Europäisches Patentamt
European Patent Office
Office européen des brevets

Environmental Report 2019

In accordance with Regulation (EC) No 1221/2009 of the European Parliament and the Council, Commission Regulation (EU) 2017/1505 and Commission Regulation (EU) 2018/2026

Contents

Executive summary

The EPO is fully committed to boosting sustainability and reducing its environmental footprint. In 2009 we adopted the Eco-Management and Audit Scheme (EMAS[1]) as the overarching framework for minimising our environmental impact and fostering a sustainable work environment for staff. But there is no one-size-fits-all approach to corporate sustainability.

Moving beyond early wins means constantly searching for solutions that are unique to our business and finding innovative ways to improve our sustainability. In 2019 the EPO once again set ambitious targets for cutting energy, water and paper consumption, improving its recycling ratio, reducing CO_2 emissions and increasing its use of renewable energies and organic food compounds. Compared to 2018, we achieved significant reductions in heat energy consumption (-19.2%), residual waste generation (-29.2%) and CO_2 emissions (-24.2%).

The next phase in our journey towards greater sustainability is outlined in the EPO's Strategic Plan 2023. Under Goal 1 "**Build an engaged, knowledgeable and collaborative organisation**" we are planning maintenance and refurbishment projects to improve the condition and sustainability of our buildings, while cutting their running costs.

With energy-efficient, state-of-the-art buildings the EPO will reduce its impact on the environment by decreasing its energy intake and lowering its CO_2 output. We aim to achieve an outstanding level of "BREEAM[2]" certification for all of our buildings. To promote environmentally-friendly transport for our staff, we installed bike parks and charging stations for e-cars and e-bikes in 2019 and plan to expand these facilities in 2020.

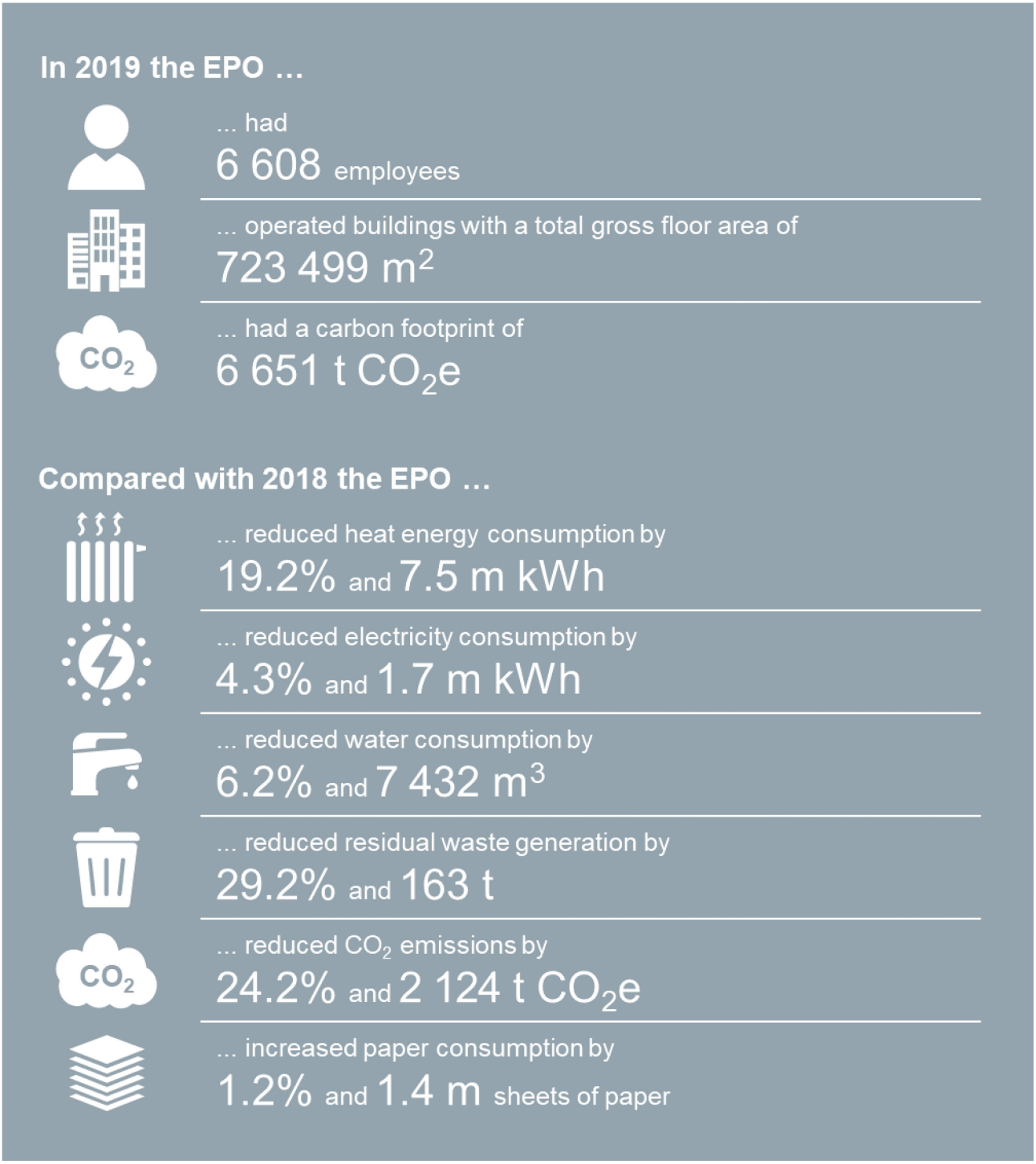
[1] In accordance with Regulation (EC) No 1221/2009 of the European Parliament, Commission Regulation (EU) 2017/1505 and Commission Regulation (EU) 2018/2026.

[2] BREEAM (Building Research Establishment Environmental Assessment Method) is a leading method for master planning projects, infrastructure and buildings. It recognizes and reflects the value in higher performing assets across the built environment lifecycle, from new construction to in-use refurbishment.

We also launched new projects on cutting paper consumption, green IT and implementing environmental management systems, which are bundled under Goal 5 "**Secure long-term sustainability.**" All of these projects feed into our long-term goal of cutting CO_2 emissions.

Going forward, the EPO will continuously track the environmental impact of its operations with a set of clearly-defined key performance indicators (KPIs) and remains firmly committed to creating a more sustainable future.

EMAS at the EPO[3]



[3] The number of employees and total gross floor area are for the EPO as a whole. All other data relate to our EMAS-certified sites only (see section 2). The EPO's carbon footprint is calculated on the basis of emissions caused by business travel (air and rail), heating energy, electricity and cooling agent refills in air-conditioning units. At the time this report was compiled the heat energy and water consumption figures for 2019 for the Berlin site were not available, so the figures for 2018 were used as an estimate.

1. Environmental policy

Approved by the President in 2009, our environmental policy provides a strategic framework for all our activities and emphasises the importance of environmental protection at the EPO. The policy is binding throughout the EPO. Senior managers are committed to ensuring that it is understood and applied in all departments.

Definition

The EPO consumes energy for heating and electrical power, as well as large volumes of water and paper, and generates both waste and CO_2 emissions. We have addressed these issues by introducing an environmental management system that meets the requirements of the EMAS eco-management and audit scheme.

With a view to improving our environmental performance, we continuously assess the environmental impact of our operations. We set objectives and long-term targets and reviews them on a regular basis by defining KPIs in our Balanced Score Card.

Principles and objectives

With our environmental policy, we undertake to:

- Promote responsible environmental awareness within the EPO and communicate and implement this policy at all levels
- Minimise the consumption of energy, water, paper and other resources
- Minimise waste and environmental pollution
- Comply with relevant environmental legislation, administrative regulations and other requirements
- Provide suitable resources to fulfil our environmental policy obligations
- Promote local environment protection initiatives and schemes and encourage active involvement in them
- Communicate this policy to stakeholders

Since we consider it the responsibility of all staff to help meet the objective of achieving optimum environmental protection, we provide appropriate training, advice and information and encourage staff to develop new ideas on how to implement the policy effectively.

In 2015 the President approved a supplementary document on environmental policy, enshrining this policy in the budget planning cycle and ensuring the involvement of senior management. The key elements of this new structure are:

- a framework for all environmental activities
- the integration of EMAS projects into the annual budget cycle
- the clear commitment of our senior management to environmental topics
- an expanded environmental report which includes the EMAS environmental statement
- the appointment of additional environmental representatives for all relevant EPO units
- the revision of the environmental policy in 2020

2. The European Patent Office

The European Patent Office (EPO), with nearly 7 000 staff, is the second-largest international organisation in Europe. It has its headquarters in Munich and offices in The Hague, Berlin, Vienna and Brussels. Since 2009 it has been certified as complying with the EMAS eco-management and audit scheme at all its sites apart from Brussels (due to its small size).

The EPO's EMAS-certified sites are:

- EPO Munich I (Isar building), Germany
  Bob-van-Benthem-Platz 1, 80469 Munich
- EPO Munich II (PschorrHöfe 1–8), Germany
  Bayerstr. 34, 80335 Munich
- EPO Berlin, Germany
  Gitschiner Str. 103, 10969 Berlin
- EPO The Hague I (Main, Shell and Hinge), Netherlands
  Patentlaan 2, 2288 EE Rijswijk
- EPO Vienna, Austria
  Rennweg 12, 1030 Vienna

Our former sites at the Capitellum in Munich (EPO Munich III (Capitellum), Landsberger Str. 30, 80339 Munich), which was rented until 31 March 2015, and Rijsvoort and Le Croisé in The Hague (EPO The Hague II (Le Croisé), Verrijn Stuartlaan 2a, 2288 EL Rijswijk and EPO The Hague III (Rijsvoort), Visseringlaan 19–23, 2288 ER Rijswijk), which were rented until the end of October 2018, were also EMAS-certified. All three sites have been vacated and the staff working there moved to other sites. For the purposes of comparability, this report shows the consumption data for Rijsvoort and Le Croisé up to and including the date on which they were vacated.

In accordance with EMAS Regulation (EC) No 1221/2009, Commission Regulation (EU) 2017/1505 and Commission Regulation (EU) 2018/2026, we issue an annual environmental report, setting out our environmental data and reporting on our progress in environmental performance. The present report can be downloaded from our website (www.epo.org).

2.1 EPO Munich

Munich is the largest of all our sites in terms of gross floor area and staff numbers. The condition of the buildings varies, some of them being relatively old, such as the Isar building (opened in 1980), others more recent, including PschorrHöfe 7 (2005) and 8 (2008). The Isar building and the PschorrHöfe have district heating. Other facilities with environmental relevance are primarily situated in the Isar building. They include a repair shop and carpenter's workshop, a water treatment installation and tanks for acid and lye solutions for water treatment.

The Isar building and PschorrHöfe 1-8 have an oil and/or grease trap and a kitchen/canteen and dish-washing area. All the Munich buildings have (small) storage areas for cleaning agents and chemicals. There is no information to suggest any land contamination at the Munich sites. Hazardous waste consists mainly of spent batteries and fluorescent tubes.

Electricity consumption in 2013: 21 323 MWh

Electricity consumption in 2019: 18 915 MWh

Savings: **11%**

Heat consumption in 2013: 21 939 MWh

Heat consumption in 2019: 18 047 MWh

Savings: **18%**

Fig. 1 EPO Munich, Isar building

Table 1 EPO Munich

Site/building	Gross floor area	Net building area	Workplaces	Status
Isar building	91 400 m²	67 847 m²	4 420	Owned by EPO
PschorrHöfe 1-8	276 300 m²	178 320 m²		Owned by EPO

