European Commission

JRC SCIENCE AND POLICY REPORT

2014 EMAS Environmental Statement 2013 Results

Institute for Energy and Transport

B. Eriksen, N. Wagenaar, P. Bruin

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Joint Research Centre
Institute for Energy and Transport

Contact information
Brian Eriksen
Address: Joint Research Centre, Institute for Energy and Transport, P.O. Box 2, NL-1755 ZG Petten, The Netherlands
E-mail: Brian.eriksen@ec.europa.eu
Tel.: +31 224 56 5438

https://ec.europa.eu/jrc

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Abstract
This report is the Environmental Annual Report 2014, with the results of 2013 of the Institute for Energy and Transport (IET) of the JRC. The report includes description of the organisational systems and structures together with the planned activities and the achieved goals. This report only refers to the activities of the JRC-Petten site of the Institute.

Table of contents

Table of contents

1 Glossary

	Dutch	English
ANVS	Autoriteit Nucleaire Veiligheid en Stralingsbescherming	Department of Nuclear Safety, Security and Safeguards
BHV	Bedrijfshulpverlening	In-company Emergency Response Team
BSI	British Standards Institute	British Standards Institute
CPR	Commissie voor de Preventie van Rampen door gevaarlijke stoffen	Committee for the prevention of disasters by hazardous substances
ECN	Energieonderzoek Centrum Nederland	Energy Research Centre of the Netherlands
EMAS	Eco-Management and Audit Systeem	Eco-Management and Audit Scheme
EMS	MilieuManagement Systeem	Environmental Management System
EPBD	Europese richtlijn energiepresentatie gebouwen	Energy Performance of Buildings Directive
EPC	Energieprestatiecertificaat	Energy Performance Certificate
GHG	Broeikasgassen	Greenhouse gases
GHS	Globally Harmonized System (*of Classification and Labeling of Chemicals)*	Globally Harmonized System (*of Classification and Labeling of Chemicals)*
HFR	Hoge Flux Reactor	High Flux Reactor
HSC	Commissie voor Veiligheid, Gezondheid en Milieu	Health and Safety Committee
IET	Instituut voor Energie en Transport	Institute for Energy and Transport
IenM	Ministerie van Infrastructuur en Milieu	Ministry of Infrastructure and Environment
INO	Intern Noodplan Onderzoek Locatie Petten	Internal Emergency Plan Research Site Petten
ISO	Internationale Organisatie voor Standaardisatie	International Organisation for Standardization
JRC	Gemeenschappelijk Centrum voor Onderzoek (GCO)	Joint Research Centre
KPI	Hoofdindicatoren	Key Performance Indicators
NRG	Nuclear Research and consultancy Group	Nuclear Research and consultancy Group
OHSAS	Handleiding voor het opzetten van een ARBO-managementsysteem (vrij vertaald)	Occupational Health and Safety Assessment Series
R&D	Onderzoek & Ontwikkeling	Research & Development
RSC	Reactor Veiligheidscommissie	Reactor Safety Committee
SCBA	Ademhalingstoestel	Self-contained breathing apparatus
SES	Veiligheid, Milieu en Beveiliging (Sector)	Safety, Environment and Security (Sector)
SSO	Veiligheidsverantwoordelijke	Site Safety Officer
VOC	Vluchtige Organische Stoffen	Volatile Organic Compounds
Wabo	Wet algemene bepalingen omgevingsrecht	Environmental Licensing (General Provisions) Bill
Ww	Waterwet	Water act

2 Introduction

This is the JRC-Petten EMAS Environmental Statement 2014, reporting on the results of 2013.
Companies who participate on a voluntary basis with EMAS - 'Eco Management and Audit Scheme' aim to enhance the environmental performance of their organisation by way of continuous improvement. The yearly EMAS Statement is much like an annual report on environmental performance of the organization. It does not only describe the current state of environmental impact of the organization, but also reports on new developments and successes or failures in achieving targets with respect to all environmental activities by JRC-Petten in the 2013 calendar year.
The statement is annually prepared by the Safety, Environment & Security (SES) department of JRC-Petten, based on information provided by other company-internal departments. The statement has been verified by AENOR.

3 Executive Summary

JRC-Petten conducts scientific and technical research 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.
The JRC-Petten site uses a certified environmental management system (ISO14001:2004), which assures compliance with requirements in terms of licenses and regulations, legislation and charters through operational control of environmental issues.
Based on the results of the environmental analysis and determination of its significant environmental aspects, JRC Petten is taking measures to prevent pollution and to reduce its environmental impact by reducing use of natural resources (mainly energy, water and paper) or by reliance of alternatives (renewable energy). This is achieved by environmental objectives, Key Performance Indicators (KPIs) and actions to improve the environmental performance. The results are shown in the tables in Chapter 6 of this statement. Obtained results by JRC Petten in regards to the consumption of energy, water and other resources is subject to heavy influence by the executed research projects executed by the different units.

4 Background

The research activities of the Institute during this reporting period were carried out under the 7th Framework Programme (2007 to 2013) of the Commission. The 7th Framework Programme was followed up by an 8th Programme, better known as Horizon 2020. This program runs from 2014 to 2020 and also focuses on Research and Innovation. The Framework Programme outlines in general terms the main priorities for Research and Development (R&D) funded by the European Union and forms the legal basis for the work of the JRC and thus also of the Institute for Energy and Transport. Nuclear R&D is approved by the European Council, whereas non-nuclear R&D is approved by a co-decision between the European Council and the European Parliament.

Since the 7th Framework Programme no significant changes have been made to the activities and focal points of the Institute for Energy and Transport in Petten. However since 2010, there is an increase in the desk top type research with the creation of a new unit which deals with the area of Energy Security. This change has no noteworthy impact on safety, health and environmental issues at the Institute.

JRC-IET Petten has experienced a gradual development towards an Integrated Management System; including quality, environment and safety; over the past decade as these areas receive continuous attention within the European Commission and at JRC-IET. The Environmental Management System (EMS) saw its first certification to ISO14001 awarded in 2004 and has since seen subsequent renewal of certification every 3 years.
The development of a Safety Management System had been completed in 2008 to such an extent, that certification according to OHSAS standard 18001 was achieved in 2009.
Both the ISO14001-conformant EMS and the OHSAS18001-certified Safety Management System are integrated into the overall Integrated Management System of the JRC-IET. As a part of these management systems, JRC-IET does not only assure compliance to environmental, safety and occupational health legislation, but also commits to continually improving its performance in these 3 areas, thus creating a safer and environmental sounder workplace and habitat for species that live on the site.

For reporting purposes, the geographically separated units of the JRC-IET (located in Ispra, Italy) are excluded from this report, since their safety, health and environment related activities are managed by the Ispra Site Management Directorate and since they have no influence the environmental performance of the site in Petten. Where 'Institute' or 'IET' is used in this report it refers solely to the JRC-IET Petten site.

Organization-wise the EMS and Safety Management System are organised and spearheaded from the Safety, Environment and Security (SES) sector, which is part of the Site Management Unit. The SES sector advises the Director and Staff of IET regarding the regulations of occupational health and safety, radiation protection, environmental protection and is monitoring the compliance with the applicable regulations.
The Head of the SES sector is the overall responsible for the sector and ensures monitoring of legislation and acts as the liaison officer with the Dutch and local authorities in regards to environmental and safety issues. He is in charge of communication of safety and environmental related issues towards the management and staff at JRC-IET Petten.
The Site Safety Officer (SSO) manages the occupational incident register and organises accident investigations whenever an incident or accident has occurred. The SSO further coordinates safety and environmental training of staff, liaises with the on-site fire brigade, and provides support to risk assessments as well as advise to staff on a day-to-day basis. During all these tasks the SSO assures that incident prevention and hazard avoidance form the overall guideline for the Safety Programme at the Site. In addition, the SSO supports the management in safety/environmental tours and has a direct line of communication to the Director.
Timely preventive maintenance and legally required inspection of health-and-safety critical equipment (e.g. safety cupboards, hoisting equipment) is performed in close cooperation between the SES sector (identification and verification of requirements) and the Infrastructure sector (organisation of the actual maintenance/inspection).

