**281,6**
219		i) losses R22, (kg)	0	0,0	27,50	0,00
220		GWP	1810	1810	1810	1810
221		**losses R22, tCO2e**	**0,0**	**0,0**	**49,8**	**0,0**
223		**inventory R410A, (kg)**				**184,2**
224		ii) losses R410A, (kg)			9,80	2,60
225		GWP	2.090	2.090,00	2090	2090
226		**losses R410A, tCO2e**	**0**	**0,00**	**20,48**	**5,43**
228		**inventory R134A, (kg)**				*808,5*
229		iii) losses R134A, (kg)	*0,0*	0,00	7,50	8,00
230		GWP	1.430	1.430,00	1430	1430
231		**losses R134A, tCO2e**	**0**	**0,00**	**10,73**	**11,44**
233		**inventory R404A, (kg)**				**161,2**
234		iv) losses R404A, (kg)	*0,0*	0,00	34,60	45,80
235		GWP	3.300	3.300,00	3300	3300
236		**losses R404A, tCO2e**	**0**	**0,00**	**114,18**	**151,14**

238		**inventory R407C, (kg)**				**176,4**
239		v) losses R407C, (kg)	*0,0*	0,00	0,00	0,00
240		GWP	3.300	3.300,00		1774
241		**losses R407C, tCO2e**	**0**	**0,00**	**0,00**	**0,00**
243		**inventory R507A, (kg)**				**29,2**
244		**vi) losses R507A, (kg)**		0,00	**5,60**	**0,00**
245		GWP			3300	3300
246		**losses R507A, tCO2e**		**0,00**	**18,48**	**0,00**
248		**inventory R422D, (kg)**				0,0
249		**vii) losses R422D, (kg)**		0,00	**0,00**	**0,00**
250		GWP			3300	3300
251		**losses R422D, tCO2e**		0,00	0,00	0,00
255	**2c**	**Site vehicle CO_2 emissions (tonnes)**			**Not avail**	**0,0**
257		**tonnes CO_2/person**				**0,000**
259		**i) from diesel (tonnes)**			**Not avail**	**0,00**
261		Kgs CO2 from one litre of diesel	*2,7*	*2,7*	2,67	2,67
262		**ii) from petrol**			**Not avail**	**0,00**
264		Kgs CO2 from one litre of petrol	*2,3*	*2,3*	2,28	2,28
265		**from other fuel (eg propane)**			Not avail	Not avail
272		Vehicle kms travelled			**Not avail**	**Not avail**
274		**Internal fleet efficiency (litres/100km)**				
278		**gCO2/km (actual)**			**Not avail**	**Not avail**
280		**Number of vehicles**		**4**	**4**	**4**
282		**kms/vehicle**		**0**	**Not avail**	**Not avail**
286	**2d**	**Total air emissions buildings (tonnes), as mimimum NOx, SO_2, PM_{10}**	**0**	**4,190**	**4,190**	**0,670**
288		**tonnes/person**			**0,0116**	**0,0019**
290		NOx, (kg)		3259	3.259	521
292		SO2, (kg)		702	702	112
294		PM10, (kg)		229	229	37
296		…..others (VOC), (kg)				
298		….others CO, (kg)				
300	**Objective III) Waste management**					
303	**3a**	**Total non hazardous waste, (tonnes)**	**88,3**	**88,7**	**61,5**	**165,8**
307		**Total non haz.waste (tonnes/person)**	**0,244**	**0,245**	**0,170**	**0,462**
309		Residual; mixed (Euralcodes: 070299, 191210, 191212, 200301, 200307) (tonnes)	19	16	11	56,1
311		Building, brick and stone (Euralcodes: 170102, 170301) (tonnes)	24,7	22,6	13,7	21,8
313		Paper and cardboard (Euralcodes: 200101) (tonnes)	2,7	2,6	1,6	32,7
315		Metal (Euralcodes: 191202, 200140) (tonnes)	38,2	35,3	27,0	37,7
317		Wood (Euralcodes: 170201, 200138) (tonnes)	4,2	12,0	8,5	16,3
319		Glass (Euralcodes: 200102) (tonnes)	0,0	0,0	0,0	0,04
321		Packaging waste: PMD (Euralcodes: 150106) (tonnes)	0	0	0	1,16
332	**3b**	**Total hazardous waste (tonnes)**	**24,736**	**17,344**	**8,121**	**27,437**
336		**Total hazardous waste, (tonnes/person)**	**0,0683**	**0,0479**	**0,0224**	**0,0764**
338		Radioactive waste (tonnes)	1,039	0,000	0,000	4,480
340		Biological waste (Euralcodes: 180103) (tonnes)	3,293	2,676	4,301	6,360
342		Electric & electronic (Euralcodes: 160213, 200136) (tonnes)	1,230	0,000	0,000	7,342
344		Asbestos (Euralcodes: 170605) (tonnes)	0,046	0,082	0,152	0,018
346		Waste from inorganic chemical processes (Euralcodes: 060106, 060205) (tonnes)	0,869	1,580	1,148	1,143
348		Waste from organic chemical processes (Euralcodes: 070101, 070103, 070104, 070701, 070704) (tonnes)	14,601	8,495	1,192	3,861

350		Paint, ink, glue, resin containing hazardous substances (Euralcodes: 080111, 200127) (tonnes)	0,920	0,000	0,084	0,090
352		Waste from thermal processes (Euralcodes: 100804) (tonnes)	1,026	0,000	0,000	0,000
354		Waste oil (Euralcodes: 130205, 130301) (tonnes)	0,432	1,868	0,077	1,273
356		Cooling gasses (Euralcodes: 140601) (tonnes)	0,000	0,000	0,000	0,033
358		Packaging waste, absorbens, cleaning cloth, filters (Euralcodes: 150110, 150202) (tonnes)	1,004	0,922	1,090	1,314
360		Antifreeze (Euralcodes: 160114) (tonnes)	0,000	0,000	0,000	0,000
362		Pressurised gasses and lab chemicals (Euralcodes: 160504, 160506) (tonnes)	0,000	0,335	0,000	1,414
364		Batteries and accus (Euralcodes: 160601, 200133) (tonnes)	0,028	0,520	0,013	0,064
366		Waste from production of water for industrial use (Euralcodes: 190905) (tonnes)	0,000	0,000	0,000	0,045
368		Waste from mechanical processes (Euralcodes: 191211) (tonnes)	0,070	0,866	0,000	0,000
372	**3c**	**Percentage of waste sorted**	83,6	84,8	84,6	71,0
374	**Objective IV) Protecting biodiversity**					
377	**4a**	**Built surface area, (m^2)**	0	0	83.934	86.359
381		**Built surface area, (m^2/person)**	0	0	232	241
385		**Built surface area as part of site, (%)**	0,0	0,0	22,1	22,7
387	**Objective V) Green procurement**					
389	**5a**	**Contracts >60k with "eco" criteria (%)**	NR	NR	NR	NR
392	**5b**	**Green products in office catalogue (%)**	**NR**	**NR**	**NR**	**NR**
394		Green products in catalogue, (No)	NR	NR	NR	NR
395		Products in catalogue, (No)	NR	NR	NR	NR
396		Total value of products purchased from catalogue (EUR)				
398		Value of green products purchased (EUR)				
400	**Objective VI) Legal conformity**					
402	**6a**	**EMAS registered buildings (%)**	**0**	**0,00**	**100,0**	**100,0**
405	**6b**	**EMAS registered useful floorspace (%)**	**0**	**0**	**100,0**	**100,0**
407		**EMAS verification non conformities**	**NA**	**NA**	**NA**	**NA**
409	**Objective VII) Communication**					
411	**7b**	**No. of difft trainings on offer**		**5**	**2**	**3**
413	site training	**No of training beneficiaries**		**78**	**49**	**49**
415		**Staff benefitting from training (%)**		**21,5**	**13,5**	**13,6**
417	**Objective VIII) Promoting dialogue with external partners**					
418						
419						
420	**Estimating EMAS costs and virtual value of identified savings**					
421	**Direct costs**	**Total Direct EMAS Cost (EUR)**			**66.000**	**66.000**
422		Total Direct Cost per employee			182	184
423		**i) Annual direct staff costs**			**66.000**	**66.000**
424		Annual direct staff costs (time FTE)			0,5	0,5
425		Annual cost of one FTE			132.000	132.000
426		**ii) Annual contract costs**			**0**	**0**
430		**iii) Annual misc costs**			**0**	**0**
433	**Energy (Bldgs)**	Electricity unit cost (Eur/MWh)	110,28	109,91	89,77	87,57
434		Gas (Eur/MWh)	49,84	53,34	53,73	47,25
435		Fuel (Eur/MWh)	65,49	68,43	67,79	61,83
436		**Total buildings energy cost (Eur/person)**	**4.676**	**4.592**	**3.694**	**3.716**
437		Electricity (Eur/person)	3704	3566	2582	2861
438		Gas (Eur/person)	242	280	313	220
439		Fuel (Eur/person)	20,11	22,96	22,74	3,34
440		**Total buildings energy cost (Eur)**	**1.692.845**	**1.662.261**	**1.337.322**	**1.334.089**
441	**Energy (vehic.)**	Diesel unit cost- (Eur/m3)				
442		Petrol unit cost- (Eur/m3)				
443		Total cost Diesel (Eur)	Not available	Not available	Not available	Not available
444		Total cost petrol (Eur)	Not available	Not available	Not available	Not available

445		Total energy costs (Eur/person)	Not available	Not available	Not available	Not available
446		**Total fuel costs (vehicles) (Eur)**	**Not available**	**Not available**	**Not available**	**Not available**
447	**Water**	Water unit cost (Eur/m3)	1,056	1,061	1,084	1,122
448		Water (Eur/person)	76,81	70,74	52,50	37,58
449		**Total water costs (Eur)**	**27.807**	**25.607**	**19.005**	**13.491**
450	**Paper**	Paper (office) - unit cost/kg			Not available	0,99
451		Paper (offset) - unit cost/kg			Not available	Not available
452		Paper (office) - Eur/person				16,04
453		Paper (offset) - Eur/person				Not available
454		Total paper (office) cost (Eur)				5757
455		Total paper cost (Eur/person)			Not available	16,04
456		**Total paper cost (Eur)**			**Not available**	**5.757**
457	**Waste**	Waste disposal (general) - unit cost/tonne			Not available	Not available
458		**Waste disposal (general) - Eur/person**			**Not available**	**Not available**
459		Waste disposal (hazardous) - unit cost/tonne			Not available	Not available
460		**Waste disposal (hazardous) - Eur/person**			**Not available**	**Not available**
461		**Total waste cost (Eur)**	**0**	**0**	**Not available**	**Not available**
462	**Other site specific data**					
463	energy for bldgs	**iv) of which supplied hot water (MWh/yr)**	**5.700**	**5.799**	**5.747**	**4.153**
464	(hot water)	*Δ %*	*-14,9*	*25,7*	*-0,9*	*-27,7*
465		**kWh/person**	**15.746**	**16.020**	**15.876**	**11.567**
466		*Δ %*		*1,7*	*-0,9*	*-27,1*
467		**kWh/m²**	**121**	**123**	**124**	**85**
468		*Δ %*		*1,7*	*0,4*	*-31,3*
470		**of which from hot water (tonnes/yr)**	**1.522**	**1.548**	**1.534**	**1.109**
471		*Δ %*		*1,7*	*-0,9*	*-27,7*
472		Kgs CO_2 from 1 kWh hot water	0,267	0,267	0,267	0,267
473		**kg/person**	**4.204**	**4.277**	**4.239**	**3.088**
474		*Δ %*		*1,7*	*-0,9*	*-27,1*
475		**kg/m²**	**0**	**0**	**33**	**23**
478		Total energy unit cost				
479		**Hot water unit cost (Eur/kWh)**	**0,045**	**0,045**	**0,049**	**0,055**
480	Hot water	Hot water cost (EUR)	257.110	261.586	281.227	226.573
481	costs	*Δ %*		*1,7*	*7,5*	*-19,4*
482		Hot water costs (EUR/person)	**710**	**723**	**777**	**631**
483		*Δ %*		*1,7*	*7,5*	*-18,8*
494		**Emissions to wastewater**				
495		**Substance**				
496						
497			**2011**	**2012**	**2013**	**2014**
498		**Suspended solids**		**82.500**	**149.400**	**177.750**
499		*Δ %*			*81,1*	*19,0*
500		**Mercury (Hg)**		**0,95**	**2,02**	**0,37**
501		*Δ %*			*112,6*	*-81,7*
502		**Cadmium (Cd)**		**1,00**	**1,04**	**1,25**
503		*Δ %*			*4,0*	*20,2*
504		**Zinc (Zn)**		**365**	**756,8**	**417,5**
505		*Δ %*			*107,3*	*-44,8*
506		**Copper (Cu)**		**35,5**	**66,0**	**53,8**
507		*Δ %*			*85,9*	*-18,6*
508		**Nickel (Ni)**		**10,0**	**11,8**	**14,0**
509		*Δ %*			*18,0*	*18,6*
510		**Chromium (Cr)**		**10,0**	**11,6**	**10,0**
511		*Δ %*			*16,0*	*-13,8*
512		Lead (Pb)		**10,0**	**18,4**	**10,0**
513		***Δ %***			*84,0*	*-45,7*
514		**Arsenic (As)**		**10,0**	**9,0**	**5,0**
515		*Δ %*			*-10,0*	*-44,4*

516		**Silver**		**10,0**	**11,4**	**0,4**
517		*Δ %*			*14,0*	*-96,5*
518		**Kjeldahl-nitrogen**		**61.000**	**75.400**	**78.250**
519		*Δ %*			*23,6*	*3,8*
520		**Nitrite**		**20,00**	**20,0**	**20,0**
521		*Δ %*			*0,0*	*0,0*
522		**Nitrate**		**110**	**100**	**100**
523		*Δ %*			*-9,1*	*0,0*
524		**Total nitrogen**		**61.000**	**75.400**	**78.250**
525		*Δ %*			*23,6*	*3,8*
526		**Total phosphorus**		**8.950**	**13.860**	**16.000**
527		*Δ %*			*54,9*	*15,4*
529		**Relighting campaign data**				
530		**Installed power (kW)**	**223,5**	**217,6**	**211,8**	
531		*Δ %*	*-5,0*	*-2,6*	*-2,7*	*-100,0*
532		**Average luminence in offices / labs (lux)**	**564,7**	**564,7**	**570,6**	
533		*Δ %*	*1,1*	*0,0*	*1,0*	*-100,0*

ANNEX E: JRC SEVILLA – INSTITUTE FOR PROSPECTIVE TECHNOLOGICAL STUDIES (IPTS)

The JRC Sevilla Site (hereafter referred to as Sevilla) comprises the Institute for Prospective Technological Studies (IPTS) and a Resource Management Unit of the JRC Directorate for Resources. IPTS is one of the European Commission's Joint Research Centre's (JRC) seven scientific institutes and was established in Sevilla, Spain in 1994.

The Sevilla premises are located in the "EXPO" building managed by EPGASA, a company held by the regional government of Andalucía, providing office space to multiple tenants. Consequently, a significant number of issues with environmental impact are not under Sevilla's direct control. Notwithstanding, Sevilla has been reporting on EMAS data for the period 2010-2013 and successfully passed its first EMAS verification audit in 2014.

E1 Overview of core indicators at JRC Sevilla since 2010

Sevilla's location, in a multi-tenant building, complicates the collection of accurate data on core indicators. Tenants do not, for example, have their own energy or water meters and therefore data on core indicators included in this report are estimates based on occupied surface (the site occupied 55,8% of the EXPO building in 2014, an increase of 520m^2 over 2013). As a result of its limited control over environmental performance, Sevilla decided to set a smaller number of environmental objectives than other sites, and to calculate theoretical consumptions based on occupation rate.

Sevilla has been collecting data on core indicators since 2010. Their variation since then is shown in Table E1.

Table E1: Percentage changes in core indicators at JRC Sevilla

Parameter	From: 2010 Overall	To: 2014 % per year	From: 2011 Overall	To: 2014 % per year	From: 2012 Overall	To: 2014 % per year	From: 2013	Target 2014
Energy bldgs (MWh/p)	-18,3	-4,6	0,0	0,0	-12,9	-6,5	-4,3	Q
Energy bldgs (kWh/m^2)	-11,4	-2,9	-4,3	-1,4	-13,3	-6,6	-9,2	Q
Water use (m3/p)	-49,2	-12,3	-37,2	-12,4	-21,5	-10,8	-20,5	0,00
Water use (l/m^2)	-45,0	-11,2	-39,9	-13,3	-21,9	-10,9	-24,6	0,00
Office paper (tonnes/pers	-64,6	-16,2	-52,7	-17,6	-32,0	-16,0	21,1	-5,00
Office paper (Shts/person/	-62,2	-15,6	-49,6	-16,5	-27,5	-13,8	29,1	-5,00
CO_2 bldgs (tonnes/p)	-32,1	-8,0	-17,2	-5,7	-25,3	-12,6	-17,8	0,00
CO_2 bldgs (kg/m^2)	-26,4	-6,6	-20,7	-6,9	-25,6	-12,8	-22,0	0,00
Non haz.waste (tonnes/p)	NA	NA	NA	NA				-5,00

The evolution of total energy consumption shows a positive evolution since 2010, with a yearly reduction rate of 4,6% per capita and 2,9% relative to surface area. The water consumption indicators also demonstrate a consistent downwards trend, with an average annual reduction of 12,3% and 11,2% relative to staff and surface area respectively, and over 20% since 2013.

Paper consumption does not follow a particular pattern, which probably responds to variability of demand due to various project needs. Office paper consumption remained in 2014 well below the average of 12 Kg/person for the period 2012-2014. Production of offset paper clearly declined in 2013 and 2014 with respect to previous years.

CO_2 emissions continue to diminish at an average rate of 8,0 % and 6,6 % per year relative to staff and surface area respectively. Given the increase of office space in 2014, the reduction

relative to surface area is particularly noticeable (21,9%) with respect to 2013.

Since 2010 Sevilla has been actively investing in technology to support high performance computing (for economic modelling), which allows centralised management and monitoring of energy consumption from its data centre.

E2 Description of JRC Sevilla activities and setting

Sevilla promotes and enables a better understanding of the links between technology, economy and society. Its mission is to provide customer-driven support to the EU policy-making process by developing science-based responses to policy challenges that have both a socio-economic and a scientific/ technological dimension.

In this context, Sevilla's activities are of a classic administrative nature. It has one service car and it shares specific services of the EXPO building with other tenants, including a canteen and a restaurant.

The EXPO building is located in the Isla de la Cartuja business district within the western part of the urban area of Seville, between the Rio Guadalquivir and the Canal Alphonso XIII as shown in the figure below.

Figure E1: Location of JRC Sevilla

0Source: Google Maps

As the name suggests, the building was built specficially for the World Exhibition that was held in Sevilla in 1992. It contains a large quantity of recycled material (particularly iron), and is accorded "protected" status by the authorities. It is a square shaped three storey building (ground, first and second floors) with an indoor tree-covered courtyard at its centre.

It also has two basements mainly for car parking. It is one of the landmarks in central Sevilla that the authorities keep partially illuminated at night.

E3 Environmental impact of JRC Sevilla activities

An update of the environmental aspects was undertaken in 2014, the results of which are summarised in the table below which is reviewed and updated every year.

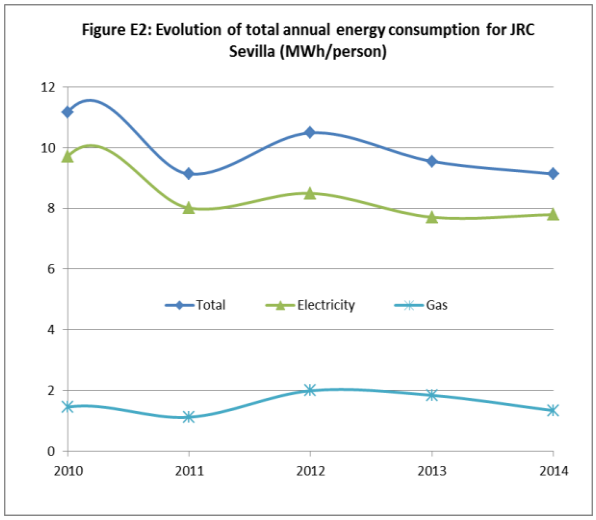
Table E2 – Summary of significant environmental aspects for the Seville site

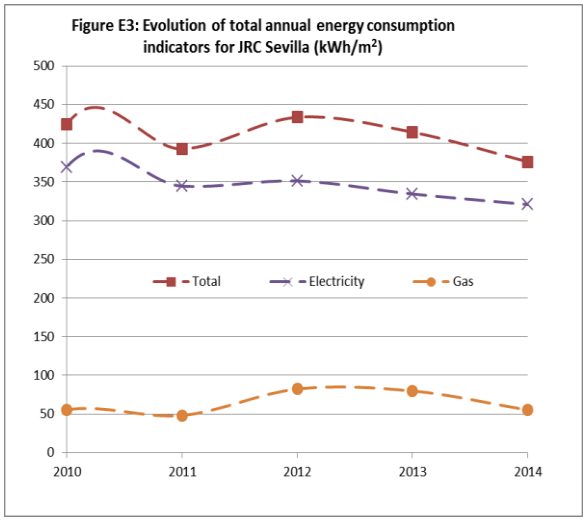
Aspect group	Environmental aspect	Environmental impact	Activity, product or service	Indicator	Action Plan actions
Air	CO2, SOx, NOx, CO, VOC emissions	Global warming, depletion of ozone layer, depletion of resources, air pollution	Official car use,	2c,	39
Waste	Paper Waste Generation	Water pollution, damage to the ecosystem, contamination of land, depletion of resources	Use of paper for office activities, printing, training and communication requirements	3a	31, 49, 86, 88, 90
	Inks and toner, waste production		Use of inks and toners for office activities	3b	31, 49, 87, 90
	Batteries Waste Generation		Use of batteries		

E4 More efficient use of natural resources

E4.1 Energy consumption

a) Buildings





Figures E2 and E3 indicate broadly similar patterns in energy consumption whether measured per person or per square meter. Total energy consumption for the Sevilla site per square meter (based Sevilla's share of the EXPO building) has remained relatively stable in recent years fluctuating within 14% of 408 KWh/m^2. Global energy consumption (MWh/year) for 2014 decreased by 9,2%, despite the enlargement of the premises by 8,0% and a 2,5% increase in staff numbers. The presence of multiple tenants and diverse activities in the building explains the lack of correlation between staff, surface and consumption figures.

The figures show a slight long term decline in total energy consumption. In the absence of significant interventions in the infrastructure, the landlord suggests that external causes such as climate (as discussed in Section 2.4) could explain energy consumption, as minimum average temperatures in Seville returned to 2011 values after two years of colder weather, while maximum temperatures averaged 0,8 degrees less than in 2011 and slightly surpassed the 25,3 degrees of 2013[46]. The benign climatic conditions may contribute to lower gas consumption in winter and reduced electricity demand in summer, and add to the potential impact of the investments in more efficient high performance computing infrastructure made in 2014. Sevilla's total energy consumption (pro rata of EXPO building's consumption) reduced by 4,3% as measured in KWh/person and decreased by 9,2% measured in KWh/m^2 in 2014.

The **2015 target** for energy consumption is to continue to inform the landlord of opportunities to improve the EXPO building's energy efficiency and to continue to regularly monitor its overall consumption. Initiatives for continued improvement in the Commission's 2015 EMAS Annual action plan are summarised below:

Annual action plan no	**Since**	**Description (and reference)[47]**	**Progress in 2014**	**Expectations in 2015, and end date (if app)**
28	2013	Encourage staff to use the stairs (posters hanged, newcomers information sessions, on the spot action)	Completed	To continue informing staff of this measure using new means of communication (e.g. JRC's Connected)
29	2013	Local replication of DG HR EMAS and environmental issues awareness campaigns	Completed	To replicate campaigns timely and widely.
31	2013	Provide information/visualisation to staff about consumption trend	Completed. Several charts have been created illustrating the consumption trend throughout the year	Design and launch a comprehensive communication campaign with visual elements (trends, graphs) taking advantage of a new cross-JRC communication platform

[46] Source: http://www.tutiempo.net/clima/Sevilla_San_Pablo/83910.htm

[47] Source: Management Review 2013

Annual action plan no	Since	Description (and reference)[47]	Progress in 2014	Expectations in 2015, and end date (if app)
82	2014	Regularly inform and encourage the landlord to carry out concrete actions related to energy efficiency saving measures aimed at optimizing the environmental performance.	Ongoing	Consolidate the established Communication framework with the landlord ensuring a timely response on relevant environmental issues

The actions seek to influence the way staff use the infrastructure under the overall objective of minimising the environmental impact of their daily work activities. Other initiatives undertaken in 2014 include making all staff aware of the successful EMAS verification and running environmental awareness sessions including for newcomers.

b) Site vehicle

Sevilla has a diesel vehicle whose usage is about one third of vehicles at other Commission sites. Distances travelled are usually short as the vehicle is used mostly for airport transfers. The calculated CO_2 emissions in 2014 were of 220 gCO_2/Km, which compares very well to Commission averages since 2011, usually over 200 gCO_2/Km. The **2014 target** was to reduce diesel consumption by 5%, and this nearly achieved, the reduction recorded at 4%.

c) Renewable energy use in buildings and vehicles

The grid electricity supplied to the EXPO building is from a mix of sources, of which 27% is from renewable sources, which represents approximatately 22% of total energy consumption. This value has changed since 2013 and therefore the share of renewables in the total electricity consumption has increased. The **2015 target** is to continue to bring to the landlord's attention opportunities to increase the proportion of renewable energy consumed in the EXPO building.

E4.2 Water consumption (indicator 1d)

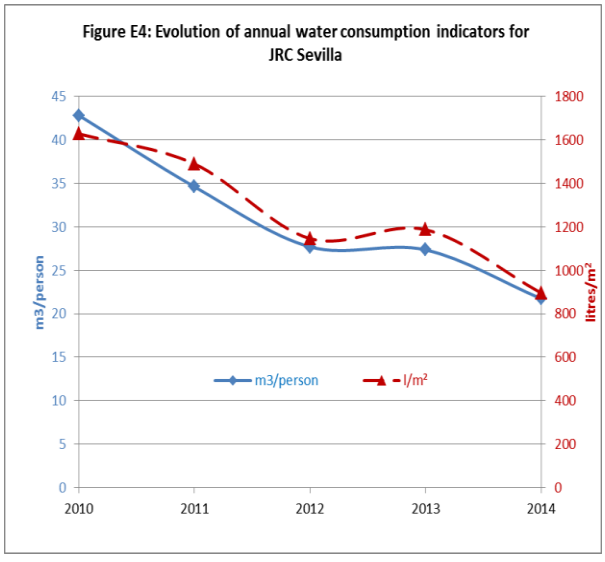


Figure E4 shows that water consumption follows a downward trend from 2010, achieving per capita accumulated reductions close to 50% since then. In 2014, in spite of the enlargement of the premises, there was a decrease in consumption of more than 20%.

Sevilla continued to carry out awareness campaigns in 2014 and the clearly descending trend is a sign that staffappreciate the importance of reducing water consumption. However gauging the campaign's real effectiveness is difficult because the site's consumption is based on its theoretical share of the EXPO building

consumption.

Annual action plan no	Since	Description (and reference)[48]	Progress in 2014	Expectations in 2015, and end date (if app)
93	2014	Include more environmentally friendly components in water dispensers	Ongoing	Incorporation of more environmental friendly high performance filters in the water dispensers. This action was completed in Q2-2015

The **2015 target** is to continue to inform the landlord about the importance of water saving while not exceeding 2014 consumption as well as to inform staff of progress achieved.

E4.3 Office paper (indicators 1e)

Paper consumption is controlled directly by the Sevilla site. The objective set for 2014 was to reduce office paper consumption by 5% and to analyse the publication process to properly identify those variables that will allow a better monitoring.

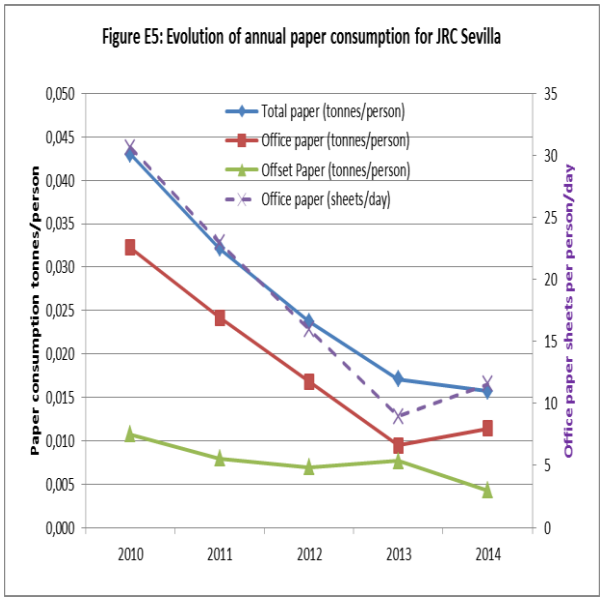


Figure E5 shows that total paper consumption has increased by 14% in 2014, therefore the objective could not be achieved. Such increase is due to the use of office paper (21% increase referred to 2013), which may be attributed to specific core business activities that still use paper - for example for the revision of draft reports.

Fortunately, the decision taken in 2013 to use lower density paper (75, instead of 80 gr/m^2) helped smoothing the impact of what otherwise would have represented a 29% increase with respect to 2013. Yet, in general terms, the 63% reduction in total paper consumption since 2010 shows clear progress in this area.

Taking into account the precedent, the objective for future exercises is to analyse in depth office paper consumption data and to identify potential seasonal variations and heaviest consumption points, to better address awareness campaigns through the various communication channels available.

Regarding offset paper consumption, Figure E5 shows a consumption increase of 2% compared to 2013. Considering that the number of reports printed during the period 2010-2014 grew 300% on the basis of business needs, the actual number of copies per report has

[48] Source: Management Review 2013 and Publications Office

been drastically reduced, which indicates the effectiveness of the policies in place for control of printed paper.

The following initiaves for continued improvement were identified in a management approved action plan:

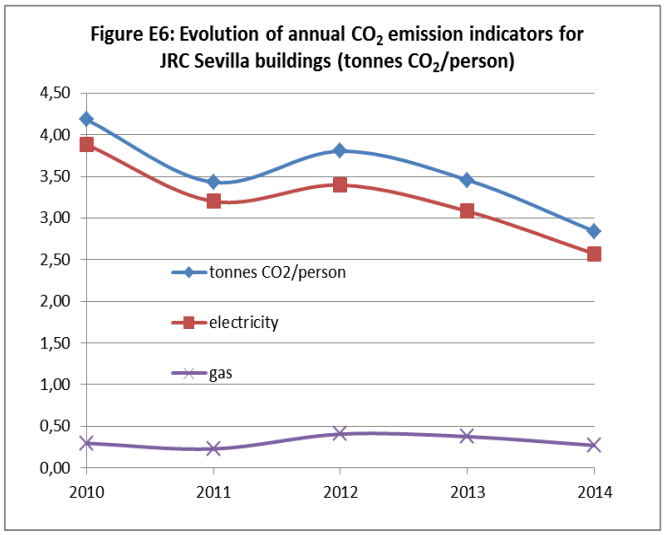
Annual action plan no	Since	Description (and reference)[49]	Progress in 2014	Expectations in 2015, and end date (if app)
31	2013	Provide information/visualisation to staff about consumption trend	Completed. Several charts have been created illustrating the consumption trend throughout the year.	Not applicable
49	2014	Raise satff's awareness to precisely calculate the number of printed publications needed.	Completed	Not applicable
87	2013	Distribution among the staff of "green cardboard recycling boxes	On going	Green card recycling boxes will be supplied to all the staff

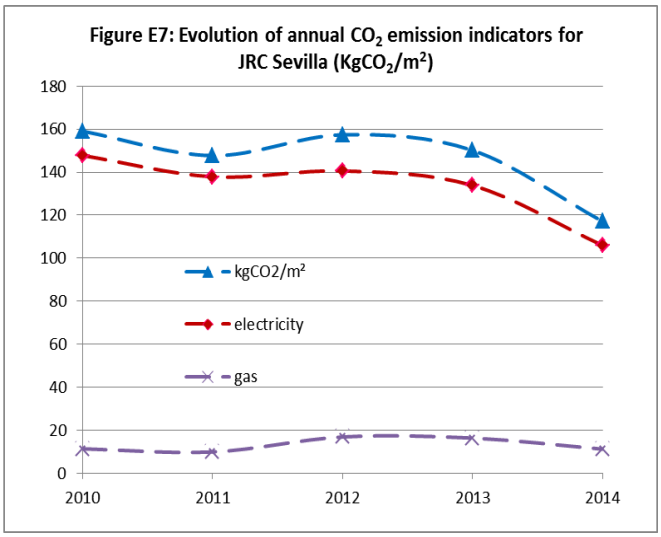
E5 Reducing emissions of CO_2, other greenhouse gases and air pollutants

The main sources of CO_2 emissions considered under EMAS are from buildings (including release of refrigerants), vehicle fleet, missions and commuting. Sevilla has evaluated CO_2 emissions for buildings in 2014 at 2.84 Tm/person.

E5.1 CO_2 emissions from buildings

a) Buildings (energy consumption)





[49] Source: Management Review 2013

Figures E6 and E7 illustrate that CO_2 emissions tend to converge to values close to 2,84 Tm/person and 117 Kg/m^2.Emissions from electricity consumption are far greater than for gas.

Given the lack of direct control on building CO_2 emissions, the **2015 target** is to continue to inform the landlord of the opportunities to improve the environmental efficiency of the building.

Several actions identified in the Commission's 2015 EMAS Annual Action Plan are aimed at influencing the landlord's behaviour and ultimately therefore in reducing CO_2 emissions, as shown below. In addition it is expected that the measures introduced to reduce energy consumption described in section E.4.1 will also contribute to reducing emissions.

Annual action plan no	**Since**	**Description (and reference)[50]**	**Progress in 2014**	**Expectations in 2015, and end date (if app)**
46	2014	Promote effective and structured communication channels with the landlord to discuss environmental issues	Completed	Consolidate the established Communication framework with the landlord ensuring a timely response on relevant environmental issues
81	2014	Develop an environmental commitment letter with the landlord	Ongoing	The landlord to endorse letter elaborated in 2014
82	2014	Regularly inform and encourage the landlord to carry out concrete actions related to energy efficiency to optimise environmental performance.	Ongoing	Consolidate the established Communication framework with the landlord ensuring a timely response on relevant environmental issues

b) Buildings other greenhouse gases (refrigerants)

The EXPO building's landlord manages maintenance of its cooling system and is therefore responsible for the refrigerants life cycle. The **2015 objective** is to monitor the maintenance interventions required by legislation that are undertaken by the landlord.

E5.2 CO_2 emissions from vehicles (indicator 2c)

a) Commission vehicle

Sevilla directly manages one service car. In 2014 it consumed 366 litres of diesel (4% less than 2013) producing 203 gCO_2/km against a manufacturer's technical specification of 136 gCO2/km. The car was used much less in 2014 than in 2012 when it travelled approximately 10.000km, covering 4.440 kms which was also more than a 31 % reduction on 2013. There are no specific management approved **Action plans** for continued improvement in this

[50] Source: Management Review 2013

domain although Action 39 of the Commission's EMAS Annual Action plan which promotes videoconferencing could contribute.

b) Missions (excluding Commission vehicle fleet)

The number of missions of Sevilla based staff was of 1.200 in 2014. Sevilla staff are encouraged to use the available videoconferencing infrastructure, which is subject to continuous improvement. In 2014, a total of 914 videoconferences were organised, representing a net 14% increase compared to 2013.

The available data does not make it possible to determine the share of missions that were replaced by videoconferences. However, it is evident that the Seville staff's high participation rate in numerous Commission internal meetings by videoconference is potentially reducing the number of missions and therefore that the infrastructure is a key factor in reducing environmental impact.

Annual action plan no	Since	Description (and reference)[51]	Progress in 2014	Expectations in 2015, and end date (if app)
39	2014	Promote the use of the existing videoconference systems as an alternative to missions, with a view to reducing the number of missions.	Completed	10% increase compared to 2014 of videoconferences in relation to missions

E6 Improving waste management and sorting

E6.1 General waste

In 2014, Sevilla disposed of 6,4 tonnes of household waste, paper and cardboard, wood, glass and metal. The site has created a comprehensive waste management procedure, which includes quantification of waste by type.

The **2015 target** is to improve the management of urban waste by monitoring the implementation of the waste management instruction published in 2014 with the support of a specialized external contractor.

