Public Health England

Protecting and improving the nation's health

Sustainability in Public Health England 2017

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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.

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PHE supports the UN
Sustainable Development Goals

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Foreword

I am very pleased to introduce PHE's fourth yearly report on sustainability, describing the work that PHE has undertaken over the last year.

We continue to make gains in reducing our carbon impact across the PHE estate, with a number of projects helping to reduce our utility usage. There has been a large introduction of photo voltaic cells over the last year, at our three largest sites; reducing our energy usage derived from fossil fuels at these specific sites.

Our business travel has risen slightly over the last year and continues to be an area where we need to focus our attention; to address this we have upgraded our videoconferencing facilities across the estate and have rolled out Skype for business. This technology, which is available to all staff, is having an effect on decision making about how we conduct our business and will help reduce our need to travel for face-to-face meetings.

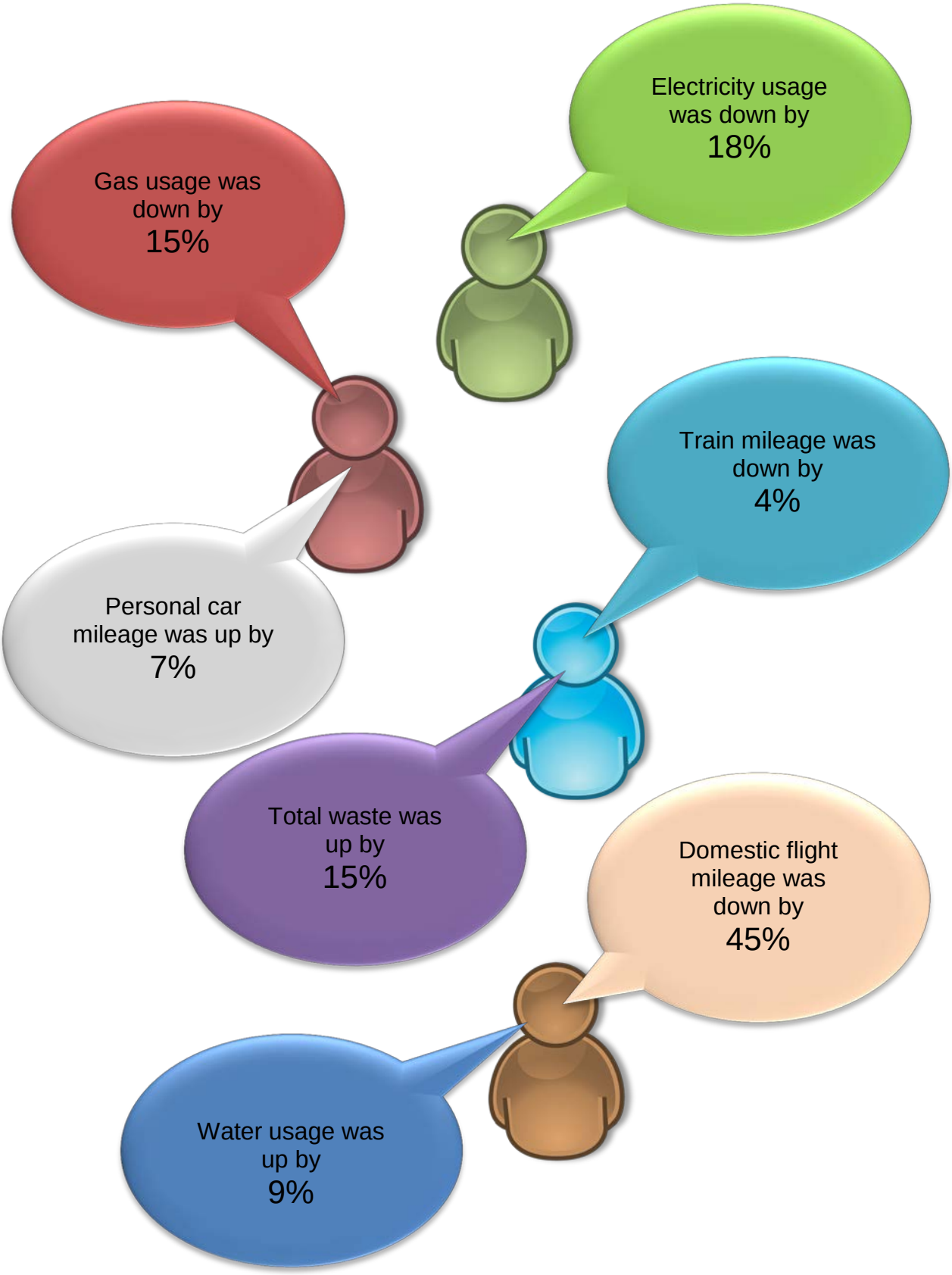
When we must travel on business, we will use public transport wherever possible, rather than our own cars. We continue to encourage staff to cycle and walk to work, whenever they can, through a number of health and wellbeing initiatives. This work helps staff understand the associated health benefits that this activity can bring.