5 EMAS

EMAS stands for 'Eco-Management and Audit Scheme' and is a voluntary scheme for organisations willing to commit themselves to evaluate and improve their environmental performance. Following a pilot study started in 2001, the Commission decided in 2009 to extend this environmental management system to all its activities and buildings in Brussels and Luxembourg as described in Commission Decision C(2009) 6873.
The JRC has stated that it will take into account the Commission-wide policy towards EMAS, starting with ISO14001-certification for all sites.

The Institute for Energy and Transport has been ISO 14001-certified for several years now and will continue to improve in this area. The additional registration for EMAS in 2013 has imposed some changes in our way of work and these changes are documented in our management system.

6 SITE ACTIVITIES AND PERFORMANCE

JRC-Petten (hereafter referred to as Petten) 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.

6.1 Overview of core indicators at Petten since 2005

Petten has been collecting site data on core indicators since 2010 and the variation in some of the main indicators is shown in Table 5.1.

Table 5.1: Percentage changes in certain core indicators at JRC Petten since 2010

Parameter	From: 2010 Overall	To: 2013 % per year	From: 2012 Overall	To: 2013 % per year	Target 2013 %
Energy bldgs (KWh/p)	-15,0	-5,00	26,3	26,3	-1,00
Energy bldgs (KWh/m^2)	-7,4	-2,46	24,9	24,9	-1,00
Water use (l/p)	67,4	22,47	-32,8	-32,8	0,00
Water use (l/m^2)	82,3	27,45	-33,6	-33,6	0,00
Office paper (kg/person)	-50,3	-16,77	-31,0	-31,0	-1,00
Office paper (Shts/person/da	-50,3	-16,77	-31,0	-31,0	-1,00
CO_2 bldgs (kg/p)	-18,6	-6,19	25,4	25,4	-1,00
CO_2 bldgs (kg/m^2)	-11,3	-3,77	24,0	24,0	-1,00
Non haz.waste (kg/p)	59,8	19,93	18,6	18,6	-1,00

Since 2010 all parameters have decreased significantly except generation of non-hazardous waste. However from 2012 to 2013, in addition to increased waste generation, there was a significant increase in energy consumption which inevitably is accompanied an increase in CO_2 emissions.

6.2 Description of JRC Petten activities

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. Petten 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 Petten'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 5.1.

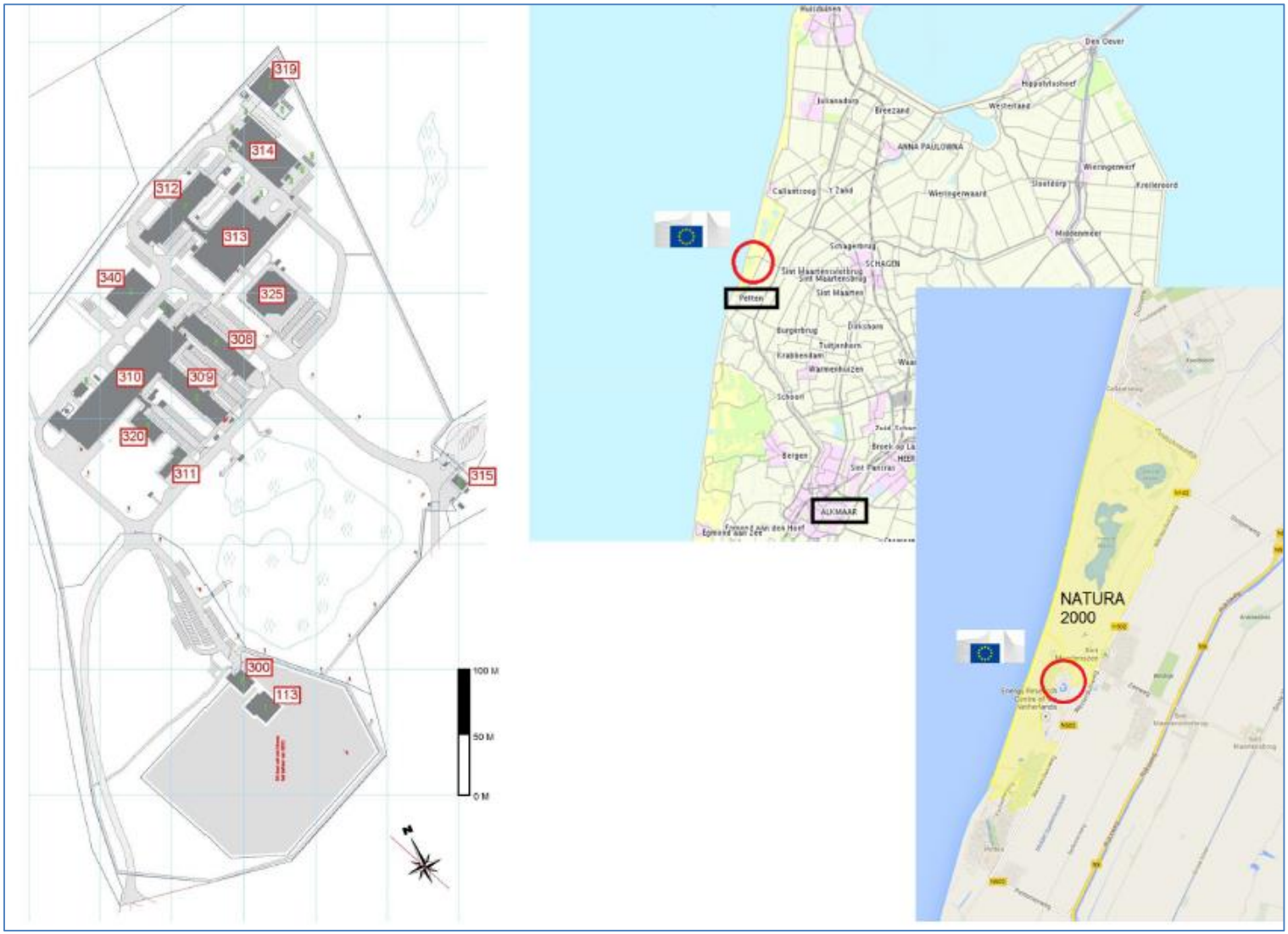


Figure 6.1: JRC Petten: Site location and layout

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), and 114 (a storage container for redundant components) located adjacent to the HFR, but outside the continuous perimeter of the remainder of the Petten site, are included within EMAS, although the latter was removed in 2013 and the process of transferring building 113 under the license to NRG is still ongoing. 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)
113/114	Laboratory, to be transferred to NRG, located on the HFR site

6.3 Environmental impact of JRC Petten activities

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

Table 6.2 – Summary of significant environmental aspects for the Petten 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	Climate control buildings

Aspect Group	Environmental Aspect	Environmen-tal Impact	Location/Activity/Product/Service
		of the ozone layer	
External Safety (hydrogen, storage dangerous substances, pressure, radiation)	Hydrogen in production/testing facilities, adequate ventilation and gas detection equipment	Disturbing / pollution of living environment. Health risks.	FCTEST, HySaST SolTeF, Hydrogen 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 Petten 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.