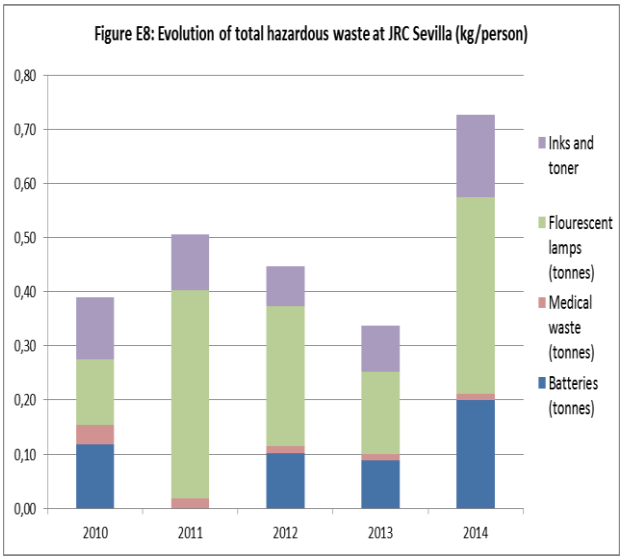
Annual action plan no	Since	Description (and reference)[52]	Progress in 2014	Expectations in 2015, and end date (if app)
86	2014	Distribution all over the premises of recycling waste bins for ensuring correct segregation of organic waste, paper, packages, glass	Completed	Not applicable

[51] Source: Management Review 2013

[52] Source: Management Review 2013

Annual action plan no	Since	Description (and reference)[52]	Progress in 2014	Expectations in 2015, and end date (if app)
90	2014	Ensure an efficient and quantifiable management of urban waste	Ongoing	To ensure an effective implementation of EMAS

E6.2 Controlled Waste



According to Figure E8 total hazardous waste has averaged 12 kg per person per year.

Fluorescent lamps are the largest component of waste generated. This number has grown substantially since 2013 due to Sevilla putting pressure on the landlord to replace defective or burned out lamps. The remainder of waste generated by Sevilla comprises batteries, inks and toners and medical waste. The awareness campaigns carried out in 2014 are probably responsible for the 126% increase in the number of batteries collected at the site.

The **2015 target** is to further develop the waste management procedure aimed first at reducing waste generation but also improving management of generated waste.

E6.3 Waste sorting

As planned in 2013, waste sorting was addressed by ensuring waste management within the corresponding service contracts, such as cleaning.

E7 Protecting biodiversity

The constructed area of the EXPO site occupied by Sevilla (its footprint at ground level) is 7.073m^2, (including the internal courtyard (2.598m^2)) which is equivalent to 24m^2 per staff member. The total area of the site occupied by the building is 11.669m^2, meaning that the "natural" proportion of the site is approximately 60,6% of the total. There are no specific management approved actions in relation to this indicator.

E8 Green Public Procurement

E8.1 Incorporating GPP into procurement contracts

Sevilla aims to incorporate green public procurement into its contracts, particularly those in excess of 60.000 EUR. A green procurement contact point was appointed following a management approved action.

The most significant contract incorporating green clauses in 2014 was the new cleaning service contract. This contract limits the use of cleaning products to those marked with ecolabel and establishes clear constraints for management of waste, including sorting and weighing.

Annual action plan no	Since	Description (and reference)[53]	Progress in 2014	Expectations in 2015, and end date (if app)
85	2014	Designation of a green procurement contact point	Completed	

Action on training is described in section E10 *Internal communication and Training*.

The target for 2015 is to include GPP criteria in at least twenty per cent of contracts. PPMT Software will include Environmental Coordinators in the workflow of procurements falling under the Green Public Procurement Criteria.

E8.2 Office supplies contract

Furniture and office supplies are acquired through Commission framework contracts, where the aspects of green procurement are considered.

There are no specific management approved actions in relation to this indicator.

E9 Demonstrating legal compliance

Under the framework of the Environmental Management System, the legal register (S.6.2.a - Legal and other environmental requirements compliance register) was updated in 2014 to incorporate those legal requirements that regulate the environmental aspects relating to JRC Seville's activities. Moreover, all the legal requirements related to the environmental aspects generated by the landlord in the management of the Expo building as well as those generated by other service providers have been included and are being checked by JRC Seville.

The existing subscription to a customised information system on environmental legislation was renewed, widening the scope of the legal database to cover EMAS.

E9.1 Prevention and risk management

Since 2010 Sevilla has recorded statistics relating to incidents on health, safety and environment. There have been no recorded accidents. Every year a third party audit is conducted to review its Management System, during which all aspects of emergency preparedness and response are checked and updated if necessary. Particular attention is paid to identifying potential accidents and reacting quickly to emergencies therefore minimising negative impacts.

[53] Source: Management Review 2013

E9.2 Maintaining the site's EMAS registration

The **2015 target** is to maintain EMAS registration for the space occupied by Sevilla (7 017 m^2, extended to 7.165 m^2 from April 2015) in the EXPO Building. In 2014, 289 staff occupied this space. The number has risen steadily since 2010 when there were 212 staff. Staff turnover is very high, reaching approximately 30% annually, which makes continuous effort necessary to raise awareness on environmental issues.

E9.3 Compliance with EMAS

Sevilla monitors the findings of EMAS internal audits and verification audits, and in cooperation with HR COORD ensures that both minor and major non conformities as well as scope for improvements are followed up. Among the last internal audit's positive findings was that the site has a well-developed tracking system for corrective and preventive actions, based on a database. The number of non-conformities generated through EMAS related internal and external audits has gradually reduced through the different inspections.

The EMAS internal audit held in February 2014, aimed at preparing the site for transition to the EMAS Regulation, raised four major and five minor NCs. All were resolved and closed before the verification exercise. A follow-up internal audit conducted in September 2014 raised five minor NCs all of which were closed. None of them concern matters of legal compliance. In October 2014, an external EMAS verification audit was conducted, resulting in one minor non-conformity related to the difficulty that Sevilla faces in obtaining information from the landlord. This non-conformity was resolved

E10 Internal communication (and training)

E10.1 Internal communication

The following actions took place during 2014:

- *Announcement on intranet:* Corporate EMAS campaigns were distributed at a local level, on the intranet. These included the EU Sustainable Mobility Campaign 2014 and mobility day on 19th September and the Earth Hour 2014 described below. The following were also published: a) modifications to EMAS related procedures that were communicated to all staff, b) the good environmental practices guide, c) guidelines for efficient driving in Seville and d) publication of energy consumption data in the EXPO building.
- *Earth Hour, 28th March:* at JRC Seville's request to participate in the Earth Hour , the EXPO building's landlord switched off the external lighting.

E10.2 Internal training

There were three specific EMAS training packages in 2014 including integrated management systems, EMAS regulation and Green Public Procurement and these involved 20 individuals. Additionally, newcomers were introduced to the Environmental Management System shortly after arrival. The **2015 target** will be to continue to provide specific training to staff with environmental responsibilities including on relevant standards and integrated systems. This will be a preparatory step for consolidating the integrated management systems. Additionally general information will be provided to staff on green public procurement.

E11 Transparent dialogue with external partners

Sevilla constantly seeks to influence its external suppliers to obtain commitments in relation to the environment and to contribute to sustainable development. 2014 was a transition period where Sevilla sought to further satisfy EMAS requirements, and during the year ten Environmental Commitment letters were signed with external providers. The EXPO building's landlord is still considering the signature of an environmental commitment letter that has been adapted to their requirements, following original submission.

Two direct communication actions were undertaken in 2014 to raise awareness on EMAS with external providers, in particular with the landlord and with the contractor of the site's cleaning contract. As a result, Sevilla will improve the monitoring of local environmental impacts related to the building and its activities. Thus, the following management approved actions apply:

Annual action plan no	Since	Description (and reference)	Progress in 2014	Expectations in 2015, and end date
81	2013	Develop an environmental commitment letter with the landlord	Started	Complete
82, 83	2013	Build up influence with the landlord to carry our concrete actions such as promoting energy and water efficiency measures.	Started	Ongoing
89	2013	Raise awareness of stakeholders on EMAS	Started	Ongoing

E12 EMAS costs (and savings)

Table E.3 shows how costs have evolved for energy, water, paper consumption and waste disposal since 2010 along with virtual savings (old consumption patterns with 2013 prices).

Table E3: EMAS costs and savings (EUR)

Parameter	Costs					Savings since:		
	2010	2011	2012	2013	2014	2010	2011	2013
Total Direct EMAS Cost (EUR)	0	0	132.000	151.840	132.000	-151.840	-132.000	19.840
Total Direct Cost per employee	0	0	541	538	457	-538	-457	82
Total buildings energy cost (Eur)	NA	0	295.470	331.838	329.966	NA	-329.966	1.872
Total buildings energy cost (Eur/person)	NA	0	1.211	1.177	1.142	NA	-1.142	35
Total fuel costs (vehicles) (Eur)	NA	356	384	530	502	NA	-146	27
Total energy costs (Eur/person)	NA	1	2	2	2	NA	-0	0
Total water costs (Eur)	NA	0	11.892	13.415	11.068	NA	-11.068	2.348
Water (Eur/person)	NA	0	49	48	38	NA	-38	9
Total paper cost (Eur)	9.457	8.481	6.601	5.495	4.086	3.963	4.395	1.409
Total paper cost (Eur/person)	45	35	27	19	14	25	21	5
Waste disposal (general) - unit cost/tonne	NA	0	NA	NA	NA	NA	NA	NA
Waste disposal (general) - Eur/person	NA	0	NA	NA	NA	NA	NA	NA

Staff and consultant costs directly associated with EMAS first arose in 2012. As indicated above, although JRC Sevilla makes a continuous effort to inform the landlord of the opportunities to reduce the building's environmental impact and the activities carried out in it, it does not have direct control over many parameters.

Paper consumption is the only cost indicator on which Sevilla exercises direct control. Expenditure in 2014 was 4.995 EUR, 9% less than in 2013 and almost half the cost for 2010.

E13 Sevilla data tables:

Line	Objective/ indicator	Parameter and units	2010	2011	2012	2013	2014
2	Basic EMAS	Population: staff in EMAS perimeter	212	240	244	282	289
4		Population: total staff	212	240	244	282	289
6		No. buildings seeking EMAS registration	0	0	0	1	1
8		Total no. of buildings	1	1	1	1	1
10		Useful surface area in EMAS perimeter, (m^2)	5.577	5.577	5.899	6.497	7.017
12		Useful surface area for all buildings, (m^2)	5.577	5.577	5.899	6.497	7.017
14		Total site area, (m^2)	11.669	11.669	11.669	11.669	11.669
16	Objective I) Efficient use of resources						
19	Ia	Total energy buildings, (MWh)	2.369	2.191	2.559	2.692	2.639
23		MWh/person	11,174	9,129	10,488	9,548	9,133
27		kWh/m²	425	393	434	414	376
29		i) supplied electricity, (MWh)	2.060	1.922	2.073	2.173	2.252
31		MWh/person	9,716	8,008	8,496	7,707	7,794
33		kWh/m²	369	345	351	335	321
35		renewables in electricity mix, (%)	0	14	14	15	27
37		from renewables, (MWh)	0	267	296	328	597
39		MWh/person	0	1,113	1,215	1,164	2,065
41		kWh/m²	0	48	50	51	85
43		non renewables in electricity in mix, (%)	100	86	86	85	74
45		from non renewables, (MWh)	2.060	1.655	1.777	1.845	1.656
47		MWh/person	9,716	6,895	7,281	6,543	5,728
49		kWh/m²	369	297	301	284	236
53		ii) supplied gas, (MWh)	309	269	486	519	387
55		MWh/person	1,458	1,121	1,992	1,840	1,339
57		kWh/m²	55	48	82	80	55
59		iii) supplied diesel, (MWh)				0	0
65		iv) district heating, (MWh)	0	0	0	0	0
67		MWh/person	0	0	0	0	0
69		kWh/m²	0	0	0	0	0
71		v) site generated renewables - biomass, (MWh)	0	0	0	0	0
73		MWh/person	0	0	0	0	0
75		kWh/m²	0	0	0	0	0
77		vi) site generated renewable - PV, (MWh)	0	0	0	0	0
79		Installed peak capacity, (kWhp)	0	0	0	0	0
81		Assumed output, (% of kWh/p)	0	0	0	0	0
83		MWh/person	0	0	0	0	0
85		kWh/m²	0	0	0	0	0
89	1b	Total energy used by service vehicles, (MWh)	6,6	3,0	3,0	4,1	4,0
93		MWh/person	0,031	0,013	0,012	0,015	0,014
97		kWh/m²	1,187	0,539	0,513	0,639	0,567
99		Diesel used, (m^3)	0,608	0,276	0,278	0,381	0,366
101		kWh of energy provided by one litre diesel	11	10,9	10,9	10,9	10,9
102		Petrol used, (m^3)	0	0	0	0	0
104		kWh of energy provided by one litre petrol	9	9,42	9,42	9,42	9,42
110	1c	Total renewable energy use, (MWhr/yr)	0	267	296	328	597
114		renewable energy as part of total, (%)	0	12,19	11,58	12,19	22,61
118		Onsite generated renewables as part of total energy, (%)	0	0	0	0	0
122	1d	Water usage in EMAS perimeter, (m^3)	9.075	8.304	6.757	7.710	6.281
126		m^3/person	42,807	34,600	27,693	27,340	21,735
130		l/m²	1.627	1.489	1.145	1.187	895
134	1e	Office paper consumption, (tonnes)	7	6	4	3	3
138		Office paper consumption (tonnes/person)	0,032	0,024	0,017	0,009	0,011

140		**Paper Density (g/m^2)**	80	80	80	80	75
142		**Sheets/kg**	200	200	200	200	214
144		**Total No. of sheets**	1.370.851	1.162.418	821.709	533.109	705.509
146		**Sheets/person**	6.466	4.843	3.368	1.890	2.441
148		**Working days in the year**	211	211	211	211	211
151		**Office paper sheets/person/day**	**31**	**23**	**16**	**9**	**12**
155	**1f**	**Offset paper consumption (tonnes)**	**2,28**	**1,91**	**1,69**	**2,16**	**1,24**
159		**Offset paper (tonnes/person)**	**0,011**	**0,008**	**0,007**	**0,008**	**0,004**
161	**Objective II) Reduction in CO2 (including CO2 equivalent of greenhouse gases) and other air pollutants**						
164	**2a**	**Total office building emissions from energy, (tonnes CO_2)**	**887**	**824**	**928**	**975**	**821**
168		**tonnes CO_2/person**	**4,184**	**3,432**	**3,805**	**3,458**	**2,842**
172		**kgCO_2/m²**	**159,0**	**147,7**	**157,4**	**150,1**	**117,1**
174		**i) from electricity, (CO_2 tonnes)**	**824**	**769**	**829**	**869**	**743**
176		Kgs CO2 from 1 kWh of electricity	0,4	0,4	0,4	0,4	0,33
177		**tonnes CO2/person**	**3,886**	**3,203**	**3,398**	**3,083**	**2,572**
179		**kgCO2/m²**	**148**	**138**	**141**	**134**	**106**
181		**ii) from gas (tonnes/yr)**	**63**	**55**	**99**	**106**	**78**
183		Kgs CO2 from 1 kWh natural gas	0,204	0,204	0,204	0,204	0,202
184		**tonnes CO2/person**	**0,297**	**0,229**	**0,406**	**0,375**	**0,270**
186		**kgCO2/m²**	**11**	**10**	**17**	**16**	**11**
188		**iii) from diesel (tonnes/yr)**				**NA**	**0**
195		**iv) from district heating (tonnes/yr)**	**0**	**0**	**0**	**0**	**0**
197		Kgs CO2 from 1 kWh	0,264	0,264	0,264	0,264	0,264
198		**tonnes CO2/person**	**0**	**0**	**0**	**0**	**0**
200		**kgCO2/m²**	**0**	**0**	**0**	**0**	**0**
202		**Total quantity of refrigerants (tonnes)**	**0**	**0**	**0**	**0**	**0**
204		**Total refrigerant losses (tonnes)**	**0**	**0**	**0**	**0**	**0**
208	**2b**	**Emissions of other gases as CO_2 equivalent (tonnes)**	**0**	**0**	**0**	**0**	**0**
212		**tonnes CO2equiv/person**	**0**	**0**	**0**	**0**	**0**
216		**kgCO2equiv/m2**	**NR**	**NR**	**NR**	**NR**	**0**
218		**inventory R22, (kg)**					
219		i) losses R22, (kg)	NR	NR	NR	NR	0
220		GWP	1810	1810	1810	1810	1810
221		**as tCO2equiv**	NR	NR	NR	NR	0
223		**inventory R410A, (kg)**					
224		ii) losses R410A, (kg)	NR	NR	NR	NR	NR
225		GWP	2090	2090	2090	2090	2090
226		**as tCO2equiv**	NR	NR	NR	NR	0,00
228		**inventory R134A, (kg)**					
229		iii) losses R134A, (kg)	NR	NR	NR	NR	NR
230		GWP	1430	1430	1430	1430	1430
231		**as tCO2equiv**					
233		**inventory R404A, (kg)**					
234		iv) losses R404A, (kg)	NR	NR	NR	NR	NR
235		GWP					
236		**as tCO2equiv**					
238		**inventory R407C, (kg)**					
239		v) losses R407C, (kg)	NR	NR	NR	NR	NR
240		GWP					
241		**as tCO2equiv**					
243		**inventory R507A, (kg)**					
244		vi) losses R507A, (kg)	NR	NR	NR	NR	NR
245		GWP					
246		**as tCO2equiv**					
248		**inventory R422D, (kg)**					
249		vii) losses R422D, (kg)	NR	NR	NR	NR	NR
250		GWP					

251		**as tCO2equiv**					
255	**2c**	**Site vehicle CO_2 emissions (tonnes)**	**2**	**1**	**0,7**	**1,0**	**0,9**
257		**tonnes CO_2/person**	**0,008**	**0,003**	**0,003**	**0,004**	**0,003**
259		**i) from diesel (tonnes)**	**1,62**	**0,74**	**0,74**	**1,02**	**0,90**
261		Kgs CO2 from one litre of diesel	2,67	2,67	2,67	2,67	2,47
262		**ii) from petrol**	**0**	**0**	**0**	**0**	**0**
264		Kgs CO2 from one litre of petrol	2,28	2,28	2,28	2,28	2,28
265		from other fuel (eg propane)	0	0	0	0	0
270		**gCO2/km (manufacturer)**	**136**	**136**	**136**	**136**	**136**
272		Vehicle kms travelled	**9693**	**6.462**	**9.889**	**6.455**	**4.440**
274		Internal fleet efficiency (litres/100km)			2,81	5,90	8,23
278		**gCO2/km (actual)**	**167**	**114**	**75**	**158**	**203**
280		Number of vehicles	1	1	1	1	1
282		**kms/vehicle**	**9.693**	**6.462**	**9.889**	**6.455**	**4.440**
286	**2d**	**Total air emissions buildings (tonnes), as mimimum NOx, SO_2, PM_{10}**	**NR**	**NR**	**NR**	**NR**	**NR**
288		**tonnes/person**					
290		NOx, (kg)	**NR**	**NR**	**NR**	**NR**	**NR**
292		SO2, (kg)	**NR**	**NR**	**NR**	**NR**	**NR**
294		PM10, (kg)	**NR**	**NR**	**NR**	**NR**	**NR**
296		…..others (VOC), (kg)	**NR**	**NR**	**NR**	**NR**	**NR**
298		….others CO, (kg)					**NR**
300	**Objective III) Waste management**						
303	**3a**	**Total non hazardous waste, (tonnes)**	**0,0**	**0,0**	**0,0**	**0,0**	**6,4**
307		**Total non haz.waste (tonnes/person)**	**0,000**	**0,000**	**0,000**	**0,000**	**0,022**
309		Household waste (tonnes)	NM	NM	NM	NM	2,200
311		Paper and cardboard (tonnes)	NM	NM	NM	NM	1,540
313		Wood (tonnes)	NM	NM	NM	NM	0,810
315		Glass (tonnes)	NM	NM	NM	NM	0,130
317		Metal (scrap) - (tonnes)	NM	NM	NM	NM	1,730
332	**3b**	**Total hazardous waste (tonnes)**	**0,059**	**0,097**	**0,001**	**0,071**	**3,326**
336		**Total hazardous waste, (tonnes/person)**	**0,000276**	**0,000402**	**0,00000410**	**0,000252**	**0,0115**
338		Batteries (tonnes)	0,025	0,000	0,025	0,025	0,058
340		Laboratory mixed waste	NA	NA	NA	NA	NA
342		Waste oil	NR	NR	NR	NR	NR
344		Filters	NR	NR	NR	NR	NR
346		Paint	NR	NR	NR	NR	NR
348		Solvent	NR	NR	NR	NR	NR
350		Spray cans	NR	NR	NR	NR	NR
352		Medical waste (tonnes)	0,008	0,005	0,003	0,003	0,003
354		Flourescent lamps (tonnes)	0,026	0,092	0,063	0,043	0,105
356		Fire extinguisher	NR	NR	NR	NR	NR
358		Lead-acid battery	NR	NR	NR	NR	NR
360		Mercury containing objects	NR	NR	NR	NR	NR
362		Asbestos material	NR	NR	NR	NR	NR
364		Developer	NR	NR	NR	NR	NR
366		Inks and toner	0,024	0,025	0,018	0,024	0,044
368		Electrical equipment (WEEE) (tonnes)	0	0	4	0	3,16
372	**3c**	**Percentage of waste sorted**	**NM**	**NM**	**NM**	**NM**	**100,00**
374	**Objective IV) Protecting biodiversity**						
377	**4a**	**Built surface area, (m^2)**	**7.073**	**7.073**	**7.073**	**7.073**	**7.073**
381		**Built surface area, (m^2/person)**	**33**	**29**	**29**	**25**	**24**
385		**Built surface area as part of site, (%)**	**61**	**61**	**61**	**60,6**	**60,6**
387	**Objective V) Green procurement**						
389	**5a**	**Contracts >60k with "eco" criteria (%)**	**NM**	**NM**	**NM**	**NM**	1
392	**5b**	**Green products in office catalogue (%)**	**NM**	**NM**	**NM**	**NM**	**NM**

394		**Green products in catalogue, (No)**	**NM**	**NM**	**NM**	**NM**	**NM**
395		**Products in catalogue, (No)**	**NM**	**NM**	**NM**	**NM**	**NM**
396		**Total value of products purchased from catalogue (EUR)**	**NM**	**NM**	**NM**	**NM**	**NM**
398		**Value of green products purchased (EUR)**	**NM**	**NM**	**NM**	**NM**	**NM**
400	**Objective VI) Legal conformity**						
402	**6a**	**EMAS registered buildings (%)**	**0**	**0**	**0**	**100**	**100**
405	**6b**	**EMAS registered useful floorspace (%)**	**0**	**0**	**0**	**100**	**100**
407		**EMAS verification non conformities**	**0**	**0**	**0**	**0**	**1**
409	**Objective VII) Communication**						
411	**7b**	**No. of difft trainings on offer**	**NR**	**NR**	**NR**	**1**	**5**
413	site training	**No of training beneficiaries**	**NR**	**NR**	**NR**	**2**	**36**
415		**Staff benefiting from training (%)**				**0,7**	**12,5**
417	**Objective VIII) Promoting dialogue with external partners**						
418							
419							
420	**Estimating EMAS costs and virtual value of identified savings**						
421	**Direct costs**	**Total Direct EMAS Cost (EUR)**	**0**	**0**	**132.000**	**151.840**	**132.000**
422		Total Direct Cost per employee	0	0	541	538	457
423		**i) Annual direct staff costs**	**0**	**0**	**132.000**	**132.000**	**132.000**
424		Annual direct staff costs (time FTE)	0	0	1	1	1
425		Annual cost of one FTE	132000	132000	132.000	132.000	132.000
426		**ii) Annual contract costs**	**0**	**0**	**0**	**19.840**	**0**
430		**iii) Annual misc costs**	**0**	**0**	**0**	**0**	**0**
433	**Energy (Bldgs)**	**Electricity unit cost (Eur/MWh)**			**127,20**	**137,90**	**135,89**
434		**Gas (Eur/MWh)**			**65,40**	**61,90**	**61,71**
435		**Fuel (Eur/MWh)**			**0,00**	**0,00**	**0,00**
436		**Total buildings energy cost (Eur/person)**			**1.211**	**1.177**	**1.142**
437		Electricity (Eur/person)			1081	1063	1059
438		Gas (Eur/person)			130	114	83
439		Fuel (Eur/person)			0,00	0,00	0,00
440		**Total buildings energy cost (Eur)**			**295.470**	**331.838**	**329.966**
441	**Energy (vehic.)**	**Diesel unit cost- (Eur/m3)**		**1290,00**	**1.380,00**	**1.390,00**	**1.374,21**
442		**Petrol unit cost- (Eur/m3)**		**0,00**	**0,00**	**0,00**	**0,00**
443		Total cost Diesel (Eur)		356	384	530	502
444		Total cost petrol (Eur)		0	0	0	0
445		Total energy costs (Eur/person)		1,48	1,57	1,88	1,74
446		**Total fuel costs (vehicles) (Eur)**		**356,04**	**384**	**530**	**502**
447	**Water**	Water unit cost (Eur/m3)			**1,76**	**1,74**	**1,76**
448		Water (Eur/person)			**48,74**	**47,57**	**38,30**
449		**Total water costs (Eur)**			**11.892**	**13.415**	**11.068**
450	**Paper**	Paper (office) - unit cost/kg	**1,04**	**1,10**	**1,14**	**1,14**	**0,90**
451		Paper (offset) - unit cost/kg	**1,04**	**1,10**	**1,14**	**1,14**	**0,90**
452		Paper (office) - Eur/person	33,46	26,58	19,16	10,75	10,28
453		Paper (offset) - Eur/person	11,15	8,75	7,90	8,73	3,86
454		Total paper (office) cost (Eur)	34,70	29,24	21,84	12,26	9,25
455		Total paper cost (Eur/person)	44,61	35,34	27,05	19,49	14,14
456		**Total paper cost (Eur)**	**9.457**	**8.481**	**6.601**	**5.495**	**4.086**
457	**Waste**	Waste disposal (general) - unit cost/tonne	0,00	0,00	0,00	0,00	0,00
458		**Waste disposal (general) - Eur/person**	**0,00**	**0,00**	**0,00**	**0,00**	**0,00**
459		Waste disposal (hazardous) - unit cost/tonne	18860,00	33191,11	44460,00	52636,66	37,72
460		**Waste disposal (hazardous) - Eur/person**	**0,01**	**0,01**	**0,00**	**0,01**	**0,00**
461		**Total waste cost (Eur)**	**0**	**0**	**0**	**0**	**0**
462	**Other site specific data**						
468	**Notes**	**NR: Not reported by the landlord**					
469		**NM: Not Measured**					
470		**NA: Not Applicable**					

ANNEX F: JRC KARLSRUHE – INSTITUTE FOR TRANSURANIUM ELEMENTS (ITU)

The Institute for Transuranium Elements (JRC Karlsruhe, hereafter referred to as Karlsruhe) is one of seven Institutes of the European Commission's Joint Research Centre. It provides the scientific foundation for the protection of European citizens against risks associated with the handling and storage of highly radioactive material.

Karlsruhe's prime objectives are to serve as a reference centre for basic actinide research, to contribute to an effective safety, safeguards and security system for the nuclear fuel cycle, and to study technological and medical applications of radionuclides/actinides.

F1 Overview of core indicators at JRC Karlsruhe since 2010

Karlsruhe has been collecting data on some core indicators since 2002 (however not in a systematic way). More recent data (from 2008) are presented in this report. Variations over the period 2010/14 and 2014/15 are shown in Table F1.

Table F1: Percentage changes in core indicators at JRC Karlsruhe over the data period

Parameter	From: 2010 Overall	To: 2014 % per year	From: 2011 Overall	To: 2014 % per year	From: 2012 Overall	To: 2014 % per year	From 2013 Overall	Target 2014
Energy bldgs (MWh/p)	-9,6	-2,41	0,7	0,23	-4,8	-2,40	-11,1	NA
Energy bldgs (KWh/m^2)	-34,0	-8,50	-27,7	-9,22	-25,9	-12,95	-10,5	NA
Water use (m^3/p)	-8,4	-2,10	33,5	11,17	21,8	10,91	20,1	NA
Water use (l^3/m^2)	-33,1	-8,27	-4,1	-1,37	-5,2	-2,59	21,0	NA
Office paper (tonnes/person)			3,5	1,16	-4,5	-2,26	24,1	NA
Office paper (Shts/person/day)			1,6	0,54	-6,2	-3,11	21,9	NA
CO_2 bldgs (tonnes/p)	-37,7	-9,42	-32,8	-10,95	-37,7	-18,85	-38,4	NA
CO_2 bldgs (kg/m^2)	-54,5	-13,62	-51,8	-17,25	-51,5	-25,75	-37,9	NA
Refrigerants lost				0,00	#DIV/0!	#DIV/0!		NA
of which R22				0,00	#DIV/0!	#DIV/0!		NA
Non haz.waste (kg/p)	0,8	0,21	41,4	13,80	-3,8	-1,90	2,0	NA

Since 2010 energy consumption measured per capita and per square metre has reduced considerably (along with CO_2 emissions), as have all measures of water and office paper consumption. A slightly larger amount of non-hazardous waste has been generated. In the last year there has been a downward trend of almost all parameters.

As a nuclear facility subject to German nuclear legislation, Karlsruhe must comply with extensive legal requirements which can limit the scope for some environmental improvements (cf. F9.1). More specifically, Karlsruhe must at all times respect strict legal requirements governing site safety and security, which gives little flexibility regarding choices in consumption. Additionally, as a research institution, Karlsruhe's consumption of energy, water and other resources may vary significantly from year to year depending on its programme of activities and experiments. Karlsruhe did not set quantitative EMAS targets in 2013 for 2014 as it focussed on achieving the qualitative objectives and actions identified in its Environmental Program. Several action plans were developed in 2013, 2014 and 2015 to better manage environmental aspects.

F2 Description of JRC Karlsruhe activities

As shown in Figure F1a, the site is located in the north of Karlsruhe (Eggenstein-Leopoldshafen), Germany at the Karlsruhe Institute of Technology (KIT) Nord Campus.

Karlsruhe has averaged about 300 staff over the last few years with a further 100 permanent contract workers on site.

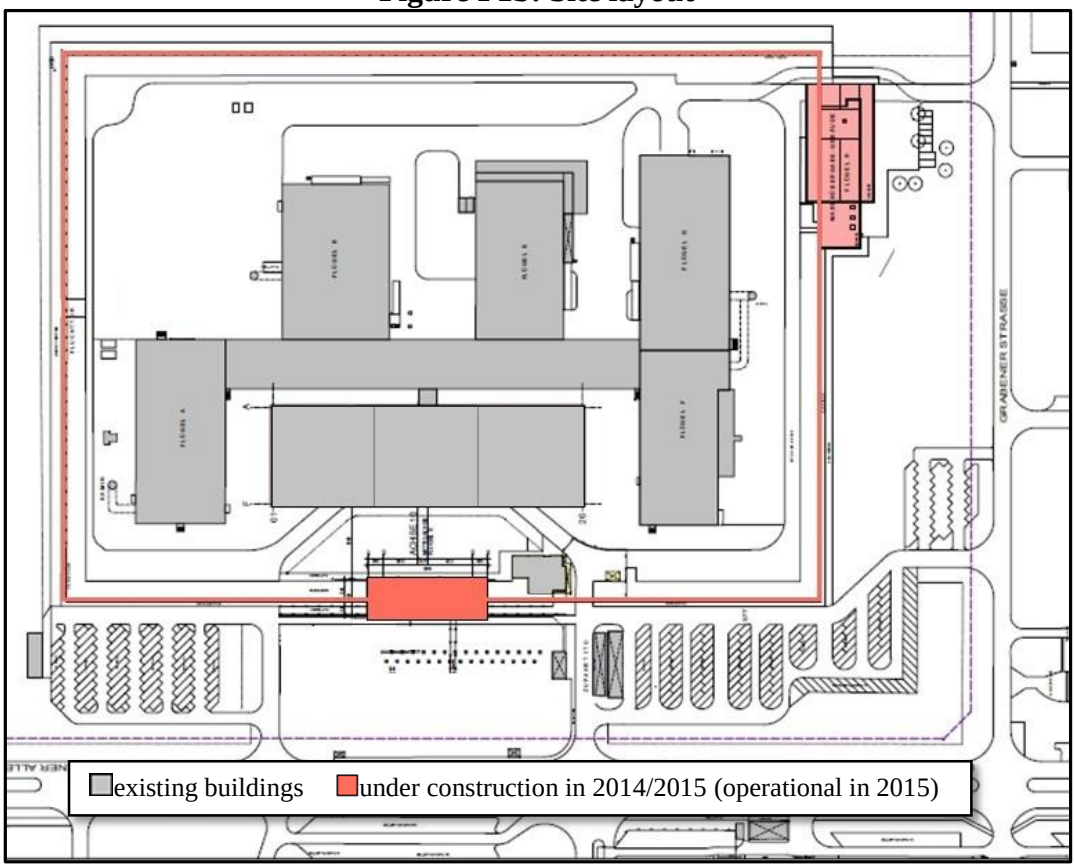
Figure F1a: Site location

As shown below in Figure F1b, other than the guard's house, the site is dominated by one building with nine interconnected wings.

With the start of operation of the new offices wing in January 2013 total floor space increased from 22.650 m² to 30.477 m². In 2015 two new buildings (guardhouse and goods transfer facilities) will start operation. Hence, the total floor space will increase to 32.210 m². The total site area is about 93 000 m².

In contrast to most other Commission premises which are dedicated mainly to administration, Karlsruhe is a nuclear facility conducting scientific and technical research It requires large laboratories and other technical and experimental facilities resulting in a wide range of activities with varying environmental impacts.

Figure F1b: Site layout



Karlsruhe's scientific activities are conducted in the nuclear area, within the frame of the EURATOM Treaty, and are summarised in Table F2:

Table F2: Description of main activities in JRC Karlsruhe's nuclear area

Activity	Description
Fundamental properties & applications	• Basic understanding of actinides, nuclear materials and fuel processes • Medical applications of alpha-emitter therapy of cancer and infectious diseases
Safety of nuclear fuels and fuel cycle	• Nuclear fuel behaviour in normal, transient and accidental conditions, codes and modelling • Safety assessment of conventional and advanced nuclear fuel cycle and advanced technologies
Nuclear waste management & decommissioning	• Assessment and modelling of key alteration processes, long-term behaviour of spent fuels under disposal and storage conditions • Development of innovative technologies and techniques for radiation surveillance, mapping and reconstruction technologies
Monitoring of radioactivity in the environment	• Procedures for data collection, evaluation and harmonisation, dispersion models • Radioactivity environmental monitoring with management of information systems
Nuclear safeguards	• Nuclear material measurements, containment &surveillance, process monitoring, analytical methodologies and measurements • Support to EURATOM safeguards regime and IAEA, operation of DG ENER onsite Laboratories
Nuclear non-proliferation	• Techniques and methodologies for the verification of absence of undeclared activities, trace and particle analysis, reference materials • Export control, trade analysis, non-proliferation studies
Nuclear security	• Prevention, detection, response, national response plan, CBRN • Combating illicit trafficking & nuclear forensics
Training and education	• European Nuclear Safety and Security School (EN3S), user facilities, higher education • Vocational training, European Nuclear Security Training Centre (EUSECTRA) • Knowledge management and dissemination

Since 2008 Karlsruhe has operated an Integrated Management System (IMS) and is certified according to ISO 9001 and 14001 as well as BS OHSAS 18001. The IMS-policy is shown below in Figure F1c;

The IMS consists of four "Management Processes" (e.g. EHS-management or IMS-management), three "Core Processes" (e.g. the scientific activities) and five "Support Processes" (e.g. HR or budget, financing & accounting). The process landscape is shown below in Figure F1d.

EUROPEAN COMMISSION
DIRECTORATE-GENERAL
JOINT RESEARCH CENTRE
Directorate E - Institute for Transuranium Elements
Director

Quality, Environmental, and Health and Safety Policy at ITU[1]

For the remote E8 unit located in Ispra, the environment and health and safety part of the ITU policy is superseded by the Ispra site environmental and health and safety policy.