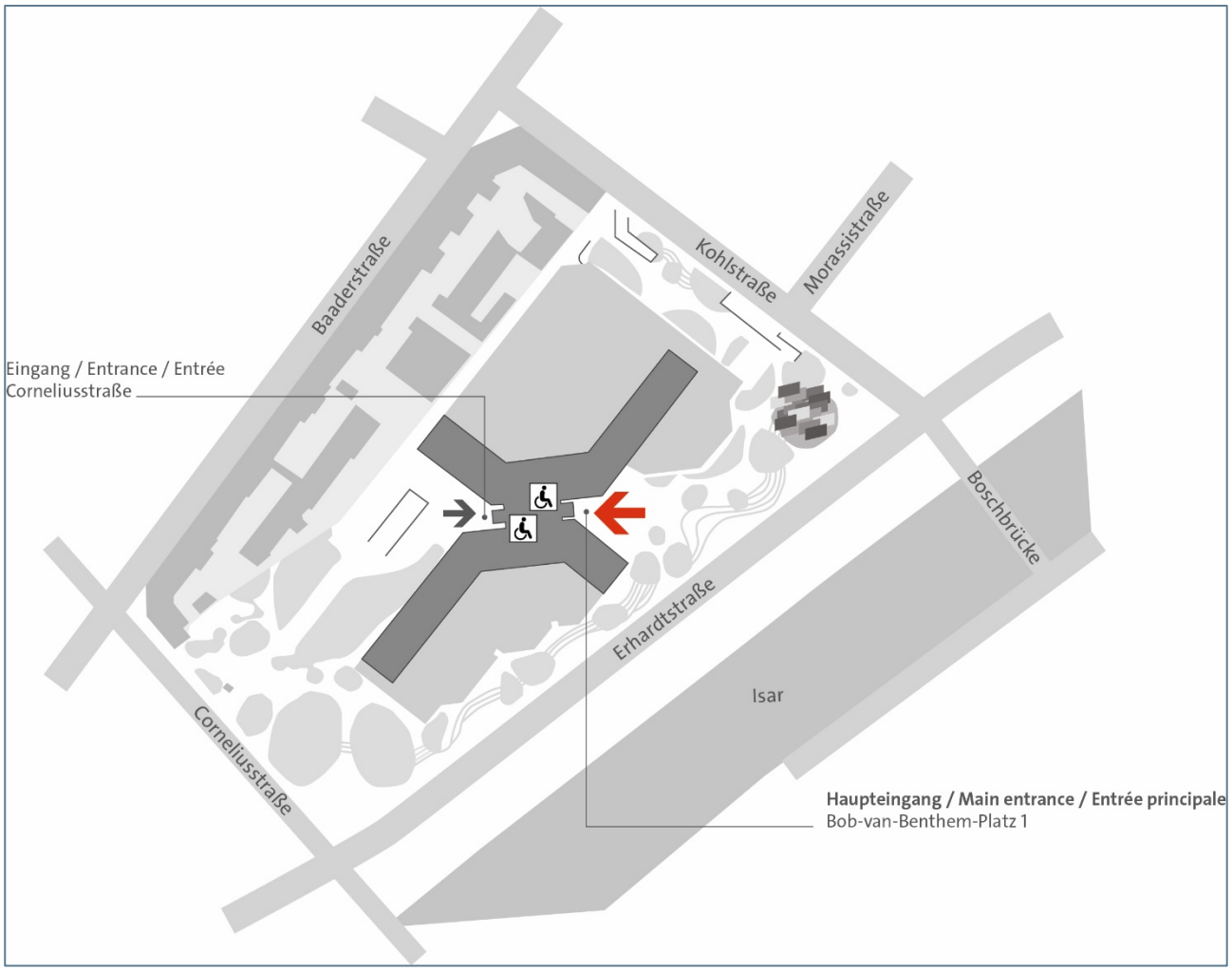


Fig. 2 EPO Munich, Isar building

Fig. 3 EPO Munich, PschorrHöfe complex

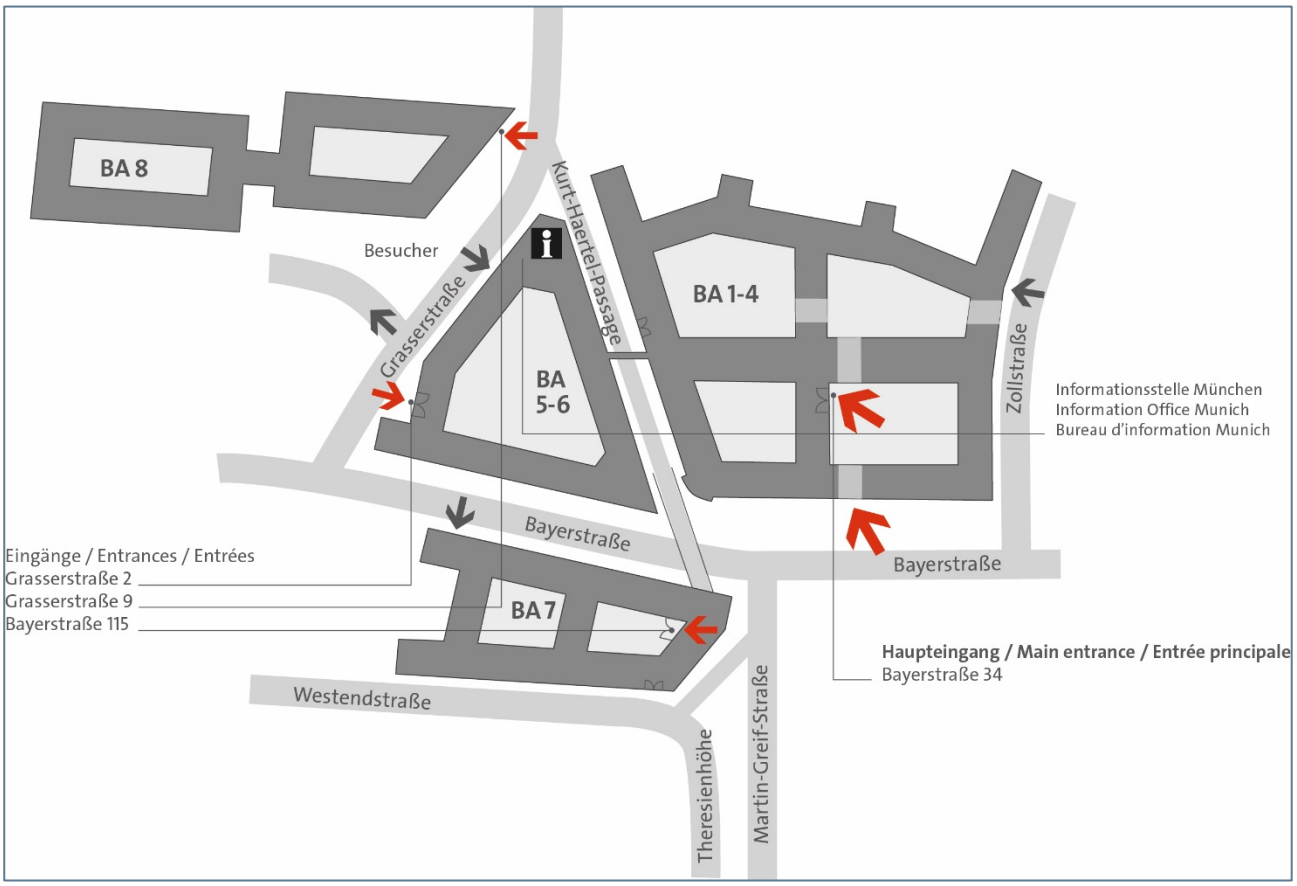


Fig. 4 EPO Munich, PschorrHöfe complex

Table 2 Environmental law and relevant facilities EPO Munich

Most relevant areas of environmental law	Relevant facilities/activities
Pollution regulations governing small and medium-sized heating systems	Heating system
Water regulations	Storage of diesel, acids and lyes, operation of oil traps, cooling and waste water discharge into sewage system
Regulations on climate protection and refrigerants	Cooling installations with at least 5 kg global warming potential (GWP)
Building energy efficiency regulations	Energy certification, building insulation, energy-efficient technologies
Regulations on health and safety and hazardous materials	Risk assessment, fire prevention, requirements for use of hazardous substances (e.g. acids, lyes)
Waste regulations	Recycling/separation/disposal of various types of waste

2.2 EPO The Hague

The Hague is our second-largest site after Munich. While there used to be three sites in The Hague, all staff are now located on the New Main site and the leases for the rented Rijsvoort and Le Croisé buildings have been terminated.

The new Main building is partly heated and cooled by ground water heat pumps and is additionally heated by natural gas. There is no information to suggest any land contamination at the sites in The Hague. Under Dutch law the site in The Hague is subject to an "activity decree", a kind of simplified environmental permit.

Electricity consumption in 2013: 19 552 MWh

Electricity consumption in 2019: 19 301 MWh

Savings: **1.3%**

Construction work on the new Main and new Hinge buildings in The Hague was completed in the summer of 2018 and the old buildings are now in the process of being demolished. The new buildings were constructed on sustainable principles, e.g. minimisation of environmental impact in the construction phase, significantly reduced energy consumption, optimum and particularly user-friendly air-conditioning. The EPO has voluntarily elected to comply with the certification criteria of multiple standards for sustainable buildings (Dutch *Bouwbesluit* Building Decree 2012, BREEAM) and to aim for an energy efficiency rating of 20% above the requirements laid down in the 2012 Dutch building regulations. In the long term, 15% of the energy required for building operation is expected to be generated on-site, e.g. from groundwater heat and solar power.

Water consumption in 2013: 48 129 m^3

Water consumption in 2019: 35 451 m^3

Savings: **26%**

Fig. 5 EPO The Hague, new Main building

Table 3 EPO The Hague

Site/building	Gross floor area	Net building area	Workplaces	Status
Main, Shell, Hinge	218 966 m²	189 953 m²	4050	Owned by EPO

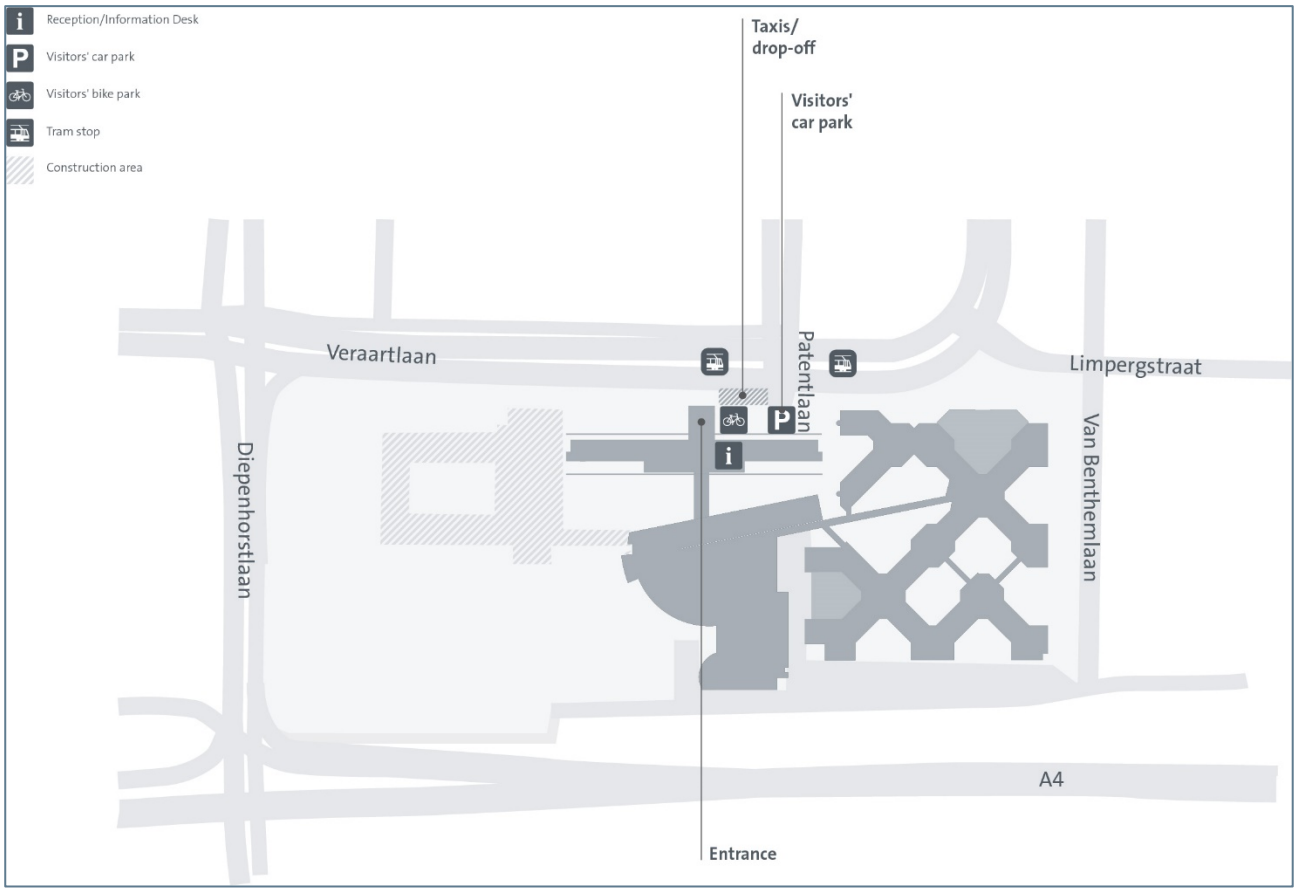


Fig. 6 EPO The Hague

Table 4 Environmental law and relevant facilities EPO The Hague

Most relevant areas of environmental law	Relevant facilities/activities
Rules on general environmental management	Environmental permit, annual environmental report to the municipality of Rijswijk
Pollution regulations governing combustion units of type B	Heating system (natural gas), checked to comply with emissions thresholds
Water regulations	Water discharge into sewage system
Hazardous materials regulations	Handling/storage/transport of hazardous substances, e.g. glycol (400 l on site), asbestos; transmission of hazardous waste (potential); grease traps, cleaning agents (approx. 400 l on site)
Regulations on underground storage of hazardous substances	Underground storage area for diesel fuel (three tanks with a capacity of 5 000 litres each and one with a capacity of 4 000 litres for emergency generators)
Regulations on climate protection and refrigerants	Cooling installations with at least 5 kg GWP, performance of density checks
Waste regulations	Recycling/separation/disposal of various types of waste, handling of hazardous waste (spent batteries, old fluorescent tubes and waste oil)
Building regulations	Building activities: criteria for renovation/rebuilding and new buildings
Health and safety	Appropriate risk assessment, fire prevention, restrictions on certain chemical agents, availability of safety information sheets and operating instructions

2.3 EPO Berlin

The Berlin sub-office is housed in a building that was constructed in the early 20th century. Due to the age of the building there are certain deficiencies in its insulation and energy efficiency. The landlord – the *Bundesanstalt für Immobilienaufgaben* – regularly conducts structural improvements, some of them extensive, with a view to enhancing the building's energy efficiency. Major renovation work on the building, including measures intended to improve energy efficiency (e.g. in lighting systems and air conditioning), was begun in 2017. The cost of this work will primarily be borne by the landlord, with the EPO contributing to individual aspects. Much of the work will be devoted to energy-saving items such as thermal insulation and lighting control/modification. The work is likely to continue until 2023.

Electricity consumption in 2013: 495 MWh

Electricity consumption in 2019: 480 MWh

Savings: **3%**

Facilities with environmental relevance include a gas-powered heating system, several cooling installations, a small storage area for cleaning agents, an X-ray machine in the post room and a kitchen/canteen operated by an external service provider. Responsibility for operating the building's heating systems and the canteen's refrigeration units lies with the landlord, while responsibility for operating the air-conditioning systems in individual meeting rooms lies with the EPO. According to the landlord there is no land contamination at the Berlin site.

Paper consumption in 2013: 2 400 000 sheets

Paper consumption in 2019: 2 227 500 sheets

Savings: **7%**

Fig. 7 EPO Berlin

Table 5 EPO Berlin

Site/building	Gross floor area	Net building area	Workplaces	Status
EPO Berlin	18 100 m²	18 093 m²	340	Rented by EPO

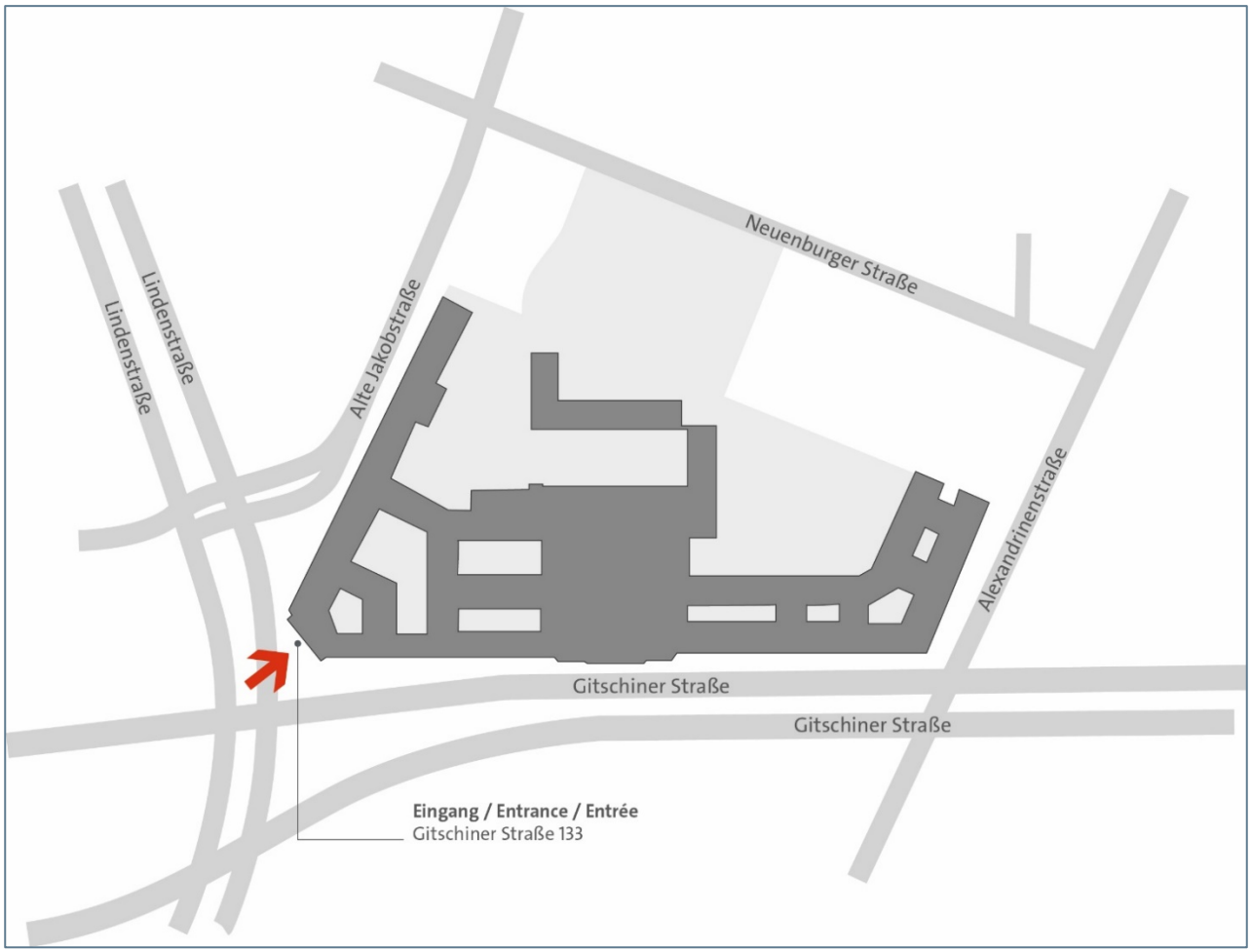


Fig. 8 EPO Berlin

Table 6 Environmental law and relevant facilities EPO Berlin

Most relevant areas of environmental law	Relevant facilities/activities
Water regulations	Water discharge into sewage system
Waste regulations	Recycling/separation/disposal of various types of waste, handling of hazardous waste (spent batteries and fluorescent tubes)
Building energy efficiency regulations	Building insulation, energy-efficient technologies
Regulations on health and safety and on hazardous materials	Risk assessment, fire prevention, restrictions on certain chemical agents

2.4 EPO Vienna

Vienna is the smallest of all the EMAS-certified sites, in terms of both gross floor area and staff numbers. The Vienna office uses district heating. Facilities with environmental relevance are limited to a small storage area for cleaning agents. There is no information to suggest any land contamination at the Vienna site. The only forms of hazardous waste are spent batteries and fluorescent tubes.

