Annual Environmental Report

2018

WAGENINGEN
UNIVERSITY & RESEARCH

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Annual environmental report 2018

Report of the environmental results of
Wageningen University & Research

Wageningen
University & Research

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Executive summary

Wageningen University & Research's (WUR) annual environmental report provides a picture of its activities relating to the environment. The report aims to demonstrate WUR's compliance with the regulations specified in various environmental permits. WUR's 2018 annual environmental report discusses the objectives and activities as set out in the 2018-2020 multi-year environmental plan.

In addition to complying with current relevant legislation and regulations, otherwise known as the 'statutory framework,' WUR has formulated a 'sustainability ambition.' WUR uses its own operational management to pioneer new approaches. This ambition is implemented within the building, energy, waste, purchasing, catering, mobility and sustainable employee fields of work. WUR strives for a clear and recognisable CSR strategy. The core of this strategy is making decisions in such a way that scientific, social and economic interests balance each other out. We make comprehensive considerations in everything we do, whereby our responsibility extends beyond WUR's own activities.

In summary, the results from 2018 are:

- a 48% reduction in the carbon footprint compared with 2010.
- The minimum annual reduction target for energy consumption is 2%. In 2018, there was a 2.2% reduction compared with last year.
- A total of 677,052 GJ of energy was sustainably generated, of which 563,100 GJ was wind energy (more than 62 million kWh).
- Water consumption was reduced by 10.4% compared with the previous year.
- Following a significant increase in the amount of waste in 2016, the amount of waste produced practically remained the same (-0.2%) in this reporting year.
- The Pianoo criteria for sustainable purchasing were used for 97% of purchasing processes.

In 2018, regular work activities were conducted in the environmental policy areas of energy, waste, water and waste water, soil, noise, air, flora and fauna (biodiversity), biosafety, external safety, asbestos, substances hazardous to the environment, transport and sustainable building. This annual environmental report expands on the specifics of each environmental policy area. Work activities are a result of the environmental permits that have been granted for all 26 WUR locations. In 2018, a total of 60 change projects were performed in addition to internal and external environmental audits. A total of 164 incidents were registered through the form to report incidents. In 2018, three incidents were specifically classified as environmental incidents, and three noise complaints were submitted.

As WUR aspires to be a socially responsible organisation, sustainability – in the broadest sense of the word – is integrated into all activities as much as possible, including in education, research and operational management. This annual environmental report therefore pays extra attention to the CSR agenda formulated by WUR. Insight is also provided into the measures relating to sustainable purchasing, catering, Green Office Wageningen and the carbon footprint.

To ensure all activities proceed smoothly, the responsibility for the environment, sustainability and CSR is established at a number of levels within the organisation. The CSR group guides Wageningen University & Research's CSR strategy and directly advises the Executive Board at the corporate level. At the executive level, the corporate Safety and Environment (Veiligheid & Milieu) sub-department is responsible for keeping the statutory frameworks up to date, and the Health & Safety and Environment sections of organisational departments further add to the environmental and sustainability policy.

1 Introduction

Each year, Wageningen University & Research (WUR) issues an annual environmental report (AER). This report provides a picture of WUR's activities relating to the environment, demonstrating its compliance with the regulations set out in the various environmental permits.

WUR has buildings at various locations in the Netherlands. Environmental permits are required for the activities conducted by WUR at these locations. The permits are clustered by location or complex as far as possible. The large environmental permits (at complex level) include regulations that WUR's annual environmental report must comply with. These have been formulated as follows for the Wageningen Campus complex permit:

'The permit holder must issue an environmental report annually (by 1 May at the latest) for inspection by the competent authority. The environmental report must at least address the following subjects: energy consumption and improvements to energy efficiency, waste products (disposal and extent of reuse), waste water, air, water consumption, soil protection, transport, sustainability and noise.'

In regard to the topics mentioned, the annual environmental report must include information on:

- The environmental impact caused by the institution (WUR) over the previous calendar year.
- The environmental measures, studies and activities performed in the previous calendar year aimed at further reducing the environmental impact caused by the institution, as well as any changes with respect to the measures, studies and activities originally planned (possible changes with respect to the annual environmental plan).
- Any newly formulated or other environmental policy intentions not falling under one of those plans in the year under review and in the following year under review.
- Incidents, significant disruptions or other unusual occurrences and complaints and how they have been dealt with in the year under review.

The annual environmental report discusses the points formulated in WUR's 2018-2020 multi-year environmental plan in more detail. This plan sets out which environment-related subjects WUR will be focusing on over the coming years, as well as information about WUR at a corporate level, this annual environmental report contains relevant supplementary information per organisational component. This supplementary information is also included in the various health & safety and environmental reports by the organisational components of WUR.

The operational management at Wageningen University (WU) and Wageningen Research (WR) are intertwined, which makes it difficult to distinguish between the products and services of the operational management at WU and WR respectively. Therefore, this report discusses the operational management for WUR as a whole.

Reading guide
Chapter 2 sets out WUR's policy and the concomitant objectives for the reporting period. This chapter also contains a summary of the results for the objectives in 2018. Chapter 3 further explains the results for each environmental policy area. Chapter 4 describes the results of WUR's sustainability policy. Permits and changes to permit regulations, as well as audits carried out, are included in chapter 5. Incidents that occurred, as well as complaints, are explained in chapter 6. Lastly, chapter 7 explains the organisation of WUR's Quality, Health & Safety and Environment column.

2 Environmental policy and environmental objectives of WUR

In addition to complying with current relevant legislation and regulations, otherwise known as the 'statutory framework,' WUR has formulated a 'sustainability ambition.' WUR uses its own operational management to pioneer new approaches. This means that WUR takes an integrated approach to sustainability in its operational management and communicates this to the outside world, and that sustainability is an integral part of decision-making. This ambition fits in with WUR's mission regarding education, research and operational management. Logically, the environment is an important part of this ambition.

The environmental policy leads to the following environmental objectives for WUR:

1. Complying with the regulations for the environmental permits.
2. Implementing sustainability ambition as set out in the WUR 2015-2018 strategic plan.

2.1 Complying with the regulations for the environmental permits

WUR consists of a number of organisational components, as shown in the organigram, each of which is housed in one or more of 26 locations. Specific permits and regulations apply to each location. The environmental permits for WUR are issued by the competent authorities (municipalities) per complex. The following environmental permits (permits relating to the Dutch Environmental Management Act [*Wet milieubeheer*]) have been issued for WUR:

- Wageningen Campus
- De Dreijen Wageningen
- WUR complex Lelystad
- WBVR Houtribweg Lelystad

The remaining environmental permits are clustered under:

- Other Wageningen
- Other locations

An overview of the permits is included in chapter 5. Permits.

2.2 Implementing WUR's 2015-2018 Strategic Plan

Sustainability is an important pillar within the primary process of research and education. Striving for 'Science for Impact' is a core aspect of this. WUR aims to contribute to solutions for major social questions, including the global food supply, climate change, developing a circular economy, conserving nature and biodiversity, and reducing poverty. The mission also expresses this as follows: 'To explore the potential of nature to improve the quality of life'.

As for operational management, WUR aspires to be a leader in sustainability. Currently, WUR is one of the most sustainable educational institutions in the Netherlands – we aim to, at the very least, maintain that position. The basic principle for sustainable operational management is to achieve a balance in the current social, environmental and economic needs without threatening future needs. WUR has implemented this basic principle as the ambition to 'lead'. In short, this means that WUR acts on and promotes sustainability in its operational management in an integrated way. Naturally, sustainability is an inherent aspect of our decision-making process, as is the application of proven technology at this level of ambition.

This sustainable ambition is implemented within the following fields of work: construction, energy, waste, purchasing, catering, mobility and sustainable employee. The results of this sustainable operational management can be seen in the high benchmarking scores and are evident in daily practice. As an example, sustainable buildings are located at Wageningen Campus, green or sustainable energy is increasingly used, and students are actively involved in the sustainability policy. In addition, facility services such as catering, cleaning and transport have been made more sustainable.

The sustainability ambitions and corporate social responsibility (CSR) have been included in the 2015-2018 Strategic Plan. WUR strives for a clear and recognisable CSR strategy. The core of this strategy is making decisions in such a way that scientific, social and economic interests balance each other out. We make comprehensive considerations in everything we do, whereby our responsibility extends beyond WUR's own activities.

2.3 Results of the 2018 sustainability objectives

The objectives for this reporting year were formulated in Wageningen University & Research's (WUR) 2018-2020 multi-year environmental plan. This paragraph provides insight into the overall result for these objectives in 2018. Table 1 summarises the results for each objective.

Table 1. Overview of WUR's overall sustainability figures

Component/topic	Goal for 2018	Achieved in 2018
Carbon footprint	Compared with reference year 2010: - reduction of carbon footprint - growth of CO_2 compensation footprint - higher % climate-neutral	 -48% +86% 113%[1]
Energy	2% reduction per year Purchasing of sustainable energy Production of sustainable energy	compared with 2017: -2.2% (excl. climate correction) 100% purchase of wind energy (Certiq) 677,052 GJ (of which 563,100 GJ=62 million kWh of wind energy)
Water	Reduction of water consumption compared with 2017	compared with 2017: -10%
Waste	Reduction of produced waste compared with 2017 Waste separation rate	compared with 2017: -0.2% 63%
Purchasing	% of sustainable purchasing	97% sustainable purchasing[2]

Figure 1 shows in which paragraph the figures and percentages of these objectives are explained. Table 2 provides insight into the usage of the environmental aspects of energy, water, waste and CO_2 emissions over the past five years from 2014 to 2018 inclusive. In order to compare WUR's sustainability figures with those of other universities, the quantitative data has been divided into data per student, per employee and per square metre. Table 2 shows that, in 2018, WUR had slightly more floor space compared with previous years (0.2% more compared with 2017). The number of students has increased further by 4%, and the number of staff (FTE) has also increased (3%). The increased number of students leads to more intensive use of the buildings and facilities. Chapter 3 further explains the differences between 2018 and previous years for each environmental policy area.

2.2% less energy used compared with 2017 On energy: par. 3.1, page 8	**63%** of the waste was separated in 2018 On waste: par. 3.2, page 10	**48%** less CO_2 emissions compared with 2010 On CO_2: par. 4.5, page 20
10% less water consumption compared with 2017 On water: par. 3.3, page 11	**106%** Sustainable energy generation On energy: par. 3.1, page 9	**215 more trees** on Wageningen Campus compared with 2010 On flora and fauna: par. 3.7, page 12

[1] The result of the measures to compensate for CO_2 as a percentage of the total CO_2 emissions, in CO_2 equivalents.
[2] Procurement processes in which Pianoo.nl's criteria have been applied, see par. 4.2 Purchasing

Figure 1. Key figures on sustainability in 2018

Table 2. Overview of overall sustainability figures per square metre and per student and employee

Benchmarks	**2018**	**+/-***	**2017**	**2016**	**2015**	**2014**
m^2 of floor surface	458,097	+0.2%	457,043	479,332	467,499	475,422
Number of students	12,439	+4%	12,000	11,278	10,380	9,544
FTE employees	5,040	+3%	4,887	4,912	4,995	5,106
Total number of students and employees (FTE + st)	17,479	+4%	16,887	16,190	15,375	14,650
Energy (quantitative)	**2018**	**+/-***	**2017**	**2016**	**2015**	**2014**
Energy (GJ)	623,193	-2%	637,391	693,845	706,771	712,717
Electricity (kWh)	50,385,528	-2%	51,558,971	54,930,781	55,660,591	57,129,458
Natural gas (Nm^3)	5,362,499	-2%	5,477,413	6,302,302	6,503,170	6,273,363
Energy (GJ/m^2)	1.36	-2%	1.39	1.45	1.51	1.50
Electricity (kWh/m^2)	110.0	-3%	112.8	114.6	119.1	120.2
Natural gas (Nm^3/m^2)	11.7	-2%	12.0	13.1	13.9	13.2
Energy (GJ/FTE + st)	35.7	-6%	37.7	42.9	46.0	48.6
Electricity (kWh/FTE + st)	2,882.6	-6%	3,053.2	3,392.9	3,620.2	3,899.6
Natural gas (Nm^3/FTE + st)	306.8	-5%	324.4	389.3	423.0	428.2
Waste (quantitative)	**2018**	**+/-***	**2017**	**2016**	**2015**	**2014**
Total waste (kg)	2,186,463	-0.2%	2,190,716	2,196,915	1,897,070	1,996,779
Hazardous waste (kg)	492,186	+36%	362,670	352,125	309,964	305,932
Industrial waste (kg)	1,393,294	-9%	1,538,927	1,548,002	1,291,922	1,361,400
Paper (kg)	300,983	+4%	289,117	296,788	295,184	329,447
Waste (kg/m^2)	4.8	-0.4%	4.8	4.6	4.1	4.2
Hazardous waste (kg/m^2)	1.1	+35%	0.8	0.7	0.7	0.6
Industrial waste (kg/m^2)	3.0	-10%	3.4	3.2	2.8	2.9
Paper (kg/m^2)	0.66	+4%	0.63	0.62	0.6	0.7
Waste (kg/FTE + st)	125.1	-4%	129.7	135.7	123.4	136.3
Hazardous waste (kg/FTE + st)	28.2	+31%	21.5	21.7	20.2	20.9
Industrial waste (kg/FTE + st)	79.7	-13%	91.1	95.6	84.0	92.9
Paper (kg/FTE + st)	17.2	+1%	17.1	18.3	19.2	22.5
Water (quantitative)	**2018**	**+/-***	**2017**	**2016**	**2015**	**2014**
Total water (m^3)	194,773	-10%	217,010	236,970	266,983	261,435
Mains water (m^3)	167,062	-10%	186,372	209,058	214,549	205,258
Well water (m^3)	27,711	-10%	30,638	27,912	52,434	56,177
Total water (m^3/m^2)	0.43	-10%	0.47	0.49	0.57	0.55
Mains water (m^3/m^2)	0.36	-11%	0.41	0.44	0.46	0.43
Well water (m^3/m^2)	0.06	-10%	0.07	0.06	0.11	0.12
Total water (m^3/FTE + st)	11.1	-13%	12.9	14.6	17.4	17.8
Mains water (m^3/FTE + st)	9.6	-13%	11.0	12.9	14.0	14.0
Well water (m^3/FTE + st)	1.6	-13%	1.8	1.7	3.4	3.8
Carbon footprint (quantitative)	**2018**	**+/-***	**2017**	**2016**	**2015**	**2014**
CO_2 emissions (kg CO_2 equivalents)	42,777	+5%	40,706	43,945	43,817	41,987
CO_2 compensation (kg CO_2 equivalents)	48,254	+6%	45,646	35,156	48,873	31,705
CO_2 emissions (kg CO_2 equivalents/m^2)	0.09	+5%	0.09	0.09	0.09	0.09
CO_2 compensation (kg CO_2 equivalents/m^2)	0.11	+5%	0.10	0.07	0.1	0.07
CO_2 emissions (kg CO_2 equivalents/FTE + st)	2.45	+2%	2.41	2.7	2.9	2.9
CO_2 compensation (kg CO_2 equivalents/FTE + st)	2.76	+2%	2.70	2.2	3.2	2.2

* Difference in 2018 compared with previous year.

3 Environmental policy areas

The regular work activities falling under the environmental policy areas were carried out in 2018. These policy areas are: energy, waste, water and waste water, soil, noise, air, flora and fauna (biodiversity), biosafety, external safety, asbestos, substances hazardous to the environment, transport and sustainable building. The paragraphs below present the results achieved in 2018 for the proposed actions and objectives from the 2018-2020 multi-year environmental plan as well as any special details.

3.1 Energy

WUR has committed itself to the third Multi-Year Agreement for Energy (MJA-3). The most important obligation arising from this Agreement is to improve energy efficiency by 30% in the period 2005-2020. This improvement of 2% per year can be achieved by reducing energy consumption, generating sustainable energy or purchasing sustainable energy generated elsewhere.

WUR will comply with the commitments that follow from the MJA-3, leading to the following results:

- The energy management implementation programme has been completed, and the quality control has been embedded in the procedure.
- The measures from the 2017-2020 energy efficiency plan are being carried out, including the sustainable energy supply project for Campus Noord in Wageningen.
- The energy incentive has been rolled out. The organisational components will be made responsible for their own budgets, in order to give insight into their energy consumption and further stimulate energy saving. Reference years have been established for PSG (2011), ASG (2013), ESG (2013), SSG (2014) and AFSG (2017).

