



WAGENINGEN
UNIVERSITY & RESEARCH

Annual environmental report 2016

Report of the environmental results of
Wageningen University & Research

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1 Introduction

Each year, Wageningen University & Research (WUR) issues an annual environmental report. With this report, WUR provides a picture of its activities relating to the environment and complies 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/complex as far as possible. The large environmental permits (at complex level) include regulations with which WUR's annual environmental report must comply. 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 the cognisance of the competent authority. The environmental report must cover the following subjects at a minimum: 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 regards 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 and/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 2016-2018 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.

Structure of this document

Chapter 2 sets out WUR's policy and the concomitant goals for 2016. Chapter 3 discusses the results achieved in 2016 in the environmental policy areas. Permit regulations and changes to these, as well as audits carried out, are explained in chapter 4. Chapter 5 presents the incidents and complaints which occurred in 2016. Chapter 6 sets out the results of the sustainability policy of WUR. And finally, chapter 7 explains the organisation of WUR's Quality, Health & Safety and Environment column.

2 Environmental policy and environmental objectives of WUR

The environmental policy of WUR is focused on:

1. Complying with or exceeding the current legislation and regulations.
2. The formulated sustainability ambition.

In addition to the statutory framework, WUR has formulated a sustainability ambition. WUR has chosen to be a 'pioneer' in terms of its operational management. 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 the WUR 2015-2018 strategic plan.

1. Complying with the regulations for the environmental permits

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) 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

WUR consists of various sciences groups and components (see figure 1).

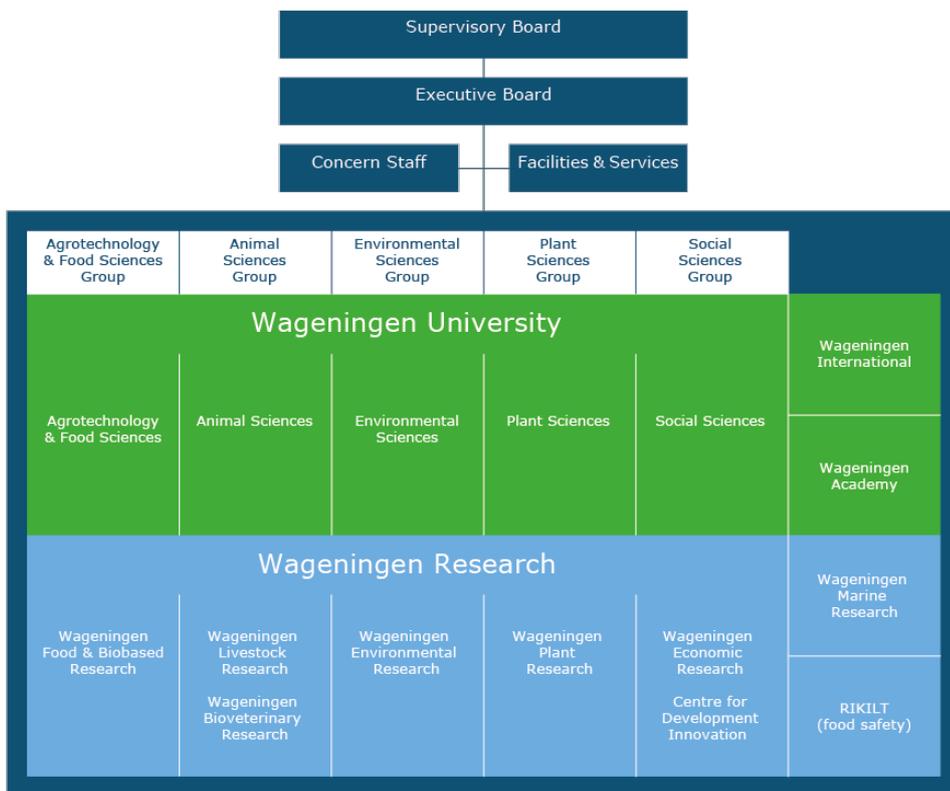


Figure 1. Organigram WUR

The various organisational components are distributed across 26 different locations, and clustered in complexes for which environmental permits have been issued (see Table 1).

Table 1. Overview of the organisational components falling under the various (and complex) environmental permits as of 01 January 2016

Locations	Wageningen Campus	De Dreijen Wageningen	WUR complex Lelystad	WBVR Houtribweg Lelystad	Other Wageningen	Other locations
Agrotechnology & Food Sciences Group (AFSG)	X	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

7. De Bongerd Sports Centre, Belmonte Botanical Garden

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)

2. Implementing the WUR 2015-2018 strategic plan

Sustainability is an important pillar within the primary process of research and education. This is expressed in the mission, 'To explore the potential of nature to improve the quality of life,' and in the ambition to take a leading role in the area of sustainable operational management. In the [2015-2018 Strategic Plan](#) risks and opportunities have been formulated in regards to sustainability and Corporate Social Responsibility (CSR). WUR is developing a clear and recognisable CSR strategy. The core of this strategy consists of making decisions in such a way that scientific, social and economic interests balance each other out. We make integral considerations for everything that we do, whereby our responsibility reaches further than WUR's own activities, for example through sustainable purchasing.

The basic principle for sustainable operational management is: *achieving a balance in the current social, environmental and economic needs without endangering future needs*. Choosing the ambition of 'pioneering' means that WUR acts on and promotes sustainability in its operational management in an integrated way. Sustainability is also an inherent aspect of our decision-making process, as is the application of proven technology. The high scores for official benchmarks such as SustainaBul, GreenMetric and Transparency Benchmark illustrate how successful WUR is in increasing the sustainability of its operational management. Sustainability activities will be discussed in chapter 6. An overview of key figures, goals formulated and results for 2016 can be found in paragraph 6.3.

3 Environmental policy areas

The regular work activities falling under the environmental policy areas were carried out in 2016. These policy areas are: energy, waste, water and waste water, noise, air, flora and fauna (biodiversity), biosafety, external safety, substances hazardous to the environment, transport and sustainable building. The paragraphs below present the results achieved in 2016 for the proposed actions and targets from the 2016-2018 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 use, generating sustainable energy and/or purchasing sustainable energy generated elsewhere.

WUR will comply with the commitments which 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 2013-2016 energy efficiency plan are being carried out, including the sustainable energy supply project for Campus Noord.
- The 2017-2020 energy efficiency plan was laid down in 2016 and will be implemented in the coming period.
- The energy incentive has been rolled out. In order to give the organisational components insight into their energy consumption and further stimulate energy saving, they will be made responsible for their own budgets. Reference years have been established for PSG (2011), ASG (2013), ESG (2013), SSG (2014) and AFSG (2017).

Energy consumption

The energy use in 2016 for WUR's buildings and installations is listed in Table 2, below, and in appendix 3.

Table 2. WUR energy consumption and energy performance in the reference year 2005 and in 2013-2016

Year	2016	2015	2014	2013	2005
Electricity (kWh)	54,930,781	55,660,591	57,129,458	59,190,720	59,581,768
Natural gas (Nm ³)	6,302,302	6,503,170	6,273,363	7,985,127	11,031,812
Primary energy (GJ)	693,845	706,771	712,717	785,446	886,033
CO ₂ (tonnes)	11,290	11,650	12,095	15,192	53,598
Energy performance		%		%	% corrected
	2016 as compared to 2015		2016 as compared to 2005		2016 as compared to 2015
Electricity (kWh)		-1.3%		-8%	-1.0%
Natural gas (Nm ³)		-3.1%		-43%	-5.5%
Primary energy (GJ)		-1.8%		-22%	-2.3%
CO ₂ (tonnes)		-3.1%		-79%	-5.5%

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 most Dutch universities. For the connections belonging to major users (approximately 95% of total use) of electricity, natural gas and water, the certified monitoring companies deliver validated measurement data on a monthly basis. For the smaller connections, the meter readings are taken on a regular basis, usually monthly and usually manually. For keeping track internally of use by individual buildings and even individual users, private interim meters are used. In a number of extraordinary cases where it is not possible to install a meter, energy use is attributed on the basis of the distribution from the location account.

Use 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. To make the corrections for cooling and heating, we use the official figures which are released annually by the Netherlands Enterprise Agency (RVO.nl).

Energy efficiency

The WUR 2030 Energy Vision was approved in 2014. The starting point is reliable, affordable energy provision in which sustainability takes a central role. Increased sustainability is to be achieved through the following methods, listed in order of priority:

1. reducing energy use
2. generating sustainable energy
3. compensating CO₂ emissions

1. Energy savings

Despite a rise in student numbers, WUR has used less energy. We have achieved energy savings by improving our use of existing buildings, effectively using heat pumps, using more heat-recovery technology and using LED lamps. We also used the 'building management system' to fine-tune air-conditioning systems. As the thermal heat storage system began to serve three more buildings in 2015, the existing cooling machines used considerably less energy in 2016.

We reduced energy use by 2.3% in 2015 as compared to 2014. This includes the correction for the influence of climate on cooling and heating. Without correction, energy use was reduced by 1.8%. This means that the MJA-3 target was reached in 2016 as well.

We achieved this reduction in spite of the continued increase in student numbers. The savings were achieved in part by improving the use of existing buildings, optimal use of heat pumps, application of heat recovery and use of LED lighting. Climate control was optimised further via the building management system. The expansion of the thermal storage system in 2015, which now cools of three more buildings, resulted in a significantly decrease in the energy consumption of existing refrigeration units.

IT energy consumption

WUR also specifically monitors its energy use for IT. In 2016 the data centres used a total of 1.57 million kWh. In 2015 this number was 1.55 million kWh. In addition, the energy balances and monitoring data reveal that the buildings used approximately 3.75 million kWh for IT. In 2016 WUR used a total of approximately 5.3 million kWh of electricity for IT. This works out to 332 kWh per student or employee and 11 kWh per square metre. The electricity used by IT makes up 7% of WUR total electricity consumption.

Energy savings in organisational components

The energy incentive encouraged organisational components to implement energy-saving measures at their location. The projects at RIKILT and PSG provide some examples of this:

- Alongside introducing Polaris III (a 30-cubic-metre, low-energy, -80°C storage unit across four floors), PSG installed LED light bulbs in Radix West and two climate cells, as well as window switches on the fume cupboards in Radix (middle).
- RIKILT optimised the energy use of the cooling and freezer unit by replacing the old freezer units with low-energy freezers. It also researched whether it could install a central cooling and freezer storage unit and tested out LED lamps in the corridors.

2. Generating sustainable energy

In 2016 WUR generated sustainable energy on a large scale. The wind turbines in Lelystad generated more than 58 million kWh in 2016. This is in part due to less favourable 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 solar panels (see Table 3). When WUR's total energy consumption is corrected for the influence of climate, 87% of the energy consumed was generated using sustainable methods.

3. Compensating CO₂ emissions

The reduction in energy and the purchase of 100% green wind energy (registered with Certiq) reduced CO₂ emissions from electricity and natural gas consumption by 79% in comparison with the baseline year 2005.

Table 3. Sustainable energy generated by WUR in 2016 (in primary GJ)

Source	2016	Type of energy
Lelystad wind turbines ¹	526,714	GJ
Bio-CHPs ²	13,327	GJ
Wageningen Campus thermal storage	62,602	GJ
Solar panels ³	1,005	GJ
Total	603,556	GJ
Energy consumption	693,845	GJ
Energy consumption corrected for climate influences	690,387	GJ
Sustainable generation as a percentage of total energy consumption	87%	

¹ Refers to the three wind farms in Lelystad owned by WUR.

² ACRRES Lelystad and De Marke Hengelo. The installation at Dairy Campus Goutum and VIC Sterksel is being managed by an external party.

³ ACRRES Lelystad, Imares Yerseke (2014), KTC de Marke Hengelo, Sinderhoeve Renkum (2015) and Sports Centre De Bongerd (2016).

3.2 Waste

WUR has three main waste flows: industrial waste, paper waste and hazardous waste. The waste policy relating to these waste flows was established in 2013. This annual environmental report includes the waste figures of the locations, buildings and activities (including from third parties) which have been granted permits, unless specified otherwise.

Table 4. Total amount of waste produced by WUR in 2016, 2015 and 2014 (in kg)

Source	2016	2015	2014
Industrial waste	1,548,002	1,291,922	1,361,400
Paper waste	296,788	295,184	329,447
Hazardous waste	352,125	309,964	305,932
Total WUR (excluding third parties)	2,196,915	1,897,070	1,996,779
Waste produced by each employee	447	379	391
Waste produced by each student	195	183	209
Waste produced by each employee and student	135	123	136

Please see appendices 2i and 2j for a breakdown of each organisational component. Annex 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.

The increase in the amount of industrial waste in 2016 (+ 256 tonnes) may be due to a large increase in the amount of residual waste (+ 189 tonnes). This was a result of removal activities in divested buildings at De Dreijen (Wageningen) and Edelhertweg 15 (Lelystad). Construction activities at Sterksel, Nexus and other locations increased the amount of building-related waste (+ 34 tonnes). The amount of hazardous waste increased by 42 tonnes, in particular because of a strong increase in the amount of animal waste (+ 35 tonnes) resulting from the variation in research activities. The increase in the amount of waste on Wageningen Campus is due to the commissioning of the Helix building and the more intense use of teaching and other facilities (as a result of the increase in student numbers).