Electricity consumption in 2013: 648 MWh

Electricity consumption in 2019: 531 MWh

Savings: **18%**

Fig. 9 EPO Vienna

Table 7 EPO Vienna

Site/building	Gross floor area	Net building area	Workplaces	Status
EPO Vienna	11 420 m²	10 600 m²	120	Owned by EPO

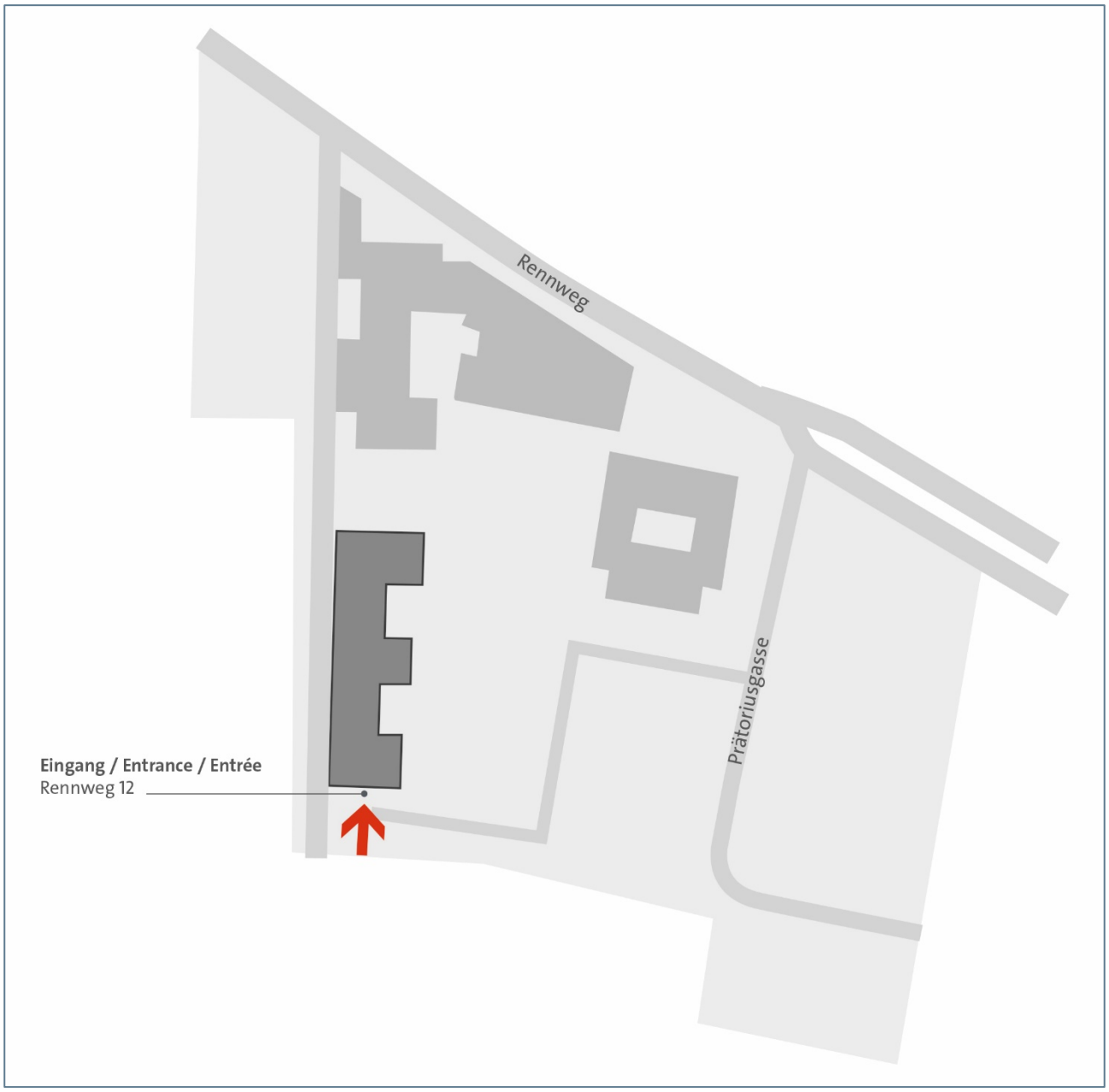


Fig. 10 EPO Vienna

Table 8 Environmental law and relevant facilities EPO Vienna

Most relevant areas of environmental law	Relevant facilities/activities
Water regulations	Water discharge into sewage system
Waste regulations	Recycling/separation/disposal of various types of waste
Building energy efficiency regulations	Energy certification, building insulation, energy-efficient technologies

3. Environmental management system

Following the adoption of our environmental policy ten years ago, we implemented an environmental management system under EMAS and took on a leading environmental role as an administrative institution. The system integrates environmental aspects into all our operational processes, which are regularly assessed with a view to identifying potential improvements in environmental protection.

3.1 Structure and responsibilities

The structure of the environmental management system is set out in our environmental management handbook, which applies to all sites. We regularly evaluate our environmental context to identify relevant stakeholders and their expectations with regard to the environmental management system. The system is also regularly assessed in internal audits, thus ensuring a continuous improvement process. Staff are encouraged to adopt environmentally-friendly behaviour. Relevant information is communicated to staff via the intranet and info screens and made available to the public in the environmental report.

Environmental management is organised and co-ordinated by the Environmental Management Officer. In addition, there are site-specific procedures and documents. These include environmental data and the environmental programme with suggestions for improvements at each site. The central Environmental Management Officer is in charge of implementing and further developing the environmental management system within the EPO. In addition, there are local environmental representatives from Directorate-General (DG) 4 at each site. They are in charge of planning, co-ordinating and monitoring local environmental activities and ensuring that environmental aspects are integrated into everyday operations at the sites. DGs 1 and 5 also have an environmental representative, who is in charge of integrating environmental aspects into the DG's specialised processes and environment-related activities. Having a representative from each DG strengthens the organisation-wide implementation of EMAS.

The Environmental Management Officer and environmental representatives, together with representatives from Procurement, Business Information Technology, Communication and Technical Services, form the EPO's central environmental team, which meets at least twice a year. A voluntary environmental group initiated by staff in Munich and The Hague supports the team's work and adds its own proposals to the environmental programme.

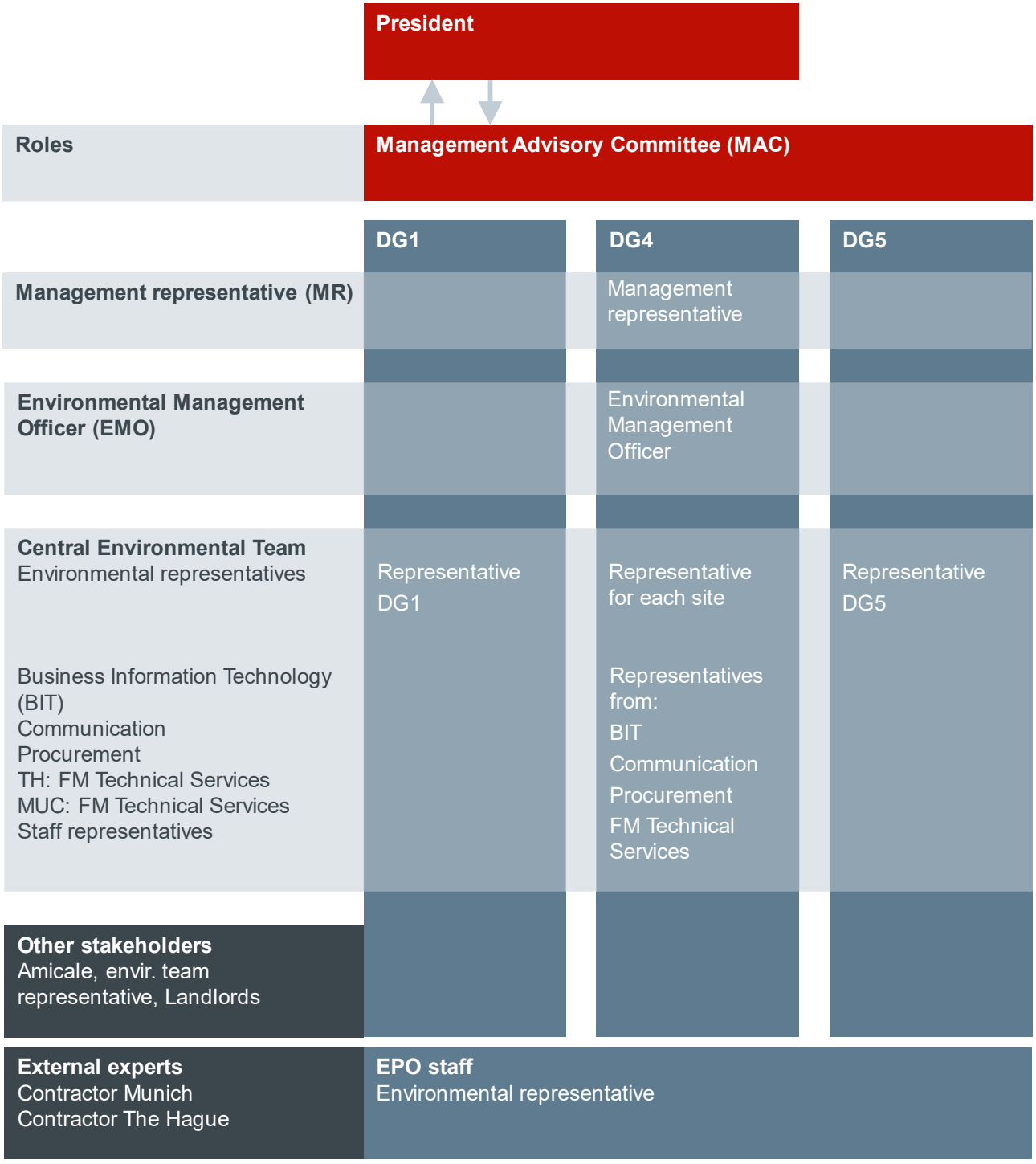


Fig. 11 EMAS governance structure

3.2 Compliance with binding obligations

EMAS and the environmental laws applying to the different EPO sites constitute external requirements to be met by the EPO and its environmental management system. The legal requirements and other binding obligations relevant for each place of employment have been identified. The most relevant environmental regulations for each place of employment are set out in the previous section. All binding obligations are documented in the legal register for each country in which the EPO is located. By continuously reviewing and updating the legal register, we identify changes to environmental law and implement new requirements. Moreover, all periodic obligations at the different sites are documented in local registers of periodic duties. Compliance with legal requirements is verified by annual internal audits. Minor non-compliances detected during the audits are corrected.

4. Strategic Plan 2023 and the EPO's environmental goals

In 2019 the EPO published its strategic plan for the period 2019 to 2023. In this strategic plan we committed ourselves to sustainability in general, and environmental sustainability in particular. One of our strategic goals is therefore to become a more sustainable organisation by reducing our environmental footprint.

The figure below shows the seven environmental goals which feature in the Strategic Plan 2023. All targeted improvements relate to the period 2019-2023. As an administrative organisation, our main impact on the environment is caused by the operation of our buildings, i.e. by the provision of a modern and healthy working environment for our staff. Consequently, five of the seven goals are connected to building operations, three of these to energy consumption. Reducing energy consumption by 12% will reduce CO_2 emissions caused by natural gas and district heating energy consumption as well. In addition, the increased share of renewable energy will support our goal to reduce CO_2. The most ambitious goal relates to paper-saving, the only goal that did not show a positive development in 2019. All other goals look likely to be exceeded, if trends continue as shown. So far, of course, comparisons can only be made between 2018 and 2019. We will continue to monitor all these goals as we work towards ensuring that these trends are maintained and also that we reduce our paper consumption.

