Public Health England

Protecting and improving the nation's health

Sustainability in Public Health England 2018

About Public Health England

Public Health England exists to protect and improve the nation's health and wellbeing, and reduce health inequalities. We do this through world-leading science, knowledge and intelligence, advocacy, partnerships and the delivery of specialist public health services. We are an executive agency of the Department of Health and Social Care, and a distinct delivery organisation with operational autonomy. We provide government, local government, the NHS, Parliament, industry and the public with evidence-based professional, scientific and delivery expertise and support.

Public Health England
Wellington House
133-155 Waterloo Road
London SE1 8UG
Tel: 020 7654 8000
www.gov.uk/phe
Twitter: @PHE_uk
Facebook: www.facebook.com/PublicHealthEngland

Prepared by: Peter M Hammond and Steven D Owens

The following people also contributed to this report: Natalie Glover; Brigitte Guile; Agnes Jung; Elizabeth Liversage; Lisa Reynolds; Aimee Stimpson; Ross Thompson; John Thornes; Derek Walter; Sarah Webb

© Crown copyright 2018
You may re-use this information (excluding logos) free of charge in any format or medium, under the terms of the Open Government Licence v3.0. To view this licence, visit OGL. Where we have identified any third party copyright information you will need to obtain permission from the copyright holders concerned.

Published November 2018
PHE publications
gateway number: 2018664

PHE supports the UN
Sustainable Development Goals

Contents

Foreword

I am very pleased to introduce PHE's fifth annual report on sustainability, describing the work that PHE has undertaken over the past year. We continue to make progress in reducing our carbon impact across the PHE estate, with a number of projects helping to reduce our utility usage. For example since the introduction of photo voltaic power generation at Chilton, Colindale and Porton, we have seen a significant reduction in our use of energy derived from fossil fuels at our 3 largest sites.

Our overall business travel has decreased by 6.5% over the past year, and we will endeavour to continue this momentum. We operate from approximately 70 sites across the country and will continue to promote the use of Skype for meetings. This technology is available to all of our staff, reducing the need to attend in person.

When we must travel, we will use public transport wherever possible, and we discourage staff from using their own cars. We continue to encourage staff to cycle and walk to work whenever they can and have promoted these healthy alternatives through a series of health and wellbeing initiatives which help our staff to understand the associated health benefits that these activities can bring.

Our wider work continues to add to the scientific evidence on the health impacts of climate change and extreme events, providing useful data for local authorities and the government. Local authorities have used this data to focus on areas of improvement to their housing stock, so that dwellings can be retrofitted to make them warmer in the winter months and cooler in summer. Our associated work on cold weather and heatwave plans is also helping to save lives, providing advice to those professionals who are on the frontline ensuring better outcomes.

We continue to advise other countries on the health impacts of devastating natural disasters, and parts of our organisation respond regularly to incidents and extreme events overseas.

We have an active sustainable development communication programme, with a number of guidance documents and tools being developed to help improve the sustainability of PHE and the wider health system.

In the coming year we will better co-ordinate our internal and external work on sustainability identifying where we can go further, faster, with a plan of action for 2019 to 2020.

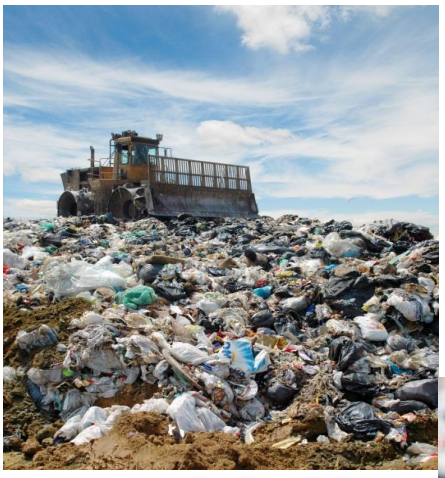
Alex Sienkiewicz
PHE Executive Lead for Sustainability

Highlights of PHE's utility and travel usage

Gas usage was down by 13%

Electricity usage was up by 0.7%

Water usage was up by 37%



Total waste was down by 29%

Domestic flights were down by 59%

Train usage was up by 7%

Personal car usage was up by 0.8%

Decrease

Increase

Executive summary

This report describes our fifth year of operation in which sustainability has continued to be an important part of our work. Some sections of the narrative, however, describe work which is continuing in the current year 2018 to 2019. Our work in this field continues to help embed sustainability into the organisation's activities and will further develop over time.

In the past year, there have been a number of organisational changes across PHE, with the formation of 2 new directorates, the Health Improvement Directorate and the People Directorate. This has made direct year-on-year comparisons difficult in some areas.

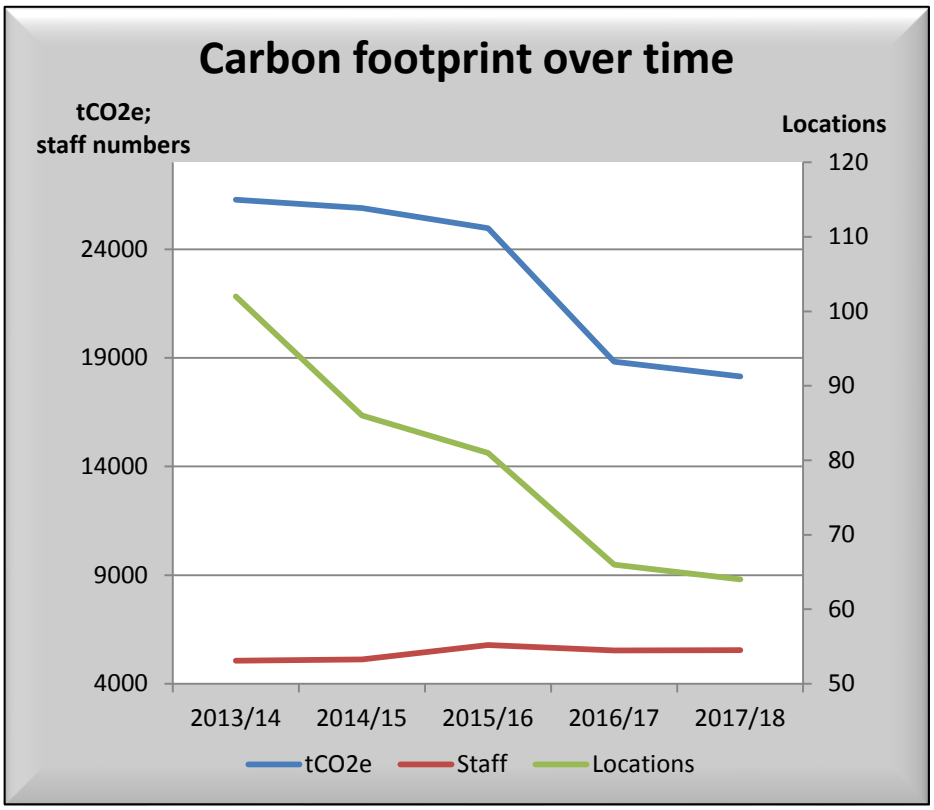
However, we believe it is important to lead by example, and this report continues to give an in-depth analysis of our carbon footprint, particularly in relation to utility use, the production and management of waste and the business travel we undertake. It also highlights the progress we are making on sustainability inside our organisation, our work with partner organisations and the work undertaken by some of our specialist teams.

In line with government strategy, PHE continues with the consolidation of its estate, and this continues to contribute to reducing our overall carbon emissions. The acquisition of our new site in Harlow has expanded the PHE estate, and this in turn has increased emissions in some areas. These will further increase over the coming years as the site is redeveloped before occupation and, in particular, there will be a significant amount of waste spoil produced requiring removal from the site. In order to ensure that our reporting remains meaningful, we have agreed with DEFRA that figures for the Harlow site will be reported as separate lines until the site becomes operational.

PHE's total carbon emissions for 2017 to 2018 were 18,141 tCO_2e, compared to 18,820 tCO_2e for 2016 to 2017, representing a reduction of 3.68% over the reporting period. Our carbon footprint for our baseline year (2013 to 2014) was 26,274 tCO_2e so the current figures represent an overall 31% reduction over our baseline year, despite the growth of the organisation in size; see the growth-versus-consolidation chart below.

PHE's carbon footprint comprises Scope 1, 2 and 3 carbon emissions, as defined by government. It comprises data relating to our reportable (owned) estate and our non-reportable sites (that is, those facilities where PHE is a tenant and emissions are reported separately by a landlord). Our investment in reducing our use of fossil fuels as a source of energy continues, with the installation of photovoltaic cells not only at

our 2 largest sites, Porton and Colindale, but also at our Chilton site. Together these installations have helped reduce our carbon emissions by 233 tCO_2e. On a bright sunny day, the array at Porton can account for as much as 10 percent of the total site electricity usage. PHE's carbon footprint over time, set against the reduction in our estate and staff numbers, is shown below for our first 5 years.



We continue to report on our carbon emissions to the Department of Health and Social Care on a quarterly basis, in line with the Greening Government Commitment. Keeping staff informed about our carbon emissions and the associated financial cost to the organisation is one of the many communication tools that we employ.

The reportable usage of water for the whole estate, inclusive of PHE Harlow, was 170,004 m^3, with a further estimated 21,253 m^3 being used by our non-reportable sites. Overall, this represents a significant rise in consumption from our reportable sites of 35% from last year. This was due to a number of major leaks which were detected at 2 of our larger sites; these have now been repaired. PHE-owned sites continue to have a mixture of office and non-office facilities making it difficult to differentiate their water usage into any meaningful datasets.

PHE has set a total waste reduction target of 2% annually to March 2020, in line with the Greening Government Initiative. There was a 29% decrease in total waste, compared to the previous year. PHE's total waste figure for 2017 to 2018 was 682 tonnes, compared to the figure for our baseline year in 2013 to 2014 of 912 tonnes.

Contractors working at PHE sites are regularly reminded about their obligation to reduce their waste wherever possible, in line with PHE's waste policy and its associated management arrangements.

Total non-hazardous waste not sent to landfill decreased by 13 tonnes over the year. This is a 30% reduction compared with last year's figures.

Due to the nature of the work carried out at a number of our sites, a significant quantity of hazardous waste is produced, with the majority of such waste being sent for incineration, in compliance with government guidelines.

We continue to work with our contractor, Computer Disposal Limited (CDL), to recycle and reuse our redundant ICT equipment. ICT waste is collected and disposed of at no cost to PHE, mostly as part of our government contract with CDL. This continues to be an effective method of disposal for this waste stream, in line with government policy. A total of 17 tonnes of ICT waste has been processed in this manner in the past financial year.

In 2017 to 2018, PHE used 15,534 reams of A4 paper, a reduction of 27 % on the previous year's figure.

In order to facilitate a comparison of travel emissions across the various parts of the organisation, PHE uses the measure of tCO_2e per whole time equivalent (wte) staff. One of the key changes to our travel footprint compared with last year was a significant increase in international flights, with a small reduction in domestic flight use.

There was a reduction in the distance travelled by taxis last year. We continue to encourage staff to use more carbon friendly means of travel, which has meant that train use has increased slightly. There was also a disappointing, albeit small, increase in the use of personal cars.

Our members of staff are encouraged to travel only when necessary and, when they must travel, to use the most sustainable modes of transport. This has led to a 6.5% decrease in our overall reportable business travel carbon emissions when compared to the previous year.

The organisation continues to recognise that less business travel will also benefit public health by preventing air pollution and support PHE's plans to reduce carbon and save money. PHE continues to lead on the health effects of air pollution, especially in relation to the use of diesel transport in our cities and large towns. This will help to increase the awareness of pollution and help government to develop further measures to reduce its impact upon our communities.

Sustainability is also an important factor in our purchases. Our procurement category managers ensure that all our tender documents contain relevant questions to confirm that the successful suppliers adhere to appropriate environmental and sustainability standards. These include ensuring that our main suppliers are applying the Social Value Act and Modern Slavery Act.

To help staff understand their sustainability obligations and the importance of reducing our carbon impact, we continue to promote our sustainability e-learning training course. This training is mandatory for all staff, with a refresh every 3 years. In the past year, 1,297 members of staff undertook the training.

A sustainable health system recognises that unhealthy behaviours can cause more damage to the environment than healthier ones. Driving (instead of walking or cycling), eating carbon-intensive processed foods and living in cold homes can all have adverse health effects. We work with other health-related bodies to inform the community about effective, practical actions that can be taken on a range of social determinants of health that are relevant to sustainability.

Introduction

PHE's ambition on sustainability and climate change

The health and wellbeing of the public, now and in the future, depends on us living within acceptable limits and developing all sustainable assets – environmentally, economically and socially. This includes the natural and built environment, public spaces, transport, physical activity, diet and food supply. It also extends to energy, education, employment, diversity, social capital and community resilience – all of which are fundamental to health and wellbeing. Addressing unsustainable patterns of living offers a wide range of benefits, from operating within safe financial and environmental limits to developing life-saving resilience and life-enhancing activities.

Achieving our goals in sustainable and low carbon ways is critical to turning the biggest strategic health threat we face into the greatest opportunity for collective action and health improvement. There are some areas where PHE can play a very distinctive role, for example providing scientific expertise leadership for local public health systems and as an exemplar employer.

Our future physical and mental health as individuals, and as communities, depends on embedding mitigation, adaptation and the principles of sustainable development into all that PHE does.

There are many opportunities for PHE to fulfil this role, including the way we do business, our role in co-ordinating science, our contribution to policy, and through advocacy. We can help to achieve this by:

- reducing risks and vulnerability (for example extreme events and disaster reduction, improved air quality, safer roads, reduced emissions, smarter ways of preventing the preventable)
- improving resilience and developing sustainable assets (for example education, good housing, life-enhancing public spaces, empowered communities and people, vibrant cultures)
- ensuring safe, sustainable and resilient public health and care services (for example transformative models of prevention and care, where every opportunity, plan, policy and contact contributes to healthy lives, healthy communities and healthy environments – now and in the future)

PHE is making very good progress, with clearer and well-monitored corporate sustainability policies, all of which have been reviewed and revised this year. Our staff are committed to making the very best use of available resources, and PHE is a leading member of a national cross-system strategy group for the UK health and care

system. The purpose of this group is to share and provide ambition, leadership, vision, and cross-system support in relation to sustainable development from and for the health and care system (specifically the public health, healthcare and social care sectors).

PHE is committed to sustainable development in all its activities and our new Sustainable Development Management Plan sets out our aims to help us operate in more sustainable ways.

PHE continues to embed sustainability into its contracts, helping to highlight risks arising from our procurement activities. We continue to utilise the tools developed by the Government Procurement Service, ensuring we maintain a robust approach to sustainability throughout the supply chain.

We continue to engage our staff through a mandatory sustainable development e-learning programme. This training provides staff with a good understanding of sustainable development and encourages them to act in a sustainable manner, taking account of their impact on the environment.

This report describes the work that PHE has undertaken on sustainable development over the past year. It includes details of our ongoing commitment to reduce our carbon footprint as well as other activities where sustainability is a key driver, such as climate change and extreme events.

In the past year there have been a number of organisational changes across PHE. Among the major changes was the formation of the Health Improvement Directorate and the People Directorate, through a consolidation and restructuring of various existing functions. A significant reorganisation of PHE’s National Infection Service was also completed. The data in this report therefore reflects the changes that have been made, although this creates challenges when attempting to make year-on-year comparisons.

Our carbon footprint

PHE has set a target to reduce its carbon emissions by 3% annually for the period to March 2020, compared to a baseline year of 2013/14, in line with the Greening Government Commitment (GGC).

To achieve this, PHE has agreed a number of carbon-related reduction targets for its estate, which include utility use, business travel, water consumption and total waste. During 2017 to 2018, a variety of projects were undertaken to help us meet our reduction targets and where possible exceed them.

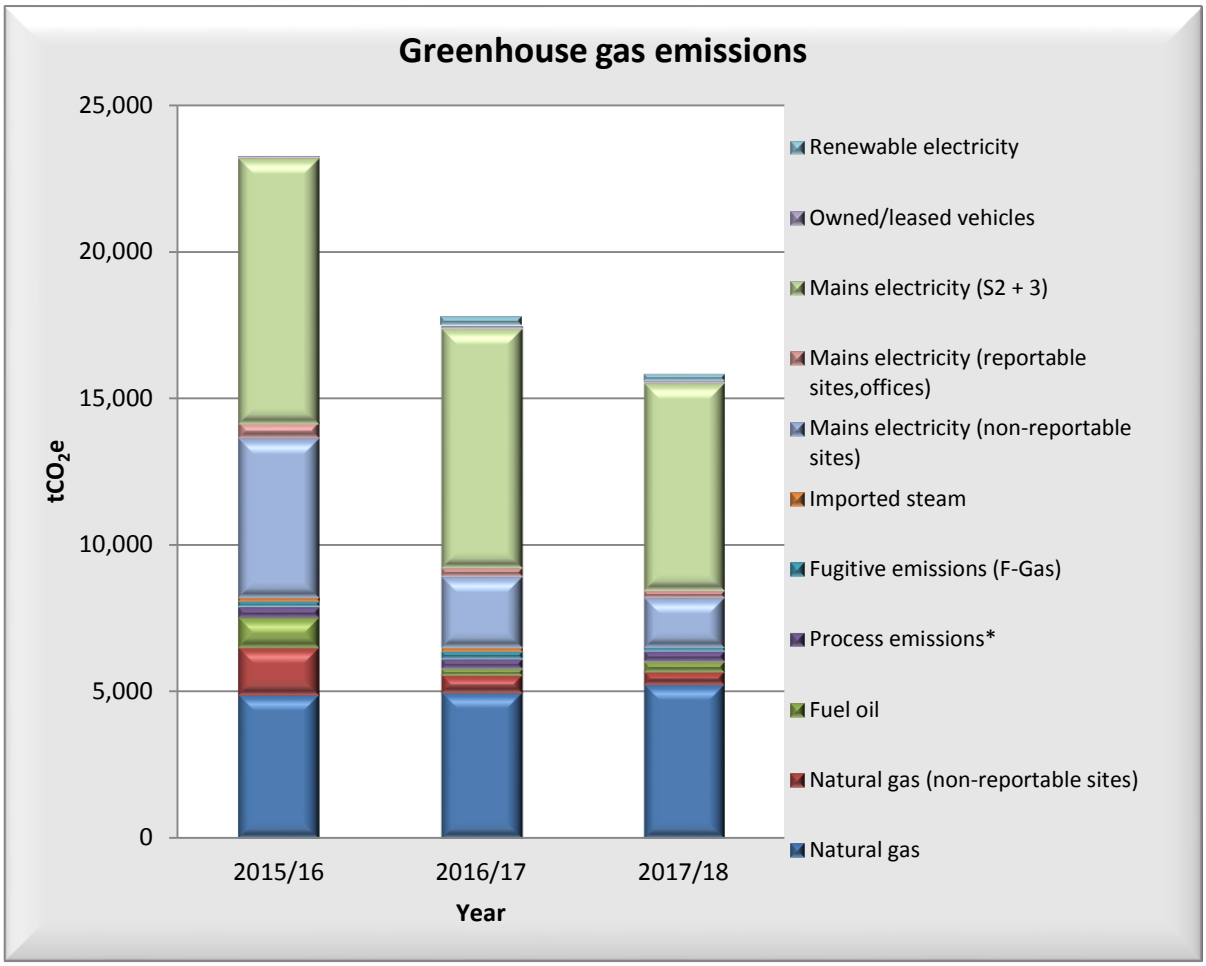
In line with government strategy, PHE continues with the consolidation of its estate. This continues to contribute to reducing our overall carbon emissions, though with our acquisition of PHE Harlow there will be a slight increase in emissions whilst this site is rebuilt. It has been agreed with DEFRA that PHE can report the emissions from its Harlow site separately, thereby ensuring that we can continue to monitor the impact of our carbon reduction activities separately from the construction work which will take place in Harlow over the coming years. Data for the Harlow site will therefore be displayed separately from the main data.

In this chapter we include emissions data from both PHE's reportable and its non-reportable sites. (Non-reportable sites are those offices or laboratories that are being reported separately by the premises' landlord.)

PHE owns 6 of its premises and has a direct relationship with the utility provider at a further one. It has numerous shared facilities embedded in government-owned property (including hospitals) and in other tenanted accommodation. There is no direct relationship with the utility provider in these premises and no sub-metering has been undertaken. To avoid double accounting of carbon emissions from these properties, they have been identified separately for reporting purposes. PHE has no properties within SSSI or AONB boundaries.