Energy consumption

The energy consumption of WUR's buildings and installations is listed in Table 3 and in appendix 3.

Table 3. WUR energy consumption and energy performance in the reference year 2005 and in 2014-2018

Year	2018	2017	2016	2015	2005
Electricity (kWh)	50,385,528	51,558,971	54,930,781	55,660,591	59,581,768
Natural gas (Nm^3)	5,362,499	5,477,413	6,302,302	6,503,170	11,031,812
Primary energy (GJ)	623,193	637,391	693,845	706,771	886,033
CO_2 (tonnes)	9,606	9,812	11,290	11,650	53,598

Energy performance	% 2018 compared with 2017	% 2018 compared with 2005
Electricity (kWh)	-2.3%	-15%
Natural gas (Nm^3)	-2.1%	-51%
Primary energy (GJ)	-2.2%	-30%
CO_2 (tonnes)	-2.1%	-82%

Usage of electricity, natural gas, heat, cooling and water is measured at all relevant buildings and installations and registered in Erbis, the central energy registration, management and information system. Erbis is a professional system in use at many Dutch universities. For the connections of electricity and natural gas, the certified monitoring companies deliver validated measurement data every day. Submeters are used to allocate costs to individual buildings and even individual users. An increasing number of meters have their measurement data registered in Erbis, and the other meters are registered by hand every month. In extraordinary cases where it is not possible to install a meter, energy consumption is attributed on the basis of the distribution of square metres from the location account.

Usage of electricity, natural gas, heat, cooling and water by third parties and student housing has been deducted from the total use. In order to make a better comparison between different years, we correct the calculations for climate influences. The official figures released annually by the Netherlands Enterprise Agency (RVO.nl) are used to make the corrections for cooling and heating.

Energy efficiency

The WUR 2030 Energy Vision was approved in 2014. This vision's basic aim is to achieve reliable, affordable energy provision, with sustainability taking a central role. Increased sustainability should be achieved through the following methods, listed by priority:

1. reducing energy consumption
2. generating sustainable energy
3. compensating for CO_2 emissions.

1. Energy savings

In summary, a 2.2% reduction in energy consumption compared with 2017 was achieved in 2018. This does not include the adjustment for climate influences on cooling and heating[3]. This means that the MJA-3 target of 2% in 2018 was met.

We achieved this reduction in spite of the continued increase in student numbers. The largest energy savings came from the relocation of Wageningen Bioveterinary Research (WBVR)– from the Edelhertweg 15 Lelystad location – and the substantial reduction in energy consumption at that location. Environmental Sciences Group (ESG), which moved out of Atlas, Plant Sciences Group (PSG), partly due to the installation of more than 2,000 solar panels in Wageningen and Lelystad, and Wageningen Marine Research (WMR) have also achieved energy savings of more than 2%. FB Education achieved a small energy saving, despite a further increase in the number of students. The other organisational components saw their energy consumption increase in 2018. This is often caused by growth in research and education.

ICT energy consumption

WUR also specifically tracks its ICT energy consumption. In 2018 the data centres used a total of 1.67 million kWh compared with 1.52 million kWh in 2016. In addition, the energy balances and monitoring data reveal that the buildings used approximately 3.75 million kWh for ICT. In 2018, WUR used a total of approximately 5.42 million kWh of electricity for ICT. This amounts to 313 kWh per student or employee and 11.8 kWh per square metre. ICT's electricity consumption represents 8% of WUR's total electricity consumption.

2. Generating sustainable energy

In 2018, as in previous years, WUR generated sustainable energy on a large scale. The wind turbines in Lelystad generated more than 62.4 million kWh in 2018, which is more than in 2017 as a result of better wind conditions. In addition, sustainable energy was also provided by combined heat and power generators using biofuel (bio-CHP) at several locations, the Wageningen Campus thermal storage system and the growing number of solar panels (see Table 5). In 2018, 106% of WUR's total energy consumption was generated sustainably.

Table 4. Sustainable energy generation by WUR in 2018 in Primary GJ.

Well	2018	2017	Unit
Lelystad wind turbines[1]	563,100	548,319	GJ
Bio-CHPs[2]	29,419	45,517	GJ
Wageningen Campus thermal storage	79,798	68,120	GJ
Solar panels[3]	4,736	1,895	GJ
Total	**677,052**	**663,850**	**GJ**
Energy consumption	623,193	637,391	GJ
Energy consumption corrected for climate influences		652,079	GJ
Sustainable generation as a percentage of total energy consumption	**106%**	**104%**	

[1] Refers to the three wind farms in Lelystad owned by WUR. The test site for windmills, also located in Lelystad on WUR-owned land, was not included in the calculations.
[2] ACRRES Lelystad, De Marke Hengelo and VIC Sterksel. The installation at Dairy Campus Goutum is being managed by an external party.
[3] ACRRES Lelystad, WMR Yerseke (2014), KTC de Marke Hengelo, Sinderhoeve Renkum (2015) and Sports Centre De Bongerd (2016).

[3] In previous years, energy consumption was adjusted for climate influences. At the time of writing, the correction factor for 2018 was not known, or not known definitely.

3. Compensating CO_2 emissions 1.

As a result of the energy savings achieved and the purchasing of 100% CertiQ-certified green wind energy, the CO_2 emissions from the consumption of gas and electricity decreased by 82% compared to the 2005 base year.

3.2 Waste

WUR recognises the following three waste flows: industrial waste, paper waste and hazardous waste. The waste policy for these waste flows was set out in 2013. This annual environmental report includes the waste figures of the locations, buildings and activities (including from third parties) that have been granted permits, unless specified otherwise.

Table 5. Amount of waste at WUR, 2013 to 2018 inclusive (in kg)

	2018	2017	2016	2015	2014	2013
Industrial waste	1,393,294	1,538,927	1,548,002	1,291,922	1,361,400	1,261,475
Paper waste	300,983	289,117	296,788	295,184	329,447	369,777
Hazardous waste	492,186	362,670	352,125	309,964	305,932	241,103
Total at WUR (excl. third parties)	**2,186,463**	**2,190,716**	**2,196,915**	**1,897,070**	**1,996,779**	**1,872,355**
Waste produced by each employee	426	448	447	383	394	364
Waste produced by each student	182	183	195	183	209	212
Waste produced by each employee and student	128	130	136	123	136	134

Please see appendices 2i and 2j for a breakdown of each organisational component. Appendix 2d shows the amount of waste produced by each municipality, while 2e shows the waste figures for the complex licences of Wageningen Campus, WUR complex Lelystad and De Dreijen.

Although the total amount of waste shows little difference (-4 tonnes) between last year and this year, there are some notable differences between the different types of waste. The volume of industrial waste fell by 146 tonnes. The main decreases in industrial waste are in the quantity of residual waste (-125 tonnes), construction and demolition waste (-41 tonnes) and wood (-11 tonnes). In addition, there is an improvement in the separation rate, given a 72-tonne increase in green and organic (vegetable, fruit, and garden) waste. This development is visible on campus at Atlas and Helix, two locations that previously did not collect organic waste. The remaining increase in this waste is concentrated in research at PSG (+31 tonnes) and third parties (+37 tonnes). The data shown here is further explored and clarified in appendices 2a to 2j.

As shown in appendices 2b and 2j, the increase in hazardous waste of 136 tonnes is caused by a sharp increase in the disposal of Specific Hospital Waste (+32 tonnes) and animal waste (+68 tonnes) as a result of an increase in and changes in animal research at ASG and a better insight into the quantities of sewage waste / oil-water-sludge mixture disposed of at PSG (+49 tonnes). The decrease in hazardous waste at AFSG (-12 tonnes) is a normalisation after the peak in 2011 following relocation. Other fluctuations are caused by normal variations in the research.

WUR adheres to the waste hierarchy (Lansink's Ladder) as far as waste processing is concerned. This means that priority is given to the most environmentally friendly processing methods for the management and processing of waste. In 2018, 96% of the waste was processed according to a method that qualifies as 'useful application' (in Dutch: 'nuttige toepassing'): 44% as recycling and 52% as other useful application (see appendix 2c). There has also been an improvement in the percentage of waste

that is processed as a separate waste stream. In 2018, the waste separation rate was 63% compared with 58% last year.

In 2018, WUR worked on a new strategy for raw materials and waste management. Using a Material Flow Analysis (MFA), i.e. a substance flow analysis, students have been able to map out all material and raw material flows. The project was initiated by Facilities and Services, and several departments and sub-departments were involved in the MFA: Location Facilities, Purchasing and Safety and Environment. The MFA is an important source of input for the new raw materials and waste policy.

3.3 Water and waste water

Total water consumption decreased in 2018 compared with 2017. This applies to all locations with the exception of Edelhertweg 1 in Lelystad, where the warm summer led to a considerable increase in water consumption. Well-water consumption decreased on Wageningen Campus and increased at Sports Centre de Bongerd, again because of the warm summer.
The water consumption in 2018 for WUR's buildings and installations is listed in Table 6 and in appendix 4.

Table 6. WUR water consumption and water performance in the reference year 2005 and in 2016-2018

Year	2018	2017	2016	2005
Mains water (m^3)	167,062	186,372	220,374	234,503
Well water (m^3)	27,711	30,638	27,912	139,518
Performance	**2018 compared with 2005**	**2017 compared with 2005**	**2016 compared with 2005**	
Mains water (%)	-29%	-21%	-6%	
Well (%)	-80%	-78%	-80%	

In 2018, only regular activities were performed. Waste-water samples are regularly taken for analysis from various locations in Wageningen and Lelystad. In 2018, six random samples exceeded the discharge standard. All excesses were investigated, and measures were taken to prevent recurrences. A report on this has been submitted to the relevant environmental agencies and Water Boards.

3.4 Soil

One soil survey was carried out in 2018. This was for the temporary new building (Portakabins) on Wageningen Campus between Axis X and Z. This soil survey established that the site was suitable for construction.

3.5 Noise

In 2014, the Municipality of Wageningen drew up a noise vision and the zoning plan *Geluidruimteverdeling Wageningen Campus e.o.* (noise allowance distribution for Wageningen Campus and environs). This offers local residents the security that noise pollution will not increase above current levels, while also creating flexibility and clarity as regards the distribution of noise allowance for businesses within this area, including Wageningen University & Research. Both documents are used as a framework for the development of the Business Strip at the southern edge of Wageningen Campus between Bornsesteeg and Mansholtlaan.

WUR systematically tests the acoustic consequences of current and future changes to operational management (including buildings and activities) on Wageningen Campus and De Dreijen. The acoustics for the following projects were calculated in 2018:

- Updated research into the sources of noise at the Radix Mid-Oost building (Campus plot 20);
- Update of De Dreijen noise report due to construction of student housing;
- Placement of temporary office units at Axis location (Campus plot 3).

Since May 2014, in addition to being evaluated in terms of the permit regulations for noise, projects have been evaluated in terms of the plot value listed in the zoning plan *Geluidruimteverdeling Wageningen Campus e.o.*.

The completed noise reports indicate that Wageningen Campus can comply with the relevant noise regulations if it takes certain supplementary measures such as noise screens or measures to address sources of noise. Taking measures is part of the construction project and/or the activity. For this reason, fifteen noise reduction measures were implemented at the Vitae location in 2018.

3.6 Air

Regular activities are carried out in relation to air emissions.

3.7 Flora and fauna

In 2018, WUR worked on a biodiversity policy to replace the 2013 flora and fauna policy. This policy is expected to be adopted in 2019. The biodiversity policy describes how we deal with flora and fauna on WUR's sites. The policy provides specific starting points for the design, management and maintenance of the WUR sites – in particular for the Action Plan for Green Spaces on Wageningen Campus (in Dutch: 'Plan van aanpak Groenvoorziening op Wageningen Campus') and the Action Plan for Test fields (in Dutch: 'Plan van aanpak voor de proefvelden') – and sets out the actions that are necessary to implement the policy. The policy's basic principles include ecological management (extensive maintenance and as little or no fertilisation as possible), making biodiversity a standard consideration when working on buildings and on sites, and applying WUR knowledge from education and research to create green spaces and maintain these spaces.

Dutch Flora and Fauna Act (Flora- en faunawet)/Nature Conservation Act (Wet natuurbescherming)

As part of the Dutch Nature Conservation Act (*Natuurbeschermingswet*), the natural value survey on the campus in Wageningen was updated in 2017. This survey has been carried out because the campus has been redesigned in recent years at various locations, but also in response to the replacement of the Flora and Fauna Act (*Flora- en Faunawet*) and the Nature Conservation Act 1998 (*Natuurbeschermingswet 1998*) by the Nature Conservation Act as of 1 January 2017 and the changed conservation status of some species in the process. The results of this survey were used in 2018 to update the flora and fauna policy framework on the campus.

In addition, an ecological survey was performed at the Hyperion and Theia buildings on Wageningen Campus. This survey was conducted to facilitate pruning and potential felling of the trees around these buildings. A number of trees at both locations have been found to have particular features that must be taken into account in terms of pruning and felling.

Stimulate biodiversity on the test facilities at Unifarm and the outdoor locations

In 2018 and previous years, various measures were taken to conserve and promote biodiversity on Wageningen Plant Research (WPR) sites.

In Vredepeel, for example, wooded banks have been created and field edges have been sown with meadow flowers. A nest box for falcons and a bee hotel have been installed, and the ditch edges are managed in a way that is beneficial to flora and fauna. A 'delayed mowing' policy is being applied and is tailored to the flowering stages of various plants.

Nest boxes and hideouts for owls and falcons, as well as bee, butterfly, and insect hotels have been installed in Lelystad, and nesting platforms for birds of prey are erected over winter. Permanent, 1.5-hectare grass patches and 0.5-hectare patches of shrubbery are distributed throughout the farm. Various parts of the site have bee-friendly and insect-friendly plants and water features.
The trial fields are managed preventively to protect the lapwing nests. An agreement has been concluded with Landschapsbeheer Flevoland (Flevoland land management) for the protection of meadow birds. A 'low tillage policy' is used to protect natural soil life as much as possible.

Cultivation measures have been introduced in Valthermond, such as the sowing of green manure. In addition, the policy of maintaining flower-rich field margins and flora and fauna-friendly ditch mowing for ditches and lateral channels[4] has been maintained.

In Westmaas, additional wooded banks have been created in the existing planted areas to create hideouts for game. A small field of *Miscanthus* (silvergrass) has also been maintained for this purpose and offers good cover for game. In consultation with the Water Board, trees have been planted along watercourses in a way that enables bats to fly between the farm and a nearby riding school. Sides of ditches have been made less steep, so that amphibians and other aquatic animals can easily come ashore. Grass edges are managed in a flora-friendly and fauna-friendly way, and there are places where owls can hide out and nest.

Unifarm has nesting boxes for owls and falcons, as well as a bee hotel. Shallow ploughing is performed on the site, in order to support the soil life. The site is also joining forces with the 'Vogelwerkgroep' (Bird Working Group) for the protection of meadow birds.

Felling licences and the obligation to replant

A lot has changed on WUR's sites in recent years as a result of renovation, demolition, new developments and changes to the infrastructure. It was necessary to fell trees in many of these circumstances.

Various diseased trees or trees posing a risk to their environment (for example in case of a storm) have also been felled. The table of permit applications in paragraph 5.3 (Table 11) details the number of applications for felling permits. A total of seven trees were felled on the WUR sites in 2018. Three dwarf cypresses *(Chamaecyparis*) were felled on the Dreijen complex, as their proximity to the fence around the complex meant they could not be properly maintained. Four ash trees *(Fraxinus excelsior*) were also felled due to ash dieback. Two of these were on the Vitae site; the other two were at Haarweg 333.

In 2018, six new trees will be planted on the Wageningen Campus, five of which will be around the bicycle shed at the Events site opposite Gaia-Lumen: two narrow-leafed ash trees *(Fraxinus angustifolius*), two black alders*(Alnus glutinosa* 'Laciniata') and an ashleaf maple *(Acer negundo*). In June, King Willem-Alexander also planted a gum tree*(Eucommia ulmoides*) at Atlas to mark the 100th anniversary of Wageningen University & Research. The seven trees felled in 2018 (see previous paragraph) have been removed from the overcompensation (216 trees in 2017). The six trees planted on the campus bring the level of overcompensation to 215 trees.