Hazardous waste

By hazardous waste, we mean all waste that is hazardous to humans, animals and the environment, as defined in article 1.1, paragraph 1 of the Dutch Environmental Management Act. The hazardous waste must not find its way into the environment but must be handled in an appropriate, sustainable manner. Because the hazardous waste flow is varied, there are many different types of end processors. Examples are the recovery of metals (from fixatives, batteries, lamps, electronics, etc.); recycling of glass; reuse of oil; and decontamination, neutralisation and dehydration of watery mixtures containing acids or bases.

The hazardous waste flows are specified in appendix 2b. The most important waste flows within WUR are laboratory waste, specific hospital waste, hazardous office waste and animal waste material. Due to the health risks, the Specific Hospital Waste and animal waste material, approximately 65% of the total, must be processed by the specialist companies Zavin (burning with energy recovery) and Rendac (destruction, production of biofuel). Approximately 13% of the hazardous waste produced by WUR is toxic and must be burned in a rotary drum furnace (with energy recovery). As a result of the high temperature in the furnace and the scrubbing of the flue gases, nothing is left of the toxic substances. The nearest rotary drum furnace is just across the border in Germany.

Waste processing

WUR's approach to waste management follows Lansink's Waste Hierarchy. In practice, this means that waste management is organised so as to give priority to the most environmentally friendly processing methods (see also the [WUR waste policy](#)). Annexes 2a, 2b and 2c specify the amounts of waste in each waste flow and how these flows are processed. 53% of the waste is collected as a separate waste flow. This figure is lower than in 2015, given the exceptionally large increase in residual waste resulting from the divestment of De Dreijen and Edelhertweg 15. 97% of the waste is processed 'usefully' (37% recycling, 60% for another useful application).

Waste separation

In 2016, we were once again able to improve how effectively we separate waste produced during daily activities. The 'EcoSmart' concept was introduced in 2016 at Leeuwenborch, Axis, Helix, Transitorium and the middle Chemistry Building. There was also a further increase in the number of locations that now separate 'plastic mix' and 'organic waste and swill'. This has improved how the following waste is collected:

- Cup2paper cups (+2 tonnes, +39%)
- SWILL/GFT (+30 tonnes, +15%)
- Plastic mix and foil (+8 tonnes, +24%).

Annex 2f (Wageningen Campus), 2g (Lelystad) and 2h (other locations) specifies the composition of waste and the separation percentages achieved at each location. The separation percentages achieved differ as a result of two factors: the level of enthusiasm with which each location implemented separation systems and the differences in activities at the locations (company canteen, scope of laboratory activities, conversion activities).

Waste vision

We started formulating our 'Waste vision for 2025' in 2016 and are yet to finalise it.

3.3 Water and waste water

Water consumption decreased in 2016 compared with 2015. The faulty well-water system at De Dreijen was decommissioned at the beginning of 2016, resulting in a large drop in well-water consumption. However, as De Dreijen eventually remained in use for a longer period of time, the location's mains-water consumption increased. Water consumption (both mains and well water) on Wageningen Campus, in Lelystad and at other locations decreased. The water consumption in 2016 for Wageningen University and Research's buildings and installations is listed in Table 6, below, and in appendix 4.

Table 6. WUR water consumption and water performance in the reference year 2006 and in 2014-2016

Year	2016	2015	2014	2005
Mains water (m ³)	209,058	214,549	205,258	234,503
Well water (m ³)	27,912	52,434	56,177	139,518
Performance	% 2016 as compared to 2005	% 2015 as compared to 2005	% 2014 as compared to 2005	
Mains (%)	-11%	-9%	-12.5%	
Well (%)	-80%	-62%	-59.7%	

Only normal activities were carried out in 2016. Waste-water samples are regularly taken for analysis from various locations in Wageningen and Lelystad. In 2016, one random sample exceeded the discharge standard. More detailed research revealed that this was an incident caused by plant-based materials that had not been removed by the sand

filter. Preventive measures were then implemented, and the incident was reported to the Vallei en Veluwe water board. This incident also had no further negative environmental effects.

3.4 Soil

No soil research was carried out in 2016.

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 is working on systematically testing 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 2016:

- Demolition of Q5 and new build of Phenomea (Campus)
- Completion of Orion (Campus)

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 noise sources. The noise measures will be a part of construction projects or activities.

3.6 Air

Regular activities are carried out in relation to the Dutch Emission Guidelines for Air (*Nederlandse emissierichtlijn Lucht, NeR*).

3.7 Flora and fauna

In 2013 the [flora and fauna policy](#) for Wageningen Campus was established. The fundamental principles were:

- Complying with or exceeding current relevant legislation and regulations.
- Complying with the requirements and wishes of WUR, whereby education and research are the priorities and the operational management facilitates and is secondary to these functions. Where possible, strengthening biodiversity on Wageningen Campus through education and research.
- Maintaining biodiversity by means of a well-considered maintenance approach.

We began to reassess our flora and fauna policy in 2016. This reassessment will continue in 2017.

Dutch Flora and Fauna Act/Nature Conservation Act

In connection with the proposed demolition of various buildings, a flora and fauna quick scan was carried out in 2016. Habitat suitability evaluations were also carried out in the local environment. If it was found that the demolition work causes negative effects and contraventions of the Flora and Fauna Act or the Nature Conservation Act, further study was carried out. On the basis of the scans and evaluations, exemption procedures were implemented and/or mitigating measures were carried out.

The following projects were specifically carried out in 2016:

- Due to the proposed demolition of four staff residences on the Houtribweg in Lelystad in 2015, flora and fauna quick scans were carried out. This led to carrying out a year-round investigation which will be performed in the course of 2016. This investigation did not reveal any peculiarities.
- The proposed demolition of a former laboratory on Runderweg 6 (Lelystad) prompted a quick scan for flora and fauna. This then led to additional research that was carried out in 2017.
- The proposed demolition of a farmyard barn on Kielekampsesteeg 1 (Wageningen) prompted a quick scan for flora and fauna. This then led to additional research that started in 2017.

- The construction of the Phenomea building and the demolition of the former Klimaatgebouw on Bornse Weilanden prompted exploratory nature research, which in turn led to follow-up actions.
- The proposed expansion of Wageningen Bioveterinary Research (WBVR) on Houtribweg (Lelystad) prompted exploratory nature research, which in turn led to follow-up actions.
- The creation of a new car park and tree-felling activities at WBVR (Lelystad) prompted a tree survey and more detailed research, which in turn led to further follow-up actions. To comply with the Dutch Forestry Act (*Boswet*), we reported the tree-felling activities to the Netherlands Enterprise Agency ('Rijksdienst voor Ondernemend Nederland,' RVO).
- The proposed demolition of the sundry buildings on Edelhertweg 16 (Lelystad) prompted a year-round nature-value survey in 2015. Due to the introduction of the new Nature Conservation Act (*Nieuwe Natuurwet*), the application process for a permit was not started in 2016, but in 2017.
- Planting new trees due to the obligation to replant. Various trees were planted in 2016.

Felling licences and the obligation to replant

Due to renovation, demolition, construction and infrastructure adjustments, a great deal has changed on the WUR grounds. It was necessary to fell trees in many of these circumstances.

Various diseased trees and/or trees posing risk to their environment (for example in case of a storm), have also been felled. The table of permit applications (paragraph 4.2, Table 8) details the number of felling permits granted in 2016 on the condition that trees be replanted.

Up to 2013, the Wageningen Campus' zoning plan was used as the guide for compensating felled trees. One component of this entailed planting lanes of oak trees to connect with the linear structures of the Binnenveld's cultural landscape. For this reason, 249 oak trees (*Quercus robur*) were planted along the Droevendaalsteeg, Bornse Weilanden and Bronland. These oak lanes were considered to be compensation for indigenous trees felled up to 2016, to the extent that it was not possible or realistic to replace the same species of tree in the same locations. Up to 2015, this concerned 104 of the 249 trees planted. In 2016, all felled trees were compensated as part of an integrated 'greening' plan for the campus. Tree species are selected in consultation with the municipality (if this relates to the bus lane and Helix). In addition, WUR has planted various trees that represent the organisation's fields of work. We have planted 325 trees in total, 293 of which are indigenous to the Netherlands. As 268 trees were felled for the bus lane and Helix, we have achieved an 'overcompensation' amounting to 57 trees. This figure does not include the 135 apple trees that were planted as part of the 'Timeline of apple production' project ('Tijdlijn van de appelproductie').

Monumental trees

In 2016, the municipality carried out a survey of the monumental trees within its borders.

This survey indicated fourteen trees on WUR's grounds that are now on the monumental tree register. These are:

- Bornsesteeg 48: 4 *Quercus robur*, 1 *Fagus sylv. Pendula*, 1 *Tilia tomentosa*.
- Duivendaal complex: 1 *Platanus acerifolia*, 1 *Fagus syl. Atropunicea*, 2 *Acer pseudoplatanus*, 1 *Aesculus carnea*, 1 *Quercus robur*, 1 *Fraxinus excelsior*.
- Bennekomssteeg: 1 *Quercus robur*.

3.8 Biosafety

The new Decree and regulations on genetically modified organisms (GMO) (*Besluit en Regeling genetisch gemodificeerde organismen*) came into effect on 1 March 2015. The permit requirement for 'contained use' on levels 1 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. Bureau GGO grants permits for the other 'containment levels', with each level requiring a separate permit.

The Human Environment and Transport Inspectorate (IL&T), part of the Ministry of Social Affairs and Employment, carried out an audit of the Plant Sciences Group in May 2016. IL&T issued a warning regarding the absence of a notification or permit on the basis of a 2.8 order (1), the absence of complete and correctly filled-in reports on the risk assessment according to Article 18 of the *Regeling ggo* (2) and the absence of an adjoining autoclave for the GMO waste from the PKM-III greenhouses (3).

A second audit was carried out in November 2016. IL&T concluded that the Wageningen University department Plant Sciences and Wageningen Plant Research both implement the *Regeling ggo 2013* at a satisfactory level. The warning was then revoked.

Several bottlenecks relating to the *Regeling ggo* have been reported at a national level, in particular on how the regulations can be implemented clearly and efficiently. However, concrete contributions from steering committees and project groups by the Biological Safety Officers (BSO) at WUR and the BSO at other larger permit holders have solved a number of bottlenecks surrounding implementation. These solutions have already been implemented at WUR. We require immense man power to deal with the admin of bringing the 'old' licences (*Regeling ggo 2003*) in line with the *Regeling ggo 2013* and carry out new risk assessments (previously done by Bureau GGO). In addition to this, the BSOs have noticed that it takes a lot of time to work according to the new system, to provide advice to researchers who are expanding their GMO activities, and to ensure that rules are enforced internally. At the end of 2016, PSG's management decided to expand its BSO capacity in mid-2017 by 0.5 FTE.

As part of the Dutch regulations on animal products (*Regeling dierlijke producten*), the Netherlands Food and Consumer product Safety Authority granted 'Animal By-Products authorisation' to locations that perform activities involving animal by-products. Within WBVR, authorisation was granted to Houtribweg 39, Edelhertweg 15 and Runderweg 4 (Lelystad). Applications have been sent off for Wageningen Livestock Research, Swine Innovation Centre (VIC) Sterksel, and the Dairy Campus in Leeuwarden. An inspector from the Netherlands Food and Consumer Product Safety Authority performed audits as part of the application procedure for an authorisation.

In 2016, the Netherlands Food and Consumer Product Safety Authority did not carry out any audits at PSG (Unifarm) and ESG (Nergena) relating to the permits for 'contained usage' (1), the import of plant-based materials (2) and the import and use of soil (3). The shortcomings revealed in 2015 were corrected in 2016. The changes in research activities were laid down in two new permits from the Netherlands Food and Consumer Product Safety Authority for PSG and ESG. We also rolled out an extensive information programme for researchers and greenhouse employees. Alongside this, we completed the admin that lays down each person's responsibilities and makes for clearer, shorter procedures and checks in the line and among staff, according to the requirements of the Netherlands Food and Consumer product Safety Authority and based on the ISO 9001 system. We also performed an entry check on organic material from Unifarm, in particular to prevent potato plants from becoming infected with the PSTVd virus. Over 2016, the BSOs primarily focused on giving instructions and following the import and export guidelines. Unifarm commissioned a new autoclave that removes waste material with quarantine status, GMO waste and plant pathogens in the validated manner.

3.9 External safety

WUR has requested a complex permit under the Dutch Nuclear Energy Act (*Kernenergiewet*, Kew) for those organisational components that use sources of radioactivity. The general radiation expert submits an annual report on the implementation of the radiation hygiene policy to the WUR Executive Board and to those Dutch government bodies that are responsible for overseeing radiation safety. Under the Nuclear Energy Act complex permit, inspections were carried out at all locations. This involved checking whether radiation limits are being exceeded and whether permit regulations were being met.

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 that were built before 1994 and whether or not asbestos is present. In 2015 an asbestos management plan was subsequently drawn up for the buildings that do have asbestos present. These asbestos management plans were completed in 2016. For each building that contained a risky asbestos situation, measures were immediately taken and remediation was carried out where necessary.