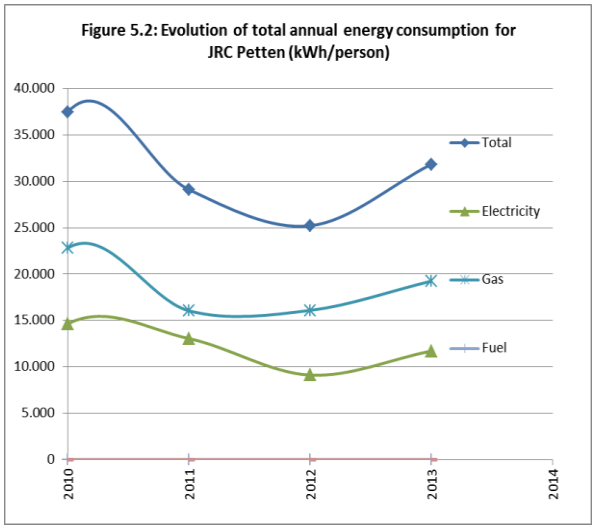
The environmental aspects in the table above are significant, based on the results of the environmental analysis. Petten is taking measures to prevent pollution and to achieve more efficient use of natural resources (mainly energy, water and paper). A majority of the impacts are followed through the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

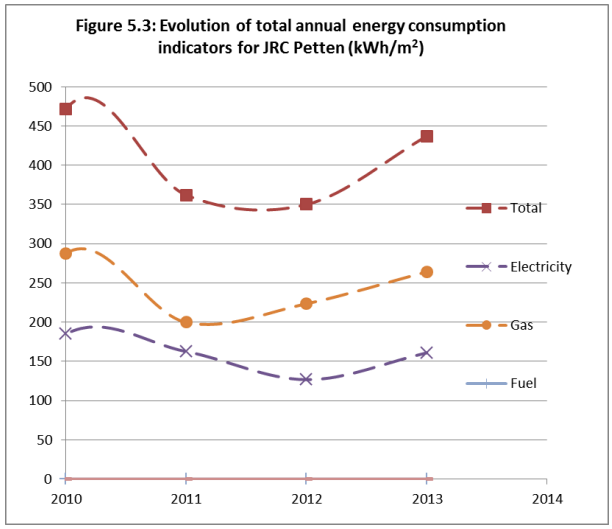
6.4 More efficient use of natural resources

6.4.1 Energy consumption

a) Buildings

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





Figures 5.2 and 5.3 illustrate that total energy consumption for buildings (indicator 1a) fell considerably between 2010 to 2012. 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. Overall there was a significantly larger number of both hot and cold degree days in 2013 than in 2012 as shown below:

Comparison of Hot Degree Days (HDD, winter) and Cold Degree Days (CDD, summer)						
	2012			2013		
	HDD	CDD	Total	HDD	CDD	Total
JRC Petten	2,117.0	272.0	2,389.0	2,301.0	290.0	2,591.0
% change 2012-13				8.7	6.6	8.5

In 2013 the air treatment and cooling installations in building 308 operated continuously giving rise to extra gas and electricity consumption. The Fuel Cell laboratory (building 301) consumed more gas for steam production due to specific experiments than is normally the case.

The **2013 target** of a 1% reduction in per capita (and per square metre) energy consumption was not met due to the above mentioned cold period. The **2014 target** is to maintain 2013 levels. Initiatives for continued improvement identified in management approved action plans for are summarised below and registered in the IET Environmental plan 2014.

Since	Description (and reference)	Progress in 2013	Expectations in 2014, and end date (if app)
2013	Photovoltaic installation at JRC Petten. Installation of photovoltaic panels on the roof of building 310 - 120 kWp.	Installation of 24 kWp	Installation of 120 kWp to be complete in 2014
2013	Assess automated information on energy and water usage by the building management system and introducing a way for evaluation and reporting to the units.	Started	To continue in 2014
2013	Study for (additional) environmental measures, with the focus on renewable energy and reduction of the energy and water consumption. The outcome will be ready medium 2014. The results will be translated to concrete projects and carried out in the second half of 2014 and in 2015 and 2016.	Started	To continue in 2014

b) Site vehicles

Petten has a fleet of just two diesel and one petrol vehicle. There there was no **2013 target** for improved performance. 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** is to reduce fleet consumption by 2%.

c) Renewable energy use in buildings and vehicles

The **2013 target** for overall renewable energy use of buildings (indicator 1c) represented was 1.6% of total buildings energy consumption to be supplied by photovoltaic cells installed onsite. The **2014 target** is to increase this to 2.3%.

6.4.2 Water consumption (indicator 1d)

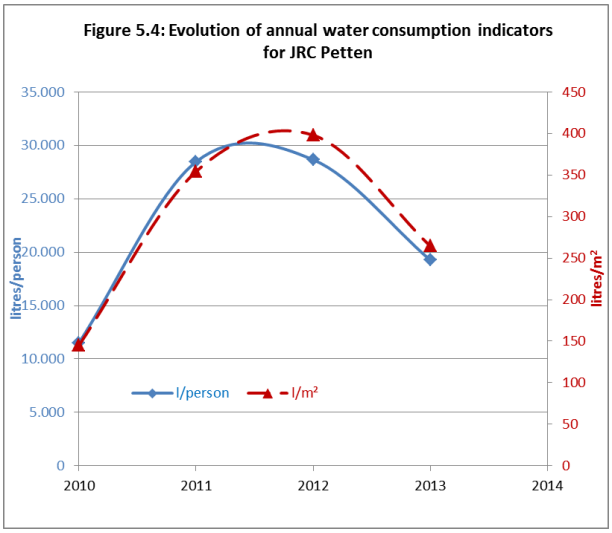


Figure 6.4 illustrates that water consumption after increasing in 2011 has reduced in 2013. The peak observed in 2011 and 2012 was due to faulty valve control in the water treatment plant of the Fuel cell laboratory in building 310. The Fuel cell laboratory required less water in 2013 leading to lower overall water consumption than in the two previous years. Site water consumption is strongly influenced by activities in building 310, where it is used as process water in technical installations. In 2013 there were periods of very low water consumption on site due to repairs in building 310.

The **2013 target** of not exceeding the 2012 consumption levels was easily achieved with an actual reduction of 34%. The **2014 target** is to not exceed 2013 levels.

6.4.3 Office paper (indicators 1e)

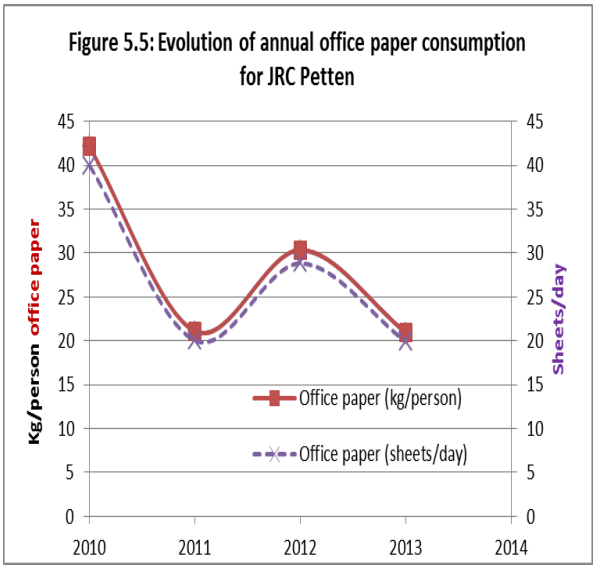


Figure 5.5 shows that paper consumption has reduced considerably since 2010, with the 2013 value representing only 50% of the initial figure. The apparent peak in 2012 may not be real, as paper is purchased infrequently and in large quantities.

The **2013 target** of reducing office paper consumption by 1% was met with an actual reduction of 32%, although as mentioned above this may be due to purchasing patterns rather than those of usage. The **2014 target** is not to exceed the 2013 level of consumption.