Greenhouse gas emissions

The major impact on the environment from PHE's activities continues to come from electricity and gas consumption at its main sites at Colindale, Porton and Chilton. PHE reports its greenhouse gas emissions on a quarterly basis to the Department of Health and Social Care, which correlates data from all of its arms-length bodies and executive agencies, in line with the GGC guidelines.



* Process emissions from Porton incinerator waste

GGC reporting requires PHE to report its scope 1, 2 and 3 emissions for its owned estate only, as it is assumed that other parts of the estate where PHE has a presence are already reporting to their sponsoring body. This is to prevent double accounting of the data. Waste water is not reported under the GGC requirements.

Our total greenhouse gas emissions are summarised below – this data includes both reportable and non-reportable sites, but excludes PHE Harlow which is reported separately.

GREENHOUSE GAS EMISSIONS		2015/16	2016/17	2017/18
SCOPE 1 + 2				
Non-financial indicators (tCO_2)	Natural gas	**4,873**	**4,952**	**5,217**
	Natural gas (non-reportable sites)	**1618**	**623**	**466**
	Fuel oil	**1,026**	**230**	**353**
	Process emissions	**365**	**319**	**349**
	Fugitive emissions (F-Gas)	**184**	**259**	**137**
	Imported steam	**150**	**135**	**0**
	Mains electricity (non-reportable sites)	**5,409**	**2,426**	**1,701**
	Mains electricity (reportable sites, offices)	**544**	**304**	**244**
	Mains electricity (S2 + 3)	**9,028**	**8,173**	**7,103**
	Owned/leased vehicles	**58**	**68**	**72**
	Renewable electricity**	**0**	**307**	**233**
Related energy consumption (kWh)	Natural gas	**26,418,276**	**26,913,536**	**28,330,159**
	Natural gas (non-reportable sites)	**8,811,147**	**3,384,729**	**2,532,871**
	Fuel oil	**1,328,909**	**831,506**	**1,279,918**
	Process emissions*	**1,983,696**	**1,733,696**	**1,895,109**
	Imported steam***	**812,223**	**736,233**	**0**
	Electricity (non-reportable sites)	**10,663,221**	**5,398,338**	**4,425,648**
	Electricity (reportable sites offices)	**1,086,342**	**676,416**	**634,648**
	Electricity (S2 + 3)	**18,043,598**	**18,190,192**	**18,477,807**
	Renewable electricity**	**0**	**684,097**	**606,319**
Related consumption ($kgCO_2$)	Fugitive emissions (F-Gas)[3]	**184,146**	**259,290**	**137,148**
Related Scope 1 travel (km)	Owned/leased vehicles	**301,851**	**352,791**	**291,172**
Financial indicators (£)	Natural gas	**1,043,937**	**616,520**	**641,948**
	Fuel oil[1]	**63,309**	**48,380**	**69,797**
	Owned/lease vehicles (fuel/i-expenses)	**19,923**	**17,130**	**21,802**
	Fugitive emissions (F-Gas)	**58,407**	**58,320**	**36,775**
	Imported steam***	**17,115**	**8,920**	**0**
	Mains electricity (reportable)	**1,986,886**	**1,970,817**	**2,086,056**
	Renewable electricity**	**0**	**66,069**	**56,863**
Total Emissions Scope 1 + 2 (tCO_2)		**16,228**	**14,440**	**13,475**
Total gross emissions from non-reportable sites Scope 1 + 2 (tCO2)		**7,028**	**3,049**	**2,168**
Renewable Energy tCO_2****		**0**	**307**	**233**

* Process emissions from Porton's Waste Incinerator

** Renewable energy is derived from Porton, Chilton and Colindale PV farms

*** Imported steam is no longer used due to the closure of our laboratories in Bristol

**** Renewable energy is subtracted from total emissions, as it is a saving

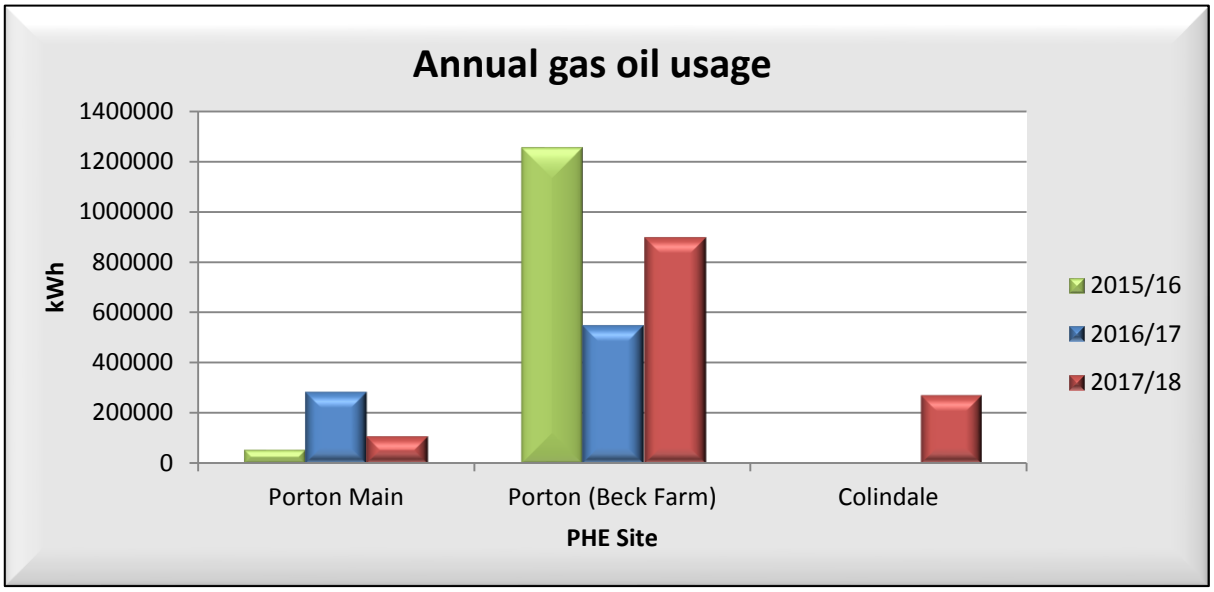
Energy consumption

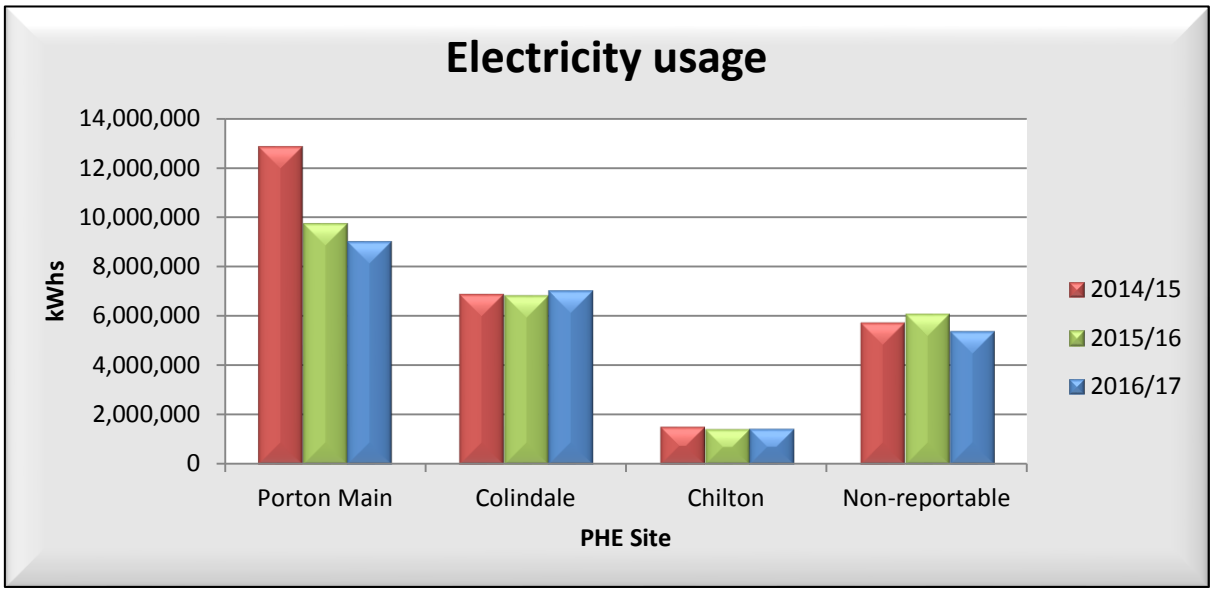
PHE's energy consumption for 2017 to 2018 for our reportable and non-reportable estate is given below.

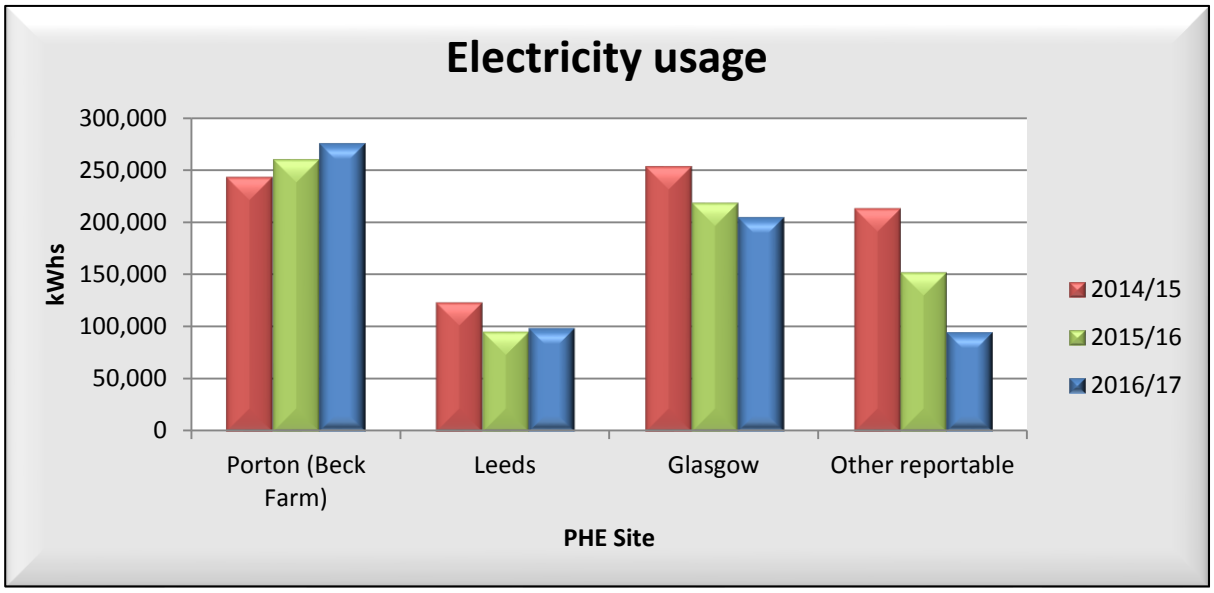
kWh's	Electricity	Natural gas	Gas oil
Porton Main**	9,196,149	16,828,568	109,100
Porton (Beck Farm)	269,000	0	897,413
Colindale**	7,186,537	8,951,200	272,750
Chilton**	1,488,802	1,980,524	655
Leeds	91,941	155,501	0
Glasgow	200,509	393,593	0
Other reportable*	73,198	20,773	0
Non-reportable	4,425,648	2,532,871	0
Total	**22,931,783**	**30,863,029**	**1,279,918**

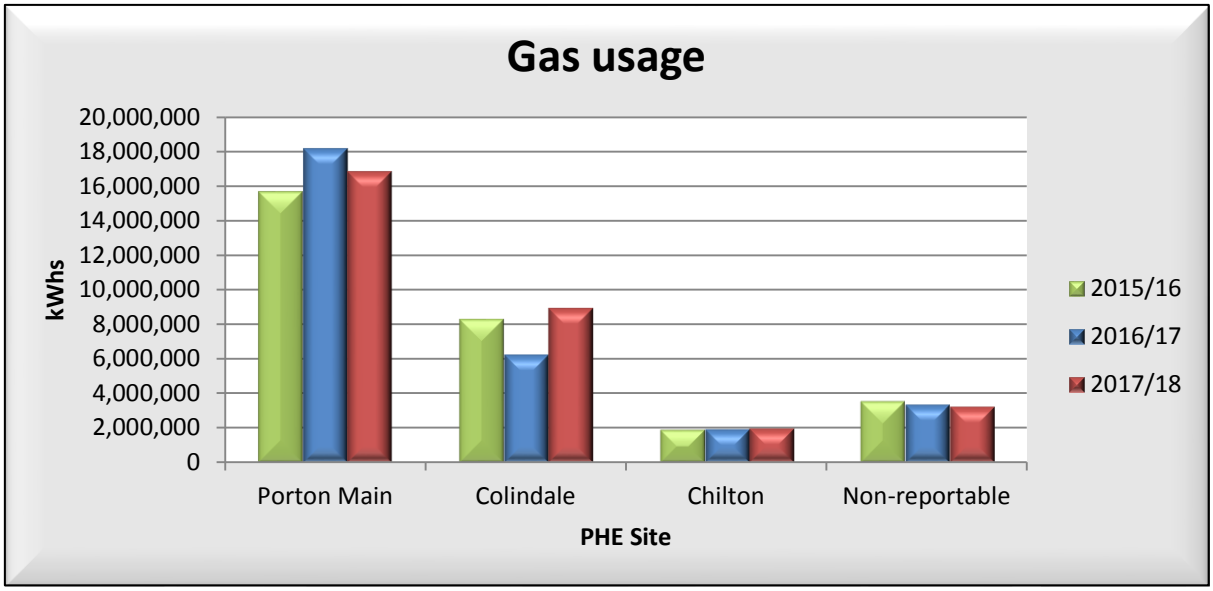
* Other reportable sites are those that we occupy and pay directly to the utility provider for services
**Electricity generated from their photovoltaic equipment has been taken away from the total usage figure

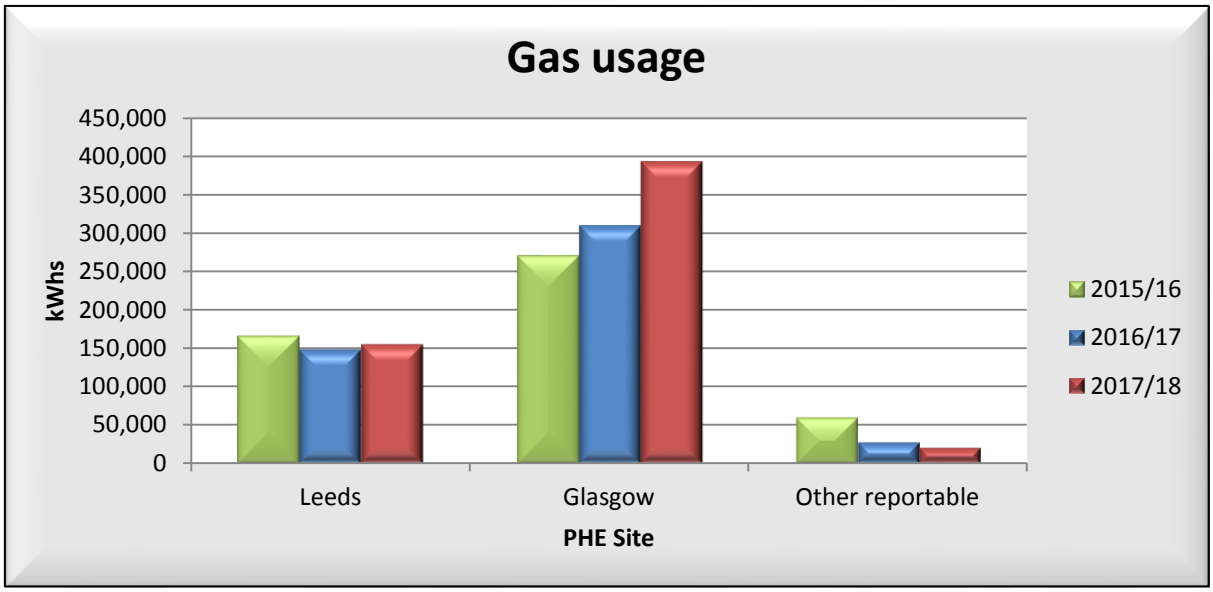
The following graphs illustrate utility usage over the last 3 years:




Electricity usage
14,000,000
12,000,000
10,000,000
8,000,000
6,000,000
4,000,000
2,000,000
0
kWhs
Porton Main
Colindale
Chilton
Non-reportable
PHE Site
2014/15
2015/16
2016/17


Electricity usage
300,000
250,000
200,000
150,000
100,000
50,000
0
kWhs
Porton (Beck Farm)
Leeds
Glasgow
Other reportable
PHE Site
2014/15
2015/16
2016/17


Gas usage
20,000,000
18,000,000
16,000,000
14,000,000
12,000,000
10,000,000
8,000,000
6,000,000
4,000,000
2,000,000
0
kWhs
Porton Main
Colindale
Chilton
Non-reportable
PHE Site
2015/16
2016/17
2017/18


Gas usage
450,000
400,000
350,000
300,000
250,000
200,000
150,000
100,000
50,000
0
kWhs
Leeds
Glasgow
Other reportable
PHE Site
2015/16
2016/17
2017/18

Carbon emissions: Chief Operating Officer Directorate

		Porton (Main)	Porton Building 1	Beck Farm	Colindale	Other**	Wellington House	Total
Emissions Type	**Emissions Source**	**tCO_2e**	**tCO_2e**	**tCO_2e**	**tCO2e**	**tCO_2e**	**tCO_2e**	**tCO_2e**
Emissions from our properties and the operations carried out therein	Natural Gas	3009.20	7.00	0.00	1648.50	331.00	41.60	5037.30
	Gas Oil	30.10	0.00	247.60	75.20	0.00	0.00	352.90
	Emissions from Electricity use	3716.00	119.40	103.40	2809.00	1063.22	164.50	7975.52
	Process Emissions (Refrigeration)	2.66	0.00	0.00	123.00	0.00	0.00	125.66
	Water supply	25.40	0.40	0.40	29.30	3.11	0.60	59.21
	Water (Waste)*	49.70	0.80	0.90	57.30	8.72	1.10	118.52
	Sub Total	**6833.06**	**127.60**	**352.30**	**4742.30**	**1406.05**	**207.80**	**13669.11**

*Waste water is not reported as part of our Greening Government Commitment

** Other reportable sites are those that we occupy and pay directly to the utility provider for services

Carbon emissions: Health Improvement Directorate

		Oxford	Blenheim House	Other**	Skipton House	Total
Emissions Type	**Emissions Source**	**tCO_2e**	**tCO_2e**	**tCO_2e**	**tCO_2e**	**tCO_2e**
Emissions from our properties and the operations carried out therein	Natural Gas	3.80	16.10	94.07	65.60	179.57
	Gas Oil	0.00	0.00	0.00	0.00	0.00
	Emissions from Electricity Use	28.10	72.90	292.49	268.60	662.09
	Process Emissions (Refrigeration)	0.00	0.00	0.00	0.00	0.00
	Water supply	0.07	0.30	0.96	0.80	2.13
	Water (Waste)*	0.15	0.40	1.60	1.50	3.65
	Sub Total	**32.12**	**89.70**	**389.12**	**336.50**	**847.44**

*Waste water is not reported as part of our Greening Government Commitment

** Other reportable sites are those that we occupy and pay directly to the utility provider for services

Carbon emissions: Health Protection & Medical Directorate

		Chilton	Glasgow	Leeds	Other**	Total
Emissions Type	**Emissions Source**	**tCO_2e**	**tCO_2e**	**tCO_2e**	**tCO_2e**	**tCO_2e**
Emissions from our properties and the operations carried out therein	Natural Gas	364.70	72.50	28.60	5.27	471.07
	Gas Oil	0.10	0.00	0.00	0.00	0.10
	Emissions from Electricity Use	652.10	92.40	44.70	14.52	803.72
	Emissions from Import of Heat or Steam	0.00	0.00	0.00	0.00	0.00
	Process Emissions (Refrigeration)	0.00	0.00	0.00	0.00	0.00
	Water supply	1.70	0.10	0.20	0.03	2.03
	Water (Waste)*	3.20	0.20	0.30	0.05	3.75
	Sub Total	**1021.80**	**165.20**	**73.80**	**19.87**	**1280.67**

* Waste water is not reported as part of our Greening Government Commitment
** Other reportable sites are those that we occupy and pay directly to the utility provider for services

Water consumption

PHE has set a target to reduce its water consumption by 2% annually to 2020, in line with the greening government initiative. The reportable usage of water for the estate (not including PHE Harlow) was 166,770 m^3, with a further estimated 21,253 m^3 being used by our non-reportable sites. Data for non-reportable sites is estimated in many cases, due to the lack of metering. Overall, this represents a rise in consumption of 35% from last year.