In accordance with the Dutch Asbestos Policy (*Asbestbeleid*), various asbestos-removal procedures were carried out during maintenance, demolition or renovation activities in 2016. Asbestos was removed from:

- De Leeuwenborch
- De Valk
- Nergena
- Transitorium
- Biotechnion (part of it)
- WMR, IJmuiden
- Former staff residence at Houtribweg (Lelystad)
- Sterksel
- Wageningen Bioveterinary Research (Lelystad)
- De Eest test farm (Nagele)

3.11 Transport and traffic

The high concentration of buildings and activities on Wageningen Campus means that traffic to, through and from Wageningen Campus has increased significantly. Annual measurements of our CO₂ footprint have enabled WUR to assess the environmental impact of its transport. Aviation and commutes by car are by far the biggest contributors to the CO₂ footprint.

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, which not only saves travel time and costs but also reduces CO₂ emissions.

A total of twelve charging stations for electric cars are located in two car parks on Wageningen Campus. Six additional charging stations will be installed at the RIKILT car park and commissioned at the beginning of 2017. We have also installed charging stations for e-bikes and scooters at bicycle-parking facilities in various buildings. Compared with previous years, we saw an increase in the use of these charging facilities. In 2016, owners of electric cars used the charging stations more than 1,500 times, charging a total of 12,000 kWh of electricity. The [charging stations](#) are public and can be used by staff, students and visitors to WUR. The charging stations are shown on the [map](#) of Wageningen Campus.

We monitor the use of different transport options in order to gain information on our CO₂ footprint. Each year, we collect data on commutes, business travel (by car, public transport and by aeroplane) and the use of private, lease and rental vehicles. In addition to this, we had a 'mobility survey' carried out by the external consultancy agency DTV Consultants in December 2015. The results from this survey were subject to further scrutiny at the beginning of 2016. The report from the survey indicated ¹ that a large number of employees (52%) and students (72%) travel to work or their place of study by bicycle. Although our employees commute less often by car (39%) than the national average, there are still options to 'travel smart' or smarter. This applies in particular to employees who live slightly further away from their place of work and now commute by car: 22% of these employees could switch to another mode of transport. We could reap the benefits of promoting e-bikes or conventional bicycles and encouraging people to commute by public transport.

WUR also introduced specific measures in 2016 to increase how often people commute by bike and public transport. These measures include:

- increasing the capacity of on-campus bicycle-parking facilities, including permanent facilities at Gaia/Lumen, Actio and temporary facilities at Helix and Forum
- modernising and expanding the cycle paths and footpaths on Wageningen Campus and installing lamps in darker areas (this could also be achieved by modifying the existing lamps).
- increasing the number of buses from Ede-Wageningen railway station to Wageningen Campus (in collaboration with the transport operator and the provincial government).

¹ Report from the 'Mobility survey for Wageningen University & Research,' DTV Consultants, 16 April 2016.
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WUR is also 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.

A final project by a student from Van Hall Larenstein University of Applied Sciences contained a proposal for the 'Mobility Plan' for Wageningen Campus, which will be established. Thanks to the mobility survey, the proposal to establish a 'Mobility Plan' and the annual measurement of our CO₂ footprint, we were able to make headway in 2016 on creating a 'Mobility Vision' for WUR as a whole and drawing up mobility plans (for each main location), containing the location-specific measures to encourage even more people to use sustainable transport to travel to WUR buildings.

Sustainable construction

In 2016, we implemented the following accommodation-related measures and achieved the following results:

- commissioning of the new Helix building. This extremely sustainable building has a compact shape and excellent insulation. It also makes use of heat recovery and concrete core activation and is connected to the thermal storage system. In part because of these sustainability measures, the building has a GreenCalc score of 520. This is well above the target score of 215.
- completion of the second sports hall at Sports Centre de Bongerd, with 459 solar panels on the roof
- decommissioning of four wings of the Chemistry Building at De Dreijen
- creation of a 'living' outdoor space by building a market square, amphitheatre and a large plank bridge in the outdoor areas
- collaboration with Liander, Parenco, the Province of Gelderland and the municipalities of Wageningen, Renkum and Ede on research into an ultra-deep geothermal water source
- feasibility study into expanding the thermal storage installation to serve existing buildings on the north-eastern campus ('Noordoostelijke Campus') and preparations for installing this
- strengthening nature values by installing a 'wet nature garden,' returning a piece of earth dating back more than 1,000 years to Wageningen Campus and creating 'The Field' and a small-scale trial field for experiments with natural agriculture.

4 Permits

4.1 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 7a and 7b.

Table 7a. Regulations which apply to the different organisational components

Organisational component	Environmental logbook ¹	Chemical registration ²	Energy and water registration 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

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 GROS (*Gevaarlijke stoffen Registratie- en Opsporingssysteem*, 'hazardous substances registration and investigation system'), Erbis and 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. Water, gas/heat and electricity use 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, Dutch Emission Guidelines for Air (NeR) checks 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 7b gives an overview of the systems used by different WUR organisational components.

Table 7b. The quality systems used by the organisational components

Organisational component	Systems	Explanation
ASG	ISO 9001	For WBVR and Wageningen Livestock Research (WLR).
	ISO 17025	For WBVR, 60 accredited (diagnostic) tests.
	ISO 17043	For WBVR, circulation exercises.
ESG	ISO 9001	For WENR and the Statutory Research Tasks(WOT)
	ISO 14001	For WENR
	ISO 17025	For CBLB, Chemical Biological Laboratory Bodem (soil) and WEPAL, (an alliance between the Biochemical and Soil Chemical Quality research teams which are part of Wageningen University's Department of Environmental Sciences).
	ISO 26000	For the total Sciences Group
	ISO 17043	For Wageningen University's Department of Environmental Sciences.
PSG	ISO 9001	For the test farms (Unifarm and Bleiswijk).
SSG	ISO 9001	For the WECR component.
WMR	ISO 9001	
	ISO 17025	
RIKILT	ISO 17025	
	ISO 17043	

4.2 Changes to permits

In the past year 68 permit procedures have been carried out (see Table 8).

Table 8. Overview of WUR permit procedures in 2016

Location	Project	Permits ¹
Bleiswijk PPO	New-build winter greenhouse	Construction under Environmental Permitting (General Provisions) Act (<i>Wabo</i>)
Bleiswijk PPO	New-build winter greenhouse	Report of environmentally neutral credentials
Bleiswijk PPO	Fire-safe use of building	Report of fire-safe use
Goutum Dairy Campus	Installation of helophyte filter	Report under Activities Decree (<i>Activiteitenbesluit</i>)
Goutum Dairy Campus	Expansion of dairy farm and improvement of manure fermenter	under Dutch Nature Conservation Act
IJmuiden WMR	Asbestos removal	Demolition under <i>Wabo</i>
Lelystad, WBVR	New-build wing	Environmentally neutral and construction under <i>Wabo</i>
Lelystad (all location)	Expansion of Opium Act authorisation	Opium Act permit
Houtribweg, Lelystad (next to WBVR)	Demolition of four staff residences, including garages	Demolition under <i>Wabo</i>
Lelystad ID, Edelhertweg 15	Termination of private limited company (already included in DLO permit)	Exemption from excise duty revoked
Lelystad PPO, Edelhertweg 1	New-build shelters	Construction under <i>Wabo</i>
Lelystad, Runderweg 4	Construction of exit lane	Report under <i>Wabo</i>
Lelystad, Runderweg 4	Installation of fence	Construction under <i>Wabo</i>
Lelystad, Runderweg 6	Converting temporary permit into permanent permit (for Accres algae greenhouse)	Construction under <i>Wabo</i>
Lelystad, Runderweg 6	Installation of helophyte filter for Accres	Report under Activities Decree (<i>Activiteitenbesluit</i>)
Lelystad, Runderweg 6	Installation of helophyte filter cancelled	Report under Activities Decree replaced by application under Water Act (<i>Waterwet</i>)
Lelystad, Runderweg 6	Application for helophyte filter for Accres	Water Act permit
Lelystad, Runderweg 6	Draining of salt/brackish water for algae cultivation	Current permit covers activity
Lelystad, Runderweg 6	Installation of argon tank on-site	Notification under Activities Decree (notification was rejected, but we are still obliged to have a permit)
Lelystad, Runderweg 6	Installation of argon tank on-site	Construction under <i>Wabo</i> (change)
Lelystad, Runderweg 6	Demolition of isotope laboratory	Demolition under <i>Wabo</i>
WBVR, Lelystad	Felling of 71 trees to make room for parking spaces	Report under Forestry Act (<i>Boswet</i>)
WBVR, Lelystad	Asbestos removal	Demolition under <i>Wabo</i>
Nagele	Asbestos removal in De Eest	Demolition under <i>Wabo</i>
Oosterschelde Schelpenhoek	Extension of test for seaweed cultivation	Water Act
Sterksel Swine Innovation Centre (VIC) Veluwe (between Ede and Kootwijk)	Expansion of manure-processing unit 'Licht op natuur' ('Spotlight on nature') project	Environmentally neutral under <i>Wabo</i> Construction under <i>Wabo</i> and permit under Spatial Planning Decree (<i>Besluit ruimtelijke ordening</i>)
Wageningen Campus	Demolition of Klimaatgebouw Qualitron 5	Demolition under <i>Wabo</i>
Wageningen Campus (near Futurum)	Felling of three trees	Felling under <i>Wabo</i>
Wageningen Campus (Wageningen University + DLO)	Research	Opium Act permit
Wageningen Campus, Actio, West/South	Modification to notification of occupancy due to expansion of Actio	Report of fire-safe use
Wageningen Campus Atlas	Installation of LED information screens	Construction under <i>Wabo</i> (other structures)
Wageningen Campus Events site	AID 2016	APV
Wageningen Campus Events site and Gaia	Wereld Water College	APV + tent
Wageningen Campus Helix	Change to locations and name change	Exemption from excise authorisation
Wageningen Campus Helix	Extension of permit	Opium Act permit
Wageningen Campus Helix	Change to location and location manager	Activity permit under Dutch Abuse of Chemical Substances (Prevention) Act (1) (WVMC)
Wageningen Campus Helix	Change to location and location manager	Activity permit under Dutch Abuse of Chemical Substances (Prevention) Act (2) (WVMC)
Wageningen Campus Helix	Extension of list of substances	Activity permit under Dutch Abuse of Chemical Substances (Prevention) Act

Location	Project	Permits ¹
Wageningen Campus Orion	Felling of one tree, for terrace	Felling under <i>Wabo</i> (permit rejected)
Wageningen Campus Orion	Installation of windbreak on terrace	Construction under <i>Wabo</i> (other structures)
Wageningen Campus Phenomea	Felling of three trees for the new-build Phenomea construction	Construction and felling under <i>Wabo</i>
Wageningen Campus Radix Agros	Construction of a bird-deterrent system	Construction under <i>Wabo</i>
Wageningen Campus Thymospad cycle path	Felling of one tree (temporary shelter)	Felling under <i>Wabo</i>
Wageningen Campus Unileverterrein (Unilever site)	Felling of two trees to prepare site for construction	Felling under <i>Wabo</i>
Wageningen Campus Vitae	Felling of three trees	Felling under <i>Wabo</i>
Wageningen Campus Vitae	Research involving drugs precursors	Activity permit under Dutch Abuse of Chemical Substances (Prevention) Act (<i>WVVC</i>)
Wageningen Campus Vitae	Research	Import permit
Wageningen De Dreijen	Application to extend permit under Environmental Management Act (<i>Wet milieubeheer</i>)	Permit under Environmental Management Act
Wageningen De Dreijen De Valk	Asbestos removal	Demolition under <i>Wabo</i>
Wageningen De Dreijen (site)	Felling of ten trees (replacement of fence)	Felling under <i>Wabo</i>
Wageningen De Dreijen Transitorium	Asbestos removal	Demolition under <i>Wabo</i>
Wageningen De Kleine Born	Demolition of whole structure	Demolition under <i>Wabo</i>
Wageningen Haarweg 333 E-F-G	Temporary student residence	<i>Wabo</i> , permit under Spatial Planning Decree
Wageningen Hal BSW (Construction Service)	Withdrawal of permit (sale)	Municipal permits
Wageningen Hal BSW (Construction Service)	Withdrawal of permit (sale)	Permit from environmental agency (<i>Omgevingsdienst</i>)
Wageningen Hal BSW (Construction Service)	Withdrawal of permit (sale)	Permit from Water Board
Wageningen Leeuwenborch	Felling of six trees	Felling under <i>Wabo</i>
Wageningen Mansholtlaan	Temporary letting of staff residence	Vacancy permit
Wageningen University, Animal Sciences	Temporary export at Experimental Zoology	ATA Carnet from Chamber of Commerce
WUR (all locations)	Change of name and authorised permit holder	Exemption from excise duty
WUR (all locations)	Change of name and authorised permit holder	Permit for excise warehouse
WUR (all locations)	Change of name and authorised permit holder	Declaration of registration under Dutch Abuse of Chemical Substances (Prevention) Act, 2a
WUR (all locations)	Name change	Opium Act permit for Farmatec
WUR (all locations)	Name change	Opium Act permit for MBC
Wageningen Leeuwenborch	Asbestos removal	Demolition under <i>Wabo</i>
Yerseke, Wageningen Marine Research (WMR)	Extension to provide room for Portakabins	Construction under <i>Wabo</i> (temporary extension)
Yerseke, Wageningen Marine Research (WMR)	Change to address of goods delivery department	Exemption from excise duty

Note 1: *Wabo*: Dutch Environmental Permitting (General Provisions) Act

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

- *Lelystad, WUR complex*: After divesting Edelhertweg 15 (expected in 2017), we will concentrate on the revision of the umbrella permit under the Environmental Management Act ('WUR Complex Lelystad'), including the discharge permit.
- *Lelystad (other)*: We will revise the permit once the new-build construction of WBVR on Houtribweg 39 is completed in 2017.
- *Sterksel Swine Innovation Centre (VIC)*: Conversion completed.
- *Goutum Dairy Campus*: New construction and conversion completed. Officially opened on 26 May 2016.
- *Netherlands (other)*: The Dutch decree on emissions-free housing and accommodation (*Besluit emissievrije huisvesting*) came into force on 1 August 2015. This was applied at the concerned locations of the Animal Science Group (ASG) in 2016.