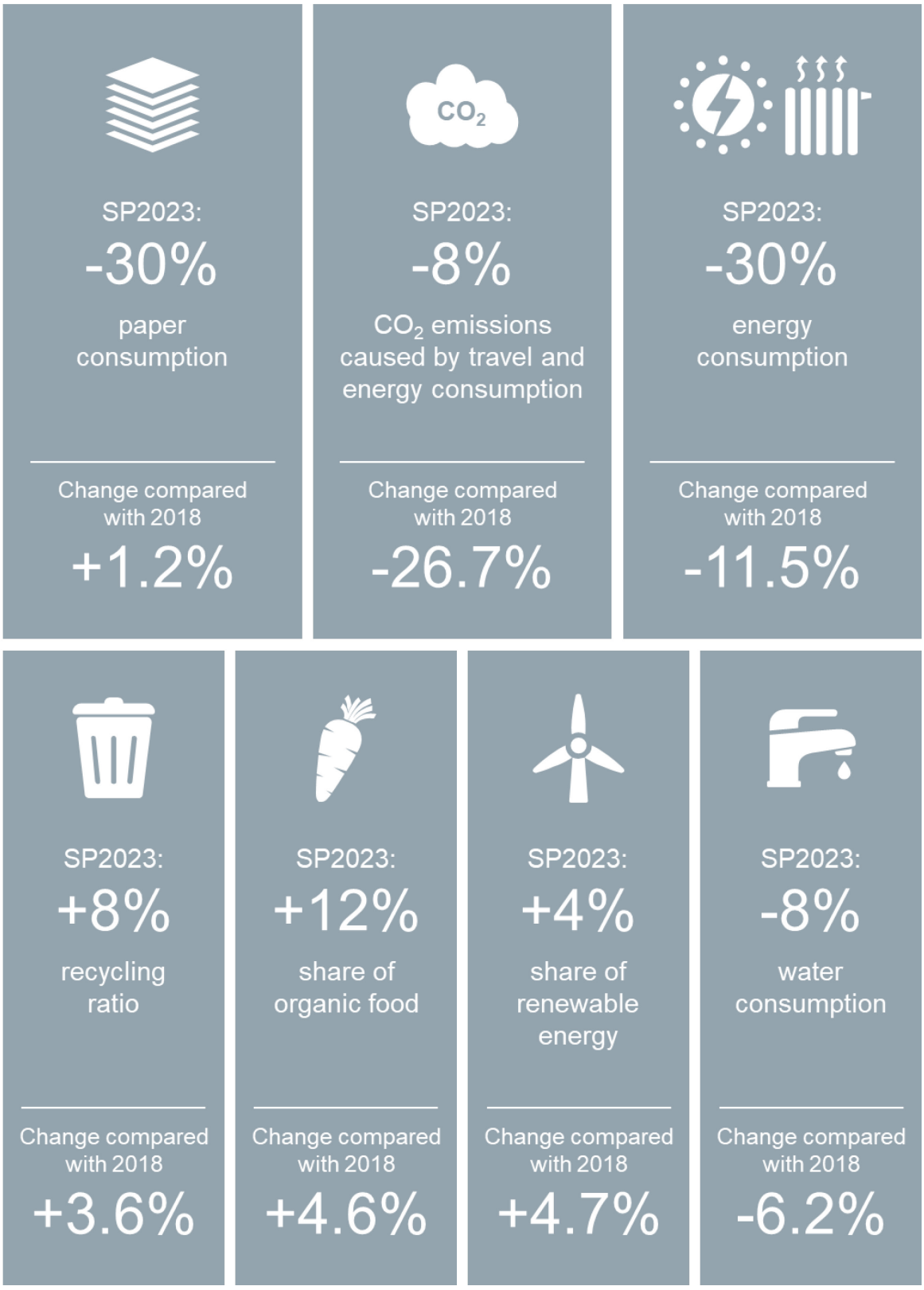


Fig. 12 Environmental goals included in the Strategic Plan 2023

5. Direct environmental aspects[4]

The EPO's activities have an environmental impact. In accordance with our environmental policy we strive to reduce this impact by applying an environmental management system and continually improving environmental performance.

To establish a basis for the development of environmental objectives and measures, we identified and evaluated our environmental aspects according to the following criteria:

- the potential harm or benefit to the environment
- the condition of the environment
- the size, amount, frequency and reversibility of the aspect or impact
- the existence and requirements of relevant environmental legislation
- the concerns of interested parties, including EPO staff

All significant environmental aspects are recorded and assessed on an annual basis. Based on this assessment new environmental objectives and measures for further improvement are developed. Environmental data has been compared across all sites in order to assess the relevance of the environmental aspects. Electricity and heating energy data has also been compared with external benchmarks.

Environmental aspects are subdivided into direct and indirect aspects. The main direct environmental aspects at the EPO are shown in Figure 13 below. The importance of each environmental aspect is indicated by the size and font size of the grey bubbles. For a detailed evaluation of all the environmental aspects see section 8.1 (annex). The indirect environmental aspects are described in section 6.

[4] The EMAS core indicators are shown in section 8. Not all environmental data is reported on in sections 5 and 8 as some data were not considered as significant for the evaluation of environmental aspects.

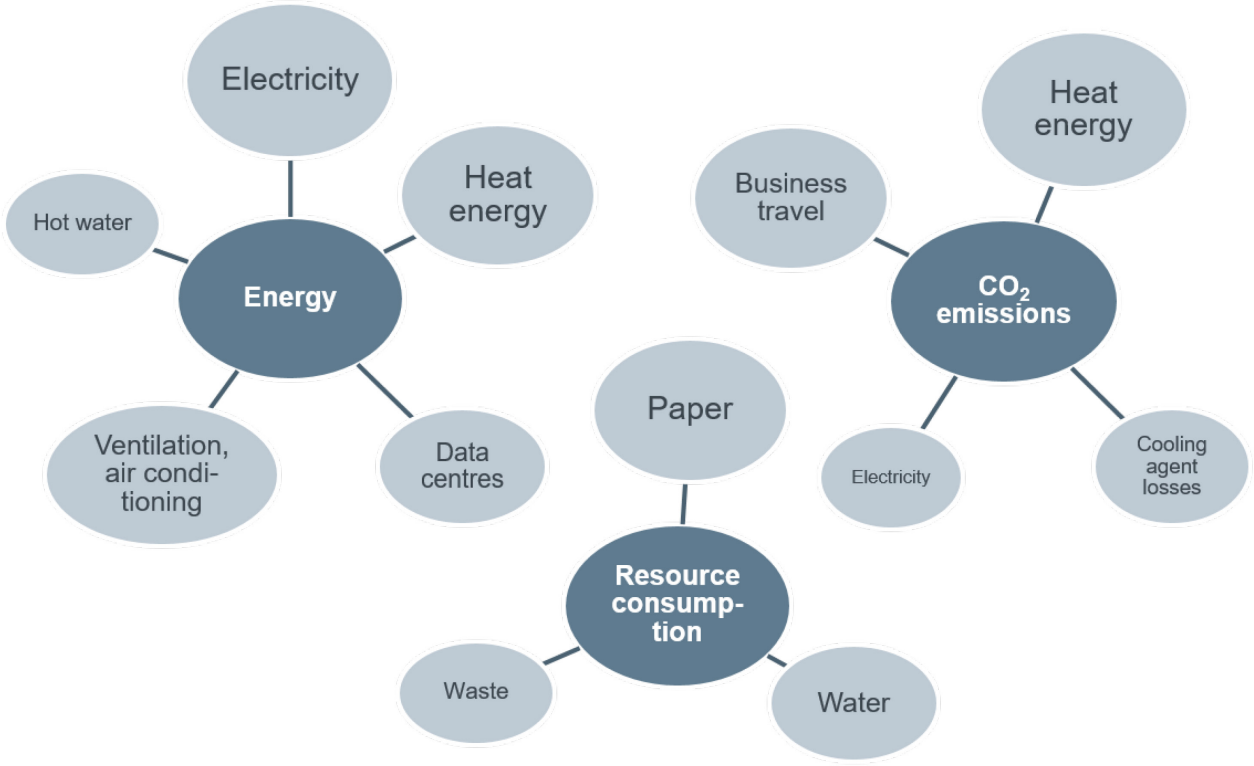


Fig. 13 Direct environmental aspects of the EPO. The font size in the grey bubbles indicates the importance of each aspect with respect to environmental impact.

5.1 Overview of all sites

The consumption data for each site and the resulting index figures are an important instrument for assessing current environmental performance, as well as planning and monitoring environmental activities and regularly reviewing the continuous improvement process. The following tables summarise the major environmental data for all buildings.

Table 9 Input (all buildings)

Input	Unit	2014	2015	2016	2017	2018	2019
Electricity consumption	MWh	39 491	39 225	37 495	36 331	40 971[5]	39 227
District heating energy	MWh	17 099	17 641	19 350	19 517	17 922	18 732
Natural gas consumption	MWh	16 874	18 099	18 425	16 987	17 685	9 781[6]
Water consumption	m^3	111 515	114 806	112 416	106 156	119 519	112 087[6]

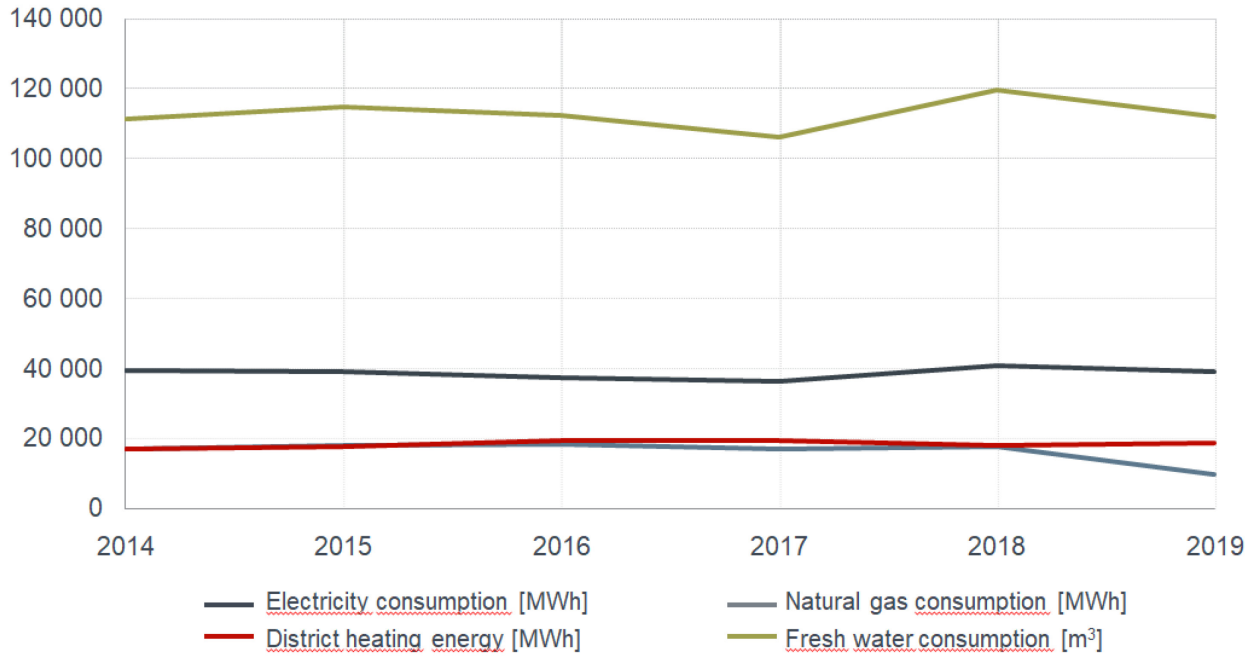


Fig. 14 Input (all buildings)

[5] The Rijsvoort data for 2018 were not available due to termination of the lease. To ensure comparability, the 2017 data were taken as an estimate and used to calculate the figure shown here.

[6] The Berlin data for 2019 were not available at the time of compiling this report. To ensure comparability, the 2018 values were taken as an estimate and used to calculate the figure shown here. These values will be corrected in next year's report.

Table 10 Output (all buildings)

Output	Unit	2014	2015	2016	2017	2018	2019
Residual waste generation	t	560	428[7]	443[7]	436	557	395[8]
Waste water generation	m^3	108 537	110 480	106 142	96 067	108 332	102 413[8]
CO_2 emissions from electricity and heating energy	t CO_2e	5 800	6 613	6 848	6 586	6 478[9]	4 805[8]

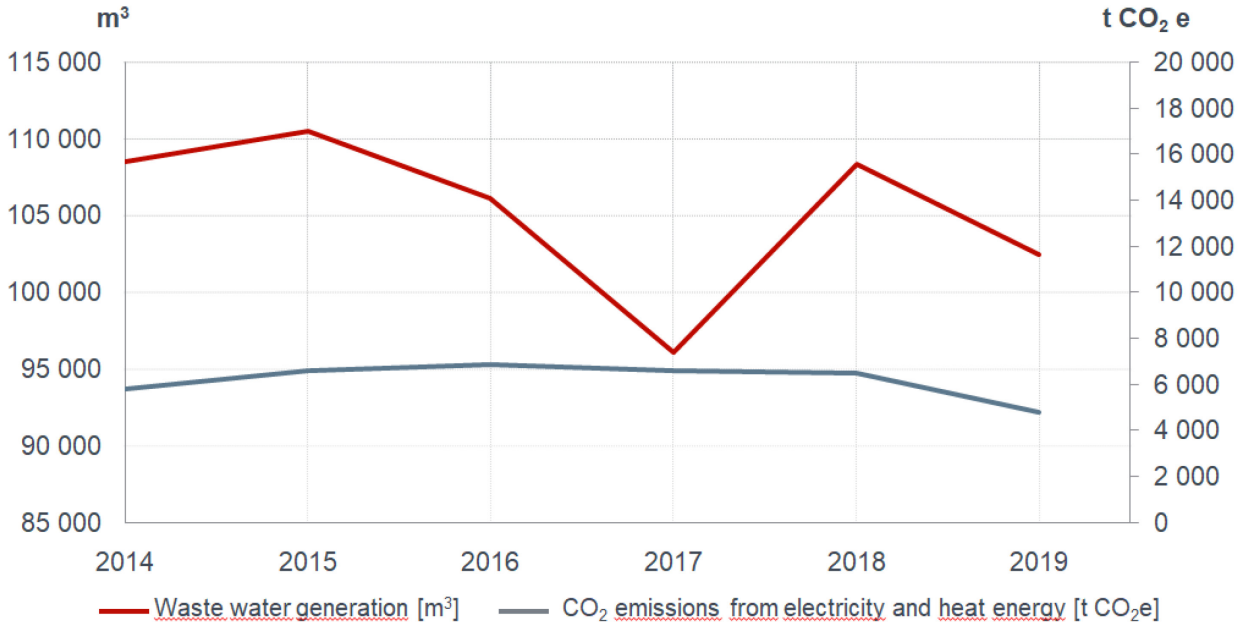


Fig. 15 Output (all buildings) – waste water generation and CO_2 emissions from electricity and heating energy

[7] Data for 2015 and 2016 were corrected compared with previous reports due to an improved data source.

[8] The Berlin data for heat energy and residual waste for 2019 were not available at the time of compiling this report. To ensure comparability, the 2018 values were taken as an estimate and used to calculate the figure shown here. These values will be corrected in next year's report.

[9] The Rijsvoort data for 2018 were not available due to termination of the lease. To ensure comparability, the 2017 values were taken as an estimate and used to calculate the figure shown here.

Fig. 16 Output (all buildings) – residual waste generation

5.2 Energy

Energy consumption in the form of electricity and heating is the most significant environmental aspect at the EPO and generates the highest costs. Electricity consumption is essentially made up of:

- cooling/ventilation and air-conditioning
- IT
- PCs and printers
- lighting in offices and public areas

Heating energy at the different sites is generated from various sources. While Munich Isar, Munich PschorrHöfe and Vienna use district heating, the buildings in Berlin and The Hague use natural gas. In the new Main building in The Hague, a heat recovery system and heat pumps are operated to provide heat energy.

Total electricity consumption 2019:
39 227 MWh

-4.3%
compared with 2018

Total heat energy consumption (weather-adjusted):
2019
31 699 MWh

-19.2%
compared with 2018

In The Hague, Munich and Vienna, the energy monitoring and control system provides valuable information on load points (installations, production areas, etc.) where there might be energy-saving potential. This information can be used to optimise installations such as HVAC systems (heating, ventilation and air-conditioning), thereby helping to reduce electricity consumption.

The charts below show a comparison of the total electricity and heating energy consumption at each site. They show both the absolute figures and index figures relative to the size of the sites (shown as consumption per square metre of floor area). Overall electricity consumption decreased by 4.3% compared with 2018, mainly because of savings in Munich Isar and Vienna. The savings in Munich Isar were achieved mainly by technical measures taken last year. The savings in Vienna were achieved by optimising the building control system, which minimised the run times of the cooling facilities.