3.8 Biosafety

Working with genetically modified organisms (GMOs)

The new *Besluit en Regeling ggo 2013* (Decree and regulations on genetically modified organisms) came into effect on 1 March 2015. The permit requirement for 'contained use' on levels I and II-k has been replaced by notification obligations. This entails that Bureau GGO, the Dutch GMO regulator, will not grant a permit for 'contained use'; instead, a user must perform a risk assessment and determine which additional rules apply. Permits for the other levels of contained use are granted starting from risk levels IIv and IIIv. All activities for permits and for authorisations for extension are classified as level III works.

In 2018, the last 'level I' members were converted into the institution-wide 'level I notice' and subject to subsequent risk assessments. All responsible employees have been involved in the internal audits for working with GMOs. This year, level II members from all PSG licences (GMO Regulations 2003 ['Regeling ggo 2003']) were reassessed and extensions were included in the GMO database – this is known as the 'tilting' of the permit system. In 2018, the permit for sub-activities with GMOs was given a 'cross-WUR' structure, instead of as a permit for several members.

The current GMO database with a risk assessment module is a stand-alone database in Microsoft Access. The preparatory activities in collaboration with other Dutch universities to make this 'stand-alone' database 'web-based' were completed in 2018.

[4] Watercourses in peatland environments.

Working with quarantine materials
PSG's Biosafety Officer (BSO) has joined forces with the Working Conditions, Safety and Environment team and the ESG's BSO and written and submitted the new Netherlands Food and Consumer Product Safety Authority (NVWA) permit applications to work with materials classified as 'quarantine'. These application details according to the NVWA R&D phyto requirements table for the PSG and ESG permit applications have been carefully coordinated with the employees responsible for quarantine and Unifarm, as well as the BSO and managers involved. These applications have been split according to Sciences Group (instead of the previous set-up, with applications for campus-wide NVWA permits), so that the BSO has a clearer view of the various activities each Sciences Group carries out in terms of quarantine materials and keeps them under review.

Good communication relating to this complex set of regulations is key to guaranteeing that we work safely, including with a view to environmental safety, with regard to the import and export of GMOs and quarantine materials. For this reason, a renewed attempt was made to write a script for the e-learning module 'Working safely with biological agents' as one of the safety modules. This was based on information provision and WUR's education & testing programme in collaboration with Safety & Environment. In addition, the BSO performs even stricter internal supervision. As was the case last year, the quality of compliance with safety regulations is part of the management assessment, based on a dashboard used by the management of PSG. At ESG, this assessment is carried out in accordance with ISO 9001 quality management and the ISO 14001 environmental management standard. These tools enable management to quickly see whether the chair groups and business units at PSG and ESG closely are compliant with the environmental and biosafety regulations.

3.9 External safety
WUR has requested a complex permit under the Dutch Nuclear Energy Act (*Kernenergiewet*, 'Kew') for organisational components that work with radioactive substances and equipment. The general, coordinating radiation expert submits an annual report on the implementation of the radiation hygiene policy to the WUR Executive Board and to the Dutch government bodies responsible for supervising radiation protection. Under the Kew complex permit, inspections were carried out at all sites to verify compliance with the limits for discharges into the environment (water and air).

3.10 Asbestos
In 2015, a WUR-wide asbestos policy was established with the following goals:
- Ensuring a safe environment for employees, students and third parties.
- Compliance with legislation and regulations.
- Assigning tasks and responsibilities when dealing with asbestos within WUR.

An inventory was made of all the buildings built before 1994 and whether or not these contained asbestos. In 2015, an asbestos management plan was subsequently drawn up for the buildings that do contain asbestos. These asbestos management plans were completed in 2016. The asbestos management plans were completed in 2016. Measures were immediately taken in each building in which the asbestos identified posed a risk, and remediation was carried out where necessary. The management plans are monitored periodically.

In 2018, a policy memorandum was adopted detailing the status of the asbestos problem, the actions to be taken with regard to this problem, and the financial consequences.

As a total ban[5] on roofs that contain asbestos will come into force in 2024, it is essential that a remediation procedure is started in good time. WUR is aware of which buildings contain asbestos. In 2018, all buildings with asbestos-containing roofs were inventoried, and a plan was made to remediate and replace these asbestos-containing roofs in the coming years. To ensure that this process is carried

[5] On 4 June, the asbestos roof ban, which should take effect on 31 December 2024, was rejected by the Dutch Senate, and the proposed amendment to the law was referred back to the Senate.

out carefully, research is also being performed at each location under the Dutch Nature Conservation Act (formerly Flora & Fauna).

A plan has also been made for the surplus buildings that will be demolished and which are known to contain asbestos. This concerns the following buildings:

- The Triton building on Wageningen Campus (demolition in connection with the construction of the third education building);
- the Wiskundegebouw in Wageningen (De Dreijen);
- the Transitorium building in Wageningen (De Dreijen);
- the buildings at Edelhertweg 13-21 in Lelystad.

In 2018, a start was made on new asbestos inventories for these buildings. The inventories, including a second opinion, will be compiled by the consultancy firms with which framework contracts were concluded in 2018. Remedial work on and demolition of these buildings will take place over the coming years.

3.11 Transport and traffic

The concentration of buildings and activities on Wageningen Campus has led to an increase in traffic to, through and from Wageningen Campus over the last years. Considering the growth in the number of students and the arrival of external and other companies and organisations at Wageningen Campus, the level of traffic is expected to increase further. This is why, in 2018, efforts were made to update the policy on sustainable mobility, and a Mobility Vision 2030 (in Dutch: 'Mobiliteitsvisie 2030') and an associated implementation agenda have been drawn up. The Executive Board took a provisional decision on this vision at the end of 2018. The draft mobility vision was then submitted to the employee and student representatives. It is expected that the mobility vision will be definitively adopted at the beginning of 2019, after which it will be published on the page on sustainable mobility on the WUR Internet.

The new policy on sustainable mobility will focus on promoting sustainable transport options, discouraging travel by car or air and making transport more sustainable. To some extent, the measures taken under the new vision are a continuation of the existing policy. Key points include:

- The use of public transport for business travel within the Netherlands is encouraged. Employees should use the NS Business Card for this.
- The basic principle of the policy for international business travel is that public transport is preferable for nearby destinations in Europe.
- The use of videoconferencing is also encouraged, as it leads to savings on travel hours and expenses as well as reduced CO_2 emissions.

The impact of transport on the climate is measured annually as part of WUR's carbon footprint (see also par. 4.5). The use of the various transport options will be monitored as far as possible. In addition to air travel and commuting, these include business travel by car and public transport and the use of private, lease and rental cars.

A new parking deck will be built on Wageningen Campus in 2018. The reason was the demolition of one of the parking spaces for the new building for Unilever. Temporary parking spaces needed to be created in some areas during the construction of the new parking facility. The parking deck opened in March 2018.

The new parking deck has six charging points for electric cars, bringing the total number of on-campus charging points to 24. The charging points can be used by WUR's employees, students and visitors, making them open to the public. The charging points are indicated on the map of Wageningen Campus. In 2018, there will be a considerable increase in the use of charging facilities compared with previous years. Owners of electric cars used the charging stations a total of 3,434 times in 2018, compared with 2,336 times and 1,684 times in 2017 and 2016 respectively. A total of 28,432 kWh was charged (in 2017 and 2016, this was 17,155 kWh and around 12,000 kWh respectively). There are also charging stations for e-bikes and scooters at bicycle-parking facilities in various buildings.

In 2018, WUR took various measures to make transport more sustainable:

- After WUR lobbied the local transport provider and the Province, even more buses are running from the Ede-Wageningen station to Wageningen Campus – from seven to eight bus services per hour. WUR will continue lobbying for further increases.
- In cooperation with the Province of Gelderland and the Municipality of Wageningen, preparations are being made to run a direct bus service from Arnhem main railway station (which will soon have an ICE connection) to Wageningen Campus under the project name 'Rijnlijn' ('Rhine line').
- WUR was involved in the development of a bicycle highway on the already very busy route from Ede, Ede-Wageningen railway station and Bennekom to Wageningen Campus.
- By the end of 2018, the bicycle-parking facilities near the Atlas building will have been doubled in capacity and tailored to the landscape (green building). Preparations are under way to further expand bicycle-parking facilities at the Radix and Helix buildings.
- The route from Langesteeg over Bornsesteeg to Wageningen Campus is open to cyclists (mostly recreational), and a pavement has been laid.
- The signage on Wageningen Campus has been changed, so that bicycle crossings are more clearly indicated and cyclists have right of way at more places. A further revision of the traffic situation at a number of busy crossing points for cyclists is currently in the pipeline.

3.12 Sustainable construction

In 2018, WUR implemented the following accommodation-related measures and achieved the following results:

- In 2018, further preparations were under way to roll out the thermal storage system in existing buildings located in the northeast part of the campus.
- The construction of a parking deck, due to the deconstruction of another car park for the new development for Unilever, called for the construction of an emergency car park. The purchasing and design process took sustainability into account as much as possible by ensuring the building was in harmony with the natural environment, by supporting this natural environment (planting), by using sustainable materials, and by constructing a building that is fully designed for disassembly.
- In 2018, WUR will continue to collaborate with parties including Liander, Parenco, the Province of Gelderland and the Municipalities of Wageningen, Renkum and Ede on research into an ultra-deep geothermal heat source. Research will also begin on residual heat at the paper factory in Renkum.
- Unilever built the Global Food Innovation Centre on Wageningen campus in 2018. This building has a high BREEAM sustainability target. The exact score will be determined according to the design of the finished construction.
- The second phase of the lighting plan was implemented in 2018. This plan specifies that, within three years, the outdoor lighting of the entire campus will be replaced with energy-efficient, dimmable LED lighting. In the central area of Wageningen campus, it is clear that targeted, dimmable fittings lead to lower light emissions into the surroundings, while traffic on roads and paths remains clearly visible.
- In 2018, preparations were made for the construction of the first phase of the new greenhouse complex on Wageningen campus. The greenhouses will use heat and cold from the thermal storage system, for which two buffer tanks will be built. Extensive sustainability measures are also being implementing, including the use of double glazing and restrictions on light emissions. In particular, the construction of the next phases will lead to a significant reduction in the amount of light emitted by the greenhouse complex on Wageningen campus.
- In 2018, preparations were made for two major new construction projects: the Dialogue Centre and a third educational building. Sustainability is one of the core themes in the design of, tendering for, and implementation of both projects.

In addition, progress was made in 2018 in reducing noise emissions from WUR's research facilities (see par. 3.5 Noise) and reducing WUR buildings' energy consumption (see par. 3.1 Energy). Further work was undertaken to remediate asbestos (see par. 3.10 Asbestos).

4 Sustainability

WUR wants to integrate sustainability as much as possible into teaching, research and operational management. WUR's website contains pages about our sustainable operational management, an explanation of major activities, as well as the results relating to energy, construction, waste, mobility, purchasing and catering.

Chapter 3 offers a more detailed discussion of the topics of energy, waste, construction and mobility. Please read below for information on the activities and results from the CSR agenda in 2018, as well as on the activities and results in terms of purchasing, catering, Green Office Wageningen and our carbon footprint.

4.1 CSR Agenda

WUR has been using a CSR agenda since 2015. This includes 21 CSR topics that are considered important both at and outside WUR, and therefore receive extra attention in the CSR policy. Ten of those are so important to our organisation and stakeholders that they deserve extra attention. The topics from the top 10 are linked as much as possible to the priority areas and key performance indicators (KPIs) in the Strategic Plan. Three pillars are essential to this approach: do what you say and show what you do, create awareness within and outside the organisation, and search for connections between research, education and operational management.

A new Strategic Plan for WUR was drawn up in 2018. In 2018, the CSR[6] group submitted a proposal for a CSR strategy for the next four years. A 'CSR – Next level' memorandum was drawn up, and this was used to inform the CSR section in the 2019-2022 Strategic Plan. The current Strategic Plan 2015-2018 sets out the CSR ambition: 'It is in line with our organisation and our domain to set big goals for Corporate Social Responsibility (CSR).' In principle, each decision we make should take account of scientific, social and economic interests. Our responsibility goes above and beyond our own activities.

In 2018, at the request of the Executive Board, the importance of the theme of 'ethically responsible conduct of research and education' was emphasised. This theme was placed higher on the CSR agenda, and 'ethics in research,' 'working in accordance with the Code of Integrity' and 'fair trade (anti-corruption)' were added as priority areas. In addition, each theme's KPIs have been assessed and adjusted where necessary. The updated CSR agenda was approved by the Executive Board in December 2018.

More details on the progress of the CSR agenda can be found in the MVO-verslag WUR 2018(Annual report WUR 2017 – only available in Dutch) This also includes the Global Reporting Initiative's GRI index.

4.2 Purchasing

In relation to tendering, WUR carries out its purchasing activities according to the applicable legislation and regulations, as well as the principles of proportionality, objectivity, non-discrimination and transparency. In addition to the applicable legislation and regulations, WUR observes its own purchasing policy.

WUR purchases sustainably and, where possible, in accordance with the sustainability criteria as published on Pianoo.nl. This applies to all products and services, from construction materials to coffee cups and services such as cleaning and security. Additional sustainability criteria for purchasing procedures can be presented to a sustainability panel consisting of approximately 57 WUR employees and students.

In addition, WUR expresses its social role by utilising regional suppliers, insofar as this is not contrary to legislation and regulations in this area. In reality, this means that WUR's buyers will point out to the

[6] Please see Chapter 7 for more information on the CSR group.

internal clients the different options available during purchasing processes and the contract period. To achieve this, WUR follows the Responsible Innovation (MVI) growth model. The MVI growth model is a method that measures the efforts made relating to Responsible Innovation and to realise higher CSR awareness.

A contract manager is assigned to each contract that involved the Purchasing department in the finalisation procedure. During the contract phase, the contract manager will consult with the supplier who must comply with the agreements relating to sustainability and CSR. If a supplier does not comply with the agreements, the contract manager must issue a warning to them.

WUR has a complaints desk where stakeholders can submit a complaint in writing about a specific tendering procedure. The tendering documentation explains how the complaint must be submitted and how it is evaluated and dealt with.

WUR's purchasing procedures are carried out entirely digitally. The Negometrix digital platform is used as a tool for tendering. The ordering process has also been digitalised, which has laid the foundations for the digital processing of invoices. Suppliers are encouraged to send their invoices digitally. Because Wageningen deals with large numbers of orders and invoices, the use of paper, toner cartridges and postal services has been drastically reduced.

Results achieved in 2018:

- a total of 41 EU and national procurement projects and multiple private processes completed with a total value of €38 million.
- According to the MVI (socially responsible purchasing) growth model, the percentage of sustainability for using Pianoo.nl's criteria was 97%.
- The international social values were included as conditions in the contract for eight procurement processes.
- In 2018, no complaints were received.
- In 2018, the sustainability panel was asked twice to provide input.

4.3 Catering

WUR has set itself the goal that products sold in company canteens and vending machines must be sustainable and healthy. Each purchasing process must at least comply with the sustainability criteria as published on Pianoo.nl (formerly the criteria of the Netherlands Enterprise Agency). All caterers at WUR buildings take sustainability very seriously, as evidenced by their sustainability policy and the yearly health & safety and environment audits and satisfaction surveys. They ensure that sustainability is 'visible' and that Fairtrade products are marked with an extra logo. The caterers use local suppliers, and many products have a sustainability label. At least 40% of the products they purchase are from guaranteed non-GMO organic farms that do not use chemical crop protection agents or artificial fertilisers and respect animal welfare. The environmental impact of packaging material must be limited as far as possible, and caterers must separate waste at the source. 75% of the product range consists of preferred (healthy) and 'neutral' products. In 2016, one of the caterers began using a bio-degradable and 100% organic cleaning agent.

The caterers continued Meatless Mondays in 2018. On Mondays, warm snacks and soups are vegetarian and a wide variety of vegetarian snacks are available. However, there is a limited choice available for people who would prefer to eat meat. The Student Cooking Corner, held on Wednesdays in Forum, gives students the opportunity to bring and sell homemade meals. During 'Seriously Sustainable,' the sustainability festival in October organised by Green Office Wageningen, caterers devoted extra attention to the sustainable range of products in the canteens. The caterers also worked on implementing KeepCups as suggested by the Reuse Revolution students' initiative (only available in Dutch). The reusable cups can be purchased at several catering sales points. Users of the KeepCup reusable cup receive discounts on their tea or coffee at selected locations.