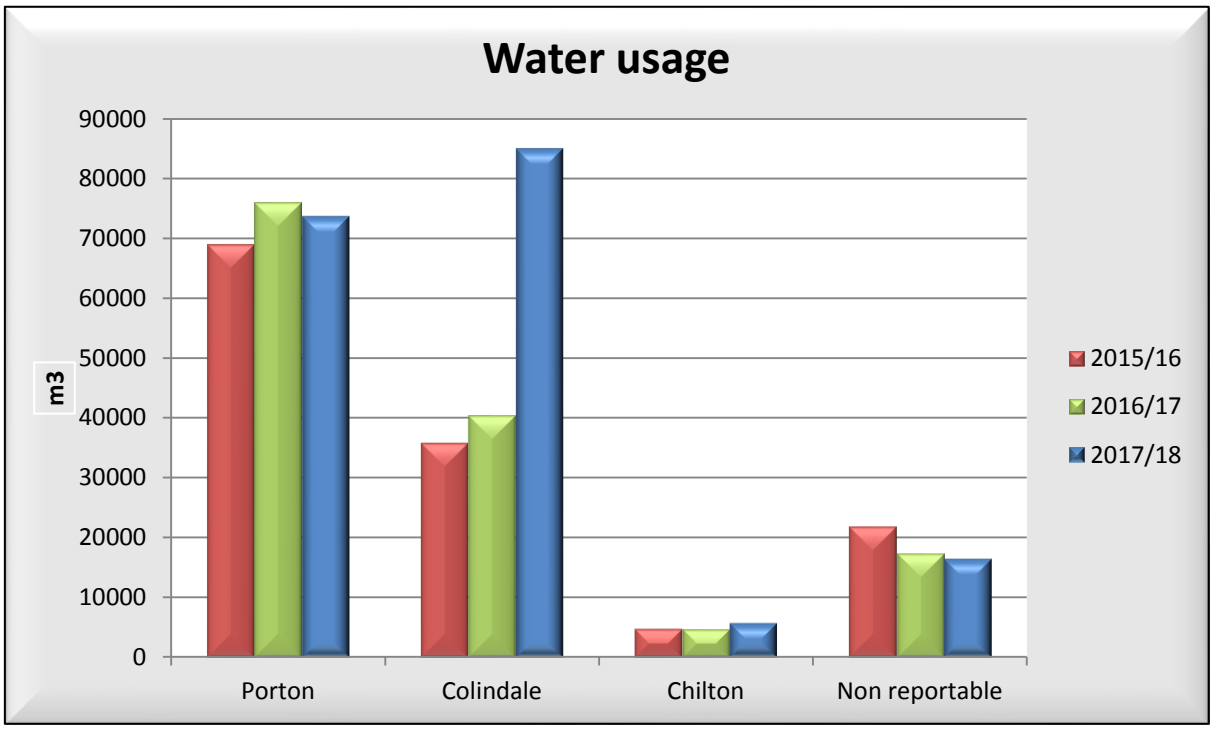
The increase was partly due to water leaks we experienced at 2 of our major sites; unfortunately these leaks were not identified for some time and the loss is reflected in the above figures. These leaks have now been repaired.

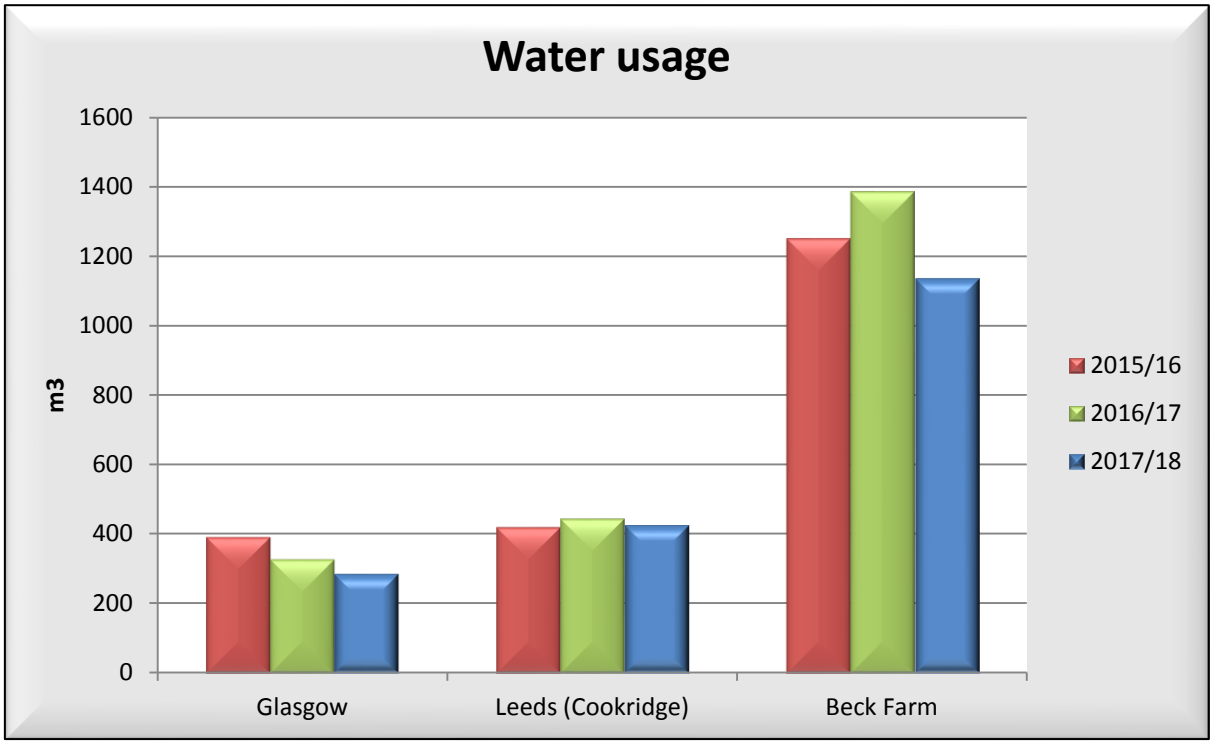
Water		2015/16	2016/17	2017/2018
SCOPE 3 (Water)				
Non-financial indicators (m^3)	Water from office estate (reportable)	538	262	216
	Water from whole estate (reportable) [excluding office estate]	113,780	123,195	166,770
	Total for reportable estate (m^3)	**114,318**	**124,187**	**166,986**
	Water from office estate (non-reportable)*	11,228	10,389	15,536
	Water from whole estate (non-reportable)* [excluding office estate]	21,910	7,089	5,987
	Total for non-reportable estate (m^3)	**33,138**	**17,478**	**21,523**
Financial indicators (£)	Water supply costs**	107,190	132,714	199,079

* Estimated usage from our non-reportable sites
** Costs from our owned estate only

Water that was consumed by our offices and laboratories which are embedded in tenanted, non-reportable accommodation continues to be estimated using a recognised benchmarking algorithm.

Water consumption from the various parts of the estate is illustrated below.


Water usage
90000
80000
70000
60000
50000
40000
30000
20000
10000
0
m3
Porton
Colindale
Chilton
Non reportable
2015/16
2016/17
2017/18

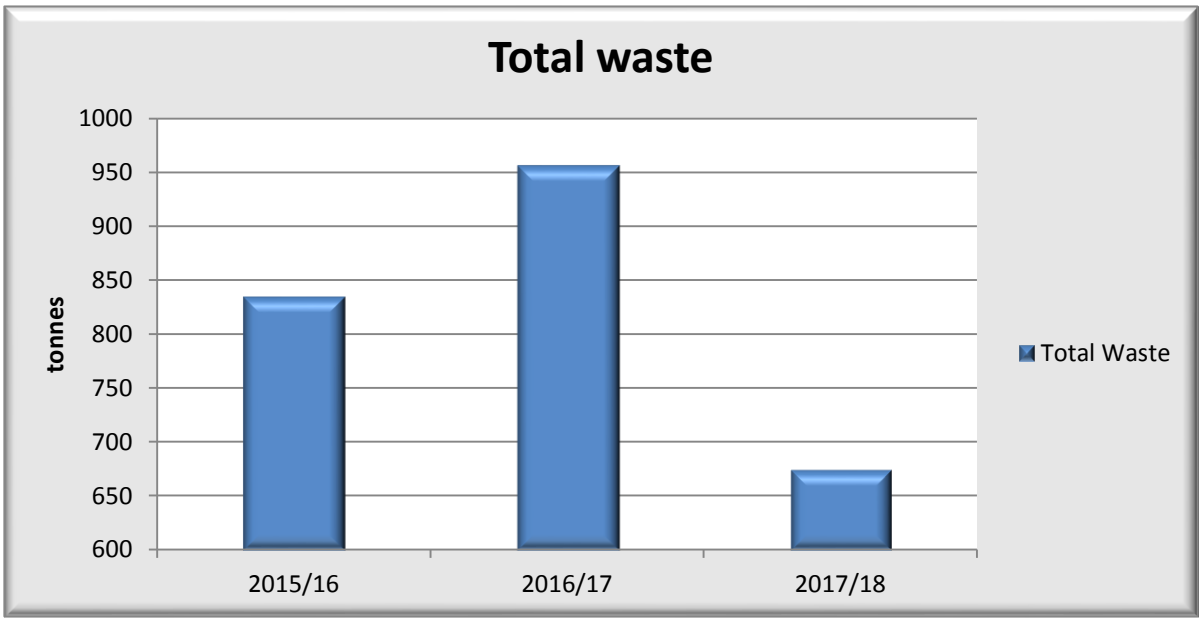

Water usage
1600
1400
1200
1000
800
600
400
200
0
m3
Glasgow
Leeds (Cookridge)
Beck Farm
2015/16
2016/17
2017/18

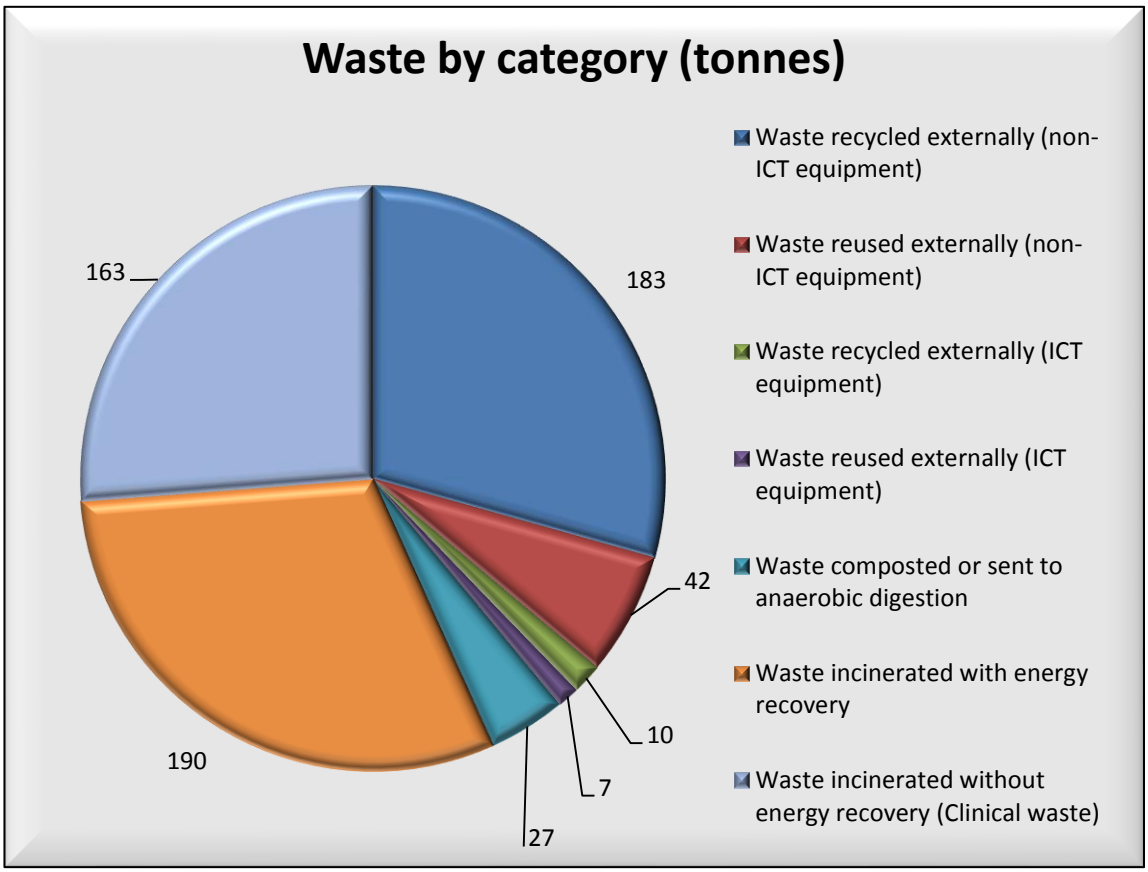
Waste

PHE has set a total waste reduction target of 2% annually to March 2020, in line with the Greening Government initiative. PHE's total waste figure for 2017 to 2018 was 675 tonnes, a 29% reduction in total waste compared with 2016 to 2017, and a 26% reduction compared to the baseline figure of 2013 to 2014.

	2015/16	2016/17	2017/18
	tonnes	tonnes	tonnes
Waste recycled externally (non-ICT equipment)	243	273	183
Waste reused externally (non-ICT equipment)	6	28	42
Waste recycled externally (ICT equipment)	7	12	10
Waste reused externally (ICT equipment)	6	5	7
Waste composted or sent to anaerobic digestion	31	50	27
Waste incinerated with energy recovery	178	257	190
Waste incinerated without energy recovery (clinical waste)	293	277	163
TOTAL ICT WASTE	13	17	18
Total waste not sent to landfill	764	903	623
Total waste sent to landfill (non-hazardous)	41	43	25
Total landfill waste deemed hazardous*	31	10	27
Total waste	**836**	**957**	**675**

* Incinerator ash





PHE continues to implement its policy of reducing the amount of waste it sends to landfill and it is therefore very encouraging to see this waste stream falling in the past year.

We continue to incinerate the majority of our waste. This waste stream employs energy recovery as a bi-product of the process, with only a small amount not leading to energy recovery.

Due to an increase in usage of the clinical waste incinerator at Porton, the hazardous incinerator ash which is produced and sent to a specialised landfill site increased last year by 17 tonnes.

We saw a 34% reduction in the amount of non-ICT waste being sent offsite for recycling or reuse.

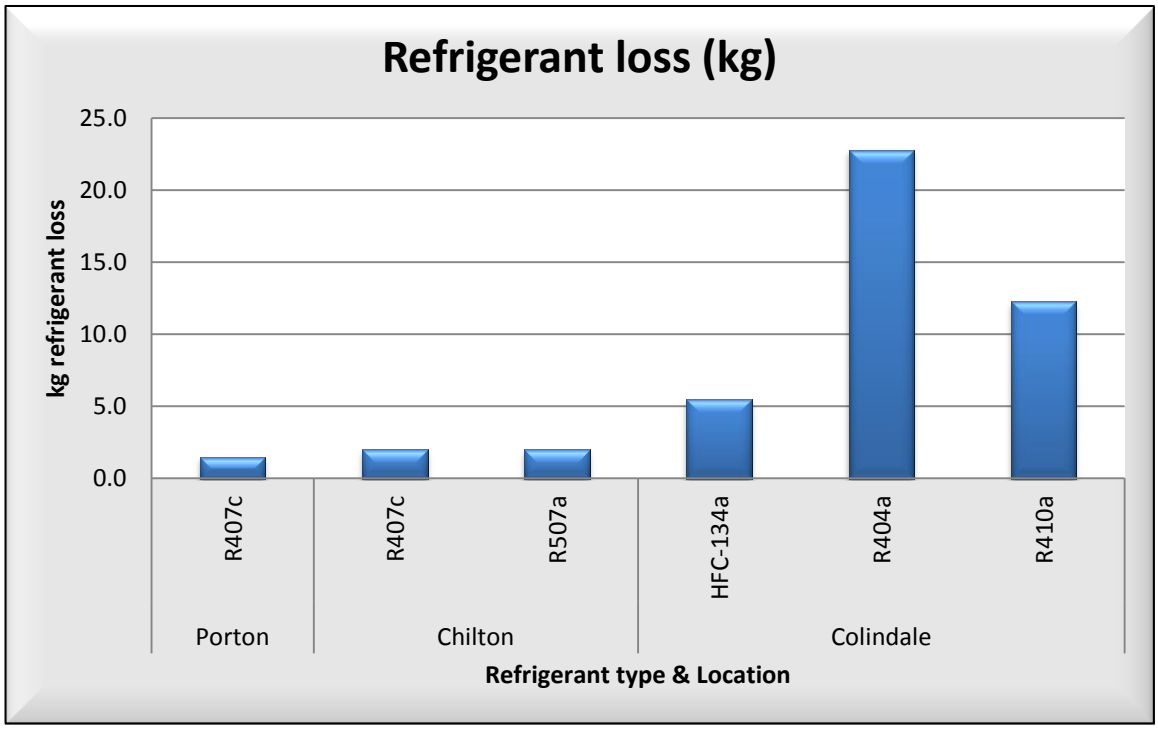
A total of 17 tonnes of ICT waste was produced last year with some 30% being recycled and the other 70% being reused by CDL, our ICT waste contractor.

Refrigerant losses

The losses of refrigerant on PHE's estate, with the associated carbon emissions, are illustrated below.

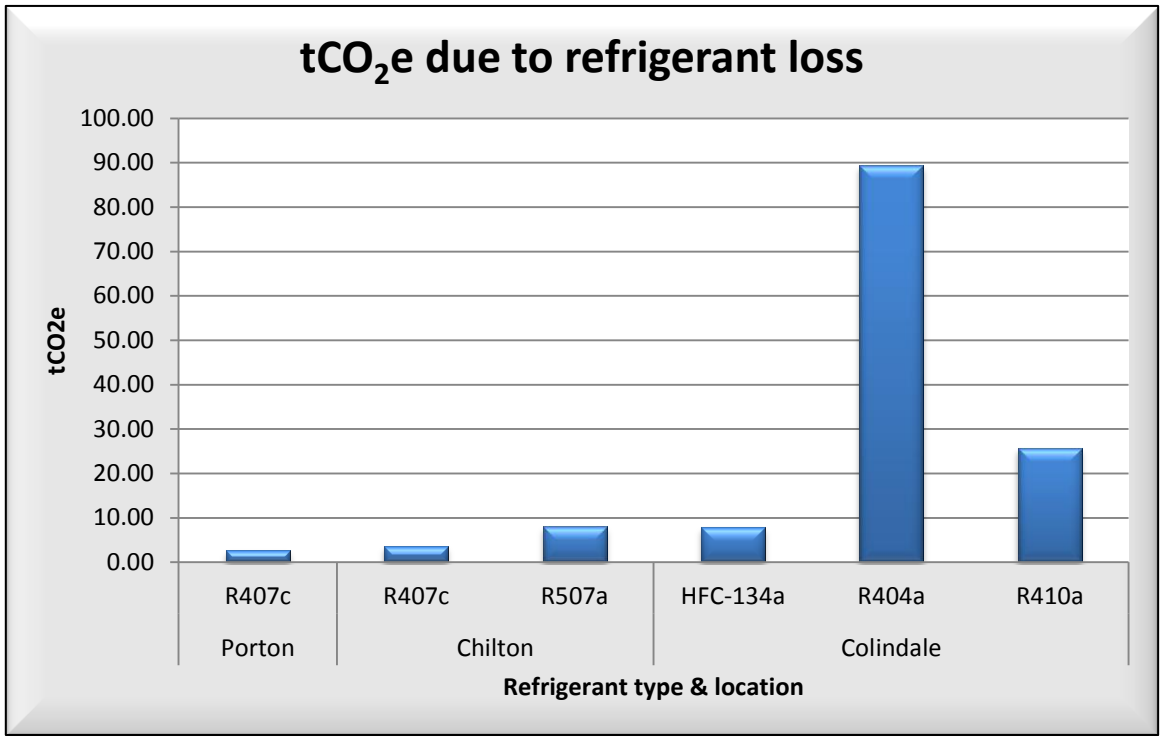
Facility / source description	Type of Refrigerant	Refrigerant Loss	GWP of refrigerant	CO_2 emissions
		kg	CO_2e	tonnes CO_2
Porton	R407c	1.5	1,774	2.66
Chilton	R407c	2.0	1,774	3.55
	R507a	2.0	3,985	7.97
Colindale	HFC-134a	5.5	1,430	7.87
	R404a	22.8	3,922	89.42
	R410a	12.3	2,088	25.68

Due to the Global Warming Potential (GWP) of each specific gas emitted, the carbon equivalent of each kg of refrigerant gas emitted is significantly higher, see above. As refrigerants, with less GWP, come onto the market these are being taken up across our estate replacing those that have a greater impact.