Weather-adjusted heat energy consumption decreased by 19.2% compared with 2018. Considerable reductions were achieved in the buildings in The Hague. In the new Main building, heat energy is provided by groundwater heat pumps, which saved more than 500 000 m^3 of natural gas compared with 2018. On the other hand, the operation of the heat pumps caused a slight increase in electricity consumption in Hinge/Shell/Main. Another reason for the overall decrease in electricity and heat energy consumption was the closure of the Le Croisé and Rijsvoort buildings at the end of 2018.

Table 11 Absolute electricity consumption for all sites 2016-2019 (MWh per year)

	2016	2017	2018	2019	Change 2018-19 in %
Berlin[10]	436	432	462	480	+3.9
MUC Isar	8 937	8 659	8 379	8 052	-3.9
MUC PH 1-8	10 787	10 908	10 743	10 863	+1.1
TH Hinge/Shell/Main	14 860	13 869	19 065	19 301	+1.2
TH Le Croisé	1 629	1 621	1 503	0	-100
TH Rijsvoort	241	255	255[11]	0	-100
Vienna	606	587	564	531	-5.8
Total	**37 496**	**36 331**	**40 971**	**39 227**	**-4.3**

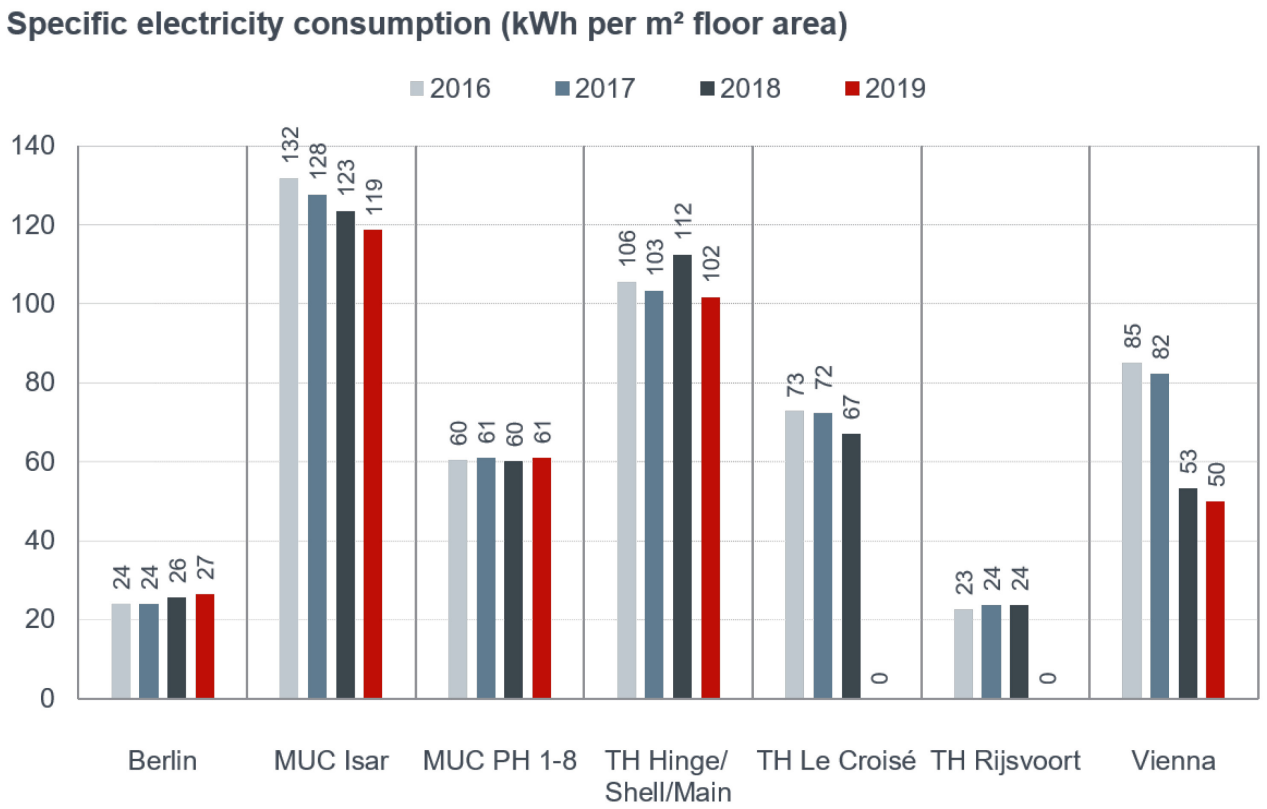


Fig. 17 Specific electricity consumption (kWh per m² floor area)

[10] The figures for electricity consumption at the EPO's Berlin site are estimates based on the landlord's division of overall electricity consumption among the tenants according to the size of the area rented by them in the building.

[11] The Rijsvoort data for 2018 were not available due to termination of the lease. To ensure comparability, the 2017 values were taken as an estimate and used to calculate the figure shown here.

Table 12 Absolute heat energy consumption (MWh per year)

	2016	2017	2018	2019	Change 2018-19 in %
Berlin	2 083	2 070	1 849	1 849[12]	0
MUC Isar[13]	8 138	8 102	7 577	8 212	+8.4
MUC PH 1-8	10 429	10 647	9 667	9 835	+1.7
TH Hinge/Shell/Main	13 355	11 916	12 814	7 932	-38.1
TH Le Croisé	1 444	1 456	1 477	0	-100
TH Rijsvoort	1 543	1 545	1 545[14]	0	-100
Vienna	784	768	678	684	+0.88
Total	**37 775**	**36 504**	**35 607**	**28 513**	**-19.9**

Table 13 Weather-adjusted heat energy consumption (MWh per year)

	2016	2017	2018	2019	Change 2018-19 in %
Berlin	2 263	2 280	2 164	2 182[13]	+0.8
MUC Isar	8 388	8 209	8 661	9 197	+6.2
MUC PH 1-8	10 749	10 788	11 051	11 016	-0.3
TH Hinge/Shell/Main	13 767	12 734	13 477	8 537	-36.7
TH Le Croisé	1 489	1 556	1 553	0	-100
TH Rijsvoort	1 591	1 651	1 625[15]	0	-100
Vienna	795	770	710	766	+7.9
Total	**39 042**	**37 989**	**39 241**	**31 699**	**-19.2**

[12] The Berlin data for 2019 were not available at the time of compiling this report. To ensure comparability, the 2018 values were taken as an estimate and used to calculate the figure shown here. These values will be corrected in next year's report.
[13] District heating in Munich Isar is provided as steam. The conversion factor from steam to kWh is provided by the energy supplier. This same factor is used for the entire Munich district heating system.
[14] The Rijsvoort data for 2018 were not available due to termination of the lease. To ensure comparability, the 2017 values were taken as an estimate and used to calculate the figure shown here.

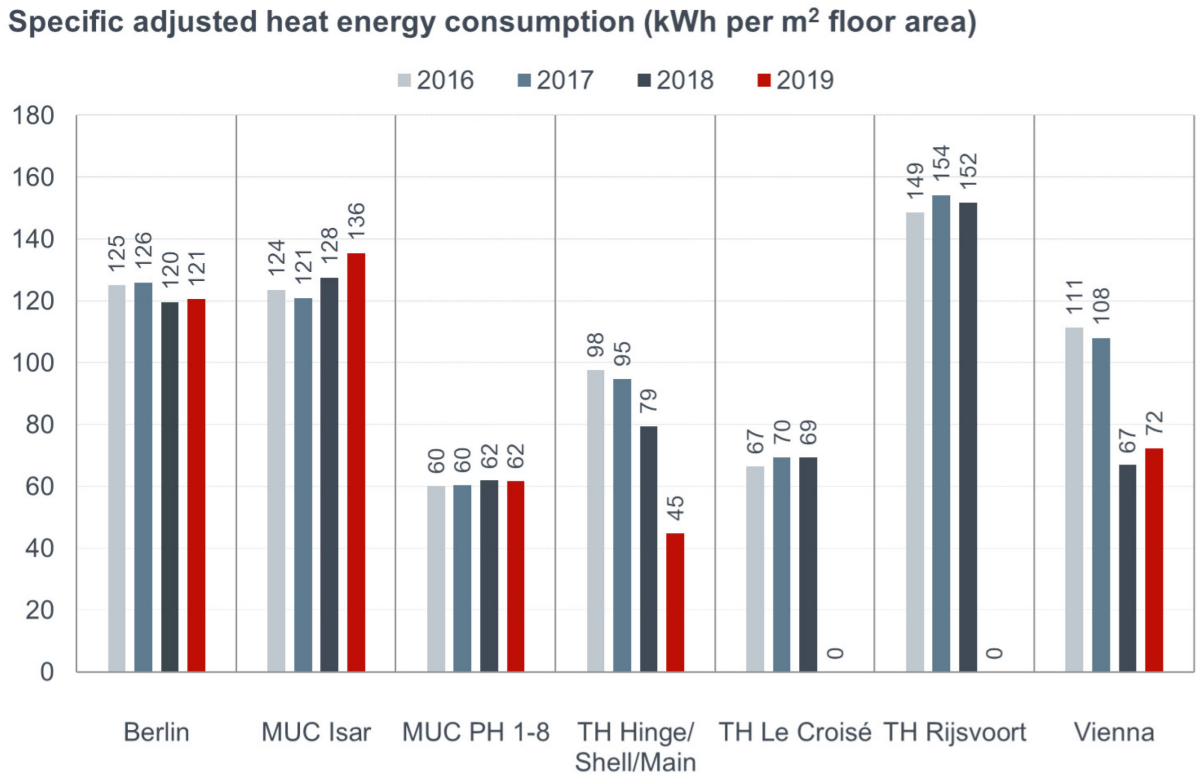


Fig. 18 Specific weather-adjusted heat energy consumption (kWh per m² floor area)

5.3 Water/waste water

At all sites water is provided by the municipal supplier. Most of it is deployed in sanitary facilities and kitchens. In the Isar and PschorrHöfe buildings in Munich and the new Main, Shell and Hinge buildings in The Hague, water is also used for the air-conditioning systems and for watering plants and green spaces on-site. Waste water contamination consists mainly of organic substances. Where needed, oil and grease traps are installed in specific locations to remove contaminants from waste water.

Total water consumption 2019: 112 087 m^3

-6.2% compared with 2018

The EPO's water consumption decreased in 2019, thanks to a decrease in The Hague of over 15%. This was due to the fact that, because of the move to the new buildings and the start-up of these buildings, water consumption in The Hague had been much higher in 2018.

Table 14 Water consumption (m^3 per year)

	2016	2017	2018	2019	Change 2018-19 in %
Berlin	2 642	2 808	3 000	3 000[15]	0
MUC Isar	20 030	22 799	23 102	26 684	+15.5
MUC PH 1-8	45 934	42 911	43 770	44 972	+2.8
TH Hinge/Shell/Main	35 779	30 090	42 554	35 451	-16.7
TH Le Croisé	3 958	4 107	3 213	0	-100
TH Rijsvoort	3 088	1 998	1 998[16]	0	-100
Vienna	985	1 433	1 882	1 980	+5.2
Total	**112 416**	**106 146**	**119 519**	**112 087**	**-6.2**

[15] The Berlin data for 2019 were not available at the time of compiling this report. To ensure comparability, the 2018 values were taken as an estimate and used to calculate the figure shown here. These values will be corrected in next year's report.
[16] The Rijsvoort data for 2018 were not available due to termination of the lease. To ensure comparability, the 2017 values were taken as an estimate and used to calculate the figure shown here.

5.4 Waste

To guarantee that waste is collected and disposed of separately, the EPO has established a waste separation system with clearly identifiable and distinguishable waste containers in all rooms and work areas at all sites. Staff are briefed on waste avoidance, recycling and correct disposal. Day-to-day residual waste and waste paper constitute the main categories of waste at all sites.

Residual waste generation 2019:
395 t

-29%
compared with 2018

Residual waste generation decreased significantly by almost one third compared with the previous year. This can be attributed to the fact that in 2018 waste generation peaked because of the move to the new buildings and the corresponding decluttering.

The high increase in food waste in The Hague (+20.3%) is due to the fact that staff previously located in Le Croisé and Rijsvoort were moved to the new Main building. This led to a higher number of meals being provided by the canteen in Hinge/Shell/Main. If the food waste produced in Le Croisé and Rijsvoort in 2018 is taken into consideration, overall food waste in The Hague increased by just 3% compared with 2018.

Table 15 Total residual waste generation (t per year)

	2016	2017	2018	2019	Change 2018-19 in %
Residual waste					
Berlin[17]	40	40	40	40[18]	0
MUC Isar	92	95	59	59	0
MUC PH 1-8	131	132	131	122	-6.9
TH Hinge/Shell/Main	132	122	239	159	-33.5
TH Le Croisé	21	16	39	0	-100
TH Rijsvoort	12	16	34	0	-100
Vienna	15	15	15	15	0
Total	**443**	**436**	**557**	**395**	**-29.0**
Paper waste					
Berlin	18	29	17	19	+11.8
MUC Isar	218	181	125	156	+24.8
MUC PH 1-8	237	204	197	148	-24.9
TH Hinge/Shell/Main	186	169	351	239	-31.9
TH Le Croisé	14	17	35	0	-100
TH Rijsvoort	4	4	17	0	-100
Vienna	38	24	24	24	0
Total	**714**	**628**	**766**	**587**	**-23.4**
Food waste					
Berlin	13	12	11	12	+9.1
MUC Isar	45	35	38	37	-2.6
MUC PH 1-8	114	102	76	81	+6.6
TH Hinge/Shell/Main	81	63	59	71	+20.3
TH Le Croisé	8	7	5	0	-100
TH Rijsvoort	9	8	5	0	-100
Vienna	0	0	0	0	0
Total	**270**	**227**	**195**	**201**	**+3.1**
Grease separator waste					
Berlin	10	10	10	12	+20.0
MUC Isar	132	109	132	150	+13.6
MUC PH 1-8	228	214	182	118	-35.1
TH Hinge/Shell/Main	0	105	100	114	+14.0
TH Le Croisé	0	0	0	0	-100
TH Rijsvoort	0	0	0	0	-100
Vienna	0	0	0	0	0
Total	**370**	**438**	**424**	**395**	**-6.8**

[17] The values for 2015-2018 have been corrected on the basis of an improved data source.

[18] The Berlin data for 2019 were not available at the time of compiling this report. To ensure comparability, the 2018 values were taken as an estimate and used to calculate the figure shown here. These values will be corrected in next year's report.

5.5 CO_2 emissions

Greenhouse gas emissions[19] caused by the activities of the EPO are calculated for energy consumption, cooling agent losses and business travel. They are indicated in CO_2 equivalents, which includes emissions of the seven greenhouse gases according to the Kyoto Protocol (carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulphur hexafluoride (SF_6) and nitrogen triflouride (NF_3).

Other emissions to the air, such as SO_2 (sulphur dioxide), NO_x (nitrogen oxide) and particulates, are considered only if they arise directly at one of our sites. This applies only to natural gas consumption at the sites in Berlin and The Hague. Since these emissions are of minor relevance, they are presented with the core indicators in section 8.3 (annex).

The factors for converting electricity and heating energy into individual emission types (kg/kWh) are based on the GEMIS (Global Emissions Model for Integrated Systems) database and the information provided by the energy suppliers at each site.

Most of our CO_2 emissions are caused by electricity and heating energy consumption. Our primary objective in minimising emissions is therefore to reduce energy consumption. Wherever possible, we aim to use "green" electricity and district heating, which is more climate-friendly than natural gas or heating oil. We also regularly inspect and maintain our heating systems.