In order to guarantee high quality of research and development work, protection of the environment, health and safety of all persons working for or on behalf of our organisation, we are committed to the following policy which is regularly reviewed:

- we continuously improve our Quality Management, Environmental, and Health and Safety performance through planning, monitoring, evaluating and re-defining relevant objectives
- we guarantee that all persons working at ITU are committed to comply with legal requirements, institute specific regulations and other identified positive impact solutions
- we systematically analyse, evaluate and reduce all risks associated with our activities with potential impact on persons, environment and quality of our work through continuous improvement measures
- we report and analyse occurring anomalies and implement preventive and corrective actions in order to avoid reoccurrences
- we promote and maintain best practices for the handling and storage of radioactive, chemical and dangerous substances and we create awareness for emergency preparedness
- we optimise radiation protection to avoid unnecessary exposures, assure traceability of radioactive and other hazardous materials and we prevent fire by taking appropriate measures and giving clear guidelines
- we limit the production of waste and the consumption of natural resources
- our managers promote a culture of implementing best Quality, Environmental, and Health and Safety practices by setting an example to their staff

Motivation, common effort and training of all persons working at ITU play an important role in achieving our Quality, Environmental and Health and Safety Policy objectives.

The achievement of these objectives and their periodic review by the management is realised and communicated within the framework of the ITU Integrated Management System.

M. Betti
ITU Director

[1]Chapter 2.3.1. of M0019/M/R4

Figures F1c: IMS Policy (above), and F1d: ITU Process Landscape (below)

EUROPEAN COMMISSION
JOINT RESEARCH CENTER
Institute for Transuranium Elements
Directorate

Dr. Maria Betti
Director
26. Mai 2015

ITU Process Landscape

Management Processes

M1	M2	M3	M4	M5
Strategic Planning and Work Programme Operational Planning, Monitoring and Reporting	Communication and Stakeholder Relations	Integrated Management System Management	Environment, Health & Safety Management *	Licence Management *
PO/ PR: N. Erdmann	PO/ PR: G. Tamborini	PO/ PR: J. Pravdova	PO/ PR: A. Bitterhof, J.-L. Vasamiliette	PO/ PR: R. Maier

Core Processes

C1	C2	C3
Work Programme related processes	Competitive Activities Management; Financial Administration of Competitive Activities	Decommissioning and Waste Management *
PO/ PR: N. Erdmann		PO/ PR: N. Rausch

Support Processes

S1	S2	S3	S4	S5
Human Resources Management	Budget, Finances and Accounting	Logistics and Infrastructure * IT Services	Procurement	ISO/IEC 17025 **
PO/ PR: E. Schaefer, M. Moravek	PO/ PR: A. Jimenez Segarra	PO/ PR: M. Gammelin, B. Latzko; PO/ PR: H. van der Vegt	PO/ PR: A. Jimenez Segarra	PO/ PR: E. Zuleger

ITU
JRC
PO: process owner
PR: process responsible
* Site specific: Karlsruhe - E.1, Ispra - Directorate C
** Not applicable to Ispra site

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Date of issue: 18/05/2015
Author: J. Pravdova
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F3 Environmental impact of JRC Karlsruhe activities

Karlsruhe undertook a full update of the environmental aspects in 2007. These are described in the Environmental Aspects Register (RGS0001/M4/R7). It is reviewed annually and updated when necessary, the latest version is dated 14th August 2014. Significant impacts associated with four main aspect groups were identified, as described in Table F3. The other aspects described in the Environmental Aspects Register can be considered of minor significance or insignificant. In addition, the imminent effects of Karlsruhe on the local environment can be considered as rather insignificant (cf. F7).

Table F3 – Summary of significant environmental aspects at JRC Karlsruhe 2014

Aspect group	Environmental Aspect	Environmental Impact	Location/ Activity	Related Indicator	Action plan (if appropriate)
Use of natural resources, including energy	Electricity consumption	Resource depletion	Ventilation system,	1a	23
		Resource depletion	Lighting system (incl. parameter security	1a	
	Heating consumption	Resource depletion and air emissions	District heating	1a	24, 25, 26
Emissions to air	Electricity and heating emissions	Global warming	Ventilation system, Lights, Heating system	2a	
	Nuclear air emissions	Possible contamination of air	Nuclear research	Dose values	38
Waste	Radioactive waste	Potential contamination due to the existence of radioactive waste	Nuclear research	Chemie-III-Abwasser, nuclear waste volume and, activity	
Transport (site vehicles)	Fuel consumption	Resource depletion	Missions	1b	36, 37
	Air emissions	Global warming and pollution linked to motor transport	Missions	2c	36, 37

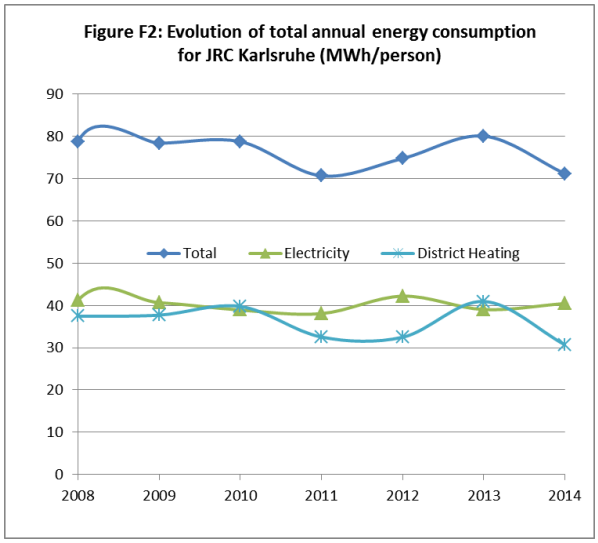
F4 More efficient use of natural resources

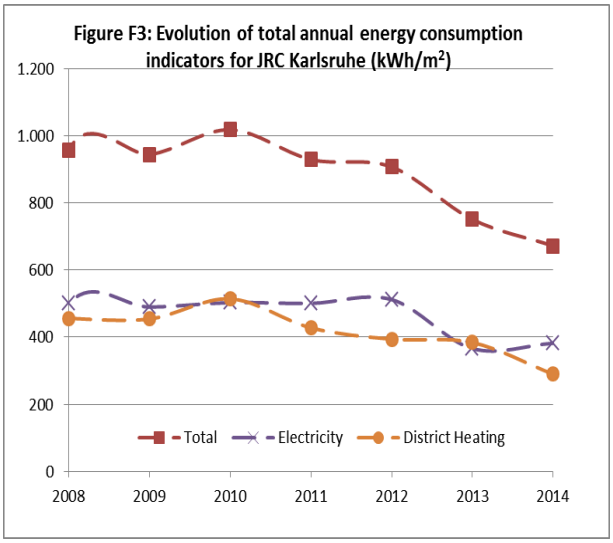
F4.1 Energy consumption

a) Buildings

Buildings' energy consumption is one of the significants aspects. Figures F2 and F3 below show that most energy consumption parameters have been fairly steady during the last few

years, although energy consumption particularly district heating fell considerably in 2014, which is due to the installation of a new more efficient heating control system in one of the laboratory wings. The site must comply with legal requirements, which is the dominant influence on energy consumption. For example, Karlsruhe is obliged to maintain an air flow of around 300.000 m^3 per hour, 24 hours per day throughout the year. The reduction of the total energy consumption per square meter in 2013 is due to the opening of the new administration building and an increase of the surface area by approx. 8.000 m². The reduction in 2014 is due to the modification in the heating control as mentioned above.





Electricity consumption has remained fairly constant in the last few years despite an increase in floor area of over 30% in 2013. The ventilation system is responsible for over 80% of Karlsruhe's electricity consumption. Any changes to the system are subject to strict regulatory control as it represents the site's main component of nuclear safety and as such is heavily integrated into the nuclear licensing that is supervised by the authorities.

Karlsruhe does not use a municipal gas supply. It receives heating energy from the KIT district heating system. Until 2012, heating energy consumption was mostly influenced by climate fluctuations which is not surprising because there have not been any major changes to the heating system or buildings insulation. In 2013 a new "state of art" office building became operational and hence consumption per m² decreased by 2% compared with 2012. From 2013 to 2014 there was a further decrease of 24%.

The **2015 target** for energy consumption is to maintain 2014 levels. Karlsruhe will open two new buildings, a guardhouse and goods transfer facilities. These buildings will require additional energy therefore reducing total energy consumption will be difficult. Initiatives for continued improvement identified in the Commission's EMAS annual action plan are summarised below:

Annual action plan no	Since	Description (and reference)	Progress in 2014	Expectations in 2015, and end date (if app)
23	2014	Start of upgrading/renewing ventilation system for wings E-G including more effective fans, up-to-date control systems and heat recovery		Put on hold until a final decision has been agreed which wings will continue operating after the start of operation of wing M

Annual action plan no	Since	Description (and reference)	Progress in 2014	Expectations in 2015, and end date (if app)
24	2014	Installation of a heat transfer station for the district heating system for wings A,B,D,E,F,G	Not applicable	Postponed to 2016
25	2014	Installation of a more effective heat regulation systems (especially for night operation) for wing A	completed	-
26	2014	Thermal insulation of "old" building parts		Put on hold until a final decision has been agreed which wings will continue operating after the start of operation of wing M

Performance measured per m^2 has clearly improved since 2010 with this trend continuing in 2014. Despite increasing the useful surface area of the buildings by 35% in 2013, total consumption in 2013 is similar to recent years and has even decreased in 2014.

b) Site vehicles

Site vehicles have an insignificant impact because Karlsruhe operates a very small fleet of ten vehicles with a combined CO_2 output (calculated) of 41,9 t (229 g/km) in 2014. **2015 target** is to reduce the combined CO_2-output as well as the output per km by 5%. In 2015, Karlsruhe will purchase two new service cars (for officer in charge and radiotion protection on call) for which the main selection criteria are CO_2 output and price, each weighted by 50%.

c) *Renewable energy use in buildings and vehicles*

According to the supplier, approximately 32% of the electricity mix is supplied by renewable sources. There are no renewable energy sources on site. District heating is generated from natural gas. There is no specific **2015 target** in relation to renewable energy. There were also no specific targets in 2014 because of Karlsruhu's lack of influence on the electricity mix.

F4.2 Water consumption (indicator 1d)

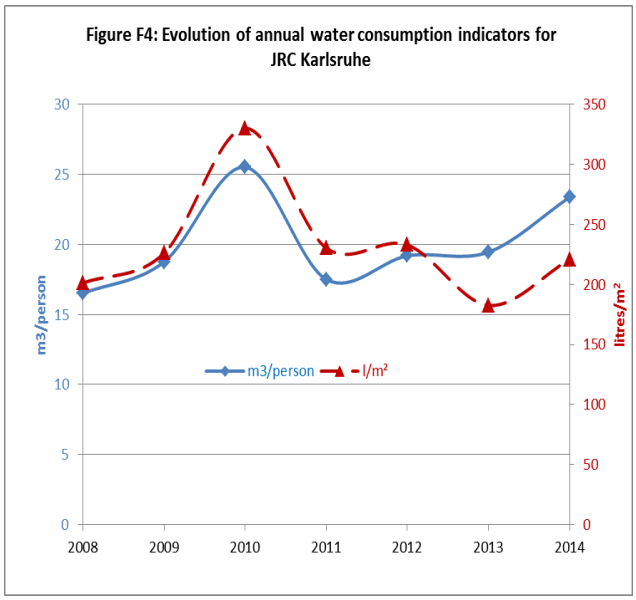
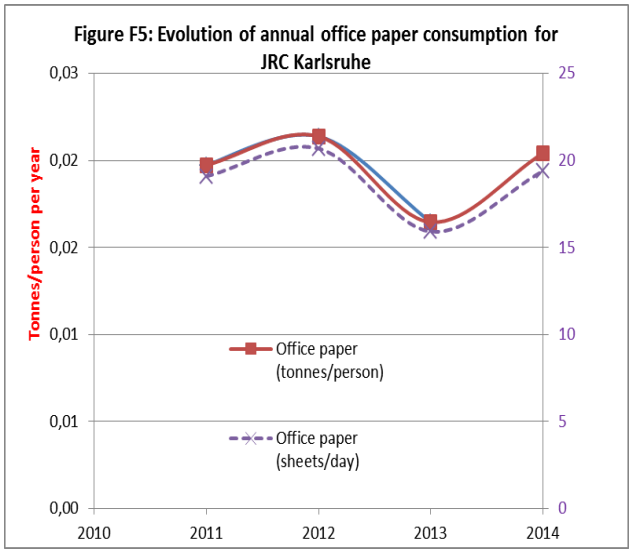


Figure F4 illustrates that water consumption remained essentially steady in recent years with the higher value recorded in 2010 due to a malfunction in the hydrogen generating plant.

Water consumption rose from 2011 to 2013 due to the opening of the new office building in 2013. This trend significantly increased in 2014.This increase in 2014 can be assocaited with higher water consumption for the moistening of the incoming air in the laboratory wings due to a cold winter and to a certain extent to the opening of the fitness room at the end of 2013 and an increase use of the showers by the training people.



The **2015 target** is not to exceed the 2014 levels. With two new buildings opening as described in Section F4.1 it will be difficult to reduce per capita water consumption.

F4.3 Office paper (indicators 1e)

Figure F5 shows that office paper consumption after a significant decrease in 2013 remained at this level, with a person using around 16 sheets per day.

The **2015 target** is to change from the purchasing data to the actual values provided by the centralised printers/copiers.

F5 Reducing emissions of CO_2, other greenhouse gases and air pollutants

F5.1 CO_2 emissions from buildings

Buildings emissions currently account for all CO_2 emissions recorded at Karlsruhe and is therefore one of the significant environmental aspects.

a) Buildings (energy consumption)

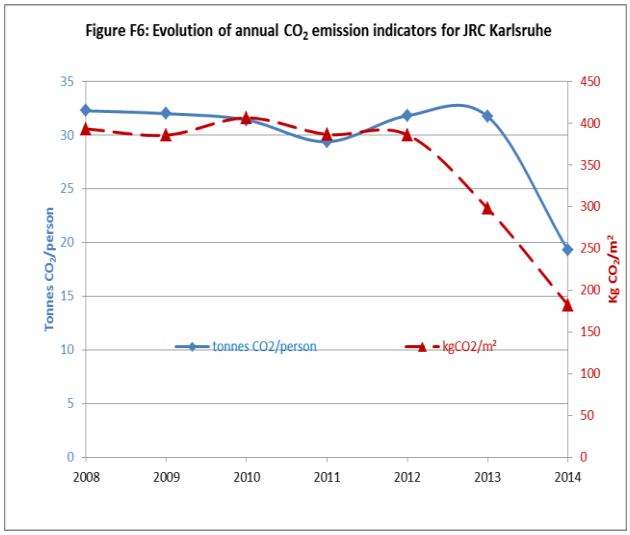


Figure F6 shows that the evolution of CO_2 emissions from buildings is, as expected; strongly linked to energy consumption and with the same trends described in section F4.1. For operational buildings, the **2015 target** is not to exceed 2014 emissions. However, due to the opening of two new buildings (Section F4.1), this overall target for the site will be difficult to meet.CO_2 emissions decreased significantly in 2014 due to new CO_2-conversion factors for electricity provided by the supplier (EnBW).

There are no management approved action plans specifically for reducing buildings' CO_2 emissions however measures introduced to reduce energy consumption described in section F4.1 will inevitably also reduce emissions.

b) Buildings other greenhouse gases (refrigerants)

At Karlsruhe emissions of refrigerants can only occur from the air conditioning systems which, owing to a rigorous maintenance programme, can be prevented. In 2014 there were no losses during normal operations, and there were no "abnormal" operations. Hence, these emissions represent an insignificant impact. As a consequence, there were no specific targets in 2014. The **2015 objective** is to repeat 2014's performance of no leakage during normal operation. Karlsruhe completed the following management approved action to phase out installations with R22:

Annual action plan no	Since	Description	Progress in 2014
35	2013	Replacement of airconditioning system in Wing A (containing HCFC (R22) by an up-to-date system (containg HFC(R134a))	Completed

F5.2 CO_2 emissions from vehicles (indicator 2c)

a) Commission vehicle fleet

Karlsruhe operates a vehicle fleet of ten vehicles. As already described in F4.1 the impact of their emissions is considered as insignificant. The **2014 target** to develop a new plan for vehicle management and monitoring of environmental impact was completed. The consumption values of the various cars were recorded and introduced into the environmental data. Moreover, the following management approved action was completed.

Annual action plan no	Since	Description	Progress in 2014	Result
36	2014	Feasibility study: implementing a charging station for electric cars/e-bikes on ITU parking space / find agreement with KIT	Completed	Not feasible, amongst others, for administrative reasons

2015 target is to reduce the combined CO_2-output as well as the output per km by 5%.

b) Missions (excluding Commission vehicle fleet)

Missions were classified as one of the significant aspects. Nevertheless, there were no specific targets in 2013 or 2014 or management approved action plans to reduce CO_2 emissions from missions. because EMAS was not yet implemented. Initiatives undertaken in 2013 to reduce the number of missions included an incentive policy which increased the number of video conferencing facilities from two to six.

*c) Commuting (and mobility***)**

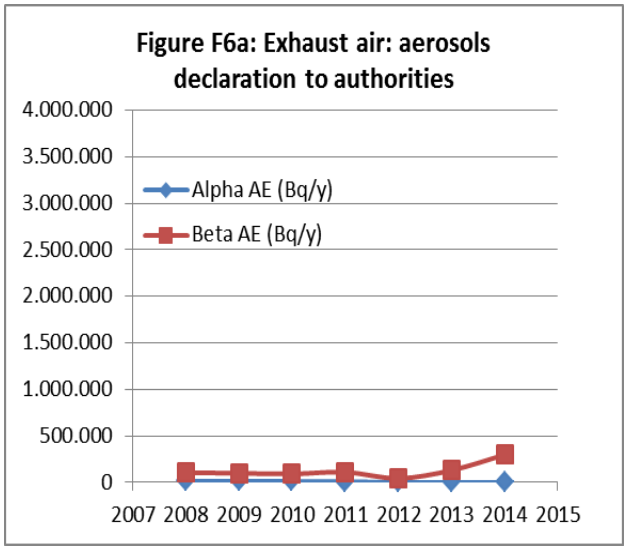
There were no specific targets for 2014. The following initiative contained in the Commission's EMAS annual action plan is being followed up:

Annual action plan no	Since	Description	Progress in 2014	Result
37	2014	Feasibility study: Encourage car pooling of staff by respective intranet page and special parking places (if feasible)	Completed	Intracomm car pooling site presented on ITU intranet starting page. Special places not feasible.

F5.3 Total air emissions of other air pollutants ($S0_2$, NO_2, PM)

Karlsruhe's emissions to air are an insignificant environmental aspect. It does not operate heating installations, hence, there are no processes generating either NOx or SOx. VOC emissions are not measured as air flow from the chemical laboratories passes through activated-carbon filters and thus can also be considered negligible. Consequently, there were no specific targets for 2014 and **2015 targets** in relation to release of air pollutants.

F5.4 Nuclear emissions



JRC-ITU does not make its own measurements relating to potential radioactive emissions to the surrounding environment but participates in KIT Campus Nord's surveillance program. KIT has an extensive surveillance program measuring air, soil, water and vegetation for radioactivity and is obliged to give regular reports about these measurements to the Umweltministerium Baden-Württemberg, the supervising authority for nuclear installations in Baden-Württemberg.

Due to extensive filtering systems emissions of radioactive substances are far below the legal limits as shown in Figure F6A. The limit for alpha-aerosols is 100.000 Bq/y, for beta-aerosols it is 40·000 000 Bq/y. In 2014 Karlsruhe recorded no emission of Alpha-Aerosols and only 0,75% of the authorised limit for Beta-emissions (cf. graph F6a; in which the maximum value represents 10% of the maximum value for beta-aerosols). Although Karlsruhe is far below the permitted values, nuclear emissions are considered as a significant aspect.

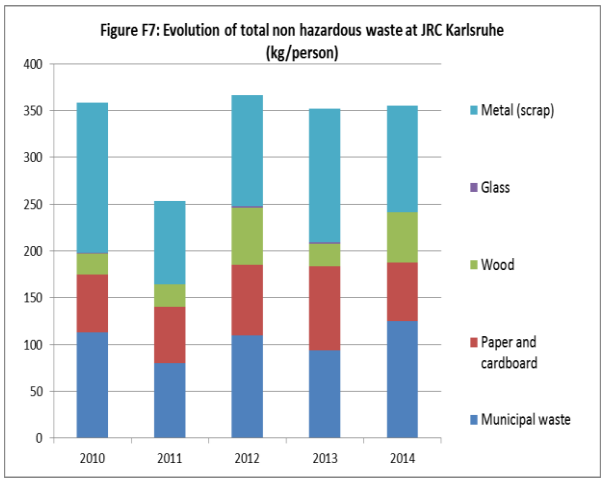
Owing to the already low values, a further reduction in nuclear emission is practically unachievable. Karlsruhe's **2015 target** is, nonetheless, to maintain this level of performance.

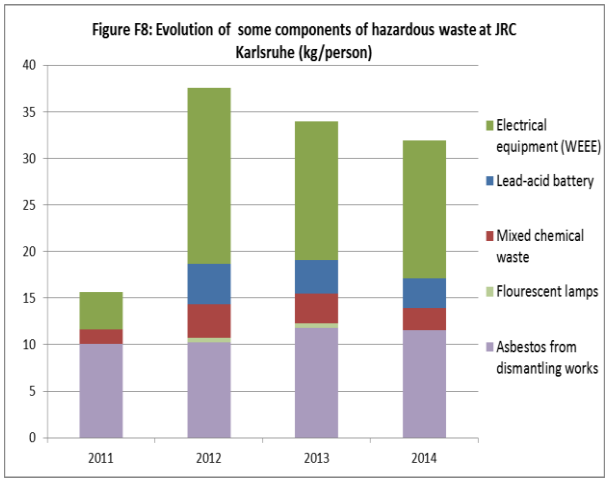
Notwithstanding, site policy is to keep emissions as low as reasonably possible, regardless of the authorised emission rates.

In 2011, as a consequence of the mediation process regarding the construction of the new laboratory wing Karlsruhe management declared a voluntary reduction of the authorised limit of "nuclear" emissions (cf. above) by 10%.

Annual action plan no	Since	Description	Progress in 2014	Expectations in 2015, and end date
38	2011	Reduction of the authorised limit of "nuclear" emissions by 10% (result of the mediation process in 2011)	No emissions of alpha aerosols	Repeat 2014 performance

F6 Improving waste management and sorting





F6.1 Non hazardous waste

Figure F7 shows no overall trend in per capita waste generation. The **2015 target** is to reduce waste by 1% compared with the 2014 level. The site has developed a policy of waste partitioning and recycling. Through this policy Karlsruhe constantly seeks to reduce overall waste production. The target will be achieved through strengthening awareness of the established procedures and through staff awareness campaigns. Non-hazardous waste is an insignificant environmental aspect.

F6.2 Hazardous Waste

Figure F8 shows the evolution in the generation of total controlled waste. Some categories of hazardous waste are disposed according to specific laboratory waste procedures and therefore accounted together with these as "mixed chemical waste". This approach has delivered the highest safety standards while reducing the administrative burden.

WEEE has been the largest component of hazardous waste since 2011 but under German law it has to be 100% recycled. By far the next largest component of hazardous waste is asbestos generated through renovation works. This is a historic liability as large parts of Karlsruhe were built in the 1960s; but asbestos will be removed in the next few years during the renovation. The **2015 target** is to reduce hazardous waste by 1%. Established procedures are working well and awareness campaigns will be continued. Therefore there are no specific management approved actions for continued improvement. Hazardous waste is an insignificant environmental aspect.

F6.2a Radioactive Waste

Nuclear waste management includes the disposal of radioactive waste as well as the unrestricted disposal of non-contaminated waste from the controlled area. Nuclear waste is considered a significant environmental aspect.

Disposal of radioactive waste can be separated in three processes:

1. Handling and disposal of radioactive waste, decontamination and dismantling;

2. Dismantling of disused glove-boxes, waste characterisation; and

3. Glove-box waste package measurements and gamma-spectrometry.

The amounts of nuclear waste since 2011 are shown in Table F4. A trend cannot be determined as the amount of disposed nuclear waste is depends on changing parameters, for example the research activities, glove box disassembling and also the capacity official nuclear waste acceptance institution of Baden-Württemberg which was strictly limited in recent years. As a consequence, there were no specific targets in 2014.

Table F4 - Nuclear waste disposed from site

Year	2011	2012	2013	2014
Waste volume (m^3)	168	112	179	152
evolution %		*-33*	*60*	*-15*
Activity (TBq)	5	2	13	2
evolution %		*-60*	*550*	*-85*

In addition to the usual handling of nuclear waste, non-contaminated waste from the contamination area can be cleared according to § 29 StrlSchV by respective measuring for unrestricted disposal[54].

F6.3 Waste sorting

Karlsruhe seeks to maximise the sorting of waste into potentially useful streams, and minimise the amount of unsorted municipal waste. The mass of waste that is sorted into streams other than municipal waste is indicated below.

Table F5: Evolution of percentage of non municipal waste streams

	2010	2011	2012	2013	2014
Percentage of waste sorted	69,8	71,2	73,9	77,2	68,8

The data in Table F5 shows that the percentage of sorted waste stays around 70% from 2010 to 2013 with a small drop in 2014.

Metals are sorted into several categories depending on the waste company's capacity. Almost 100% of electronic waste, batteries and glass are recycled. Wood and packaging recycling is maximised as much as possible according to the applicable regulations (managed by the waste company). Plastic is either recycled or used as surrogate fuel, for example in cement works; the respective decisions are made by the waste company. Construction waste is recycled as far

[54] Materials and other items for disposal coming from the controlled area are considered as potentially contaminated and hence, have to be treated as radioactive waste (according to the respective German regulations). On the other hand, there is a regulatory procedure to release these waste items out of the area of application of these regulations. For that, the items have to be measured and the detected values have to be below fixed values given by the applicable regulations. If the measured values are below the limit values the waste items can be treated as non-nuclear waste.

as possible depending on its composition (determined by the waste company). Municipal waste is not considered as sorted waste but it goes into a waste treatment plant where metals, other reusable and inert materials are extracted (and also recycled when possible) and the remaining (usually) organic material is used as surrogate fuel.

The **2015 target** is to maintain the percentage of sorted waste above 65%. There are no specific management approved actions for continued improvement. The target will be achieved through maintaining established procedures.

F6.4 Wastewater discharges

Karlsruhe's wastewater discharge falls into two categories: i) wastewater from the control and surveillance area which is tested for radioactive contamination and selected chemical parameters before being discharged to KIT's wastewater treatment installations, and ii) wastewater from the non-nuclear areas which is treated as conventional domestic sewage at KIT's wastewater plant. Wastewater discharge quantity corresponds to water consumption, as there is no other water input into the institute. These wastewater discharges are insignificant environmental aspects.

Another category of waste water (known as Chemie-III-Abwasser) comes from the Hot Cells and the decontamination processes in wing B. It is collected separately and disposed of as radioactive waste by the official nuclear waste acceptance institution of Baden-Württemberg. The quantities have increased slightly in recent years as shown in Table F6.

Table F6 – Radioactive waste water

Year	2011	2012	2013	2014
Chemie-III-Abwasser (m^3)	3	6	9	10
evolution %		*100*	*50*	*11*

F7 Protecting biodiversity

The total area of the site occupied by impermeable surfaces including buildings, parking lots, paved roads and paths etc. is 68.000 m^2, which is equivalent to 238 m^2 for each staff member. The "natural" proportion of the site covers approximately 25.000 m^2 or 27% of the total. The **2015 target** is to maintain the built surface at around 75% of the total site area. However, due to regulatory constraints, two new buildings (as mentioned in section F4.1) will be opened bringing the total built up proportion of the site to 75%.

Imminent effects of the site on the local environment can be considered as mostly insignificant but for ground sealing caused by the buildings and paved areas. Karlsruhe has no significant air emissions except the air coming out of the ventilation systems which is constantly measured with regard to radioactive contamination. Although the site is situated on one or more aquifers there is also no significant influence because the installation is a completely closed system with no possible emissions to the groundwater at all (except rainwater coming from the roofs). An influence to the surrounding biota is also negligible as the area of the site is rather small compared to the surrounding landscape (mostly forests) and there are almost no emissions to the neighbourhood (neither air, water or noise). As a consequence, there were no specific targets in 2014.

F8 Green Public Procurement

F8.1 Incorporating GPP into procurement contracts

Karlsruhe aims to incorporate green public procurement into its contracts exceeding 60.000 EUR and has increased the number of contracts incorporating "green" criteria in the last few years. A staff training campaign was conducted in January 2014. In 2014 18% of contracts exceeding 60.000 EUR included "green" criteria. The **2015 target** will be to incorporate GPP criteria in more than 3% of contracts.

F8.2 Office supply contracts

Most office supplies are provided through framework contracts arising from the Commission's (OIB) call for tenders. The Commission takes care to apply selection and award "green criteria" in order to select suitable contractors and products. Examples of the Commission's current framework contracts used by ITU are those for office supplies, office furniture or the supply of PCs and peripherals (through DG-DIGIT's contracts). There is no specific management approved action to support this improvement.

F9 Demonstrating legal compliance

F9.1 Legal situation

Karlsruhe is a nuclear installation according to the respective German legislation and as such bound in a tight regulatory framework set up by the Atomgesetz (Atomic Energy Act, latest version November 2015) and its subordinated Rechtsverordnungen (ordinances) like the Strahlenschutzverordnung (Radiation Protection Ordinance, latest version December 2014) or the Röntgenverordnung (Ordinance on X-Ray Devices, latest version December 2014).

Karlsruhe operates under a set of nuclear licences including amendments listed below:

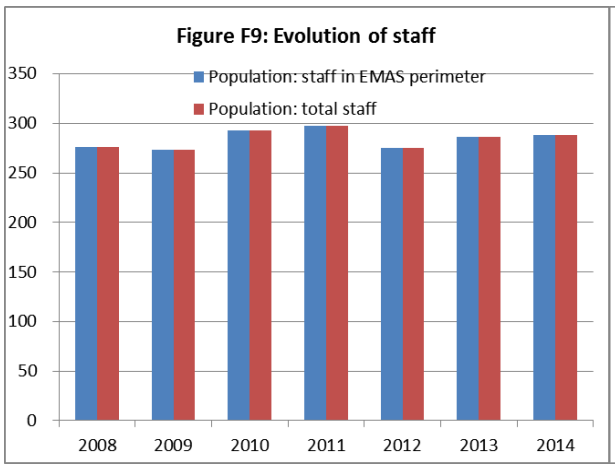
- Genehmigung/licence Nr. K/30/65 [07/65]
- Genehmigung/licence K/46/66 - LU/101/66 [10/66]
- Nachtrag 1 zur Genehmigung/amendment 1 to licence Nr. K/30/65 [09/66]
- Nachtrag 1 zur Genehmigung/amendment 1 to licence Nr. K/46/66 - LU/101/66 [10/66]
- Nachtrag 2 zur Genehmigung/amendment 2 to licence Nr. K/30/65 - LU/95/66 [10/67]
- Nachtrag 3 zur Genehmigung//amendment 3 to licence Nr. K/30/65 - LU/95/66 [11/71]
- Nachtrag 4 zur Genehmigung/amendment 4 to licence Nr. K/30/65 - LU/95/66 [07/74]
- Nachtrag 5 zur Genehmigung/amendment 5 to licence Nr. K/30/65 - LU/95/66 [08/77]
- Nachtrag 6 zur Genehmigung/amendment 6 to licence Nr. K/30/65- LU/95/66 [06/81]
- Nachtrag 7 zur Genehmigung//amendment 7 to licence Nr. K/30/65 - LU/95/66 [04/82]
- Nachtrag 8 zur Genehmigung/amendment 8 to licence Nr. K/30/65 - LU/95/66 [07/82]
- Änderungsgenehmigung zum Nachtrag 8/licence for modification to amendment 8 [09/84]
- Genehmigung/licence S1/97 [10/97]
- Änderungsgenehmigung nach § 9 AtG (Flügel M)/ licence for modification acc. to § 9 AtG (wing M) Nr. K/132/2012 [03/12]

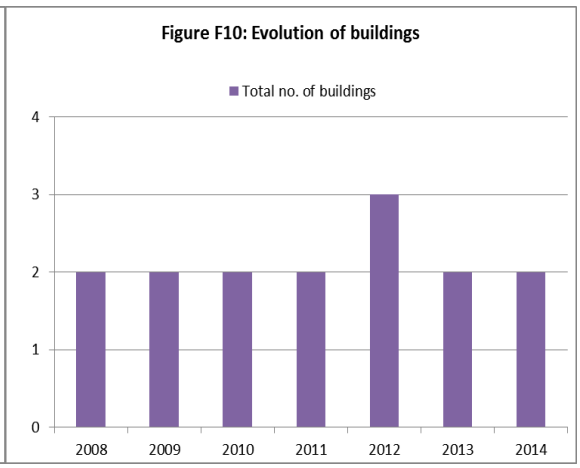
Other applicable regulations are listed and assessed in the Legal Register RGS0002/M4/R9. It is updated twice per year. The latest version is dated December 2015.

Karlsruhe operates under close and constant surveillance of the competent supervisory authority (Ministry of Environment of Baden-Württemberg; cf. also F11). Since start of operations there were no legal proceedings against Karlsruhe and consequently also no penalties or fines.

F9.2 Achieving the site's EMAS registration

Figure F9 indicates that the total number of staff has remained between 275 and 300 in recent years with numbers in 2014 similar to 2013. This is due to turnover of temporary contracts, held for example by grant-holders and fellows. The configuration in the number of buildings shown in Figure F10 remained stable.





In 2012 there was an additional temporary building (office containers) for the administrative staff as the older administrative wing was renovated and expanded. This building was disassembled after the new office wings became operational. In 2014/15 there will be two new buildings, a guard's house and a goods transfer building that will become operational in 2015. The site will then contain four buildings.

The **2015 target** is to achieve EMAS certification for the entire site (as summarised in the following management approved action) and to renew the ISO 14001 certification.

Annual action plan no	Since	Description (and reference)	Progress in 2014	Expectations in 2015, and end date
69	2013	Preparation for EMAS registration	Ongoing, verification audit postponed for administrative reasons	Continue in 2015

F9.3 Compliance with EMAS

Karlsruhe is working towards inclusion in the Commission's EMAS registration in 2015, based on reporting for 2014. Fulfilling ISO 14001 requirements provides a useful base for achieving this target.

F10 Internal communication (and training)

In 2013 there was one site based EMAS training package that was taken up by 10 staff members, nearly 4% of total staff, and prioritising Karlsruhe's senior management. In 2014 about 64% of the staff participated on the commission's EMAS e-learning module. The **2015 target** is to provide one site based training course for management and other concerned staff.

At JRC-Karlsruhe, 23% of staff participated in the EMAS sustainable mobility competition on 19/09/2014, opting for greener alternatives of transport. The Director's office team ranked first, with a participation rate of more than 60%. Other top-ranking units showed 33-50% of staff participating.

F11 Transparent dialogue with external partners

Karlsruhe holds licences under German Atomic Law and the Radiation Protection Ordinance (cf. F9.1). These cover all operations and plant components and therefore all modifications must be approved by the competent supervisory authority (Ministry of Environment of Baden-Württemberg). Karlsruhe and the supervisory authority are responsible for compliance with the licences and the latter therefore regularly monitors Karlsruhe's nuclear area. Karlsruhe and the Ministry of Environment share objectives for the safety and security of Karlsruhe's nuclear area. In this context Karlsruhe and the competent authority enjoy a close collaboration based on regular meetings, solving problems and verifications.

Dialogue also involves, in addition to local communities and stakeholders, international stakeholders through activities such as site visits and information campaigns. . In this context, the following are some of the persons and interest groups who visited Karlsruhe:

- Baden-Badener Unternehmergespräche,
- CDU Eggenstein –Leopoldshafen,
- European School Karlsruhe,
- Gemeinderat (city council) of Karlsruhe,
- Daniel Caspary (MEP),
- Syed Kamall (MEP),
- Lions Karlsruhe,
- Several student groups of the KIT,
- French Alternative Energies and Atomic Energy Commission (CEA),
- Chinese Academy of Science,
- IAEA Training,
- Delegation of DG ENER - DIRECTORATE B (Internal energy market) and DIRECTORATE C (Renewables, research and Innovation, Energy Efficiency), and
- DWM Seminar

F12 EMAS costs (and savings)

Table F7 presents the evolution of costs for some EMAS parameters and an estimation of savings based on unit cost data.