There is a legal requirement to monitor and measure the amount of refrigerants (known as F-gases) that are lost to the atmosphere from the operation of cooling and air handling systems fitted on our owned estate. At each of our properties where this

type of equipment is fitted, an F-Gas log is maintained by the local estates team. This records how much of each particular gas has had to be topped up through operational losses. This information is collated and sent quarterly to DH&SC as part of PHE's return under the Greening Government Commitment.



Paper usage

PHE continues to have an active programme to reduce paper usage, in line with government targets. We can report that on average 47% of the paper used by PHE in 2017 to 2018 comprised of recycled paper.

In 2017 to 2018, PHE used 15,534 reams of A4 paper, 255 reams of A3 paper and 68 reams of A5 paper. Our A5 and A4 paper usage has reduced by some 31% and 28% respectively, with A3 increasing by 5%, compared with the previous year. PHE's paper usage is summarised below.

	Ream		
Year	**A5**	**A4**	**A3**
2015/16	85	26,353	359
2016/17	98	21,439	244
2017/18	68	15,534	255
Reduction	**–31%**	**–28%**	**+5%**

Communication around paper usage and the need to 'think before you print' is still widely encouraged across the estate. Where possible, we have also moved to shared multi-functional devices for printing. We also use 'follow-me' printing, which requires users to log in using their id cards at the printer before any printing is delivered and this, in turn, has significantly reduced waste by ensuring printing only occurs when needed.

PHE Harlow utility usage

We have developed a robust strategy for sustainability and the procurement of goods and services associated with the major construction project being undertaken at our new facility in Harlow.

We have written into our planning documentation that the specification and design of all construction projects shall take due account of the contribution the project can make towards the Greening Government Commitment and that as a minimum all suppliers are to follow 'Achieving Excellence in Construction Procurement Guide 11: Sustainability'.

Procurement for this project will also take account of the Government Buying Standard for Construction. As a minimum, this requires:

- any new procurement project (whether new build, refurbishment, purchased, leased or the procurement of a service − for example managed workspace) must fall into the upper quartile of energy performance for the building type, except where specific operational requirements prevent this

- all timber or timber products (including timber used solely during the construction process such as temporary fencing, hoardings or shuttering) must be purchased in accordance with the government's timber procurement policy

Scope 1 and 2 emissions for PHE Harlow, are detailed below:

PHE Harlow greenhouse gas emissions	**2017/18**
Non-financial indicators (tCO_2)	
Natural gas	102
Mains electricity	1,308
Related energy consumption (kWh)	
Natural gas	555,301
Mains electricity	3,401,300
Financial indicators (£)	
Natural gas	117,952
Mains electricity	368,081
Total gross emissions reportable under Scope 1 + 2	**1,410**

Water (Harlow)	2017/18
Non-Financial Indicators (m^3)	
Water usage	5,483
Financial Indicators (£)	
Water supply costs	2,800

The main use of water, over the year, has been for the routine flushing of the sites pipework to prevent *Legionella* contamination. Construction on the site is due to commence in the near future, when water supplies to existing buildings across the site will be isolated.

Waste (Harlow)	2017/18
Non-financial indicators (kgs)	
Waste incinerated with energy recovery	3,288
Financial indicators (£)	
Waste costs	406

As shown above, general waste at the Harlow site is disposed of via an incinerator with energy recovery. The site reported that some 3.3 tonnes of general waste was disposed of during the last year.

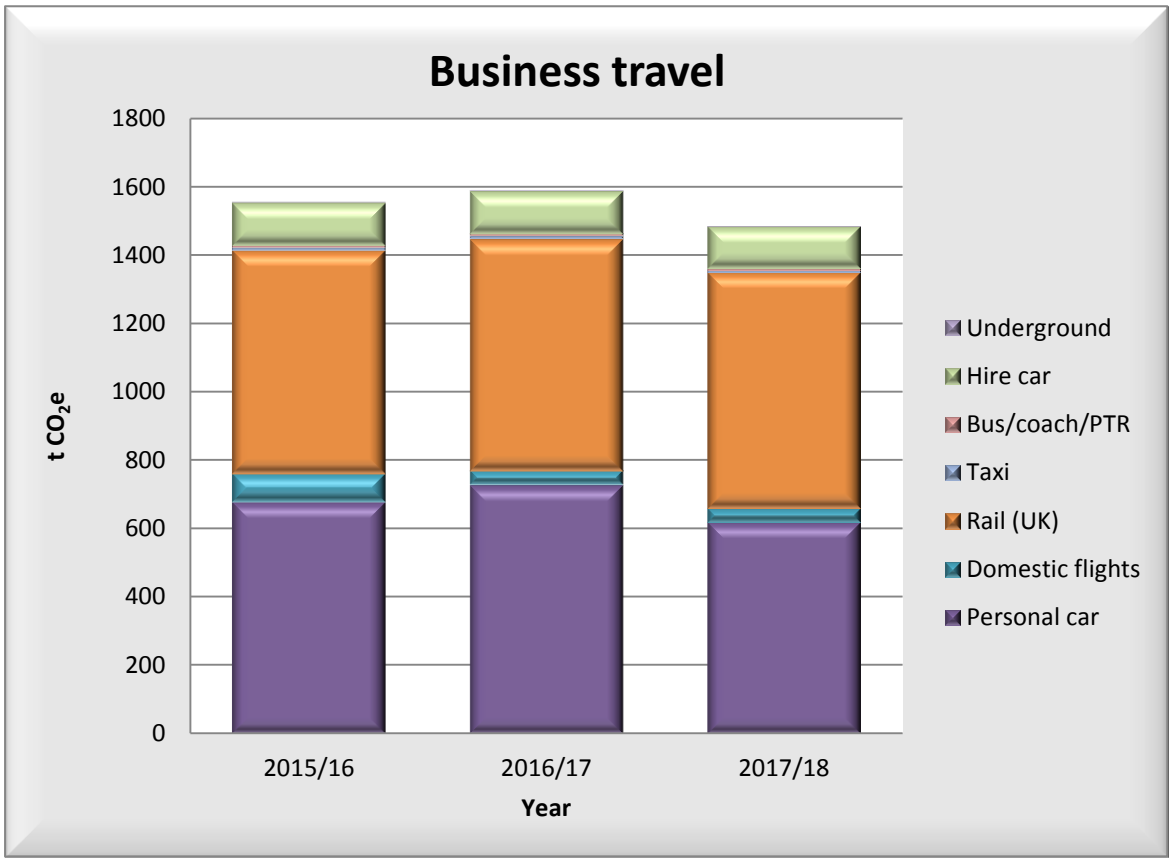
Our travel footprint

PHE has a target to reduce business travel by at least 2% annually, relative to our baseline year of 2013/14, through to March 2020. Staff are encouraged to limit journeys wherever possible and when they must travel, to use the most sustainable modes of transport.

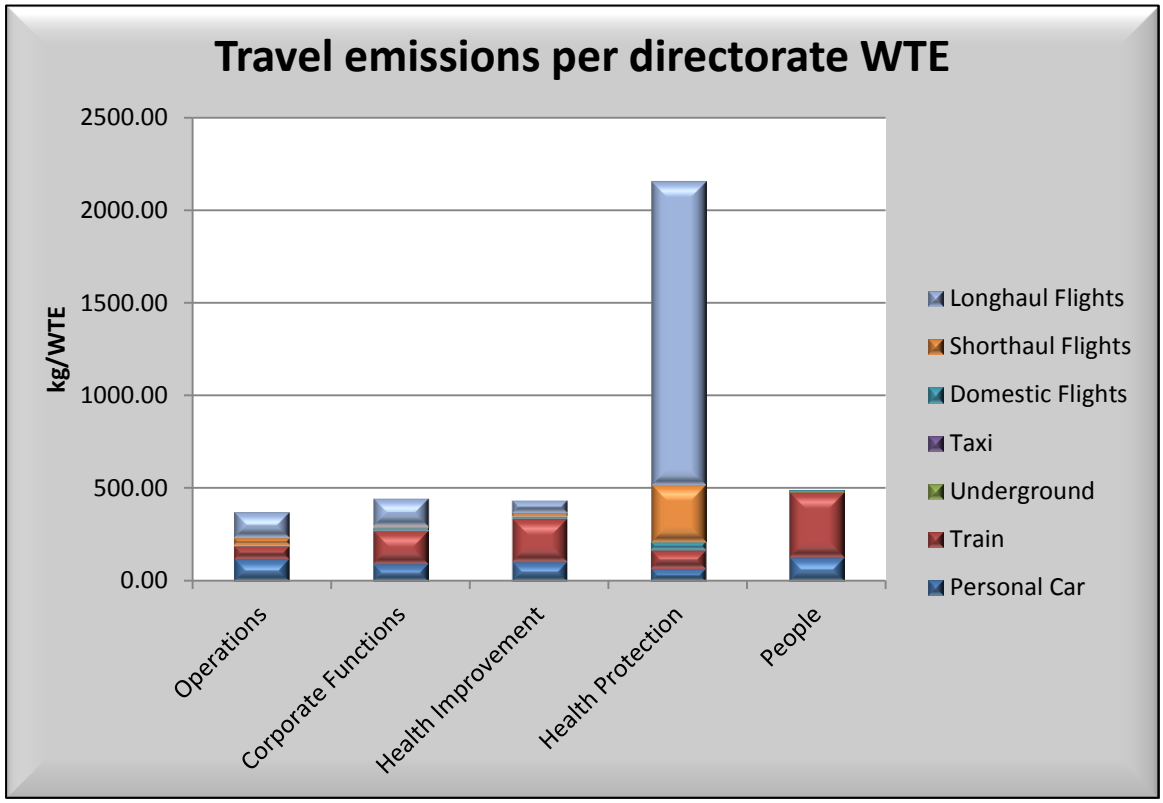
We accept that our members of staff sometimes need to travel to deliver the business objectives of the organisation. Nevertheless, there has been a 6.5% decrease in our overall reportable business travel carbon emissions compared to the previous year.

We have managed to reduce our carbon impact from domestic flights by some 4.6% compared to last year. UK rail emissions were up by 2.2%, believed to be due to a reduction in business travel by personal car of 14.8% compared to last year.

However, there was a significant increase in emissions per WTE from international flights last year. A number of factors have been identified which might account for this increase, including our greater public health involvement in supporting international health programmes.



A breakdown of the impact of the various reportable types of business travel are given in the graph above, note this does not include short or long haul flight data as this is not reportable under government reporting requirements. Though in the spirit of transparency this data is reported in detail below.



The chart above summarises in detail the carbon emissions per WTE from business travel undertaken by each PHE directorate. Operational activities by the Health Protection and Medical directorate require its staff to travel extensively overseas, as illustrated above. These are discussed in more detail in the section on air travel below.

Business travel		2015/16	2016/17	2017/18
SCOPE 3				
Non-financial indicators (tCO_2)	Personal car	678	727	619
	Domestic flights	83	42	41
	Rail (UK)	653	677	692
	Taxi	8	7	6
	Bus/coach/PTR	7	8	5
	Hire car	125	125	123
	Underground	1	1	1
	Total	**1,555**	**1,589**	**1,487**
Related Scope 3 travel (km)	Personal car	3,637,801	3,890,555	3,921,112
	Domestic flights	524,039	288,386	286,752
	Rail (UK)	14,460,906	13,867,076	14,785,302
	Taxi[1]	50,468	45,943	41,250
	Bus/coach/PTR[1]	72,150	83,213	47,734
	Hire car	668,295	668,882	673,801
	Underground[1]	15,672	15,183	29,257
	Total	**19,429,331**	**18,859,238**	**19,785,207**
Financial indicators (£)	Personal car	1,028,793	1,101,425	925,888
	Domestic flights	92,970	55,376	22,341
	Rail (UK)	3,882,894	3,692,035	4,089,704
	Taxi	112,143	102,096	91,666
	Bus/coach/PTR	33,986	32,608	25,260
	Hire car	102,068	116,109	103,443
	Underground	71,237	69,012	62,110
	Total	**5,324,091**	**5,168,661**	**5,320,412**
Other business travel (km)	Short-haul international average	1,991,556	1,693,778	1,863,015
	Long-haul international average	6,210,706	4,588,511	7,511,569
	Rail: Eurostar	98,988	101,482	74,982
Total	Total Gross Emissions Scope 3 Business Travel (tCO_2)	**1,555**	**1,589**	**1,487**
	Total Financial Cost Scope 3 Business Travel (£)	**5,324,091**	**5,168,661**	**5,320,412**
	Total Other Financial Cost, not covered in Scope 3 (£)	**875,865**	**485,165**	**256,151**

[1] Figures calculated using our own conversion table

In order to facilitate a comparison of travel emissions across the various parts of the organisation, PHE uses the measure of tCO_2e per whole time equivalent (wte) staff. The key changes to our travel footprint compared with last year were:

- emissions per wte from UK (domestic) flights are down by 17%
- emissions per wte from international flights are up by 77%
- emissions per wte train use per wte are up by 13%
- emissions per wte from personal car use are down by 16%
- emissions per wte from taxi use are up by 16%
- emissions (tCO_2e) from use of PHE owned/leased vehicles are up by 5%

Microsoft's Skype continues to be a well-supported tool in the initiative to minimise travel for meeting attendance. PHE recognises that less business travel will not only benefit public health by preventing air pollution, but also supports PHE's plans to reduce carbon and saves money.

Active travel initiatives across the whole of PHE are one of the ways we have been asking staff to consider whether they actually have to attend a meeting in person. If staff are travelling locally, walking or using a bicycle (where practicable) are examples of how carbon savings can be made while contributing to improving health. PHE is an advocate of active travel in the UK.

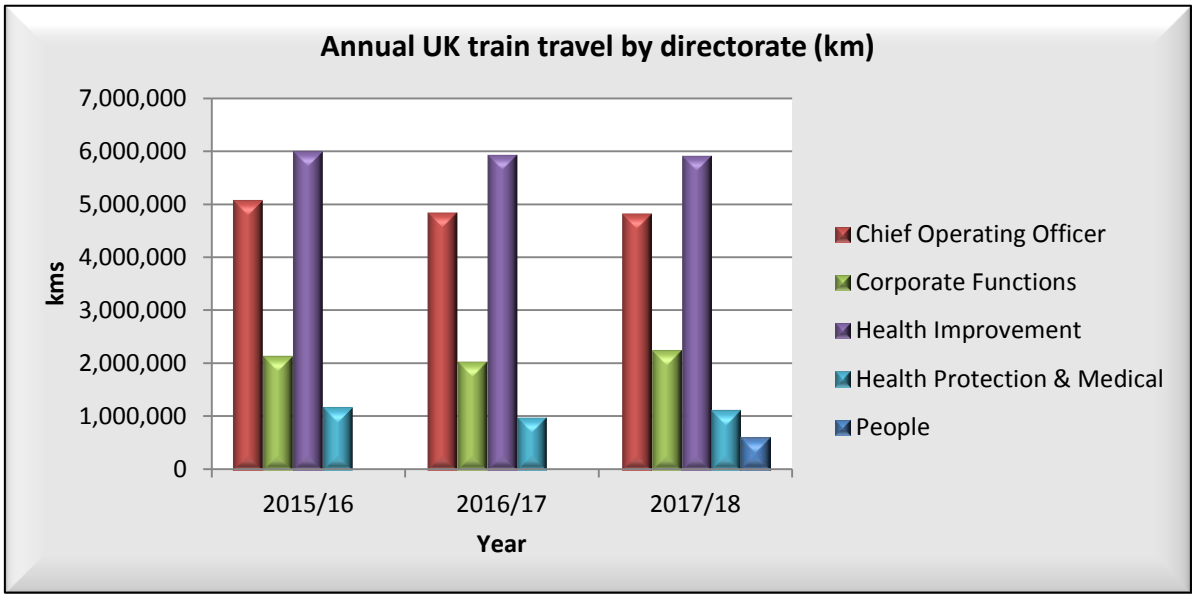
Rail travel

During 2017 to 2018, PHE staff travelled 14,719,973 km by train, representing a 6.62% increase on the previous year. The Chief Operating Officer's directorate continues to undertake the greatest number of journeys by rail, travelling nearly 5 million km. PHE's total spend on UK rail travel amounted to £3,971,950 and the following table summarises PHE's carbon footprint due to rail travel.

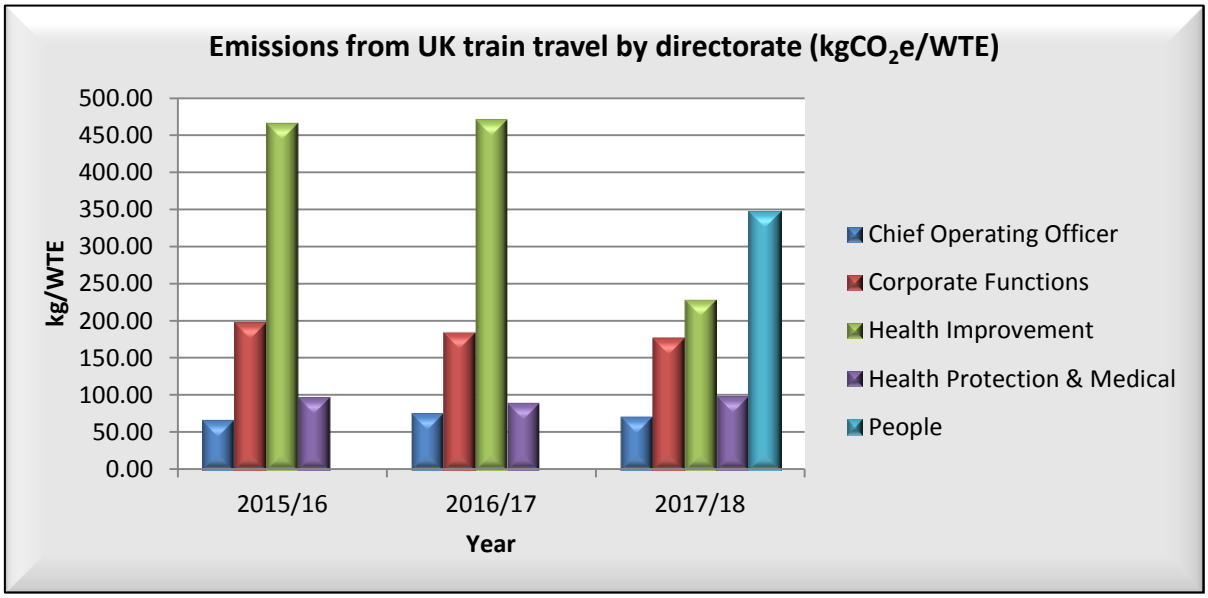
Directorate	Distance km	WTE	tCO_2	$kgCO_2$/WTE
Chief Operating Officer*	4,826,333	3,162	236	71
Corporate Functions	2,244,149	567	110	177
Health Improvement	5,921,147	1,186	289	230
Health Protection & Medical	1,118,202	528	55	99
People	610,141	79	30	348
Total	14,719,973	5,521	719	924

*Includes National Infection Service, PHE regions and centres

Our rail travel in 2017 to 2018 is summarised below, expressed as both distance travelled, and in terms of emissions expressed as $kgCO_2e$ per wte.



Emissions due to rail travel are expressed as kgCO_{2e} per wte. It should be noted that the size of the organisation has changed over the last year, impacting on the total emissions. However, the measure of kgCO_{2e} per wte still allows a meaningful comparison and gives the following distribution.