4.4 Green Office Wageningen

Green Office Wageningen takes a central role in sustainability by supporting and connecting students, employees and projects. The responsibilities of Green Office Wageningen consist of:

- Connecting WUR Facilities and Services with the education and research departments. Green Office Wageningen promotes this cooperation on projects that focus on making operational management more environmentally friendly, such as through an MSc thesis, trainee posts, practical and research assignments within courses, and Academic Consultancy Training (ACT) assignments.
- Creating a platform for interested parties in the field of sustainability, where information can be exchanged and collaboration can take place.
- Providing support in the execution of ideas and initiatives focused on sustainability within WUR.
- Strengthening WUR's sustainability strategy.

Green Office Wageningen organises various activities and meetings and communicates on these topics through the Green Office website and social media. Green Office's motto in 2018 was 'Sustainability as lifestyle', which focused on students and WUR employees. Green Office Wageningen is part of the Green Active Network, a platform in which 15 organisations – including student organisations – with green goals work together. Some joint activities were organised in 2018, including the Regreening weekends for first-year students in February and August.

Green Office organised a sustainability festival called Seriously Sustainable in the week of the *Dag van de Duurzaamheid* (Sustainability Day) on 10 October. Working together with other student organisations, Green Office put on a varied range of lectures and activities.

Green Office's activities in 2018 were:

- The Warm Sweater Week was held in February. The Orion and Forum educational buildings recorded a 1.5-degree drop in the temperature. This may not seem like much, but it does lead to lower energy consumption. Together with the Green Active Network, various activities were organised including a 'Sweater Swap' and a 'DIY Natural Cosmetics' workshop.
- In collaboration with Studium Generale, Green Office and the WUR project group 'Modern Slavery' organised a series of lectures on the theme of Modern Slavery. After an introduction to the history of slavery, there were two evenings with lectures on modern slavery in production chains – electronics, fashion, tea and cocoa – with the series ending on a lecture by Kevin Bales, the authority in this field.
- The Green Teacher Awards were hosted for the third time on 2 March 2018, with prizes were awarded to five lecturers at Wageningen University. Interviews with 2018's Green Teachers were published in a booklet (see also: the Green Office website).
- During the Conscious Consuming Week, Green Office and Wageningen Environmental Platform organised activities such as Plogging (in collaboration with 'Wageningen Schoon') and a workshop on 'DIY Eco-friendly body products'.
- Green Match creates a link between education and sustainable management at WUR. Green Office acts as an intermediary in various ways between students and clients on possible topics for assignments as part of courses, work placements, or theses. In 2018, these included 'A checklist for organizing sustainable events at WUR' and 'The most sustainable option for disposable and reusable cups'.
- Green Office worked together with others to organise Entrepreneurship for Sustainability, a series of workshops and sessions in which students could gain support in setting up their own sustainable initiative or project. There were lectures on Sustainable Buildings, Modern Slavery, Emerging Economies, and other topics.
- Organised every Wednesday, the Student Cooking Corner gives students the opportunity to sell homemade vegetarian or vegan meals in the canteen of the Forum building (in collaboration with the caterer Cormet).
- '*Collect, Fix, Share*' is central to the bike sales during the introduction days for students. In collaboration with Green Office and location managers, abandoned bicycles were collected from bicycle-parking areas on Wageningen Campus and repaired by the second-hand shop Restore Kringloopwinkel in Ede. The restored bicycles were sold to students during the winter and summer editions of the Annual Introduction Days (AID).
- In 2018, Green Office participated in the Green Impact programme that saw various teams within WUR compete with each other to promote sustainability in the workplace.

Green Office Wageningen's website, Facebook and Instagram have more information about Green Office's activities.

4.5 Carbon footprint and CO_2 compensation footprint

The carbon footprint and the CO_2 compensation footprint give WUR insight into a number of factors, including the direct and indirect emissions of hazardous gases, coolant leakages, livestock numbers, land use and the environmental consequences of transport. The carbon footprints from recent years have alerted WUR to the size of its CO_2 emissions and what it can do to reduce and compensate for them.

The carbon footprint is reported on at WUR's corporate level. Additionally, separate CO_2 targets are set for the organisational components, so that they, coordinated by the QHSE sections, can specify priority areas and take measures to gain as much control as possible over their CO_2 emissions and reduce these where possible.

The following aspects have been included in the calculation of the carbon footprint:

Scope 1: (direct emissions)	▪ Fuel consumption from heating offices, greenhouses and laboratories (natural gas). ▪ Emissions resulting from the leakage of coolants (F-gases); ▪ Fuel consumption of lease vehicles (diesel, petrol, LPG). ▪ Fuel consumption of WUR's own vehicle fleet (diesel, petrol, LPG). ▪ Fuel consumption of agricultural vehicles (diesel). ▪ Fuel consumption of rental cars and rented coaches (petrol). ▪ Emissions from agricultural land owned by WUR (nitrous oxide). ▪ Emissions from livestock (methane).
Scope 2: (indirect emissions)	▪ Emissions from electricity purchased for offices, greenhouses and laboratories. ▪ Electricity use of electric lease vehicles. ▪ Emissions from kilometres driven on business using private vehicles. ▪ Emissions from kilometres flown on business. ▪ Emissions from business travel using public transport (within the Netherlands and internationally).
Scope 3: (other indirect emissions)	▪ Emissions caused by processing of hazardous and animal waste. ▪ Emissions caused by processing of paper waste. ▪ Emissions from journeys to work by bus, train and metro. ▪ Emissions from air kilometres flown by students.

CO_2 inventory in 2018

The inventories of the carbon footprint and CO_2 compensation were carried out in conformity with ISO 14064-1:2006 (E), 'Quantification and reporting of greenhouse gas emissions and removals,' which was based on the Greenhouse Gas Protocol. The CO_2 performance ladder, version 3.0, was used as a starting point. The independent agency Royal HaskoningDHV verified the completeness of the data used for the carbon footprint and CO_2 compensation footprint.

The data collected over 2018 is comparable with the data collected from 2014 to 2017. Nearly all energy, transport and waste data from all 26 locations in the Netherlands has been included. Supplementary notes:

- 2010 was taken as a reference year for our carbon footprint. As more sources of emissions are added each year and calculations have changed since 2015, the reference year was recalculated in 2016. This included the changes and shifts of CO_2 emission sources in the 2010-2015 period as well as the changes in the CO_2 emission factors. The recalculation was based on the system used in the CO_2 Performance Ladder.
- From 2015 onwards, calculations are performed with the CO_2 emission factors that were actualised in 2014. For more information, please refer to www.co2emissiefactoren.nl (only available in Dutch).
- Residual waste is defined as 'the total amount of waste less animal and hazardous waste and less paper and cardboard waste'. Emissions from the processing of old paper and cardboard waste are allocated to the purchaser of recycled paper and cardboard, which means that WUR has a score of zero for these emissions.
- WUR rents locations and buildings to third parties. This means that third parties are engaged in their individual activities and, have their individual carbon footprints. For this reason, they have not been included in the WUR carbon footprint and CO_2 compensation footprint.

CO_2 emissions per scope

The total carbon footprint in 2018 is 42.8 kton of CO_2. Compared with the reference year 2010, CO_2 emissions decreased by 48% in 2018. There has been a 5.1% increase in CO_2 emissions compared with the footprint in 2017. In addition, the downward trend in absolute electricity consumption will continue in 2018 (see Section 3.1 Energy).

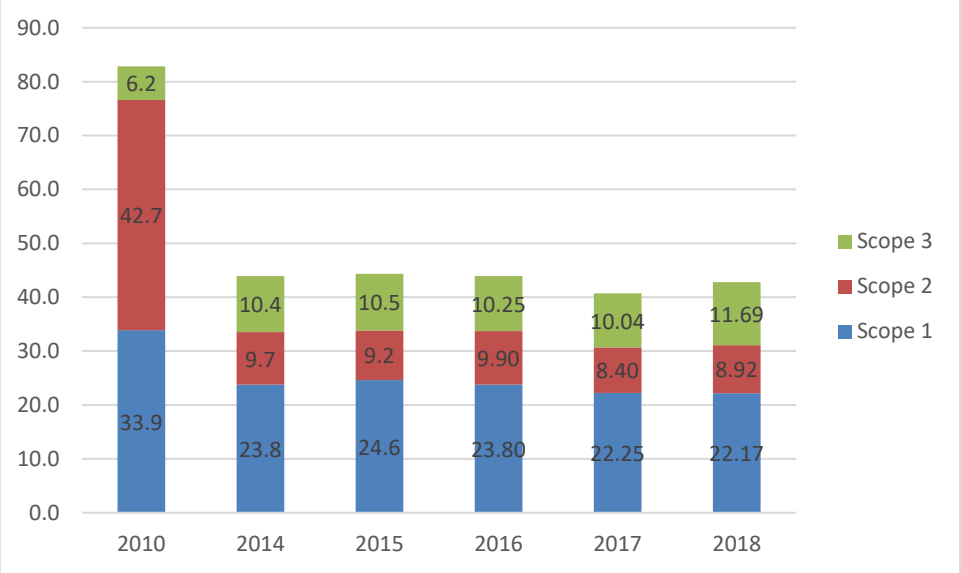


Figure 2. CO_2 emissions in kilotonnes per scope in 2010 and in the 2014-2018 period

Figure 2 shows the scope distribution of the carbon footprints for 2010 and the period 2014-2018.

In scope 1, the total emissions are virtually the same as in 2017 (-0.4%). Although the quantity of natural gas (-2%), the number of rental cars (-30%) and the number of livestock (-4%) decreased in this scope, there was an increase in the use of agricultural vehicles (20%). This was mainly due to the extremely dry summer, as a result of which agricultural vehicles had to be deployed more often in order to water the agricultural land. Coolant emissions have also increased (56%) compared with 2017.

In scope 2, however, there was an increase in emissions this year (6.2%). The increase in the number of business flights (7%) and the increase and business use of private cars (5%) accounts for the increase in scope 2. The number of kilometres travelled on business travel made by public transport increased (2.5%), while emissions decreased by -1%. This is because international public transport is making greater use of sustainable energy, and this has reduced the emission factor for international train journeys.

The largest increase within the scope distribution this year can be seen in scope 3 (16.3%). The growth in the number of FTEs (8%) has led to an increase in emissions from commuting (13%). However, the emission from commuting per FTE has decreased (-5%). The number of kilometres flown by students and course participants has also increased considerably (28%). Emissions from waste processing increased dramatically (+15%) This increase in emissions is due to the amount of hazardous waste. The disposal and processing of hazardous waste emits more CO_2, which requires a calculation with a higher CO_2 emissions factor than for residual waste.

Emission sources

The sources contributing the most to greenhouse gas emissions are the buildings (natural gas), the kilometres flown (jet fuel), commuter traffic (petrol) and agricultural land (nitrous oxide), as shown in figures 3 and 4.

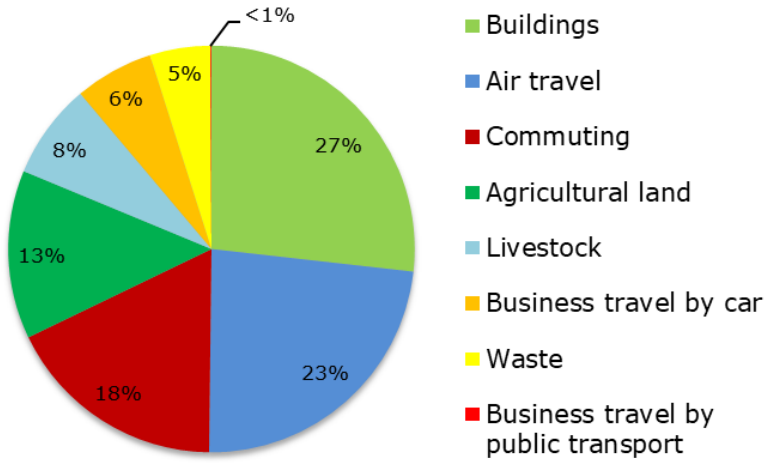


Figure 3. Distribution of CO_2 emissions of operational management in 2018

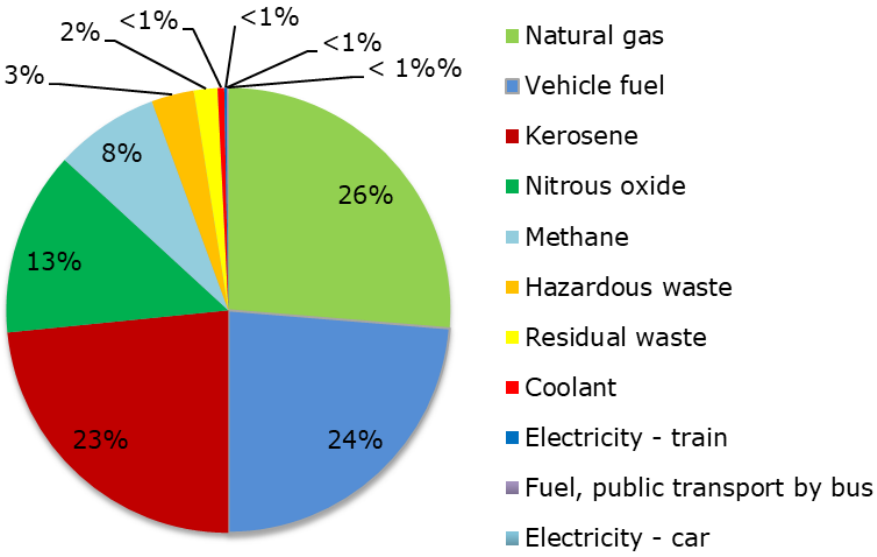


Figure 4. Distribution of CO_2 emissions across the various emissions sources in 2018

CO_2 compensation

WUR compensates its energy consumption in the following ways:

- By generating its own wind energy (more than 62.4 million kWh in 2018).
- Thermal storage systems on WUR's own sites, to heat and cool various buildings on Wageningen Campus (8.8. million kWh in 2018);
- The operation of the biomass-fired combined heat and power plants 'Acrres' in Lelystad, Swine Innovation Centre (VIC) Sterksel and 'De Marke' in Hengelo.
- By generating its own solar energy (0.57 million kWh in 2018).
- The separation of the various types of waste to the maximum possible extent.

The total CO_2 compensation footprint in 2018 was 48.3 kilotonnes of CO_2. See figure 5 for the distribution of the compensation sources in 2018. This is a 87% increase in compensation as compared to the figures for the reference year 2010.

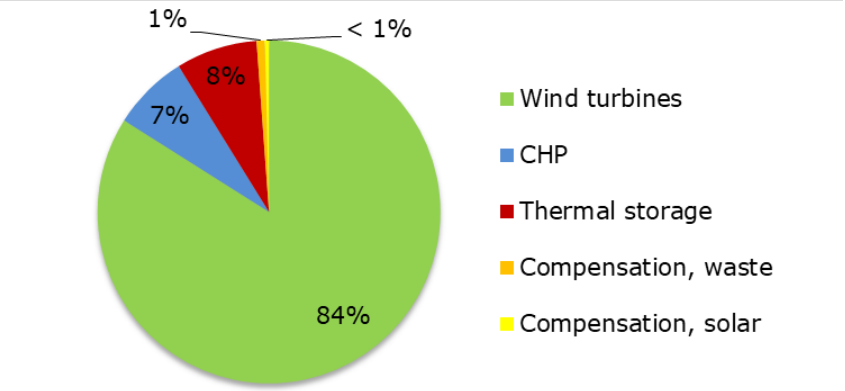


Figure 5. Results of WUR's compensation measures in kilotonnes in 2018

Compared with 2017, the CO_2 compensation footprint increased in 2018. This difference is mainly due to the increase in the number of solar panels, which resulted in a higher yield of solar energy (174%) (see section 3.1 Energy). The wind conditions were once again favourable this year, as a result of which the energy yield of the wind farms in Lelystad was higher than last year (3%). Other sources of compensation also show improvements, such as a higher yield from thermal energy storage (36%) on Wageningen Campus, and an increase in energy generated by biogas installations (12%).

Result

Compared with the reference year 2010, 2018's carbon footprint was reduced in 2018 (-48%) and its CO_2 compensation footprint was 87% higher. The ratio of the carbon footprint to the CO_2 compensation footprint in the period 2014-2018 is shown in table 7 and figure 6. In 2010 the CO_2 compensation footprint was equivalent to 32% of the CO_2 emissions. In 2018 the CO_2 compensation footprint was greater than the CO_2 emissions. The CO_2 compensation was also higher in 2018 than in 2017.