Table F7: EMAS costs and savings for selected parameters in EUR

	Costs:					Savings since:	
	2010	**2011**	**2012**	**2013**	**2014**	**2011**	**2013**
Total Direct EMAS Cost (EUR)	0	0	0	81.000	81.000	-81.000	0
Total Direct Cost per employee	0	0	0	283	281	-283	2
Total buildings energy cost (Eur)	1.026.000	1.020.960	1.044.180	1.004.580	1.048.523	-27.563	-43.943
Total buildings energy cost (Eur/person)	3.502	3.426	3.797	3.513	3.641	-215	-128
Total water costs (Eur)	14.201	10.432	10.550	12.239	14.806	-4.374	-2.567
Water (Eur/person)	48	35	38	43	51	-16	-9
Total paper cost (Eur)	NR	NR	6.938	5.551	6.938		-1.388
Total paper cost (Eur/person)	NR	NR	25	19	24		-5

Direct EMAS costs appear only in 2013 and were unchanged in 2014, the total comprising 0.5 FTE (full time equivalent staff member) and a small consultancy contract and consequently cost per employee were similar but slightly lower than in 2013.

Data collected for EMAS reporting permits indicates that total energy costs increased by 27.563 EUR for the period 2011 to 2014 and per capita costs have risen slightly. Total and per capita water costs rose in 2014 compared with 2013. Paper costs also increased in 2014.

Overall waste disposal costs have not been included as they comprise several different components, for example 60 EUR/tonne for wood; 130 EUR/tonne for municipal waste; 210 EUR/tonne for mixed plastics (incl. PVC); and 330 EUR/tonne for mineral fibrous insulating material. Recycling of waste metals however generates revenue and can vary by type of metal and scrap exchange prices. Mixed scrap may typically fetch 100-150 EUR/tonne, whereas copper 1.000 to 1.300 EUR/tonne.

It is clear that energy costs per person are by far the most significant cost factor. Karlsruhe's ability to demonstrate cost savings under EMAS will be challenged by its strict licensing requirements.

F13 Data tables for JRC Karlsruhe:

Line	Objective/ indicator	Parameter and units	2008	2009	2010	2011	2012	2013	2014
2	**Basic EMAS**	**Population: staff in EMAS perimeter**	**276**	**273**	**293**	**298**	**275**	**286**	**288**
4		**Population: total staff**	**276**	**273**	**293**	**298**	**275**	**286**	**288**
6		**No. buildings seeking EMAS registration**	**0**	**0**	**0**	**0**	**0**	**2**	**2**
8		**Total no. of buildings**	**2**	**2**	**2**	**2**	**3**	**2**	**2**
10		**Useful surface area in EMAS perimeter, (m^2)**	**22.650**	**22.650**	**22.650**	**22.650**	**22.650**	**30.477**	**30.477**
12		Useful surface area for all buildings, (m^2)	22.650	22.650	22.650	22.650	22.650	30.477	30.477
14		Total site area, (m^2)	93.000	93.000	93.000	93.000	93.000	93.000	93.000
16	**Objective I) Efficient use of resources**								
19	**Ia**	**Total energy buildings, (MWh)**	**21.705**	**21.393**	**23.065**	**21.052**	**20.550**	**22.888**	**20.489**
23		**MWh/person**	**78,641**	**78,363**	**78,721**	**70,645**	**74,728**	**80,029**	**71,143**
27		**kWh/m^2**	**958**	**945**	**1.018**	**929**	**907**	**751**	**672**
29		i) supplied electricity, (MWh)	11.375	11.100	11.400	11.344	11.602	11.162	11.650
31		**MWh/person**	**41,214**	**40,659**	**38,908**	**38,067**	**42,189**	**39,028**	**40,452**
33		**kWh/m^2**	**502,2**	**490,1**	**503,3**	**500,8**	**512,2**	**366,2**	**382,3**
35		renewables in electricity mix, (%)	20	20	20	20	20	20	32
37		from renewables, (MWh)	2.275	2.220	2.280	2.269	2.320	2.232	3.681
39		**MWh/person**	**8,243**	**8,132**	**7,782**	**7,613**	**8,438**	**7,806**	**12,783**
41		**kWh/m^2**	**100**	**98**	**101**	**100**	**102**	**73**	**121**
43		non renewables in electricity in mix, (%)	80	80	80	80	80	80	68
45		from non renewables, (MWh)	9.100	8.880	9.120	9.075	9.282	8.930	7.969
47		**MWh/person**	**32,971**	**32,527**	**31,126**	**30,454**	**33,751**	**31,222**	**27,669**
49		**kWh/m^2**	**402**	**392**	**403**	**401**	**410**	**293**	**261**
53		ii) supplied gas, (MWh)	0	0	0	0	0	0	0
55		**MWh/person**	**0,000**	**0,000**	**0,000**	**0,000**	**0,000**	**0,000**	**0,000**
57		**kWh/m^2**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
59		iii) supplied diesel, (MWh)			16,3	16,3	16,3	16,3	16,3
61		**MWh/person**			**0,056**	**0,055**	**0,059**	**0,057**	**0,057**
63		**kWh/m^2**			**0,7**	**0,7**	**0,7**	**0,5**	**0,5**
65		iv) district heating, (MWh)	10.330	10.293	11.649	9.692	8.932	11.710	8.839
67		**MWh/person**	**37,428**	**37,703**	**39,758**	**32,523**	**32,480**	**40,944**	**30,690**
69		**kWh/m^2**	**456,1**	**454,4**	**514,3**	**427,9**	**394,3**	**384,2**	**290,0**
71		v) site generated renewables - biomass, (MWh)	0	0	0	0	0	0	0
73		**MWh/person**	**0,000**	**0,000**	**0,000**	**0,000**	**0,000**	**0,000**	**0,000**
75		**kWh/m^2**	**0,0**	**0,0**	**0,0**	**0,0**	**0,0**	**0,0**	**0,0**
77		vi) site generated renewable - PV, (MWh)			0	0	0,0	0,0	0,0
79		Installed peak capacity, (kWhp)			0	0	0,0	0	0
81		Assumed output, (% of kWh/p)			0	0	0	0	0
83		**MWh/person**			**0**	**0**	**0,0000**	**0,0000**	**0,0000**
85		**kWh/m^2**			**0**	**0**	**0,000**	**0,000**	**0,000**
89	**1b**	**Total energy used by service vehicles, (MWh/yr)**			**0**	**0**	**0**	**0**	**172,44**
93		**MWh/person**			**0**	**0**	**0**	**0,000**	**0,599**
97		**kWh/m^2**			**0**	**0**	**0,0**	**0,000**	**5,658**
99		**Diesel used, (m^3)**			**0**	**0**	**0,000**	**0,000**	**5,708**
101		kWh of energy provided by one litre diesel			11	10,9	10,9	10,89	10,89
102		**Petrol used, (m^3)**			**0**	**0**	**0,000**	**0,000**	**11,707**
104		kWh of energy provided by one litre petrol			9	9,4	9,4	9,42	9,42
105		**Other fuel (optional)**			**0**	**0**	**0,0**	**0,0**	**0,0**
107		kWh of energy provided by one……			5	5,0	5,0	5,0	5,0
110	**1c**	**Total renewable energy use, (MWhr/yr)**			**2.280**	**2.269**	**2.320**	**2.232**	**3.681**
114		**renewable energy as part of total, (%)**			**9,88**	**10,78**	**11,29**	**9,75**	**17,97**
118		**Onsite generated renewables as part of total energy, (%)**			**0,00**	**0,00**	**0,00**	**0,00**	**0,00**
122	**1d**	**Water usage in EMAS perimeter, (m^3)**	**4.557**	**5.117**	**7.474**	**5.216**	**5.275**	**5.563**	**6.730**
126		**m^3/person**	**16,511**	**18,744**	**25,509**	**17,503**	**19,182**	**19,451**	**23,368**
130		**l/m^2**	**201**	**226**	**330**	**230**	**233**	**183**	**221**
134	**1e**	**Office paper consumption, (tonnes)**				**5,880**	**5,880**	**4,704**	**5,880**
138		**Office paper consumption (tonnes/person)**			**0,000**	**0,020**	**0,021**	**0,016**	**0,020**
140		Paper Density (g/m^2)			80	80	80	80,0	80,0
142		Sheets/kg			200	200	200	200	200
144		Total No. of sheets			0	1.200.000	1.200.000	960.000	1.200.000
146		Sheets/person				4.027	4.364	3.357	4.092
148		Working days in the year			211	211	211	211	211

151		**Office paper sheets/person/day**			**0**	**19**	**21**	**16**	**19**
155	**1f**	**Offset paper consumption (tonnes)**			**0,0**	**0,0**	**0,0**	**0,0**	**0,0**
159		**Offset paper (tonnes/person)**			0,000	0,000	0,000	0,000	0,000
161	**Objective II) Reduction in CO2 (including CO2 equivalent of greenhouse gases) and other air pollutants**								
164	**2a**	**Total office building emissions from energy, (tonnes CO_2)**	**8.912**	**8.741**	**9.212**	**8.762**	**8.752**	**9.084**	**5.557**
168		**tonnes CO_2/person**	**32,288**	**32,020**	**31,439**	**29,402**	**31,825**	**31,763**	**19,294**
172		**kgCO_2/m²**	**393,4**	**385,9**	**406,7**	**386,8**	**386,4**	**298,1**	**182,3**
174		**i) from electricity, (CO_2 tonnes)**	**6.711**	**6.549**	**6.726**	**6.693**	**6.845**	**6.586**	**3.670**
176		Kgs CO2 from 1 kWh of electricity	0,59	0,59	0,59	0,59	0,59	0,59	0,315
177		**tonnes CO2/person**	**24,316**	**23,989**	**22,956**	**22,460**	**24,892**	**23,027**	**12,742**
179		**kgCO2/m²**	**296**	**289**	**297**	**295**	**302**	**216**	**120**
181		**ii) from gas (tonnes/yr)**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
183		Kgs CO2 from 1 kWh natural gas	0,213	0,213	0,213	0,213	0,213	0,213	0,213
184		**tonnes CO2/person**	**0,000**	**0,000**	**0,000**	**0,000**	**0,000**	**0,000**	**0,000**
186		**kgCO2/m²**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
188		**iii) from diesel (tonnes/yr)**			**4**	**4**	**4**	**4**	**4,3**
190		Kgs CO2 from 1 kWh diesel			0,264	0,264	0,264	0,264	0,264
191		**tonnes CO2/person**			**15**	**0,014**	**0,016**	**0,015**	**0,015**
193		**kgCO2/m²**			**0**	**0**	**0**	**0**	**0**
195		**iv) from district heating (tonnes/yr)**	**2.200**	**2.192**	**2.481**	**2.064**	**1.903**	**2.494**	**1.883**
197		Kgs CO2 from 1 kWh	0,213	0,213	0,213	0,213	0,213	0,213	0,213
198		**tonnes CO2/person**	**7,972**	**8,031**	**8,468**	**6,928**	**6,918**	**8,721**	**6,537**
200		**kgCO2/m²**	**97**	**97**	**110**	**91**	**84**	**82**	**62**
202		Total quantity of refrigerants (tonnes)			**n.a.**	**n.a.**	**n.a.**	**n.a.**	**0,000**
204		**Total refrigerant losses (tonnes)**			**n.a.**	**n.a.**	**n.a.**	**n.a.**	**0,000**
208	**2b**	**Emissions of other gases as CO_2 equivalent (tonnes)**			**0,0**	**0,0**	**0,0**	**0,0**	**0,0**
212		**tonnes CO2equiv/person**			**0,000**	**0,000**	**0,000**	**0,000**	**0,000**
216		**kgCO2equiv/m2**			**0,000**	**0,000**	**0,000**	**0,000**	**0,000**
218		**inventory R22, (kg)**							
219		i) losses R22, (kg)			0	0	0,0	0,00	0,00
220		GWP			1810	1810	1810	1810	1810
221		**as tCO2equiv**			0,0	0,0	0,0	0,0	0,0
223		**inventory R410A, (kg)**							
224		ii) losses R410A, (kg)			0,00	0,00	0,00	0,00	0,00
225		GWP			2.090	2.090	2.090,00	2090	2090
226		**as tCO2equiv**			0	0	0,00	0,00	0,00
228		**inventory R134A, (kg)**							
229		iii) losses R134A, (kg)			0	0,0	0,00	0,00	0,00
230		GWP			1.430	1.430	1.430,00	1430	1430
231		**as tCO2equiv**			0	0	0,00	0,00	0,00
233		**inventory R404A, (kg)**							
234		iv) losses R404A, (kg)			0	0,0	0,00	0,00	0,00
235		GWP			1.000	1.000	1.000,00	1000	1000
236		**as tCO2equiv**			0	0	0,00	0,00	0,00
238		**inventory R407C, (kg)**							
239		v) losses R407C, (kg)			0	0,0	0,00	0,00	0,00
240		GWP			1.000	1.000	1.000,00	1000	1000
241		**as tCO2equiv**			0	0	0,00	0,00	0,00
243		**inventory R507A, (kg)**							
244		vi) losses R507A, (kg)					0,00	0,00	0,00
245		GWP						3300	3300
246		**as tCO2equiv**					0,00	0,00	0,00
248		**inventory R422D, (kg)**							
249		vii) losses R422D, (kg)					0,00	0,00	0,00
250		GWP						3300	3300
251		**as tCO2equiv**					0,00	0,00	0,00
255	**2c**	**Site vehicle CO_2 emissions (tonnes)**			**0**	**0**	**0,0**	**0,0**	**41,9**
257		**tonnes CO_2/person**			**0**	**0**	**0,000**	**0,000**	**0,146**
259		**i) from diesel (tonnes)**			**0**	**0**	**0,0**	**0**	**15,2**
261		Kgs CO2 from one litre of diesel			2,67	2,7	2,7	2,67	2,67
262		**ii) from petrol**			**0**	**0**	0,00	**0,0**	**26,7**
264		Kgs CO2 from one litre of petrol			2,28	2,3	2,3	2,28	2,28
265		**from other fuel (eg propane)**			0	0,0	0,0	0,00	0,00
270		**gCO2/km (manufacturer)**			**0**	**0**	**0**	**0,0**	**202,0**
272		Vehicle kms travelled			0	0	0	0	183.400
274		**Internal fleet efficiency (litres/100km)**							**9,50**
278		**gCO2/km (actual)**							**229**
280		Number of vehicles			8	8	8	8	10

282		**kms/vehicle**			**0**	**0**	**0**	**0**	**0**
286	**2d**	**Total air emissions buildings (tonnes), as mimimum NOx, SO_2, PM_{10}**			**0**	**0**	**0**	**0,0**	**0,0**
288		**tonnes/person**						0,0000	0,0000
290		NOx, (kg)			n.a.	n.a.	n.a.	n.a.	n.a.
292		SO2, (kg)			n.a.	n.a.	n.a.	n.a.	n.a.
294		PM10, (kg)			n.a.	n.a.	n.a.	n.a.	n.a.
296		…..others (VOC), (kg)			n.a.	n.a.	n.a.	n.a.	n.a.
298		….others CO, (kg)							
300	**Objective III) Waste management**								
303	**3a**	**Total non hazardous waste, (tonnes)**			**107,5**	**77,9**	**105,7**	**103,7**	**106,5**
307		**Total non haz.waste (tonnes/person)**			**0,367**	**0,262**	**0,384**	**0,363**	**0,370**
309		Municipal waste			33,2	23,8	30,3	26,7	36,1
311		Paper and cardboard			18,0	18,0	20,8	25,7	18,0
313		Wood			6,7	7,1	16,6	6,9	15,4
315		Glass			0,2	0,0	0,6	0,6	0,0
317		Metal (scrap)			47,0	26,6	32,7	40,8	32,9
321		Plastic			2	2	5	3	4
332	**3b**	**Total hazardous waste (tonnes)**			**2,330**	**4,650**	**10,324**	**13,580**	**9,369**
336		**Total hazardous waste, (tonnes/person)**			**0,0080**	**0,0156**	**0,0375**	**0,0475**	**0,0325**
340		Mixed chemical waste			**0,000**	**0,470**	**0,980**	**0,920**	**0,697**
344		Filters			n.a.	n.a.	n.a.	n.a.	n.a.
352		Medical waste			**n.a.**	**n.a.**	**n.a.**	**n.a.**	**n.a.**
354		Flourescent lamps			**0,000**	**0,000**	**0,134**	**0,134**	**0,000**
356		Fire extinguisher			n.a.	n.a.	n.a.	n.a.	n.a.
358		Lead-acid battery					1,19	1,016	0,902
360		Mercury containing objects			n.a.	n.a.	n.a.	n.a.	n.a.
362		Asbestos from dismantling works			0	3	2,82	3,38	3,32
364		Insulating glass fibre						3,86	0,18
368		Electrical equipment (WEEE)			2,33	1,18	5,20	4,27	4,27
372	**3c**	**Percentage of waste sorted**			**69,76**	**71,18**	**73,91**	**77,20**	**68,85**
374	**Objective IV) Protecting biodiversity**								
377	**4a**	**Built surface area, (m^2)**			**64.500**	**64.500**	**68.000**	**68.000**	**68.000**
381		**Built surface area, (m^2/person)**			**220**	**216**	**247**	**238**	**236**
385		**Built surface area as part of site, (%)**			**69**	**69**	**73**	**73,1**	**73,1**
387	**Objective V) Green procurement**								
389	**5a**	**Contracts >60k with "eco" criteria (%)**			NR	NR	NR	NR	18
392	**5b**	**Green products in office catalogue (%)**			**NR**	**NR**	**NR**	**NR**	**NR**
394		Green products in catalogue, (No)			NR	NR	NR	NR	NR
395		Products in catalogue, (No)			NR	NR	NR	NR	NR
396		Total value of products purchased from catalogue (EUR)			NR	NR	NR	NR	NR
398		Value of green products purchased (EUR)			NR	NR	NR	NR	NR
400	**Objective VI) Legal conformity**								
402	**6a**	**EMAS registered buildings (%)**			0	0	**0**	**0**	**0**
405	**6b**	**EMAS registered useful floorspace (%)**			0	0	0	**0,0**	**0,0**
407		**EMAS verification non conformities**			0	**0**	**0**	**0**	**0**
409	**Objective VII) Communication**								
411	**7b**	**No. of difft trainings on offer**					**0**	**1**	**1**
413	site training	**No of training beneficiaries**					**0**	**10**	**234**
415		**Staff benefiting from training (%)**					**0,0**	**3,5**	**81,3**
417	**Objective VIII) Promoting dialogue with external partners**								
418									
419									
420	**Estimating EMAS costs and virtual value of identified savings**								
421	**Direct costs**	**Total Direct EMAS Cost (EUR)**			0	0	**0**	**81.000**	**81.000**
422		Total Direct Cost per employee			0	0	0	283	281
423		**i) Annual direct staff costs**			**0**	**0**	**0**	**66.000**	**66.000**
424		Annual direct staff costs (time FTE)			0	0	0	0,5	0,5
425		Annual cost of one FTE			132000	132000	132.000	132.000	132.000
426		**ii) Annual contract costs**			**0**	**0**	**0**	**15.000**	**15.000**
427		Contract 1 (cost per year) if applicable			0	0	0	15.000	15.000
430		**iii) Annual misc costs**			**0**	**0**	**0**	**0**	**0**
433	**Energy (Bldgs)**	Electricity unit cost (Eur/MWh)			90,00	90,00	90,00	90,00	90,00
434		Gas (Eur/MWh)			70,00	70,00	70,00	70,00	70,00
435		Fuel (Eur/MWh)			0,00	0,00	0,00	0,00	0,00
436		**Total buildings energy cost (Eur/person)**			**3.502**	**3.426**	**3.797**	**3.513**	**3.641**
437		Electricity (Eur/person)			3502	3426	3797	3513	3641
438		Gas (Eur/person)			0	0	0	0	0
439		Fuel (Eur/person)			0,00	0,00	0,00	0,00	0,00

440		Total buildings energy cost (Eur)			1.026.000	1.020.960	1.044.180	1.004.580	1.048.523
441	**Energy (vehic.)**	Diesel unit cost- (Eur/m3)			n.a.	n.a.	n.a.	n.a.	n.a.
442		Petrol unit cost- (Eur/m3)			n.a.	n.a.	n.a.	n.a.	n.a.
443		Total cost Diesel (Eur)							
444		Total cost petrol (Eur)							
445		Total energy costs (Eur/person)					n.a.	n.a.	n.a.
446		**Total fuel costs (vehicles) (Eur)**							
447	**Water**	Water unit cost (Eur/m3)			1,90	2,00	2,00	2,20	2,20
448		Water (Eur/person)			48,47	35,01	38,36	42,79	51,41
449		**Total water costs (Eur)**			**14.201**	**10.432**	**10.550**	**12.239**	**14.806**
450	**Paper**	Paper (office) - unit cost/kg				1,18	1,18	1,18	1,18
451		Paper (offset) - unit cost/kg				0,00	0,00	0,00	0,00
452		Paper (office) - Eur/person				23,28	25,23	19,41	24,09
453		Paper (offset) - Eur/person				0,00	0,00	0,00	0,00
454		Total paper (office) cost (Eur)				27,47	29,77	22,90	28,43
455		**Total paper cost (Eur/person)**				**23,28**	**25,23**	**19,41**	**24,09**
456		Total paper cost (Eur)				6.938	6.938	5.551	6.938
457	**Waste**	Waste disposal (general) - unit cost/tonne			n.a.	n.a.	n.a.	n.a.	n.a.
458		**Waste disposal (general) - Eur/person**			**n.a.**	**n.a.**	**n.a.**	**n.a.**	**n.a.**
459		Waste disposal (hazardous) - unit cost/tonne			n.a.	n.a.	n.a.	n.a.	n.a.
460		**Waste disposal (hazardous) - Eur/person**			**n.a.**	**n.a.**	**n.a.**	**n.a.**	**n.a.**
461		**Total waste cost (Eur)**			**n.a.**	**n.a.**	**n.a.**	**n.a.**	**n.a.**
462	**Other site specific data**								
468		Alpha AE (Bq/y)	13.000	14.000	11.000	8.000	0	0	0
469		Beta AE (Bq/y)	105.000	98.000	91.000	110.000	43.300	130.000	297.000
470		Nuclear waste volume (m3)				168	112	179	152
472		Activity TBq				5	2	13	2
474		Chemie-III-Abwasser (m³)	10			3	6	9	10

ANNEX G: JRC ISPRA

In 1957 the Euratom Treaty, signed in Rome by six European founding Members (Belgium, France, Germany, Italy, Luxembourg and the Netherlands), created the European Atomic Energy Community (EURATOM). Since its creation EURATOM has supported the establishment and growth of safe nuclear power related industries to contribute the peace, health and prosperity of European citizens. To support this mission, Article 8 of the Treaty established a Joint Research Centre (JRC) with sites located in four Member States to perform top level research and disseminate findings for policy-making and to set uniform safe standards. Ispra was selected as the Italian site.

The activities of what has become the JRC Ispra site began in 1958 with the construction of the Ispra 1 nuclear reactor by the Italian "Comitato Nazionale per l'Energia Atomica" (CNEN). Subsequently, under the agreement between the Italian government and the European Atomic Energy Community (Euratom), the Ispra site came under the jurisdiction of the European Community, with an act ratified on 1st August 1960 (Italian Law 906). Initially the site was dedicated to nuclear research. At the beginning of 1990s, however, it was decided to focus on new areas of research, mainly related to environment and sustainability, health and consumer protection and protection and security of the citizen. Currently the nuclear plants and most of installations located within the site are in the process of decommissioning.

The site hosts three scientific research institutes:

a) **IES** – Institute for Environment and Sustainability: whose mission is to provide scientific and technical support to EU policy makers concerned with the protection and sustainable development of the European and global environments;
b) **IHCP** – Institute for Health and Consumer Protection; whose mission is to provide scientific and technical support to the EU policy makers working for the protection of the interests and health of European citizens in the areas of food, consumer products, chemicals and public health; and
c) **IPSC** – Institute for the Protection and the Security of the Citizen; whose mission is to enhance safety and stability of the European society on the basis of an agreed EU agenda by turning scientific results into measurable impact.

The site also accommodates personnel from other JRC sites and European Commission DGs as well as some detached Units of other JRC research institutes, in particular:

a) **IET** – Institute for Energy and Transport (IET) which is headquartered in Petten (Netherlands); and whose mission is to provide support to European Union policy makers working with technological innovation to ensure sustainable, safe, secure and efficient energy production, distribution and use and to foster sustainable and efficient transport in Europe; and
b) **ITU** – Institute for Transuranium Elements, which is headquartered in Karlsruhe (Germany) and which provides the scientific foundation for the protection of European citizens against risks associated with the handling and storage of highly radioactive material.

In addition to these research institutes, the Ispra Site Management (**ISM**) Directorate is responsible for site management and for nuclear decommissioning, safety, security and protection. Its mission is to make the site a safe, secure and attractive working environment by providing efficient customer-driven services to facilitate the current and future scientific

activities of the Ispra Institutes; while ensuring that the site is a good neighbour to the community.

JRC Ispra also hosts also partially two administrative directorates (Directorate A and B), and three units (PMO.06, OIB.OS.3 and HR.C.5) which do not belong to DG JRC. All the above-mentioned organisations are in the EMAS scope, which covers the entire site and some areas outside the fence as described in G2.2.

The average daily presence on the JRC Ispra site is more than 2 700 people, of whom more than 1.800 are JRC staff and about 850 are external contractors. The site hosts about 25.000 visitors on a yearly basis.

G1 Overview of core indicators at JRC Ispra since 2011

JRC Ispra has been reporting on EMAS parameters since 2014 with data mostly stretching back at least to 2011. The variation of the core indicators is shown below.

Table G.1: Percentage changes in core indicators at JRC Ispra over long, medium and short term

Parameter and units	From: 2011 Overall	From: 2013 Overall	To: 2014 % per year
Energy bldgs (KWh/p)	-14,0	-5,9	-5,9
Energy bldgs (KWh/m^2)	-18,4	-17,2	-17,2
Water (m3/p)	-50,6	-18,4	-18,4
Water use (l/m^2)	-53,1	-28,2	-28,2
Office paper (ton/person)	-13,8	3,3	3,3
Office paper (Shts/person/day)	-13,8	3,3	3,3
CO2 buildings (ton/p)	-15,3	-6,8	-6,8
CO_2 bldgs (kg/m^2)	-19,5	-18,0	-18,0
CO2 veichles (ton/p)	-3,8	-0,6	-0,6
Non haz.waste (kg/p)	5,6	-11,6	-11,6

It is evident that there have been significant reductions since 2011 in all parameters other than non-hazardous waste production, which is strongly influenced by the maintenance, construction and demolition activities undertaken at the site.

G2 Description of JRC Ispra setting and activities

G2.1 Site setting

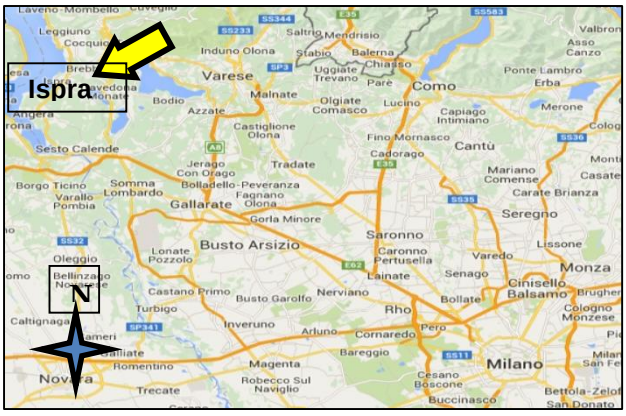


Figure G1 – Geographical overview of JRC Ispra site (*source Google Maps*).

The Ispra site occupies about 167 hectares, and is located about 70 km north west of Milan, in Italy, as shown in Figure G1. The site is in a hilly area between Lakes Maggiore and Varese. at an altitude of approximately 230 m above sea level. The site contains two small ponds, one wide basin in the centre of the site and many hectares of groves

(comprising mainly pines, birches, oaks, acacias and chestnut trees).

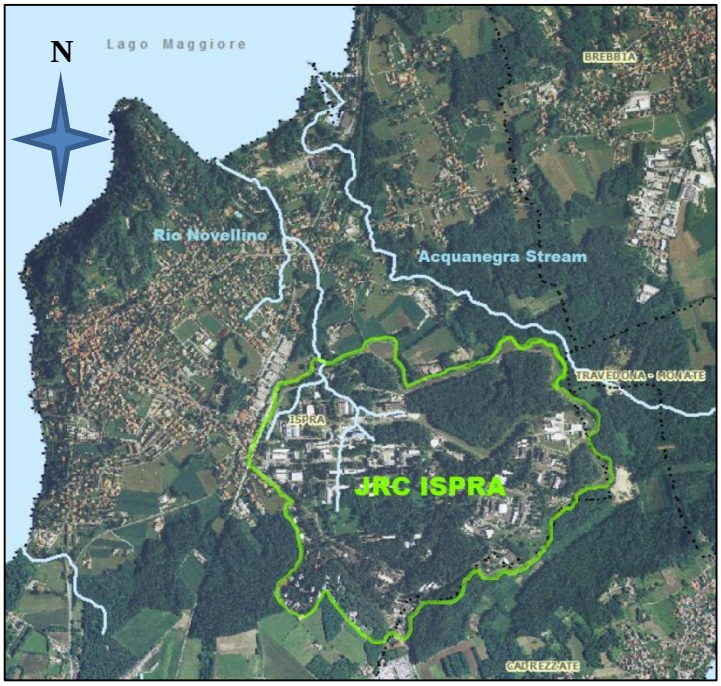


Figure G2 – Location of Rio Novellino and Acquanegra Stream *(source:http://cartografia.provincia.va.it/)*.

The main surfacewater courses that flow in the vicinity of the site are the Rio Novellino, a small river which has its source within the site and flows SE to NW, and the Acquanegra, Stream which flows alongside the north-east boundary. Both discharge into "Lake Maggiore".

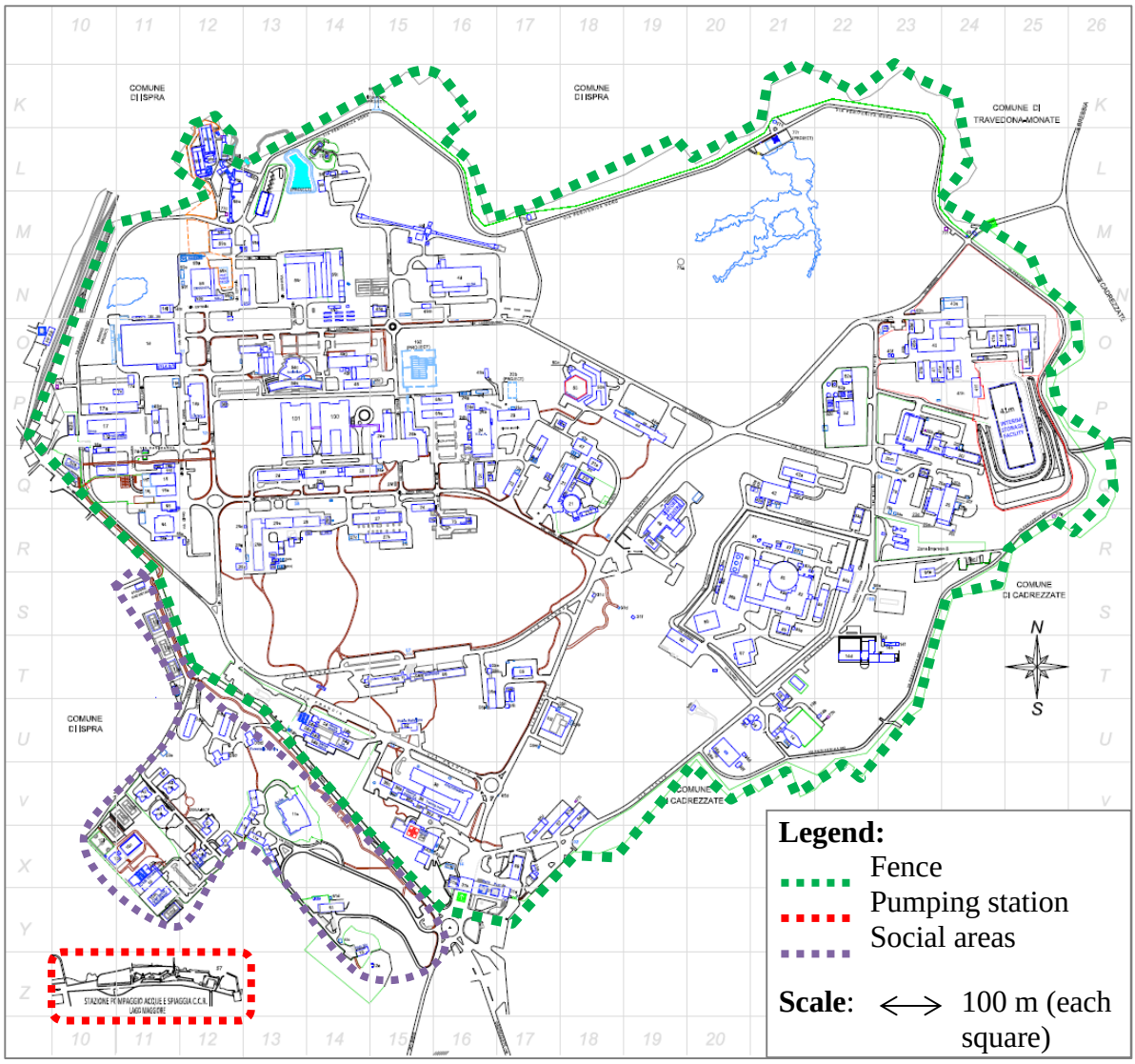
The meteorological conditions of the site are extremely variable and the weather can change very suddenly. The coldest months are typically December and January, while during summer average temperatures exceed 20°C. The average rainfall in the area is less than 1 000 mm, August and September are the wettest months when rainfall can exceed 150 mm in just a few days. The relative humidity registered in the JRC site is generally high due to the presence of two large lakes nearby. The site is generally well protected from the winds: but analysis of the multi-year wind rose indicates that the dominant wind direction is from North to South, and it is in this direction that the higher speeds can be registered.

G2.2 Description of JRC Ispra activities

Core based activities and plants of Ispra site are located inside the fence, as shown in Figure G2. Some facilities are outside the fence, such as the pumping station located on the Lake Maggiore shore, about 3 km from the Ispra site, the JRC apartments and guest quarters (about sixty flats and twenty lodgings), the Club House, childcare and sports facilities and building 51 that hosts some of ISM's staff. All these premises are within the EMAS scope.

Within the boundaries of the site there are about 300 buildings out of which approximately 140 are technical outbuildings (such as gas cylinder cabinets, transformer cabinets, etc.). There are some new buildings, but most of the structures are more than twenty years old. About 60% of the buildings are from the 1960s, 15% from the 1980s and about 20% from the 1990s. Only a few buildings have been built more recently, and these were designed to create a high density zone, in which the scientific activities are concentrated. The new buildings have improved the overall energy efficiency of Ispra infrastructure which is still largely dominated by inherently inefficient older buildings.

Figure G3 - General overview of JRC Ispra Site



a) JRC Ispra utility plants and infrastructure

ISM is responsible for running the JRC Ispra site's utility plants in order to provide an appropriate service at a site level. The most relevant utility plants are as follows:

Table G2 – JRC Ispra utility plants.

Utlity plant	Function	Operation period
Trigeneration plant supplied with methane	Electricity, hot water and cold water production	From 2004
Wastewater treatment plant	Wastewater treatment before discharge in the Lake Maggiore	From 1978
Pumping station	Water supply from the Lake Maggiore	From 1960s
Filtering station	Water disinfection and distribution through the site network	From 1960s

Utlity plant	Function	Operation period
Sewage network	Collection of wastewater from buildings to wastewater treatment plant	From 1960s
Electrical energy transformer station (Bld. 14)	Reduction of the electric voltage and distribution through the site network	From 1960s
Electrical energy transformer cabins	Reduction of the electric voltage and distribution through the buildings	From 1960s
Petrol station	Supply of fuel for internal fleet and other utilities	From 1960s and totally refurbished in 2012
Technical galleries	Distribution of all utilities needed for the ordinary operation of the JRC Ispra site (e.g. electric cables, hot and cold water pipes, drinking and industrial water pipeline, optical cables).	From 1960s

b) Nuclear installations:

Activities for the development of a nuclear research centre at Ispra started in 1958. In 1959 the first reactor (Ispra-1) became operational. Over the years further research installations, including ESSOR, the second nuclear reactor, and labs were constructed.

The facilities still operating are:

- ADECO – "Atelier Démantèlement Eléments Combustibles Orgel", Experimental organic heavy water nuclear reactor.
- Dry wells - old nuclear material and waste store.
- PERLA – Performance Laboratory.
- PUNITA - Pulsed Neutron Interrogation Test Assembly.
- SGRR – "Stazione di Gestione dei Rifiuti Radioattivi", Radioactve waste treatment facility.