4.3 Environmental audits

During the year under review, internal audits were carried out by the Safety and Environment sub-department, and external audits (enforcement 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

Enforcement inspections were carried out by the competent authorities at the various WUR locations in 2016 in relation to the permit under the Environmental Management Act (see Table 9).

Apart from the aforementioned environmental checks, NVWA and Bureau GMO also carried out inspections. These occur individually on various locations throughout the year.

Table 9. Overview of external audits in 2016

Complex/site	Location	Date	Nature of audit
Wageningen De Dreijen	Site/design	25 January 2016	Second subsequent inspection of gas pipes
Wageningen Campus	Radix Klima	11/04/2016	Subsequent inspection of ammonia refrigeration system
Wageningen De Dreijen	Site/design	26/04/2016	Finalisation of inspection of gas pipes
Wageningen Campus	Sports Centre de Bongerd	07/06/2016	Subsequent inspection and first inspection for new sports hall
IJmuiden	WMR	06/09/2016	Regular environmental inspection
Den Helder	WMR	02/11/2016	First environmental inspection
Wageningen De Dreijen	Site/design	10/11/2016	Regular environmental inspection
Wageningen Campus	Helix	10/11/2016	Initial environmental control
Lelystad, WUR complex	Runderweg 6 and 8 and Edelhartweg 1	14/11/2016	Inspection in accordance with Enforcement Plan

A failure was detected during one of the inspections. During the second subsequent inspection of the network of gas pipes on the De Dreijen site, De Vallei environmental agency found for a second time that the gas pipes had not been inspected in accordance with SCOPE 7. WUR is responsible for making sure this is the case. This is a breach on the grounds of Article 3.7 m of the *Activiteitenregeling milieubeheer* (Dutch activities regulations for environment management). Based on this, the environmental agency imposed a fine of €10,000. A second fine would be payable if the failure was not remedied before the end of April 2016. The inspections were completed before the end of April 2016 (and certificates issued). The environmental agency also performed a final inspection, thereby ending and closing the procedure.

5 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 year 2016, 128 incidents were registered by means of the incident reporting form, three of which were classified as environmental incidents (see Table 10).

Table 10. Reports submitted using the incident reporting form in 2016

What the report relates to	AFSG	AID	ASG	CS	ESG	FB	WMR	Education	PSG	RIKILT-NVWA	SSG	Grounds and other	Total
Accident involving minor injury	14		6		8	6		2	3	2		4	45
Accident involving some injury (doctor required)	2		3		4	2		3	5	1			20
Other	4		2		2			8	1				18
Unsafe situation or deficiency	8		7						2				17
Fire or fire alarm	1		5		5								11
Accident involving no injury	4		4			1							9
Accident involving serious injury	1					1		1					3
Environmental incident					1			1					2
Incident involving biological agents			1										1
Loss and theft	1												1
Near accident					1								1
Incident involving radioactivity													
Fatal accident													
Environmental incident involving GMOs													
Bomb alert													
Letters containing possible biological pathogens													
Total	35	0	28	0	21	10	0	15	11	3	1	4	128

Alongside two environmental incidents, there was one report of an accident involving biological agents. However, this did not lead to a contamination of the environment. There were also two complaints relating to excessive noise levels. The incidents and complaints are detailed below:

Incident 1 : Unwanted discharge of rinse water into surface water (ditches) at Accres, Runderweg 6 in Lelystad.

Nature of the incident While pumping out the grey water from the washing installation for sugar beets, the valve stopped functioning properly. This caused around 5 m³ of grey water to become contaminated with clay and sand residue and enter the storm drain via the site. The open connection between the drain and the ditches cause the latter to become contaminated with this grey water.

Follow-up action The ditch was immediately sealed using boards and emptied. The contaminated water removed was then spread over the grounds.

The Zuiderzeeland water board was immediately informed of this incident.

Environmental damage None.

Follow-up Having visited the site and seen that WUR had taken adequate measures and cleared up the situation in an exemplary fashion, the water board considered the case to be closed.

Prevention As far as possible, the valve should be inspected before each use.

Status Closed.

Incident 2 : Leakage of small volume of hydraulic oil from lorry at Lumen.

Nature of the incident While unloading goods, a small volume of hydraulic oil leaked out of the lorry's loading and unloading system (hydraulic tailgate).

Follow-up action The driver of the lorry took appropriate action in the situation by clearing up the leakage using an absorbent.

Environmental damage None.

Follow-up A closer inspection did not detect any further oil residue.

Prevention None.

Status Closed.

Complaint 1 : Excessive noise levels on Wageningen Campus during the General Introduction Days in 2016.

Nature of complaint Various residents (in Bennekom and at other locations) complained about the excessive noise levels caused by live music in the marquees on Wageningen Campus.

Follow-up action Data from interim and other measurements at fixed measurement points indicated that the noise level was well below the permitted maximum level.

Environmental damage None.

Follow-up WUR informed the residents of its findings. The Municipality of Wageningen also confirmed that the maximum noise levels were not exceeded in the evenings. The municipality also did not take the complaints further.

Prevention In the future, WUR is going to work more effectively with the municipality and inform residents of the planned activities or parties, especially those taking place in the evening.

Status Closed.

Complaint 2 : Complaint from RIKILT/Vitae about excessive noise levels on Wageningen Campus

Nature of the complaint A resident of Tarthorst complained about the excessive noise levels coming from the fans in Vitae during the evening and at night.

Follow-up action The fans and air-treatment units were inspected, to make sure they were functioning properly.

Environmental damage None.

Follow-up It has not been possible to trace where the sound is coming from, given the difficulty of pin-pointing a location.

Prevention Further measures will be taken once the problem has become clear.

Status Still being processed (to be closed in 2017).

6 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 2016, as well as on the activities and results in terms of purchasing, catering, Green Office Wageningen and our CO₂ footprint.

6.1 CSR Agenda

In 2016, WUR added elaborated on its CSR strategy. 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.

Over 2016, the Sustainability group² was tasked with formulating a CSR strategy for WUR based on the CSR ambition that was included in the Strategic Plan 2015-2018: 'It is in line with our organisation and our domain to set high goals for Corporate Social Responsibility (CSR).' In principle, each decision we make should take account of scientific, social and economic interests. How do the choices we make affect stakeholders? And can we justify these choices? Our responsibility goes above and beyond our own activities.

In 2016, we added more shape to WUR's CSR strategy, further developing it within the context of the 'CSR agenda' that states the social themes we will focus on more in the coming years. The CSR agenda contains 21 major CSR topics both at WUR and outside our institution. Ten of those are so important for our organisation and stakeholders that they deserve extra attention. The CSR topics tie in as far as possible with the priority areas and KPIs in the Strategic Plan.

In 2016, CSR was one of the priority areas in the Strategic Plan. It was necessary to develop CSR policy according to two action points: to improve environmental sustainability (energy and CO₂ footprint) and inclusivity (encourage feedback, mobility, diversity and participation). In terms of environmental sustainability, we looked to further crystallise the environmental topics on the CSR agenda and the pan-WUR Energy Efficiency Plan (EEP) for 2017 to 2020. In terms of HR, CSR was interpreted as 'Inclusivity'. This means that we take on people from various target groups and focus our attention on talent, mobility, equal opportunities and being representative of the population at large. Reports on the progress of these efforts are regularly sent to the Executive Board.

6.2 Procurement

In relation to tendering, WUR follows the applicable legislation and regulations in the procurement field, as well as the principles of proportionality, objectivity, non-discrimination and transparency. In addition to the applicable legislation and regulations, WUR has its own purchasing policy. The relevant documents can be found on the internet under the Facilities and Services Purchases department (see [link](#)).

The mode of operation within WUR is to make social responsible purchases and, where possible, apply at least the sustainability criteria published at [Pianoo.nl](#) (in Dutch). 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 63 WUR employees and students.

In addition, WUR finds it desirable to express 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 the buyers of WUR will point out to the internal clients the different possibilities available during procurement processes and contract period. To achieve this, the Responsible Innovation (MVI) growth model is put into action. The MVI growth model is a method to measure the efforts made relating to Responsible Innovation and to realise higher CSR awareness.

² Please see Chapter 7 for more information on the Sustainability group.

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 interested parties can submit a complaint in writing about a specific tendering procedure. The way in which the complaint must be submitted and how it is evaluated and dealt with are formulated in the tendering documentation.

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

Results achieved in 2016:

- In 2016, a total of 35 EU procurement projects were completed with a total value of €34 million. Following the Socially Responsible Purchasing (SRP) model, WUR reached a percentage of 94.3% for sustainability in procurement projects according to the Pianoo criteria (see pianoo.nl).
- We received six complaints. All complaints were processed and assessed, of which one was justified and the others unjustified.
- The Sustainability panel was asked twice in 2016 to provide its input.

6.3 Catering

WUR has given itself the objective that products sold in the company canteens and vending machines must be sustainable and healthy. Each purchasing process must at least comply with the criteria from 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 farmers that do not use chemical crop protection agents or artificial fertilisers and are conscious of animal welfare. The environmental impact of packaging material must be limited as far as possible, and caterers must separate waste at the source. Three quarters of the product range consists of preferred (healthy) and 'neutral' products according to the classification by the Dutch nutrition centre ('Voedingscentrum'). In 2016, one of the caterers began using a bio-degradable and 100% organic cleaning agent.

In 2016, caterers and Green Office Wageningen teamed up to create 'Meatless Mondays' – days on which warm meals and soups are vegetarian and there is a huge range of vegetarian snacks. However, if people still want to eat meat, there is a limited choice of meat croquettes and two sandwiches, one with fish and one with meat. 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.

6.4 Green Office Wageningen

Green Office Wageningen takes a central role in the area of 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, for instance through an MSc thesis, trainee posts and Academic Consultancy Training 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 different activities and meetings and writes about these on the [Green Office website](#), the Green Office newsletter and its social media. The Green Office's motto over 2016 was 'Linking-Learning-Innovating for a more sustainable WUR,' focusing both on students and the new target group: WUR employees. It experimented with a 'Sustainability Challenge,' which was open to employees, and organised lunchtime lectures and debates. Green Office Wageningen also joined the [Green Active Network](#). Established in 2016, the network provides a platform for companies to work together on 'green goals'. Fifteen organisations are currently members of the network, and there will be greater efforts to organise joint activities in 2017.

In 2016, Green Office has been working on:

- **Roadmap for Sustainable IT:** the starting point of the roadmap was the campaign 'Use IT smartly,' which aimed to raise awareness of sustainability and the use of IT. The Roadmap first assessed the sustainability of IT practice at WUR. The project focused on socially responsible procurement, sustainable use and sustainable transport of IT waste.
- **Green Gifts:** In 2016, as part of the Academic Consultancy Training (ACT), a group of students examined the sustainability of promotional gifts and gadgets at WUR. The report by the project group formed the basis of a discussion with concerned parties about our sustainability policy on promotional gifts.
- **Meatless Monday:** After the start of 2015, four large canteens on Wageningen Campus (Forum, Orion, Leeuwenborch and Impulse) joined forces to develop 'Meatless Monday' – the day on which their range of meals, sandwiches and snacks are almost exclusively vegetarian. Green Office continued to promote Meatless Monday in 2016 and organised a lunchtime debate on this theme during the 'Seriously Sustainable' event.
- **Warm Sweater Week:** The fourth edition of the 'Warm Sweater Week' was held in January, as part of which the temperature in the Forum and Zodiac buildings was lowered by 2°C to reduce energy consumption. Green Office organised different activities such as a Sustainability Tour of the campus, a knitting workshop and a fashion event.
- **Student Cooking Corner:** Each Wednesday, students are allowed to sell home-made vegetarian or vegan meals at Forum's canteen. This project is possible thanks to a collaboration with the caterer, Cormet.
- **Collect, Fix, Share:** 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).
- **Green Match:** Green Office is looking for subjects for students in order to create matches between education and sustainable operational management at WUR. This method enabled three students to find a work placement in 2016, and Green Office commissioned an ACT project for sustainable promotional gifts.
- **Entrepreneurship for Sustainability:** Green Office worked together with others to organise the second edition of a series of workshops and sessions in which students could gain support in setting up their own sustainable initiative or project. The sessions were held in StartHub Wageningen in collaboration with StartLife.
- **Seriously Sustainable:** Green Office organised a sustainability festival in the week of the 'Sustainability Day' (*Dag van de Duurzaamheid*), which took place on 10 October 2016. Working together with other student organisations, Green Office put on a varied range of lectures and activities including a sustainability market, the Sustainability Challenge, Sustainability Hour, a Fairphone workshop and a Clothes Swap.