Table 7. WUR's carbon footprint and CO_2 compensation footprint in the 2014-2017 period and the 2010 reference year

Year	2010	2014	2015	2016	2017	2018
CO_2 emissions in kilotonnes	82.9	43.9	44.4	43.9	40.7	42.8
CO_2 compensation	26	36.1	48.8	35.2	45.6	48.3
Reduction compared with the reference year in percent		43%	46%	47%	51%	48%
CO_2 compensation as a percentage of the CO_2 emissions	31%	72%	110%	80%	112%	113%

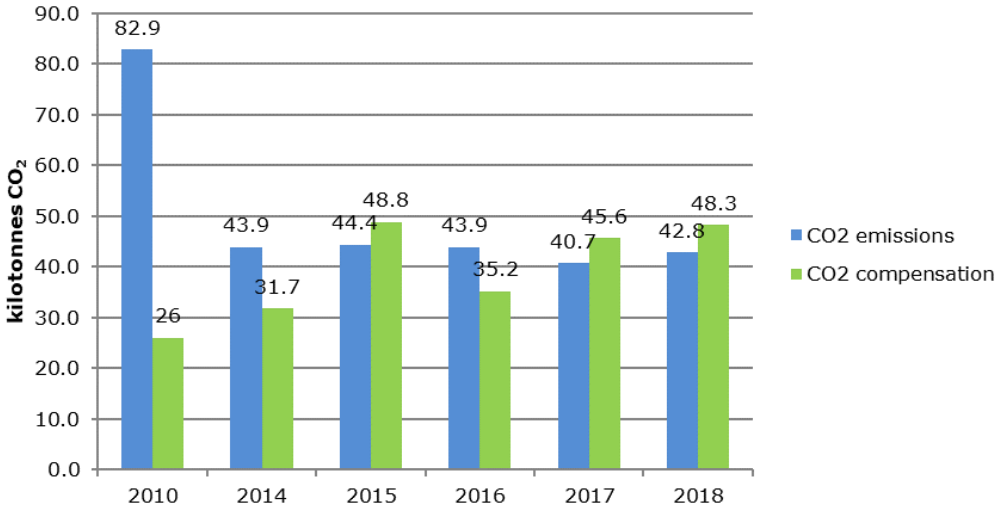


Figure 6. WUR's carbon footprint and CO_2 compensation footprint in the 2014-2018 period and the 2010 reference year

5 Permits

5.1 Permits for complexes

The various organisational components are distributed across 26 different locations, and clustered in complexes for which environmental permits have been issued (see Table 8).

Table 8. Overview of the organisational components falling under the various environmental permits, including those for complexes, in 2018

Locations	Wageningen Campus	De Dreijen Wageningen	WUR complex Lelystad	WBVR Houtribweg Lelystad	Other Wageningen	Other locations
Agrotechnology & Food Sciences Group (AFSG)	X					
Animal Sciences Group (ASG)	X		X	X		X[1]
Environmental Sciences Group (ESG)	X					X[2]
Energy & Exploitation Lelystad (E&EL)[3]			X			
Plant Sciences Group (PSG)	X		X			X[1]
Social Sciences Group (SSG)					X[4]	X[5]
Wageningen Marine Research (WMR)						X[6]
RIKILT	X					
Facilities and Services (FB)	X	X	X		X[7]	X[8]
Corporate Staff+ (CS+)[9]	X				X[10]	X[11]

1. Test facilities
2. Sinderhoeve (Renkum)
3. E&EL (Energy & Exploitation Lelystad) has been a separate organisational component of WUR since 2013.
4. De Leeuwenborch
5. WECR The Hague and other locations
6. IJmuiden, Yerseke, Den Helder (2 locations)
7. Sports Centre de Bongerd
8. Schoutenhoef (Bennekom)
9. The Corporate Staff (CS), Wageningen International (WI) and Wageningen Academy (WA) together make up CS+.
10. Main Auditorium, Achter de Aula, student accommodation in Wageningen (Haarweg and Stadsbrink)
11. Bennekom (Beringhem)

5.2 Permit regulations

The applicable regulations set out in the environmental permits apply to the activities carried out by different organisational components. An overview of this can be found in tables 9 and 10.

Table 9. Regulations which apply to the different organisational components

Organisational component	Environmental logbook[1]	Registration of chemicals[2]	Registration of energy and water[3]	Emergency plan[4]	Maintenance, inspections, checks[5]
AFSG	X	X	X	X	X
ASG	X	X	X	X	X
ESG	X	X	X	X	X
E&EL	X	X	X	X	X
PSG	X	X	X	X	X
SSG			X	X	X
WMR		X	X	X	X
RIKILT	X	X	X	X	X
FB	X	X	X	X	X
CS+	X		X	X	X

The columns from table 9 are explained on a point-by-point basis below:

1. The environmental logbook contains information about maintenance, measurements, tests, inspections and environmental studies. In recording this information, the existing information sources are used as much as possible, such as the *Gevaarlijke stoffen Registratie- en Opsporingssysteem* (GROS, 'hazardous substances registration and investigation system'), the *Energie, registratie, beheer en informatiesysteem* (Erbis, energy, registration, control and information system) and drawings in Planon. As WMR is not included in the complex permit, it is not legally obliged to keep an environmental logbook. WMR follows a different method of registration.
2. Chemical registration is required at all locations where work involving hazardous substances is performed. At most of those locations, the GROS software package is used for this purpose.
3. The use of water, gas/heat and electricity is registered in Erbis.
4. Each year, the emergency plans of the buildings are assessed and adapted to the current situation where required. The emergency management team is involved in the exercises on location.
5. Periodic checks and tests of the systems are carried out in order to determine environmental emissions and guarantee safe operation. Examples include waste water checks, checks for odour emissions, fume cupboard checks, manure storage checks, air emissions checks (formerly: Dutch Emission Guidelines for Air [NeR]), and checks of building-related systems. Inspection reports are recorded in the environmental logbook.

All organisational components work according to the statutory guidelines. Tasks which are part of environmental-related processes are established and safeguarded by a certified quality system. The organisational components are nevertheless free to determine whether and to what extent they work with such a system. The specific culture, wishes or expectations of the organisational component's staff, local residents or clients may be decisive in choosing whether to introduce a certified quality system. Table 10 gives an overview of the systems used by different WUR organisational components.

Table 10. The quality systems used by the organisational components

Organisational component	Systems	Explanation
ASG	ISO 9001 ISO 17025 ISO 17043	For WBVR and Wageningen Livestock Research (WLR). For WBVR, 60 accredited (diagnostic) tests. For WBVR, circulation exercises.
ESG	ISO 9001 ISO 14001 ISO 17025 ISO 26000 ISO 17043	For WENR and the Statutory Research Tasks (‘Wettelijke onderzoekstaken’, WOT) For WENR WEPAL (an alliance between the Biochemical and Soil Chemical Quality research teams, which are part of Wageningen University's Department of Environmental Sciences). For the total Sciences Group For Wageningen University’s Department of Environmental Sciences.
PSG	ISO 9001	For the Unifarm, Bleiswijk and the Centre for Genetic Resources Plant Genetic Resources (CGN PGR) test locations. Hazard Analysis Critical Control Points (HACCP) for the Lelystad test location.
SSG	ISO 9001	For the WECR component
WMR	ISO 9001 ISO 17025	
RIKILT	ISO 17025 ISO 17043	

5.3 Changes to permits

In the past year, 60 permit procedures have been supported by the Permits Centre (see Table 11).

Table 11. Overview of WUR permit procedures in 2018

Location	Project	Permits[1]
Bennekom Langesteeg 21	Change from accommodation to office	Environmental Permitting (General Provisions) Act and *Besluit ruimtelijke ordening* (RO, Spatial Planning Decree)
Nergena, Bennekom	Installation of greenhouse tunnel dryer	Construction under Wabo
Bleiswijk Greenhouse horticulture	Construction of a demo and bubble greenhouse	Construction under Wabo
Bleiswijk Greenhouse horticulture	Demolition/dismantling of greenhouse	Demolition under Environmental Permitting (General Provisions) Act (Wabo)
Bleiswijk Greenhouse horticulture	Construction of office/lab building	Construction under Wabo
Den Helder, Spoorweghaven	Construction of a warehouse	Report under Activities Decree (*Activiteitenbesluit*)
Den Helder, Spoorweghaven	Amend permit (for the discharge of saltwater)	Water Act (*Waterwet*)
Den Helder, Spoorweghaven	Construction of a warehouse	Construction under Wabo
Goutum Dairy Campus	Fire-safe use of new building	Occupancy notification under Wabo
Goutum Dairy Campus	Construction of additional manure basins	Report of environmentally neutral credentials
Broekemahoeve, Lelystad	Remediation of asbestos on roofing sheets	Report of asbestos removal
Lelystad, Runderweg 5	Remediation of roof material containing asbestos	Demolition under Environmental Permitting (General Provisions) Act (Wabo)
Lelystad, Runderweg 4	Placement of above-ground oil tank	Report under Activities Decree (*Activiteitenbesluit*)
Netherlands (for WMR)	Exemption from the investigation into the whole of the Netherlands	Exemption under the Nature Conservation Act (*Natuurbeschermingswet*)
Randwijk PPO	Construction of a 'cabrio greenhouse'	Construction under Wabo and *Besluit ruimtelijke ordening* (RO, Spatial Planning Decree)
Sterksel Swine Innovation Centre (VIC)	Funding for asbestos phase test remediation	Netherlands Enterprise Agency grant for asbestos roofs
Sterksel Swine Innovation Centre (VIC)	Grant for asbestos phase I	Netherlands Enterprise Agency grant for asbestos roofs
Wageningen Born Oost	Placement of electricity metering substation and switching substation	Construction under Wabo
Wageningen Campus (third education building)	Preliminary consultation regarding construction under Wabo and *Besluit ruimtelijke ordening* (RO, Spatial Planning Decree)	Amendment of zoning plan
Wageningen Campus site	Temporary campsite during Annual Introduction Days (AID).	APV
Wageningen Campus (new-build Dialogue Centre)	Preliminary consultation regarding Wabo and RO	Amendment of zoning plan
Wageningen Campus (site for new-build Dialogue Centre)	Felling of several trees	Felling under Wabo (two trees)
Wageningen Campus Axis (between parts X and Z)	Temporary structure (Portakabins)	Construction under Wabo
Wageningen Campus Axis Z	Tent for symposium	APV
Wageningen Campus Innovatron	Conversion into office/lab spaces	Construction under Wabo
Wageningen Campus Innovatron	Relocation from LSR to Innovatron	Report of environmentally neutral credentials
Wageningen Campus Lumen	Installation of temporary cooling unit	Construction under Wabo
Wageningen Campus Lumen	Installation of temporary cooling unit	Environmentally neutral under Wabo
Wageningen Campus Orion	ISCW (Hackathon)	APV (General Municipal Regulation) + Permit under Article 35 of the Licensing and Catering Act
Wageningen Campus multistorey car park	Fire-safe use	Occupancy notification under Wabo
Wageningen Campus Radix	New-build glass research facility	Environmental Permitting (General Provisions) Act and *Besluit ruimtelijke ordening* (RO, Spatial Planning Decree)
Wageningen Campus site	Anniversary tent (100th anniversary of Wageningen University)	Construction under Wabo and *Besluit ruimtelijke ordening* (RO, Spatial Planning Decree)
Wageningen Campus site	Anniversary tent (100th anniversary of Wageningen University)	Wabo fire safety
Wageningen Campus site	Anniversary tent (100th anniversary of Wageningen University)	APV (General Municipal Regulation) + Permit under Article 35 of the Licensing and Catering Act

Location	Project	Permits[1]
Wageningen Campus site	Extension of temporary car park behind Axis Z	Construction under Wabo and *Besluit ruimtelijke ordening* (RO, Spatial Planning Decree)
Wageningen Campus site	WWW day (100th anniversary of Wageningen University)	APV (General Municipal Regulation) + Permit under Article 35 of the Licensing and Catering Act
Wageningen Campus site	Construction of a clock tower	Construction under Wabo
Wageningen Campus site	Wisdom & Wonder Festival	APV (General Municipal Regulation) + Permit under Article 35 of the Licensing and Catering Act
Wageningen Campus site	General Introduction Days (AID)	APV (General Municipal Regulation) for tent and barbecue
Wageningen Campus Vitae (site)	Felling of two diseased trees	Felling under Wabo
Wageningen Dreijen (near De Valk)	Felling of three conifers	Felling under Wabo
Wageningen Dreijen De Valk	Asbestos remediation in installation parts	Demolition under Environmental Permitting (General Provisions) Act (Wabo)
Wageningen Dreijen	Partial withdrawal due to student housing	Environmental permit under Wabo
Wageningen Dreijen middle Chemistry Building	MDB-SK self-contained design in connection with partial withdrawal Wm Dreijen	Report under Activities Decree (*Activiteitenbesluit*)
Wageningen Dreijen Wiskundegebouw	Add additional emergency door	Construction under Wabo
Wageningen Duivendaal	Extension as temporary housing for students	Vacancy permit
Wageningen Duivendaal	Extension as temporary housing for students	Environmental Permitting (General Provisions) Act and Besluit ruimtelijke ordening (RO, Spatial Planning Decree) + fire-safe use
Wageningen Haarweg 333	Felling of two diseased trees	Felling under Wabo
Wageningen Leeuwenborch	Repositioning of fire-resistant partitions	Construction under Wabo
Wageningen Leeuwenborch	Repositioning of fire-resistant partitions	Construction under Wabo
Wageningen Leeuwenborch	Felling of several trees	Felling under Wabo (two trees)
Wageningen University / Wageningen Research	Working with chemicals	17 permits / exemptions / notifications / registrations

NB1: Wabo = Environmental Permitting (General Provisions) Act (*Wet algemene bepalingen omgevingsrecht*) / RO = Spatial Planning Decree (*Besluit ruimtelijke ordening*)

In addition, the following activities were carried out at the complex level:

- *Lelystad, WUR complex:* After divesting and demolishing Edelhertweg 15 (expected in Q3/Q4 of 2019 or in early 2020), we will concentrate on revising the umbrella permit under the Environmental Management Act ('WUR Complex Lelystad'), including the discharge permit. Due to the complexity of the task (e.g. year-round survey of Flora and Fauna), it is not possible to indicate exactly when demolition will actually start.
- *Lelystad (other):* We revised the permit after completing and opening the new building for Wageningen Bioveterinary Research (WBVR) on Houtribweg 39, we revised the permit under the Dutch Environmental Permitting (General Provisions) Act for Wageningen Campus at the end of 2018/beginning of 2019.
  This is expected to be completed in Q2 of 2019.
- *Bleiswijk Greenhouse horticulture:* Due to new construction and the requirement of the DCMR Environmental Protection Agency Rijnmond, the first steps were taken at the end of 2018 to apply for a new environmental permit under Wabo.
- *Wageningen Campus:* The 2013 GMO Decree (*Besluit genetisch gemodificeerde organismen*) imposes new requirements on environmental permits for institutions working with GMOs. A partial overhaul was started in order to comply with the obligation to update, as laid down in the decree.

5.4 Environmental audits

During the year under review, internal audits were carried out by the Safety and Environment sub-department, and external audits (compliance inspections) were carried out by the competent authorities. The various audits are listed below.

Internal audits

The KAM officials at the organisational components are responsible for compliance with the permit regulations and the associated internal audits.

External audits for Environmental Management Act permits
Compliance inspections were carried out by the competent authorities at the various WUR locations in 2018 in relation to the permit under the Environmental Management Act (see Table 12). Apart from the aforementioned environmental checks, NVWA and Bureau GMO also carried out inspections. These occur individually on various locations throughout the year.

Table 12. Overview of external audits in 2018

Complex/site	Location	Date	Nature of audit
Lelystad, Houtribweg 39	WBVR	20/02/2018	First subsequent inspection
Lelystad, Houtribweg 39	WBVR	17/04/2018	Second subsequent inspection
Wageningen Dreijen	Dreijen complex	26/06/2018	Final inspection due to cessation of activities
Lelystad, Edelhertweg 15	Wastewater reservoir	05/07/2018	Random inspection
Lelystad, Edelhertweg 15	Wastewater reservoir	23/11/2018	Subsequent inspection

6 Complaints and incidents

Complaints and incidents are registered centrally, including the problem analysis, follow-up and reduction/avoidance of direct consequences. This means WUR can:

- Formulate actions to prevent recurrence.
- Carry out internal and external reporting.
- Gain insight at the level of organisational components and at a corporate level.
- Ensure archival accuracy.
- Report to and gain information from the competent authority.