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

Since	Description (and reference)	Progress in 2013	Expectations in 2014, and end date
2013	Implement a plan to more accurately measure paper inventory	Started	To continue in 2014

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

6.5.1 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 5.3: Percentage of CO_2 emissions from different sources in 2013 (kg/person)

Source	Quantity	% of total
Buildings (EMAS)	11.789	99,78
Refrigerants loss	20,25	0,17
Vehicles, all Commission	5,53	0,05
Missions (excluding vehicles)		0,00
Total	**11.815**	**100,00**

a) Buildings (energy consumption)

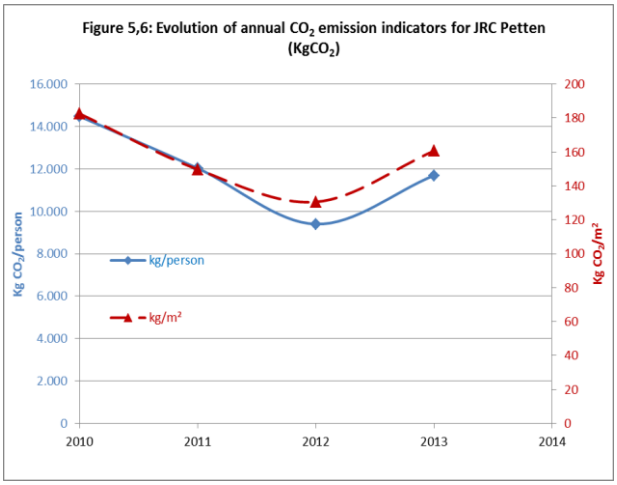


Figure 6.6 illustrates that CO_2 emissions have reduced since 2010; the 2013 per capita value representing 81% of the initial figure. This is in line with the reduction in energy consumption and therefore to be expected.

The **2013 target** of a 1% reduction in CO_2 emissions was not met with an actual expansion of 24%, mostly due to extra gas and electricity use in the cold period from January to May 2013. The **2014 target** is to maintain the 2013 level of emissions.

b) Buildings other greenhouse gases (refrigerants)

The **2013 target** under the IET environmental plan was to reduce GHG emissions by 1%, and this was not achieved. The **2014 objective** is for these emissions not to exceed the 2013 levels. Petten has the following management approved plan in place to phase out installations with R22:

Since	Description	Progress in 2013	Expectations in 2014, and end date
2014	Phase out all the R22 containnig air conditioning units located within the institute before 2014	Ongoing	To finish in 2014

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

Table 5.4: Phase out of equipment (with HCFC, R22), number of units left at end of year

	2010	2011	2012	2013
Total	15	10	7	4

6.5.2 CO_2 emissions from vehicles

a) JRC Petten vehicle fleet

The **2013 target** of reducing emissions from its five vehicles (of which one electric) by 1% was not met. The manufacturer's actual fleet emissions recorded for 2013 as 242.4 gCO2/km. The **2014 target** for emissions is to reduce the energy consumption of service cars by 2% in relation to 2013.

b) Missions (excluding Commission vehicle fleet)

There were no specific targets in 2013 or 2014 or management approved action plans to reduce CO_2 emissions from missions.

c) Commuting (and mobility)

There were no specific Petten targets in 2013 or 2014 or management approved action plans to reduce CO_2 emissions from commuting.

6.5.3 Total air emissions of other air pollutants ($S0_2$, NO_2, PM, VOC)

The **2013 target** was to reduce atmospheric emissions of SO_2, NO_x and PM expressed in kg/year by 1%. The **objective for 2014** is to reduce (or at least not exceed) the 2013 emissions levels. Both PM10 and SO_2 were below the limit of detection in 2013, similar to 2012. VOC emissions were 21 kg in 2013, down from 25 kg in 2012 due to reduced use of solvents.

NOx emissions from heating installations were 779 kg in 2013 compared with 660 kg in 2012. This represented an 18% increase due to higher gas consumption of heating installations during the cold period lasting from January to May 2013. The NOx emission factors of the gas heating equipment of buildings 310, 311 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 2013 and no specific actions planned for 2014. The targeted reductions will be achieved through campaigns of general awareness reminding staff of the importance of reducing resource consumption.

6.6 Improving waste management and sorting

6.6.1 General waste

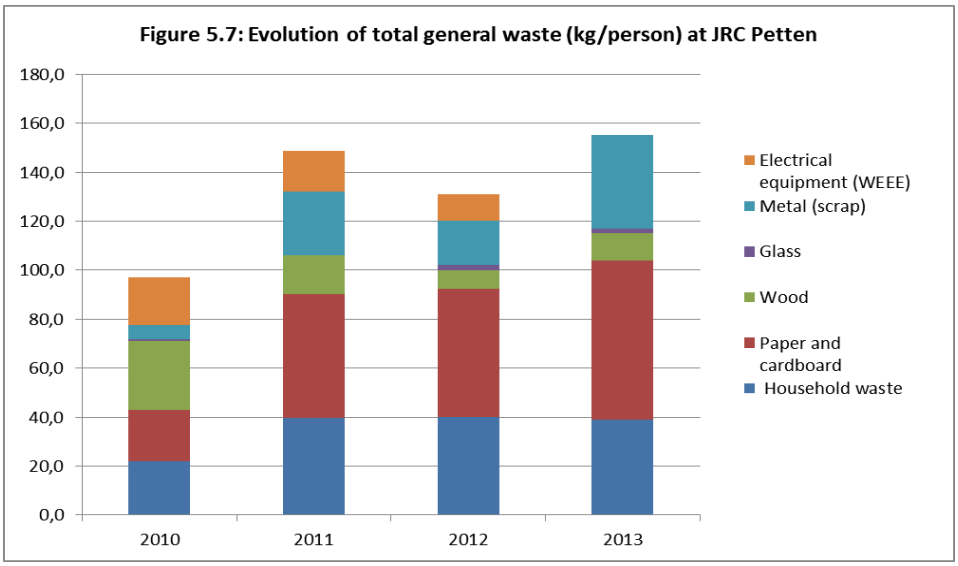


Figure 6.7 shows that household and paper/carton waste make up a large percentage of the waste and with quantities generated remaining almost stable over the last three years. There has been a greater than 20% increase in the total amount of general waste generated in each of the last three years compared 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. Unlike in previous years no electrical equipment waste was generated in 2013, a large clean up having occurred in 2012. Though some waste electrical equipment was gathered throughout the year, this was placed into temporary warehouse storage and there was no need for waste disposal.

The **2013 target** of a 1% reduction in total waste generation was not met with an actual increase of 19%. The **2014 target** is not to exceed the 2013 waste generation levels. There are no specific management approved **actions** for continued improvement.

6.6.2 Controlled Waste

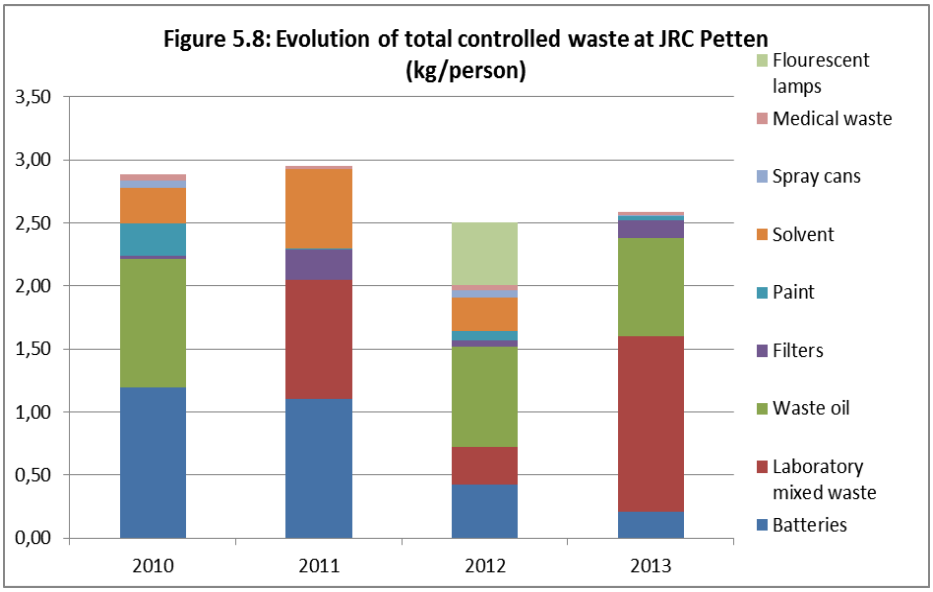


Figure 6.8 indicates total controlled waste has averaged 2kg to 3kg per person in recent years. Laboratory mixed waste became the largest contributor in 2013 because several laboratories were cleaned during the year. There **2013 target** was for a 1% reduction in controlled waste, with the **2014 target** to maintain the level of 2013.