The [Green Office annual report 2016](#) provides full details on activities in 2016.

6.5 Carbon footprint and CO₂ compensation footprint

The carbon footprint and the CO₂ 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 CO₂ emissions and what it can do to reduce and compensate for them.

The [CO₂ footprint](#) provides a report at corporate WUR level. Alongside this, the different organisational components were asked to establish their individual CO₂ footprints, so that they, coordinated by the QHSE sections, could specify priority areas and take measures to gain as much control as possible over their CO₂ emissions and reduce these where possible.

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

Scope 1: (direct emissions)	<ul style="list-style-type: none"> ▪ 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)	<ul style="list-style-type: none"> ▪ Emissions from electricity purchased for offices, greenhouses and laboratories. ▪ Fuel use of electric lease vehicles. ▪ Emissions from business travel in private cars. ▪ Emissions from kilometres flown on business trips. ▪ Emissions from business travel using public transport (within the Netherlands and international travel).
Scope 3: (other indirect emissions)	<ul style="list-style-type: none"> ▪ Emissions caused by processing 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.

CO₂ inventories 2016

The inventories of the carbon footprint and CO₂ 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 CO₂ 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 CO₂ compensation footprint.

The data collected over 2016 is comparable to the data collected in 2015. 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 CO₂ footprint. As more sources of emissions are added each year, and the calculation method was modified at the start of 2015 (changes to the CO₂ emissions factors, etc.), it is almost impossible to compare the reference year with the current footprint. Part of the CO₂ inventory in 2016 involved a recalculation of 2010 that took account of the changes and shifts in the CO₂ in the emissions sources from 2010 to 2015, including changes to the CO₂ emissions factors. The recalculation was based on the system used in the CO₂ Performance Ladder ('CO₂-Prestatieladder').
- As of 2015, we will calculate according to the CO₂ emissions factors updated in 2014 (see www.co2emissiefactoren.nl).
- 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; therefore 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 CO₂ compensation footprint.

CO₂ emissions

The CO₂ emissions in 2016 have decreased by 46% in comparison to the reference year of 2010. There has been a slight reduction compared with the footprint in 2015 (-1%).

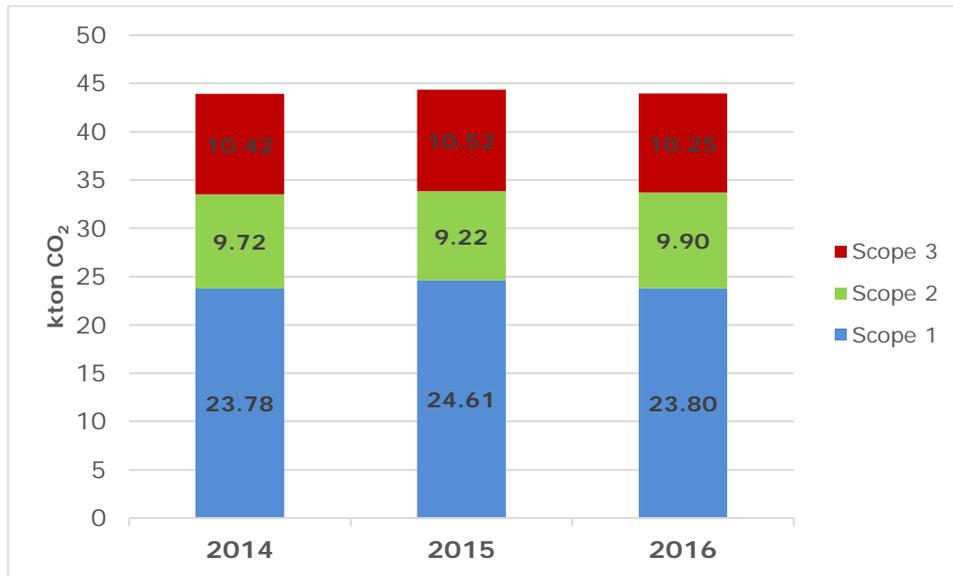


Figure 2. CO₂ emissions in kilotonnes per scope in the period 2014-2016

Figure 2 indicates the scope distribution of the CO₂ footprints from 2014 to 2016 inclusive. The distribution of the scopes over the past three years has remained virtually the same.

The scope 1 emission in 2016 decreased by 3% compared with the previous year. As 2016 was a relatively warm year, we used less natural gas in the buildings (see paragraph 3.1: Energy). We also had less livestock in 2016 (-14%), and our vehicle fleet used less fuel (-1%). However, the various relocations (to the new Helix building) and the divestment of other buildings (in Lelystad and De Dreijen in Wageningen) led to a considerably higher use of coolants.

As it happens, the CO₂ emissions within scope 2 in 2016 were higher than previous years (+7% compared with 2015). Although less petrol was used for business travel undertaken with private vehicles (-2%), there was more business travel by aeroplane (+10%). The emissions from business travel by public transport decreased significantly (-65%), as the Dutch railways ('Nederlandse Spoorwegen') increasingly use green energy to power their trains, reducing the emissions factor for train journeys within the Netherlands.

The CO₂ emissions in scope 3 decreased by 3% compared with 2015. In 2016, WUR reserved fewer flights for students and course participants (-4%). The emissions from employees' commutes were also lower (-6%), in line with the downwards trend of the number of employees who work at WUR. Emissions from waste processing increased significantly (+16%) as a result of building divestments, construction activities and increased research activities (see paragraph 3.2: Waste).

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). See figures 3 and 4.

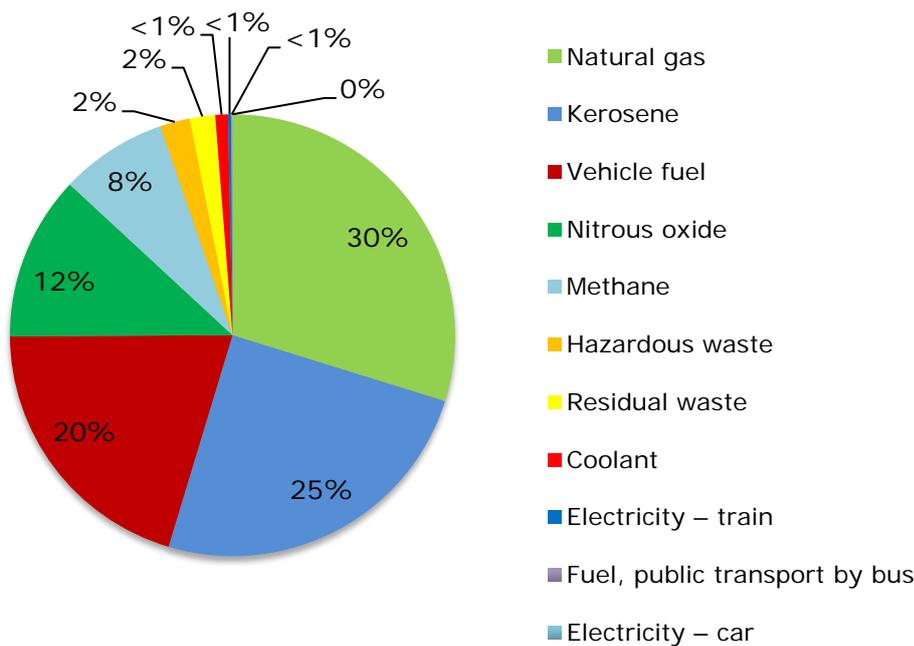


Figure 3. Breakdown of CO₂ emissions by operational activity, 2016

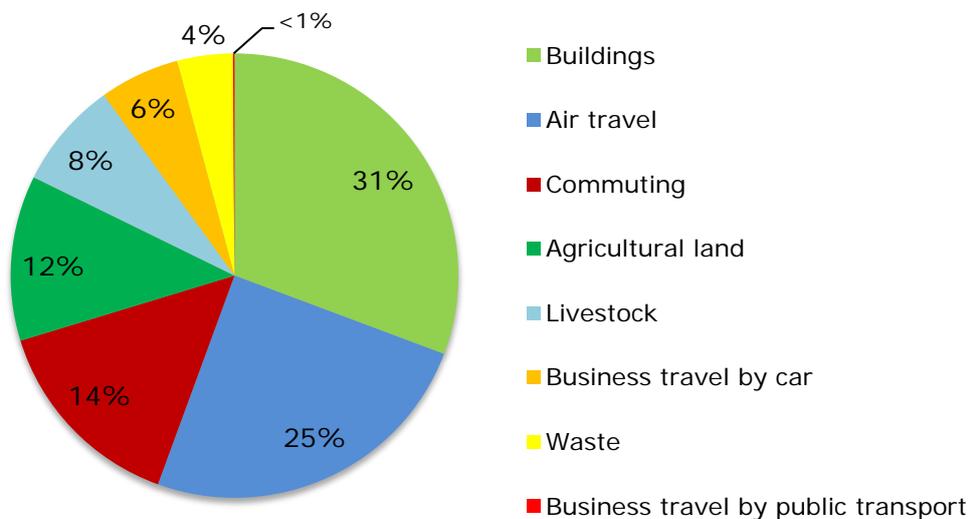


Figure 4. Distribution of CO₂ emissions across the various emissions sources, 2016

CO₂ compensation

WUR compensates its energy use in the following ways:

- By generating wind energy (more than 58 million kWh in 2016).
- Thermal storage systems on WUR's own grounds, to heat and cool various buildings on Wageningen Campus.
- The operation of the biomass-fired combined heat and power plants 'Acres' in Lelystad and 'VIC Sterkel' and 'De Marke' in Hengelo.
- By generating solar energy.
- The separation of the various types of waste to the maximum possible extent.

The total CO₂ compensation footprint in 2016 was 35.2 kilotonnes of CO₂. See figure 5 for the distribution of the compensation sources in 2016. This is a 35% increase in compensation as compared to the figures for the reference year 2010.

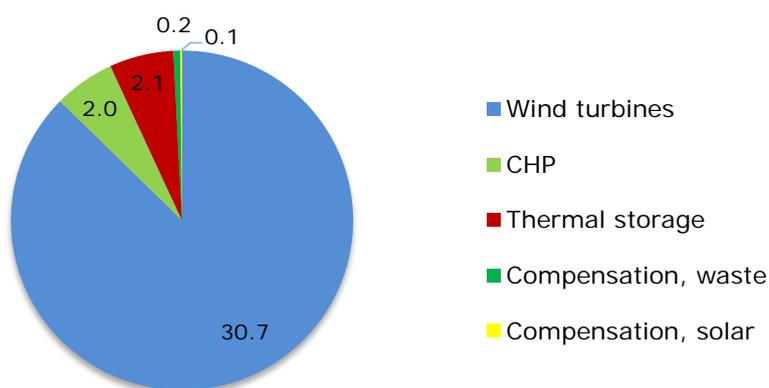


Figure 5. Results of WUR's compensation measures in kilotonnes, 2016

Our CO₂ compensation footprint in 2016 was lower than in 2015 (-28%). This difference is primarily due to the unfavourable wind conditions and disappointing energy yield from the wind farms in Lelystad (see paragraph 3.1: Energy). While we did not compensate for air kilometres in 2016, there has been an improvement in other compensation sources. For instance, the yield from thermal energy storage on Wageningen Campus was higher (as the installation now serves more buildings), and more energy was generated by biogas installations and solar panels.

Climate neutrality

Compared to the reference year of 2010, in 2016 the carbon footprint was reduced by 46% and the CO₂ compensation footprint was 35% higher. The ratio of the carbon footprint to the CO₂ compensation footprint in the period 2014-2016 is shown in figure 11 and table 6. In 2010 the CO₂ compensation footprint was equivalent to 32% of the CO₂ emissions. In 2015, our CO₂ compensation was greater than the CO₂ emissions, at 110% of the CO₂ emissions. This figure was 80% in 2016.

