

Annex EMS-PRO-003 version 5: Summary of main EMAS indicators

No	Indicator description <sup>1</sup>	Unit of measure	Output 1 <sup>2</sup> -per	Output 2 <sup>3</sup> per	Comment
<b>I) Efficient use of resources</b>					
1a	Total annual energy consumption (buildings)	MWh	person	m <sup>2</sup>	The sum obtained preferably from invoices, (or measurements/assumptions of usage based on building occupation if invoices not available) for different sources of energy (mains electricity, mains gas, district heating, diesel, installed PV etc.) Separating the different energy sources is necessary for calculating CO <sub>2</sub> emissions as in 2a below)
	Annual consumption of mains electricity from renewable sources	MWh	person	m <sup>2</sup>	May be equivalent to 100% if renewable energy is specifically contracted from mains supplier, or lower % based on renewables as proportion of the electricity mix (also specified by the supplier). Certificates of origin should be obtained from electricity suppliers
	Annual consumption of onsite generated renewable energy	MWh	person	m <sup>2</sup>	Energy produced on site (for electricity and heat) from renewable sources
1c	Annual total of all energy consumption produced from renewable sources	MWh	person	m <sup>2</sup>	Obtained by combining the two items above. For reporting may also be expressed as a percentage of total energy consumption
1b	Total energy consumption (service vehicles)	MWh	person	m <sup>2</sup>	The sum of energy consumption from different fuels, based on invoiced quantities most commonly diesel or petrol. Published conversion factors convert volumes of fuel into energy (e.g. <a href="http://www.carbontrust.com">www.carbontrust.com</a> , 2013 1L= 10.89/ 9.42 kWh for diesel/ petrol respectively)
1d	Annual water consumption	m <sup>3</sup>	person	m <sup>2</sup>	Based on invoices

<sup>1</sup> Core indicators are defined in EMAS Regulation 1221/2009 Annex IV (Section 2). They "shall apply to all types of organisations....and focus on the following key environmental areas: energy efficiency, material efficiency, water, waste, biodiversity and emissions". These indicators (and others that are closely related) are included in Sections I to IV.

<sup>2</sup> The EMAS Regulation also states that "The indication of the overall annual output .....for organisations in the non-productive sectors (administration/services)...shall relate to the size of the organisation expressed in number of employees."  
 Following agreement at the EMAS workshop 28 March 2014 that the number of staff should be the average of those working on site in a year, for year "n" this value is now obtained from averaging figures obtained from HR.A3 for 01/01 of year "N" and Year "N + 1" based on COMREF, an amendment was agreed at the EMAS workshop in April 2017 to ensure consistency that personnel numbers for each of the sites should be provided for all sites by DG.HR. Any variance from this approach must be clearly explained by sites and applied retroactively. HR.D2 requested the data from HR.A3 for all sites and makes it available for the reporting exercise. Sites using staff data from other sources must justify the different approach. The source data is uploaded to CIRCABC

<sup>3</sup> Indicators related to building performance are often also expressed per m<sup>2</sup>. Surfaces used may be those already used by sites for reporting purposes to avoid generating an additional dataset specifically for EMAS reporting. The approach used must be described by the sites to provide easy verification, and reflect sq. meters, normally excluding outside car parks.