Staff in the People directorate generated highest emissions per person (348 kgCO_{2e}/wte) from train travel, in part due to the low numbers of staff in the directorate. This compares with members of staff from the Health Improvement directorate, who generated 230 kgCO_{2e}/wte, down by 51.32% compared to last year's figures.

Air travel

PHE fully recognises its public health commitments, not only in the UK but also internationally. Therefore travelling by air to meet these commitments is generally unavoidable but we also recognise the importance of minimising our air travel wherever possible, especially within the UK. Moreover, reducing domestic air travel is a specific Greening Government target.

As PHE matures, a large proportion of our international work is undertaken due to our commitment to Global Public Health issues, with PHE having staff in its Rapid Support Team ready to travel anywhere around the globe to respond to outbreaks and incidents of international concern, and supporting the public health response to humanitarian disasters. Thus, staff in the Health Protection and Medical Directorate undertake significant international travel. This is evident from in the data below, which summarise our air travel.

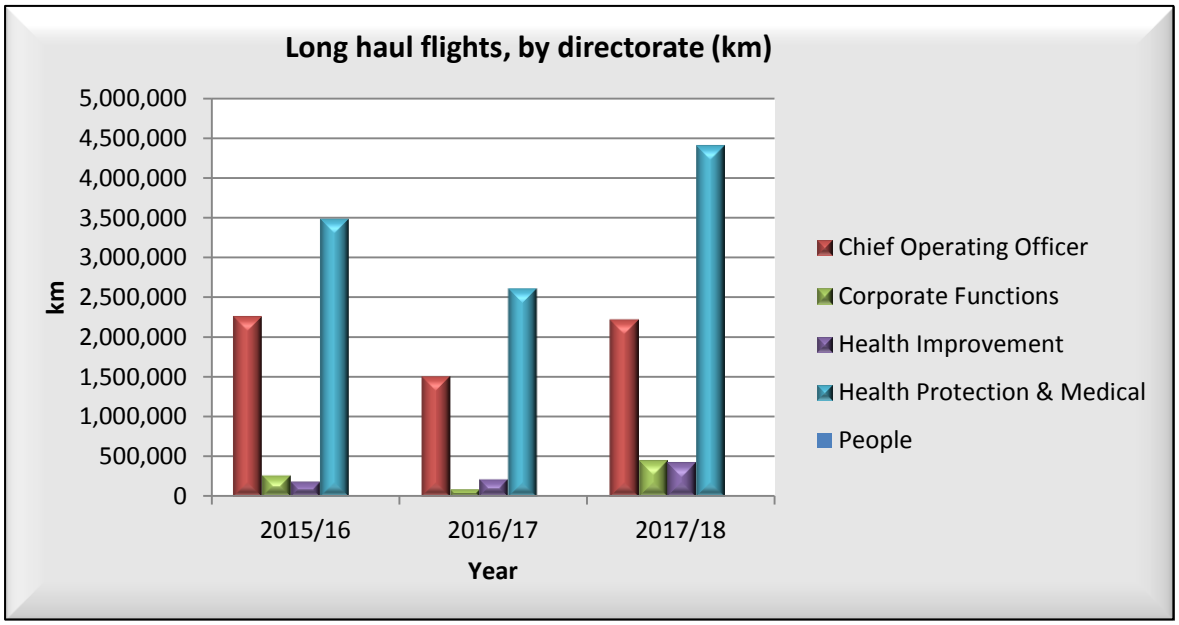
Directorate	WTE	$kgCO_2$/WTE		
		Domestic	Short haul	Long haul
Chief Operating Officer	3,162	9.98	33.95	138.03
Corporate Functions	567	13.39	10.81	150.34
Health Improvement	1,186	10.91	19.97	68.45
Health Protection & Medical	528	43.45	303.74	1,640.95
People	79	8.24	0.00	0.00
Total	5,521	86	368	1,998

Total distances travelled by air are shown in the following table, by quarter.

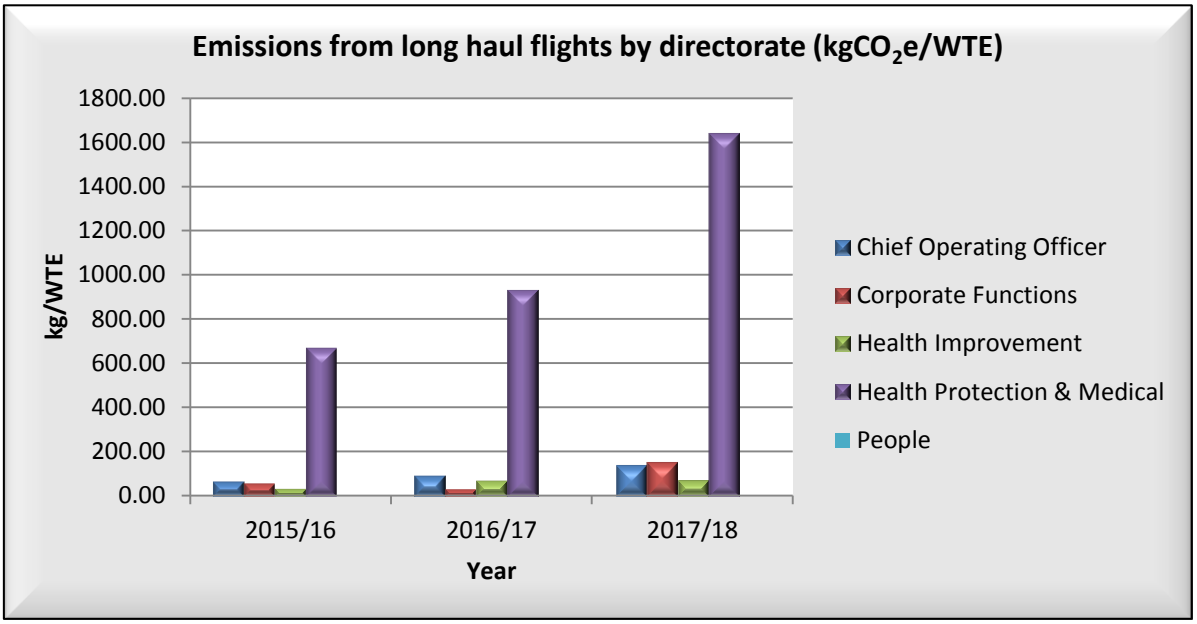
Directorate	Distance travelled (km)				
	Q1	Q2	Q3	Q4	Annual total (km)
Domestic flights (<500 km)					
Chief Operating Officer	50,623	36,140	23,997	8,264	119,024
Corporate Functions	10,998	5,717	6,768	6,263	29,747
Health Improvement	21,975	6,000	12,944	8,256	49,176
Health Protection & Medical	33,076	17,163	8,860	27,180	86,278
People	415	1,063	1,048	0	2,526
Total domestic flights	**117,088**	**66,083**	**53,618**	**49,963**	**286,752**
Short-haul flights (500-3,700 km)					
Chief Operating Officer	252,016	158,443	202,472	59,156	672,087
Corporate Functions	19,514	6,102	10,098	4,173	39,887
Health Improvement	41,989	23,622	63,378	20,462	149,450
Health Protection & Medical	287,032	242,402	326,471	145,686	1,001,591
People	0	0	0	0	0
Total short-haul flights	**600,551**	**430,569**	**602,419**	**229,477**	**1,863,015**
Long-haul flights (>3,700 km)					
Chief Operating Officer	305,997	429,166	926,173	567,232	2,228,568
Corporate Functions	166,380	51,258	199,275	35,372	452,284
Health Improvement	271,452	34,000	15,784	96,484	417,721
Health Protection & Medical	963,137	907,950	1,355,572	1,186,337	4,412,996
People	0	0	0	0	0
Total long-haul flights	**1,706,966**	**1,422,374**	**2,496,804**	**1,885,425**	7,511,569
TOTAL ALL FLIGHTS	**2,424,605**	**1,919,026**	**3,152,840**	**2,164,865**	**9,661,336**

Long haul flights

Compared with last year there was a 69% increase in the amount of international air travel undertaken. The Health Protection and Medical directorate was the greatest user of long haul flights, as explained earlier this is mainly due to PHE's operational commitments overseas.

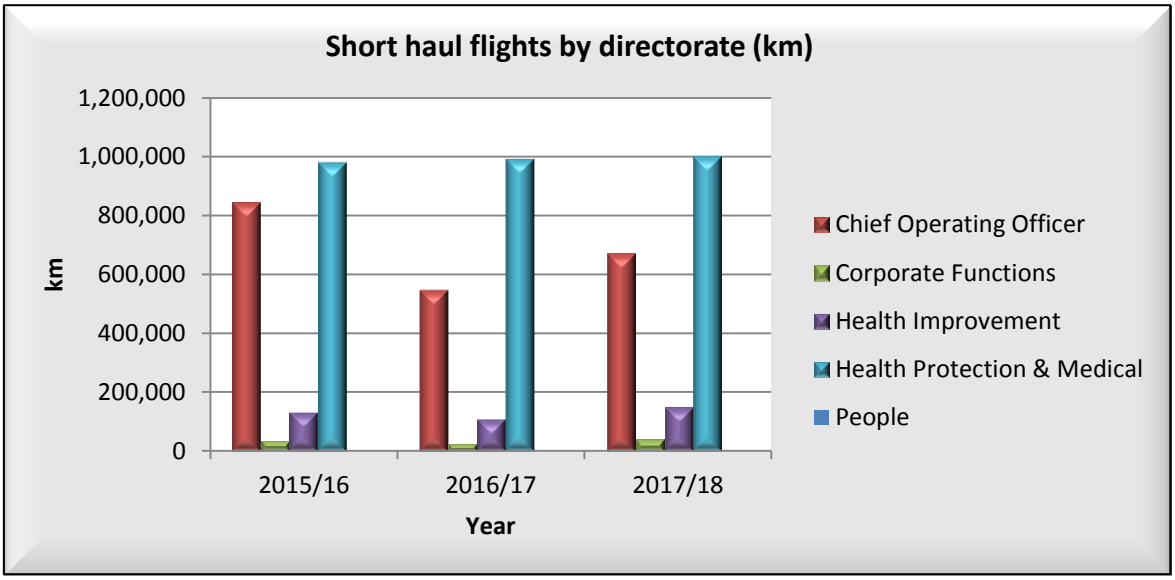


The emissions due to long haul air travel are expressed as $kgCO_2e$ per wte. This gives the following distribution:

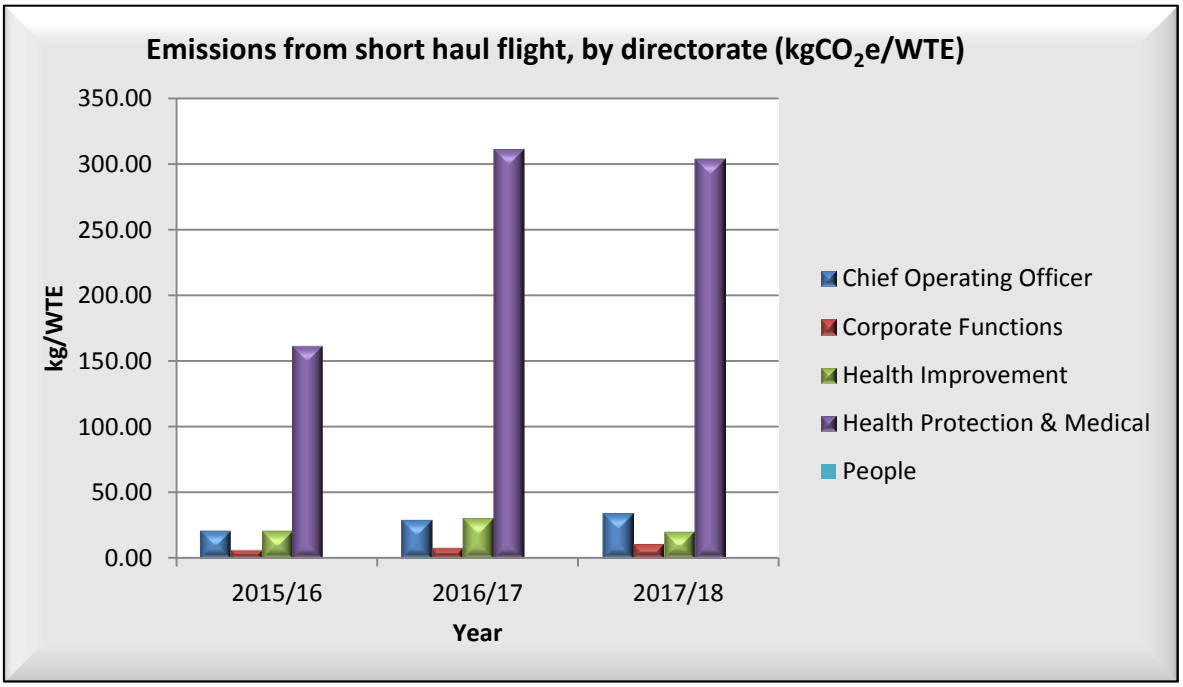


Short haul flights

Short haul between the UK and Europe, increased by some 12% in 2017 to 2018 compared with the previous year. The Health Protection and Medical directorate and the Chief Operating Officer's directorates continued to be the greatest users of short haul air travel.

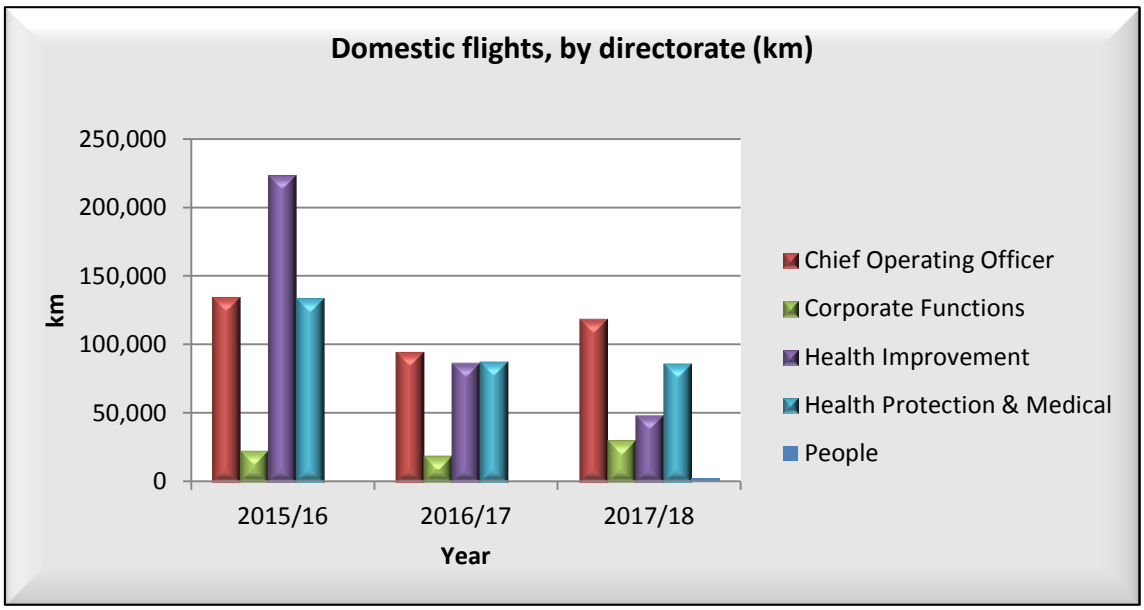


To facilitate comparison across PHE directorates the emissions due to short haul air travel are expressed as $kgCO_2e$ per wte. This gives the following distribution:

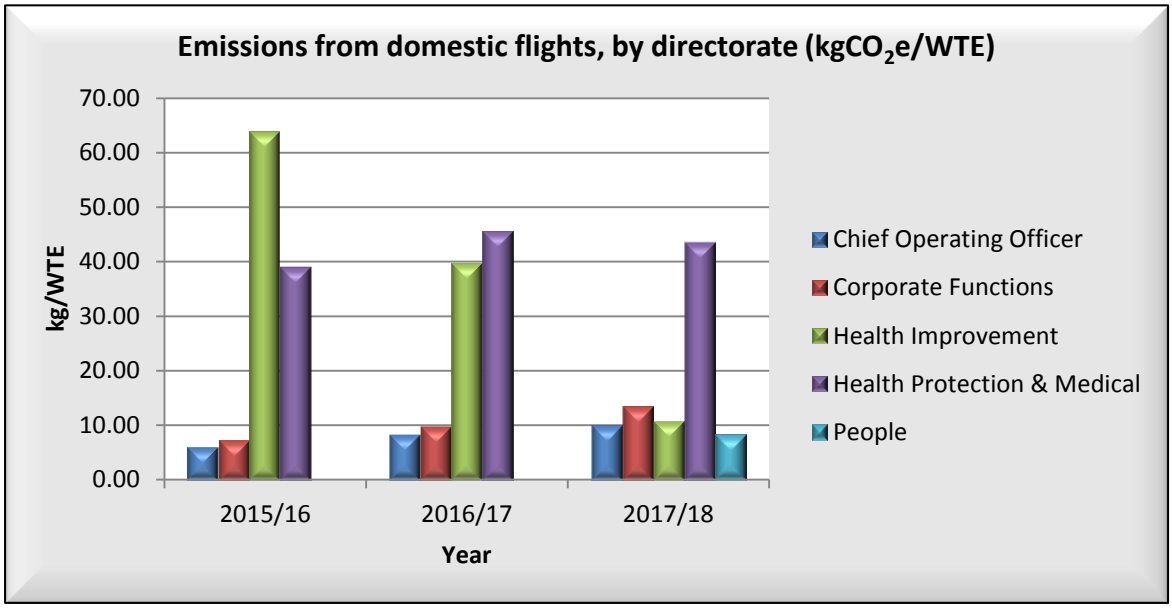


Domestic flights

The government has indicated that air travel within the UK must be reduced significantly and this has been reflected in the latest GGC targets. Distance travelled by PHE staff using domestic air travel reduced some 0.6% from the previous year.



Although there was an overall reduction in domestic air travel in 2017 to 2018 (above), when the data is calculated as kgCO_2e per wte (below); the distribution reflects the recent reorganisation of staff across PHE and clearly shows which directorate utilises this form of travel most per headcount.