In the reporting year 2018, 164 incidents were registered by means of the incident reporting form, three of which were classified as environmental incidents (see Table 13).

Table 13. Reports submitted using the incident reporting form in 2018

What the report relates to	AFSG	AID	ASG	CS	ESG	FB	WMR	Education	PSG	RIKILT-NVWA	SSG	Sites and other	Total
Accident involving minor injury	11	1	11	2	4	2		13	4			2	**50**
Unsafe situation or deficiency	10		11		3	1							**25**
Accident involving some injury (doctor required)	7	1	4	1	3	2		2	4				**24**
Other	1			2	3			11	3				**20**
Accident involving no injury	4		1	1	4					1			**11**
Fire or fire alarm	2		2		3				1				**8**
Near accident			3		2			1		1			**7**
Incident involving biological agents			4										**4**
Accident involving serious injury								1			1		**2**
Environmental incident			1		1					1			**3**
Environmental incident involving GMOs													
Loss and theft													
Incident involving radioactivity													
Fatal accident													
Bomb alert													
Letters containing possible biological pathogens													
Total	**35**	**2**	**47**	**6**	**23**	**5**	**0**	**28**	**12**	**3**	**1**	**2**	**164**

The four reported incidents involving biological agents did not lead to contamination of the environment. The three incidents and the complaint are detailed below:

Incident 1	Storage of laboratory waste in inappropriate place, without labelling
Nature	A fully filled IBC container was found on the closed area next to the energy building ('energiegebouw'). The container was not labelled. There were white, dried-up spots on the ground next to the container.
Follow-up action	Container emptied and disposed of by waste disposal.
Environmental damage	None. Installation and leakage on an impervious floor. The substances collected were not found to be environmentally harmful.
Follow-up	Internal investigation of the person responsible, in order to identify the substance.
Prevention	The guidelines for waste disposal and labelling have been brought to the attention of all employees at the Sciences Group (SG).
Status	Closed.
Incident 2	Accident with forklift truck at loading/unloading platform involving battery acid outflow
Nature	A supplier's forklift truck fell over at the loading/unloading platform. The contents of the batteries were spilled over the platform. The attendees (supplier and warehouse employee from WUR) rinsed away the battery acid with a lot of water, discharging a diluted quantity into the environment.
Follow-up action	The HSE employee was only informed of the incident 24 hours later.

Environmental damage	Minimum. The HSE employee measured the acidity of the soil where the discharge took place and found no non-standard values.
Follow-up	Employees instructed to inform in-house emergency response team (BHV)
Prevention	None.
Status	Closed.

Incident 3	At the site in Sterksel (NBr), a manure bag was found torn next to the biogas installation.
Nature	Manure had been spilled over a small part of the site.
Follow-up action	A contracting company contained and removed the manure. The environmental agency was informed immediately. After inspection, it was established that adequate, pro-active action had been taken.
Environmental damage	None. This rapid response prevented further spread of the manure.
Monitoring	Perform regular visual checks of the manure bags.
Prevention	None.
Status	Closed.

Complaint 1	Complaints about noise nuisance from Vitae, Wageningen Campus.
Nature	A resident of the Noordwest neighbourhood complained about the excessive noise levels coming from the cooling units on the west side of Vitae during the evening and night-time hours.
Follow-up action	The fans and cooling units were inspected, to make sure they were functioning properly. No malfunctions were identified.
Environmental damage	None.
Follow-up	The cooling units are being replaced.
Prevention	Further measures will be taken once the problem has become clear.
Status	Ongoing (to be closed in 2019).
NOTE	According to the DGMR's existing noise report (2017), WUR meets the noise standards for the Noordwest neighbourhood. That is not to say that the resident may experience some excessive noise levels.

Complaint 2	Complaints about noise nuisance from Vitae, Wageningen Campus.
Nature	Tarthorst residents experience nuisance from a continuous noise caused by installed units. The level of noise depends on the wind direction.
Environmental damage	None.
Follow-up action	The units were inspected, to make sure they were functioning properly. No malfunctions were identified. In December 2018, fifteen noise-saving measures were implemented for various units.
Status	Measurements were taken in the first quarter of 2019, and the noise report was updated to check whether the target reduction in noise had been achieved.
NOTE	According to DGMR's existing noise report (2017), WUR meets the noise standards for the Tarthorst neighbourhood. However, this does not take away from the fact that residents are experiencing some excessive noise levels.

Complaint 3	Complaints about noise nuisance from Vitae, Wageningen Campus.
Nature	Tarthorst residents experience incidental noise nuisance, occurring every few days and lasts about 15-30 minutes in the evening.
Environmental damage	None.
Monitoring	Current monitoring of units did not provide information on the source of the noise. However, a resident has identified the cause: a supplier filling the fuel tank.
Prevention	It has been agreed with the supplier that deliveries may not be made after 8:00 PM or at night.

7 Organisational

WUR has embedded the goal '*To promote a safe and environmentally friendly work/study environment and contribute to compliance with the health & safety and environmental regulations, to the quality of work and organisation and hence to a safe, environmentally safe and healthy working environment within the institution*' within the Quality, Health & Safety and Environment (QHSE) column The abbreviation QHSE stands for Quality, Health & Safety and Environment.

The QHSE column consists of a corporate Safety and Environment sub-department positioned in Facility and Services and various decentralised QHSE sub-departments of the organisational components. The responsibilities in the QHSE column are assigned according to the mandates of WUR. This means that Safety and Environment is responsible for policy at a corporate level, and the QHSE sub-departments are responsible for implementation. The QHSE sub-departments and the Safety and Environment sub-department work together closely. They work at a number of levels according to the Deming cycle: 'PLAN', 'DO', 'CHECK' and 'ACT'.

In terms of the permits, including environmental permits, this means that the corporate Safety and Environment sub-department is responsible for maintaining the legislative framework and making sure that the Permits Centre functions well. The Permits Centre provides a point of contact for all employees and students of WUR with regard to legislation and regulations as well as serving as a point of contact for various competent authorities. In this way, it is possible to gain an overview of all permits held by WUR, thereby providing insight into the risks and permit regulations. The QHSE sub-departments are responsible for keeping the permits up to date and complying with the permit regulations. In this, the organisational components are dependent on each other and need to be able to trust in one another because environmental permits are issued not per organisational component but at the complex level.

A number of internal and external audits were carried out in 2018 for purposes of ISO certifications and a number of permits as well as for energy management, biological safety and radiation. In doing so, WUR has total insight in compliance with legislation and regulations.

WUR has specified its ambitions for sustainability and CSR in its Strategic plan. For more information, see paragraph 2.2 Implementing the WUR 2015-2018 strategic plan. At corporate level, the CSR group manages WUR's CSR strategy. The CSR group advises the Executive Board directly. The CSR group members are the director of Facilities and Services (chairperson); the director of Corporate Human Resources; the director of Corporate Communications & Marketing; a representative of the directors of the organisational components; the Manager of value creation; representative(s) from the Student Council; and a sustainability policy officer (secretary). The chairperson of the CSR group is accountable to the Executive Board/Board of Directors.

Legal entities
The objectives and activities of the separate legal entities in the WUR alliance (Wageningen University and Wageningen Research) are coordinated at strategic and tactical levels. Organisational components work together on operational management.

The Safety & Environment sub-department head is designated to act as the authorised permit holder on behalf of Wageningen University and Wageningen Research and to perform legal and other acts with regard to those institutions' responsibility for the following Dutch legislation:

- Environmental Permitting (General Provisions) Act
- Water Act
- Chemical Weapons Convention (Implementation) Act
- Nuclear Energy Act
- Excise Duty Act
- Opium Act
- Abuse of Chemical Substances (Prevention) Act
- GMO Decree

Accountability to competent authorities
Within the framework of environmental legislation, the competent authorities are reported to through the annual environmental report, the electronic annual environmental report (for the Multi-Year Agreement for Energy 3) and the annual radiation hygiene report.

In 2018 no significant fines or sanctions were imposed as a result of environmental contraventions. The National Contact Point did not report that WU or WR violated the OECD guidelines.

Communication
A Safety and Environment team site has been set up in SharePoint for the experts within Wageningen University & Research (Quality, Health & Safety and Environment column and other involved parties). The most important function of this team site is to provide digital access to all the relevant documents and to inform experts in the relevant fields. The regulation matrix for the Dutch Environmental Management Act permit for Wageningen Campus and WUR complex Lelystad is also on the team site. This matrix describes which level within the organisation is responsible for compliance with each regulation.

Employees and students of WUR are informed about environmental matters by means of intranet, the Permits Centre and the Sustainability pathway.

Training programmes
Within the Quality, Health & Safety and Environment column, employees participated in the following training programmes, courses and symposia:

- In-house emergency and first aid service team leader training session and refreshment exercises.
- In-house emergency and first-aid service training sessions, including basic and refreshment training for emergency and first-aid services, supplementary respiratory protection, and fire-extinguishing drills.
- Radiation hygiene courses
- Risk-based auditing according to ISO 19011:2018 (ESG)

Appendix 1. Glossary

Organisational

AFSG	Agrotechnology & Food Sciences Group
ASG	Animal Sciences Group
CS	Corporate Staff
CS+	Corporate Staff, including Wageningen International and Wageningen Academy
ESG	Environmental Sciences Group
E&EL	Energy & Exploitation Lelystad
FB	Facilities and Services
QHSE	Quality, Health & Safety and Environment (QHSE/KAM)
PPO	Applied Plant Research (Praktijkonderzoek Plant en Omgeving)
PSG	Plant Sciences Group
RIKILT	RIKILT – Institute for Food Safety
SSG	Social Sciences Group
V&M	Safety and Environment, Real Estate and Housing department, Facilities and Services
WBVR	Wageningen Bioveterinary Research (formerly Central Veterinary Institute, CVI)
WECR	Wageningen Economic Research (formerly LEI)
WENR	Wageningen Environmental Research (formerly Alterra)
WMR	Wageningen Marine Research (formerly IMARES)
WR	Wageningen Research
WU	Wageningen University
WUR	Wageningen University & Research

Terms

BSO	Biological Safety Officer
DBP	Animal by-products ('Dierlijke bijproducten')
Erbis	Energy registration, management and information system
GMO	Genetically Modified Organisms
GROS	Hazardous substances registration and investigation system ('Gevaarlijke stoffen Registratie- en Opsporingssysteem')
KEW	Dutch Nuclear Energy Act (*Kernenergiewet*)
KGA	Small Hazardous Waste ('klein gevaarlijk afval')
MJA-3	Multi-Year Agreement for Energy 3 ('Meerjarenafspraak Energie 3')
MJV	Annual environmental report ('Milieujaarverslag')
CSR	Corporate Social Responsibility
NCP	National Contact Point (OECD Guidelines)
NeR	Dutch Emission Guidelines for Air ('Nederlandse emissierichtlijn Lucht')
NVWA	Netherlands Food and Consumer Product Safety Authority ('Nederlandse Voedsel en Warenautoriteit')
OECD	Organisation for Economic Cooperation and Development
RvO	Netherlands Enterprise Agency ('Rijksdienst voor Ondernemend Nederland')
SZA	Specific Hospital Waste ('specifiek ziekenhuisafval')
Wabo	Dutch Environmental Permitting (General Provisions) Act (*Wet algemene bepalingen omgevingsrecht*)
CHP	Combined heat and power installation
WKO	Thermal storage system ('Warmte-Koude Opslag')
Wm	Dutch Environmental Management Act (*Wet milieubeheer*)

Appendix 2. Waste figures for 2018 (WUR, incl. third parties)

Appendix 2a. Quantity and composition of waste 2018 (in kg) for each organisational component

Waste flow	AFSG	ASG	CS+	ESG	FB	PSG	RIKILT	SSG	Third parties	Total	Processing (GRI)
Residual waste	93,937	293,306	30,339	59,359	102,844	282,910	16,120	22,771	52,394	953,980	Energy recovery
Organic waste/green waste/swill	43,714	1,897	1,753		65,432	86,140	6,291	18,541	298,213	521,981	Recycling (co-fermentation)
Construction/demolition/rubble	6,640			15,200	18,640	33,626		2,800		76,906	Recycling
Foil/plastics	10,041	5,647	766	633	14,680	13,920	2,278	2,092		50,057	Recycling
Glass	425	5,645	440	920	1,588	5,634	3,545	693	3,895	22,785	Recycling
Land						18,400				18,400	Miscellaneous
Wood	3,500			420	300	15,660				19,880	Recycling
Manure		64,740								64,740	Recycling
Metals						10,520				10,520	Recycling
Scrap		4,340								4,340	Recycling
Rock wool						3,400				3,400	Recycling
Greases/potato, fruit and vegetable						675				675	Recycling
Dates		107			25					132	Shredding + Recycling
Paper/cardboard	52,400	37,319	17,887	38,812	58,639	52,425	15,936	27,565	2,156	303,139	Shredding + Recycling
Hazardous waste	48,674	299,770		18,011	12,024	64,649	49,014	44	65,559	557,745	See appendix 2b
Total	**259,331**	**712,771**	**51,185**	**133,355**	**274,172**	**587,959**	**93,184**	**74,506**	**422,217**	**2,608,680**	
Separation %	**64%**	**59%**	**41%**	**55%**	**62%**	**52%**	**83%**	**69%**	**88%**	**63%**	

Appendix 2b. Hazardous waste (in kg) in 2018 (WUR, including third parties), broken down by EWC code

EWC code	EWC name	Weight	Processing method (in accordance with GRI)
020108*	Pesticides	18,077	Incineration
050108*	Tar waste	43	Other: ONO[7]
060105*	Concentrated inorganic acids / Nitric acid	7,913	Other: ONO
060106*	COD waste	1,093	Other: ONO
060204*	Various inorganic alkalis / Caustic soda	334	Other: ONO
060205*	Various inorganic alkalis / Kjeldahl waste	7,796	Other: ONO
060313*	Inorganic salts, soluble	854	Energy recovery
070103*	Organic liquid rich in halogens	594	Energy recovery
070104*/140603*	Low-halogen or halogen-free solutions	11,177	Energy recovery
070704*	Organic alkalis	12	Other: ONO
090101*	Photo chemicals mixed (kV) / photographic developer	88	Recycling
090104*	Fixative	80	Recycling
110105*	Various inorganic acids	206	Other: ONO
110106*	Organic acids	672	Other: ONO
130205*/130208*	Category II waste oil	400	Recycling
130508	Oil, water and slurry mixture	24,234	Recycling
140602*	Processing of solvents, halogen-rich	3,114	Other: ONO
150110*	Lab glass, thermal glass, empty packaging (unrinsed)	24,869	Incineration
150202*	Lab waste – filters, pipettes, toxic waste	5,890	Energy recovery
160107*	Oil filters	6	Recycling
160114*	Coolant	307	Distilling
160303*	Inorganic salts, non-soluble	6,801	Other: ONO
160305*	Organic waste mixed	2,170	Incineration
160601*	Lead batteries	219	Recycling
161001*	Low calorific mixtures (DTO)	6,619	Incineration
170503*	Oil-contaminated soil	2324	Energy recovery
170605*	Waste containing asbestos	69	Dumping (long-term storage)
180103*	specific hospital waste (SZA)/infectious waste/biological waste	227,398	Energy recovery
200121*	Fluorescent lamps / mercury waste	832	Recycling
200123*	White and brown goods	11,915	Recycling
200127*	Hazardous household waste/Toners	387	Energy recovery
200129*	Cleaners	39	Other: ONO
200133*	Batteries	513	Recycling
200135*	Cables	16	Recycling
200136	Electronics products / computers	433	Recycling
200199	Hazardous office waste	1,236	Energy recovery
200306	Sewage waste	33,989	Other: Wet soil cleaning
	Animal waste	153,902	Other: sterilisation, then processing into meat-and-bone meal for the production of biogas/biodiesel
Total		**557,745**	

[7] ONO stands for detoxification, neutralisation, and draining/dewatering ('ontgiften, neutraliseren en ontwateren')

Appendix 2c. Quantity of waste 2018 (in kg) per step of the Lansink Ladder (in accordance with GRI)

Waste flow	Step of the Lansink Ladder							Total
	Recycling	Energy recovery	Other: sterilisation, then processing into meat-and-bone meal for the production of biofuel	Other: detoxification, neutralisation, and draining/dewatering (ONO)	Other: Wet soil cleaning	Incineration	Dump	
Industrial waste	793,816	953,980						1,747,796
Paper	303,139							303,139
Hazardous waste	40,002	249,860	153,902	28,023	33,989	51,735	69	557,745
Total	**1,136,957**	**1,203,840**	**153,902**	**28,023**	**33,989**	**51,735**	**69**	**2,608,680**
Fraction	**44%**	**46%**	**6%**	**1%**	**1%**	**2%**	**0%**	

Appendix 2d. Total quantity of waste (kg) per municipality in 2018

Location – complex	Industrial waste	Hazardous waste	Paper	Total
Wageningen	1,095,429	284,802	258,408	1,638,639
Lelystad	395,547	253,365	23,054	671,966
Bleiswijk	90,104	1,266	5,320	96,690
The Hague	4,697	44	1,555	6,296
Den Helder	8,147	705	678	9,530
Drachten			535	535
Ede	33,604		1,216	34,820
Goes			200	200
Hengelo	1,229		480	1,709
IJmuiden	9,751	9,252	1,047	20,050
Leeuwarden	36,035	530	4,535	41,100
Lisse	7,874			7,874
Marwijksoord	1,056			1,056
Oisterwijk			220	220
Randwijk	16,430	96	1,950	18,476
Renkum	852			852
Sterksel	8,336		2,160	10,496
Valthermond	7,486			7,486
Vredepeel	22,674			22,674
Westmaas	5,163		1,200	6,363
Yerseke	3,382	7,685	580	11,647
Total	**1,747,796**	**557,745**	**303,139**	**2,608,680**

[1] An empty cell indicates that no figures are available.