Currently the long term shutdown[55] nuclear installations are:

- Ispra 1, ESSOR and ECO nuclear research reactors.
- Cyclotron: a type of particle accelerator in which charged particles are propelled by an alternating electric field between two large electrodes in a constant magnetic field created by two large magnets. Shutdown in 2014.
- LCSR – "Laboratorio Caldo Studi e Ricerche", Hot cells facility: a laboratory progressively shutdown in the 90's.
- STRRL – "Stazione di Trattamento dei Rifiuti Radioattivi Liquidi", Radioactive liquid effluent treatment facility: shut down after 40 years of operation and replaced by the new "Stazione di Trattamento degli Effluenti Liquidi", Liquid effluent treatment plant facility (STEL).

[55] Shutdown: an interruption of nuclear activity. Therefore it does not necessarily imply that nuclear facilities have been decommissioned.

An example of complete decommissioning is RadioCHemistry Laboratory –RCHL. This lab has been progressively shutdown in 1990s. The decommissioning programme was completed and the buildings are currently being used as the JRC Visitors' Centre.

The nuclear activities at the JRC–Ispra impact the environment in essentially three ways:

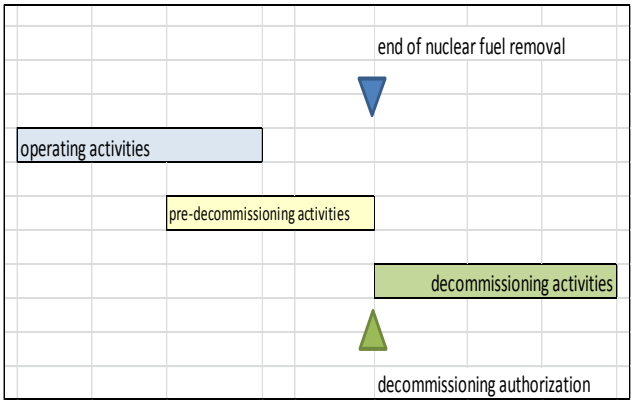
1. Radioactive emissions during the operating and the future decommissioning activities phase (see Paragraph G5.4 on *Radioactive emissions*);
2. The management of old radioactive waste and the generation of radioactive decommissioning waste (see Paragraph G6.5 on *Radioactive Waste Management System*);
3. Indirect use of conventional industrial resources (i.e. not due to the nuclear nature of the operations).

c) The Decommissioning programme

The site's nuclear plants and most of nuclear research installations are currently either under decommissioning[56] or in preparation for decommissioning. Decommissioning has the ambitious goal of restoring the site to its original condition (also called "green field" status) " in most of the former nuclear areas by 2030. The programme includes the following steps:

1. removal of nuclear materials;
2. dismantling and removal of the radioactive waste;
3. reduction of any residual radioactivity and a final radiological survey;
4. Re-establish "green field" status having no radiological constraints.

The decommissioning programme, as well as all the nuclear activities performed on the JRC Ispra site, are fully implemented under the Italian legislation and are inspected by the Italian nuclear safety authority (I.S.P.R.A.). The completion of the decommissioning programme is funded by a budget about 750 million Euro (to be completed by 2030).



Pre-decommissioning is an intermediate stage between the operating and decommissioning phases (see figure to the left).

The main objective of the Ispra site Decommissioning and Waste Management Programme[58] is to decommission the shutdown nuclear facilities and to manage the resulting waste together with the old waste.

[56] Decommissioning: the last major licensed phase of a nuclear installation. It involves taking the installation out of operation while ensuring the health and safety of personnel and the general public and the protection of the environment, and culminates in the termination of the installation license.

[58] For further information please refer to: http://dwm.jrc.ec.europa.eu

The SGRR, the Radioactve waste treatment facility, is the supporting facility for the decommissioning and waste management. This facility is located in the designated zone known as "Area 40" and will be the main centre of future waste management activities. The Interim Store Facility has been built to accommodate temporarily the storage of low level conditioned radioactive waste produced in the SGRR facility, until these shall be transferred to the Italian national repository.

In the future decommissioning phase, a significant increase in waste production is expected and therefore the aim will be maximize the ratio between conventional and radioactive wastes by using advanced techniques such as blasting to reduce the volume of radioactive portion.

d) Research activities

The core activities of the **IHCP** are in line with European legislation regarding:

- chemicals (REACH) and biocides;
- genetically-modified organisms;
- cosmetics and animal welfare;
- consumer products;
- food and food-contact materials; and
- nanomaterial.

IHCP performs chemical, biological and physical testing and analysis in dedicated laboratories onsite, such as the ECVAM[59] labs which are mainly dedicated to the study of the alternative methods to animal testing.

IES covers the entire range of environmental sciences, with particular competences in the field of earth observation and remote sensing. Through its research actions, the IES supports a large number of European policies and programmes including i) the Europe 20/20/20 Strategy and its flagship initiatives for a resource-efficient Europe, ii) the Digital Agenda for Europe, iii) the Innovation Union, and iv) the Industrial Policy for the Globalisation Era. The IES runs several large-scale research infrastructures including the European Reference Laboratory for Air Pollution (ERLAP) and one of the monitoring stations based on Italian territory in the framework of the European Monitoring and Evaluation Programme (EMEP). This laboratory analyses air quality for European projects monitoring atmospheric pollution and those investigating climate change on a global scale by means of a new 100 metres air sampling tower.

Based on a combination of advanced ICT and engineering expertise, **IPSC** provides European policy makers with scientific and technology advice on issues relevant to safety, security and stability both within and outside the EU. It provides scientific and technological support to European Union policies including those for global stability and security, crisis management, maritime and fisheries management and the protection of critical infrastructures. IPSC's core competencies are in the field of engineering and information technologies, satellite image processing and analysis, open source information analysis, structural mechanics and risk assessment. The European Laboratory for Structural Assessment (ELSA) accommodates several studies on materials endurance, particularly using concrete and new materials.

[59] ECVAM is the European Centre for the Validation of Alternative Methods. For more information see Internet web page: https://eurl-ecvam.jrc.ec.europa.eu/

Moreover, the technologically sophisticated equipment enables the lab to conduct some seismic tests on full-scale buildings.

IET's Ispra units deal with the energy supply, renewable energy, and sustainable transport by means of the European Solar Test Installation (ESTI) and the Vehicle Emissions Laboratories (VELA). VELA's main activity is the analysis of air emissions generated by cars, vans, scooters and trucks under different fuels and climatic conditions. Therefore the labs contained air conditioned rooms. New laboratories are being built where research on electric vehicles and on energy storage efficiency will be undertaken.

ITU's Ispra unit deals with Nuclear Security and provides technical support to the EURATOM and International Atomic Energy Agency (AIEA) nuclear inspectors developing and operating advanced detection tools to uncover clandestine nuclear activities.

G3 Environmental impact of JRC Ispra activities

This section considers the site's significant environmental aspects. An analysis of environmental aspects has been made using a specific procedure[60] under which significant environmental aspects have been identified and these are summarised in Table G.3. The ISM is taking measures to reduce pollution (airborne emissions, waste production, wastewater discharge) and to achieve more efficient use of natural resources (mainly energy and water).

Table G.3 also shows the indicators that are most pertinent to the significant environmental aspects, along with actions that have been defined and validated by the EMAS Steering Committee, and which are referenced in the following sections.

[60] P01, "Identification and evaluation of environmental aspects", Environmental Management system

Table G3 Significant environmental aspects at JRC Ispra

Aspect group	Environmental aspect	Environmental impact	Location/activity	Indicator	Action Plan Reference
Air and energy	Energy use in buildings, machines, equipment etc. Energy production in trigeneration plant. Refrigerant gas releases. Radioactive atmospheric release[61]	Air pollution, climate change, depletion of ozone layer (HCFC emissions)	All site but in particular: trigeneration plant; non-nuclear scientific laboratories; use of service vehicles; site maintenance and infrastructures development; nuclear controlled areas	(1a) Total energy buildings (electricity + gas) (MWh/yr) (MWh/person) (kWh/m²) (1b) Total energy used by service vehicles (MWh/yr) (MWh/person) (kWh/m²) (1c) Total renewable energy use (MWhr/yr) (Renewables as % of total energy use) (Onsite generated renewables as % of total energy use) (2a) Total building emissions CO_2 (tonnesO_2equiv/yr)(tonnes/person) (kg/m²) (2b) Refrigerants CO_2equiv (tonnesO_2equiv/yr) (tonnesCO_2equiv/person) (kgCO_2equiv/m^2) (2c) Site vehicle CO_2 emissions (tonnesO_2equiv/yr) (tonnesCO_2equiv/person) (kgCO_2equiv/m^2) (2d) Total air emissions buildings (tonnes) (tonnes/person)	101, 102, 103, 104, 105, 106, 107, 111, 113, 114, 122, 123, 125
Waste	Various household-like waste (e.g. packaging, paper, glass, plastic) Non-hazardous waste from maintenance activities Hazardous non-nuclear waste (chemical, biologic, batteries etc.) Nuclear waste[62]	Exploitation of renewable materials, waste production, disturbing of living environment and health risks	All site, especially: office; canteens; non-nuclear scientific laboratories; site management and infrastructure; nuclear controlled areas	(3a) Total non-hazardous waste, (tonnes) (tonnes/person) (3b) Total hazardous waste (tonnes) (tonnes/person) (3c) Percentage of waste sorted (%)	140, 141, 142

[61] The radioactive release in the environment (mainly air and water) are strictly monitored by the Italian authority (Italian Supervisory Authority) to whom JRC Ispra sent annually a detailed report.

Aspect group	Environmental aspect	Environmental impact	Location/activity	Indicator	Action Plan Reference
Waste water	Waste water discharge from wastewater treatment plant Soil and groundwater contamination Radioactive release in wastewater [63]	Water and soil pollution, disturbing of living environment and health risks	Wastewater treatment plant, scientific laboratories, site management and infrastructure, nuclear controlled areas	Total treated wastewater (m^3)	109
Resources	Use of chemicals and consumables, including paper Use of water for drinking but also for cooling purposes	Exploitation and decrease in natural resources	All site, especially: scientific laboratories, office, print shop, site management and infrastructure, trigeneration plant, canteens	(1e) Office paper consumption (tonnes)(tonnes/person) (Number of sheets total) (Number of sheets per person) (No. of sheets per person/ per day) (1f) Offset paper consumption (tonnes) (tonnes/person) (1d) Water consumption (m^3) (m^3/person) (l/m^2)	110, 112

[62] It should be noted that nuclear waste are not counted in the waste indicators.

[63] See previous note Nr.2.

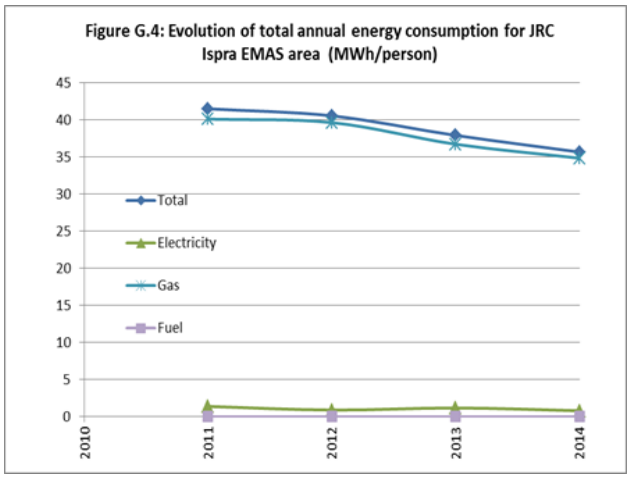
G4 More efficient use of natural resources

G4.1 Energy consumption

a) Buildings

Electrical energy is provided to the JRC Ispra site mostly by the internal trigeneration gas plant managed by ISM and, where needed, from an external supplier. The plant has been in permanent operation since September 2004. It is connected to a thermal and cooling pumping station and related networks for heating and air conditioning for most of the buildings. Currently only a small number of buildings remain unconnected to this system and refrigeration for these is provided by independent coolers or by pumping fresh water from Lake Maggiore, which passes through the site's filtering station, and is then distributed in the centre (the so-called "industrial water").

The main purpose of the external provider is as a backup power supply. There are also nine emergency diesel powered plants (five fixed and four mobile). The canteens and the Club House of the site are supplied with methane gas, directly from the methane distribution network, for cooking as are the sports centres and the residencial areas, located outside the fence.



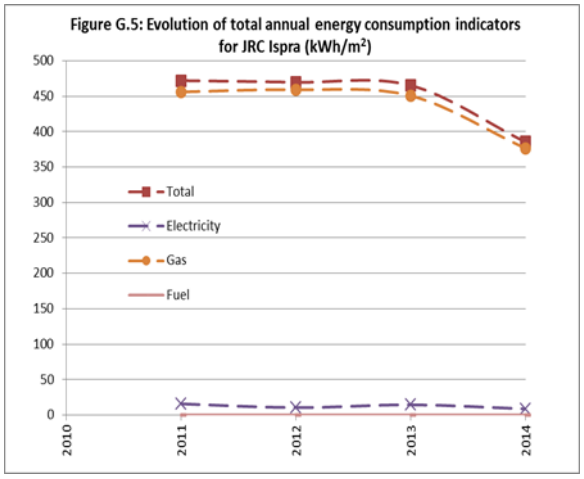


Figure G.4 shows that per capita total annual energy consumption has decreased steadily since 2011, despite a larger staff presence on site in recent years. Figure G.5 shows a large reduction in energy consumption since 2013. New energy efficient buildings 100 and 101 have increased the site's useful surface area and contributed to a reduction in the overall energy consumption per square metre. Further to this, it has been evaluated that the present consumption of buildings 100 and 101 is slightly higher than the current saved consumption of old demolished or abandoned buildings to date. By means of the following actions foreseen within the specific construction site plan:

a) start-up of the heat pumps;
b) abandoning definitively all buildings partially occupied;
c) continuing the demolition or refurbishment of old buildings, as applicable

we can predict further important savings in primary energy.

Total energy consumption decreased due to several energy saving actions implemented over the last few years. In particular, the installation of new operational logic for electrical energy saving in many buildings and the replacement of old lighting systems with new LED lamps in streets and in the underground galleries.

Specific initiatives have been planned and carried out in the course of the years aiming to increase staff awareness about energy saving, in collaboration with ISM communication and JRC Ispra Green Team, obtaining relevant saving results. For instance adhering to the 2014 "M'illumino di meno" campaign yielded a 10% energy saving result with respect to business as usual conditions. This result is consistent with those of previous years.

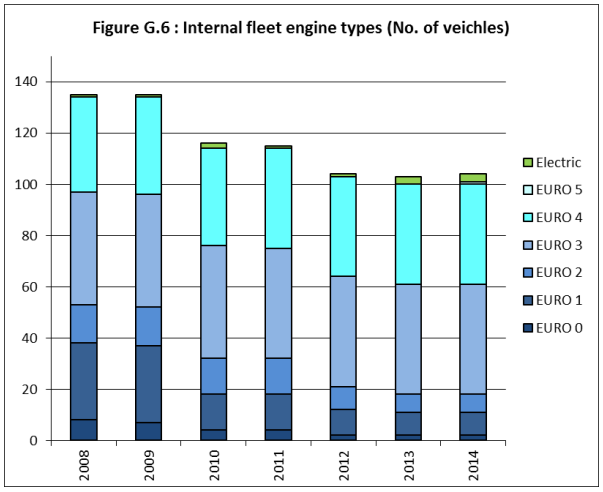
The **2015 target** is to keep a constant positive trend of total energy savings (about -1,5% MWh/yr) although to the increasing number of staff, the relocation of staff in the new buildings but the delay in the demolitions of the old and less efficient buildings. It should be noted that the target has been set without considering new operational facilities with high energy consumption, namely VELA 8, VELA 9 and the Smart Grid Laboratory that are planned to be operational before the end of 2015.

Initiatives for continued improvement identified in the Commission's 2015 EMAS annual action plan are summarised below. Most of the improvement actions are implemented each year, depending on technical and budgetary considerations.

Annual action plan no.	Since	Description	Progress in 2014	Expectations in 2015, and end date (if app)
101	2011	Implement site development plan taking into account: a) old buildings refurbishment must reach at least energy class C, and b) old non performing buildings to be removed according to the building demolition plan.	On-going	On-going
102	2011	Installation of measurement devices for electric and thermal energy (both warm and cold) consumption with automatic data recording in occasion of the refurbishment of buildings.	On-going	On-going
103	2011	Installation of new operational logic systems for energy saving on air conditioning systems and for electrical energy saving.	On-going	On-going
104	2012	Replacing street lamps with more efficient ones (LED).	On-going	On-going
105	2011	Installing presence sensors in all common areas in order to improve energy saving (automatic light switch off).	On-going	On-going
108	2015	Update the 2011 Energy Management Plan		Starting
111	2014	Technical analysis for improvement the efficiency of the most significant HVAC plants in the Nuclear Decommissioning Unit (ISM C.1 unit).	Starting	On-going
113	2015	Technical analysis of the electrical system in the Nuclear Decommissioning Unit (ISM C.1 unit).		Starting
114	2013	Refurbishment of new Foresteria with a high level of energy efficiency.	On-going	Completion of works and kick off of data collection

b) Site vehicles

A fleet of 104 service vehicles supports site staff in their research and other technical activities, providing internal mobility across the rather large site. The fleet includes mobile laboratories, works vehicles, internal postal service vehicles as well as those for the fire brigade and ambulances, etc.



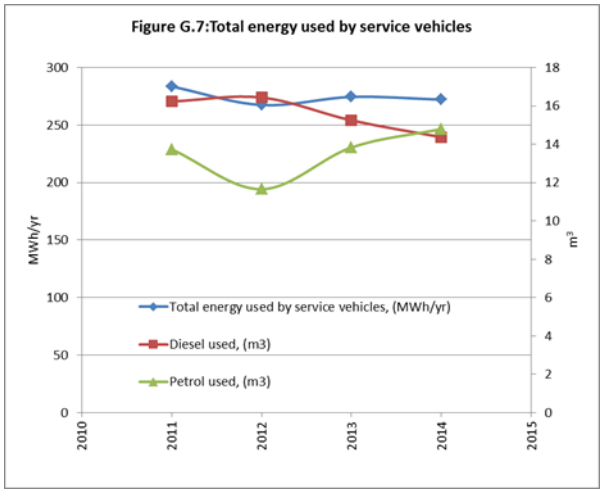


Figure G.6 shows the breakdown of the vehicle fleet by EURO standard. The standard is imposed on manufacturers of engines of vehicles sold in the EU, with each successive standards being more stringent than the last particularly with respect to emissions. The number of site vehicles has fallen because a policy for reduction of its number and the rationalisation of its use has been applied since 2009. The older less efficient and more polluting vehicles with EURO 0 and EURO 1 engines are still required for some special purposes such as towing mobile laboratories, firefighting and as an ambulance. But these vehicles are seldom used, and their impact therefore small.

The fleet has become cleaner, with vehicles with engines classified at least as EURO 3 increasing from 72% in 2011 to 83 % in 2014. Two electric vehicles (EV) were added to the fleet in 2013 for a total of three EVs.

Figure G.7 shows that the total energy[64] used by service vehicles decreased about 4% from 2011 to 2014. When the refurbished JRC Ispra petrol station became operational, the consumption of diesel and gasoline during 2013 stabilized at just below the 2011. The anomalous 2012 figures are explained by the fact that while the petrol station was under refurbishment, diesel fuel was still availble on site: this fostered its use with respect to petrol.

In order to reduce the vehicle fleet's environmental impact the site is planning to purchase ten electric passenger and ten electric small vans in the period 2014-2015 to replace existing conventional vehicles. The **2015 target** is to reduce total fleet consumption by 8%.

In the period 2016-2017, JRC Ispra plans to buy a further forty electric vehicles: twenty electric passenger and twenty electric small vans. The service vehicle fleet would then comprise low or zero emission vehicles with the exception of large vans (vehicles for

[64] The ammount indicated in the Figure G6 are included external refueling regarding service cars during missions but are not included consumption of "operating machinery", lifter, generator and other little machinery

infrastructure works) and special vehicles, such as mobile laboratories, firefighting vehicles or the site ambulance.

The actions contained in the Commission's 2015 annual action plan to reach the prefixed targets are summarised below.

Annual Action plan no	Since	Description	Progress in 2014	Expectations in 2015, and end date (if app)
123	2014	Purchase 18 electrical vehicles to replace conventional vehicles in the JRC-Ispra service fleet	Call for tender launched	JRC Ispra to purchase 17 electric vehicles, 10 small two-seat cars, 5 electric vans, two seats, for goods, and 2 electric vans, four seats. These vehicles are to be delivered in June 2015.
125	2014	Install charging stations for electrical vehicles at the Via Grecia parking, the main entrance and the service vehicles garage.	Preliminary study started	On-going

c) Renewable energy use in buildings and vehicles

Taking into account that the JRC Ispra trigeneration plant cannot be classified as a renewable energy source, even though it provides greater efficiency than traditional means of energy generation, the installations which can produce energy from renewable sources within the site are the photovoltaic (PV) pannels systems operated by ESTI (IET) for research purposes and linked to JRC Ispra network, the PVs installed in Via Grecia parking area and on the roofs of buildings 100 and 101 which came into operation in October 2014.

ISM is planning a major investment in order to significantly increase renewable energy production. And besides the on-site renewable energy production, Ispra's external electricity supplier certified in 2013 that renewable energy accounted for 37.06% of the energy mix supplied to Ispra. The **2015 target** is to increase the use of renewable energy of 15% by means of the following planned actions:

Annual Action plan no	Since	Description	Progress in 2014	Expectations in 2015, and end date (if app)
106	2014	Install photovoltaic panels on the roofs of buildings 100-101 and in the Via Grecia parking.area	Completed within the year	In production
107	2015	Install photovoltaic panels on the roof of buildings 48 and 18.		Starting

G4.2 Water consumption

Water supply is from a pumping station located on the shore of Lake Maggiore about three kilometres from the Ispra site. This pumping station is considered as part of JRC Ispra and is

run by ISM. The pumping station delivers water through three steel pipes leading to a treatment station within the Ispra site. All the water coming from the pumping station is initially treated with hydrochloric acid and chlorite to eliminate algae and microorganisms and then filtered through several sand filters. The treated water then undergoes a second phase of disinfection with the addition of chlorine dioxide in order to become drinking water. From the filtering station, the water distribution network branches into three different lines which run for about 74 km underground within the centre and comprise:

a) low pressure drinking water: for most staff use (canteen, toilets, etc.);
b) high pressure drinking water: high pressure is maintained within the main circuits (particularly the fire circuit within the ESSOR nuclear area); and
c) cooling water: it supplies many utilities, such as the building's cooling plants, most of the fire circuits, the evaporative towers serving the trigeneration plant and the VELA laboratories.

Apart from the drinking and sanitary use, the water is used also for cooling buildings, using two different networks:

i) a closed circuit supplied with the cooling water produced in the trigeneration plant; and

ii) an open circuit supplied directly with the industrial water pumped from the lake which is then discharged into the sewage system and received mainly in the wastewater treatment plant and partially in the sewerage system that collects rain water and discharges it outside the site into the Acquanegra Stream.

During the last few years most of the site buildings have been on the closed cooling circuit, reducing the need for water to be abstracted the lake and treated. Currently the main buildings that are still cooled with lake water in an open circuit are those in the nuclear area (Isola Nucleare ESSOR, with a flow of about 100 m^3/h and Cyclotron which was shut down at the end of 2014).

It should also be noted that when the Isola Nucleare ESSOR complex and other labs were built, it was thought appropriate to use lake water for HVAC cooling. Consideration of whether overall water consumption could be reduced would have to take into account the probable additional use of electricity for cooling instead. Furthermore a significant amount of the site's energy and industrial water consumption is dedicated to ensuring nuclear safety including the conservation of nuclear plant and existing radioactive waste through confinement systems, safety devices, systematic controls, and monitoring of the site and the surrounding environment.

In 2006, JRC Ispra signed an agreement to supply water, upon request, to the Brebbia Municipality, especially during summer months. The total amount of water distributed to the Municipality was relatively insignificant in relation to the site's hydrological balance and typically less than 1000 m^3/year). Lombardy Regional Decree n. 9082 was signed on 15th October 2012 regulating the abstraction of water from Lake Maggiore.

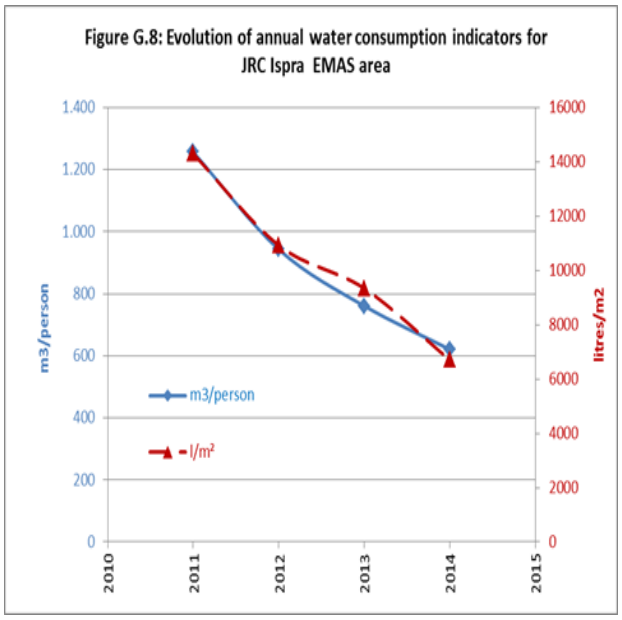


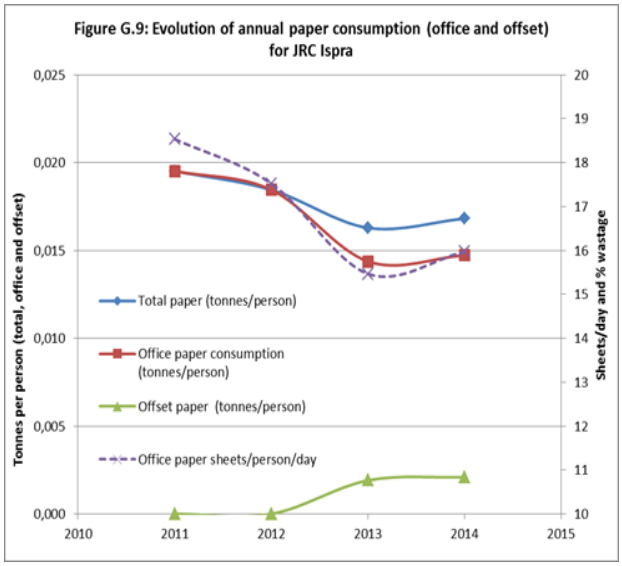
Figure G.8 shows how water consumption has evolved since 2011 measured on a per capita and per square metre basis. Overall water consumption registered a reduction of more than 45% from 2011, due to the implementation of specific actions aimed at reducing water consumption and detecting leaks in the distribution system.

In order to further reduce water consumption, a new regulation system was installed at the pumping station in 2013, allowing for automatic regulation of the pumps' speed. Moreover, the connection of buildings to the closed cooling circuit has been continued and has almost been fully completed.

As mentioned in section G.4[65], in 2014 a self-assessment was launched to optimize the use of thermal energy in the main nuclear facilities. Another self-assessment to optimize electrical energy is planned for late 2015.

The **target for 2015** is to reduce further water consumption (-2,5% in 2014) both by connecting the buildings to the closed cooling circuit and by enhancing the maintenance of the distribution network, in order to eliminate the leakages.

Annual Action plan no	Since	Description	Progress in 2014	Expectations in 2015, and end date (if app)
110	2011	Reduce water consumption by connecting buildings to the cooling water network	On-going	On-going



G4.3 Office paper

Office paper is mainly used for everyday printing in the offices but also in the internal print shop for the production of reports, leaflets, etc. An environmentally friendly printing policy limits single orders to the internal print shop to a maximum of 200 copies.

Paper consumption (measured currently as "distribution") has been steadily decreasing as shown in Figure G.9 since 2011. In 2014 the reduction was around 14% since 2011

[65] Please refer to the Annual action plan, action No. 111

(equivalent of 19 to 16 sheets per person per day). The **2015 target** is at least a further 5% reduction.

Offset paper consumption was measured separately in 2013 for the first time. Previously it was included in the office paper counting.

G5 Reducing emissions of CO_2, other greenhouse gases and air pollutants

G5.1 CO_2 emissions from buildings

Table G.3: Percentage of CO_2 emissions from different sources in 2014 (ton/person)

Source	Quantity (ton/person)	% of total
Buildings	7	99,2
Refrigerants loss	0,04	0,5
Vehicles	0,03	0,4
Total	**7,39**	**100,0**

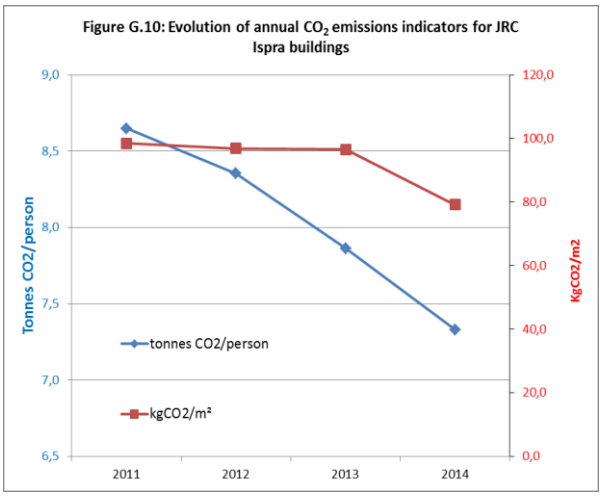
Table G.3 illustrates that buildings account for over 99% of calculated CO_2 emissions in 2014.

a) Buildings (CO_2 from energy consumption)

CO_2 emissions are generated through combustion of the main energy sources:

i. natural gas for the operation of trigeneration plant (production of electricity and hot water), hot water for heating the residences and sports centres, and cooking in the canteen and club house; and
ii. electricity supplied by external supplier from the electricity grid.

Figure G.10 shows that, as with energy consumption, per capita CO_2 emissions has decreased in the last few years, and the **2015 target** is a 1,5% reduction over 2014.

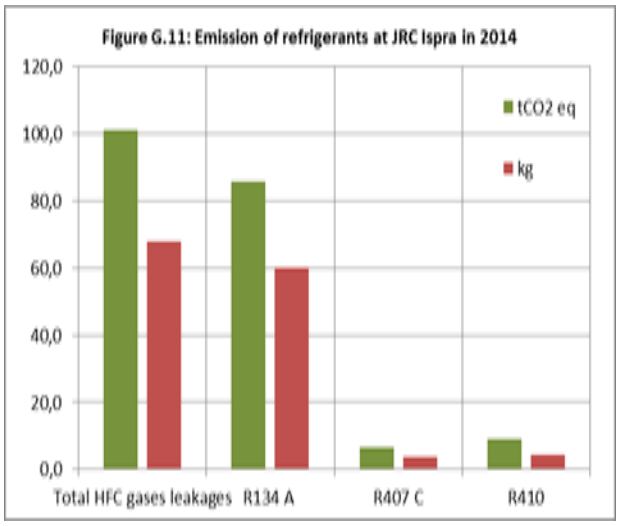


Consumption per square metre decreased slightly in 2014.

Ispra decided to meet the 20/20/20 Directive requirements, which target a 20% reduction in CO_2 emissions by 2020, but adopting 2010 as a baseline. This commitment was formalised in the Site Energy Management Policy, signed by all Directors having staff in Ispra site, in May 2012. The measures introduced to reduce energy consumption described in section G4.1 will also reduce CO_2 emissions.

b) Buildings other greenhouse gases (cooling gases)

Figure G11 shows JRC Ispra's recorded losses of cooling gases (in kg), together with equivalent quantity of CO_2 (in tonnes).



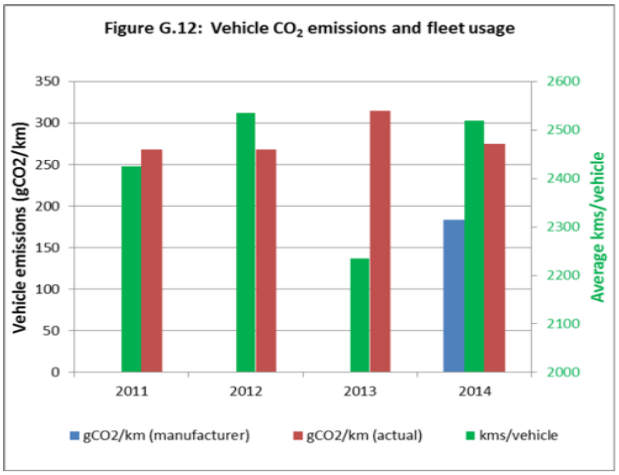
In 2014 about 100 tonnes equivalent of CO_2 were lost from machines installed in offices as well as laboratories. More than 75% of this is due to R134A coming from the chillers of the trigeneration plant.

Although some cooling installations still contain R22, there were no detected leakages of this gas.

A consistent dataset of refrigerant gas quantities in JRC Ispra's installations was established in 2014. The **2015 target** is for emissions of cooling gases not to exceed levels recorded in 2014.

G5.2 CO_2 emissions from vehicles

a) Commission vehicle fleet



The theoretical value of JRC Ispra's internal fleet emissions was calculated in 2014 for the first time using data from the vehicle manufacturer's record books (for cars and trucks). This value was increased by a nominal 10% in order to take into account the 10 older *special vehicles*, for which information about CO_2 emissions was not available.

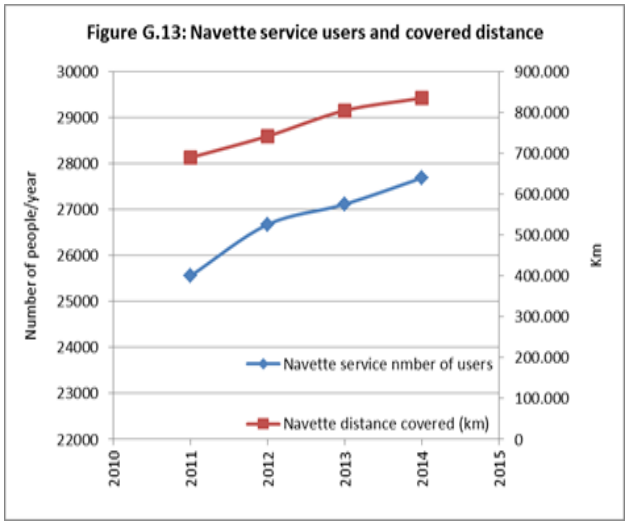
It should be noted that vehicles usually cover very short distances within the site, significantly reducing their efficiency.

As mentioned in section G4.1, there is an on-going action to replace most of the conventional service vehicles with electrical ones. This will lead to a very significant reduction in emissions. Moreover, normal and electric bicycles are already available on site, for service use and assigned to varoius buildings. In this regard, an action has been planned in order to encourage the use of bicycles for moving around the site.

Annual action plan no	Since	Description	Progress in 2014	Expectations in 2015, and end date (if app)
124	2014	Fully implement "Policy on JRC-Ispra Service Bicycles": operative repair shop, inventory of service bicycles, common identification plates.	Started	To be concluded 3rd quarter 2015

b) Missions (excluding Commission vehicle fleet)

ISM manages a contractor taxi service (so-called "Navette") used for transporting JRC staff from the site to the most important transport interchanges (chiefly Malpensa Airport and Milan railway station).

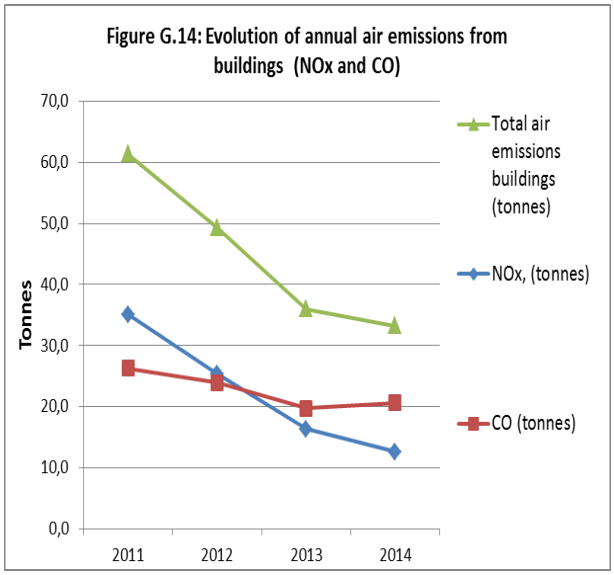


The data in Figure G.13 shows an increase in the number of users of the Navette service of about 8% compared to 2011. During the last few years, flights to and from Linate Airport have increased, resulting in the Navette service covering a greater distance. It should be noted that the requests for the navette service depends on the activities and needs of the JRC's Units. There are no specific action plans relating to the use of Navette service.

c) Commuting (and mobility)

Public transport is not a practical option for commuting to JRC Ispra. Staff predominantly drive or carpool to work: a dedicated Intranet site "smallads" helps staff to find car pooling partners The site has provided a bus service since the 1980s for commuting. The service is currently free to users and mostly covers the Varese Province, but also reaches out as far as Milan. There are no 2015 targets fixed relating to commuting.