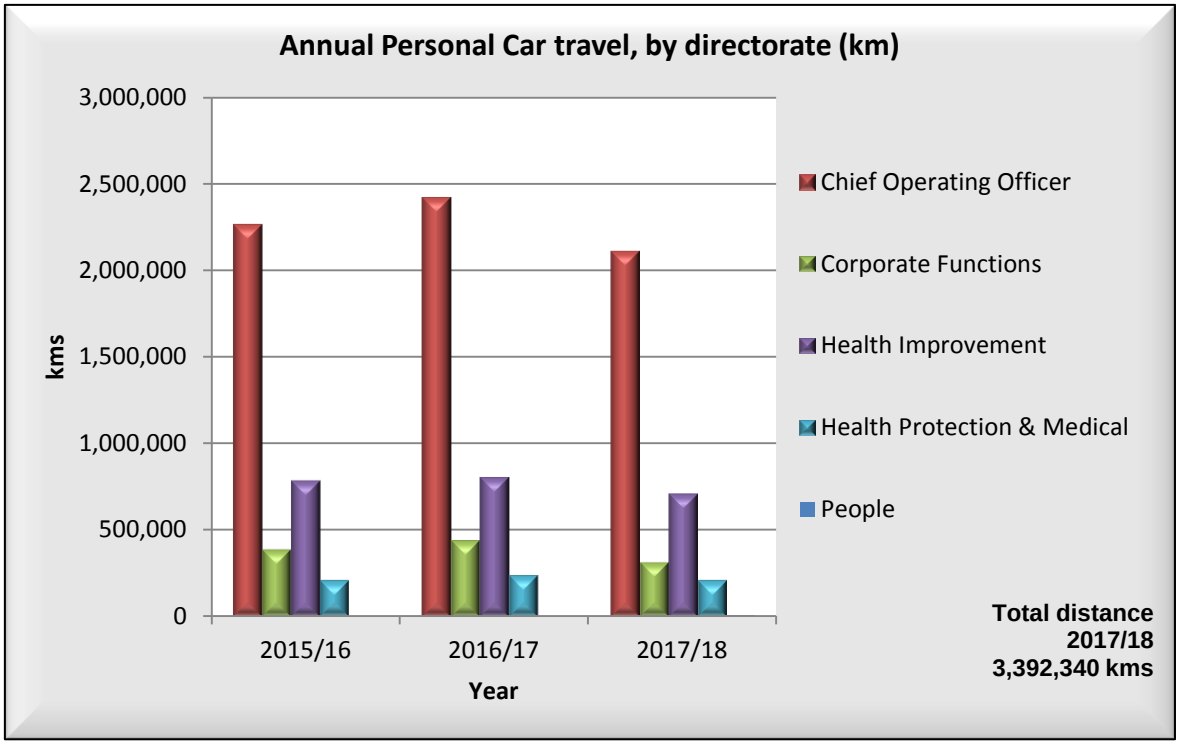


Car use for business travel

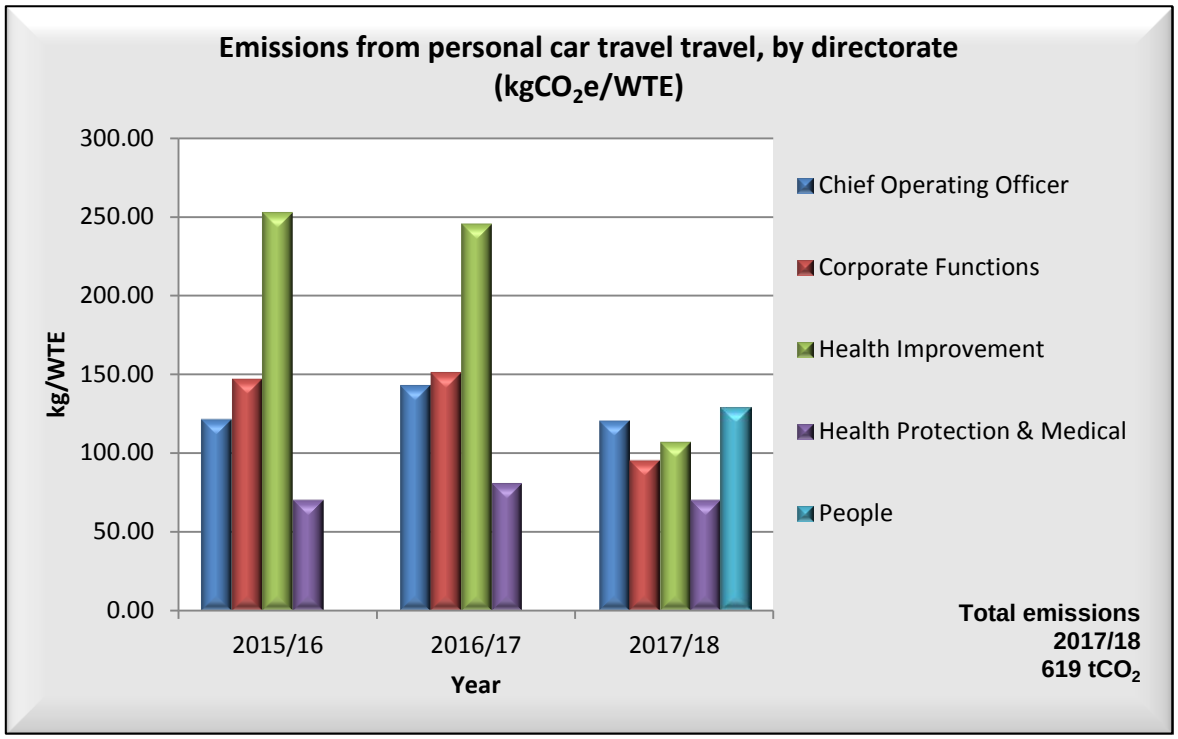
PHE continues to undertake a significant amount of business travel by car, the majority of it in personal cars. For 2017 to 2018 we travelled some 3,392,340 km in our own cars at a cost of £1,119,401 (that is 33p/km). The distance travelled, compared with last year, has decreased by some 13%.The method for calculating personal car travel is derived from PHE's i-expenses claims data.

Personal car use by directorate (with associated cost) is shown below:

Directorate	Distance travelled (km)				Annual total (km)	Cost £
	Q1	Q2	Q3	Q4		
Chief Operating Officer	468,504	532,425	600,840	509,206	2,110,975	573,018
Corporate Functions	71,246	74,008	92,500	72,748	310,501	278,265
Health Improvement	153,884	175,262	205,363	173,654	708,163	193,513
Health Protection & Medical	43,567	45,976	65,291	49,713	204,547	58,416
People	10,853	12,787	15,311	19,202	58,153	16,190
Total Personal Car	**748,054**	**840,457**	**979,305**	**824,523**	**3,392,340**	**1,119,401**



Business travel, by PHE staff in 2017 to 2018, using personal cars is shown below:



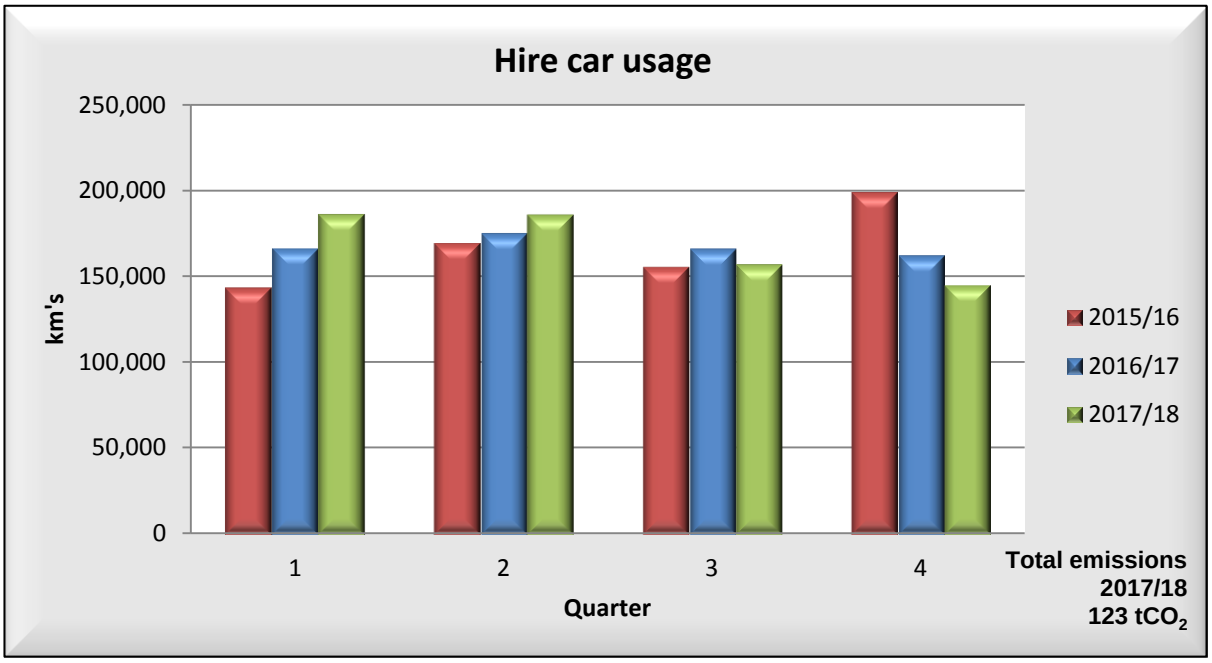
Hire car versus personal car use

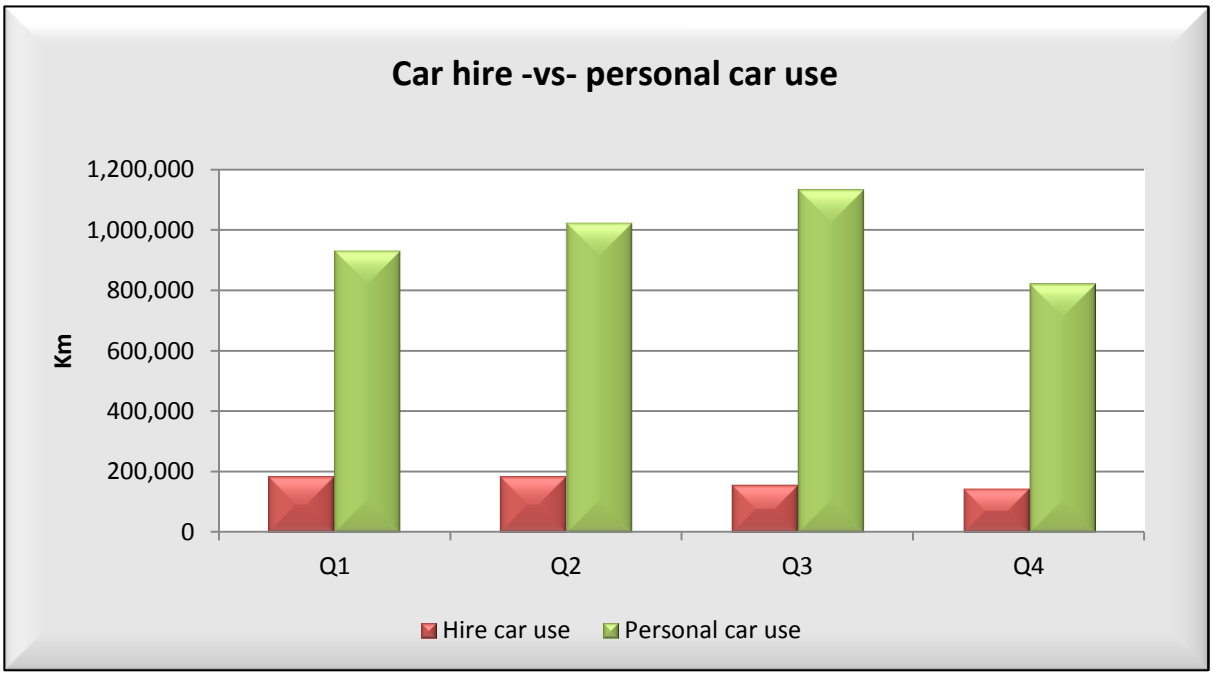
PHE continues to have a contractual arrangement with Enterprise Cars for the supply of hire cars across the country. PHE policy states that members of staff should, wherever practicable, use hire cars for journeys over 100 miles, instead of using their own vehicles, with travelling via public transport or rail being the first choice.

PHE staff using hire cars travelled a total of 673,801 km, at a hire cost of £103,443 (that is 15p/km) in 2017 to 2018, an increase of some 0.7% compared with the previous year and a 4.8% increase on our baseline. The cost of refuelling the hire cars was £38,544.

PHE recognises it has more to do in this area, though we have recently made it easier for staff to book hire cars with a new online booking system. We are hopeful that as this system matures, across the organisation, we will start to realise the potential not only for greater carbon savings, but also for increased financial savings.

The trend for travel by personal car (compared with hire car) over the last year has increased and this is illustrated below in the car hire versus personal car use graph.


Hire car usage
250,000
200,000
150,000
100,000
50,000
0
km's
1
2
3
4
Quarter
2015/16
2016/17
2017/18
Total emissions
2017/18
123 tCO2


Car hire -vs- personal car use
1,200,000
1,000,000
800,000
600,000
400,000
200,000
0
Km
Q1
Q2
Q3
Q4
Hire car use
Personal car use

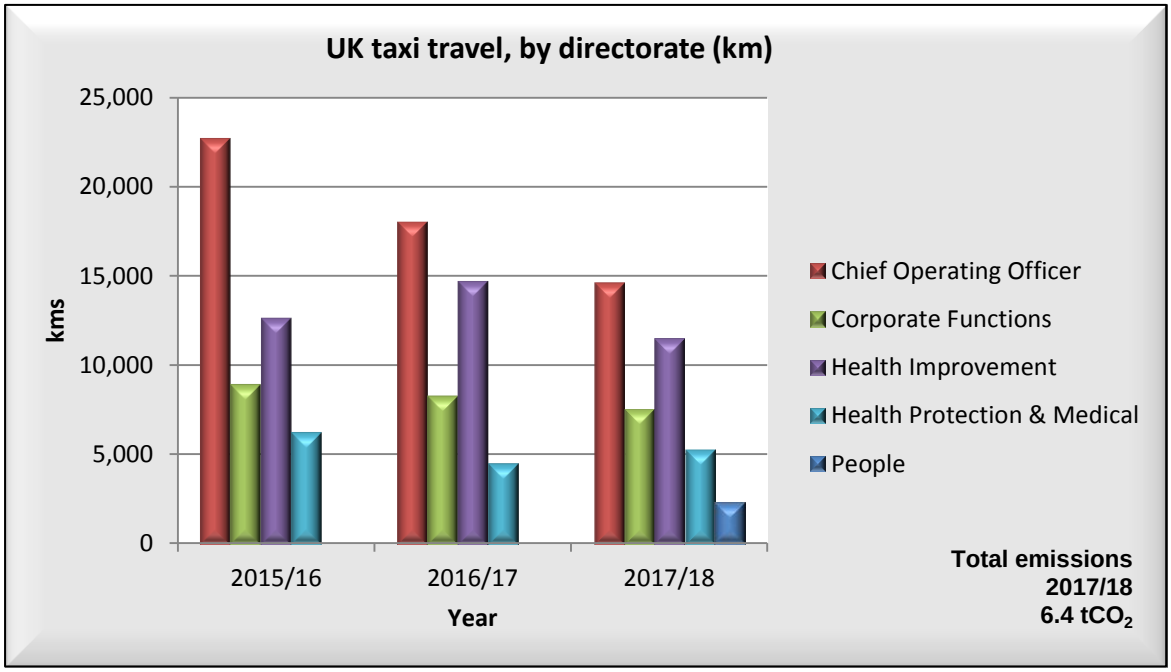
Underground and taxi travel

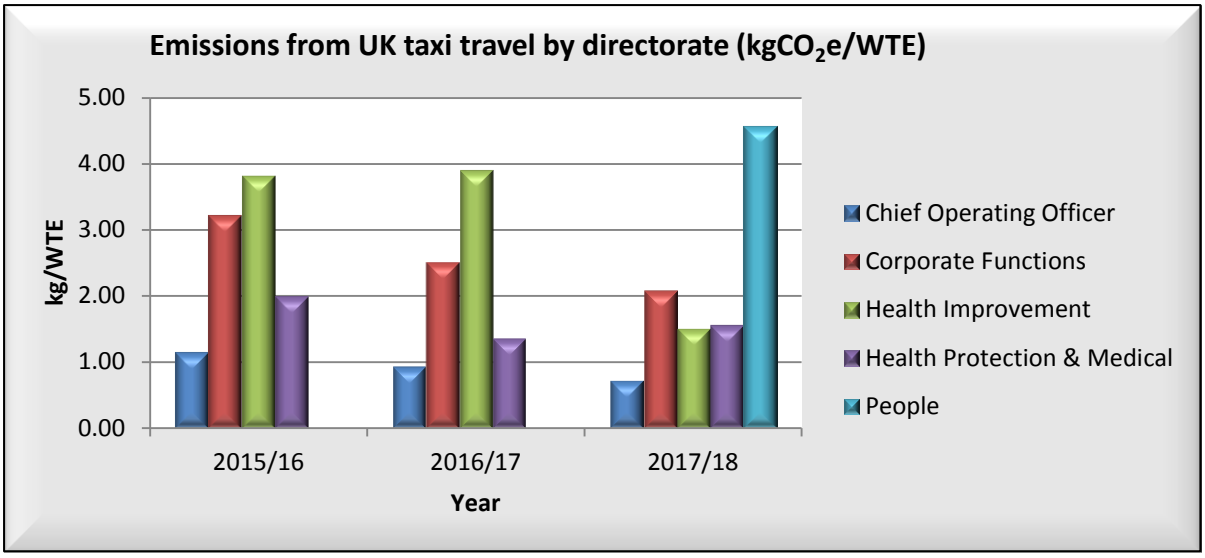
We continue to use an algorithm developed in-house for calculating distance from the cost of a taxi, bus and underground journey. This method gives us a general estimate. However, it is still difficult to distinguish journeys by bus and underground where either an Oyster or rail travel card has been used, as opposed to the purchase of specific, single transport tickets.

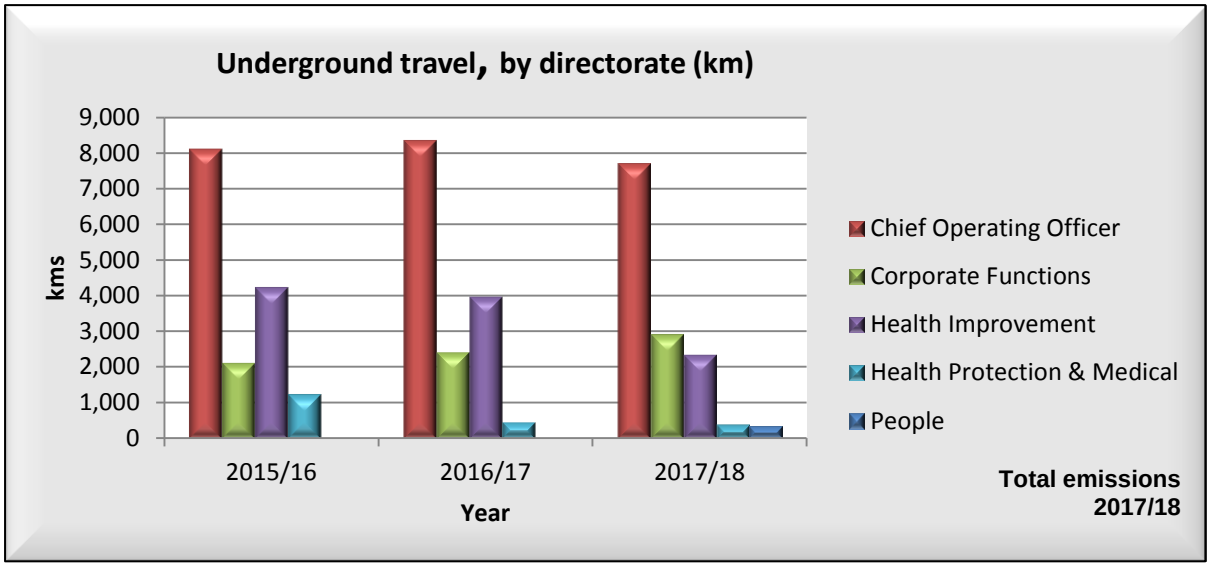
Emissions per WTE from our use of taxis have increased from 8.7 $kgCO_2e$ in the previous year, to 10.44 $kgCO_2e$ this year, a rise of 20%. The algorithm that is used to normalise this data does highlight some anomalies with the creation of a new directorate, with a low WTE number. The distance travelled this year reduced by 10% and the cost by 9%. Analysis of the data indicates that the majority of taxi journeys are undertaken outside of the capital.

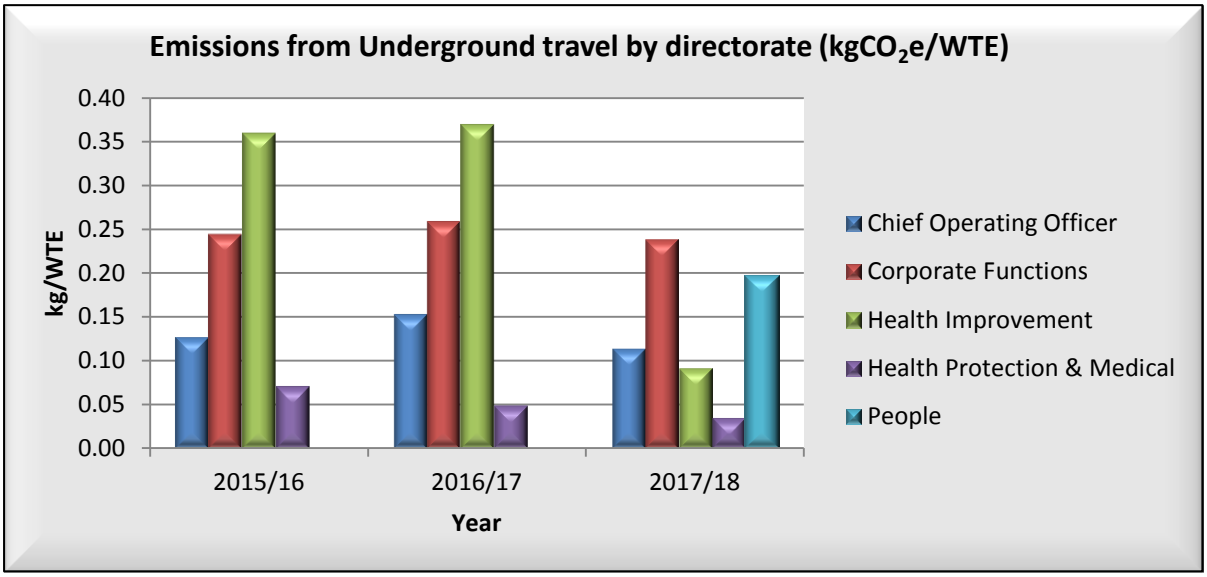
The distance travelled by PHE staff using the London underground in 2017 to 2018 decreased from 15,181 to 13,664 Kms, some 10% compared to the previous year.