[2] The industrial waste from the The Hague, Hengelo, Leeuwarden, Lisse, Marwijksoord, Sterksel, Valthermond, Vredepeel, and Westmaas locations is often not weighted. The figures have been calculated on the basis of volumes that have been disposed of and standard weights for that type.

Appendix 2e. Quantity and composition of waste in 2017-2018 (in kg) for each complex under Dutch Environmental Management Act (*Wet milieubeheer*)

	WURcomplex Lelystad		Wageningen Campus		Wageningen De Dreijen	
	2017	2018	2017	2018	2017	2018
Industrial waste						
Residual waste	195,752	199,234	509,134	561,613	31,638	14,243
Organic waste/green waste/swill	14,520	20,220	112,157	349,800	3,369	550
Construction/demolition/rubble	4,100		30,060	36,990		
Foil/plastics	1,460		55,791	45,654	210	204
Land	15,680	18,400	48,700			
Glass	2,816	1,440	9,666	16,577		
Wood	13,220	4,960	14,780	14,620	300	
Manure	4,140	64,740				
Metals	13,270	10,520				
Scrap			0	440		
Greases/potato, fruit and vegetable	3,720	675	0			
Dates	152		71	132		
Paper						
Cup2Paper	1,049	809	5,670	13,828	11	
Paper/cardboard	24,618	22,245	192,206	241,450	4,125	2,880
Confidential	0		0		1,520	
Hazardous waste						
Hazardous waste	55,197	147,059	139,285	244,087	14,810	14
Rendac	47,491	98359	21,593	40,701		
White and brown goods			6,029			
Total	**397,185**	**588,661**	**1,145,141**	**1,565,892**	**49,162**	**15,638**
Separation %	51%	66%	56%	64%	43%	20%

Appendix 2f. Quantity and composition of waste in 2018 (in kg) for each Wageningen Campus location

	Gaia/ Lumen	Atlas	Radix	Unifarm	Axis	Helix	Forum	Orion	Actio/ Nexus	Vitae	Zodiac
Residual waste	58,507	21,495	94,027	92,159	47,450	24,767	34,478	21,737	9,322	47,140	17,600
Cup2Paper	3,557	750	1,580	1,695	1,375	2,203			1,672	681	315
Paper/cardboard	35,255	15,512	22,900	8,610	28,772	17,905	31,940	10,050	9,115	15,255	11,330
Organic waste/green waste/swill		1,753	2,775		23,086	20,628	26,019	29,622	5,616	238,621	1,897
Scrap											440
Foil/plastics	633	540	1,614	12,480	6,101	3,940	9,124	2,664	786	2,116	5,462
Construction/demolition/rubble	8,000			12,350	6,640						
Wood	420			10,700	3,500						
Glass	920	125	879	4,880		425	513	650		7,115	720
Dates							25				107
Hazardous waste	10,911	7,100	16,940	45,050	26,634	15,655	2,107	8,106	34	104,692	6,858
Rendac											5,596
Total	**118,203**	**47,275**	**140,715**	**187,924**	**143,558**	**85,523**	**104,206**	**72,829**	**26,545**	**415,620**	**50,325**
Separation %	51%	55%	33%	51%	67%	71%	67%	70%	65%	89%	65%

(continued)	Carus	Innovatron	Triton	Nergena	Droevendaal	Hoge Born	Leeuwenborch	De Bongerd	Schoutenhoef
Residual waste	64,100		6,392	9,100	2,920	11,899	18,231	11,340	14,664
Cup2Paper									51
Paper/cardboard	1,555	2,145	1,375	755		2,156	25,055	1,765	1,165
Organic waste/green waste/swill							18,541	850	
Scrap									
Foil/plastics			226				1,960	450	
Construction/demolition/rubble							2,800		18,640
Wood									300
Glass			75			325	668	275	
Dates									
Hazardous waste									
Rendac	35,105								
Total	**100,760**	**2,145**	**8,068**	**9,855**	**2,920**	**14,380**	**67,255**	**14,680**	**34,820**
Separation %	36%	100%	21%	8%	0%	17%	73%	23%	58%

Appendix 2g. Quantity and composition of waste in 2018 (in kg) for each Lelystad location

	Edelhertweg 1	Edelhertweg 15	Houtribweg 39	Runderweg 4	Runderweg 6
Residual waste	27,378		95,640	74,736	9,475
Organic waste/green waste/swill	20,220				65,883
Construction/demolition/rubble					
Foil/plastics					
Land	18,400				
Glass		1,440			
Wood	4,960				
Cup2Paper	620	189			
Manure		64,740			
Metals	10,520				
Scrap					
Rock wool					
Greases/potato, fruit and vegetable	675				
Dates					
Animal waste					
Hazardous waste	11,453	3,494	132,112		7,947
Paper/cardboard	5,610		13,560		3,075
Rendac			82,428	15,931	
Total	**99,836**	**69,863**	**323,740**	**90,667**	**86,380**
Separation %	**73%**	**100%**	**70%**	**18%**	**89%**

Appendix 2h. Quantity and composition of waste in 2018 (in kg) for other locations

	Wageningen Economic Research The Hague	WMR	WLR	PSG
Residual waste	4,540	17,783	32,135	282,910
Organic waste/green waste/swill				86,140
Construction/demolition/rubble				33,626
Foil/plastics	132	12		13,920
Land				18,400
Glass	25	3,485		5,634
Wood				15,660
Cup2Paper	547			
Manure				
Metals				10,520
Scrap			3,900	
Rock wool				3,400
Greases/potato, fruit and vegetable				675
Dates				
Animal waste		7,950		
Hazardous waste	44	2,600	530	64,649
Paper/cardboard	1,008	2,305	4,535	52,425
Rendac		7,092		
Grand Total	**6,296**	**41,227**	**41,100**	**587,959**
Separation %	**28%**	**57%**	**22%**	**52%**

Appendix 2i Quantity of waste (in kg) in 2018 and 2017, broken down according to organisational component

	2018				
	Industrial waste	Paper	Hazardous waste	Total	Separation %
AFSG	158,257	52,400	48,674	259,331	64%
ASG	375,682	37,319	299,770	712,771	59%
CS+	33,298	17,887		51,185	41%
ESG	76,532	38,812	18,011	133,355	55%
Facilities and Services	203,509	58,639	12,024	274,172	62%
PSG	470,885	52,425	64,649	587,959	52%
RIKILT	28,234	15,936	49,014	93,184	83%
SSG	46,897	27,565	44	74,506	69%
Subtotal for WUR	**1,393,294**	**300,983**	**492,186**	**2,186,463**	**59%**
Third parties	354,502	2,156	65,559	422,217	88%
Total	**1,747,796**	**303,139**	**557,745**	**2,608,680**	**63%**

	2017				
	Industrial waste	Paper	Hazardous waste	Grand Total	Separation %
AFSG	157,925	42,645	60,504	261,074	56%
ASG	490,034	48,939	203,189	742,162	52%
CS+	32,058	13,990		46,048	35%
Facilities and Services	211,722	53,743	16,000	281,465	51%
ESG	51,825	33,950	17,083	102,857	68%
PSG	514,222	48,873	16,093	579,188	49%
RIKILT	29,862	14,889	49,672	94,423	80%
SSG	51,280	32,089	89	83,458	67%
Subtotal for WUR	**1,538,928**	**289,117**	**362,630**	**2,190,675**	**54%**
Third parties	330,252	6,651	59,525	396,428	83%
Total	**1,869,180**	**295,768**	**442,155**	**2,587,103**	**58%**

Notes to Table 4:

1. The household waste produced by the Netherlands Food and Consumer Product Safety Authority (NVWA) is disposed of through RIKILT. Hazardous waste and specific industrial waste flows are disposed of independently and listed under 'Third parties on WUR site'.
2. In the case of multi-tenant buildings, the waste is assigned to the main tenant.
3. Each year, PSG composts 600 tonnes of green waste from the greenhouses and garden waste on Wageningen Campus. Every year, Applied Plant Research in Lelystad co-ferments approximately 81 tonnes of green waste in its own co-fermenter. Because this creates a closed waste cycle, it is not counted as waste.

Appendix 2j Hazardous waste (in kg) in 2012-2018, broken down according to organisational component

Organisational component	2012	2013	2014	2015	2016	2017	2018
AFSG	54,549	42,794	44,610	45,222	51,820	60,504	48,674
ASG	94,062	149,948	158,932	154,690	201,792	203,189	299,770
CS+		4					
Facilities and Services	8,448	2,091	7,985	11,280	10,901	16,000	12,024
ESG	14,162	7,437	18,412	13,876	15,425	17,083	18,011
PSG	37,898	10,406	38,986	49,132	31,184	16,093	64,649
RIKILT	25,242	28,348	36,890	35,706	40,817	49,672	49,014
SSG		75	117	58	186	89	44
Subtotal for WUR	**234,361**	**241,103**	**305,932**	**309,964**	**352,125**	**362,630**	**492,186**
Third parties	26,865	49,729	52,503	47,390	50,622	59,525	65,559
Total	**261,226**	**290,832**	**358,435**	**357,354**	**402,747**	**422,155**	**557,745**

Appendix 3. Energy consumption 2005 and 2009-2018

Energy consumption	Electricity (kWh)	Natural gas (Nm^3)	Energy (GJ)	Tonnes of CO_2:
2018	50,385,528	5,362,499	623,193	9,606
2017	51,558,971	5,477,413	637,391	9,812
2016	54,930,781	6,302,302	693,845	11,290
2015	55,660,591	6,503,170	706,771	11,650
2014	57,129,458	6,273,363	712,717	12,095
2013	59,167,202	7,864,487	781,416	14,976
2012	59,559,676	8,324,624	799,511	15,806
2011	58,986,867	8,103,014	788,522	15,400
2010	59,522,471	9,720,625	844,550	53,447
2009	62,844,056	9,133,439	855.927	53,762
2005	59,581,768	11,031,812	886,033	53,598
Energy consumption compared with 2005	**Electricity (kWh)**	**Natural gas (Nm^3)**	**Energy (GJ)**	**Tonnes of CO_2:**
2018	85%	49%	70%	18%
2017	87%	50%	72%	18%
2016	92%	57%	78%	21%
2015	93%	59%	80%	22%
2014	96%	57%	80%	23%
2013	99%	71%	88%	28%
2012	100%	75%	90%	29%
2011	99%	73%	89%	29%
2010	100%	88%	95%	100%
2009	105%	83%	97%	100%
2005	100%	100%	100%	100%

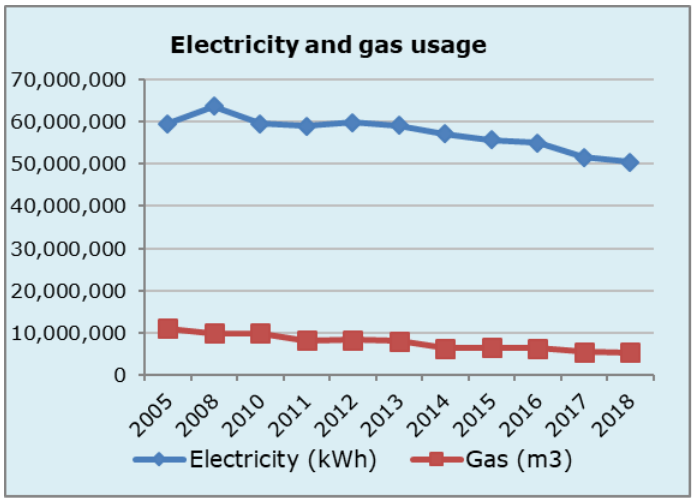
Energy consumption Complexes, 2016	Electricity (kWh)	Natural gas (Nm^3)	Energy (GJ)	Tonnes of CO_2:
Wageningen Campus	39,532,894	2888.310	447,211	5,174
Dreijen	3,671,806	853,963	60,074	1,530
Lelystad	9,384,781	2,135,210	152,042	3,825
Other	2,341,300	424,819	34,517	761
Total	**54,930,781**	**6,302,302**	**693,845**	**11,290**

Energy consumption Complexes, 2017	Electricity (kWh)	Natural gas	Energy (GJ)	Tonnes of CO_2:
Wageningen Campus	39,599,681	2,721,807	442,542	4,876
Dreijen	628,734	268,242	14,148	481
Lelystad	9,075,623	2,067,560	147,119	3,704
Other	2,254,933	419,804	33,581	752
Total	**51,558,971**	**5,477,413**	**637,391**	**9,812**

Energy consumption Complexes, 2018	Electricity (kWh)	Natural gas	Energy (GJ)	Tonnes of CO_2:
Wageningen Campus	39,832,066	2,817,285	447,656	5,047
Dreijen	558,796	169,717	10,401	304
Lelystad	7,813,383	1,964,528	132,498	3,519
Other	2,181,283	410,698	32,639	736
Total	**50,385,528**	**5,362,498**	**623,193**	**9,606**

Floor area in m^2 GFA	2018	2017	2015	2008
Wageningen Campus	260,877	256,454	243,208	
De Dreijen	37,253	44,733	77,693	
Lelystad	117,603	113,867	108,898	
Other	42,365	41,989	37,700	
Total	**458,097***	**457,043***	**467,499***	**605,618**
Specific consumption	**2018**	**2017**	**2015**	**2008**
Natural gas (GJ/m^2)	0.373	0.379	0.440	0.654
Electricity (GJ/m^2)	0.999	1.018	1.074	1.132
Total	**1.369**	**1.395**	**1.512**	**1.785**

*Including vacancy, including from Duivendaal, De Dreijen and Edelhertweg Lelystad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30,000,000
20,000,000
10,000,000
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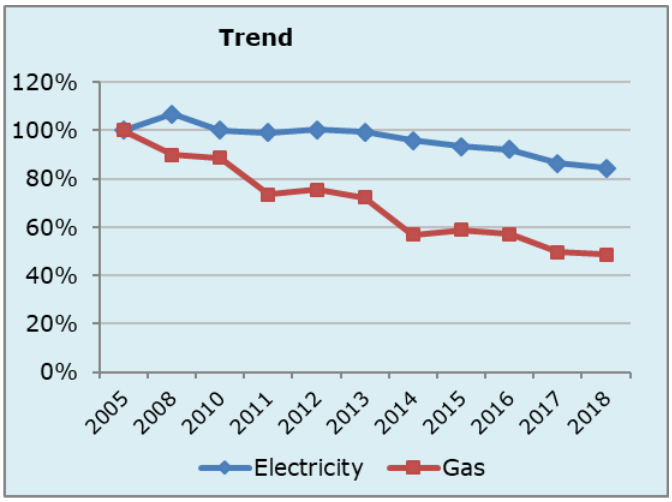
2005
2008
2010
2011
2012
2013
2014
2015
2016
2017
2018
Electricity (kWh)
Gas (m3)