G5.3 Total air emissions of other air pollutants (NO_x, CO)



Ispra estimated the quantity of air pollutants emitted by the trigeneration plant which is equipped with instrumentation providing continuous "in-line" analysis of NO_x and CO concentrations.

As the trigeneration plant is fuelled by natural gas, other air pollutants such as SO_2 or PM are not emitted. This also applies to the boilers at the JRC Ispra residences.

In 2013 a catalytic converter was installed at the trigeneration plant to reduce the concentration of NO_x and CO in plant emissions, ensuring that the limits in force in the Lombardy Region were respected.

The **2015 target** is to not exceed 2014 air emission levels. A significant decrease of NO_x and CO emissions can only be achieved through the installation of gas turbines for which the following action is currently on-going.

Annual action plan no	Since	Description	Progress in 2014	Expectations in 2015, and end date (if app)
122	2013	To install two 4.5 MW high efficiency gas turbines	On hold pending on-going legal action	To be decided following pending legal action

G5.4 Radioctive emissions

JRC Ispra, as established in the operational provisions for nuclear installations and under Italian law, has set up a program of environmental monitoring in order to detect and record potential radioactive releases and monitor the level of radioactivity in the environment in its surroundings. This uses a network of fixed instrumentation for sampling and/or direct measurement complemented by environmental sampling (of groundwater, rivers, waters of Lake Maggiore, sediments, fodder, honey, fish, milk, vegetables, etc .) made within the site and in the surrounding areas.

Within the framework of operation and pre-decommissioning of its nuclear and radioactive facilities and installations, the site is authorized to discharge low quantities of gaseous and liquid radioactive effluents, through authorized release points, in accordance with the limits set out in operational provisions issued by the Italian Regulatory Authority.

Gaseous radioactive effluents can only be released from the nuclear installations after filtration and continuous radiometric control. Similarly, the release of radioactive liquid effluents is permitted only after treatment and prior radiometric control. Solid materials are released following a clearance[66] process. A detailed report of the releases by the site and an assessment report of the dose to the human population in the surrounding areas are sent annually to the Italian Control Authority.

In 2014, as in previous years, the discharge of radioactivity from liquids and gas released was a very small fraction of the authorized limits. Gaseous releases accounted for about 0,2% of the limit, consisting almost entirely of Tritium Liquid releases were only 0,05% of the limit. These releases resulted in negligible dose values to the population, quantified as less than 1 microSv/year[67], even under conservative assumptions. 2014 data is still to be published by the Italian Control Authority. The 2015 target is to maintain this level of performance.

JRC Ispra is committed to keep the effluent treatment systems, the measurement instrumentation and the whole environmental monitoring network updated and efficient both in order to keep emissions as low as reasonably achievable and to be ready for the most challenging decommissioning activities.

In this context, in 2007 the JRC Ispra replaced the old liquid effluents treatment plant (called STRRL, Radioactive liquid effluent treatment facility) with a modern treatment plant for

[66] Clearence: the removal of radioactive materials or radioactive objects within authorized practices from any further regulatory control by the regulatory body.

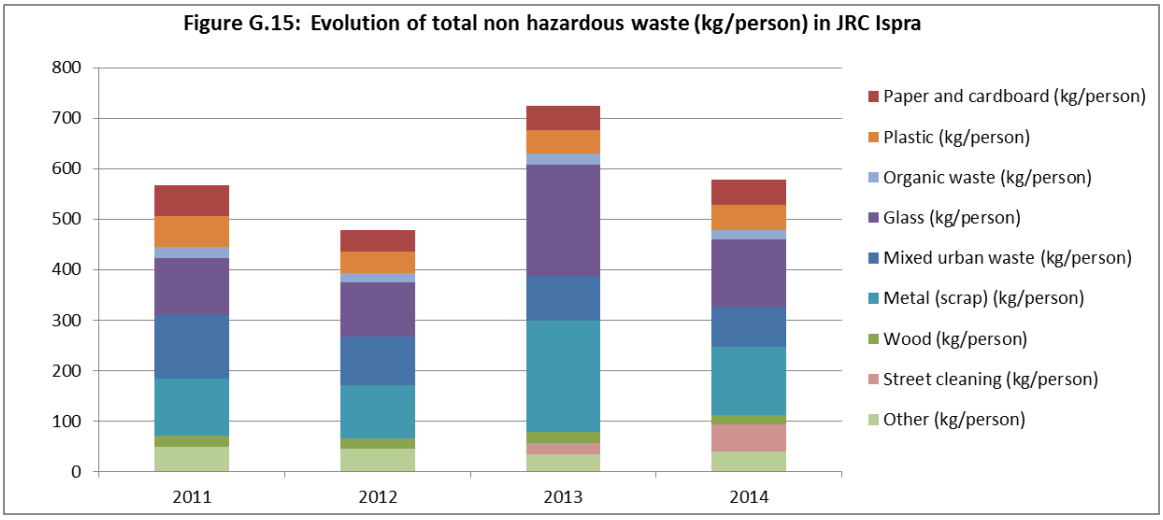
[67] The Sievert (Sv) is the unit of measure of dose (technically, dose equivalent) deposited in body tissue, averaged over the body. Such a dose would be caused by an exposure imparted by ionizing x-ray or gamma radiation undergoing an energy loss of 1 joule per kilogram of body tissue.

liquid effluents (called STEL, Liquid effluent treatment plant facility) based on more environmentally friendly physical phenomena such as precipitation and flocculation whose operational provisions foresee more restrictive limits for authorized releases. Furthermore, during the last year, most of the fixed instrumentation for the environmental monitoring network has been replaced with more modern and efficient instruments.

G6 Improving waste management and sorting (including waste water)

Ispra produces many different waste streams which vary according to site activities, and which are sorted as much as possible. All the activities of conventional waste collection, handling and disposal are managed by ISM through a contract with external suppliers specialised in waste management.

G6.1 Non-hazardous waste

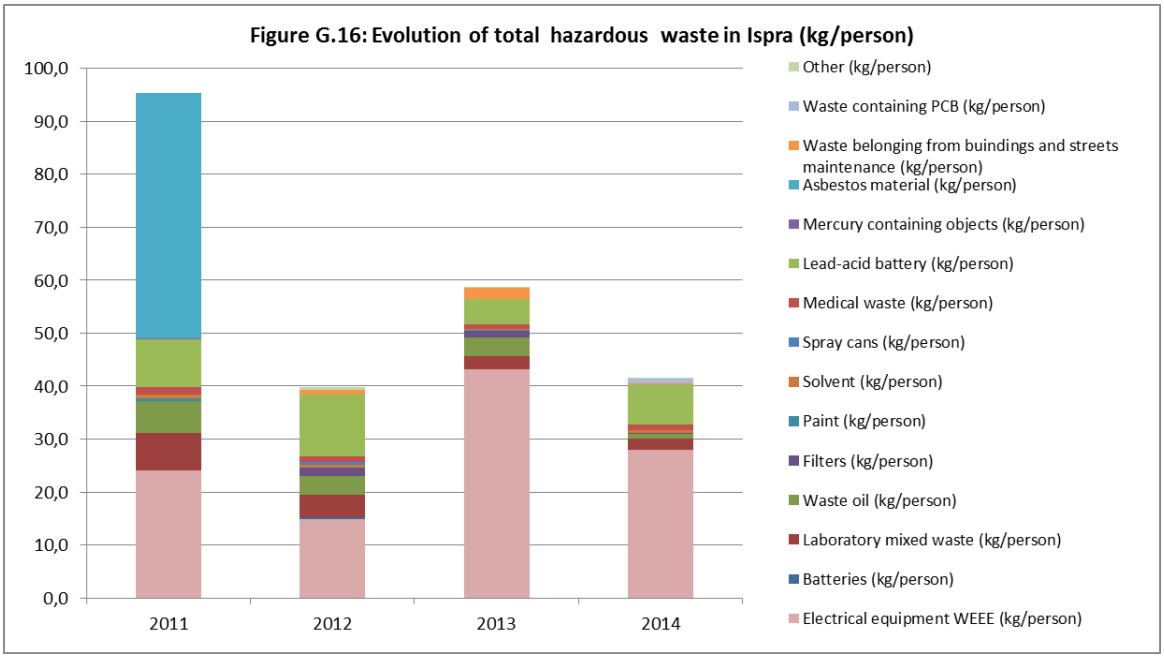


The amount of some types of non-hazardous waste produced such as plastic, glass, organic waste, paper are directly correlated with the total staff presence on site and roughly constant over time. This cannot be said for waste produced by maintenance and construction activities, such as metal, street cleaning debris, etc.

Consequently, it is not possible to set an overall reduction target for waste production for the next year because the total amount of waste produced on JRC Ispra site is strongly influenced by the maintenance, construction and demolition activities undertaken at the site, as well as nuclear decommissioning. Action included in the Commission's 2015 EMAS annual action plan for non-hazardous waste management are as follows:

Annual action plan no	Since	Description	Progress in 2014	Expectations in 2015, and end date
141	2011	Increase the percentage of recycled urban waste.	On-going	Continuing action
142	2011	Increase awareness of waste management (reduction and separation).	On-going	Continuing action

G6.2 Hazardous Waste



Hazardous waste generation depends on site specific research activities carried out in the laboratories and the particular maintenance operations needed. From 2012 responsibility for asbestos disposal was transferred to the remediation contractor.

Nevertheless, the **2015 target** is not to exceed the figure for 2014; although this depends on eventual removal of laboratories containing large quantities of hazardous waste. One specific management approved action for controlled waste is as follows:

Annual action plan no	Since	Description	Progress in 2014	Expectations in 2015, and end date
140	2014	Construction of a new hazardous waste storage shed.	Preliminary feasibility study started	Building phase

G6.3 Waste sorting

Table G.4 Percentage of waste sorted at JRC Ispra

	2011	2012	2013	2014
Percentage of waste sorted	71,3	73,9	82,1	81,5

The Table G.4 above demonstrates that in the last few years there has been a generally increasing trend in the amount of waste sorted into separate waste streams. The **2015 target** is to continue to increase the sorted and recovered proportions.

G6.4 Wastewater discharges

In Ispra, wastewater (including WC, laboratory sinks, canteen, etc.) is conveyed by means of 26 km sewerage system to the site wastewater treatment plant which has been operational since 1978. Just under half of JRC Ispra's treated wastewater actually originates from the

Ispra Municipality sewage system and it should comprise waste only from civil and some craft activities.

A secondary water collector system is dedicated to white water (building cooling water, precipitation and soil drainage) that discharges into the Acquanegra Stream in several areas of the site. Meteoric water is also collected in the wastewater sewage system causing dilution of the wastewater which reduces the treatment plant's efficiency.

On average about 3.6 million cubic metres of wastewater are treated annually. During heavy rainfall, the maximum flow that can be treated in the plant and which is limited by the UV treatment equipment, is 870 m^3/h. Excess flow is diverted into the final reservoir through two different bypasses located upstream of the plant. Wastewater discharge is monitored to ensure compliance with the Italian threshold limits for water discharges.

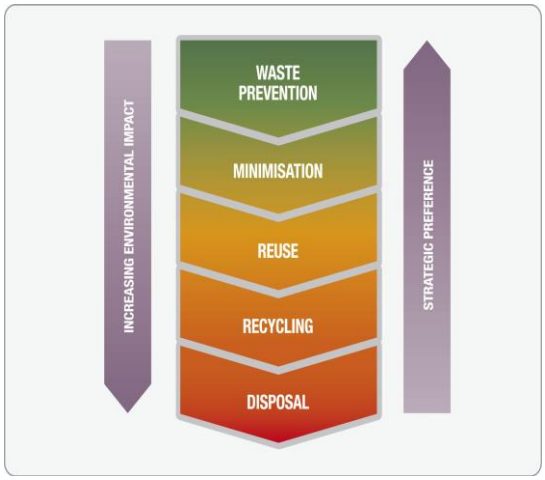
The following dedicated project has been launched in order to analyse and address improvement actions for the entire JRC Ispra sewage network.

Annual action plan no	Since	Description	Progress in 2014	Expectations in 2015, and end date (if app)
109	2014	Separate the rain water and the "black" wastewater implementing the wastewater multiannual management plan	Starting	On-going

G6.5 Radioactive Waste Management System

Significant quantities of radioactive wastes were accumulated on site from past on site activities. Even greater quantities of waste are expected to be generated by the decommissioning activities in the next few decades. The Nuclear Decommissioning Unit is developing a management system for radioactive wastes ensuring strong internal controls are in place both for historical waste and for new waste originating from operations and (pre)decommissioning activities.

Historical solid nuclear waste is stored in "Area 40", either unconditioned or conditioned in bituminised drums, or in concrete blocks or in buried concrete cylinders (the so-called "roman pits").



The radioactive waste management system set up at the site includes clearance materials and radioactive waste in accordance with Italian Law (mainly Legislative Decree 230/95).. It includes elements related to planning, quality assurance and activity recording.

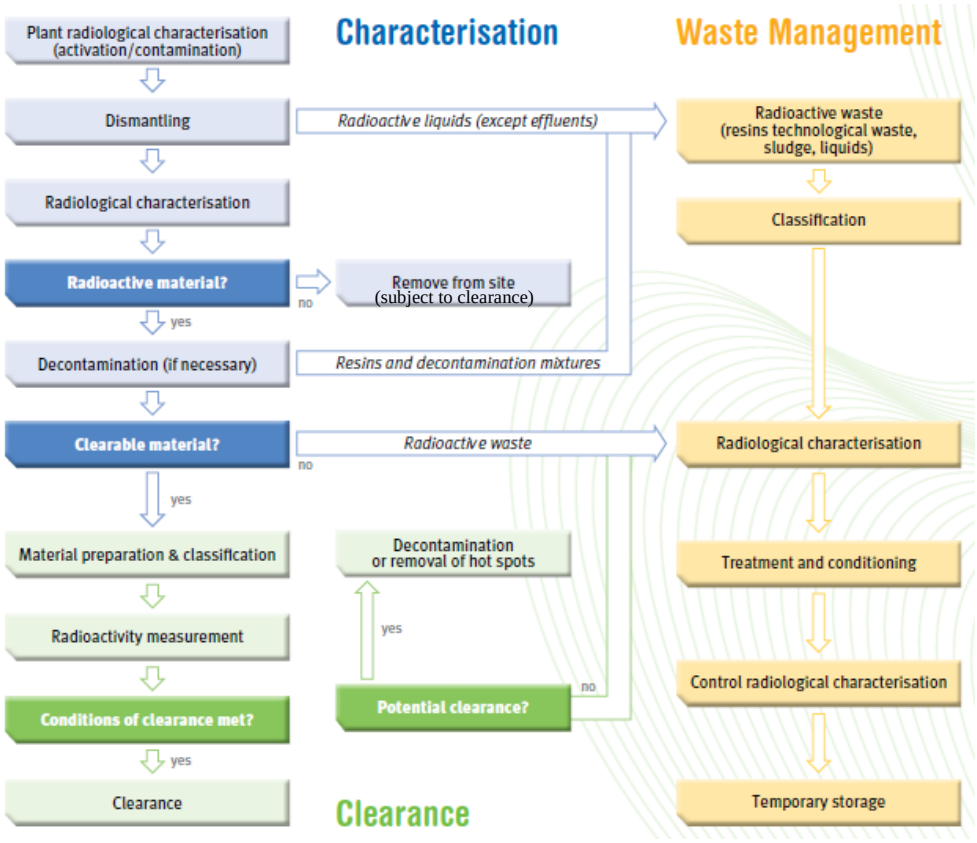
The waste management policy of JRC Ispra is based on three main rules according to Italian law and international guidelines:

1. Minimise the amount of unused nuclear materials by recycling them within industry.
2. Maximise the quantity of clearable waste

that can be removed from regulatory control.

3. Reduce the volume of remaining radioactive waste for temporary storage on the Ispra site.

For radioactive waste, the route from bulk waste to an acceptable form for final disposal goes through multiple steps of characterization, pre-treatment, treatment and conditioning. The waste management system thus provides for the flexibility in the waste management strategy to respond to changing external constraints, such as the evolving regulatory framework and the design of the final disposal facility.
A summary diagram of radioactive waste management is included below:

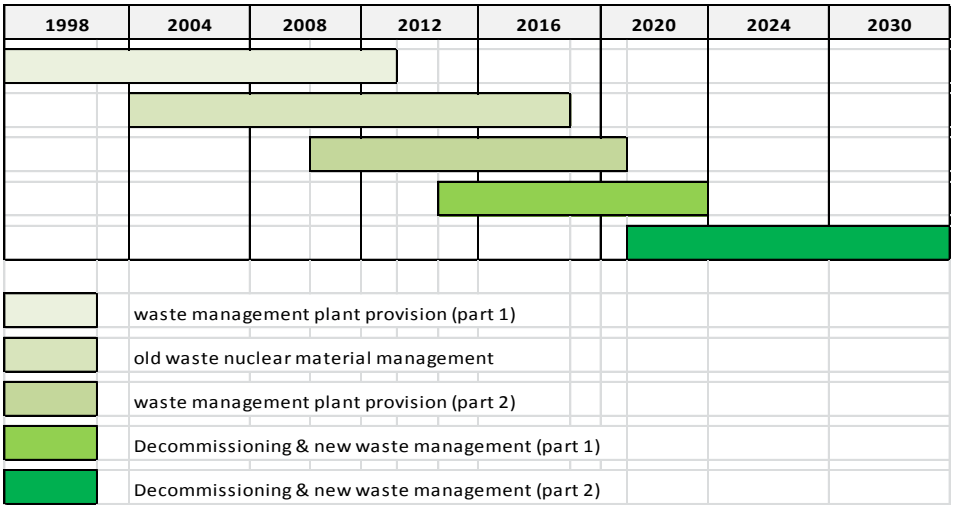


The Italian regulatory framework allows for the clearance of materials, i.e. its unrestricted use after removal from regulatory control. The procedure for clearance of materials is complex but well defined. Currently limited quantities of material are removed from regulatory control, following a strict procedure providing for substantial safety margins to minimise any risk of releasing uncontrolled quantities of radioactivity to the public. Given the high value of clearance in the Waste Management Strategy Hierarchy and the absolute priority given to safety, the challenge is to increase the efficiency of the process to cope with the increasing flow of material produced by the rising decommissioning activity.

JRC-Ispra's nuclear waste is less than 1% in radiological content and 10% in volume of the radioactive waste produced in Italy. Whereas the implementation of the Decommissioning & Waste Management Programme is under the sole responsibility of the JRC, as stated by the Euratom Treaty and corresponding national legislation, most of the activities are today carried out by contractors with internationally recognised expertise in the nuclear field to ensure the application of the most exacting technological standards.

Provision of complementary on-site/off-site waste management services will integrate and complete the full range of complete activities.

A summary diagram of Decommissioning & Waste Management is illustrated in figure below:



G7 Protecting biodiversity

In 2013 a study was conducted including a field survey to investigate plant diversity at the site and to record the main plant species and the natural habitats. Twenty species were recorded as being valuable vascular plants. Among them, *Eleocharis carniolica* is protected under the European Directive Habitats[68] .

Several types of plant communities were recorded in wetlands, meadows and woodlands. The plant communities were arranged in six classes according the phytosociological classification.

A relationship was also reported between the plant communities and the European habitats protected under the Annex I of the Directive Habitats ("natural habitat types of community interest whose conservation requires the designation of special areas of conservation"). About 50% of the JRC site proved at least a high naturalistic value, as shown below in Figure G17).

[68] In particular the *Eleocharis carniolica* is listed in the Annex II entitled "plant species of community interest whose conservation requires the designation of special areas of conservation" of the Directive Habitats (Directive Nr. 92/43/CEE).

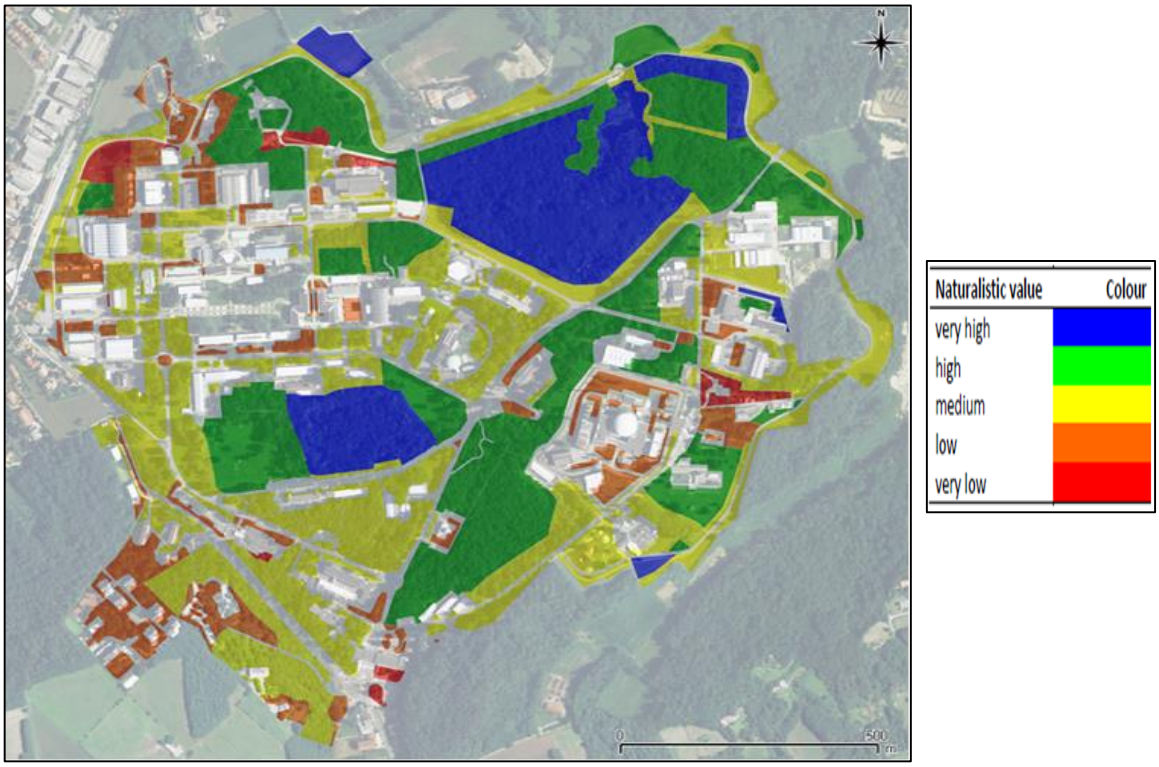


Figure G17 – Distribution of the naturalistic value in JRC Ispra site

During the field surveys some samples of *Rana Latastei* were found within the site as well as other types of amphibian. *Rana Latastei* is protected under Annex II of the Habitats Directive and the other amphibians found are all protected by various laws (community, national or regional).

A dedicated action was launched in order to improve management of the environmental heritage of JRC Ispra site.

Annual action plan no	Since	Description	Progress in 2014	Expectations in 2015, and end date (if app)
143	2015	Define a JRC Ispra green policy addressing green areas, flora and fauna and apply this.		Starting

G8 Green Public Procurement

G8.1 Incorporating GPP into procurement procedures

GPP has been embedded the JRC public procurement manual (v.4 May 2014). Following developments in the Public Procurement Management Tool (PPMT) in 2014, since the beginning of 2015 the categories of goods and service which may potentially be subject to green procurement have been flagged based on Common Procurement Categories (CPVs.) If products and goods belong to these categories, at an early stage of the procurement process PPMT automatically identifies the actor responsible for the environmental issues in a given

Institute/Unit, usually an Environmental Officer. S/he can either approve the request, reject it or require changes when needed. This Corporate business rule is implemented at all the JRC Sites.

Annual action plan no	Since	Description	Progress in 2014	Expectations in 2015, and end date (if app)
148	2014	Identify JRC Ispra's planned tenders where GPP criteria can be included (in technical specifications, selection and award criteria)	ongoing	permanent action - to be continued
149	2014	Implement GPP in JRC Ispra procurement where applicable	ongoing	permanent action - to be continued
150	2014	Provide advice and support on application of GPP in JRC procurement	ongoing	permanent action - to be continued

G9 Demonstrating legal compliance

G9.1 Prevention and risk management

According to the Site Agreement, Italian Law 906/1960, JRC Ispra is fully compliant to the Italian legislation regarding nuclear activities, for which JRC Ispra currently applies the requirements laid down in the 18 licences issued by the Italian Nuclear Authorities. On the other hand, in order to ensure the full compliance to Italian environmental legislation according to Law 906/1960, JRC Ispra is applying environmental legislation under its own responsibility, having developed a strategy of issuing internal environmental authorisations which are technically equivalent to those released by Italian authorities This strategy, as well as internal environmental authorisations issued by JRC Ispra, are shared with the Italian Authorities during the yearly EMAS Round Table meetings.

Under the framework of the Environmental Management System, developed at the site since 2009, several tools are currently in place to ensure that all legislation applicable to the site activities is checked and implementation monitored. These include:

- Register of legal requirements and obligations;
- Procedure for the management of the legal compliance and environmental requirements applicable to the JRC Ispra site;
- Consultation Procedure for all new projects and activities performed on site;
- Safety and Environmental Inspection (inspection by JRC Ispra Safety Inspector); and
- Internal and external audits.

Further discussion of the approach to nuclear waste management is provided in Section G 6.5.

G9.2 EMAS registration

As of 2010, the JRC Ispra site is ISO 14001 certified and the **2015 target** for JRC Ispra is to achieve the EMAS registration for the entire site.

G9.3 Compliance with EMAS

The outcome of the first internal audit performed in preparation for the external verification has been of a major non-conformity, eight minor non-conformities and some "scopes for improvement". Ispra monitors the findings of EMAS internal audit, and in cooperation with HR COORD ensures that non conformities as well as "scopes for improvement" are followed up.

G10 Internal communication (and training)

G10.1 Internal communication

An Environmental Communication Action Plan was established in 2014 in coordination with the JRC EMAS team. The existing ISM Environmental Communication Policy and Strategy has been updated and is now awaiting approval. In 2014 the focus, for internal communication, was on raising the awareness of the EMAS project among site personnel and informing the staff about the many on-going measures to make the Ispra site more environmentally friendly. The main instrument adopted for the internal communication campaigns is the intranet portal, namely ISPRAnet. This portal in 2015 will be migrated onto the Corporate platform called Connected@jrc.

A highlight is the Sustainable Mobility Unit's Competition, which is organised yearly by the Green Team, in collaboration with the ISM Directorate, as a contribution towards our objective of encouraging personnel to reduce their environmental footprint by using sustainable means of transport such as car sharing, public transport, cycling or walking.

As recognition for the success of this initiative, JRC received a Green Commission (EMAS) Award in 2013 for the most successful local event promoting environmental sustainability. The Awards are organised by the Commission's EMAS coordination team to show that small actions can lead to big changes. The EMAS team wanted to put the spotlight on local actions in the different Commission locations, which have contributed in reaching the Commission's environmental objectives.

In 2015 information campaigns will continue to be launched in collaboration with the Ispra Green Team to raise the personnel's awareness of the EMAS project and the on-going measures to include the Ispra site under the Commission's EMAS registration.

G10.2 Internal training

In 2014, internal training focussed on newcomers, all of whom attended a specific JRC Ispra environmental training session lasting 20 minutes, and which included a question and answer session. In addition, safety training courses are being extended in order to also include environmental aspects. The latter is to be finalised by the end of 2015. In total, there have been 23 sessions with 239 participants.

Moreover, three (2 hours) sessions have been organised in January 2014 by VC with all the JRC sites on Green Public Procurement (GPP). Around 200 staff members across the JRC

attended the presentations, of which 100 working at the JRC Ispra site. The objective was to inform operational and financial staff working with procurement on the concept, aim, principle and application of GPP as defined by the Commission (DG ENV) and their application and the implementation at the JRC (actors, steps in procedures, tools and tender documents).

G11 Transparent dialogue with external stakeholders

External communication has been reinforced by means of individual meetings with all the Mayors in the neighbouring towns and other public organisations. Moreover the first EMAS Round Table with representatives of these the towns, the Province of Varese, the Lombardy Region and the Italian EMAS Committee was held on October 2014 and it will be repeated yearly.

A second edition of the EMAS Round Table will be held on the 2nd July 2015, whereby 45 Italian authorities have been already invited to participate. Several bilateral meetings with the key stakeholders have also been organised in preparation of the EMAS Round Table meeting.

G12 EMAS costs (and savings)

The following table estimates how costs have evolved for running EMAS and for expenditure on energy, water and waste disposal.

Table G.5 EMAS costs and virtual savings	**2013**	**2014**	Virtual 2014 savings compared with 2013: **2013**
Total Direct EMAS Cost (EUR)	486.799	383.760	103.040
Total Direct Cost per employee	178	139	39
Total buildings energy cost (Eur)	4.652.275	4.101.219	551.057
Total buildings energy cost (Eur/person)	1.699	1.482	217
Total fuel costs (vehicles) (Eur)	24.854	20.049	4.805
Total energy costs (Eur/person)	9	7	2
Total water costs (Eur)	374.940	377.740	-2.800
Water (Eur/person)	136,9	136,5	0,4
Total paper cost (Eur)	n.a.	57.376	n.a.
Total paper cost (Eur/person)	n.a.	21	n.a.
Waste disposal (non hazardous) - unit cost/tonne	176	208	-32
Waste disposal (non hazardous) - Eur/person	83	86	-4

Energy costs have fallen by more than 12% and by the equivalent of just over 200 EUR/person from 2013 to 2014. The expenditure on fuel cost for service vehicles is more or less constant as well as for waste disposal; on the other hand the expenditure on water consumption increased slightly due to the cost for some extraordinary maintenance works performed during the last few years.

It should be noted that the direct EMAS costs, mainly account for advisory services, not only strictly speaking for the EMAS registration as these grant Internal Control Standards, such as the respect of environmental legislation, and also include specific projects, such as an ecological study over green areas and the computation of the Organisational Environmental Footprint for the JRC Ispra Site. Such costs fell in 2014 due to the limited possibility of use of the relative framework contract. The 2015 EMAS costs shall depend over the outcome of the environmental advisory call for tender.

G13 JRC Ispra data tables:

Line	Objective/ indicator	Parameter and units	2011	2012	2013	2014
2	**Basic EMAS**	**Population: staff in EMAS perimeter**	**2.520**	**2.574**	**2.738**	**2.767**
4		**Population: total staff**	**2.520**	**2.574**	**2.738**	**2.767**
6		**No. buildings seeking EMAS registration**				**419**
8		**Total no. of buildings**	**422**	**423**	**421**	**419**
10		**Useful surface area in EMAS perimeter, (m^2)**	**221.444**	**222.148**	**223.077**	**256.077**
12		**Useful surface area for all buildings, (m^2)**	**221.444**	**222.148**	**223.077**	**256.077**
14		**Total site area, (m^2)**	**1.622.948**	**1.622.948**	**1.622.948**	**1.622.948**
16	**Objective I) Efficient use of resources**					
19	**Ia**	**Total energy buildings, (MWh)**	**104.543**	**104.297**	**103.797**	**99.893**
23		**MWh/person**	**41,493**	**40,512**	**37,906**	**36,103**
27		**kWh/m²**	**472**	**469**	**465**	**390**
29		i) supplied electricity, (MWh)	3.502	2.328	3.236	2.232
31		**MWh/person**	**1,390**	**0,904**	**1,182**	**0,807**
33		**kWh/m²**	**16**	**10**	**15**	**9**
35		**renewables in electricity mix, (%)**	**34**	**45**	**37,06**	**43,07**
37		from renewables, (MWh)	1.177	1.059	1.199	961
39		**MWh/person**	**0,467**	**0,411**	**0,438**	**0,347**
41		**kWh/m²**				**4**
43		**non renewables in electricity in mix, (%)**	**66,39**	**54,53**	**62,94**	**56,93**
45		from non renewables, (MWh)	2.325	1.269	2.037	1.271
47		**MWh/person**	**0,923**	**0,493**	**0,744**	**0,459**
49		**kWh/m²**	**10**	**6**	**9**	**5**
53		ii) supplied gas, (MWh)	101.028	**101.954**	**100.544**	**97.609**
55		**MWh/person**	**40,098**	**39,602**	**36,718**	**35,278**
57		**kWh/m²**	**456**	**459**	**451**	**381**
59		iii) supplied diesel, (MWh)	0	0	0	0
61		**MWh/person**	**0,000**	**0,000**	**0,000**	**0,000**
63		**kWh/m²**	**0,0**	**0,0**	**0,0**	**0,0**
65		**iv) district heating, (MWh)**	**0**	**0**	**0**	**0**
67		**MWh/person**	**0,000**	**0,000**	**0,000**	**0,000**
69		**kWh/m²**	**0,0**	**0,0**	**0,0**	**0,0**
71		v) site generated renewables - biomass, (MWh)	0	0	0	0
73		**MWh/person**	**0,000**	**0,000**	**0,000**	**0,000**
75		**kWh/m²**	**0,0**	**0,0**	**0,0**	**0,0**
77		vi) site generated renewable - PV, (MWh)	13,20	14,69	17,00	52,20
79		**Installed peak capacity, (kWhp)**	**12,4**	**12,4**	**12,4**	**306,6**
81		Assumed output, (% of kWh/p)				50
83		**MWh/person**	**0,0052**	**0,0057**	**0,0062**	**0,0189**
85		**kWh/m²**	**0,000**	**0,000**	**0,000**	**0,000**
89	**1b**	**Total energy used by service vehicles, (MWh/yr)**	**283,6**	**267,4**	**274,5**	**270,6**
93		**MWh/person**	**0,113**	**0,104**	**0,100**	**0,098**
97		**kWh/m²**	**1,280**	**1,204**	**1,230**	**1,057**
99		**Diesel used, (m^3)**	**16,231**	**16,438**	**15,244**	**14,367**
101		kWh of energy provided by one litre diesel	10,06	10,06	10,06	10,12
102		**Petrol used, (m^3)**	**13,734**	**11,652**	**13,833**	**14,618**
104		kWh of energy provided by one litre petrol	8,75	8,75	8,75	8,56
105		**Other fuel (optional)**	**0,0**	**0,0**	**0,0**	**0,0**
107		kWh of energy provided by one……				**0,0**
110	**1c**	**Total renewable energy use, (MWhr/yr)**	**1.190**	**1.073**	**1.216**	**1.014**
114		**Renewable energy as part of total, (%)**	**1,14**	**1,03**	**1,17**	**1,01**
118		**Onsite generated renewables as part of total energy, (%)**	**0,01**	**0,01**	**0,02**	**0,05**
122	**1d**	**Water usage in EMAS perimeter, (m^3)**	**3.166.000**	**2.425.970**	**2.083.210**	**1.717.056**
126		**m^3/person**	**1.256,6**	**942,3**	**760,8**	**620,6**
130		**l/m²**	**14.297**	**10.921**	**9.339**	**6.705**
134	**1e**	**Office paper consumption, (tonnes)**	**49,163**	**47,488**	**44,585**	**46,531**
138		**Office paper consumption (tonnes/person)**	**0,020**	**0,018**	**0,016**	**0,017**
140		Paper Density (g/m^2)	80	80	80,0	80,0
142		Sheets/kg	200	200	200	200
144		Total No. of sheets	9.853.102	9.517.422	8.935.642	9.325.644
146		Sheets/person	3.911	3.697	3.263	3.370
148		Working days in the year	211	211	211	211
151		**Office paper sheets/person/day**	**19**	**18**	**15**	**16**