Table 11. WUR's carbon footprint and CO₂ compensation footprint in 2010-2015³

Year	2016	2015	2014	2010
CO ₂ emissions in kilotonnes	43.9	44.4	43.9	81.3
CO ₂ compensation	35.2	48.8	36.1	26
Climate neutrality (%)	80%	110%	72%	32%

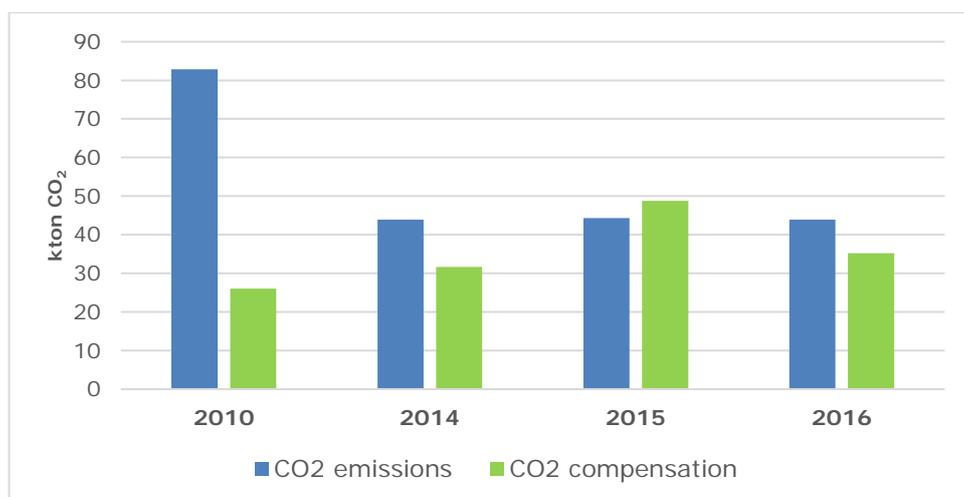


Figure 6. Carbon footprint and CO₂ compensation footprint in 2014-2016 compared to reference year 2010

³ This report differs from previous years due to recalculation of the baseline year in 2010 (see explanation on page 21). This report on our CO₂ footprint in 2016 provides an explanation of how the recalculation was performed.

6.6 Overview of WUR overall sustainability figures

The operational management at Wageningen University (WU) and Wageningen Research (WR) are intertwined with one another. This means that it is difficult to make a difference between the operational management at WU and the operational management at WR regarding the products and services. Therefore, this report discusses the operational management for WUR as a whole. The overall overview of WUR's sustainability figures is given in table 12. In order to compare the sustainability figures of WUR with those of other universities, the quantitative data has been divided into data per student, per employee and per square metre (see Table 13).

Table 12. Overview of WUR overall sustainability figures

Component/topic	Objective	Achieved in 2016
CO ₂ footprint	Reduction compared to reference year 2010	46% reduction
CO ₂ compensation footprint	Increase compared to reference year 2010	35% increase
Climate neutrality	Increase compared to reference year 2010	80%
Energy	2% reduction per year	2.3 % reduction compared to 2015 (including climate correction)
	Purchase of sustainable energy	100% purchase of wind energy (Certiq)
	Production of sustainable energy	603,556 GJ (of which 58 million kWh of wind energy)
Water	Reduction in water use compared to 2015	11% reduction
Waste	Reduction in waste produced compared to 2015	16% increase
Construction	GreenCalc standard 215	Construction of new research building Helix 520
Procurement	50% sustainable purchases	94.3% sustainable purchases

Table 13. Overview of overall sustainability figures per m² and per student and employee

Benchmarks	2016	+/-*	2015	2014	2013	2012
m ² of floor surface	479,332	+3%	467,499	475,422	481,484	495,857
Number of students	11,278	+9%	10,380	9,544	8,825	8,248
FTE employees	4,912	-2%	4,995	5,106	5,190	5,275
Total number of students and employees (FTE + st)	16,190	+5%	15,375	14,650	14,015	13,523
Energy (quantitative)	2016	+/-*	2015	2014	2013	2012
Energy (GJ)	693,845	-2%	706,771	712,717	785,446	801,547
Electricity (kWh)	54,930,781	-1%	55,660,591	57,129,458	59,190,720	59,785,905
Natural gas (Nm ³)	6,302,302	-3%	6,503,170	6,273,363	7,985,127	8,324,624
Energy (GJ/m ²)	1.45	-4%	1.51	1.5	1.6	1.6
Electricity (kWh/m ²)	114.6	-4%	119.1	120.2	122.9	120.6
Natural gas (Nm ³ /m ²)	13.1	-5%	13.9	13.2	16.3	16.8
Energy (GJ/FTE + st)	42.9	-7%	46.0	48.6	56.0	59.3
Electricity (kWh/FTE + st)	3,392.9	-6%	3,620.2	3,899.6	4,223.4	4,421.1
Natural gas (Nm ³ /FTE + st)	389.3	-8%	423.0	428.2	569.8	617.7
Waste (quantitative)	2016	+/-*	2015	2014	2013	2012
Total waste (kg)	2,196,915	+16%	1,897,070	1,996,779	1,872,355	2,000,784
Hazardous waste (kg)	352,125	+14%	309,964	305,932	241,103	222,011
Industrial waste (kg)	1,548,002	+20%	1,291,922	1,361,400	1,261,475	1,494,851
Paper (kg)	296,788	+1%	295,184	329,447	369,777	283,922
Waste (kg/m ²)	4.6	+13%	4.1	4.2	3.9	4.0
Hazardous waste (kg/m ²)	0.7	+11%	0.7	0.6	0.5	0.4
Industrial waste (kg/m ²)	3.2	+17%	2.8	2.9	2.6	3.0
Paper (kg/m ²)	0.6	-2%	0.6	0.7	0.8	0.6
Waste (kg/FTE + st)	135.7	+10%	123.4	136.3	133.6	148.0
Hazardous waste (kg/FTE + st)	21.7	+8%	20.2	20.9	17.2	16.4
Industrial waste (kg/FTE + st)	95.6	+14%	84.0	92.9	90.0	110.5
Paper (kg/FTE + st)	18.3	-5%	19.2	22.5	26.4	21.0
Water (quantitative)	2016	+/-*	2015	2014	2013	2012
Total water (m ³)	236,970	-11%	266,983	261,435	274,457	257,209
Mains water (m ³)	209,058	-3%	214,549	205,258	215,055	199,622
Well water (m ³)	27,912	-47%	52,434	56,177	59,402	57,587
Total water (m ³ /m ²)	0.49	-13%	0.57	0.55	0.57	0.52
Mains water (m ³ /m ²)	0.44	-5%	0.46	0.43	0.45	0.40
Well water (m ³ /m ²)	0.06	-48%	0.11	0.12	0.12	0.12
Total water (m ³ /FTE + st)	14.6	-16%	17.4	17.8	19.6	19.0
Mains water (m ³ /FTE + st)	12.9	-7%	14.0	14.0	15.3	14.8
Well water (m ³ /FTE + st)	1.7	-49%	3.4	3.8	4.2	4.3
CO₂ footprint (quantitative)	2016	+/-*	2015	2014	2013	2012
CO ₂ emissions (kg CO ₂ equivalents)	43,945	0%	43,817	41,987	47,102	41,700
CO ₂ compensation (kg CO ₂ equivalents)	35,156	-28%	48,873	31,705	36,655	36,114
CO ₂ emissions (kg CO ₂ equivalents/m ²)	0.09	-2%	0.09	0.09	0.1	0.08
CO ₂ compensation (kg CO ₂ equivalents/m ²)	0.07	-30%	0.1	0.07	0.08	0.07
CO ₂ emissions (kg CO ₂ equivalents/FTE + st)	2.7	-5%	2.9	2.9	3.3	3.1
CO ₂ compensation (kg CO ₂ equivalents/FTE + st)	2.2	-32%	3.2	2.2	2.5	2.7

* Difference between 2016 and preceding year.

Table 13 shows that in 2016, WUR had 3% more floor space compared to 2015. The total number of students and employees (FTE) has risen by 5%. This means that in 2016 as well, more intense use was made of buildings and amenities. An explanation of the differences between 2016 and previous years can be found in chapter 3.

Finally, the carbon footprint per student and employee is 2.7 tonnes of CO₂ and the carbon footprint per square metres is 0.09 tonnes of CO₂. A total of 2.2 tonnes of CO₂ was compensated for each student or employee and 0.07 tonnes of CO₂ was compensated for each square metre.

7 Organisation

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 QHSE column consists of a corporate Safety and Environment sub-department and various decentralised QHSE sub-departments within the Sciences Groups. The responsibilities within 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 of the Sciences Groups are responsible for implementation. In terms of the Deming cycle, this means that the QHSE sub-departments are responsible for the 'DO' activity and Safety and Environment is responsible for the 'PLAN,' 'CHECK' and 'ACT' activities. The QHSE sub-departments and the Safety and Environment sub-department work together closely.

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 regard, 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.

Various internal and external audits were carried out in 2016 for purposes of ISO certification as well as for energy management, biological safety and radiation. In this way, WUR makes the CHECK phase of the Deming cycle concrete, and WUR gains more insight into compliance with legislation and regulation per organisational components and for WUR as a whole.

In 2016, the Sustainability group specified the content of the ambitions for sustainability and CSR as laid down in the Strategic Plan for 2015-2018. The CSR group advises the Executive Board on matters relating to sustainability. The Sustainability group members are the director of Facilities and Services (chair); the director of Corporate Human Resources; the director of Corporate Communications & Marketing; a representative of the directors of operational management, the director of Education, Research & Innovation; representative(s) from the Student Council; and a sustainability policy officer (secretary). The chair of the Sustainability group is accountable to the Executive Board/Board of Directors.

In 2016 the Sustainability group gave concrete shape to the sustainability and CSR ambitions as set out in the 2015-2018 Strategic Plan. As the CSR agenda encompasses sustainability in the broadest sense (people, plant, profit), this group will continue under the name 'CSR group' at the end of 2016. The CSR group advises the Executive Board about sustainability. The CSR group members are the director of Facilities and Services (chair); the director of Corporate Human Resources; the director of Corporate Communications & Marketing; a representative of the directors of operational management, the director of Education, Research & Innovation; representative(s) from the Student Council; and a sustainability policy officer (secretary). The chair of the Sustainability 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 substantively 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.

One fine was issued in 2016, relating to the violation of environmental regulations. This sanction was described in chapter 4 (4.3 Environmental audits). 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:

- Advanced safety studies training programme.
- 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 exercises for emergency and first aid services, supplementary respiration protection and fire-extinguishing drills.
- Radiation hygiene courses.
- GMO and new legislation and regulation workshop.
- Biosafety symposium.
- pre-Conference Course 'They are trained, but are they competent?' at the European BioSafety Association (EBSA).
- Symposium by the 'BVF Platform' (Dutch platform for biological safety officers) on Biological agents: 'Genetic manipulation – why not?' ('Genetische manipulatie, waarom niet?').
- Process and quality management course.
- Audits and internal audits course.
- Workplace research course.
- Radio Protection Week, Oxford, September 2016.
- Autumn symposium by 'Vereniging voor Stralingshygiëne, NVS' (the Dutch association for radiation protection).

Appendix 1. Glossary of terms

Organisation

AFSG	Agrotechnology & Food Sciences Group
ASG	Animal Sciences Group
ATV	AgroTechnology and Food Sciences
CDI	Centre for Development Innovation, component of SSG
CS	Corporate Staff
CS+	Corporate Staff including Wageningen Academy
DDW	Department of Animal Sciences
ESG	Environmental Sciences Group
E&EL	Energy & Exploitation Lelystad
ER&I	Education, Research and Innovation
FB	Facilities and Services
FBR	Food & Biobased Research
PPO	Applied Plant Research
PSG	Plant Sciences Group
QHSE (KAM in Dutch)	Quality, Health & Safety and Environment
RIKILT	RIKILT-Institute for Food Safety
SSG	Social Sciences Group
V&M	Safety and Environment, Real Estate and Housing department, Facilities and Services
WA	Wageningen Academy
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)
WUR	Wageningen University & Research

Terms

BVF	Biological Safety Officer
DBP	Animal by-products
Erbis	Energy registration, management and information system
GMO	Genetically Modified Organisms
GROS	<i>Gevaarlijke stoffen Registratie- en Opsporingssysteem</i> ('hazardous substances registration and investigation system')
ILT	Human Environment and Transport Inspectorate
ex-Kew	Dutch Nuclear Energy Act
KGA	Hazardous Office Waste
MJA3	Multi-Year Agreement for Energy 3
MJP	Annual environmental plan
MJV	Annual environmental report
CSR	Corporate Social Responsibility
NCP	National Contact Point (OECD guidelines)
NeR	Dutch Emission Guidelines for Air
NVWA	Netherlands Food and Consumer Product Safety Authority
OECD	Organisation for Economic Cooperation and Development
RVO	Netherlands Enterprise Agency
SZA	Specific Hospital Waste
Wabo	Dutch Environmental Permitting (General Provisions) Act
CHP	Combined heat and power installation
WKO	Thermal storage system
Wm	Dutch Environmental Management Act

Appendix 2. Waste figures Wageningen University & Research (including third parties)

Appendix 2a. Total quantity and composition of waste (kg) per organisation component 2016

Waste flow	AFSG	ASG	CS+	ESG	FB	WMR	PSG	RIKILT	SSG	Derden	Totaal	Verwerking (GRI)
Residual waste	264,586	264,636	38,032	39,207	99,503	20,643	318,861	20,780	30,706	68,366	1,165,320	Thermal recycling
Garden waste/green waste/swill	14,026				59,523		94,910	3,797	20,939	128,158	321,353	Recycling: fermentation
Rubble/construction & demolition waste		35,300	1,600		66,996		10,520				114,416	Recycling
Plastic wrap & plastics	6,126	3,097	24		14,276	40	16,300	2,088	1,194		43,145	Recycling
Soil							27,350				27,350	Other
Wood	2,880	2,140			520		21,080				26,620	Recycling
Glass	5,510	2,897	245	575	1,030	94	5,042	3,775	822	3,332	23,322	Recycling
Scrap	420	15,870									16,290	Recycling
Rock wool							9,680				9,680	Recycling
Oil/grease/fat/butter	285				0						285	Recycling
Data/confidential		47			30						77	Shredding & recycling
Paper	63,488	31,468	14,912	29,006	53,526	4,147	54,362	14,072	31,807	6,418	303,206	Shredding & recycling
Hazardous waste	51,820	181,190		15,425	10,901	20,602	31,184	40,817	186	50,622	402,747	See table 2b
Total	409,141	536,645	54,813	84,213	306,305	45,526	589,289	85,329	85,654	256,896	2,453,811	
% waste separation	35.3%	50.7%	30.6%	53.4%	67.5%	54.7%	45.9%	75.6%	64.2%	73.4%	52.5%	