6.6.3 Waste sorting

Table 5.5: Percentage of waste sorted at JRC Petten

	2010	2011	2012	2013
Percentage of waste sorted	78,2	74,3	70,1	76,1

Table 6.5 shows that the proportion of total waste sorted has remained between 70 and 80% over the last four years, however a 9% improvement was recorded in 2013. There was no specific **2013 target** for sorting waste, and the **2014 target** is to achieve the 2013 level of performance.

a) Discharges to wastewater

Petten discharges wastewater under its Environmental Permit and is required to undertake sampling on a regular basis, results of which are shown in Table 5.6.

Table 5.6 Control of discharges to wastewater		Concentration (mg/m3)			
Substance	Limit mg/m3	Inorganic emissions to the sewer system			
		2010	**2011**	**2012**	**2013**
Chloride (Cl-)	-	260	200	170	210
Evolution %		0	-23,1	-15	24
Release of heavy metals to the sewer system	**0**				
Mercury (Hg) - Limit 10mg/m3	10	<0,3	0,14	<0.1	<0.1
Δ %		0	0	0	0
Cadmium (Cd) - Limit 20mg/m3	20	<0,4	<0,4	0,71	<0.4
Δ %	0	0	0	0	0
Zinc (Zn)	The sum of 5 metals: 5,000	180	140	300	300
Δ %		0	-22	114	0
Copper (Cu)		190	220	130	160
Δ %		0	16	-41	23
Nickel (Ni)		14	<5,0	11	5
Δ %		0	0	0	-55
Chromium (Cr)		15	6,3	5	5
Δ %		0	-58	-21	0
Lead (Pb)		<5	<5,0	14	5
Δ %		0	0	0	-64
Arsenic (As)		<2	<1,5	1,7	1,5
Δ %		0	0	0	-12
Metals: the sum of the 5 highest values - 5000 mg/m3	0	399	366	462	475
Δ %		0	-8	26	3

*Exceeding the legal limit as a result of building 113. Corrective actions have been taken.

**collected in separate tanks and emptied by an external certified company, in m3

***Equals the consumption of water plus the water FCTEST facility (489 m3), minus water collected from chemical laboratories in 312

The data indicate the concentrations in wastewater are below license limits, and therefore demonstrate that Petten complies with the sampling requirements of its wastewater licence (which now forms a part of the environmental licence), for the determinants mentioned above. Although the wastewater permit requires sampling once per year, in order to establish a more complete data series and to better be able to evaluate and react more quickly where necessary to adverse trends, Petten carries out the measurements twice per year. The verification audit of 2013 indicated that better on site record keeping was required including maintaining a logbook.

The action planned for 2013 to adjust the scope of analysis to include mineral oil and EOX (Extractable Organic Halogen compounds) was completed.

6.7 Protecting biodiversity

The constructed area of buildings (footprint at ground level) in Petten is 13,365 m^2, equivalent to 51 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 **2013 target** in relation to biodiversity at the Petten site: the objective in 2012 having been to report on the Natura 2000 site in the Environmental Statement. The **2014 target** is to develop and implement a Natura 2000 Control Plan with the Dutch authorities according to the following management approved action.

Since	Description (and reference)	Progress in 2013	Expectations in 2014, and end date
2014	Development and implementation of a NATURA 2000 Control Plan with the Dutch authorities	NA	Systematic development and implementation

6.8 Green Public Procurement

6.8.1 Incorporating GPP into procurement contracts

No specific actions have been undertaken in 2013 but environmental criteria have systematically been considered when defining selection and award criteria, mandatory technical requirements, etc. for every relevant tender procedure. The **2014 target** will be to apply GPP measures developed for the EC and all JRC activities as identified in the following management approved action:

Since	Description (and reference)	Progress in 2013	Expectations in 2014, and end date
2014	Green Public Procurement will be developed for the EC and all JRC activities. JRC Petten will implement the GPP procedure when ready.	NA	Systematic implementation

6.8.2 Office supplies contract

There was no specific **2013 target** and no 2014 target for the number of "green" products in the office supply catalogue.

6.9 Demonstrating legal compliance

6.9.1 Prevention and risk management

Petten 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).

6.9.2 Maintaining the site's EMAS registration

The **2013 target** was re-certification of the existing ISO 14001 and EMAS verification for the first time, both of which were achieved. The 2014 target is to maintain the EMAS certification for the entire site. The following management approved action plans were identified to further improve performance.

Since	Description (and reference)	Progress in 2013	Expectations in 2014, and end date
2013	Revision of the site's environmental license	Ongoing	Continue in 2014
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.	Ongoing	Continue in 2014
2013/14	Environmental tours: include environmental aspects in the safety and environmental tours	Ongoing	Continue in 2014
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).	Ongoing	Continue in 2014

6.9.3 Compliance with EMAS

The number of (minor) non-conformities generated through EMAS external verifications reduced to one in 2013. Petten 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.

6.10 Internal communication (and training)

6.10.1 Internal communication

There have been several internal communication actions such as: EMAS newsletter to all staff in JRC-Petten, presentation of EMAS system during Unit and Management meetings and EMAS posters' campaigns in accordance to the corporate communication campaigns.

6.10.2 Internal trainings

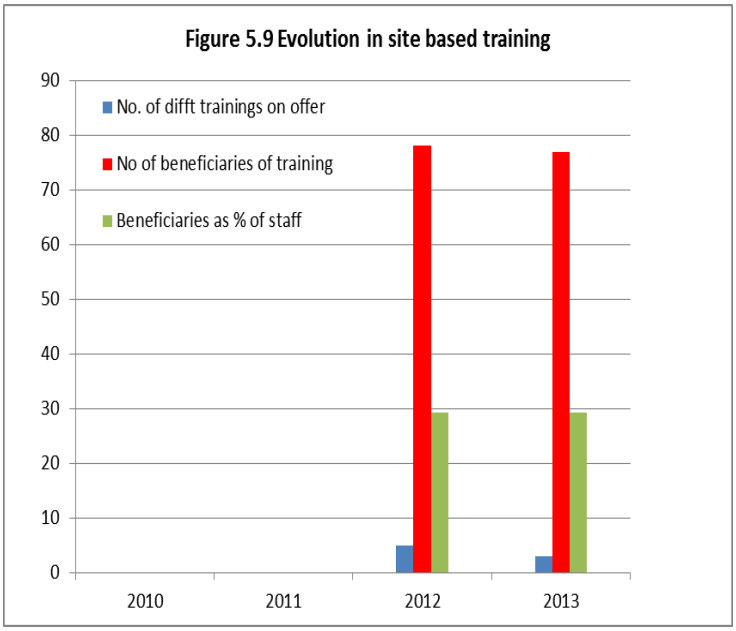


Figure 6.9 shows the evolution in site based training. There were specific awareness and training packages available in 2013, and the **2014 target** is to maintain these.

Regarding awareness, in 2013, the SES (safety, environment, security) unit participated in one Management Meeting, eight Unit meetings, seven newcomers trainings and four Health and Safety Committee meetings.