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1e	Office paper consumption	Tonnes	person	Sheets/day per person	Calculation of mass and sheets/person per day based on actual purchased no. of sheets if known (eg JRC Karlsruhe), or calculated using paper density and average number of days worked (211) per year. Based on A4 size equivalent consumption.
1f	Offset paper consumption	Tonnes	person		Applies where a site has a print shop. Refers higher quality paper used for printing posters, reports, pamphlets etc.
	Offset paper consumption (paper wastage)	Tonnes	person		Expressed as a percentage of print quality paper that is not used in the final product (wastage). OIB developed this indicator, and in 2013 was the only site to report on this
<b>II) Reduction in CO2 emissions (including CO2 equivalent of greenhouse gases) and air pollutants</b>					
2a	CO <sub>2</sub> e emissions for buildings	Tonnes (tCO <sub>2</sub> e)	person	m <sup>2</sup>	Calculated as the sum of CO <sub>2</sub> e produced by the energy sources cited in 1a (energy consumption). Factors used to calculate CO <sub>2</sub> e emissions from energy consumption should clearly indicate whether they include: <b>For combusted fuels:</b> upstream ("well to tank") and combustion ("tank to wheel") emissions. For natural gas and diesel these can be those be Europe average values provided by Base Carbone, ADEME). <b>For natural gas</b> if supplied as HHV (higher heating value) as usually the case on invoices, the value is multiplied by 0.901 to give the LHV (lower heating value) which is the basis for using Base CARBONE emission factors. Where gas consumption is measured on the meter in m <sup>3</sup> , it must be converted to kWh LHV using the conversion factor supplied by the system operator before converting to CO <sub>2</sub> e <b>For electricity</b> reporting should include market based factors (from individual supplier contracts), and where green certificates certificate details and guarantee of origin). Factors for a location based approach should also include location ( <a href="#">new</a> ) national average grid values (from the International Energy Agency).
2b	Other greenhouse gas (GHG) emissions as CO <sub>2</sub> equivalent for buildings	Tonnes (tCO <sub>2</sub> e)			For Commission buildings, the most significant elements are considered to be refrigerants, which have a large global warming potential (GWP) and refrigerant "losses" are reported as recorded by technical services. GWP for individual refrigerants should be taken from the latest internationally accepted data (most recent IPCC Assessment Report (currently 5 <sup>th</sup> report of 2014)).
2c	CO <sub>2</sub> emissions for site vehicles	Tonnes (tCO <sub>2</sub> e)	per person		Calculated from consumed quantities of fuel in 1b Factors to include combustion and upstream component where appropriate, and can be considered not to vary for basic fuels (diesel/petrol) significantly across the sites, also come from the Base Carbone, ADEME
	Average vehicle fleet CO <sub>2</sub> e emissions (manufacturer)	grams	km		Theoretical value, calculated from manufacturer's data (for average fuel cycle)

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	Service vehicle fleet kms travelled	kms	vehicle	person	Calculated actual kms travelled and fleet size based on recorded data, pro rata to give annual values if necessary depending on the recording intervals
	Average vehicle fleet CO <sub>2</sub> e emissions (actual)	grams	km		Based on actual kms travelled and emissions – using fuel consumption data collected under 1b as an input, and emissions (2c)
2d	Other air emissions (buildings)	Kgs	person		The EMAS regulation states this should include "at least" SO <sub>2</sub> , NO <sub>x</sub> and PM (and reported separately). These are generated through combustion (ie boilers) and in the absence of specific measurements, assumptions can be used to derive a figure. VOCs may be included. These may not be appropriate (especially non urban) in all the EMAS site settings, especially those in rural areas.
2e	Other air emissions (cars)	kgs	km	person	Not yet used.
<b>III) Waste management</b>					
3a	Total general waste generated annually	Tonnes	person		Waste from categories not considered "dangerous", "hazardous" or "controlled", including but not necessarily limited to paper, cardboard, wood, glass, metal, plastic etc. "Domestic" waste is part of this category and represents the residue of everyday waste that is not sorted out at site level. Sites define their own waste streams.
3b	Total hazardous waste	Tonnes	person		Waste streams requiring stricter measures for disposal, and defined by individual sites
3c	Percentage of waste sorted				Includes all waste streams except "domestic" waste, and shows the extent to which the site is able to sort its waste streams. May also include residue of unsorted dangerous waste, for example at nuclear sites)
<b>IV) Protecting biodiversity</b>					
4	Built surface area	m <sup>2</sup>	person		The footprint at ground level of the constructed site area (impermeable surfaces including the building, car parking, access roads, paths, paved court yards). For urban offices, would normally be very similar (the same or only slightly smaller) to the site area as defined below.
	Site area	m <sup>2</sup>	person		Total ground service within the site perimeter