PHE's carbon footprint due to travel by taxi and on the London underground is shown below, by directorate.




Emissions from UK taxi travel by directorate (kgCO2e/WTE)
5.00
4.00
3.00
2.00
1.00
0.00
kg/WTE
2015/16
2016/17
2017/18
Year
Chief Operating Officer
Corporate Functions
Health Improvement
Health Protection & Medical
People


Underground travel, by directorate (km)
9,000
8,000
7,000
6,000
5,000
4,000
3,000
2,000
1,000
0
kms
2015/16
2016/17
2017/18
Year
Chief Operating Officer
Corporate Functions
Health Improvement
Health Protection & Medical
People
Total emissions 2017/18


Emissions from Underground travel by directorate (kgCO2e/WTE)
0.40
0.35
0.30
0.25
0.20
0.15
0.10
0.05
0.00
kg/WTE
2015/16
2016/17
2017/18
Year
Chief Operating Officer
Corporate Functions
Health Improvement
Health Protection & Medical
People

Ethical and sustainable procurement

PHE's procurement department, supported by internal stakeholders, seeks to use its buying power to positively impact key public health and social agendas. This work is underpinned by the Social Value Act 2012 and the Modern Slavery Act 2015.

A corporate statement has been published on the PHE's internet and intranet supplier pages, advising suppliers that the procurement team will be working with them as part of their supplier and contract management processes in the following 4 key areas:

- economic
- employment
- environmental
- social

These categories cover areas such as:

- sustainable procurement
- addressing health inequalities
- equality and diversity
- apprenticeships
- third sector engagement
- small and medium enterprises
- the Modern Slavery Act
- payment of the living wage

PHE's procurement department has specialised category managers to ensure that the most cost-effective and sustainable items and services are purchased. Environmental sustainability is therefore an important part of all of our purchases. These category managers ensure that all of our tender documents contain relevant questions to confirm that the successful suppliers adhere to given environmental and sustainability standards, appropriate to the category of purchase.

Our tender process is managed through e-tendering and our documentation is stored electronically. We ask specific questions about a company's environmental management system, including about their impact on energy and water used for production, and their disposal of waste and the sourcing of raw materials.

The tender document can be adapted to include specific questions relevant to a particular tender. This will then be scored to ensure that the companies that take

account of the importance of sustainability and environmental issues are recognised for their contribution to this important area.

Specific training courses are being developed for commercial staff across PHE involved in developing specifications and managing contracts, so that our purchases can positively support PHE's social and public health agenda.

Sustainable procurement

PHE continues to strengthen its commitment to its green procurement initiatives, by introducing new ways of procuring goods and services. We have also engaged stakeholders with regards our commitment to the Social Value Act and Modern Slavery Act, via our Procurement Strategy Group.

Biodiversity and health equity

PHE fully recognises that health inequalities are systematic, avoidable and unjust differences in health and wellbeing between different groups of people. Reducing health inequalities is not only central to our mission, but also a legal requirement on behalf of the Secretary of State as part of the Health and Social Care Act 2012. While the causes of health inequalities are often deep rooted and complex, there is much that PHE can do to contribute to reductions in health inequalities.

PHE has a legal duty to have due regard to reducing health inequalities (Health and Social Care Act). We must fulfil the public sector equality duty (Equality Act 2010) in our work, which requires us to consider the needs of all individuals in our products and services. We aim to reduce inequalities through working with national and local government, the NHS, industry and the voluntary and community sector.

We also continue to have an active programme related to ‘healthy people, healthy places’. A number of health and wellbeing groups have been set up to inform staff about the benefits of active lifestyles and healthy diets, and the health problems associated with smoking and excess alcohol. Mental wellbeing classes also continue to be run across the estate to help staff to cope with the stresses and strains of everyday life.

All new major build or refurbishment projects undertaken in PHE assess whether they will impact on the biodiversity of the environment. A recent project at one of our main rural sites encountered a badger set in an area where there was a planned demolition. PHE recognised its legal duty to ensure no harm could occur to the potential occupants of the set and a full ecological assessment was undertaken.

A camera was set up to capture any movement of animals in the area, especially at night. Over the period of a month only 1 badger was seen on the camera, and this didn’t enter the set. It was concluded that the set was no longer occupied, and after taking specialist advice it was agreed that the demolition project could go ahead. This is only 1 small example of the measures PHE has adopted to protect our natural environment.

Sustainability in the centres and regions

Approaches to sustainability

PHE has 4 regions, the North; the Midlands and East; the South; and London. The 3 regions outside London are made up of 8 PHE centres.

Each of the 4 PHE regions has its own approach to sustainability networks and partnership engagement, developed to best serve differing local and regional needs. All regions have networks in place and each PHE region and centre has a sustainability lead.

Networks and groups

The regional and centre networks promote sustainability awareness, share best practice and help each other to take forward action on sustainable development. Many have both internal and external groups. Examples of the groups in place are:

- Northern Sustainable Development and Health group – the North has continued to increase its membership, with over 160 current members; the steering group has continued to coordinate and drive forward the work of the network
- Midlands and East virtual regional network – this group continues to meet with the aim of supporting the active local networks and sharing ideas and good practice; key activities have supported masterclasses held by the local networks
- South Region Sustainability and Health Network – this group continue to lead work jointly between NHS England and PHE
- London Sustainability Champions Group – a group has been established within London to raise awareness of sustainable practices across PHE's London sites; the group supports delivery of PHE's sustainability commitments and provides a focal point for sharing ideas and good practice across PHE London.

Conferences, masterclasses and events

Conferences and events are often used to raise awareness on sustainability issues and connect those who work in this field, both internally and externally. Examples of the conferences, events and masterclasses that have taken place across PHE's regions are:

- a masterclass that was held in June 2018 in the North Region on Digital Innovation and Sustainable Development which brought together speakers from national and local suppliers with public sector organisations to discuss how our increasingly digital world can help to deliver safer, more efficient and more sustainable services − it looked at how organisations are applying digital solutions

to their sustainability questions and some of the technologies that are shaping our future
- two masterclasses held in the West Midlands between November 2017 and March 2018, the first on getting sustainability onto an organisation's agenda and the second on sustainability and behaviour change
- a masterclass in PHE's South Region on air pollution, bringing together national experts on the science and local authority experts to discuss engaging with communities and implementation processes
- sustainability champions across the London Region delivering an awareness session at the PHE London Staff Away Day and speaking about their 2-year Sustainability Awareness Programme, milestones and timing of projects

Working with our partners

PHE has links with partners such as NHS England, directors of public health, academia and other agencies. Examples of some of the work that has taken place regarding sustainability with our partners are:

- members from PHE's London Region being active members of the London Climate Change Partnership, whose work includes raising awareness on the Health and Care Sustainable Development Strategy; work includes lowering health risks related to heatwaves and cold weather − this is exemplified by the initiative 'Urban Heat', a community-led approach to the heatwave project delivered by Westminster University
- the West Midlands Centre refreshing its air quality group which is one of our key priorities; cities, such as Birmingham, are under significant pressure to improve their air quality and in May 2018 the centre held an air quality event with representatives from a number of organisations including local authorities, the NHS and academia attending − a follow-up event is being planned

Travel

Centres and regions have worked alongside PHE's finance team to develop a travel dashboard. This is a visual tool that managers and staff can use to view travel, including factors such as miles travelled and CO_2 emissions. This is been used across centres and regions to monitor travel and create appropriate action plans, with a view to reducing carbon emissions and minimising travel. There has been a concomitant focus on utilising Skype for Business and where possible, sending 1 representative from a team instead of multiple attendance at meetings.

Examples of work that has been undertaken on travel are:

- sustainable travel guidance has been developed in the Yorkshire and Humber Centre and all staff across the centre were provided with a full year's travel information for their team − team meetings were then utilised to discuss the travel

data and teams were given a number of questions to consider to explore ideas on how the team could reduce travel and utilise more sustainable travel practices
- the South West team has drafted a sustainable meeting guide including details of local meeting rooms that are close to public transport and offer social value opportunities through their use

Office moves

Sustainability is at the heart of any office moves that take place across the regions and these projects are used as an opportunity to examine how PHE can become a sustainability exemplar. All such projects consider proximity to public transport and energy efficiency – for example, the fitting of energy-saving devices such as lighting sensors. Recycling is also a key focus across all of our premises.

Staff health and wellbeing

As part of the sustainability agenda our regions have also looked at how sustainability can benefit the health and wellbeing of staff. Some examples include:

- centres and regions promoting a number of initiatives to staff over the year including Sustainable Health and Care Week which focused on a different topic each day − these covered waste, green spaces, community and travel, where information and a number of different initiatives were available to staff; Clean Air Day was also promoted, leading to staff across centres and regions posting pledges on how they would contribute to Clean Air Day
- some centres have implemented the purchasing of railcards which provides discounted travel to staff, the cost of which is recovered through salary deductions; other centres are now piloting or considering such schemes − this has been used to encourage staff to take public transport to work and when attending local meetings
- some centres have promoted volunteering for sustainable causes to their staff which not only promotes staff health and wellbeing, but has also assisted in the development of local causes such as gardening projects

Ambassador programme

PHE's regions have developed a Sustainable Development Ambassador programme over the past 12 months. This programme has sought to develop named local leaders in health and sustainable development in each region. The leaders will act as a focus for their area through whom others can develop their learning, improve their engagement skills, and share and coordinate their commitment, competence, capacity and experience of health and sustainable development.

Applications and a selection process took place across regions and the programme is now up and running. Ambassadors across the regions come from a variety of

backgrounds including hospital and primary care, public health, local government, general management, estates management and clinical specialities. The ambassadors in each of the regions have been meeting together in action learning circles, undertaking 360-degree appraisals and completing relevant training and development where required.

The ambassadors have taken on a variety of projects around the country. Some examples include reducing waste in general practice, making hospital theatres more sustainable, reducing plastics and embedding sustainability into decision making.

Other initiatives

Centres and regions have considered and progressed other initiatives to assist in the sustainability agenda. Some examples of these include:

- the Midlands and East Region proposing the establishment of a sustainability fellowship post which is intended to provide strategic leadership in sustainability and health, disseminate the principles and benefits of sustainable development to health and care stakeholders, and to undertake specific project work in sustainability and health
- the South Region starting a task and finish group on reducing single use plastics in the South − we have a number of organisations and communities that are striving to do this and we are supporting the learning between them

Sustainable development in the Health Improvement Directorate

A fundamental role for Public Health England (PHE) is to gather and signpost emerging research evidence to improve our understanding of the impacts of the lived environment (built/natural, social, and economic) on health and wellbeing. Our Healthy Places team has taken this one step further by 'translating' the research evidence and the implications of emerging evidence into policy and practice.

The PHE Healthy Places team has recently published, as well as contributed to, documents aimed at supporting the planning of healthier places. The emerging evidence increasingly supports a broad narrative for PHE: what is good for the environment is good for the health of individuals and the wider community, which is good for the economy, now and in the future.

Spatial planning for health

The first publication was the Healthy High Streets document in which PHE commissioned the UCL Institute of Health Equity to synthesise the latest and most relevant evidence for local decision makers, built environment professionals (for example planners, urban designers, landscape architects), town managers, public health professionals, and others involved in implementing street design principles on the health and wellbeing benefits of making high streets more inclusive, safe and healthier, particularly in areas of high deprivation.

This review provides a rapid assessment of evidence relating to pedestrian friendly, healthy high streets in urban settings, with specific reference to design interventions and street furniture. Evidence relating to both children and adults is considered, alongside groups who may have specific needs or preferences such as older people, younger people, disabled people (considering specific impairments where relevant) and different ethnic groups. The review illustrates how, across a broad range of local stakeholders, a greater understanding of how place and people interacting could help realise the potential of our high streets, and contribute to health and economic gains of our local communities.

The second publication by the Town and Country Planning Association (TCPA), TCPA: Securing constructive collaboration and consensus for planning healthy developments: *A report from the Developers and Wellbeing project* was developed to encourage collaborations between council planners and their public health teams in order to create places in which living a healthy lifestyle is an easy option. A lot has been achieved. However, as councils have gained confidence in their ability to create healthier places, they have realised that to achieve significant change they would

need to involve developers and, therefore, understand more about how to do this. To meet this need the TCPA set up the Developers and Wellbeing project in 2017.

This project explores how the TCPA encourages a consensus between the public and private sectors as well as wider stakeholders about the need to build and sustain high-quality, healthy places. The project was focused around 10 workshops with local authority planning and public health teams, housing developers and a wide network of stakeholders. In addition, developers were interviewed to find out what they thought about their role in creating healthy places.

The meetings and conversations yielded interesting perspectives and reflections from developers, including insight into their relationships with public bodies during the planning process. The activities were supported by an evidence review of publications and studies from industry and academic sources on the subject of healthy places and economic value.

PHE recognises the influence that good housing, the wider built environment and sustainability has on health and wellbeing. The aim of our Healthy Places programme is to develop the evidence base and raise awareness of the role which the built and natural environment can play in improving health and reducing health inequalities – and support local and national government and our key stakeholders to address these. This report by the TCPA is an important contribution to understanding how the public sector can work together with those in the building industry to plan, design and build places and homes which are health-promoting and help make healthy choices, easier choices.

At the 2018 PHE conference, we held a session on Planning, Housing and Healthier Communities. This workshop was aimed at Local public health professionals, planners and housing professionals working in local authority settings and explored the implications of the new planning system for the delivery of healthier housing in neighbourhoods, which are themselves designed to support healthier lifestyles. The role of local public health professionals in partnership with colleagues in planning and housing to support the development of healthier communities and reduce health inequalities was also taken into account.

The session:

- provided a better understanding of the key changes proposed in the new National Planning Policy Framework and supporting Planning Practice Guidance
- delivered further knowledge on how health professionals can better engage in the planning and housing system to ensure that they support the development of healthier communities
- developed a better understanding of the housing and place based challenges facing local communities

Two years ago at the 2016 PHE conference, we hosted a masterclass on Green Infrastructure that examined the evidence base and guidance on green infrastructure and health and experimented through a role play scenario to show how this evidence is translated and used to inform the planning decision making process. It provided a learning opportunity for participants working at the cusp between public health research and evidence and demonstrated how such evidence is applied, or not, when planning decisions are made and priorities are being decided for areas for housing and greenspace.

In recent years, the harmful impact of poor air quality on people's health has become more widely appreciated. Improving health and air quality will depend on how well we align the shift to a more prevention-focussed health system with the transition to a low carbon economy, where significant benefits for both will emerge from coordinated approaches. Some of this shift is already happening, as the low carbon sector already makes a significant contribution to our economy with a turnover of £120 billion a year in the UK (source Sir David King).

PHE has actively supported the development of the NHSE Healthy New Towns programme. The programme supports the development of model towns where prevention is 'designed-in' from the start and with the potential for an enhanced focus on how green infrastructure can support improved health and wellbeing. Ten Healthy New Towns are involved in the programme and their progress over the next few years will be closely monitored.

Too many homes in this country are still cold; have internal hazards: 20% do not meet Decent Homes Standards. Most of these homes (as well as many that do meet basic standards), have fuel inefficient boilers, insufficient or no insulation, or are not future proofed for expected climate change. All of these have impacts on both health and the environment. Housing and Health is a fundamental issue for all, and the Healthy Places team sponsored a series of Housing Development Workshops delivered across the country last winter where the evidence of health risks from housing conditions and housing circumstances were explored against local priorities.

The workshops broadly explored 3 themes: unhealthy homes ('bricks and mortar' impact for example, cold, disrepair); unsuitable homes (overcrowding, un-adapted, and inaccessible); unstable homes (precarious housing and homelessness). These workshops generated a lot of interest in local areas to understand how to improve health through the home.

To support local areas to address poor (often environmentally unsound) housing, a series of housing resources are now included on our Homes for Health collection (www.gov.uk/government/collections/housing-for-health) page, which also contains a wealth of material to support local authorities, health and social care commissioners

and decision makers to improve health and wellbeing through the places where people live.

Nationally, the Healthy Places team continues to work across government and with PHE colleagues providing advice and guidance on a range of issues bringing together aspects of built and natural environment and their impacts on health. We support Natural England and have engaged with other partner agencies that have an active interest in the natural environment such as the Forestry Commission and the Royal Society for the Protection of Birds – through their planning and research function.

Most recently we have advised Ordnance Survey on their recently released interactive digital map and database identifying accessible greenspace in Britain. Colleagues in PHE have successfully migrated this data into our powerful SHAPE mapping tool to support the strategic planning of services and physical assets, which we hope will be of practical help to Local Authorities and NHS commissioners to further create and support programmes of work more sustainably.

Sustainability at PHE Porton

Introduction

The Porton site is a large operational site with a variety of complex and resource intensive activities. In addition to PHE's research and administration activities, the pharmaceutical manufacturing activities of Porton Biopharma Limited (PBL) are located on the site and supported by PHE. In August 2017, PHE South West Cancer Registry was relocated from West Dean in Salisbury to Porton. To accommodate these new arrivals one of our buildings had to be totally refurbished for its permanent residence, this has included a complete roof replacement which involved the installation of greater energy efficiency materials.

Energy

There was a 1% rise in measured grid electricity used at Porton during 2017-18. For a long duration during this period, the solar PV array was non-operational due to a technical fault. The loss of electricity generation during this period was estimated to be approximately 178MWh, which is roughly equal to that of the 1% rise in consumption.

The PV array was fixed in early April 2018 and has since been generating above average volumes. By the end of the 2017-18 financial year over 1GWh of electricity has been generated in total since its initial installation.

To comply with the Energy Efficiency (Private Rented Property), England and Wales Regulations 2015 all of our qualifying buildings, leased to PBL, had to be assessed by an external environmental consultant to attain their Energy Performance Certificates (EPC). All of the PHE leased buildings onsite have achieved a credible EPC, with recommended energy saving measures being planned or implemented where required.

Environmental reviews have also been made of all new builds and cabin installations on site. This has so far identified inferior levels of insulation which have then been remedied in the construction.

The upgrade design of one of our satellite sites is progressing well, with gas oil heating being replaced with mains gas supply and new insulated roofing materials also being fitted to save energy. However, due to Home Office requirements, it is possible that energy demand onsite will increase slightly due to new Heating, Ventilation and Air Conditioning (HVAC) requirements and larger enclosure areas onsite.

Electricity − sub-meters

Work on sub-metering electricity use onsite is still continuing due in part to the change in Porton's infrastructure. Data from the fitted sub meters is now on the site's building management system and monthly monitoring is completed with reports on utility use recorded for each area.

Gas

We saw a 7% reduction in the total gas consumption used on the main site. This demonstrates the efficiency of the new boilers installed in mid-2016. The boilers provide low and high pressure steam as the primary heat source for a number of critical site systems, including the autoclaves, as well as the heating medium for the majority of the site's buildings.

Water

Water use at Porton saw a 15% rise in water consumption, this was due in part to a major water leak onsite, which is now fixed. A review of Porton's water supply is being undertaken, by an external consultant, on behalf of the water supplier. Water abstraction in this area is under stress; future Environment Agency guidance is likely to recommend reducing the volumes that the site, as part of the Porton tri-partite campus, can abstract in the future. Solutions are therefore being sought, by all parties, for further reductions in water consumption.

Waste

Waste Standard Operating Procedures (SOPs) training has continued on a monthly basis, during the year, with 202 people trained in total. During the year, we investigated sending non-SAPO waste to an offsite clinical waste incinerator as an alternative contingency option.

The total quantity of waste produced on site decreased from 471 tonnes in 2015 to 2016 to 413 tonnes in 2017-18. This was achieved by a general reduction in waste production and more efficient abatement in our incinerator operation meaning less waste incinerator ash being sent off site for disposal.

Incinerator

The incinerator ran well during the year with no major faults. A few short duration (<3 days) unplanned shutdowns were required to fix elements that broke through normal wear and tear. There was 1 notifiable breach due to an exceedance of the permitted emissions levels for Carbon monoxide (CO). This was reported to Wiltshire County Council (WCC) and an investigation implemented. However, it is unclear what caused the CO levels to rise, causing the breach, but WCC were confident of the approach taken by our staff to identify this issue.