Regarding training: there were two sessions for BHV refreshment, two for lifting weights safely, one on freeing passengers out of lifts, four on ergonomics at PC work places, one each on gas safety awareness, OHSAS 18001 auditing, self-contained breathing apparatuses and four first aid.

6.11 Transparent dialogue with external partners

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

- Gemeente Schagen, relevant in the context of the Omgevingsvergunning (Env.permit)
- Provincie Noord-Holland, relevant in the context of groundwater en 'koude warmte opslag' (Geothermal cooling, cold heat storage)
- Hoogheemraadschap Hollands Noorderkwartier, relevant in the context of wastewater pollution measurements/levy
- GEA Grenco - Maintenance cooling equipment
- SITA - waste
- Victoria - Cleaning
- NUON - Energy supply
- ECN + PWN - water supply
- Cofely - maintenance heating and ventilation equipment
- AMART - wastewater pollution measurements 'afvalwaterputten'

6.12 EMAS costs (and savings)

The following table indicates how costs have evolved for running EMAS and for expenditure on energy, water, paper consumption and waste disposal.

Table 5.7 EMAS costs (and savings)	Costs			Cost savings compared to	
	2010	2012	2013	2010	2012
Total Direct EMAS Cost	0	66.000	66.000	-66.000	0
Total Direct Cost per employee	0	248	251	-251	-3
Total buildings energy cost (Eur)	430.950	324.714	399.680	31.270	-74.966
Total buildings energy cost (Eur/person)	1.858	1.221	1.520	338	-299
Total fuel costs (vehicles) (Eur)	0	820	957	-957	-137
Total energy costs (Eur/person)	0	3	4	-4	-1
Total water costs (Eur)	5.338	15.250	10.130	-4.792	5.120
Water (Eur/person)	23	57	39	-16	19
Total paper cost (Eur)	15.632	12.912	8.805	6.827	4.107
Total paper cost (Eur/person)	67	49	33	34	15
Waste disposal (general) - unit cost/tonne	90	90	90	0	0
Waste disposal (general) - Eur/person	9	12	14	-5	-2
Waste disposal (hazardous) - unit cost/ton	750	750	750	0	0
Waste disposal (hazardous) - Eur/person	2	5	2	0	2

Costs associated with running EMAS include the combination of staff time and consultancy contracts which are recorded since 2012. In 2013 these were equivalent to 251 EUR per person, little changed from 2012.

Energy expenditure in 2013 was 338 EUR less per person than it had been in 2010. 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 2013 was 137 EUR per person more than in 2012.

Water and paper costs were both lower in 2013 than they had been in 2012, with water costing 18 EUR less per person (but 16 EUR more than in 2010). Savings per employee for paper over the same period was greater, with paper cost per employee in 2013 being 34 EUR less than it had been in 2010, and 15 EUR less than in 2012.

Per capita costs for general waste disposal have risen to around 14 EUR, and remain far higher than those for hazardous waste disposal equivalent to approximately 2 EUR.

Appendix

JRC Petten data tables

Indicator	Definition	2010	2011	2012	2013
(Basic EMAS parameters)	**Population: total staff 'EMAS area'**	**232**	**229**	**266**	**263**
	Δ %		*-1,3*	*16,2*	*-1,1*
	Population: total staff	**232**	**229**	**266**	**263**
	Δ %		*-1,3*	*16,2*	*-1,1*
	No. buildings seeking EMAS registration	**14**	**14**	**14**	**14**
	Δ %		*0,0*	*0,0*	*0,0*
	Total number of buildings	**14**	**14**	**14**	**14**
	Δ %		*0,0*	*0,0*	*0,0*
	Total useful surface area all buildings in EMAS area, (m^2)	**18.400**	**18.400**	**19.150**	**19.150**
	Δ %		*0,0*	*4,1*	*0,0*
	Total useful surface area for all buildings, (m^2)	**18.400**	**18.400**	**19.150**	**19.150**
	Δ %		*0,0*	*4,1*	*0,0*
	Total site area, (m^2)	**305.554**	**305.554**	**305.554**	**305.554**
	Δ %		*0,0*	*0,0*	*0,0*
I) Efficient use of resources					
Ia	**Total energy buildings (elec+gas +fuel) - MWh/yr**	**8.690**	**6.665**	**6.746**	**8.373**
	Δ %	*13,5*	*-2,5*	*17,5*	*24,1*
	kWh/person	**37.457**	**29.105**	**25.214**	**31.836**
	Δ %	*-4,9*	*-13,9*	*0,0*	*26,3*
	kWh/m²	**472**	**362**	**350**	**437**
	Δ %	*-2,9*	*-14,1*	*2,5*	*24,9*
	i) of which total supplied electricity (MWh/yr)	**3.400**	**2.990**	**2.426**	**3.082**
	Δ %		*-12,1*	*-18,9*	*27,0*
	kWh/person	**14.655**	**13.057**	**9.120**	**11.719**
	Δ %		*-10,9*	*-30,1*	*28,5*
	kWh/m²	**185**	**163**	**127**	**161**
	Δ %		*-12,1*	*-22,0*	*27,0*
	comprising "green" (MWh/yr)	**0**	**0**	**0**	**0**
	Percentage of green electricity in mix	**0**	**0**	**0**	**0**
	kWh/person	**0**	**0**	**0**	**0**
	kWh/m²	**0**	**0**	**0**	**0**
	comprising non "green" (MWh/yr)	**3.400**	**2.990**	**2.426**	**3.082**
	Δ %		*-12,1*	*-18,9*	*27,0*
	Percentage of non green electricity in mix	**100**	**100**	**100**	**100**
	Δ %		*0,0*	*0,0*	*0,0*
	kWh/person	**14.655**	**13.057**	**9.120**	**11.719**
	Δ %		*-10,9*	*-30,1*	*28,5*
	kWh/m²	**185**	**163**	**127**	**161**
	Δ %		*-12,1*	*-22,0*	*27,0*
	ii) of which supplied gas (MWh/yr)	**5.290**	**3.675**	**4.281**	**5.061**
	Δ %		*-14,9*	*25,7*	*18,2*
	kWh/person	**22.802**	**16.048**	**16.094**	**19.243**
	Δ %		*-29,6*	*0,3*	*19,6*
	kWh/m²	**288**	**200**	**224**	**264**
	Δ %		*-30,5*	*11,9*	*18,2*
	iii) of which supplied diesel (MWh/yr)	**0**	**0**	**0**	**0**
	kWh/person	**0**	**0**	**0**	**0**
	kWh/m²	**0**	**0**	**0**	**0**
	iv) of which site generated "green" (MWh/yr)	**0,0**	**0,0**	**38,7**	**230,0**
	Δ %				*495*
	Installed peak capacity (kWhp)	**0**	**0**	**24,5**	**145,75**
	Δ %				*495*
	Assumed output (% of peak capacity)	**18**	**18**	**18**	**18**
	Δ %		*0,0*	*0,0*	*0,0*