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	Natural surface area	m <sup>2</sup>	person		Could be considered "natural" or non-constructed part of the site. But may include features such as green roofs, and roof gardens if well planted.
<b>V) Green procurement</b>					
5	Percentage of procurement contracts signed with "eco" criteria				Contracts in which, standard or specific clauses have been modified specifically to deliver greater environmental benefits than would otherwise be the case. These should be quantifiable where possible.
	Office procurement – number of "eco " products in catalogue	No "eco" prods	Total no of prods		Depends on information supplied in the office supply catalogue, supplier defines whether the product has an "eco" criteria
	Office procurement – sales of "eco " products in catalogue	"eco" prods sales	Total prods sales		
<b>VI) Ensuring legal compliance</b>					
6	% of EMAS registered buildings	EMAS bldgs.	Total bldgs.		100% for sites registered in one go (JRC Petten, Karlsruhe, Geel, Sevilla) but lower percentage for larger more complex sites (Brussels, Luxembourg, JRC Ispra)
	% EMAS registered floor space	EMAS useful floor-space	Total floor-space		Useful floor space is used for calculating the energy, resources consumption and emissions parameters above on a sq. meter basis. This may be derived from sources including contracts, site plans etc, and should include all parts of the site that are occupied or used by the Commission other than outside (not enclosed) parking area. Underground parking is included.
	Non conformities arising from EMAS verification audits	Number			The number non conformities (major and minor) included in EMAS verification audit reports for the given year
<b>VII) Improving Communication</b>					
7a	Number of different training packages on offer at site level				Specifically training offered at the site level, not delivered through HR COORD
	Number of beneficiaries of the above training	Total number	person		Total number of beneficiaries, also expressed as percentage of the total number of staff
<b>VIII) Promoting dialogue with external partners</b>					
<b>IX) Direct costs of implementing EMAS</b>					

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9a	Yearly direct staff cost of EMAS	No of FTE (Eur)	Per person		Cost of EMAS time inputs – full time equivalents (FTE) used to calculate cost based (In 2013, 1 FTE = 132.000 EUR)
9b	Yearly direct contract cost related to EMAS	Eur	Per person		For example could include contracts for environmental expertise specifically related to EMAS or pertinent proportion of other contracts not specifically associated with EMAS.
<b>X) Unit costs of resources consumed, and waste generated</b>					
10	Unit cost electricity	Eur	kwh		From invoices, to include all associated costs (network, distribution, green levy etc)
	Unit cost gas	Eur	kwh		(If applicable) –from invoices, to include all associated costs (network, distribution, green levy etc)
	Unit cost district heating	Eur	kwh		(if applicable) - (If applicable) –from invoices, to include all associated costs (network, distribution, green levy, etc.)
	Unit cost diesel or other fuel	Eur	Litre		(if applicable) could refer to use of back-up generators;
	Unit cost of vehicle fuel (diesel)	Eur	Litre		(if applicable) cou
	Unit cost of vehicle fuel (petrol)	Eur	Litre		
	Unit cost of water supply	Eur	M <sup>3</sup>		Water used by the site, to include all network, distribution, sewerage, levies, etc.)
	Unit cost of office paper	Eur	Kg	sheets	
	Unit cost of general waste	Eur	Tonne		This may be comprised of several waste streams with different costs, please provide breakdown where appropriate. Where a waste product generates revenue (e.g. metals) price is negative.
Unit cost of hazardous waste	Eur	Tonne		This may be comprised of several waste streams, please provide breakdown where appropriate	

## B) Estimating of CO<sub>2</sub>e emissions from staff business travel

### Introduction

The following describes how HR.D2 prepares information on CO<sub>2</sub> emissions that is included in ES reporting since 2013 and for which the raw data is supplied by a third party (the Commission's travel agency).

### Steps to follow

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1. HR.D2 requests CO<sub>2</sub> missions data from PMO.2, a service overseen by DG-HR as follows:

No	Data	Original Source	Comment
1	Quarterly data provided in spreadsheets for air, rail and rental car hire	Produced by Atmosfair under contract to American Express, the Commission's business travel partner	Emissions calculations according to Atmosfair's methodology, general principles available on the internet at their website.
2	The ratio of missions in MIPS that used the travel agency	PMO.2, based on data in MIPS	The quarterly data presented by Atmosfair is only for missions booked through the travel agency. Missions booked independently by mission performers therefore taken into account by "pro rata".
4	Data for "avions-taxi"	PMO2	Data is presented together for the EEAS and the Commission, only Commission data is used.