In 2019, CO_2 emissions from energy consumption decreased by 25.8% compared with 2018. All our sites apart from Le Croisé and Rijsvoort in The Hague have been using green electricity for several years. As the leases for Le Croisé and Rijsvoort were terminated at the end of 2018, all the electricity used by the EPO is now from renewable sources. CO_2 emissions from heat energy consumption were reduced considerably as the heat pumps installed in the new Main building in The Hague saved around 500 000 m^3 of natural gas.

CO_2 emissions from energy consumption 2019:
4 805 t CO_2e

-25.8%
compared with 2018

[19] In this report, the term "CO_2 emissions" is used to refer to all greenhouse gas emissions.

Further building-related emissions originate from losses of cooling agents which occur sporadically due to defects and/or repairs of cooling facilities. Maintenance of cooling facilities is performed at frequent intervals to minimise the risk of cooling agent losses. In 2018, there was a leakage in Vienna which explains the high increase in CO_2-equivalent emissions at this site.

Table 16 Total CO_2-equivalent emissions from electricity, heating and cooling agent losses (t CO_2e per year)

	2016	2017	2018	2019	Change 2018-19 in %
Berlin	420	417	374	374[20]	0
MUC Isar[21]	1 269	1 324	1 208[22]	1 311	+8.6
MUC PH 1-8[21]	1 659	1 781	1 738[22]	1 656	-4.7
TH Hinge/Shell/Main	2 698	2 407	2 589	1 946	-24.8
TH Le Croisé	479	481	471	0	-100
TH Rijsvoort	339	341	341[23]	0	-100
Vienna[24]	16	15	134	14	-89.8
Total	**6 880**	**6 766**	**6 854**	**5 301**	**-22.7**

[20] The Berlin data for heat energy consumption for 2019 were not available at the time of compiling this report. To ensure comparability, the 2018 values were taken as an estimate and used to calculate the figure shown here. These values will be corrected in next year's report.

[21] The conversion factor for heat energy to CO_2e is provided by the energy supplier. It is the same for all heat energy from district heating provided by the supplier.

[22] Value corrected compared with previous report.

[23] The Rijsvoort data for 2018 were not available due to termination of the lease. To ensure comparability, the 2017 values were taken as an estimate and used to calculate the figure shown here.

[24] The conversion factor for heat energy to CO_2e was provided by the energy supplier in 2015. No update is available.

Next to energy consumption, business travel is the second-largest source of CO_2 emissions caused by the EPO. Business trips between the EPO sites constitute the main component of travel at the EPO. To a lesser extent, staff travel to meet customers and other partners or attend conferences and other events.

As part of our efforts to reduce our carbon footprint, staff at all sites are informed of the CO_2 emissions associated with business travel in the Balanced Scorecard and via internal communications and are encouraged to use the videoconference rooms.

CO_2 emissions from air and rail travel
2019:
1 350 t CO_2e

-30%
compared with 2018

Fig. 19 shows a decrease in emissions from air travel for all sites. Staff are encouraged to avoid flights, so the decrease is presumably caused by changes in staff behaviour. DG 1 director meetings were reorganised, which led to a significant decrease in flights between The Hague and Munich. Furthermore, the rail connections between Munich and Berlin and Munich and Vienna have been promoted to staff. Another factor was the installation of Skype for Business, which enables staff to conduct virtual meetings from their own PCs.

Fig. 20 shows CO_2 emissions from train travel. Having already fallen in the preceding years, these emissions have been set at zero in 2018, due to the fact that since then the railway companies in the Netherlands, Germany and Austria have been using renewable energy if not across the board then at least for business customers.

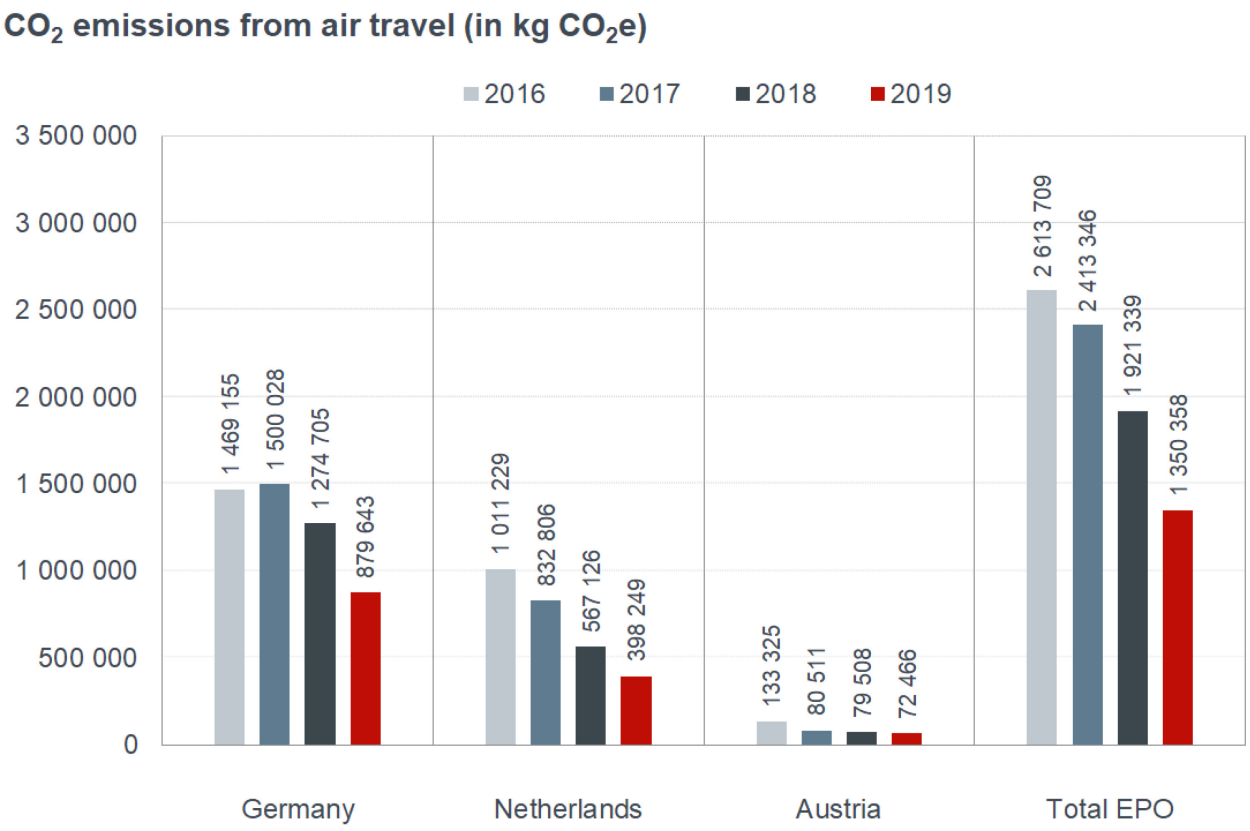


Fig. 19 CO_2 emissions from air travel (in kg CO_2e)

Source: American Express Global Business Travel. Note: Emissions allocated to place of departure. Since 2017, emissions have been displayed by country, not by individual location, due to the data structure of the new service provider.

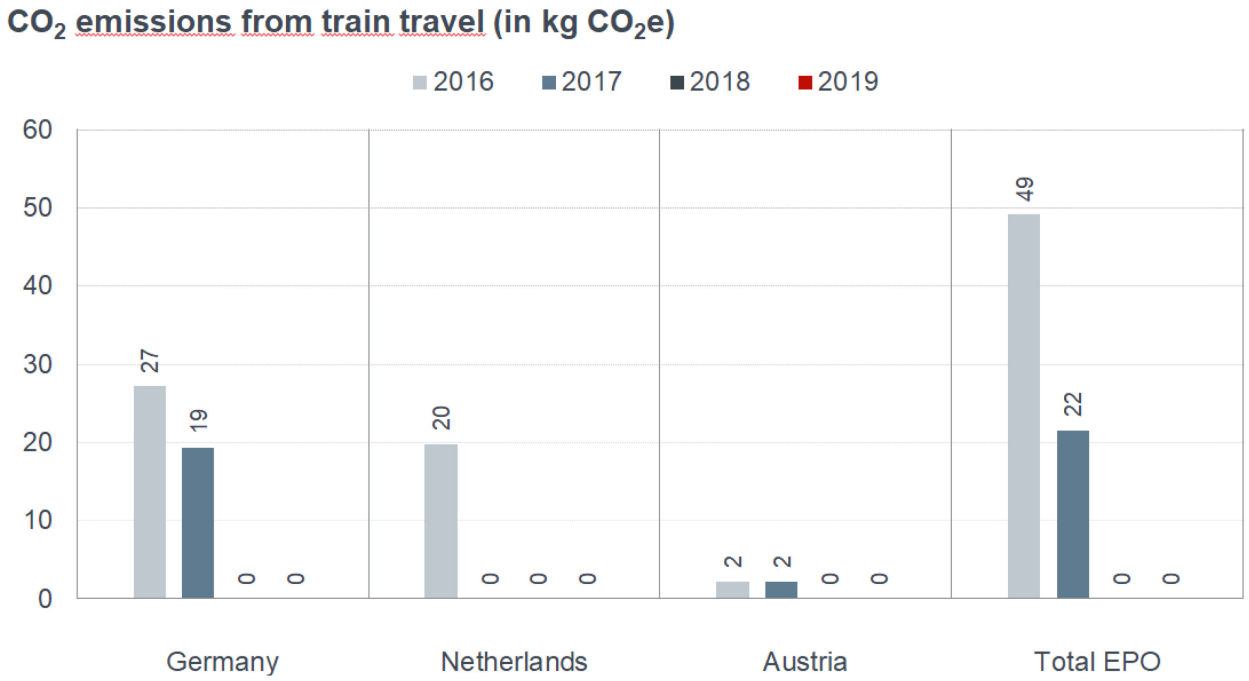


Fig. 20 CO_2 emissions from train travel (in kg CO_2e)

Source: American Express Global Business Travel for April to December 2017. Since no data for the first quarter of 2017 could be provided, the CO_2 emissions from train travel for 2017 suffer from a lack of comparability.

Note: Emissions allocated to place of departure.

5.6 Paper consumption

Paper consumption at the EPO is high, as our core activity – patent examination – means that we have to print a huge amount of documents.

Total paper consumption 2019: 123.6 million sheets

+1.2% compared with 2018

Compared with 2018, overall paper consumption has increased slightly by 1.2%. This is due to higher consumption at the Munich sites.[25] At all the other sites, the number of sheets was reduced. The large decrease at the Berlin site can be attributed to an increased awareness of paper-saving on the part of staff, as well as a drop in staff numbers due to retirements.

Overall paper consumption is mainly linked to the number of products, i.e. the number of patent examination processes, irrespective of whether or not the patent was granted. 2019 saw the end of the downward trend of the past three years. Although paper consumption per product is still at the second-lowest level since 2014, steps will be taken in the coming years to improve environmental performance. Paper consumption and paper consumption trends are monitored by a KPI in the Balanced Score Card.

Table 17 Paper consumption per site (sheets)

	2016	2017	2018	2019	Change 2018-19 in %
Berlin	2 896 000	3 379 000	2 792 500	2 227 500	-20.2
Munich[26]	52 838 500	53 988 600	53 889 180	58 730 000	+8.9
The Hague[26]	65 932 500	64 937 500	65 160 000	62 330 000	-4.3
Vienna	374 500	363 125	338 250	326 525	-3.5
Total	**122 041 500**	**122 668 225**	**122 179 930**	**123 614 025**	**+1.2**

[25] In Munich and The Hague paper consumption can be indicated only for the site as a whole, and not for individual buildings.

[26] In Munich and The Hague paper consumption can be indicated only for the site as a whole, and not for individual buildings.

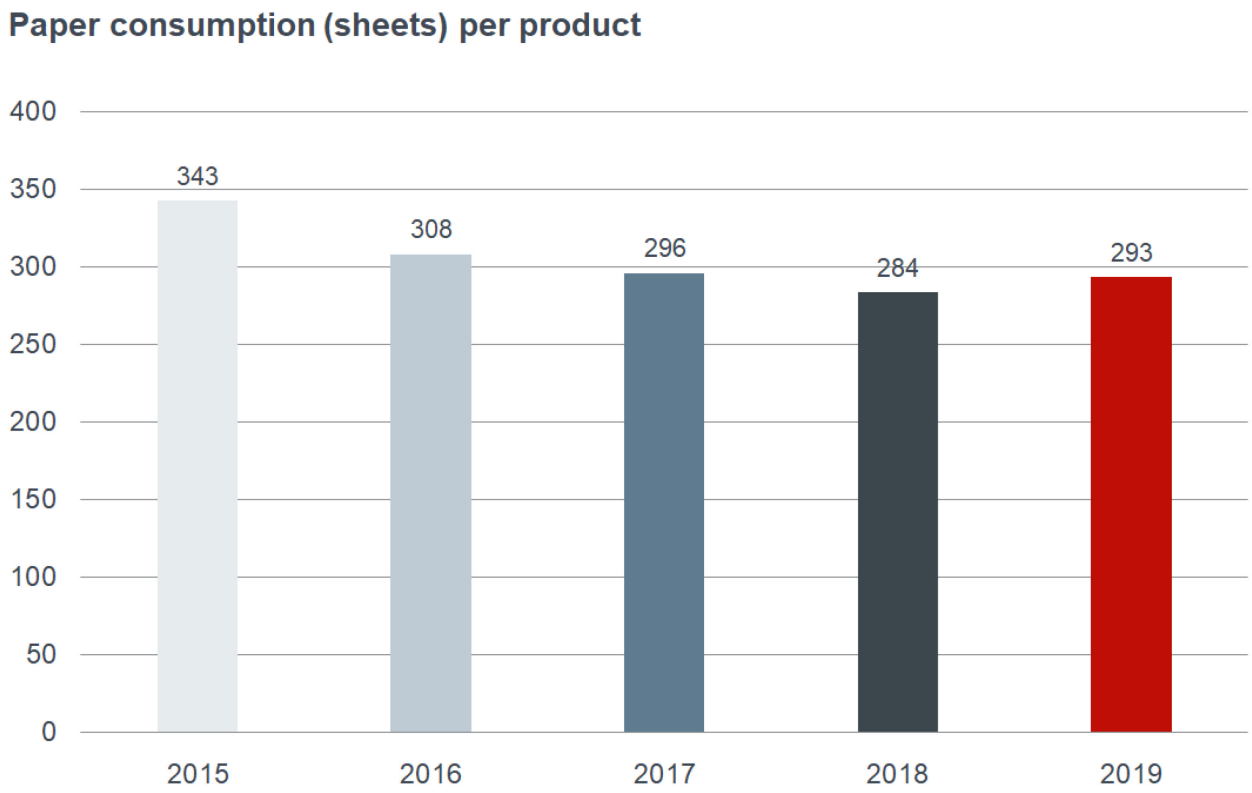


Fig. 21 Paper consumption (sheets) per product[27]

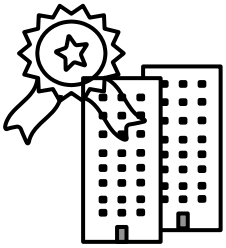
[27] A "product" is a single patent examination process.