	kWh/person	**0**	**0**	**145**	**874**
	Δ %				*502*
	kWh/m²	**0**	**0**	**2**	**12**
	Δ %				*494,9*
1b	**Total energy service vehicles (petrol + diesel) - MWh/yr**	**0**	**0**	**6,2**	**6,0**
Indicator	**Definition**	**2010**	**2011**	**2012**	**2013**
	Δ %				*-3,7*
	kWh/person	**0**	**0**	**23**	**23**
	Δ %				*-2,6*
	kWh/m²	**0**	**0**	**0,3**	**0,3**
	Δ %				*-3,7*
	Diesel used (litres)			**400**	**0**
	Δ %				*-100,0*
	kWh of energy provided by one litre diesel	10,89	10,89	10,89	10,89
	Petrol used (litres)			**200**	**638**
	Δ %				*219,0*
	kWh of energy provided by one litre petrol	9,42	9,42	9,42	9,42
	Other fuel used if applicable (propane?)	**0**	**0**	**0**	**0**
1c	**Total renewable energy use (MWhr/yr)**	**0**	**0**	**39**	**230**
	Δ %				*494,9*
	Renewables as % of total energy use	**0,00**	**0,00**	**0,57**	**2,75**
	Δ %				*379,3*
1d	**Onsite generated renewables as % of total energy use**	**0,00**	**0,00**	**0,57**	**2,75**
	Δ %				*379,3*
	Water consumption (m3)	**2.669**	**6.520**	**7.625**	**5.065**
	Δ %		*144,3*	*16,9*	*-33,6*
	l/person	**11.504**	**28.472**	**28.665**	**19.259**
	Δ %		*147,5*	*0,7*	*-32,8*
	l/m²	**145**	**354**	**398**	**264**
	Δ %		*144,3*	*12,4*	*-33,6*
1e	**Paper consumption (tonnes)**	**9,770**	**4,832**	**8,070**	**5,503**
	Δ %		*-50,5*	*67,0*	*-31,8*
	Paper consumption (kg/person)	**42**	**21**	**30**	**21**
	Δ %		*-49,9*	*43,8*	*-31,0*
	Paper Density (g/m^2)	80	80	80	80,0
	Number of sheets per kg	200	200	200	200
	Δ %		*0,0*	*0,0*	*0,0*
	Number of sheets total	1.958.073	968.414	1.617.364	1.102.894
	Δ %		*-50,5*	*67,0*	*-31,8*
	Number of sheets per person	8.440	4.229	6.080	4.194
	Δ %		*-49,9*	*43,8*	*-31,0*
	Working days in the year	211	211	211	211
	No. of sheets per person/ per day	**40**	**20**	**29**	**20**
	Δ %		*-49,9*	*43,8*	*-31,0*
1f	**Offset paper consumption (tonnes)**	**0,0**	**0,0**	**0,0**	**0,0**
	Paper consumption (kg/person)	0	0	0	0
II) Reduction in CO2 (including CO2 equivalent of greenhouse gases) and other air pollutants					
2a	**Total building emissions CO_2 (tonnes/yr)**	**3.359**	**2.755**	**2.500**	**3.100**
	Δ %		*-18,0*	*-9,3*	*24,0*
	kgCO_2/person	**14.478**	**12.031**	**9.398**	**11.789**
	Δ %		*-16,9*	*-21,9*	*25,4*
	kgCO_2/m²	**183**	**150**	**131**	**162**
	Δ %		*-18,0*	*-12,8*	*24,0*
	of which from electricity (tonnes/yr)	**2.281**	**2.006**	**1.628**	**2.068**
	Δ %		*-12,1*	*-18,9*	*27,0*
	Kgs CO_2 from 1 kWh of electricity	0,671	0,671	0,671	0,671
	kgCO2/person	**9.834**	**8.761**	**6.120**	**7.863**
	Δ %		*-10,9*	*-30,1*	*28,5*
	kgCO2/m²	**124**	**109**	**85**	**108**
	Δ %		*-12,1*	*-22,0*	*27,0*

	of which from gas (tonnes/yr)	**1.079**	**750**	**873**	**1.032**
	Δ %		*-30,5*	*16,5*	*18,2*
	Kgs CO_2 from 1 kWh natural gas	0,204	0,204	0,204	0,204
	kgCO2/person	**4.652**	**3.274**	**3.283**	**3.926**
	Δ %		*-29,6*	*0,3*	*19,6*
Indicator	**Definition**	**2010**	**2011**	**2012**	**2013**
	kgCO2/m²	**59**	**41**	**46**	**54**
	Δ %		*-30,5*	*11,9*	*18,2*
	of which from diesel (tonnes/yr)	**0**	**0**	**0**	**0**
	Kgs CO_2 from 1 kWh diesel	0,264	0,264	0,264	0,264
	kgCO2/person	**0**	**0**	**0**	**0**
	kgCO2/m²	**0**	**0**	**0**	**0**
2b	**Charge total des refrigerants (kg)**				**382**
	Pertes totales des refrigerants (kg)				**3**
data	**Emissions des autres gas en CO2 equivalent (tonnes)**	**26,0**	**26,0**	**2,0**	**5,3**
	Δ %		*0,0*	*-92,3*	*166,3*
Refrigerants	**kgCO2equiv/person**	**112,07**	**113,54**	**7,52**	**20,25**
coolants	*Δ %*		*1,3*	*-93,4*	*169,3*
with high	**kgCO2equiv/m²**	**0,001**	**0,001**	**0,000**	**0,000**
Global	*Δ %*		*0,0*	*-92,6*	*166,3*
Warming	**i) of which R22 (kg)**			0,00	0,00
Potential	GWP			1.810	1.810
(GWP)	**tCO2equiv**	0,0	0,0	0,0	0,0
	ii) of which R410A (kg)			1,20	0,00
	GWP			2.090	2.090
	tCO2equiv			2,51	0,00
	iii) of which R134A (kg)			0,00	0,00
	GWP			1.430	1.430
	tCO2equiv			0,00	0,00
	iv) of which R404a (kg)			0,00	0,00
	tCO2equiv			0,00	0,00
	v) of which R407c (kg)			0,00	3,00
	GWP			1.000	1.775
	tCO2equiv			0,00	5,33
2c	**Site vehicle CO_2 emissions (tonnes)**	**16**	**16**	**2**	**1,5**
	Δ %				*-27,3*
	kgCO2/person	**69,0**	**69,9**	**7,5**	**5,5**
	Δ %				*-26,4*
	of which from diesel			1,07	0,00
	Δ %				*-100,0*
	Kgs CO2 from one litre of diesel			2,67	2,67
	of which from petrol			0,46	1,45
	Δ %				*219,0*
	Kgs CO2 from one litre of petrol			2,28	2,28
	of which other fuel (eg propane)			0,00	0,00
	gCO2/km (manufacturer)				**180,00**
	Vehicle kms travelled			6.000	6.000
	gCO2/km (actual)			**333,3**	**242,4**
	Δ %				*-27,3*
	(Number of vehicles)			**5**	**5**
	Δ %				*0,0*
	(kms/vehicle)			**1.200**	**1.200**
	Δ %				*0,0*
2d	**Total air emissions bldgs (kg)**	**805**	**540**	**685**	**800**
(SO2, NOx, PM)	*Δ %*		*-32,9*	*26,9*	*16,8*
and others?	**of which NOx**	772	540	660	779
	Δ %		*-30,1*	*22,2*	*18,0*
	of which SO_2	NM	NM	NM	NM
	of which PM_{10}	NM	NM	NM	NM
	others (VOC)	33		25	21