Appendix 2b. Hazardous waste (kg) 2016 WUR (including third parties) per EWC code

EWC code	Waste flow (description)	2016	Processing method
050108*	Bitumen, tectyl, tar, grease	157	Other: unknown
060101*/060106*	COD/CSZ waste	154	Other: DND ⁴
060102*	Diluted hydrochloric acid	315	Other: DND
060105*	Nitric acid	7,398	Other: DND
060106*	Various inorganic acids / Fluoride / hydrogen fluoride	7,754	Other: DND
060203*	Ammonium	26	Other: DND
060204*	Inorganic lyes / Sodium hydroxide solution	88	Other: DND
060205*/200115*	Inorganic lyes / Kjeldahl waste	9,296	Other: DND
060313*/160303*	Silica gel	56	Energy recovery
060314*	Ammonium sulfate	34	Other: DND
070103*	Fluids with high halogen content	934	Incineration
070104*	Fluids with low halogen content	3,967	Energy recovery
070704*	Organic lyes / amines	94	Other: DND
080111*/200127*	Paint	292	Energy recovery
080409*	Glues, resins and putties	119	Energy recovery
090101*	Developer, film	189	Recycling
090104*	Fixative	251	Recycling
110106*	Organic lyes / Acetic acid	592	Other: DND
130204*	Waste oil	38	Recycling
130205*/130208* /200126*	Used oil cat. II	1,262	Recycling
130204*	Used oil cat. III	22	Recycling
130502*/130508*	Oil/water/silt mixtures	23,010	Recycling
130899*	Waste containing oil	262	Energy recovery
140602*	Solvents with high halogen content	4,326	Incineration
140603*/160506*	Solvents with low/no halogen content	8,312	Energy recovery
150110*	Lab glass, thermal glass, empty packaging (unrinsed)	6,232	Incineration
150202*	Lab waste - filters, pipettes with chemical residues	2,949	Energy recovery
160107*	Oil filters	10	Recycling
160113*	Brake fluid (clean)	134	Recycling
160114*	Coolant (clean)	270	Recycling
160206*	Lab chemicals, various	32	Incineration
160214*	Electronics (scrap)	739	Recycling
160303*/160506*	Inorganic salts	66	Other: DND
160504*	Spray cans	41	Incineration
160506*	Lab chemicals cat. I to IV	2,151	Incineration
160508*	Organic acids in cans	103	Incineration
160601*	Lead batteries	109	Recycling
161001*	Waste water with pesticides, fluids/mixtures with low calorific value, contaminated water	7,753	Incineration
170503*	Soil contaminated (PAHs)	731	Energy recovery
170605*	Material containing asbestos	6	Disposal
170903*	Small hazardous construction waste	710	Energy recovery
180103*/180202*	Specific Hospital Waste and animal waste material / biologically contaminated material	155,922	Energy recovery
190809	Fat waste	1,680	Other: unknown
200113*	Solvents	40	Incineration

⁴ DND: decontamination, neutralisation and dehydration
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EWC code	Waste flow (description)	2016	Processing method
200119*	Pesticides	29,211	Incineration
200121*	Various lamps, objects containing mercury	1,140	Recycling
200123*	White & brown goods	4,377	Recycling
200127*	Small hazardous waste / Toners	420	Energy recovery
200129*	Cleaners	128	Other: DND
200132*	Medicines and cosmetics	341	Energy recovery
200133*	Batteries	967	Recycling
200135*/200136	White & brown goods / Electronics (scrap)	11,957	Recycling
200199	Small hazardous office waste	90	Energy recovery
-	Animal waste	105,465	Other: sterilization and processing to animal meal for production biofuel
-	Radioactive waste	25	Disposal (long term storage)
Total (kg)		402,747	

Appendix 2c Total quantity of waste (kg) in 2016 per step in Lansink's Waste Hierarchy (according to GRI)

Waste flow	Processing method : step in Lansink's Waste Hierarchy							Total
	Recycling	Energy recovery	Other: sterilization and processing to animal meal for production biofuel	Other: decontamination, neutralisation and dehydration	Other: unknown	Incineration	Disposal	
Industrial waste	555,188	1,165,320			27,350			1,747,858
Paper	303,206							303,206
Hazardous waste	44,475	174,171	105,465	25,945	1,837	50,823	31	402,747
Total	902,869	1,339,491	105,465	25,945	29,187	50,823	31	2,453,811
Fraction	37%	55%	4%	1%	1%	2%	0%	

Appendix 2d Total quantity of waste (kg) per municipality in 2016

Municipality	Hazardous	Industrial waste	Paper	Total
Wageningen	212,210	1,167,681	243,673	1,623,564
Lelystad	167,575	299,827	32,654	500,056
Assen			161	161
Bleiswijk	1,022	96,234	4,930	102,186
Den Haag	186	7,345	7,564	15,095
Den Helder	2,032	3,887	858	6,777
Ede	0	24,911	1,961	26,872
Haaksbergen			244	244
Hengelo	1	1,349	600	1,950
IJmuiden	11,896	9,286	3,189	24,371
Leeuwarden		32,377	2,384	34,761
Lisse	771	43,118		43,889
Marwijksoord		1,056	360	1,416
Nagele		960		960
Oisterwijk			408	408
Randwijk		7,291	1,490	8,781
Renkum		753		753
Sterksel		27,796	1,000	28,796
Valthermond		5,380	840	6,220
Vredepeel		3,968	550	4,518
Westmaas	380	7,035	240	7,655
Yerseke	6,674	7,604	100	14,378
Total	402,747	1,747,858	303,206	2,453,811

¹ An empty cell means no figures are available.

² The industrial waste from the locations The Hague, Hengelo, Leeuwarden, Lisse, Marwijksoord, Sterksel, Valthermond, Vredepeel and Westmaas are usually not weighed. The figures are calculated on the basis of volumes disposed of and standard similar weights.

Appendix 2e Waste quantity (kg) and composition 2015-2016 per Wm-complex

Waste flow	Sub waste flow	WUR-complex Lelystad		Wageningen Campus		Wageningen De Dreijen	
		2016	2015	2016	2015	2016	2015
Industrial waste	Residual waste	162,913	137,420	589,757	520,113	164,828	89,318
	Garden waste/green waste/swill	12,040	25,920	212,163	171,035	1,441	
	Rubble/construction & demolition waste			51,420	42,540		20,880
	Foil/Plastic			40,516	32,131	46	
	Soil	17,560	25,334				
	Wood	6,460	5,220	16,320	10,390	1,700	1,440
	Glass	757	445	17,355	9,494	3,900	1,020
	Scrap		7,320	420			
	Oil/grease/fat/butter		980		1,368	285	38
	Data/confidential	47	119	30	195		
Paper	Paper & cardboard	23,340	19,725	180,320	165,395	31,840	41,675
	Cup2Paper	559	320	5,659	2,910	739	1,195
Hazardous waste	Hazardous waste	62,423	65,965	162,377	153,484	16,674	16,037
	Rendac	40,333	11,314	23,424	22,107		
	White & brown goods	1,277	2,400	5,266	7,001	3,759	2,636
Total		327,709	302,482	1,305,027	1,138,163	225,212	174,239
Waste separation %		50.3%	54.6%	54.8%	54.3%	26.8%	48.7%

Appendix 2f Waste (kg) in 2016, broken down by waste flow and Wageningen Campus location

Waste flow	Gaia/ Lumen	Atlas	Radix	Unifarm	Axis	Helix	Futurum	Forum	Orion	Actio/ Nexus
Residual waste	38,454	22,810	75,960	150,678	81,574	11,500	15,540	31,227	20,043	11,603
Garden waste/green waste/swill				8,100	8,758	3,842	0	31,663	21,900	5,791
Rubble/construction & demolition waste		1,600		2,080				1,180		46,560
Plastic wrap/plastic	0			15,820	3,600	2,500		10,909	2,987	384
Glass	575	50	432	4,560	760	175	675	254	552	
Wood				14,620	1,180				520	
Scrap				0	420					
Data/confidential	0							0		30
Paper & cardboard	27,945	12,365	25,155	9,725	18,264	9,305	2,785	29,983	6,945	9,685
Cup2Paper	1,061	999	682		1,357					378
Hazardous waste	8,068	6,920	8,203	328	27,623	3,298		1,396	8,411	
Rendac										
White & brown goods	437		3,502		235	261		384		
Total	76,540	44,744	113,934	205,911	143,771	30,881	19,000	106,996	61,358	74,431
Waste separation %	49.8%	49.0%	33.3%	26.8%	43.3%	62.8%	18.2%	70.8%	67.3%	84.4%

Waste flow	Vitae	Zodiac	Carus	Innovatron	Triton	Hoge Born	Theia	Wageningen Campus (total)
Residual waste	49,440	28,100	29,880	0	11,138	11,683	127	589,757
Garden waste/green waste/swill	131,169			940	0			212,163
Rubble/construction & demolition waste								51,420
Plastic wrap/plastic	2,088	2,228			0			40,516
Glass	6,500	0	2,140		75	607		17,355
Wood								16,320
Scrap								420
Data/confidential		0						30
Paper & cardboard	13,225	8,690	1,145	1,835	1,265	1,748	255	180,320
Cup2Paper	847	335						5,659
Hazardous waste	90,962	7,168						162,377
Rendac			23,424					23,424
White & brown goods	447							5,266
Total	294,678	46,521	56,589	2,775	12,478	14,038	382	1,305,027
Waste separation %	83.2%	39.6%	47.2%		10.7%	16.8%	66.8%	54.8

Appendix 2g Waste (kg) in 2016, broken down by waste flow and location in Lelystad

Waste flow	Edelhertweg 1	Edelhertweg 15	Runderweg 2	Runderweg 4	Runderweg 6	Runderweg 8	Houtribweg 39	Total
Residual waste	30,391	28,180	2,080	65,069	23,799	13,394	79,360	242,273
Soil	17,560							17,560
Scrap							12,310	12,310
Garden waste/green waste/swill	12,040							12,040
Wood	6,460						2,140	8,600
Glass		757						757
Data/confidential		47						47
Hazardous waste	16,978	43,185		2,260			37,517	99,940
Rendac		27,575		12,758			24,406	64,739
White & brown goods		1,277					1,619	2,896
Paper & cardboard	9,980	8,070			4,670	620	8,755	32,095
Cup2Paper	410	149						559
Total	93,819	109,240	2,080	80,087	28,469	14,014	166,107	493,816
Separation %	67.6%	74.2%	0.0%	18.8%	16.4%	4.4%	52.2%	50.9%

Appendix 2h Waste (kg) in 2016, broken down by waste flow and location (other)

Waste flow	Wageningen De Dreijen	Wageningen other	Schouten- hoef	Sinder- hoeve	PSG outside locations	WLR Innovation centers	WMR	WECR Den Haag	WECR other	Total
Residual waste	164,828		14,591	753	61,832	28,033	20,643	7,320		333,290
Garden waste/green waste/swill	1,441	20,939			74,770					97,150
Rubble/construction/demolition waste		8,936	10,320		8,440	29,060				56,756
Soil					9,790					9,790
Rock wool					9,680					9,680
Glass	3,900	1,141			50		94	25		5,210
Scrap						3,560				3,560
Plastic wrap /plastic	46	1,194			480	869	40			2,629
Wood	1,700									1,700
Oil/grease/fat/butter	285									285
Paper & cardboard	31,840	25,115	1,835		8,410	3,929	4,147	5,754	624	81,654
Archive								1,275	244	1,519
Cup2Paper	739		126					535		1,400
Hazardous waste	16,674	710	0		2,173	1	3,300	45		22,903
Rendac							17,302			17,302
White & brown goods	3,759							141		3,900
Total	225,212	93,325	26,872	753	175,625	65,452	45,526	15,095	868	648,728
Separation %	26.8%	62.2%	45.7%	0.0%	64.8%	57.2%	54.7%	51.5%		48,6%

Appendix 2i. Total quantity of waste in 2016 en 2015 (in kg), broken down by organisational component

Organisational component	Hazardous waste	Industrial waste	Paper waste	Total	Waste separation %
2016					
AFSG	51,820	293,833	63,488	409,141	35%
ASG	181,190	323,987	31,468	536,645	51%
Corporate Staff		39,901	14,912	54,813	31%
ESG	15,425	39,782	29,006	84,213	53%
Facility Services	10,901	241,878	53,526	306,305	68%
PSG	31,184	503,743	54,362	589,289	46%
RIKILT + NVWA	40,817	30,440	14,072	85,329	76%
SSG	186	53,661	31,807	85,654	64%
Wageningen Marine Research	20,602	20,777	4,147	45,526	55%
Subtotal WUR	352,125	1,548,002	296,788	2,196,915	50%
Third parties on WUR grounds	50,622	199,856	6,418	256,896	66%
Total	402,747	1,747,858	303,206	2,453,811	53%
2015					
AFSG	45,222	206,988	62,355	314,565	43%
ASG	129,138	246,204	47,611	422,953	48%
Corporate Staff		33,546	17,975	51,521	39%
ESG	13,876	39,718	27,835	81,429	58%
Facility Services	11,280	203,224	54,021	268,525	63%
Wageningen Marine Research	25,552	20,916	4,016	50,484	64%
PSG	49,132	463,875	36,410	549,417	51%
RIKILT + NVWA	35,706	24,444	13,695	73,845	75%
SSG	58	53,007	31,266	84,331	60%
Subtotal WUR	309,964	1,291,922	295,184	1,897,070	51%
Third parties on WUR grounds	47,390	180,848	4,064	232,302	76%
Total	357,354	1,472,770	299,248	2,129,372	55%

Notes:

- The household waste produced by the Netherlands Food and Consumer Product Safety Authority (NVWA) is removed through RIKILT. Hazardous waste and specific operational waste flows are disposed of independently and are listed under 'Third parties on WUR grounds'.
- In cases where a building has more than one tenant, the waste is attributed to the main tenant.
- Each year, PSG composts 600 tonnes of green waste from the greenhouses and garden waste on Wageningen Campus. PPO-Lelystad ferments approximately 81 tonnes of green waste in its own fermenter each year. Because this is a closed cycle, it is not counted as waste.