155	**1f**	**Offset paper consumption (tonnes)**	**n.a.**	**n.a.**	**5,2**	**5,8**
159		**Offset paper (tonnes/person)**			**0,002**	**0,002**
161	**Objective II) Reduction in CO2 (including CO2 equivalent of greenhouse gases) and other air pollutants**					
164	**2a**	**Total office building emissions from energy, (tonnes CO_2)**	**21.793**	**21.490**	**21.531**	**20.523**
168		**tonnes CO_2/person**	**8,6**	**8,3**	**7,9**	**7,4**
172		**kgCO_2/m²**	**98,4**	**96,7**	**96,5**	**80,1**
174		**i) from electricity, (CO_2 tonnes)**	**1.425**	**936**	**1.301**	**909**
176		Kgs CO2 from 1 kWh of electricity	0,407	0,402	0,402	0,407
177		**tonnes CO2/person**	**0,566**	**0,364**	**0,475**	**0,328**
179		**kgCO2/m²**	**6**	**4**	**6**	**4**
181		**ii) from gas (tonnes/yr)**	**20.367**	**20.554**	**20.230**	**19.615**
183		Kgs CO2 from 1 kWh natural gas	0,202	0,202	0,201	0,201
184		**tonnes CO2/person**	**8,084**	**7,984**	**7,388**	**7,089**
186		**kgCO2/m²**	**92**	**93**	**91**	**77**
188		**iii) from diesel (tonnes/yr)**	**0**	**0**	**0**	**0**
190		Kgs CO2 from 1 kWh diesel	0,264	0,264	0,264	0,264
191		**tonnes CO2/person**	**0,000**	**0,000**	**0,000**	**0,000**
193		**kgCO2/m²**	**0**	**0**	**0**	**0**
195		**iv) from district heating (tonnes/yr)**	**0**	**0**	**0**	**0**
197		Kgs CO2 from 1 kWh	0,264	0,264	0,264	0,264
198		**tonnes CO2/person**	**0,000**	**0,000**	**0,000**	**0,000**
200		**kgCO2/m²**	**0**	**0**	**0**	**0**
202		**Total quantity of refrigerants (tonnes)**	**n.a**	**n.a**	**n.a.**	**2,890**
204		**Total refrigerant losses (tonnes)**	**0,021**	**0,030**	**0,087**	**0,068**
208	**2b**	**Emissions of other gases as CO_2 equivalent (tonnes)**	**52,6**	**87,8**	**173,1**	**101,1**
212		**tonnes CO2equiv/person**	**0,021**	**0,034**	**0,063**	**0,037**
216		**kgCO2equiv/m2**	**0,000**	**0,000**	**0,001**	**0,000**
218		**inventory R22, (kg)**	**n.a.**	**n.a.**	**n.a.**	**35,6**
219		i) losses R22, (kg)	0,00	0,00	0,00	0,00
220		GWP	1760	1760	1760	1760
221		**as tCO2equiv**	**0,0**	**0,0**	**0,0**	**0,0**
223		**inventory R410A, (kg)**	**n.a.**	**n.a.**	**n.a.**	**354,1**
224		ii) losses R410A, (kg)	4,18	17,27	22,16	4,30
225		GWP	2088	2088	2088	2088
226		**as tCO2equiv**	**8,73**	**36,05**	**46,26**	**8,98**
228		**inventory R134A, (kg)**	**n.a.**	**n.a.**	**n.a.**	**967,7**
229		iii) losses R134A, (kg)	0,00	0,00	50,00	60,00
230		GWP	1430	1430	1430	1430
231		**as tCO2equiv**	**0,00**	**0,00**	**71,50**	**85,80**
233		**inventory R404A, (kg)**	**n.a.**	**n.a.**	**n.a.**	**311,0**
234		iv) losses R404A, (kg)	0,00	13,20	12,10	0,00
235		GWP	3922	3922	3922	3922
236		**as tCO2equiv**	**0,00**	**51,77**	**47,46**	**0,00**
238		**inventory R407C, (kg)**	**n.a.**	**n.a.**	**n.a.**	**416,92**
239		v) losses R407C, (kg)	1,68	0,00	0,60	3,59
240		GWP	1774	1774	1774	1774
241		**as tCO2equiv**	**2,98**	**0,00**	**1,06**	**6,37**
243		**inventory R507A, (kg)**	**n.a.**	**n.a.**	**n.a.**	**694,00**
244		vi) losses R507A, (kg)	*0,0*	0,00	0,00	0,00
245		GWP	3985	3985	3985	3985
246		**as tCO2equiv**	**0,00**	**0,00**	**0,00**	**0,00**
248		**inventory R422D, (kg)**	**n.a.**	**n.a.**	**n.a.**	**37,80**
249		vii) losses R422D, (kg)	15,00	0,00	2,50	0,00
250		GWP	2729	2729	2729	2729
251		**as tCO2equiv**	**40,94**	**0,00**	**6,82**	**0,00**
255	**2c**	**Site vehicle CO_2 emissions (tonnes)**	**74,8**	**70,7**	**72,4**	**71,6**
257		**tonnes CO_2/person**	**0,030**	**0,027**	**0,026**	**0,026**
259		**i) from diesel (tonnes)**	**44**	**44**	**41**	**39**
261		Kgs CO2 from one litre of diesel	2,697	2,697	2,697	2,682

262		**ii) from petrol**	**31,1**	**26,4**	**31,3**	**33,0**
264		Kgs CO2 from one litre of petrol	2,262	2,262	2,262	2,261
265		**from other fuel (eg propane)**	-	-	-	-
270		**gCO2/km (manufacturer)**	**n.a.**	**n.a.**	**n.a.**	**183,7**
272		Vehicle kms travelled	278.922	263.651	230.139	262.025
274		**Internal fleet efficiency (litres/100km)**	**10,74**	**10,65**	**12,63**	**11,06**
278		**gCO2/km (actual)**	**268,3**	**268,1**	**314,6**	**273,2**
280		Number of vehicles	115	104	103	104
282		**kms/vehicle**	**2.425**	**2.535**	**2.234**	**2.519**
286	**2d**	**Total air emissions buildings (tonnes), as mimimum NOx, SO_2, PM_{10}**	**61,4**	**49,4**	**36,0**	**33,2**
288		**tonnes/person**			**0,0131**	**0,0120**
290		NOx, (kg)	35124,65	25397,76	16287,83	12591,32
292		SO2, (kg)	n.a.	n.a.	n.a.	n.a.
294		PM10, (kg)	n.a.	n.a.	n.a.	n.a.
296		…..others (VOC), (kg)	n.a.	n.a.	n.a.	n.a.
298		….others CO, (kg)	26.285,4	23.955,7	19.709,19	20.629,21
300	**Objective III) Waste management**					
303	**3a**	**Total non hazardous waste, (tonnes)**	**989,8**	**883,1**	**1.285,7**	**1.147,8**
307		**Total non haz.waste (tonnes/person)**	**0,393**	**0,343**	**0,470**	**0,415**
309		**Mixed urban waste (tonnes)**	318,2	245,7	243,4	221,5
311		**Paper and cardboard (tonnes)**	153,3	109,0	130,1	137,6
313		**Wood (tonnes)**	58,7	51,1	62,0	50,3
315		**Glass (tonnes)**	4,9	24,5	24,9	31,1
317		**Metal (scrap) (tonnes)**	283,3	274,9	601,4	370,8
319						
321		**Plastic (tonnes)**	31,3	27,6	33,0	33,1
323		**Organic waste (tonnes)**	19,5	34,2	37,7	44,1
325		**Street cleaning (tonnes)**	0,0	0,0	57,8	151,3
327		**Other (tonnes)**	120,7	116,1	95,4	108,1
332	**3b**	**Total hazardous waste (tonnes)**	**119,251**	**59,326**	**74,115**	**50,139**
336		**Total hazardous waste, (tonnes/person)**	**0,0473**	**0,0230**	**0,0271**	**0,0181**
338		Batteries (tonnes)	0,000	0,750	0,180	0,000
340		Laboratory mixed waste (tonnes)	18,010	10,920	6,590	5,829
342		Waste oil (tonnes)	14,930	9,100	9,770	2,632
344		Filters (tonnes)	0,000	4,010	3,280	0,239
346		Paint (tonnes)	1,410	0,100	0,600	0,314
348		Solvent (tonnes)	1,740	1,340	0,420	1,185
350		Spray cans (tonnes)	0,000	1,490	0,000	0,040
352		Medical waste (tonnes)	3,641	2,716	2,580	3,020
354		Flourescent lamps (tonnes)	-	-	-	-
356		Fire extinguisher (tonnes)	-	-	-	-
358		Lead-acid battery (tonnes)	8,990	11,620	4,710	7,633
360		Mercury containing objects (tonnes)	0,240	0,000	0,035	0,007
362		Asbestos material (tonnes)	46,270	0,000	0,000	0,000
364		Waste belonging from buindings and streets maintenance (tonnes)	0,000	0,890	2,040	0,172
366		Waste containing PCB (tonnes)	0,000	0,080	0,000	0,870
368		Electrical equipment WEEE	24,020	14,960	43,190	27,958
372	**3c**	**Percentage of waste sorted**	**71,31**	**73,93**	**82,10**	**81,51**
374	**Objective IV) Protecting biodiversity**					
377	**4a**	**Built surface area, (m^2)**	**n.a.**	**n.a.**	**n.a.**	**692.984**
381		**Built surface area, (m^2/person)**				250
385		**Built surface area as part of site, (%)**				42,7
387	**Objective V) Green procurement**					
389	**5a**	**Contracts >60k with "eco" criteria (%)**	n.a.	n.a.	17	32
392	**5b**	**Green products in office catalogue (%)**	**26,1**	**26,1**	**26,1**	**24,2**
394		**Green products in catalogue, (No)**	**153**	**153**	**153**	**165**
395		**Products in catalogue, (No)**	**586**	**586**	**586**	**682**
396		**Total value of products purchased from catalogue (EUR)**	**347.442**	**353.695**	**270.138**	**280.000**
398		Value of green products purchased (EUR)	n.a.	n.a.	n.a.	n.a.

400	**Objective VI) Legal conformity**					
402	**6a**	**EMAS registered buildings (%)**	**n.a.**	**n.a.**	**n.a.**	**419**
405	**6b**	**EMAS registered useful floorspace (%)**	**n.a.**	**n.a.**	**n.a.**	**100**
407		EMAS verification non conformities	n.a.	n.a.	n.a.	n.a.
409	**Objective VII) Communication**					
411	**7b**	**No. of difft trainings on offer**	**4**	**5**	**3**	**2**
413	site training	**No of training beneficiaries**	**26**	**63**	**133**	**340**
415		**Staff benefiting from training (%)**	**1,0**	**2,4**	**4,9**	**12,3**
417	**Objective VIII) Promoting dialogue with external partners**					
418						
419						
420	**Estimating EMAS costs and virtual value of identified savings**					
421	**Direct costs**	**Total Direct EMAS Cost (EUR)**			**486.799**	**383.760**
422		Total Direct Cost per employee			178	139
423		**i) Annual direct staff costs**			**244.200**	**244.200**
424		Annual direct staff costs (time FTE)			1,85	1,85
425		Annual cost of one FTE			132.000,0	132.000,0
426		**ii) Annual contract costs**			**242.599**	**139.560**
427		Environmental advisory contract	n.a.	n.a.	235.949	135.760
428		ISO 14001 certification contract	n.a.	n.a.	6.650	3.800
429		Contract 3 (cost per year) if applicable	n.a.	n.a.	n.a.	n.a.
430		**iii) Annual misc costs**				**0**
433	**Energy (Bldgs)**	**Electricity unit cost (Eur/MWh)**	n.a.	n.a.	159,99	168,20
434		**Gas (Eur/MWh)**	n.a.	n.a.	41,12	38,65
435		**Fuel (Eur/MWh)**	n.a.	n.a.	n.a.	n.a.
436		**Total buildings energy cost (Eur/person)**	n.a.	n.a.	**1.698,907**	**1.499,180**
437		Electricity (Eur/person)	n.a.	n.a.	189	136
438		Gas (Eur/person)	n.a.	n.a.	1510	1363
439		Fuel (Eur/person)	n.a.	n.a.	n.a.	n.a.
440		**Total buildings energy cost (Eur)**	**n.a.**	**n.a.**	**4.652.111**	**4.148.033**
441	**Energy (vehic.)**	Diesel unit cost- (Eur/m3)	783,81	1.004,88	1.007,80	735,99
442		Petrol unit cost- (Eur/m3)	567,59	1.015,05	686,11	648,15
443		Total cost Diesel (Eur)	**12.722**	**16.518**	**15.363**	**10.574**
444		Total cost petrol (Eur)	**7.795**	**11.827**	**9.491**	**9.475**
445		Total energy costs (Eur/person)	**8,14**	**11,01**	**9,08**	**7,25**
446		**Total fuel costs (vehicles) (Eur)**	**20.517**	**28.346**	**24.854**	**20.049**
447	**Water**	Water unit cost (Eur/m3)	n.a.	n.a.	0,18	0,22
448		Water (Eur/person)	n.a.	n.a.	**136,94**	**136,53**
449		**Total water costs (Eur)**	n.a.	n.a.	**374.978**	**377.752**
450	**Paper**	Paper (office) - unit cost/kg	n.a.	n.a.	n.a.	1,23
451		Paper (offset) - unit cost/kg	-	-	-	-
452		Paper (office) - Eur/person	n.a.	n.a.	n.a.	20,74
453		Paper (offset) - Eur/person	-	-	-	-
454		Total paper (office) cost (Eur)	n.a.	n.a.	n.a.	25,57
455		Total paper cost (Eur/person)	n.a.	n.a.	n.a.	
456		**Total paper cost (Eur)**	**n.a.**	**n.a.**	**n.a.**	**57.376**
457	**Waste**	Waste disposal (non hazardous) - unit cost/tonne	253,55	277,69	175,98	207,82
458		**Waste disposal (non hazardous) - Eur/person**	**99,61**	**95,26**	**82,63**	**86,21**
459		Waste disposal (hazardous) - unit cost/tonne	748,67	2934,06	1285,89	1696,16
460		**Waste disposal (hazardous) - Eur/person**	**35,43**	**67,61**	**34,80**	**30,737**
461		**Total waste cost (Eur)**	**340.243**	**419.302**	**321.562**	**323.582**
462	**Other site specific data**					
463	**2b**	**inventory R23, (kg)**	**n.a.**	**n.a.**	**n.a.**	**41,20**
464		**vi) losses R23, (kg)**	**0,0**	**0,00**	**0,00**	**0,00**
465		GWP	14800	14800	14800	14800
466		**as tCO2equiv**	**0,00**	**0,00**	**0,00**	**0,00**
468		**inventory R427A, (kg)**	**n.a.**	**n.a.**	**n.a.**	**7,30**
469		vi) losses R427A, (kg)	0,0	0,00	0,00	0,00
470		GWP	2138	2138	2138	2138
471		**as tCO2equiv**	**0,00**	**0,00**	**0,00**	**0,00**
473		**inventory R508B, (kg)**	**n.a.**	**n.a.**	**n.a.**	**24,10**
474		**vi) losses R508B, (kg)**	0,0	0,00	**0,00**	**0,00**
475		GWP	13396	13396	13396	13396
476		**as tCO2equiv**	0,00	0,00	0,00	0,00
479	**2c**	Electric	1	1	3	3
480		Euro 5	0	0	0	1

481		Euro 4	39	39	39	39
482		Euro 3	43	43	43	43
483		Euro 2	14	9	7	7
484		Euro 1	14	10	9	9
485		Euro 0	4	2	2	2
486		**Navette service number of users**	**25.560**	**26.676**	**27.117**	**27.689**
487		**Navette distance covered (km)**	**690.209**	**742.551**	**805.211**	**835.599**

ANNEX H: GRANGE - FOOD AND VETERINARY OFFICE (FVO)

The European Commission's Health and Food SafetyDirectorate General (DG SANTE), has offices located at Grange (Dunsany) in County Meath in Ireland, some 45 kilometres north-west of Dublin, and approximately 10 kilometres south-east of Trim. There are approximately 180 staff, covering a range of administrative and technical activities. And the working environment is typical of an administrative office. English is the predominant working language.

The site is home of the Food and Veterinary Office (FVO). A large proportion of staff conduct inspections within the Europe and abroad, and consequently at any one time a relatively large number of staff are on mission. The site is currently transitioning to EMAS and seeking to be included in the Commission's EMAS registration in 2015.

Figure H1: Aerial view of the Food and veterinary office

H1 Overview of core indicators at Grange

Grange has been collecting data on core indicators (mostly utilities) since it opened as a purpose built facility in April 2002. A summary of some of the main parameters from 2005 is presented below in Table H1 which focusses on data expressed per square metre, as staff numbers prior to 2014 are not available.elow:

Table H1: Percentage changes in core indicators at Grange

Parameter	From: 2005 Overall	To: 2014 % per year	From: 2011 Overall	To: 2014 % per year	From: 2013	Target 2014
Energy bldgs (KWh/m^2)	22,2	2,5	29,5	9,8	7,6	NA
Water use (l/m^2)	-17,1	-1,9	23,8	7,9	9,7	NA
CO_2 bldgs (kg/m^2)	13,5	1,5	21,4	7,1	4,6	NA

Since 2005 water use per square metre has reduced, although energy consumption for buildings and CO2 emissions have risen. All of these parameters have been increasing in the last three years. Energy and water consumption has fluctuated considerably since the site

opened, and several attempts to identify the causes of these fluctuations have been unsuccessful owing to a lack of technical knowledge and resources. A priority for 2015 is to identify patterns and explanations behind the variations in order to be able to translate analytical results into remedial actions.

H2 Description of FVO's activities and setting

Under the European Commission's Directorate-General for Health and Food Safety, the Food and Veterinary Office (FVO) has about 180 employees, who are professionals originating from virtually all 28 Member States of the European Union.

The FVO carries out audits in EU Member States and in countries exporting food, feed, animals or plants to the EU. It checks how the national authorities in each country ensure that products entering the EU market are safe. FVO audits also check that national authorities keep important animal and plant diseases under control and that animal welfare rules are respected. FVO auditing is based on checking compliance with EU legislation.

The site is located in a rural setting north west of Dublin, as shown below in Figure H2.

Figure H2: FVO location 45km NW of Dublin

The site consists of one main rectangular building and several outbuildings set in a rural location. It includes a restaurant, café and crèche. There is a large conference facility which can accommodate major events, but which is used relatively infrequently.

Notable features in the vicinity include surface water course, a nearby Teagasc agricultural research centre who is responsible for coordinating national research and development in the production of world class Irish Beef in ways compatible with environmental awareness, food safety from the consumer's viewpoint, and the best practices of animal health and welfare.

The Commission site also includes an old waste water treatment plant that is disused since October 2010 and that still has to be decommissioned by the actual owner of the site "the Office of Public Works " (OPW). Indeed, the Commission has a rent/leasing arrangement with the OPW at the end of which the Commission will own 100% of the premises (April 2022). Since October 2010 the wastewater of the site is discharged into the new main sewer instead (Kiltale sewage scheme).

H3 Environmental impact of the FVO activities

A local procedure for the identification, examination and evaluation of the FVO's environmental aspects and impacts, both direct and indirect under normal, abnormal and emergency conditions was developed in 2015. The identification of environmental impacts takes account of the organisation's current and past activities, products and/or services.

A summary of the preliminary analysis of aspects and impacts is presented below in Table H2, which also indicates the related indicators and actions identified in the Commission's 2015 EMAS annual action plan that was adopted by the Steering Committee in 2015.

A study on the Grange environmental aspects was undertaken for the first time in 2014, the results of which are summarised in the table below. This table will be reviewed and updated every year

Table H2: Summary of significant environmental aspects for the Grange site

Environmental aspect	Environmental impact	Activity, product or services	Indicator/Action plan	Significance Rating*	Significant on the basis of legal requirements
Emissions to surface and storm drains	It is possible that contaminated water would reach the surface water system if there was a leak from a vehicle as outlined above. Chemicals stored within the buildings are in secondary containment, as are fuels and water treatment chemicals.	Rain water run off from roofs, hard standing areas, car parks etc.	A spillage of hazardous material is a possible source of release to surface water. The gas oil tank bund has been in place for 12 years and it is good practice to perform regular integrity testing or engineering inspection. An integrity testing of the bund is foreseen in 2015	525	
Energy - Electricity	Energy production and usage has impacts on air and water quality as well as depletion of natural resources.	For office activities; facilities and all parts of the site	Energy usage is monitored, however this is not related to specific significant energy users in order to identify energy reduction opportunities. Projects have been implemented to reduce energy use (e.g. energy saving from changing out sodium for led fittings for external lighting) or energy equivalent use (e.g. by saving water). There is a plan of installing meters in different parts of the building in order to identify significant energy users.	750	
Hazardous waste	Potential impacts include contamination of air, water and land. The waste management process and the use of licenced and approved recycling and recovery contractors minimises the impact on the environment.	Operation of equipment, including lighting, electronic equipment, boilers, cooking facilities etc.	Waste is monitored and recorded on a monthly basis.	204	500
Interactions with groundwater and soil	Contamination of soil or ground water by potential spillage or leak of sewage waste water, effluent, fuel or chemicals.	Delivery, storage, handling and use of fuels and small quantities of chemicals. Storage of sewage waste on site in dis-used septic tank (disconnected but still stores waste).	Management of this activity by: Secondary containment. Spill response procedure and kits.	640	
Non-hazardous waste	Impacts are resource depletion in the re-use, recycling and recovery activities, and use of landfill. Impact on landfill is minimised by re-use, recycling and recovery.	Packaging materials, timber, metals, non-hazardous WEEE, food waste, paper	The site has worked to reduce the impact of non-hazardous waste by improving segregation and recycling. In 2014 it has diverted 95% of non-hazardous waste from landfill.	336	

Rating* = Environmental aspects scored at 500 or more are deemed significant on the basis of the overall likelihood and severity of the environmental impact (NB local site based methodology used to determine scores)

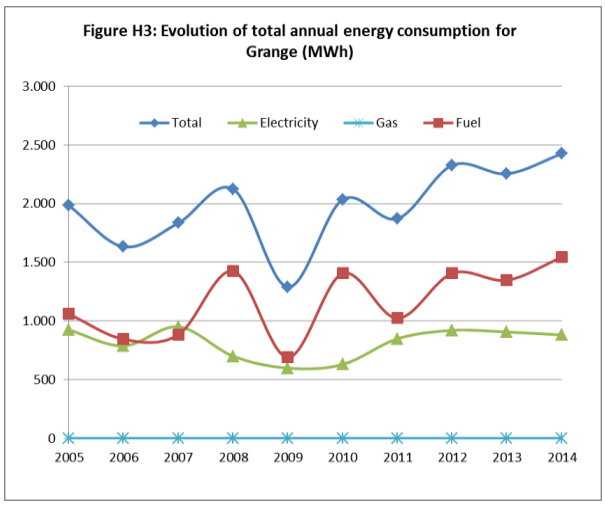
All such environmental aspects are thus deemed significant and appear in Red.

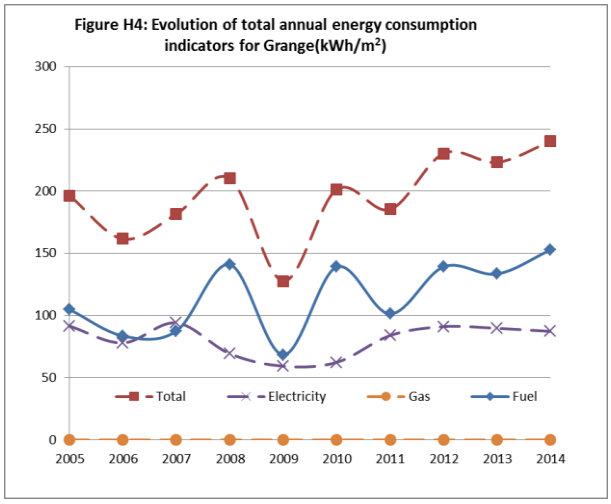
H4 More efficient use of natural resources

H4.1 Energy consumption

a) Buildings

Most of the site's energy requirements for the buildings are met from the electricity grid, and from heating oil supplied periodically and stored in an 85.000 litre bunded storage tank as shown in Figure H3. There is no mains connection for gas. A very small quantity of gas is used for cooking in the canteen and restaurant, and is provided by a propane storage tank. Figure H3 shows that heating oil has in recent years provided a larger share of the site's energy use than electricity.

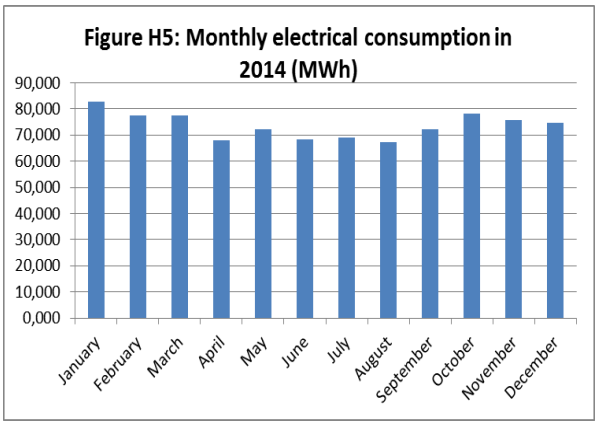


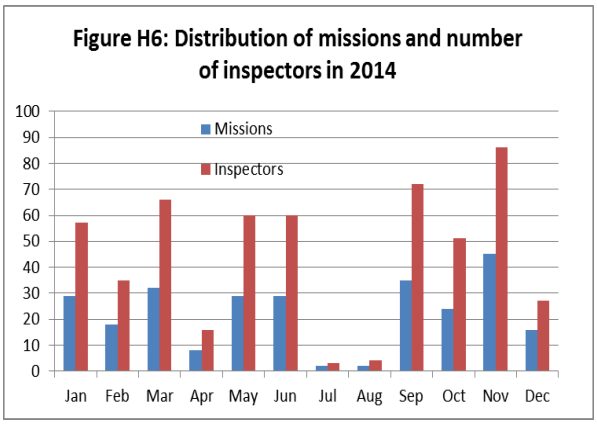


Per capita total buildings energy consumption in 2014 was 12,4 MWh, of which 4,52 MWh was from electricity and 7,91 MWh from heating oil. Approximately 0,01 MWh was provided by the cooking gas.

However the site has not changed configuration fundamentally since it was constructed and therefore historical information energy consumption can be reported per square metre as shown in Figure H4. Electricity consumption has fallen slightly in 2014.

A breakdown of monthly energy consumption in 2014 is provided in Figure H5.





The pattern in electricity consumption seems to be related to external causes such as climate, seasons (natural light lux level) and levels of office occupancy as shown in Figure H6.

Indeed, in 2014 the FVO conducted 269 audit missions and, considering an average mission duration of about 11days and a team typically of 2 inspectors, a total of 5.918 man-days of non-presence of staff that impacts electricity consumption in addition to regular factors such as holidays, sickness and missions to Brussels.

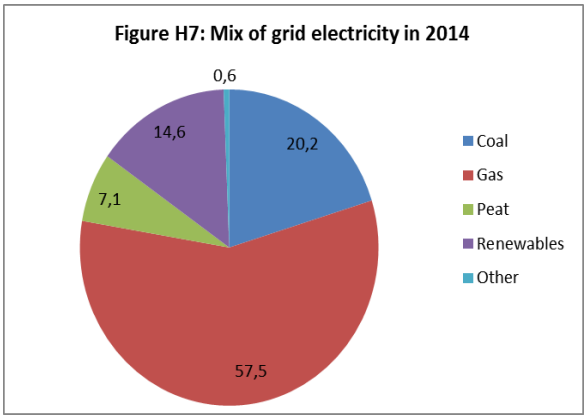
In 2015 electricity meters will be installed in different areas of the site and connected with the FVO's Building Management System (BMS), and will deliver more reliable data that will help us to have a better understanding about the electricity consumption of the FVO's office together with other set of data.

Another project planned in 2015 is to modify management of the 44 lights in the car park to decrease their electricity consumption. Each is fitted with a 40W induction lamp, and including 2W of the control gear/ballast wattage, accounts for a final hourly consumption of 42W. Their total annual consumption is around 7.534 KWh (based on operating 4.077 h per year) but by reducing the effective usage to 1.092 hours (with lights on 3hours per day, seven days a week year round) the total consumption should reduce to of 2.018 KWh, representing a saving of 5.516 KWh.

b) Site vehicle

The site vehicle is a 1999 Seat Alhambra diesel with CO_2 emissions of 174g/km (according to manufacturers specifications). The distance travelled each year is typically low, and was 7 674km in 2014. It is used for audit missions in either the Republic of Ireland or Northern Ireland.

c) Renewable energy use in buildings and vehicles



The composition of the grid electricity supply is shown in Figure H7. Gas is the most important component, but renewables account for 14,6%. Grange does not have information on the grid mix for previous years.

A new solar thermal hot water system was installed in August 2014 to supply the main kitchen, the various kitchenettes around the building, and hand basins in toilets. It is too soon to evaluate whether the expected electricity savings have been achieved.

H4.2 Water consumption

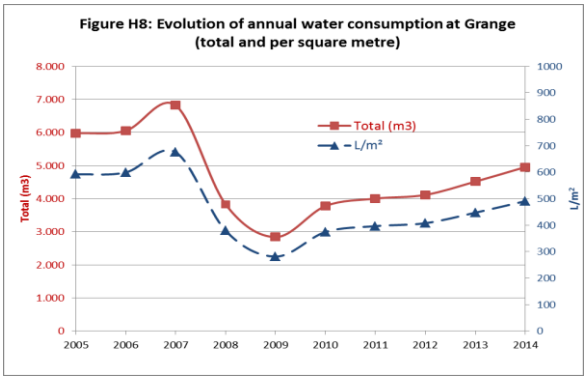


Figure H8 shows total water consumption as a total and per square metre since 2005. The last three years an average annual increase of around 8% has been noted, despite efforts to reduce consumption. Per capita consumption in 2014 was 25,4 m^3

Reducing the demand internally within the building, will also reduce the demand placed

on the local water main. During 2014 water meters were installed in different locations in the building to try to identify main patterns of usage and possible leakages. One of the factors we believe contributed towards increased water consumption, was that we have seen a major increase in the number of external meetings and workshops taking on site. In 2014 we had 19 meetings with average duration of 2 days and between 40 and 60 participants each, compared with initial number of ± 6 meetings of previous years. We have made our staff aware that energy is required to deliver water to the site, and that there are consequently CO_2 emissions associated with turning on the tap. For each cubic metre of water delivered through the mains, we estimate "upstream" emissions to be approxiatley 1,08 tonnes of CO_2.[69]..

H4.3 Office paper consumption

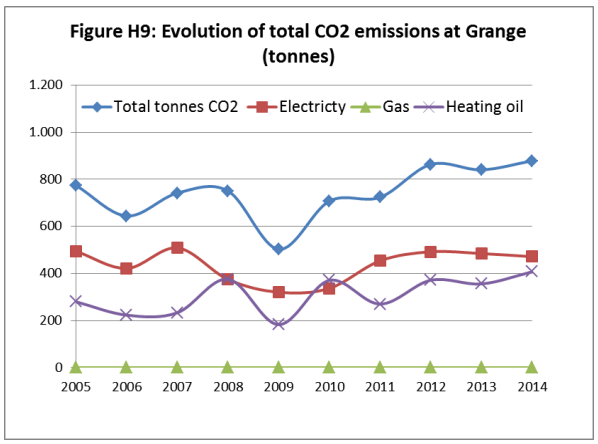
Paper consumption in 2014 was 375.000 sheets, an average of 1.923 sheets per person equivalent to around 9 sheets per day. The objective for 2015 is to reduce it of 5% by ensuring that: i) all printers and photocopiers have the option "printing 2 sides" set as a default and ii) staff are informed about the issue and are motivated to be part of the solution

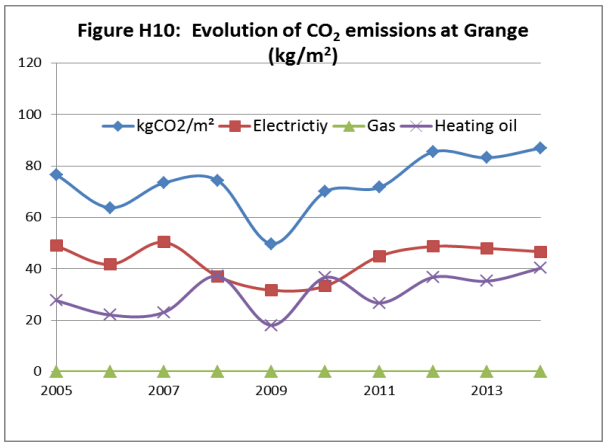
H5 Reducing emissions of CO_2, other greenhouse gases and air pollutants

H5.1 CO_2 emissions from buildings

Emissions associated with energy supply for the buildings account for virtually all the CO_2 emissions evaluated for the site

a) Buildings (CO_2 from energy consumption)





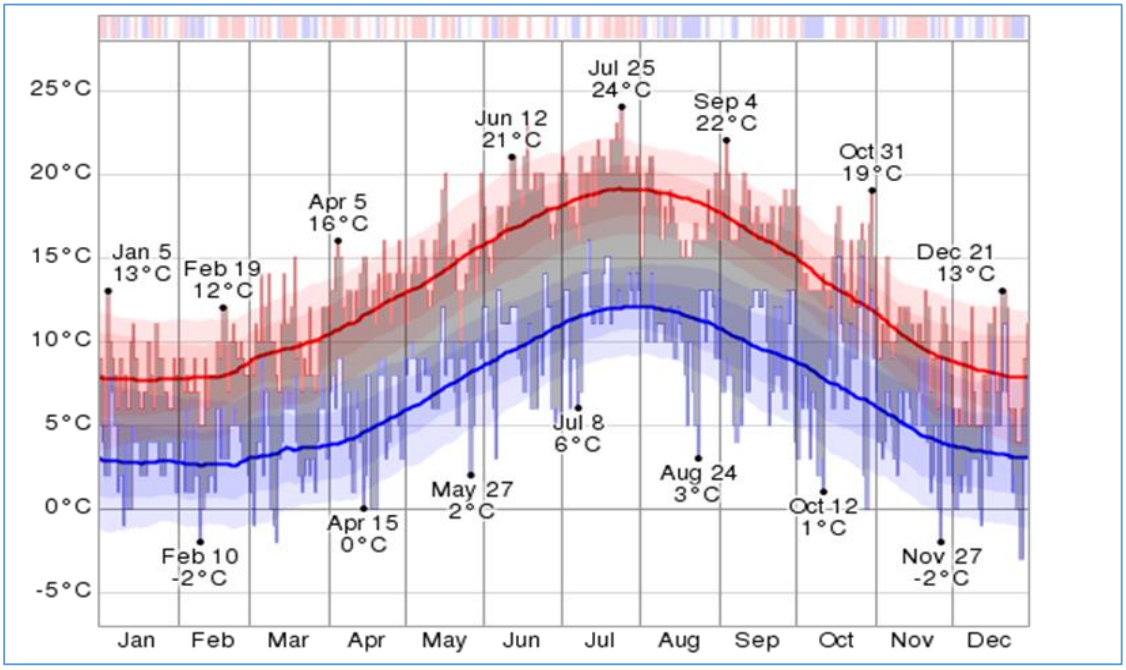
Although there was a slight decrease in CO_2 emissions from 2012 to 2013 for all forms of energy, in 2014 more heating oil was used as it was a colder winter. CO_2 emissions due to electricity consumption are shown to fall, although this is based on the assumption that the percentage of non-renewables in the grid mix before 2014 was similar to that in 2014.

Per capita emissions in 2014 were 4,5 tonnes of which 2,4 from electricity generation and 2,1 from diesel.

[69] Figure obtained through research in 2008-9 CO2 = (M^3*2)*0,538

The distribution of temperatures throughout 2014 is provided in Figure H1 where the red and blue lines represent the daily high and low temperatures respectively.

Figure H11: Distribution of temperatures near Grange



(source https://weatherspark.com/history/28818/2014/Dublin-Leinster-Ireland)

From the data above we can see that the coldest day of 2014 was December 28, with a low temperature of -3°C. It was one of ten days in the year when the temperature dropped below -1°C. The coldest month of 2014 was February with an average daily low temperature of 3°C. Relative to the long term average conditions, the coldest day was August 24 and in relative terms the coldest month was August, with an average low temperature of 10°C, two degrees below average. And the longest relatively cold spell was from September 2 to September 14, constituting 13 consecutive days with cooler than average low temperatures.

The hottest day of 2014 was July 25, with a high temperature of 24°C. It was one of ten days when the temperature exceeded 22°C. The hottest month was July with an average daily high temperature of 20°C. Relative to the long term average the warmest month was April, with an average high temperature of 13°C, one degree warmer than usual. The longest warm spell was from June 10 to June 27, constituting 18 consecutive days with warmer than average high temperatures. The month of April had the largest fraction of warmer than average days with 87% days with higher than average high temperatures.

b) Buildings other greenhouse gases (cooling gases)

No loss of refrigerants has been recorded in 2014. Maintenance on: i) air conditioning units is done on a quarterly/six-monthly and annually base; ii) main kitchen freezers and fridges are done on a six-monthly and annually base; iii) 2 main Hitachi chillers is done on a monthly and annually base and although they are not used they are nevertheless maintained in operational condition.