Travel

In 2017 to 2018, PHE Porton has continued to provide incentives to its members of staff and its contractors to encourage sustainable travel to work, as part of the campus' green travel plan. Incentives have included offering cyclists a loyalty card for free breakfasts; providing a shared free shuttle bus for staff for both commuter journeys and visitors arriving at Salisbury train station throughout the day; and continuing our membership to the web-based Liftshare scheme.

Wildlife and environment

With the rural location of PHE Porton, there is much wildlife living in close proximity to our site. To support the proposed demolition of a number of the 'white huts', we have undertaken various ecological surveys and habitat risk assessments to ensure we are mitigating any impacts we may have on local wildlife habitats.

These will include:

- a bat emergence survey at dusk to identify if any of the buildings to be demolished have any roosting sites
- the need to erect a wildlife trap camera overlooking a badger sett adjacent one of the buildings to assess whether or not the sett is still in use
- an inspection of all internal areas to make sure there are no nesting birds present, as these are afforded legal protection from disturbance

Sustainability at PHE Colindale

Introduction

PHE Colindale continued to apply utility-reduction measures according to the objectives set out in the 'Greening of Government targets' however the situation has become more challenging as many initiatives have already been implemented.

A new forecast published by scientists at the Met Office indicates the annual global average temperature is likely to exceed 1°C and could reach 1.5 °C above pre-industrial levels during the next 5 years (2018 to 2022)[1].

February and March 2018 saw extremely low temperatures and large quantities of snow but most notable were western-prevailing winds from storms. The year 2017 was notable for cloud cover and lack of sunshine. However, cloud cover kept the warmth in the atmosphere, and 2017 was still one of the warmest years since records began, with a high in June of 34.5C.

Energy projects

Electricity

There have been a number of lighting projects rolled out this year with the emphasis on the installation of emergency lighting. There were also a number of T12 fluorescent lights replaced, with energy-efficient lights, and new lighting control systems. This project alone has the potential to save approximately 33,500KWh of electricity annually.

The new lighting control system has automatic switch-down and off controls, which means that the associated lighting does not need to be changed as frequently. With less time switched on, and less power used, there are also financial savings in terms of maintenance as well.

Gas

There were 2 boiler burner replacements completed during the year. It is anticipated that this will make significant savings of gas in the future.

Other projects have included the upgrading of the boiler steam pressure reducing sets, and the rationalisation of office space. The latter resulting in less heating being needed for this area.

[1] www.metoffice.gov.uk/news/releases/2018/decadal-forecast-2018

Water

There was a large water leak from the main valve to the site which affected our improving record of water reduction. However, after replacing the main valve and installing a new water meter, water reduction is back on track.

Paper

Paper use has continued to decline, as more staff now use the multi-function devices connected to the local computer network. Administrative staff have also been advised to limit the number of copies completed for meetings and consider paper use carefully.

Waste

We have focused on the reuse of waste this year. With the help of the Colindale wellbeing team and the craft group, we utilized EU pallets that have been transformed into furniture for the staff to use in the gardens on site. In addition, the cushions for the couches were produced by using off-cuts of fabric donated by staff and the stuffing was produced from polystyrene packaging previously used in transporting items for protection.

A large cupboard has also been built by staff from pallets and used scaffolding planks. This is to store the soft furnishings and garden tools for the gardening group.

Biodiversity and the natural environment

In the last year, the onsite allotments were refurbished. With the help of plants from the Royal College of Physicians, PHE allotment group has turned the raised beds into a ‘Physic Garden’. The ‘Physic Garden’ at Colindale was initiated to demonstrate the medicinal, edible and other beneficial use of plants.

The garden began to take shape earlier this year with plant donations from interested staff that either have taken shoots from established plants at home or produced plants from seeds. We introduced a ‘Physic Garden’ at Colindale because many tropical plants are valuable in terms of health such as the ‘Catharanthus Roseus’ (Madagascar Periwinkle) known for its use in the prevention of childhood leukaemia and cancer treatment[2].

Pallet wood has been used in signage for the raised beds and individual plants. Tropical plants will be grown using the indoor planters, under skylights in Corporate Services.

[2] https://blogs.reading.ac.uk/tropical-biodiversity/2014/03/catharanthus-roseus-cancer-fighting/

The Colindale Wildlife Group has continued to progress, guiding staff on the wildlife at Colindale and encouraging staff to plant bee-friendly plants in their own gardens and take part in the annual butterfly count.

Bat, bird and insect houses have also been made, which are situated at various locations to improve biodiversity on site.

Sustainability events

Two sustainability events were held at Colindale in March and October 2017.

At the October event, 2 special guests visited the site to see the ‘Physic Garden’ and give advice:

- Dr Henry Oakeley an eminent, retired psychiatrist and now 12 years, a fellow of the Physic Garden of the Royal College of Physicians who gave an interesting talk to staff about the medicinal value of plants
- Dr David Pencheon, former Head of the Sustainable Development Unit (SDU) which is jointly funded by the NHS and PHE, who spoke to staff about the importance of the environment in terms of our wellbeing

Sustainability at PHE Harlow

Introduction

Public Health England acquired the former Glaxo-Smith Kline site in Harlow in June 2017. The site has a small resident team who, under the auspices of the site services team at Colindale, are managing the site from day to day until it becomes fully operational.

From a sustainability perspective, PHE has been investigating the use of utilities onsite and the existing engineering framework to determine what services are currently required, whilst the site is not in a working capacity.

Utilities

The utility suppliers were the first to be considered and in order to minimize the costs, our team started by switching off everything that was non-essential on site. PHE have also organized new suppliers for main utilities onsite, through the Crown Commercial Services (CCS), to align services to preferred Crown suppliers. This reduced the price per unit of gas from 7.6 pence per KWh to 1.9 pence per KWh.

When PHE took over the site, gas was being used to fire the sites boilers. to heat the engineering block as the rest of the site was not used. The boilers were subsequently shut down as it was deemed inefficient to maintain running the boilers for this small area; with the office team reverting to local electric heaters instead.

Continued operation of the boilers would have required us to apply for a permit to operate the boilers. This is due to the potential pollution impact of burning any fuel in an appliance with thermal input of 50megawatts or more with associated activities of oil storage, effluent balancing and boiler feed-water treatment.

The electricity supplier was changed, through CCS, resulting in a cost reduction from £0.2 per KWh to £0.09 per KWh.

Fluorinated gases

An asset register had been completed prior to PHE purchasing the site at Harlow. The site team used this register to highlight what equipment had to be removed from the site, with F-gases that were now obsolete or unable to be replaced if leakage occurred. All of the equipment with obsolete F-gases contained inside has been removed and the gases have been reclaimed.

Waste

There is currently limited waste produced on site. Most of it is incinerated with energy recovery. Waste for recycling is collected separately although quantities are minimal. Office and laboratory furniture, specifically chairs, left on the Harlow site have been reused in offices at the Colindale site.

Transport

No PHE staff permanently work onsite yet so we do not have any data to report with regards travel. We have though organised a number of site visits for staff as part of briefing them on the Harlow programme and to engage them in the corresponding change.

Sustainability at PHE Chilton

Introduction

After a gap of some several years, a new Sustainability Champions Group has been set up at PHE Chilton, which met for the first time this year. A total of 20 Departmental Champions have volunteered to join the group. New Terms of Reference have been agreed and the group aims to meet every 2 months to help improve sustainability across the site.

A new Sustainability Champions section has been created on Chilton's Directorate Document Tracking (DDT) platform and is accessible to the Centre Management Team (CMT) and staff alike. This section contains key documents and reference information on sustainable development and environmental management.

Transport

Subject to CMT approval, the Sustainability Champions Group is planning to undertake a site wide travel survey this autumn, aimed at understanding and baselining current sustainable travel arrangements in relation to the corporate carbon footprint and its associated environmental impact.

The survey will be conducted via an online Select Survey questionnaire and will be facilitated by the champions in each department.

Utilities

There have been a number of projects undertaken to reduce our environmental impact across a number of our sites, including the fitting of photo-voltaic cells on the roof of the main building.

The estates and facilities department is exploring step-wise measures to ensure Chilton is compliant with the Government's plan to eliminate Consumer Single Use Plastics (CSUP) from its estates. The estates and facilities team, along with colleagues from procurement, will be working with suppliers to look at ways to replace existing CSUP items/materials/activities with non-CSUP alternatives over time. Although not compulsory, the government is encouraging all ALBs to sign up to this plan.

Future initiatives

In co-operation with the Chilton estates and facilities team and the members of the sustainability champions group, a new ‘Green Impact’ initiative is to be trialled to encourage the sustainable procurement of equipment and operation of its laboratories and departments. Laboratories and departments will be awarded a Bronze, Silver or Gold rating at the end of 2019.

Climate change and extreme events

Cold Weather Plan for England and Heatwave Plan for England

PHE coordinate and publish the Heatwave Plan for England and the Cold Weather Plan for England on behalf of the health and social care sector. Both plans set out clear actions to be taken by the NHS, social care, local government, and the community and voluntary sector, as well as the public, to minimise the effects of heat and cold on health.

The plans themselves will remain extant until further notice. An independent evaluation of the Heatwave Plan, commissioned by the Department of Health and Social Care, is currently being undertaken by the Policy Innovation Research Unit at the London School of Hygiene and Tropical Medicine. Results of this evaluation will be published in late 2018.

Winter 2017 to 2018 and summer 2018 have seen some of the most extreme weather the UK has experienced in a number of years. There were severe cold temperatures and heavy snow at the end of February and early March, the hottest April day on record, and the unusually warm period seen over the whole of July. These conditions required a public health response in several parts of the country.

‘Beast from the East’ and cold weather

Late February to early March 2018 saw the most significant spell of snow and low temperatures in the UK overall since December 2010. Wind direction shifted to bring very cold air from the arctic and Siberia, dubbed the ‘Beast from the East’ by the British media. Minimum temperatures over the period dropped as low as -11.7°C with a maximum temperature of -3.7°C.

Hazardous conditions were compounded by storm Emma which brought widespread severe snow and wind warnings, including 2 red warnings for snow. A Level 2 (Alert and Readiness) Cold Weather alert was issued on 21 February 2018 which was upgraded to a Level 3 (Cold Weather Action) alert on Friday 23 February for all parts of England. The Level 3 alert remained in place until the 4th March.

A nationally dispersed incident was declared on the 27 February, leading to the activation of the PHE National Incident Co-ordination Centre (NICC). The Corporate Resilience Team managed the NICC in support of the Incident Director with specialist input from the Extreme Events and Health Protection team (EEHP). EEHP delivered a steady output of public health messages through the regional/national broadcasting and media with the EEHP lead appearing in over 36 media interviews.

EEHP also provided daily situation reports to the Winter Resilience Network convened by the Cabinet Office to promote cross-government action and information sharing. Between 1 November 2017 and 31 March 2018, a total of 75 cold weather alerts were issued by the Met Office. During this time at least 1 region within England was at Level 2 alert for 24 days and at least 1 region within England at Level 3 alert for 51 days.

Enhanced health surveillance was undertaken and impacts observed were in line with the severe weather conditions. The observed health impacts over this specific period will formally be assessed with results published later this year.

EEHP, in conjunction with other PHE teams, has produced a document to advise local authorities on identifying fuel-poor households. The team has also had input into a fuel poverty conference being held by the Department for Business, Energy and Industrial Strategy in 2018.

Summer 2018 heatwave

Summer 2018 saw an unusually extended period of above average temperatures throughout the UK. Unseasonably warm weather occurred mid-April with the 19 April recording the highest April temperature on record. The early May Bank Holiday also saw temperatures in the high 20s°C and low 30s°C, and the end of May saw temperatures approach Heat-health warning thresholds.

These 3 notably warm periods occurred outside the Heat-Health Watch season which runs from the 1 June until the 15 September each year. June saw temperatures above average for the time of year; however threshold temperatures were not breached until the end of the month.

The Met Office issued the first Level 2 (Alert and Readiness) hot weather alert on the 26 June. From this date, at least 1 region in England was at a Level 2 or Level 3 (Heatwave Action) until the 10 July. While temperatures reduced from the 10, prompting a return to Level 1, temperatures hovered just below threshold temperatures in many regions.

This slight respite was short lived however, with another Level 2 issued from the 20 July and upgraded to a Level 3 on the 23 until the 28 July. A further Level 2 was issued 5 days later on the 3 August and was upgraded to a Level 3 on the 6 June for 2 days.

The Extreme Events team responded to these extreme temperatures by providing regular and steady output of public health messages through the regional/national broadcasting and media, social media and via partners in other organisations. From the 25 June when the first Level 2 alert was issued until 7 August, the final

day of alerting for the season, PHE's 'Beat the Heat' resources were downloaded 5,600 times.

Over the official Heat Health Watch 2018 season there were 17 days where at least 1 region in England was at a Level 2 hot weather alert and 11 days where at least 1 region in England was at a Level 3 hot weather alert. This makes summer 2018 significant when compared to the previous 5 years. For example, the significant 2013 heat event saw just 5 days where at least 1 region in England was at a Level 2 and 7 days with at least 1 region in England at a Level 3.

Routine health surveillance was undertaken and impacts observed in line with the raised temperatures. The observed health impacts over this summer will formally be assessed with results published later this year.

Flooding

PHE are active participants in the coordination and analysis of data from the National study of flooding and health. Outputs from this programme this past year include the article *Secondary stressors are associated with probable psychological morbidity after flooding: a cross-sectional analysis* published in the European Journal of Public Health in December 2017 and the year 2 results paper *The English National Cohort Study of Flooding and Health: the change in the prevalence of psychological morbidity at year 2* published in the BMC Public Health open access peer-reviewed journal in January 2018. In addition, EEHP are currently redeveloping public-facing information materials on flooding and health.

Emerging issues

PHE continue to work with colleagues across government, academia and international partners to identify new and emerging risks, assess the current evidence base and identify gaps in the current knowledge. Two examples of this are the health impacts of drought in England and thunderstorm asthma.

Defra is the lead governmental department for drought risk management, supported by the Environment Agency, which chairs the National Drought group, of which PHE is a member. EEHP are currently developing public facing informational materials on drought and health.

With a severe epidemic asthma event following a thunderstorm in Melbourne, Australia in November 2016, PHE have been working with colleagues to assess if the current syndromic surveillance systems used to routinely monitor observed health impacts is sensitive enough to detect episodes of thunderstorm asthma. This work remains ongoing.

National Adaptation Programme and the Environmental Audit Committee report into heatwaves

Informed by the Climate Change Risk Assessment 2017, PHE have been working with colleagues from the Department of Health and Social Care (DHSC), NHS England and the Sustainable Development Unit to identify high-level health objectives under the auspices of the second National Adaptation Programme (2018 to 2023).

This activity was included in the 2018 remit letter to PHE from DHSC Ministers. The high-level objectives have been agreed across government and published in the report The National Adaptation Programme and the Third Strategy for Climate Adaptation Reporting.

These objectives include:

- development of a single adverse weather and health plan, bringing together and improving existing guidance − this will aim to mainstream action within the health system and local communities reduce health risks associated with adverse weather and address the health risks identified in the second CCRA
- continue to undertake research to understand more comprehensively the health consequences of hot weather and the health interventions available to minimise preventable harm
- update the evidence base on the health impacts of climate change through the production of an UK focused report (‘Health Effects of Climate Change in the UK’) based on the latest Climate Change Projections, following publication of UKCP18

The Parliamentary Environmental Audit Committee (EAC) held an inquiry entitled ‘Heatwaves: Adapting to Climate Change inquiry’. The inquiry aimed to consider risks to health, wellbeing and productivity associated with heatwaves, review the level of UK resilience to them and assess the Government’s actions to date. The Committee also examined the public health risks associated with higher temperatures as well as heatwaves.

PHE contributed to the cross government written evidence on heatwaves. In addition, PHE’s Head of Extreme Events and Health Protection team and the Director of Environmental Public Health supported an evidence gathering session and the Director of Health Protection and Medical Director provided oral evidence.

The EAC inquiry report and recommendations were published on 26 July 2018 and can be found here. The government will respond to the report later in 2018 to which PHE has contributed.

HPRU and research activities

The Health Protection Research Unit (HPRU) in Environmental Change and Health (ECH) is funded by NIHR and includes LSHTM, PHE, University of Exeter, UCL and the Met Office. Its aim is to enable health decision-makers to have the knowledge, foresight and tools to mitigate, adapt to and benefit from environmental change, through research into the impacts of and responses to environmental changes that affect our health.

This HPRU helps PHE to fulfil its requirements under the National Adaptation Programme (2018 to 2023) and other policies on sustainable development, and also produce research of relevance to other government departments such as BEIS, MHCLG, and Defra, regarding the health co-benefits of environmental, housing, planning and energy policies (particularly adaptation to and mitigation of climate change), and the protection of the natural environment.

Topics covered in the HPRU include health and sustainability in urban and built environments, the urban heat island, housing adaptation measures, air pollution episodes, extreme events such as heatwaves and cold spells, flooding and health protection, green and blue spaces, harmful algal blooms, and the relationship between the weather and vector-borne diseases.

Future work in this HPRU will focus on a number of topics related to sustainability and climate change:

- climate resilience, including a better understanding of the impact of flooding on health and health services, contributing to the revision of the National Adaptation Programme (see above) following publication of the CCRA 2017, as well as evaluation of the impacts on cold-related morbidity and mortality of the introduction of PHE Cold Weather Plan for England
- healthy sustainable cities, demonstrating the effects of the built environment on health, including the Urban Heat Island, building retrofit in line with low-carbon strategies, and the impact of building retrofit on building overheating and associated health effects, as well as urban green space − this research also supports the ‘Healthy People Healthy Places’ programme, and informs PHE’s Heatwave and Cold Weather Plans
- public health and the natural environment, including green/blue infrastructure, and climate change and vector borne/infectious disease

Many members of the HPRU in Environmental Change and Health presented at and attended the PHE Public Health Research and Science Conference, held in Warwick in March 2018. This conference supports high quality and innovative science through the sharing of good practice and to help strengthen scientific activity,

with a focus on the application of scientific methods to protect and improve health, including the work of the NIHR HPRUs.

PHE members presented their research on heat-health relationships across the UK, the Urban Heat Island and potential interventions in the built environment that may mitigate the Urban Heat Island and also reduce indoor temperatures, as well as the mental health impacts of high temperature, flooding and health protection, and climate and infectious diseases.

Management and governance

The importance of delivering our sustainable development goals is a common thread throughout the whole of Public Health England and all of our staff have a responsibility for realising the opportunities that they can offer.

This commitment to PHE's sustainability aspirations, obligations and legal requirements is laid out in PHE's Sustainable Development Management plan. This enables the organisation to demonstrate true leadership and highlights the ambition to be an exemplar organisation with regard to sustainability in the health sector.

Operational delivery of the sustainable development agenda was originally devolved from PHE's Management Committee to the Sustainable Development and Climate Change Programme Board, which monitored progress on the implementation of related objectives and targets.

In 2018, PHE's Management Committee agreed to the formation of a new group which will now report directly to the top tier of management in the organisation. This gives a direct line of sight to executive directors, and the Chief Executive, for all sustainability activities in the organisation.

Sustainable Development has implications for all aspects of PHE's business. The organisation's various senior management teams therefore have a responsibility to implement the requirements of the Sustainable Development Management Plan through local business plans. Doing so will enable PHE to measure performance, help achieve a better understanding of our impact on the environment and to prioritise medium and longer term activities. It will also help to refine and target advice to others on matters such as climate change and the United Nations Office in Geneva's Sustainable Development Goals and strengthen the ways in which the organisation works across the healthcare spectrum, particularly with organisations such as the NHS Sustainable Development Unit.

Contributors to the year's report

The authors would like to personally thank the contributors below for their help on bringing this report to life:

Natalie Glover	Operations Directorate and Regional lead
Brigitte Guile	Sustainability Manager, PHE Colindale
Agnes Jung	Emergency Preparedness Manager, London
Elizabeth Liversage	Head of Procurement Services
Lisa Reynolds	Senior Business Manager, PHE Porton
Aimee Stimpson	National lead for Healthy Places
Ross Thompson	Environmental Hazards and Emergencies Department
John Thornes	Principal Climate Change Scientist
Derek Walter	Sustainability Manager, PHE Porton
Sarah Webb	Regional Lead for EPRR, Midlands and East England