Appendix 2j. Hazardous waste (in kg) in 2012-2016, broken down by organisational component

Organisational component	2012	2013	2014	2015	2016
AFSG	54,549	42,794	44,610	45,222	51,820
ASG	75,162	124,289	141,762	129,138	181,190
Corporate Staff		4			
ESG	14,162	7,437	18,412	13,876	15,425
Facility Services	8,448	2,091	7,985	11,280	10,901
Wageningen Marine Research	18,900	25,659	17,170	25,552	20,602
PSG	37,898	10,406	38,986	49,132	31,184
RIKILT	25,242	28,348	36,890	35,706	40,817
SSG		75	117	58	186
Subtotal WUR	234,361	241,103	305,932	309,964	352,125
Third parties on WUR grounds	26,865	49,729	52,503	47,390	50,622
Total	261,226	290,832	358,435	357,354	402,747

Appendix 3. Energy consumption WUR in 2005 and 2008-2016

Energy consumption	Electricity (kWh)	Gas (m ³)	Energy (GJ)	Tonnes of CO ₂
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
2008	63,685,301	9,923,959	888,039	53,965
2005	59,581,768	11,031,812	886,033	53,598
Energy consumption compared to 2005	Electricity (kWh)	Gas	Energy (GJ)	Tonnes of CO ₂
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%
2008	107%	90%	100%	101%
2005	100%	100%	100%	100%

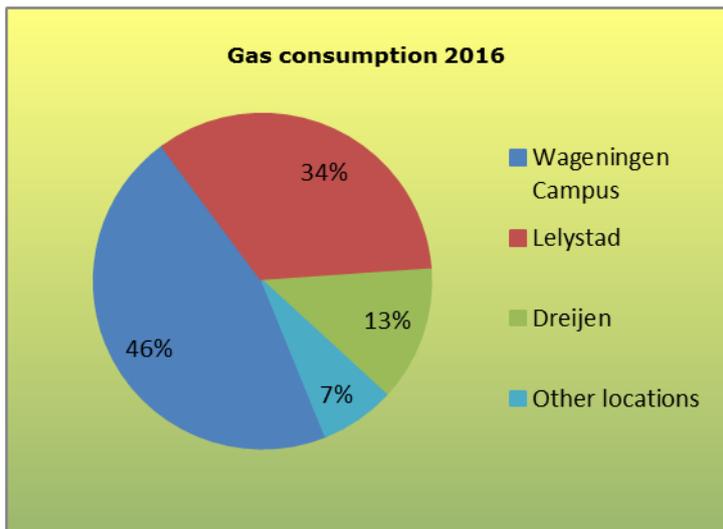
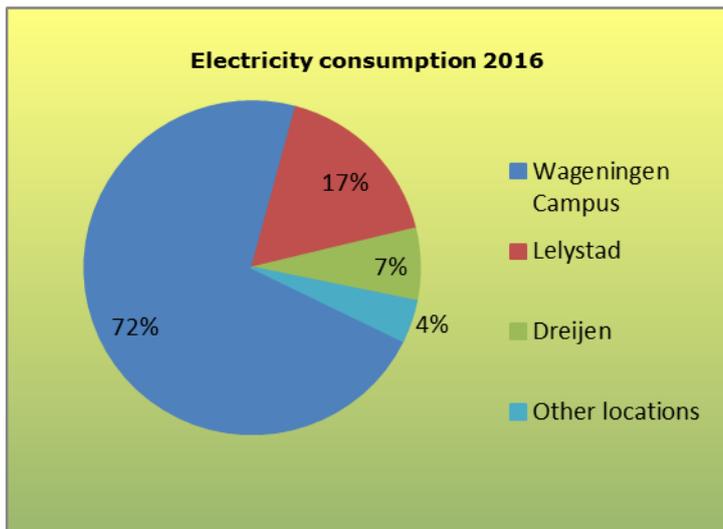
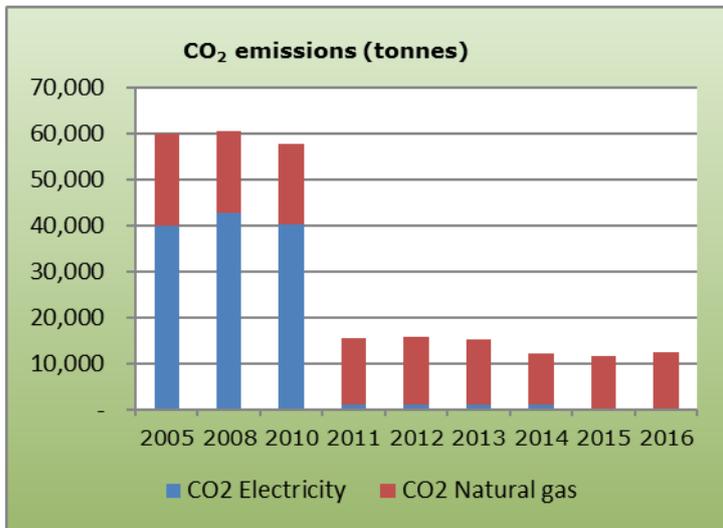
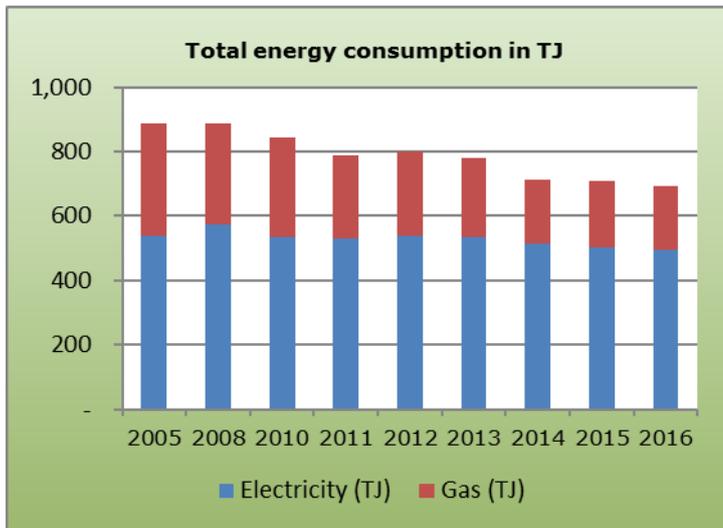
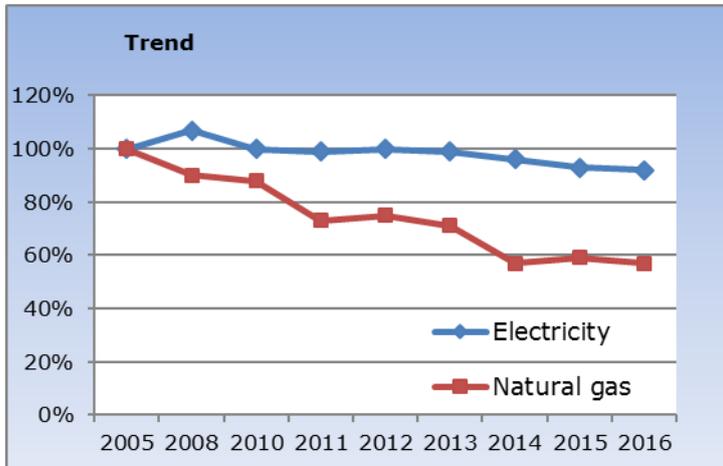
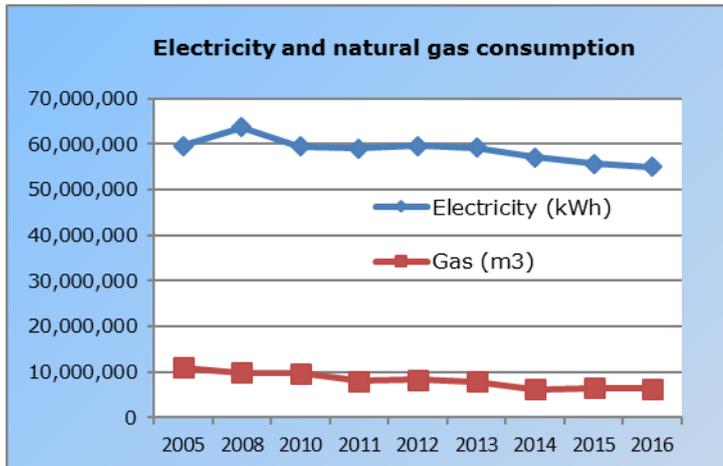
Energy consumption Complexes, 2014	Electricity (kWh)	Gas	Energy (GJ)	Tonnes of CO ₂
Dreijen	10,692,898	2,006,693	159,748	3,755
Wageningen Campus	36,764,842	2,658,824	415,035	5,314
Kortenoord	0	0	0	0
Lelystad	7,429,469	1,265,561	106,920	2,379
Other	2,242,249	342,285	31,014	647
Total	57,129,458	6,273,363	712,717	12,095

Energy consumption Complexes, 2015	Electricity (kWh)	Gas	Energy (GJ)	Tonnes of CO ₂
Dreijen	6,412,617	1,269,598	97,896	2,274
Wageningen Campus	36,931,506	2,764,842	419,891	4,953
Kortenoord	0	0	0	0
Lelystad	10,081,853	2,096,010	157,075	3,755
Other	2,234,615	372,720	31,908	668
Total	55,660,591	6,503,170	706,771	11,650

Energy consumption Complexes, 2016	Electricity (kWh)	Gas	Energy (GJ)	Tonnes of CO ₂
Dreijen	3,671,806	853,963	60,074	1,530
Wageningen Campus	39,532,894	2,888,310	447,211	5,174
Kortenoord	0	0	0	0
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

Gross floor area in m ²	2016	2015	2014	2008
De Dreijen	73,400	77,693		
Wageningen Campus	257,813	243,208		
Kortenoord	0	0		
Lelystad	108,898	108,898		
Other	39,221	37,700		
Total	479,332	467,499	475,422	605,618
Specific energy use	2016	2015	2014	2008
Aardgas (GJ/m ²)	0.416	0.433	0.418	0.654
Elektra (GJ/m ²)	1.031	1.054	1.081	1.132
Total	1.448	1.487	1.499	1.785

Appendix 3. (continued) Energy consumption WUR in 2005, 2008-2016



Appendix 4. Water/waste water consumption WUR in 2005-2016

Water/waste water use	Mains water (m ³)	Well water (m ³)	CO ₂ mains water (kg)	CO ₂ well water (kg)
2016	209,058	27,912	62,299	8,318
2015	214,549	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 to 2005	Mains water	Well water (m ³)	CO ₂ mains water	CO ₂ well water
2016	89%	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/waste water consumption by complex 2014	Mains water (m ³)	Well water (m ³)	CO ₂ mains water (kg)	CO ₂ well water (kg)
Dreijen	25,246	19,000	7,523	5,662
Wageningen Campus	81,048	35,865	24,152	10,668
Kortenoord	0	0	0	0
Lelystad	87,363	0	26,034	0
Other	11,601	1,312	3,457	391
Total	205,258	56,177	61,167	16,741

Water/waste water consumption 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
Kortenoord	0	0	0	0
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/waste water consumption by complex 2016	Mains water (m ³)	Well water (m ³)	CO ₂ mains water (kg)	CO ₂ well water (kg)
Dreijen	39,825	666	11,868	198
Wageningen Campus	90,025	26,444	26,827	7,880
Kortenoord	0	0	0	0
Lelystad	64,829	0	19,319	0
Other	14,379	802	4,285	239
Total	209,058	27,912	62,299	8,318

Appendix 4. (continued) Water/waste water consumption WUR in 2005-2016