H5.2 CO_2 emissions from vehicles

a) Commission vehicle fleet

The car is well maintained and serviced according to the manufacturer's service schedule. Therefore, since annual CO_2 emission are quite low at 1,34 tonnes we consider that no further no action is required in the near future.

b) Missions and travel within the site (excluding Commission vehicle fleet)

There are currently no specific actions to improve performance in this area.

c) Commuting (and mobility)

There were no specific targets in 2013 or 2014 or actions identified in the Commission's EMAS 2015 Annual Action Plan to reduce CO_2 emissions from missions. The site conducted a staff survey on commuting by alternative ways of coming to work other than by car in 2014. As a result a pilot study will be launched in 2015 with a shuttle bus connecting the site with the public transport system.

H5.3 Total air emissions of other air pollutants ($S0_2$, NO_2, PM)

Some air pollutants are produced by the generator consumes the heating oil. During 2015, the site will arrive at a better understanding of the quantities of pollutants generated and potentially released to the atmosphere.

H6 Improving waste management and sorting

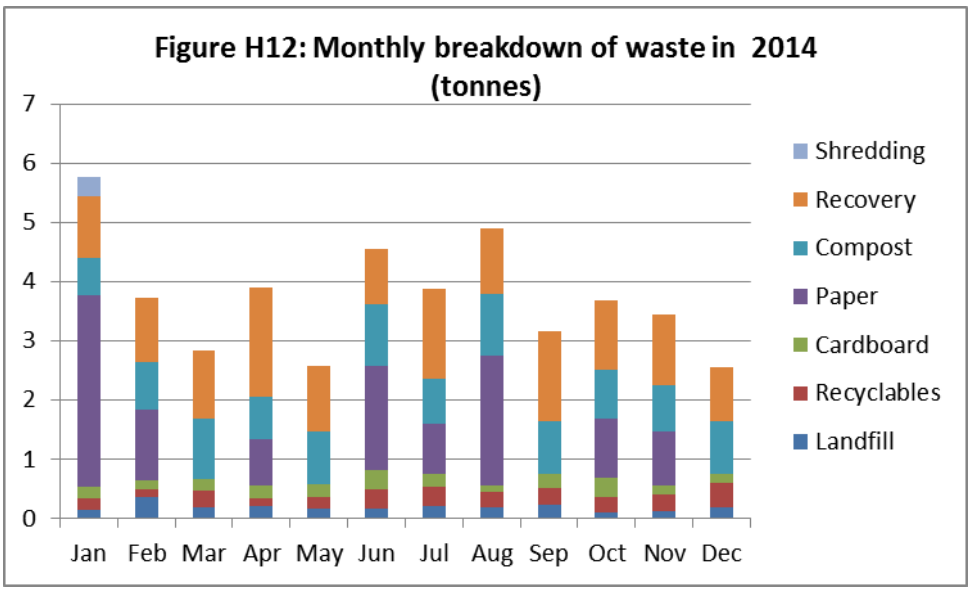
H6.1 Non hazardous waste

Table H3: Breakdown of waste types at Grange 2014 (in tonnes)

	Landfill	Recyclable	Cardboard	Paper	Compost	Recovery	Shredding	Total	Monthly % Recycle rate
Jan	0,155	0,178	0,200	3,245	0,631	1,041	0,325	5,775	**97,3**
Feb	0,366	0,125	0,145	1,200	0,808	1,081	0,000	3,725	**90,2**
Mar	0,200	0,263	0,210	0,000	1,009	1,151	0,000	2,833	**92,9**
Apr	0,206	0,145	0,200	0,800	0,706	1,851	0,000	3,908	**94,7**
May	0,167	0,204	0,200	0,000	0,900	1,098	0,000	2,569	**93,5**
Jun	0,166	0,324	0,332	1,750	1,047	0,925	0,000	4,544	**96,3**
Jul	0,214	0,332	0,200	0,850	0,770	1,522	0,000	3,888	**94,5**
Aug	0,184	0,276	0,092	2,200	1,034	1,120	0,000	4,906	**96,2**
Sep	0,233	0,294	0,237	0,000	0,884	1,511	0,000	3,159	**92,6**
Oct	0,106	0,264	0,320	1,000	0,820	1,175	0,000	3,685	**97,1**
Nov	0,131	0,269	0,167	0,900	0,795	1,186	0,000	3,448	**96,2**
Dec	0,183	0,424	0,140	0,000	0,899	0,910	0,000	2,556	**92,8**
Total	**2,311**	**3,098**	**2,443**	**11,945**	**10,303**	**14,571**	**0,325**	**44,996**	**94,9**
% of total	***5,1***	***6,9***	***5,4***	***26,5***	***22,9***	***32,4***	***0,7***		

The data in Table H3 shows that the average monthly recycle rate was 94,9%, representing all waste streams that did not go to landfill. This was a 43 percentage point increase on the 62% recorded in 2013, although the total quantity of waste did rise from 36,1 tonnes in 2013 to 45,0 tonnes in 2014.

Recovery items (waste sorted manually from the domestic waste) represented the largest single component of waste, and with office paper and compost (food waste from the kitchens) accounting for more than 80% of the waste. Recyclables in the form of bottles, plastic, cans, glass etc, represented only 6,9%. The figures show that improved recycling and recovery measures put in place are working. The distribution of waste types throughout 2014 is shown in Figure H12.



H7 Protecting biodiversity

The dimensions of the Grange site are shown in the plate to the left, from which the footprint is calculated at approximately 8.5ha within which the constructed area is about 1.01ha. Owing to its rural location respecting and promoting biodiversity is very important. The number of staff per unit surface area is low, a staff member occupies on average 470m² of the site or 52m^2 of the built up area

In order to maintain and improve biodiversity the following actions were taken:

1) Creation of a natural meadow for bees and other insects called “Nectar café” (see pictures below). The meadow covers 200m² and has been planted with flowers that will provide all insects and particularly bees, with a space free from pesticides.

2) Creation of an allotment where some staff grow a wide variety of vegetables. They are indirectly supporting the sustainability of the local biodiversity through the compost that is created from the organic leftovers and cleaning of the different plant beds. The gardeners are not allowed to use pesticides. Rabbits, slugs, birds and rodents are among the animals that make the most advantage of the crops produced by our colleagues.

The allotment project is very popular among our staff. And both projects are the results of adopting a "bottom-up" approach to implementation. Indeed, they were developed when proposals from staff members to management were accepted and supported.

H8 Green public procurement

H8.1 Incorporating GPP into procurement contracts

Two main contracts for the Facilities Management and the Cleaning services were processed in 2014 and these mentioned EMAS as presented in the extract below:

Environmental Considerations

> The European Commission is particularly anxious to uphold best practices which have due regard to environmental considerations relating to all activities under this contract.
>
> The Contractor shall fully respect the requirements of Eco-Management and Audit Scheme (EMAS) and ISO 14001 as these standards are currently applicable to the Grange site.
>
> The Contractor shall maintain all records and provide all reports under EMAS requirements in accordance with the EU EMAS Regulation EC No 1221/2009 of the European Parliament and of the Council of 25 November 2009.

H8.2 Office supplies

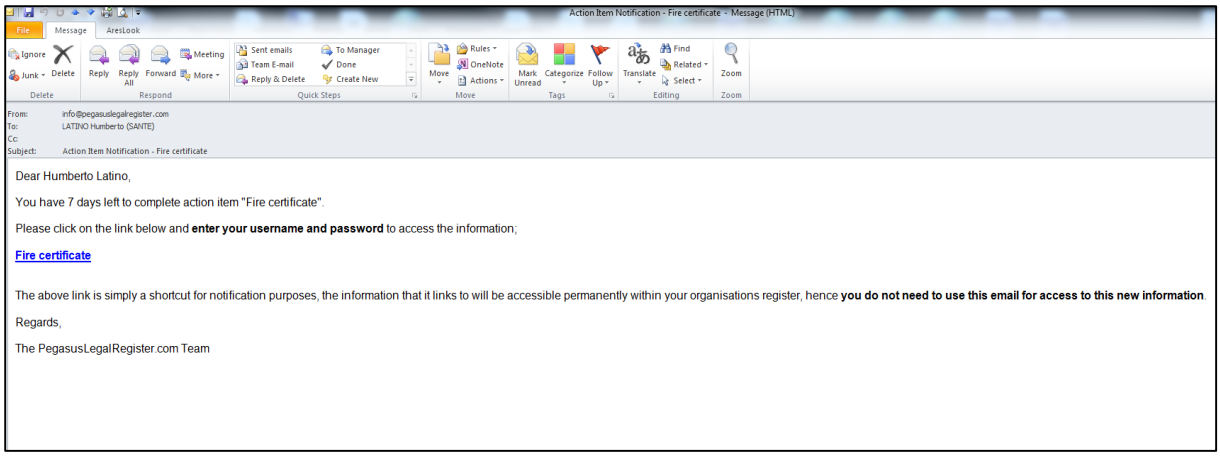
Grange uses an official Commission framework contract for its office supplies. Very little eco-friendly office supplies were bought in 2014 but figures for the first three months of 2015 are very encouraging, since the 113 eco-friendly items bought so far account for 47% of the total supplies bought (404 items).

H9 Demonstrating legal compliance

H9.1 Legal compliance

A procedure for compiling the legal register has been in place since late 2014. The Register of Environmental Legislation is reviewed and updated continually by an external consultancy (www.pegasuslegalregister.com).

As a new or updated piece of information is added to the register an automated email is issued to relevant FVO users notifying them of the change, and ensures that there is appropriate follow up (see image below).



For each piece of legislation, the Legal Register provides:

a. Full title of legislation;
b. Reference number;
c. Purpose of the Act/Regulation/Directive;
d. Implications for FVO;
e. Summary of the Act/Regulation/Directive

The Register of Environmental Legislation is divided into the following sections:

Section 1 - General Environmental Legislation
Section 2 - Water
Section 3 - Waste
Section 4 - Air Pollution
Section 5 - Physical Planning
Section 6 - Noise
Section 7 - Energy
Section 8 - Dangerous Substances
Section 9 - Emergency Preparedness
Section 10 - Habitats and Eco systems
Section 11 - Existing Licenses, Planning Permissions and EMS Policy

Unlike most other Commission EMAS sites, Grange does not require a permit to operate. It does require a fire safety certificate and a planning permit.

Compliance with applicable legislation is demonstrated through the responses provided to questionnaires which generate scores. The FVO is compliant with the relevant legislation.

H9.2 Compliance with EMAS

The FVO monitors the findings of EMAS Internal and Verification Audits, and in co-operation with DG HR COORD ensures that all non-conformities and scope for improvements are monitored and that remedial actions are taken to close them down.

H10 Internal communication (and training)

H10.1 Internal communication

Grange participated in the 2014 Mobility week by organising a daylong event during which both conventional and electric bicycles along with electric cars were on show. Staff were able to test the vehicles and so gain a useful insight into alternative ways of transport as shown below.

EMAS was added as permanent item in the agenda of the weekly FVO Administration Management meeting for which the minutes are distributed to all staff, therefore allowing them to be updated on progress to EMAS.

H10.2 Internal training

In 2014 Grange was currently transitioning to EMAS and therefore did not have specific internal training designed and proposed to staff and to the main EMAS actors.

H11 Transparent dialogue with external partners

A site level EMAS Steering Committee has been created and the external facilities management contractor has been invited to be a member. The contractor should be able to contribute by sharing his knowledge and bringing an alternative viewpoint to the group.

The committee will be the main force seeking to influence contractors and stakeholders in order to obtain their commitment to improving the Grange site's environmental performance and contributing to its sustainable development.

H12 EMAS costs (and savings)

The per capita costs of implementing EMAS at Grange in 2014 were approximately 243 EUR, Per capita energy and water costs were 618 EUR and 31 EUR respectively.

H13 Grange data tables

Line	Objective/ indicator	Parameter and units	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
2	**Basic EMAS**	**Population: staff in EMAS perimeter**	**195**	**195**	**195**	**195**	**195**	**195**	**195**	**195**	**195**	**195**
4		**Population: total staff**	**195**	**195**	**195**	**195**	**195**	**195**	**195**	**195**	**195**	**195**
6		**No. buildings seeking EMAS registration**									**0**	**3**
8		Total no. of buildings									0	3
10		**Useful surface area in EMAS perimeter, (m^2)**	**10.100**	**10.100**	**10.100**	**10.100**	**10.100**	**10.100**	**10.100**	**10.100**	**10.100**	**10.100**
12		**Useful surface area for all buildings, (m^2)**	**10.100**	**10.100**	**10.100**	**10.100**	**10.100**	**10.100**	**10.100**	**10.100**	**10.100**	**10.100**
14		**Total site area, (m^2)**	**85.600**	**85.600**	**85.600**	**85.600**	**85.600**	**85.600**	**85.600**	**85.600**	**85.600**	**85.600**
16	**Objective I) Efficient use of resources**											
19	**Ia**	**Total energy buildings, (MWh)**	**1.991**	**1.639**	**1.841**	**2.131**	**1.296**	**2.041**	**1.878**	**2.333**	**2.260**	**2.271**
23		**MWh/person**	**10,209**	**8,404**	**9,440**	**10,926**	**6,646**	**10,466**	**9,630**	**11,963**	**11,591**	**11,647**
27		**kWh/m²**	**197**	**162**	**182**	**211**	**128**	**202**	**186**	**231**	**224**	**225**
29		**i) supplied electricity, (MWh)**	924	788	951	700	598	630	848	920	906	881
31		**MWh/person**	**4,740**	**4,039**	**4,875**	**3,590**	**3,068**	**3,228**	**4,349**	**4,718**	**4,646**	**4,520**
33		**kWh/m²**	**92**	**78**	**94**	**69**	**59**	**62**	**84**	**91**	**90**	**87**
35		**renewables in electricity mix, (%)**	14,6	14,6	14,6	14,6	14,6	14,6	14,6	14,6	14,6	14,6
37		**from renewables, (MWh)**	**135**	**115**	**139**	**102**	**87**	**92**	**124**	**134**	**132**	**129**
39		**MWh/person**	**0,692**	**0,590**	**0,712**	**0,524**	**0,448**	**0,471**	**0,635**	**0,689**	**0,678**	**0,660**
41		**kWh/m²**	**13**	**11**	**14**	**10**	**9**	**9**	**12**	**13**	**13**	**13**
43		**non renewables in electricity in mix, (%)**	**85**	**85**	**85**	**85**	**85**	**85**	**85**	**85**	**85**	**85**
45		**from non renewables, (MWh)**	**789**	**673**	**812**	**598**	**511**	**538**	**724**	**786**	**774**	**753**
47		**MWh/person**	**4,048**	**3,449**	**4,163**	**3,066**	**2,620**	**2,757**	**3,714**	**4,029**	**3,968**	**3,860**
49		**kWh/m²**	**78**	**67**	**80**	**59**	**51**	**53**	**72**	**78**	**77**	**75**
53		ii) supplied gas, (MWh)	6,86570	6,8657	6,8657	6,8657	6,8657	6,8657	6,8657	6,8657	6,8657	6,8657
55		**MWh/person**	**0,035**	**0,035**	**0,035**	**0,035**	**0,035**	**0,035**	**0,035**	**0,035**	**0,035**	**0,035**
57		**kWh/m²**	**0,680**	**0,680**	**0,680**	**0,680**	**0,680**	**0,680**	**0,680**	**0,680**	**0,680**	**0,680**
59		iii) supplied diesel, (MWh)	1.060	844	883	1.424	691	1.405	1.023	1.406	1.347	1.383
61		**MWh/person**	**5,434**	**4,330**	**4,530**	**7,301**	**3,544**	**7,203**	**5,246**	**7,209**	**6,910**	**7,092**
63		**kWh/m²**	**104,9**	**83,6**	**87,5**	**141,0**	**68,4**	**139,1**	**101,3**	**139,2**	**133,4**	**136,9**
65		iv) district heating, (MWh)										0
71		v) site generated renewables - biomass, (MWh)										0

77		vi) site generated renewable - PV, (MWh)										0,0
79		**Installed peak capacity, (kWhp)**										**0**
81		Assumed output, (% of kWh/p)										50
83		**MWh/person**										**0,000**
85		**kWh/m²**										**0,000**
89	**1b**	**Total energy used by service vehicles, (MWh/yr)**										**0,000**
93		**MWh/person**										**0,000**
97		**kWh/m²**										**0,000**
99		**Diesel used, (m^3)**										**0,000**
101		kWh of energy provided by one litre diesel										10,89
102		**Petrol used, (m^3)**										**0,000**
104		kWh of energy provided by one litre petrol										9,42
105		**Other fuel (optional)**										**0,0**
110	**1c**	**Total renewable energy use, (MWhr/yr)**	**135**	**115**	**139**	**102**	**87**	**92**	**124**	**134**	**132**	**129**
114		**renewable energy as part of total, (%)**						**4,50**	**6,59**	**5,76**	**5,85**	**5,67**
118		**Onsite generated renewables as part of total energy, (%)**						**0,00**	**0,00**	**0,00**	**0,00**	**0,00**
122	**1d**	Water usage in EMAS perimeter, (m^3)	5.979	6.054	6.821	3.829	2.840	3.778	4.003	4.115	4.517	4.956
126		**m^3/person**	**30,662**	**31,046**	**34,979**	**19,636**	**14,564**	**19,374**	**20,528**	**21,103**	**23,164**	**25,415**
130		**L/m²**	**592**	**599**	**675**	**379**	**281**	**374**	**396**	**407**	**447**	**491**
134	**1e**	Office paper consumption, (tonnes)										1,84
138		**Office paper consumption (tonnes/person)**										**0,009**
140		**Paper Density (g/m^2)**										78,628
142		**Sheets/kg**										204
144	181	**Total No. of sheets**										375.000
146		**Sheets/person**										**1.923**
148		Working days in the year										211
151		**Office paper sheets/person/day**										**9,1**
155	**1f**	Offset paper consumption (tonnes)										0,0
159		**Offset paper (tonnes/person)**										0,000
161	**Objective II) Reduction in CO2 (including CO2 equivalent of greenhouse gases) and other air pollutants**											
164	**2a**	**Total office building emissions from energy, (tonnes CO_2)**	**776**	**646**	**743**	**752**	**504**	**709**	**725**	**865**	**842**	**838**
168		**tonnes CO_2/person**	**3,978**	**3,311**	**3,811**	**3,855**	**2,584**	**3,636**	**3,719**	**4,435**	**4,317**	**4,298**
172		**kgCO_2/m²**	**76,8**	**63,9**	**73,6**	**74,4**	**49,9**	**70,2**	**71,8**	**85,6**	**83,3**	**83,0**
174		**i) from electricity, (CO_2 tonnes)**	**495**	**421**	**509**	**375**	**320**	**337**	**454**	**492**	**485**	**472**

176		Kgs CO2 from 1 kWh of electricity	0,535	0,535	0,535	0,535	0,535	0,535	0,535	0,535	0,535	0,535
177		**tonnes CO2/person**	**2,536**	**2,161**	**2,608**	**1,921**	**1,641**	**1,727**	**2,327**	**2,524**	**2,486**	**2,418**
179		**kgCO2/m²**	**49**	**42**	**50**	**37**	**32**	**33**	**45**	**49**	**48**	**47**
181		**ii) from gas (tonnes/yr)**	**1,40060**	**1,40060**	**1,40060**	**1,40060**	**1,40060**	**1,40060**	**1,40060**	**1,40060**	**1,40060**	**1,40060**
183		Kgs CO2 from 1 kWh natural gas	0,204	0,204	0,204	0,204	0,204	0,204	0,204	0,204	0,204	0,204
184		**tonnes CO2/person**	**0,007**	**0,007**	**0,007**	**0,007**	**0,007**	**0,007**	**0,007**	**0,007**	**0,007**	**0,007**
186		**kgCO2/m²**	**0,139**	**0,139**	**0,139**	**0,139**	**0,139**	**0,139**	**0,139**	**0,139**	**0,139**	**0,139**
188		**iii) from diesel (tonnes/yr)**	**280**	**223**	**233**	**376**	**182**	**371**	**270**	**371**	**356**	**365**
190		Kgs CO2 from 1 kWh diesel	0,264	0,264	0,264	0,264	0,264	0,264	0,264	0,264	0,264	0,264
191		**tonnes CO2/person**	**1,435**	**1,143**	**1,196**	**1,927**	**0,935**	**1,901**	**1,385**	**1,903**	**1,824**	**1,872**
193		**kgCO2/m²**	**28**	**22**	**23**	**37**	**18**	**37**	**27**	**37**	**35**	**36**
195		**iv) from district heating (tonnes/yr)**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
197		Kgs CO2 from 1 kWh								0,264	0,264	0,264
198		**tonnes CO2/person**									**0,000**	**0,000**
200		**kgCO2/m²**									**0**	**0**
202		**Total quantity of refrigerants (tonnes)**										**0,000**
204		**Total refrigerant losses (tonnes)**										**0,000**
208	**2b**	**Emissions of other gases as CO_2 equivalent (tonnes)**										**0,0**
212		**tonnes CO2equiv/person**										**0,000**
216		**kgCO2equiv/m2**										**0,000**
218		**inventory R22, (kg)**										
219		i) losses R22, (kg)										NA
220		GWP										1810
221		**as tCO2equiv**										0,0
223		**inventory R410A, (kg)**										
224		ii) losses R410A, (kg)										NA
225		GWP										2090,00
226		**as tCO2equiv**										0,00
228		**inventory R134A, (kg)**										
229		iii) losses R134A, (kg)										NA
230		GWP										1430
231		**as tCO2equiv**										0,00
233		**inventory R404A, (kg)**										
234		iv) losses R404A, (kg)										NA
235		GWP										
236		**as tCO2equiv**										

238		**inventory R407C, (kg)**										
239		v) losses R407C, (kg)										NA
240		GWP										
241		**as tCO2equiv**										
243		**inventory R507A, (kg)**										
244		vi) losses R507A, (kg)										NA
245		GWP										3300
246		**as tCO2equiv**										NA
248		**inventory R422D, (kg)**										
249		vii) losses R422D, (kg)										NA
250		GWP										3300
251		**as tCO2equiv**										NA
255	**2c**	**Site vehicle CO_2 emissions (tonnes)**										**0,0**
257		**tonnes CO_2/person**										**0,000**
259		**i) from diesel (tonnes)**										**0,000**
261		Kgs CO2 from one litre of diesel										2,67
262		**ii) from petrol**										**0,0**
264		Kgs CO2 from one litre of petrol										2,28
265		**from other fuel (eg propane)**										**0,00**
270		**gCO2/km (manufacturer)**										**174,0**
272		Vehicle kms travelled										7.674
278		**gCO2/km (actual)**										**174**
280		**Number of vehicles**										**1**
282		**kms/vehicle**										**7.674**
286	**2d**	**Total air emissions buildings (tonnes), as mimimum NOx, SO_2, PM_{10}**										**0,0**
288		**tonnes/person**										0,0000
290		NOx, (kg)										NA
292		SO2, (kg)										NA
294		PM10, (kg)										NA
296		…..others (VOC), (kg)										NA
298		….others CO, (kg)										NA
300	**Objective III) Waste management**											
303	**3a**	**Total non hazardous waste, (tonnes)**									**36,508**	**44,996**
307		**Total non haz.waste (tonnes/person)**									**0,187**	**0,231**
309		**Household waste (tonnes), landfill**										2,31
311		**Recyclables**										3,10

313		**Cardboards**										2,44
315		**Paper**										11,95
317		**Shredding**										0,33
319		**Compost**										10,30
321		**Recovery***										14,57
332	**3b**	**Total hazardous waste (tonnes)**									**0,000**	**NA**
336		**Total hazardous waste, (tonnes/person)**									**0,0000**	**0,0000**
338		Waste 1									0,000	NA
340		Waste 2									0,000	NA
372	**3c**	**Percentage of waste sorted**									**0,00**	**95,00**
374	**Objective IV) Protecting biodiversity**											
377	**4a**	**Built surface area, (m^2)**										10.100
381		**Built surface area, (m^2/person)**										**52**
385		**Built surface area as part of site, (%)**										12
387	**Objective V) Green procurement**											
389	**5a**	**Contracts >60k with "eco" criteria (%)**										2
392	**5b**	**Green products in office catalogue (%)**										
394		**Green products in catalogue, (No)**										NA
395		**Products in catalogue, (No)**										NA
396		**Total value of products purchased from catalogue (EUR)**										NA
398		**Value of green products purchased (EUR)**										NA
400	**Objective VI) Legal conformity**											
402	**6a**	**EMAS registered buildings (%)**										**NA**
405	**6b**	**EMAS registered useful floorspace (%)**										**0,0**
407		**EMAS verification non conformities**										**NA**
409	**Objective VII) Communication**											
411	**7b**	**No. of difft trainings on offer**										NA
413	site training	**No of training beneficiaries**										NA
415		**Staff benefiting from training (%)**										
417	**Objective VIII) Promoting dialogue with external partners**											
418												
419												
420	**Estimating EMAS costs and virtual value of identified savings**											
421	**Direct costs**	**Total Direct EMAS Cost (EUR)**										**47.400**
422		Total Direct Cost per employee										243
423		**i) Annual direct staff costs**										**33.000**
424		Annual direct staff costs (time FTE)										0,25

425		Annual cost of one FTE										132.000
426		**ii) Annual contract costs**										**14.400**
427		Contract 1 (cost per year) if applicable										14.400
430		**iii) Annual misc costs**										**0**
433	**Energy (Bldgs)**	**Electricity unit cost (Eur/MWh)**										116,86
434		**Gas (Eur/MWh)**										646,29
435		**Fuel (Eur/MWh)**										42,78
436		**Total buildings energy cost (Eur/person)**										**631,01**
437		Electricity (Eur/person)										528
438		Gas (Eur/person)										22,7550
439		Fuel (Eur/person)										80,10
440		**Total buildings energy cost (Eur)**										**123.048**
441	**Energy (vehic.)**	**Diesel unit cost- (Eur/m3)**										
442		**Petrol unit cost- (Eur/m3)**										
443		Total cost Diesel (Eur)										0
444		Total cost petrol (Eur)										0
445		Total energy costs (Eur/person)										0,00
446		**Total fuel costs (vehicles) (Eur)**										**0**
447	**Water**	Water unit cost (Eur/m3)										1,23
448		Water (Eur/person)										31,26
449		**Total water costs (Eur)**										**6.096**
450	**Paper**	Paper (office) - unit cost/kg										
451		Paper (offset) - unit cost/kg										
452		Paper (office) - Eur/person										0,00
453		Paper (offset) - Eur/person										0,00
454		Total paper (office) cost (Eur)										0,00
455		Total paper cost (Eur/person)										0,00
456		**Total paper cost (Eur)**										**0**
457	**Waste**	Waste disposal (general) - unit cost/tonne						0,00	0,00	0,00	0,00	NA
458		**Waste disposal (general) - Eur/person**						**0,00**	**0,00**	**0,00**	**0,00**	**0,00**
459		Waste disposal (hazardous) - unit cost/tonne						18860,00	33191,11	44460,00	52636,66	NA
460		**Waste disposal (hazardous) - Eur/person**						**0,00**	**0,00**	**0,00**	**0,000**	**0,000**
461		**Total waste cost (Eur)**						**0**	**0**	**0**	**0**	
462	**Other site specific data**											
469		**NM: Not Measured**										
470		**NA: Not Applicable**										

ANNEX I CONVERSION FACTORS

No	Factor	Factor value and reference																	
		OIB		OIL		JRC												SANTE	
		Brussels		Luxem-bourg		Petten		Geel		Sevilla		Karlsruhe		Ispra		Grange			
1	kWh of energy provided by one litre diesel	11,1	1a	10,89	1b	10,89		10,89		10,89		10,89		10,12		10,89			
2	kWh of energy provided by one litre petrol	9,4	2a	9,42	2b	9,42		9,42		9,42		9,42		8,56		9,42			
2a	kWh of energy provided by one litre of LPG															7,1	20		
3	Working days in the year	211	3	211		211		211		211		211		211		211			
4	Kgs CO2 from 1 kWh of electricity	0,014	4a	0	4b	0,671	4c	0,285	4d	0,4	4e	0,315	4f	0,407		0,535			
5	Kgs CO2 from 1 kWh natural gas	0,201	5a	0,19	5b	0,204	5c	0,202	5d	0,204		0,213		0,201		0,204			
6	Kgs CO2 from 1 kWh diesel	0,264	6a			0,264		0,267	6b	0,264		0,264		0,264		0,264			
7	Kgs CO2 from district heating (hot water)			0,264	7a			0,267	7b			0,213	7c						
8	Kgs CO2 from 1 litre diesel (vehicle fleet)	2,6	8a	2,67	8b	2,67		2,67		2,67		2,67		2,682		2,67			
9	Kgs CO2 from 1 litre petrol (vehicle fleet)	2,3	9a	2,28	9b	2,28		2,28		2,28		2,28		2,261		2,28			
10	Global Warming Potential of R22	1.810	10	1.810		1.810		1.810		1.810		1.810		1.760	17	1.810			
11	Global Warming Potential of R410a	2.090	11	2.090		2.090		2.090		2.090		2.090		2.088	18	2.090			
12	Global Warming Potential of R134a	1.430	12	1.430		1.430		1.430		1.430		1.430		1.430	18	1.430			
13	Global Warming Potential of R404a	3.920	13a	3.260	13b			3.300	13c					3.922	18				
14	Global Warming Potential of R407c	1.770	14a	1.256	14b	1.775	14c							1.774	18				
15	Global Warming Potential of R507a							3.300	15			3.300		3.985	18	3.300			
16	Annual cost of one FTE	132.000	16	132.000		132.000		132.000		132.000		132.000		132.000	19	132.000			

Notes	
1a, 2a	By Neil Packer, Staffordshire University UK - 2011
1b, 2b	www.carbontrust.com, Conversion factors 2013
3	DG-HR data (Email El-Bourai - Rourke 13/03/2014)
4a	As 95% of electricity in Brussels is renewable, factor presented is 0,05 x 0,275 (0,275 value a referenced in note 5a/6a)
4b	100 % electricity from renewable sources, considered to not generate CO2 emissions
4c	Conversion factors: = m3 natural gas x 31,65/3,6, 1kWh=0,671 kgCO2/kWh, 1m3 natural gas = 1,791 kg CO2/m3 from ES 2012 (footnote 39)
4d	EU Covenant of Mayors, recommendation for Belgium, www.covenantofmayors.eu/IMG/pdf/technical_annex_en.pdf (2/02/2014)
4e	Kgs CO2 generated by consuming 1 kWh of electricity: data rectified: 0.40 kg CO2 by KW/h ENDESA Energía XXI
4f	Source EnBW
(4a),5a,6a	Email of 27/03/2013 de l'IGBE (Institut Bruxellois pour la Gestion de l'Environnement), l'Administration de l'Environnement et de l'Energie de la Région de Bruxelles-Capitale. Facteur pour le gaz : 0.201 kg/kWh, pour l'electricité 0.275 kg/kWh, pour le fuel : 0.264 kg/kWh »
5b	www.enovos.eu -reference from Environmental Statement (data for 2012)
5c	Kgs CO2 generated by consuming 1 kWh natural gas (ES for 2012 data, footnote 39: 1,791/8,792)
5d	EU Covenant of Mayors, recommendation for Belgium, www.covenantofmayors.eu/IMG/pdf/technical_annex_en.pdf (2/02/2014)
6b	www.restscreen.net/ang/emission_factors_for_diesel_generator_image.php presented 2,6 which is higher than other sites, (eg IGBE have proposed for fuel - propose lower value more coherent with other sites
7a	From Email from Pierette Karges to Jean Haas 14/04/2014 (District heating for DROSBACH only)
7c	Umweltbundesamt
8a, 9a	Internal data OIB (calculated from basic chemical principles)
8b, 9b	Internal data OIL (from Ecofleet management software)
10, 12	IPPC, 4th annual report 100 year value
11	Global Warming Potential (GWP) for R410A (Handboek CO2 Prestatieladder, Version 2,1, ES data 2012 footnote 41)
13a, 14a	http://www.ipcc.ch/publications_and_data/ar4/wg1/en/ch2s2-10-2.html
	values of the GWP 100-yr, weighted average of the different components of the gas
13b, 14b	International Insitute for Refrigeration (www.iifiir.org data sheets for 404A and 407C) but no losses data recorded for OIL for these refrigerants
13c, 14c	Source: 20120718_Handboek_CO2_Prestatieladder_Versie_2_1 (Bijlagen, par. 6.2)
15	http://www.engineeringtoolbox.com/Refrigerants-Environment-Properties-d_1220.html
16	Note Circulaire of RUF of 8th August 2013, BUDG D4
17	GWP has been calculated according to Climate Change 2013: The Physical Science Basis (AR5)" - IPCC, 2013. Appendix 8A, pag 731
18	GWP has been calculated according to the UE Regulation UE n.517 of 16/04/2014.
19	Under verification
20	LPG Tank User Manual

ANNEX J GLOSSARY

DG	Directorate-General:
	BUDG (Budget) ; CLIMA (Climate Action); DIGIT (IT); DGT (Translation); ENER (Energy) ENV (Environment); HR (Human Resources and Security); JRC (Joint Research Centre) MOVE (Mobility and Transport)
CO	Carbon monoxide
CO_2	Carbon dioxide: A colourless, odourless, incombustible gas, formed during respiration, combustion and organic decomposition and used in food refrigeration, carbonated beverages, inert atmospheres, fire extinguishers, and aerosols
EC	European Commission
ECF	Elementally chlorine-free.
ECOR	EMAS correspondent in the DGs and departments.
EMAS	Eco-Management and Audit Scheme.
EMS	Environmental management system
EMS-SOP	Standard operational procedures relating to the management of environmental aspects at the European Commission Environmental management system
EPI	EU Fire picket
ESSOR	Essais Orgel
EU	European Union of 27 Member States since 1 January 2007.
GELINA	Geel Electron Linear Accelerator
GIME	Inter-insitutional group on Environmental Management (GIME for French equivalent)
GPP	Green Public Procurement - Procuring works, goods or services such that the negative impact on the environment reduced beyond that which would be achieved under standard procurement procedures
GWP	Global Warming Potential - a number expressing the potential of a gas to contribute to global warming based on CO_2 having a value of 1
HCFC	Hydrochlorofluorocarbon.
HDD (CDD)	Hot degree days, a measure of the temperature conditions in winter, describes the amount of time below a reference temperature and for which heating is therefore required. CDD applies to summer, and reflects the amount of time above the reference temperature when cooling may be necessary
HVAC	Heating, ventilation and air conditioning
IBGE	Institut bruxellois pour la gestion de l'environnement (Brussels Institute for Environmental Management)
ICT	Information and communication technologies
ISO 14001	Internationally-agreed standard for environmental management
KIT	Karlsruhe Insitute of Technology
NOx	Nitrous oxides, gases released to the atmosphere as a result of combustion of fossil fuels
OIB	Office for Infrastructure and Logistics in Brussels
OIL	Office for Infrastructure and Logistics in Luxembourg
OP (OPOCE)	Office for Official Publications of the European Communities
OXFAM	Development, relief and campaigning organisation that works to find solutions to poverty around the world
PAG	Annual Management Plan (Plan Annuel de Gestion) for EMAS
PC	Personal computer
PMC	Paper, metal and cartons (for drinks) = packaging
PM	Particulate matter, usually referring to particles released to the atmosphere as the result of combustion of fossil fuels, especially diesel
RFI	Radiative Forcing Index: A factor applied to CO_2 emissions to take into account their greater impact at higher atmospheric levels
R22	Hydrochlorofluorocarbon (HCFC-22), an ozone depleting gas used as a refrigerant. It has a smaller ozone-depleting potential than CFC-12. It is a temporary replacement for CFC-12 and its use in the EU will be banned in 2015.
SECT	Service externe de contrôle technique – authorised external inspection body
SG	Secretariat-General.
SIN	First-aid officers
SIPP	Internal service for accident prevention and protection at work
SMEs	Small and Medium Enterprises
SO_2	Sulphur dioxide, a gas produced by combustion of fossil fuels which can have harmful consequence for the environment by forming acid rain
STIB	Société des Transports Intercommunaux de Bruxelles (Intercommunal Transport Company in Brussels)
TCF	Totally chlorine-fee
VOC	Volatile Organic Compounds: Often associated with combustion of fossil fuels but produced through other chemical processes are air pollutants