SP2023 − Building investment programme

Our Strategic Plan 2023 includes a comprehensive set of maintenance and refurbishment projects for our buildings. Taking the new Main building in The Hague as a benchmark, we will offer all staff a modern, healthy work environment that supports engagement, performance, productivity and motivation. This new environment will feature both shared working spaces for collaborative activities and individual, sound-insulated areas for high-concentration tasks, giving staff greater flexibility to choose the working environment that best meets their needs.

Construction work will improve the condition of our buildings and their sustainability, while reducing running costs and energy consumption. CO_2 footprints and sustainability are major concerns in today's society, as highlighted by the Paris Agreement of 2015. At the EPO we take our environmental and social responsibilities very seriously. One of the key aims of the Strategic Plan is to help improve the cities and countries we live in. Energy-efficient, state-of-the-art buildings reduce our impact on the environment by decreasing its energy intake and lowering our CO_2 output.

We aim to achieve an outstanding rating under the BREEAM certification scheme for all sites and all our buildings, old and new. To achieve the highest level of certification, extensive measures need to be taken. These will cover building components and operating concepts as well as better connections to public transport. To support staff wishing to use environmentally friendly transport to travel to work, a number of bike parks and charging stations for e-cars and e-bikes will be provided.



6. Indirect environmental aspects

All indirect environmental aspects under the EMAS III Regulation have been assessed for their relevance to the EPO. Fig. 22 illustrates the most important indirect environmental aspects which have been identified for all EPO sites. The importance of each one is indicated by the size and font size of the grey bubbles. For a detailed assessment see section 8.2 (annex).

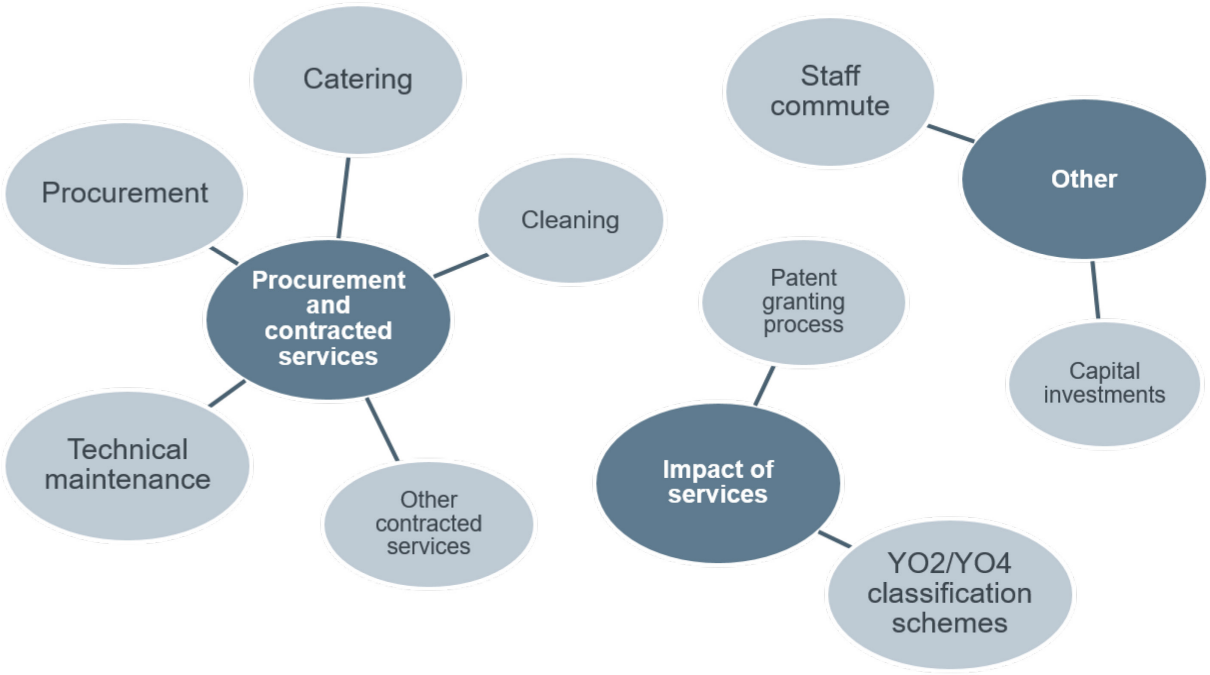


Fig. 22 Indirect environmental aspects of the EPO The font size in the grey bubbles indicates the importance of each aspect with respect to environmental impact.

The most relevant areas of indirect impact on the environment for the EPO are the procurement of goods and services and our core business of patenting inventions. In terms of sustainable procurement, improvements have been achieved based on regulatory changes in recent years that enable environmental criteria to be taken into consideration when making procurement decisions.

We are aware of the environmental impact of our core business, the patent granting process. Several years ago we set up the YO2 scheme, an alternative patent search scheme that makes it easier for searchers and inventors to find patents relating to climate change mitigation technologies. The scheme works by sorting patents by the type of renewable energy technology they contribute to and not just by general technological criteria. We also developed the YO4 scheme, which follows the same principle as the YO2 scheme but is concerned with climate change adaptation technologies.

Another important indirect environmental aspect relates to the activities of our contractors. The main contracted services with environmental impact are catering, cleaning and technical facility management. These services are contracted in such a way as to ensure that they comply with our environmental goals. One of these goals is aimed at increasing the share of organic compounds in the food served at our canteens and cafeterias. Together with the caterers, we are working towards increasing the share of organic compounds by 12% by 2023.

The EPO is aware of the influence it has on the community. In 2019 we joined the *Klimapakt Münchner Wirtschaft* (Munich Climate Pact), a project set up by the city of Munich to bring together local players in their endeavours to become climate-friendly organisations. Its main goals are to provide a platform for the participating organisations to exchange experiences and best practices and to take joint steps to reduce their climate impacts. Along with our participation in Munich's operational mobility management project, this initiative shows our commitment to becoming a sustainable organisation at both European and local level.

7. Activities supporting SP2023

In accordance with our environmental policy we seek to minimise our environmental footprint. Under SP2023, we have defined long-term environmental goals, including energy savings as well as improvements in resource efficiency, waste avoidance and organic food catering. These goals will enable us to take a strategic approach that will complement our annual monitoring and ensure the fulfilment of our objectives over time.

To achieve these overall goals, the central environmental management team draws up an annual environmental programme with targets and improvement measures. The programme takes into account developments in environmental aspects, suggestions for improvements from internal audits and external inspections, and suggestions from staff and environmental groups. It also takes account of best environmental management practices as recommended in the European Commission's sectoral reference document for public administration[28] and uses them as inspiration for the development of improvement measures.

The tables below present the main actions implemented in 2019 and those planned for 2020/2021. Measures with regard to technical installations relate exclusively to the buildings owned by the EPO, due to the fact that its rented buildings are operated and maintained by the respective landlords.

Energy savings generated by technical measures in 2019:

250 000 kWh

0.37% of total energy consumption

Total number of improvement measures taken in 2019:

35

Energy savings planned for measures in 2020:

350 000 kWh

0.51% of total energy consumption

[28] Commission Decision (EU) 2019/61 of 19 December 2018.

7.1 Energy

Action	Site	Savings/impact	Status
2019			
Change to LED lights in the stairwells, Sky Bar, cafeteria and gym	Munich	100 000 kWh per year	Completed
Install new/improved air conditioning system	Munich	150 000 kWh per year	Completed
Optimise hot and cold air flows in PschorrHöfe 7 through a more efficient floor layout of the racks in the data centre	Munich	Not quantifiable	Completed
Install LED lights in garages	The Hague	26 000 kWh per year	In progress
Substitute natural gas by heat pump system in the new Main building	The Hague	500 000 m^3 of natural gas	Completed
Replace light bulbs in desktop lights by LED lights	Berlin	660 kWh per year	In progress
Deploy new workstations with lower energy consumption (gradual replacement)	All sites	900 000 kWh per year (estimated)	In progress

Action	Site	Savings/impact	Status
2020/21			
Extend software for weather-dependent regulation of heating and cooling equipment to PschörrHöfe 6 and 8	Munich	350 000 kWh per year	Planned
Replace ordinary light bulbs by LED (corridors, offices PH, garage)	Munich	Not quantifiable	Planned
Ensure full functioning of the metering system in the new Main building	The Hague	Not quantifiable	Planned
Install heat pump in the Shell building	The Hague	Not quantifiable	Planned
Implement a monitoring system for the two wells in the new Main building	The Hague	Not quantifiable	Planned
Adapt the cooling system for the caterers, new Main building	The Hague	Not quantifiable	Planned
Carry out pilot with LED lighting on an entire floor of offices	The Hague	Not quantifiable	Planned
Connect booking system for meeting rooms with building management system to efficiently manage energy supply of meeting rooms	The Hague	Not quantifiable	Planned

7.2 Water

Action	Site	Savings/impact	Status
No specific measures concerning the saving of water performed in/planned for 2019/2020/2021 (will be done when the buildings are refurbished).			

7.3 Waste

Action	Site	Savings/impact	Status
2019			
Stop using plastic bags for waste bins	Munich, Vienna, Berlin	Approx. 350 000 plastic bags per year	Completed
Publish an article on waste segregation on the intranet to raise staff awareness	Munich	Not quantifiable	Completed
Reduce plastic used for take-away food in canteen (e.g. muesli, salads)	Munich	13 000 -14 000 plastic recipients per year	Completed
Discontinue use of plastic cups in coffee machines	Munich	Not quantifiable	Completed
Discontinue display dishes in canteen	Munich, The Hague	Approx. 3.5 tons of food waste per year	Completed
Hold a meeting on the correct handling of construction waste	Munich	Not quantifiable	Completed
Introduce new regulation in canteen: full menu to be available only until 13.15 hrs (closing time 14.00 hrs) to save on food waste	The Hague	Not quantifiable	Completed
Use compostable plastic for take-away food from the canteen	Vienna	Not quantifiable	Completed
2020/21			
So far, no specific waste reduction measures have been identified for 2020/2021.			

7.4 CO_2 emissions

Action	Site	Savings/impact	Status
2019			
Join the *Klimapakt Münchner Wirtschaft* (Munich Climate Pact)	Munich	Not quantifiable	Completed
Reorganise director meetings to reduce flights (organise meetings via videoconference)	All sites	Not quantifiable	Completed

7.5 Paper consumption

Action	Site	Savings/impact	Status
2019			
No specific paper-saving measures in 2019.			
2020/21			
Encourage staff to reduce paper consumption by printing less and shifting to printing mode P5000, which saves on the green cover sheets.	All sites	Not quantifiable	Planned

7.6 Communication

Action	Site	Savings/impact	Status
2019			
Participate in the "Cycle to work" campaign	Munich	Not quantifiable	Completed
Organise an e-car exhibition	Munich, The Hague	Not quantifiable	Completed
Organise four lunchtime talks on environmental topics	The Hague	Four talks with 20-50 participants each	Completed
Raise awareness of new Berlin-Munich ICE connection	Berlin	Not quantifiable	In progress
Organise an EMAS info stand at the EPO's Health & Safety Day	Berlin	Not quantifiable	Completed
Provide DG 1 staff with regular information about EMAS	All sites	Not quantifiable	Completed
2020/21			
Raise awareness of the paper consumption KPI index	Munich	Not quantifiable	Planned
Organise a lecture on plastics/packaging	Munich	Not quantifiable	Planned
Organise lunchtime talks	The Hague	Not quantifiable	Planned

7.7 Procurement

Action	Site	Savings/impact	Status
2019			
Integrate sustainability criteria into the following contracts (start date in 2019):			
CAFM & Cloud migration	All sites	Not quantifiable	Completed
DataCenter Luxembourg	Remote (Luxembourg)	Not quantifiable	Completed
SSL VPN network equipment and maintenance	All sites	Not quantifiable	Completed
Introduce a general statement on reducing travel by suppliers during provision of their services, supporting the use of digital communication technologies	All sites	Not quantifiable	Completed
Introduce a standard "environmental clause" and questions currently in BIT procurement area, to be extended to all procurement procedures	All sites	Not quantifiable	Completed
Arrange informal meetings between Green IT and EMAS Central Procurement representatives	The Hague	Not quantifiable	Ongoing
2020/2021			
Integrate sustainability criteria into the following contracts (start date in 2020):		Not quantifiable	
Stationery and IT consumables	All sites	Not quantifiable	Planned
Gardening and landscaping services	Munich	Not quantifiable	Planned
Sustainable electricity supply (100% renewable)	Munich, The Hague	Not quantifiable	Planned

7.8 Other

Action	Site	Savings/impact	Status
2019			
Extend the Isar bike park and provide more parking spaces for bicycles	Munich	248 roofed and locked parking spaces	Completed
Organise a repair café	Munich	Not quantifiable	Completed
Organise various recycling collection campaigns	Munich	22 m³ clothes, 14 m³ toys, 3 m³ baby clothes, 83 school bags, 80 kg old wax, 350 kg corks, 8 700 books and 4 500 CD/DVDs were collected for charitable projects	Completed
Provide an organic menu in the canteen	The Hague	Not quantifiable	Completed
Take a structured approach to investigating what office supply items can be replaced with environmentally-friendly alternatives	Berlin	Not quantifiable	In progress
Plan e-car charging stations with landlord	Berlin	Not quantifiable	In progress
2020/21			
Conduct a staff survey on the mobility concept	Munich	Not quantifiable	Planned

8. Annex

8.1 Evaluation of direct environmental aspects

To help assess their relevance and the need for action, the different environmental aspects have been rated as follows:
A = very significant environmental aspect with above-average need for action
B = significant environmental aspect with average need for action
C = less significant environmental aspect with low need for action

In addition, the extent to which they can be influenced is indicated by the following ratings:
I = short-term control possible
II = mid- to long-term control possible
III = control not possible or possible only in the long term or subject to third-party decisions

All direct environmental aspects under the EMAS III Regulation were assessed for their relevance to the EPO. Only the aspects that were found to be relevant are included below.

Some aspects have received an updated rating compared with the 2018 report in order to reflect changes in 2019. Electricity consumption at the PschorrHöfe data centre was downgraded from A to B because the measures implemented in the course of the construction of the new data centre increased energy efficiency. The importance of electricity consumption for heating, ventilation and air conditioning (HVAC) in the Isar building was also downgraded from A to B. The energy optimisation project in the Isar building, which included the refurbishment of the cooling facilities and the exchange of old heating pumps, was completed in 2019. For the new Main building in The Hague, the importance of controlling water consumption for sanitary use and the canteens was upgraded (from B to A) as the planned grey water system intended to reduce water consumption is not running yet.

As a result of political movements and discussions around the subject of climate change, public awareness of climate protection issues has increased, resulting in a higher controllability for mobility behaviour. At the EPO, control of emissions from flights was rated up following the introduction of a number of regulations on business travel policy and the reorganisation of meetings to avoid flights. These measures have already proven to be very successful, as CO_2 emissions from flights were down 30% in 2019.