2. The calculations (and assumptions) made are as follows, and taking into account that the ES produced in the year N will include data only for the year N-1:

- a. The quarterly spreadsheets prepared by Atmosfair (No1 above) are sorted to separate flights from rail travel where they are presented in the same file (Often, but not always, rail and air travel are presented together, and car hire in a separate file).
- b. Cancelled bookings, delineated by a "-1" in the spreadsheet (normally column K) are removed
- c. DG HR's unit HR.A3 (HR reporting) is requested to sort the missions according to the place of work of the person on mission. This is done using excel macros based on the passenger staff ID (prior to 2016, it was based on matching the name only).

*Comment 1: HR.A3's initial sorting of missions according to the place of work of the job holder was based on passenger names, which sometimes are not resolved in the Commission staff database. HR.A3 suggested that if mission goers were identified by their personnel number, the task would be more straightforward, and result in a lower number of rejections (typically 10-12% for air travel, and less for rail travel. PMO2 has delivered the data in this format since 2016).*

- d. The quarterly totals (by mode and by site) are added to provide a total annual figure for actual CO<sub>2</sub> emissions for air, rail and car hire. These are scaled up by dividing by the ratio of missions booked through the agency, to take into account the missions that are not booked through the agency (which assumes that whether that there is no difference between missions booked through the agency and those that are not).

*Comment 2: Actual CO<sub>2</sub> emissions are reported, although the Atmosfair calculations also present emissions using different radiative forcing indexes (RFIs).*

*Comment 3: Where data is corrupt/missing, it is excluded*

- e. HR.D2 inserts the results of this analysis for each site in the site datasheets. Results for the Commission as a whole are also reported, with appropriate disclaimers in the ES Corporate summary volume. Data for emissions from the use of service cars at site level is also included, although this is calculated separately at site level and the data included in the data sheets in the Annex for each site.
- f. The data used to derive the tables presented in the ES is included in separate files in the CIRCABC working folder for the reporting year in question the Master Excel Spreadsheet upon which reporting in the ES is based. Data is reported at site level, with summary values derived for the Commission as a whole.

*Comment 4: The MIPS reporting upon which this is based does not include JRC Ispra which has a separate contract for its business travel provider.*

### **C) Estimating CO<sub>2</sub>e emissions from staff commuting in Brussels**

#### **Introduction**

This procedure describes how HR.D2 estimates CO<sub>2e</sub> emissions for Commission staff commuting and which is reported in the ES since 2013.

#### **Steps to follow**

1. HRCOORD requests commuting data from OIB.CPE2 a service overseen by DG.HR:

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No	Data	Original Source	Comment
1	Report of the staff commuting survey including mode of travel or respondents	"in house" production	Produced roughly every two years, modes include metro, tram, bus, train, car, scooter/moto
2	Distance between Brussels centre (a reference point), and communes of the survey respondents	Google Maps	The central reference point for Brussels for 2013 reporting was the Berlaymont, and the main municipality building was the reference point for individual communes.
3	Emissions per km for different modes of transport	From STIB website	Web page is entitled "calcul de la quantité de CO2".

2. The calculations (and assumptions) made are as follows, and taking into account that the ES produced in the year N will include data only for the year N-1: As the staff survey occurs every two years, this calculation should normally be updated only every two years

- a. The respondents to the survey are sorted by mode of travel and by commune. Unspecified communes are referred together as "other"
- b. For 2013, a representative distance between the commune (main municipal building and the Berlaymont) was established using the average of the three shortest routes as determined on Google Maps. Unspecified "other" communes distance is 40km.

*Comment 1: Distances were estimated for the 34 communes that were identified in the 2012 survey. Although more communes were identified in the 2014 survey, for reporting (i.e. repeatability) the distances estimated for the 34 communes the 2012 survey were used again, and correspondingly for all other communes the 40km figure was applied.*

- c. The total number of kilometres travelled for each respondent is calculated using the above figures and assuming 211 working days per year (average number of working days source DG.HR.R1).
- d. The total kms travelled per mode was calculated and a value computed for the whole of Brussels by pro rata of the sample size. The resultant figure for each mode was multiplied by the appropriate factor to generate the CO2 emissions.
- e. The data reported is contained in excel spreadsheets in the working directory for the reporting year in CIRCABC