Trend
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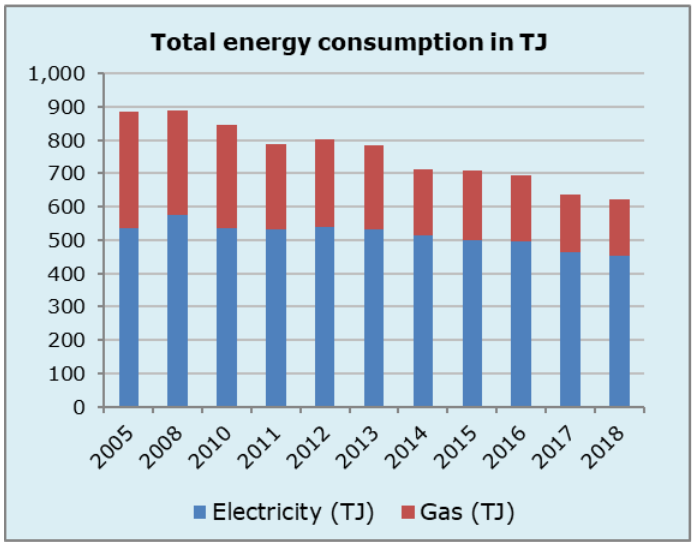
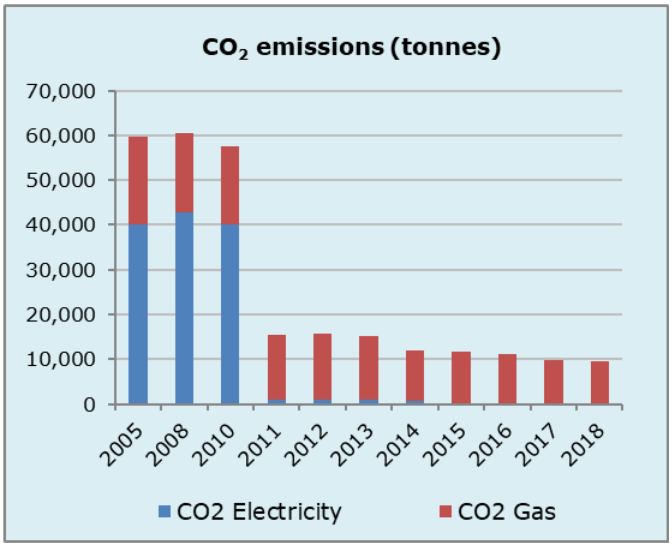
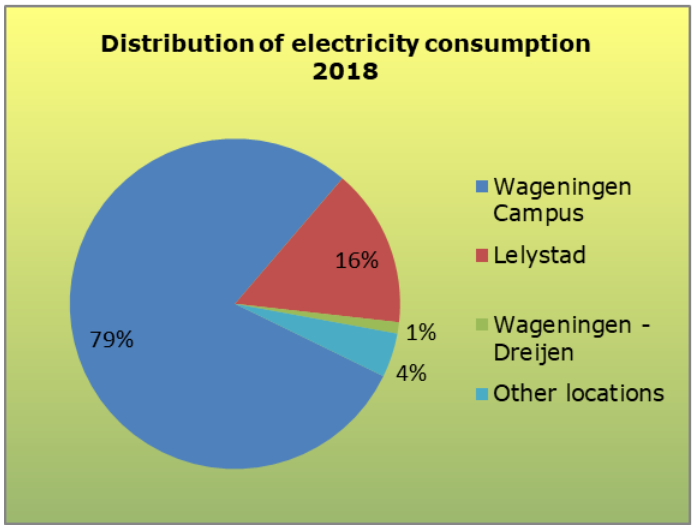
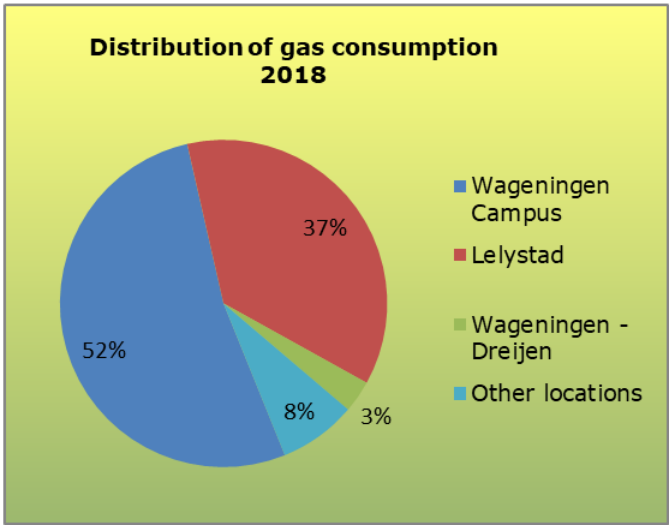
100%
80%
60%
40%
20%
0%
2005
2008
2010
2011
2012
2013
2014
2015
2016
2017
2018
Electricity
Gas


Total energy consumption in TJ
1,000
900
800
700
600
500
400
300
200
100
0
2005
2008
2010
2011
2012
2013
2014
2015
2016
2017
2018
Electricity (TJ)
Gas (TJ)


CO2 emissions (tonnes)
70,000
60,000
50,000
40,000
30,000
20,000
10,000
0
2005
2008
2010
2011
2012
2013
2014
2015
2016
2017
2018
CO2 Electricity
CO2 Gas


Distribution of electricity consumption 2018
16%
1%
4%
79%
Wageningen Campus
Lelystad
Wageningen - Dreijen
Other locations


Distribution of gas consumption 2018
37%
52%
8%
3%
Wageningen Campus
Lelystad
Wageningen - Dreijen
Other locations

Appendix 4. Water/waste water consumption 2005-2018

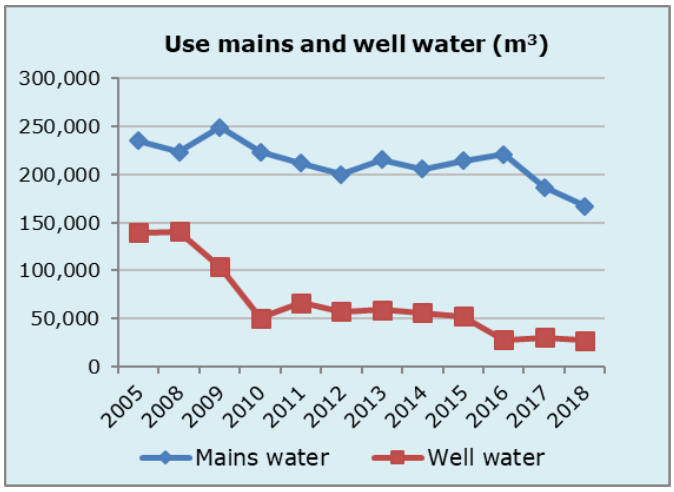
Water/waste water use	Mains water (m^3)	Well water (m^3)	CO_2 mains water (kg)	CO_2 well water (kg)
2018	167,062	27,711	50,119	8,313
2017	186,372	30,638	55,539	9,130
2016	220,374	27,912	62,299	8,318
2015	213,986	52,434	63,936	15,625
2014	205,258	56,177	61,578	18,474
2013	215,055	59,402	64,517	17,821
2012	199,622	57,587	59,887	17,276
2011	211,265	66,524	63,380	19,957
2010	222,863	50,595	66,859	15,179
2009	248,477	103,720	74,543	31,116
2008	223,091	140,806	66,927	42,242
2005	223,091	140,806	66,927	42,242
Water/waste water use compared with 2005	**Mains**	**Well water (m^3)**	**CO_2 mains water**	**CO_2 well water**
2018	71%	20%	71%	20%
2017	79%	22%	79%	22%
2016	94%	20%	89%	20%
2015	91%	38%	91%	38%
2014	88%	40%	88%	40%
2013	92%	43%	92%	43%
2012	85%	41%	85%	41%
2011	90%	48%	90%	48%
2010	95%	36%	95%	36%
2009	106%	74%	106%	74%
2008	95%	101%	95%	101%

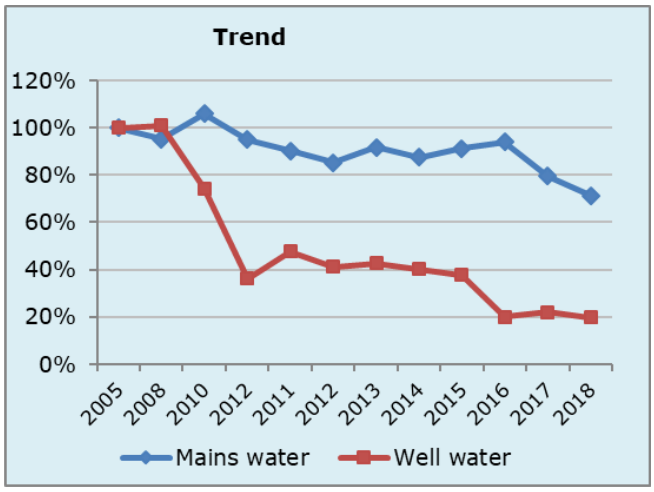
Water usage /waste water by complex 2015	Mains water (m^3)	Well water (m^3)	CO_2 mains water (kg)	CO_2 well water (kg)
Dreijen	25,815	22,615	7,693	6,739
Wageningen Campus	90,589	28,738	26,996	8,564
Lelystad	82,762	0	24,663	0
Other	15,383	1,081	4,584	322
Total	**214,549**	**52,434**	**63,936**	**15,625**

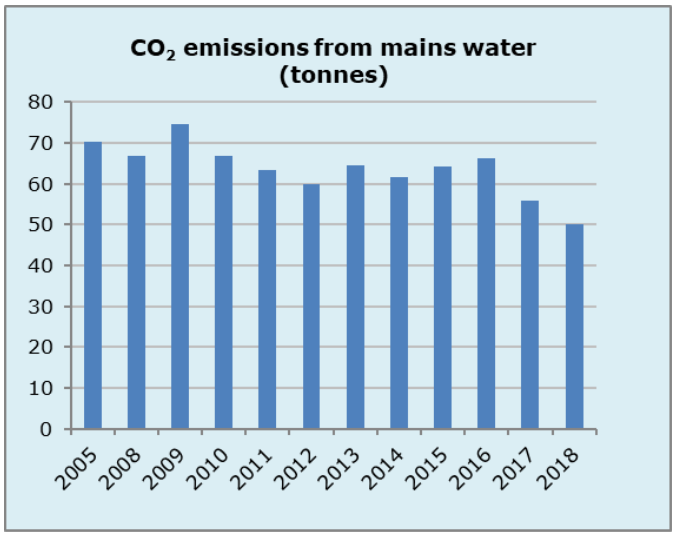
Water usage / waste water by complex 2016	Mains water (m^3)	Well water (m^3)	CO_2 mains water (kg)	CO_2 well water (kg)
Dreijen	39,907	666	11,868	198
Wageningen Campus	100,860	26,444	26,827	7,880
Lelystad	65,227		19,319	0
Other	14,379	802	4,285	239
Total	**220,374**	**27,912**	**62,299**	**8,318**

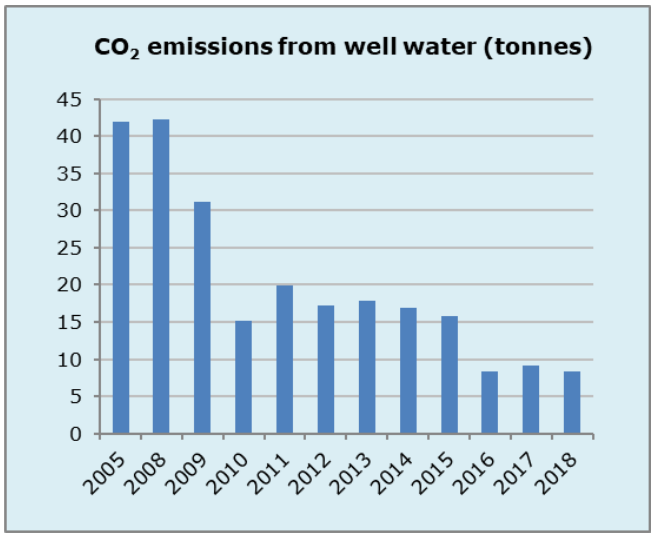
Water usage / waste water by complex 2017	Mains water (m^3)	Well water (m^3)	CO_2 mains water (kg)	CO_2 well water (kg)
Dreijen	13,842		4,125	
Wageningen Campus	103,781	29,295	30,927	8,730
Lelystad	58,656		17,479	
Other	10,093	1,343	3,008	400
Total	**186,372**	**30,638**	**55,539**	**9,130**

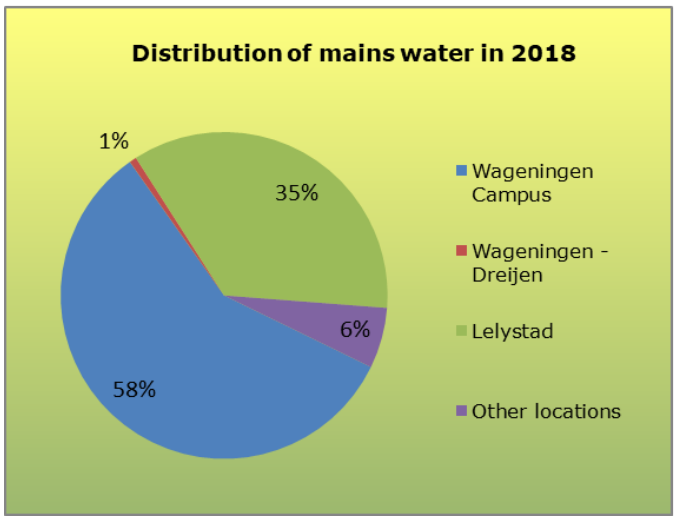
Water usage / waste water by complex 2018	Mains water (m^3)	Well water (m^3)	CO_2 mains water (kg)	CO_2 well water (kg)
Dreijen	1,191		355	
Wageningen Campus	96,888	23,877	28,873	7,115
Lelystad	58,956		17,659	
Other	10,027	3,834	2,988	1,143
Total	**167,062**	**27,711**	**49,784**	**8,258**

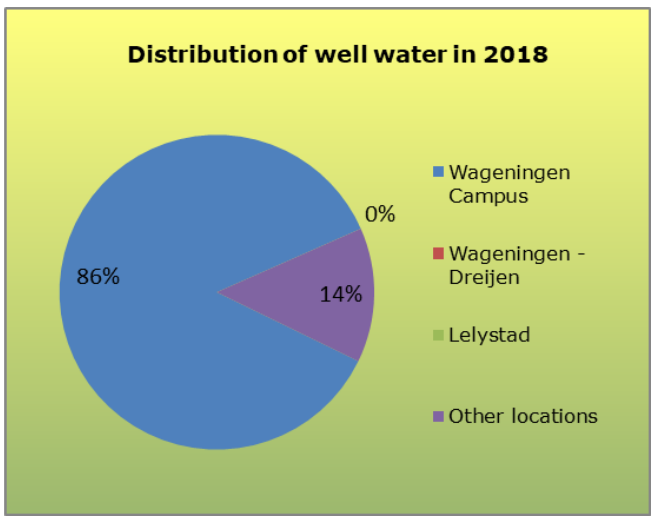

Use mains and well water (m³)
300,000
250,000
200,000
150,000
100,000
50,000
0
2005
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
Mains water
Well water


Trend
120%
100%
80%
60%
40%
20%
0%
2005
2008
2010
2012
2011
2012
2013
2014
2015
2016
2017
2018
Mains water
Well water


CO2 emissions from mains water (tonnes)
80
70
60
50
40
30
20
10
0
2005
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018


CO2 emissions from well water (tonnes)
45
40
35
30
25
20
15
10
5
0
2005
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018


Distribution of mains water in 2018
1%
35%
6%
58%
Wageningen Campus
Wageningen - Dreijen
Lelystad
Other locations


Distribution of well water in 2018
0%
86%
14%
Wageningen Campus
Wageningen - Dreijen
Lelystad
Other locations