III) Waste management					
3a	**Total general waste (tonnes)**	**22,550**	**34,070**	**34,830**	**40,847**
	Δ %	*-7,4*	*1,6*	*-1,3*	*17,3*
	Total general waste (kg/person)	**97**	**149**	**131**	**155**
	Δ %		*53,1*	*-12,0*	*18,6*
	Household waste (tonnes)	5,080	9,120	10,630	10,208
	Δ %		*79,5*	*16,6*	*-4,0*
Indicator	**Definition**	**2010**	**2011**	**2012**	**2013**
	Paper and cardboard (tonnes)	4,890	11,550	13,940	17,087
	Δ %		*136,2*	*20,7*	*22,6*
	Wood (tonnes)	6,520	3,600	2,050	2,945
	Δ %		*-44,8*	*-43,1*	*43,7*
	Glass (tonnes)	0,200	0,000	0,570	0,532
	Δ %		*-100,0*	*n.a*	*-6,7*
	Metal (scrap)	1,300	6,000	4,800	10,075
	Δ %		*361,5*	*-20,0*	*109,9*
	Electrical equipment (WEEE)	4,560	3,800	2,840	0,000
	Δ %		*-16,7*	*-25,3*	*-100,0*
3b	**Total dangerous waste (tonnes)**	**0,731**	**1,376**	**0,722**	**1,950**
	evolution %		*88,2*	*-47,5*	*170,1*
	Total dangerous waste (kg/person)	**3,15**	**6,01**	**2,71**	**7,41**
	Δ %		*90,7*	*-54,8*	*173,2*
	Batteries (tonnes)	**0,278**	**0,253**	**0,113**	**0,055**
	Δ %		*-9,0*	*-55,3*	*-51,3*
	Laboratory mixed waste (tonnes)	**0,000**	**0,216**	**0,080**	**0,365**
	Δ %		*n.a.*	*-63,0*	*356,3*
	Waste oil (tonnes)	**0,235**	**0,000**	**0,210**	**0,207**
	Δ %		*-100,0*	*n.a.*	*-1,4*
	Filters (tonnes)	**0,007**	**0,056**	**0,015**	**0,035**
	Δ %		*700,0*	*n.a*	*133,3*
	Paint (tonnes)	**0,060**	**0,001**	**0,018**	**0,010**
	Δ %		*-98,3*	*1.700,0*	*-44,4*
	Solvent (tonnes)	**0,064**	**0,144**	**0,072**	**0,000**
	Δ %		*125,0*	*-50,0*	*0,0*
	Spray cans (tonnes)	**0,014**	**0,000**	**0,014**	**0,003**
	Δ %		*-100,0*	*n.a.*	*-78,6*
	Medical waste (tonnes)	**0,012**	**0,007**	**0,011**	**0,006**
	Δ %		*-41,7*	*57,1*	*-45,5*
	Flourescent lamps (tonnes)	**0,000**	**0,000**	**0,134**	**0,000**
	Δ %		*n.a.*	*n.a*	*-100,0*
	Fire extinguisher (tonnes)	**0,043**	**0,000**	**0,000**	**0,000**
	Δ %		*-100,0*	*n.a.*	
	Lead-acid battery (tonnes)	**0,018**	**0,000**	**0,032**	**0,477**
	Δ %		*-100,0*	*n.a.*	*1.390,6*
	Mercury containing objects (tonnes)	**0,000**	**0,004**	**0,000**	**0,006**
	Δ %		*n.a.*	*-100,0*	
	Asbestos material (tonnes)	**0,000**	**0,000**	**0,023**	**0,000**
	Δ %		*n.a.*	*n.a*	*-100,0*
	Developer (tonnes)	**0,000**	**0,665**	**0,000**	**0,769**
	Δ %		*n.a.*	*-100,0*	
	Cleanser (tonnes)	**0,000**	**0,030**	**0,000**	**0,017**
	Δ %		*n.a.*	*-100,0*	
3c	**Percentage of waste sorted**	**78,2**	**74,3**	**70,1**	**76,15**
	Δ %		*-5,0*	*-5,6*	*8,6*
IV) Protecting biodiversity					
4a	**Built surface area (m^2)**		**13.365**	**13.365**	**13.365**
	Δ %			*0,0*	*0,0*
	Built surface area m^2/person		**58**	**50**	**51**
	Δ %			*-13,9*	*1,1*
	Built surface area as % of site		**4,4**	**4,4**	**4,4**
	Δ %			*0,0*	*0,0*

V) Green procurement					
5a	**% contrats signé, critères "eco"**			NR	NR
5b	**produits verts en catalogue (%)**			NR	NR
	produits verts en catalogue fraction			NR	NR
	Valeur total de produits commandés du catalogue (EUR)			NR	NR
	Valeur de produits verts commandés (EUR)			NR	NR
VI) Legal conformity					
	% of EMAS registered buildings				**100**
Indicator	**Definition**	**2010**	**2011**	**2012**	**2013**
	m^2 of EMAS registered useful floorspace				**100**
	EMAS verification non conformities				**1**
VII) Communication					
7b training at site level	**No. of difft trainings on offer**			**5**	**3**
	Δ %				*-40,0*
	No of beneficiaries of training			**78**	**77**
	Δ %				*-1,3*
	Beneficiaries as % of staff			**29,3**	**29,3**
	Δ %				*-0,2*
VIII) Promoting dialogue with external partners					
XX) ECONOMIC COSTS of EMAS and Virtual Value of Identified Savings					
Direct costs	**Total Direct EMAS Cost**	**0**	**0**	**66.000**	**66.000**
	Total Direct Cost per employee	0	0	248	251
Of which	**i) Annual direct staff costs (EUR)**	**0**	**0**	**66.000**	**66.000**
	Annual direct staff costs (time FTE)	0	0	0,5	0,5
	Annual cost of one FTE (EUR)	132.000	132.000	132.000	132.000
	ii) Annual contract costs (EUR)	**0**	**0**	**0**	**0**
	iii) Annual Misc costs	**0**	**0**	**0**	**0**
	Total energy unit cost				
Energy (Bldgs)	Electricity unit cost (Eur/kWh)	0,074	0,074	0,074	0,074
	Gas (Eur/kWh)	0,034	0,034	0,034	0,034
	Fuel (Eur/kWh)	0,10	0,10	0,10	0,10
	Total buildings energy cost (Eur/person)	**1.858**	**1.510**	**1.221**	**1.520**
	Electricity (Eur/person)	1082	964	674	865
	Gas (Eur/person)	775	546	547	654
	Fuel (Eur/person)	0,00	0,00	0,00	0,00
	Total buildings energy cost (Eur)	430.950	345.762	324.714	399.680
Energy (vehicles)	Diesel unit cost- (Eur/litre)	1,30	1,30	1,30	1,30
	Petrol unit cost- (Eur/litre)	1,50	1,50	1,50	1,50
	Total cost Diesel (Eur)	0	0	520	0
	Total cost petrol (Eur)	0	0	300	957
	Total energy costs (Eur/person)	**0**	**0**	**3,08**	**3,64**
	Total fuel costs (vehicles) (Eur)	0,00	0,00	820	957
Water	Water unit cost (Eur/m^3)	2,00	2,00	2,00	2,00
	Water (Eur/person)	**23,01**	**56,94**	**57,33**	**38,52**
	Total water costs (Eur)	5.338	13.040	15.250	10.130
Paper	Paper (office) - unit cost/kg	1,60	1,60	1,60	1,60
	Paper (offset) - unit cost/kg	8,00	8,00	8,00	8,00
	Paper (office) - Eur/person	**67,38**	**33,76**	**48,54**	**33,48**
	Paper (offset) - Eur/person	**0,00**	**0,00**	**0,00**	**0,00**
	Total paper (office) cost (Eur)	107,81	54,02	77,67	53,57
	Total paper cost (Eur/person)	67,38	33,76	48,54	33,48
	Total paper cost (Eur)	15.632	7.731	12.912	8.805
Waste	Waste disposal (general) - unit cost/tonne	90,00	90,00	90,00	90,00
	Waste disposal (general) - Eur/person	**8,75**	**13,39**	**11,78**	**13,98**
	Waste disposal (hazardous) - unit cost/tonne	750	750	750	750
	Waste disposal (hazardous) - Eur/person	**2,36**	**4,51**	**2,04**	**5,56**
	Total waste cost (Eur)	2.030	3.066	3.135	3.676
Other site specific data					

	Δ %		*-6,1*	*-15,1*	*15,9*
	Staff …..non statutory	**35**	**44**	**109**	**81**
	Δ %		*25,7*	*147,7*	*-25,7*
Phase out of equipment (with HCFC, R22), number of units left at end of year					
Phase out of equipment by the end of the year		15	10	7	4
Notes	**NM: Not Measured**				

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