		Berlin	MUC Isar	MUC PschorrHöfe	TH Hinge	TH Shell	TH Main	TH Le Croisé	TH Rijsvoort	Vienna
Relevant direct environmental aspects										
Resource consumption: energy										
Resource consumption: electricity	General power	A II	A II	A II	A II	A II	A II	A II	A II	A II
	Data centre	-	A II	B II	-	A III	C II	-	-	A II
	Garages	-	B I	A I	B II	B II	-	-	-	A I
	HVAC	-	B II	A III	A II	A II	A II	-	-	A II
	Canteen	-	A III	AIII	AIII	-	C III	-	-	-
Resource consumption: heating energy	General resource consumption	A II	-	-	-	-	B II	B II	B II	B II
	Space heating		A I	A I	AII	AII	B II	-	-	-
	Hot water	-	B III	B II	A II	B II	-	-	-	-
	Humidification	-	B II	-	BIII	A II	C II	-	-	-

	Berlin	MUC Isar	MUC PschorrHöfe	TH Hinge	TH Shell	TH Main	TH Le Croisé	TH Rijsvoort	Vienna
CO_2 emissions									
Emissions from electricity consumption	C II	C II	C II	C II	C II	C II	C III	C III	C II
Emissions from community heating	-	B III	B III	-	-	-	-	-	B III
Emissions from gas	B III	-	-	A III	A III	B II	A III	A III	-
Emissions from business travel by plane	A I	A I	A I	A I	A I	A I	A I	A I	A I
Emissions from business travel by other means of transport	C II	C II	C II	C II	C II	C II	C II	C II	C II
Resource consumption: water									
Resource consumption: water for sanitary/canteen use	B II	B II	A II	A II	A II	A II	B II	B II	B II
Resource consumption: water for technical/cooling use	-	B II	B II	B II	B II	A II	-	-	-
Containment input waste water	B II	B II	B II	B II	B II	BII	B II	B II	B II
Resource consumption: waste									
Waste – non-hazardous	B II	B II	B II	C II	C II	C II	C II	B II	B II
Waste – hazardous	C III	B II	B II	B II	B II	B II	C II	C II	C II
Resource consumption: paper									
Resource consumption: paper	B II	A II	A II	A II	A II	A II	A II	A II	B II
Risk: environmental accidents									
Risk of environmental accidents	C II	B II	B II	B II	B II	B II	B II	C II	C II

8.2 Evaluation of indirect environmental aspects

The indirect environmental aspects were identified for all EPO sites and assessed as equally relevant for all sites. All indirect environmental aspects under the EMAS III Regulation were assessed for their relevance to the EPO. Only the aspects that were found to be relevant are included below.

Relevant environmental aspect (indirect)	Impact	Influence
Impact of services		
Patent granting process	B	II
Classification scheme "green" patents	A	I
Environmental behaviour of contractors/procurement		
Environmental impact of catering/canteen contractors	A	II
Environmental impact of technical maintenance contractors	A	II
Environmental impact of cleaning contractors	B	II
Environmental impact of other contractors	B	II
Procurement	A	II
Purchase of food for canteen	A	II
Use of ecological resources for building/renovation (e.g. paint)	A	I
Others		
Staff travel to/from office	A	III
Capital investments	B	III

8.3 EMAS core indicators[29]

The following tables show the EMAS core indicators for environmental aspects. The emission values for SO_2 (sulphur dioxide), NO_x (nitrogen oxide) and particulates are shown only if they arise directly at the building in question. They are not calculated for electricity and district heating. The value for paper consumption in Munich and The Hague is in each case the average of the values for all the buildings on each of those two sites.

On the basis of our assessment of the environmental aspects, we consider some of the core indicators to be irrelevant, which is why they are not included below. At the same time, this report goes into more detail on other criteria more relevant to the EPO.

[29] Not all environmental data is reported on in sections 5 and 8, as some data were not considered as significant for the evaluation of environmental aspects.

EPO Berlin	Unit	2017	2018	2019
Number of employees	empl	268	236	219
Total direct electricity consumption[30]	kWh/empl	1 612	1 959	2 193
Total direct heat energy consumption	kWh/m^2	114	102	102[31]
Renewable energy as percentage of total consumption (electricity and heat)	%	17.27	20.00	20.62
Paper consumption (material efficiency)	sheet/empl	12 608	11 833	10 171
Water consumption	m^3/empl	10.48	12.71	13.70[31]
Total waste generation				
• Residual waste	t/empl	0.15	0.17	0.18[31]
• Paper/card	t/empl	0.11	0.07	0.09
• Food waste	t/empl	0.04	0.05	0.05
• Food waste per meal served	kg/meal	0.38	0.39	0.60
• Grease trap residues	t/empl	0.04	0.04	0.05
Total hazardous waste generation	kg/empl	0.87[32]	0.00	0.00
Built surface area (sealed)	m^2	11 250	11 250	11 250
Total nature-oriented area on site	m^2	12 339	12 339	12 339
Emissions (electricity, heat[31] and cooling agent losses)				
• CO_2 equivalent	t CO_2e/empl	1.56	1.58	1.71
• SO_2	kg/empl	0.00[33]	0.00[33]	0.00
• NO_x	kg/empl	0.05[33]	0.05[33]	0.05
• Particulates	kg/empl	0.01[33]	0.01[33]	0.01

[30] The figures for electricity consumption at the EPO's Berlin site are estimates based on the landlord's division of overall electricity consumption among the tenants according to the size of the area rented by them in the building.
[31] The data for 2019 were not available at the time of compiling this report. To ensure comparability, the 2018 values were taken as an estimate and used to calculate the figure shown here. These values will be corrected in next year's report.
[32] In 2017 some old refrigerators were disposed of, causing an increase in hazardous waste.
[33] Value corrected compared with previous report.

EPO Munich – Isar building	Unit	2017	2018	2019
Number of employees	Empl	799	830	720
Total direct electricity consumption	kWh/empl	10 838	10 095	11 183
Total direct heat energy consumption	kWh/m^2	119	112	121
Renewable energy as percentage of total consumption (electricity and heat)	%	55.19	55.98	53.19
Paper consumption (material efficiency)	sheet/empl	13 689[34]	14 459[34]	17 112
Water consumption	m^3/empl	28.53	27.83	37.06
Total waste generation				
• Residual waste	t/empl	0.12	0.07	0.08
• Paper/card	t/empl	0.23	0.15	0.22
• Food waste	t/empl	0.04	0.05	0.05
• Food waste per meal served	kg/meal	0.29	0.30	0.29
• Grease trap residues	t/empl	0.14	0.16	0.21
Total hazardous waste generation	kg/empl	3.41	9.09	3.52
Built surface area (sealed)	m^2	18 113	18 113	18 113
Total nature-oriented area on site	m^2	10 579	10 579	10 579
Emissions (electricity and heat)				
• CO_2 equivalent	t CO_2e/empl	1.66[35]	1.46[35]	1.82
• SO_2	kg/empl	0	0	0
• NOx	kg/empl	0	0	0
• Particulates	kg/empl	0	0	0

[34] Value corrected compared with previous report.
[35] Value corrected compared with previous report (rounding error).

EPO Munich – PschorrHöfe 1-8	Unit	2017	2018	2019
Number of employees	Empl	3 145	2 897	2 712
Total direct electricity consumption	kWh/empl	3 468	3 708	4 006
Total direct heat energy consumption	kWh/m^2	60	54	55
Renewable energy as percentage of total consumption (electricity and heat)	%	54.21	56.09	55.95
Paper consumption (material efficiency)	sheet/empl	13 689[36]	14 459[36]	17 112
Water consumption	m^3/empl	13.64	15.11	16.58
Total waste generation				
• Residual waste	t/empl	0.04	0.05	0.04
• Paper/card	t/empl	0.06	0.07	0.05
• Food waste	t/empl	0.03	0.03	0.03
• Food waste per meal served	kg/meal	0.23[36]	0.20[36]	0.22
• Grease trap residues	t/empl	0.07	0.06	0.04
Total hazardous waste generation	kg/empl	5.04[37]	1.88	2.18
Built surface area (sealed)	m^2	42 641	42 641	42 641
Total nature-oriented area on site	m^2	18 422	18 422	18 422
Emissions (electricity, heat and cooling agent losses)				
• CO_2 equivalent	t CO_2e/empl	0.57	0.60	0.61
• SO_2	kg/empl	0	0	0
• NO_x	kg/empl	0	0	0
• Particulates	kg/empl	0	0	0

[36] Value corrected compared with previous report.

[37] Disposal of numerous computers and IT devices and removal of "old" mineral wool from the corridors and hallways in PschorrHöfe 1-6.

EPO The Hague – Main, Hinge, Shell	Unit	2017	2018	2019
Number of employees	Empl	2 405	2 580	2 624
Total direct electricity consumption	kWh/empl	5 767	7 389	7 356
Total direct heat energy consumption	kWh/m^2	89	76	42
Renewable energy as percentage of total consumption (electricity and heat)	%	53.79	59.80	70.87
Paper consumption (material efficiency)	sheet/empl	21 256	20 173	23 754
Water consumption	m^3/empl	12.51	16.49	13.51
Total waste generation				
• Residual waste	t/empl	0.05	0.09	0.06
• Paper/card	t/empl	0.07	0.14	0.09
• Food waste	t/empl	0.03	0.02	0.03
• Food waste per meal served	kg/meal	0.28	0.26	0.30
• Grease trap residues	t/empl	0.04	0.04	0.04
Total hazardous waste generation	kg/empl	4.52	0.00	0.49
Built surface area (sealed)	m^2	60 247	51 196	51 196
Total nature-oriented area on site	m^2	data not available	43 018	43 018
Emissions (electricity, heat and cooling agent losses)				
• CO_2 equivalent	t CO_2e/empl	1.00	1.00	0.61
• SO_2	kg/empl	0.00[38]	0.00[38]	0.00
• NO_x	kg/empl	0.30[38]	0.30[38]	0.18
• Particulates	kg/empl	0.00[38]	0.00[38]	0.00

[38] Value corrected compared with previous report.

EPO The Hague – Le Croisé (lease ended 2018)	Unit[39]	2017	2018	2019
Number of workplaces	Wp	430	450	-
Total direct electricity consumption	kWh/wp	3 770	3 341	-
Total direct heat energy consumption	kWh/m^2	65	66	-
Renewable energy as percentage of total consumption (electricity and heat)[40]	%	N/A	N/A	-
Paper consumption (material efficiency)	sheet/wp	21 256	20 173[41]	-
Water consumption	m^3/wp	9.55	7.14	-
Total waste generation				
• Residual waste	t/wp	0.04	0.09	-
• Paper/card	t/wp	0.04	0.08	-
• Food waste	t/wp	0.02	0.01	-
• Food waste per meal served	kg/meal	0.35	0.32	-
Total hazardous waste generation	kg/wp	4.23	0.00	-
Built surface area (sealed)	m^2	4 200	4 200	-
Total nature-oriented area on site[42]	m^2	N/A	N/A	-
Emissions (electricity, heat and cooling agent losses)				
• CO_2 equivalent	t CO_2e/wp	1.12	1.05	-
• SO_2	kg/wp	0.00[43]	0.00[43]	-
• NO_x	kg/wp	0.20[43]	0.20[43]	-
• Particulates	kg/wp	0.00[43]	0.00[43]	-

[39] As the building was gradually vacated during the course of 2018, reporting the number of employees would not have been representative of consumption, so workplaces have been chosen as the reference unit.
[40] No data provided by landlord.
[41] Value corrected compared with previous report.
[42] The lease was terminated at the end of 2018 and the landlord no longer provides data.
[43] Value corrected compared with previous report.

EPO The Hague – Rijsvoort (lease ended 2018)	Unit[44]	2017	2018	2019
Number of workplaces	Wp	220	200	-
Total direct electricity consumption	kWh/wp	1 159	1 275	-
Total direct heat energy consumption	kWh/m^2	144	144	-
Renewable energy as percentage of total consumption (electricity and heat)[45]	%	N/A	N/A	-
Paper consumption (material efficiency)	sheet/wp	21 256	20 173[46]	-
Water consumption	m^3/wp	9.08	9.99	-
Total waste generation				
• Residual waste	t/wp	0.07	0.17	-
• Paper/card	t/wp	0.02	0.09	-
• Food waste	t/wp	0.04	0.03	-
• Food waste per meal served	kg/meal	1.19	0.96	-
Total hazardous waste generation	kg/wp	0.00	0.00	-
Built surface area (sealed)	m^2	4 558	4 558	-
Total nature-oriented area on site[47]	m^2	N/A	N/A	-
Emissions (electricity, heat and cooling agent losses)				
• CO_2 equivalent	t CO_2e/wp	1.55	1.71	-
• SO_2	kg/wp	0.00[48]	0.00[48]	-
• NO_x	kg/wp	0.42[48]	0.47[48]	-
• Particulates	kg/wp	0.01[48]	0.01[48]	-

[44] As the building was gradually vacated in the course of 2018, reporting the number of employees would not have been representative of consumption, so workplaces have been chosen as the reference unit.
[45] Values not provided by landlord.
[46] Value corrected compared with previous report.
[47] The lease was terminated at the end of 2018 and the landlord no longer provides data.
[48] Value corrected compared with previous report.

EPO Vienna	Unit	2017	2018	2019
Number of employees	Empl	94	110	87
Total direct electricity consumption	kWh/empl	6 242	5 126	6 106
Total direct heat energy consumption	kWh/m^2	108	64	65
Renewable energy as percentage of total consumption (electricity and heat)	%	53.97	55.68	54.29
Paper consumption (material efficiency)	sheet/empl	3 863	3 075	3 753
Water consumption	m^3/empl	15.24	17.11	22.76
Total waste generation				
• Residual waste	t/empl	0.16	0.14	0.17
• Paper/card	t/empl	0.26	0.22	0.28
• Food waste[49]	t/empl	N/A	N/A	N/A
Total hazardous waste generation	kg/empl	10.74	1.36	0.34
Built surface area (sealed)	m^2	2 547	2 547	2 547
Total nature-oriented area on site	m^2	1 966	1 966	1 966
Emissions (electricity, heat and cooling agent losses)				
• CO_2 equivalent	t CO_2e/empl	0.16	1.21[50]	0.16
• SO_2	kg/empl	0	0	0
• NO_x	kg/empl	0	0	0
• Particulates	kg/empl	0	0	0

[49] Disposal handled by canteen service provider.

[50] Significant increase in emissions due to cooling agent losses in Vienna.

ENVIRONMENTAL VERIFIER'S DECLARATION

Dr. Hans-Peter Wruk, with EMAS environmental verifier registration number DE-V-0051 accredited for the scope 841 (NACE-Code) "administration of the state" declares to have verified whether the whole organization

European Patent Office
Bob-van-Bentheim-Platz 1
D-80469 Munich

as indicated in the environmental statement with registration number DE 155-00278 meets all requirements of

Regulation (EC) 1221/2009

in the version of 19th of December 2018 of the European Parliament and of the Council on the voluntary participation by organizations in a Community eco -management and audit scheme (EMAS).

By signing this declaration, I declare that:

- the verification and validation has been carried out in full compliance with the requirements of Regulations (EC) No 1221/2009 in the version of 19th oo December 2018
- the outcome of the verification and validation confirms that there is no evidence of non-compliance with applicable legal requirements relating to the environment,
- the data and information of the environmental statement of the organization reflect a reliable, credible and correct image of all the organizations activities, within the scope mentioned in the environmental statement.

Done at Pinneberg on 24th of Mai 2020

Dr.-Ing. Hans-Peter Wruk
Environmental Verifier

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accredited by:
DAU - Deutsche Akkreditierungs- und Zulassungsgesellschaft für Umweltgutachter mbH
Accreditation-No. DE-V-0051

Dr. Hans-Peter Wruk
Environmental Verifier