Our work continues to add to the scientific evidence on the health impacts of climate change and extreme events, providing useful data for local and national government. Providing local authorities with data on how to improve their housing stock so that it can be retrofitted to make it warmer in the winter months and cooler in summer is just one aspect of this work. This work is known to have helped save lives, providing vital health advice to those who are most in need. We also continue to advise other countries on the health impacts of devastating natural disasters.

We have reviewed and revised our Sustainable Development Management Plan and all of our environmental policies in the last year. We also have an active sustainable development communication programme, with a number of guidance documents written to help improve the sustainability of PHE and the wider health system.

Professor Paul Cosford CB
PHE executive lead for sustainability

Highlights of PHE's utility and travel usage



Executive summary

This is PHE's fourth year of operation and sustainability has continued to be an important part of our work. Our recently revised Sustainable Development Management Plan continues to help embed sustainability into the organisation's activities and will further develop over time.

We believe it is important to lead by example and this report gives an in-depth analysis of our carbon footprint – particularly in relation to the use of energy and water, the production and management of waste and the business travel we undertake. It also highlights the progress we are making on sustainability internally, with some of our partner organisations, and by some of our specialist teams.

In line with the government's estates strategy, PHE continues with the consolidation of its estate. This consolidation strategy has contributed to reducing our overall carbon emissions; with this, we will no longer be reporting data relating to the carbon footprint of Porton Biopharma Limited (PBL). In the past these data were included in PHE's reporting, but as PBL is a separate legal entity, it is in no longer appropriate to include its carbon emissions in PHE's footprint. This has inevitably led to a reduction in PHE's carbon footprint, but this reflects a reporting change and is not a true reduction in total emissions from the Department of Health and Social Care-owned site at Porton. PBL contribute approximately 7% of the total carbon emissions at the Porton site.

PHE's total carbon emissions for 2016/17, inclusive of business travel and water usage, were 18,816 tCO_2e. This compares to 24,963 tCO_2e for 2015/16, and 26,274 tCO_2e for 2013/14, and it represents a reduction of 25% on the previous year, and a 28% reduction on our baseline year overall. Allowing for the impact of separating out emissions due to PBL at our Porton site, this equates to a true reduction of 19% and 23% respectively.

PHE's carbon footprint comprises scope one, two and three 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). We have continued to invest in reducing our use of fossil fuels as a source of energy and the installation of photovoltaic cells at our two largest sites, Porton and Colindale has helped reduce our carbon emissions by 307 tCO_2e.

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. Our interactive dashboard, which allows members of staff to access quarterly sustainability data for business travel, utility usage (electricity, gas and water), total waste produced

and data on sustainability training, continues to be a success. This has been very effective in keeping staff informed about our carbon emissions, and the associated financial cost to the organisation.

The reportable usage of water for the whole estate was 124,187 m^3, with a further estimated 17,478 m^3 being used by our non-reportable sites. For our reportable sites, this represents an 8.63% increase in consumption from last year although overall, there has been a 29.4% reduction compared to our baseline year. However, 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. PHE's total waste figure for 2016/17 was 850 tonnes, a 2.3% increase in total waste compared with 2015/16 although overall it represents an 8.6% decrease on the baseline figure.

A number of initiatives have been introduced to reduce waste at all PHE locations, covering both offices and laboratories. 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 23 tonnes over the year. This is a 4% 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 and the majority of such waste was sent for incineration in compliance with government guidelines. Various controls have been put in place to manage this and we have reduced the hazardous waste sent to landfill in 2016/17 by 15 tonnes compared with 2015/16 and by 8 tonnes compared with the baseline year.

We continue to work with our contractor 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 last financial year.

In 2016/17, PHE used 21,439 reams of A4 paper, a reduction of 19% 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 overall reduction in both domestic and international flights. In part we believe this was

due to PHE's response to the Ebola crisis in West Africa being wound down. There was also a reduction in emissions due to the use of taxis. We have encouraged staff to use more carbon friendly means of travel and train use has increased, but there has been an increase in the use of personal cars and we recognise we have more to do in this area.

We therefore accept that our members of staff sometimes need to travel to deliver the business objectives of the organisation. However, staff are encouraged to travel only when necessary and, when they must travel, to use the most sustainable modes of transport. Despite this, there was a small increase in business travel overall during 2016/17.

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. A lot of work has been undertaken by PHE on the health effects of air pollution, (especially 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 of our tender documents contain relevant questions to confirm that the successful suppliers adhere to appropriate environmental and sustainability standards.

To help staff understand their obligations concerning sustainability and the importance of reducing our carbon impact, we continue to promote our sustainability e-learning training course. This training is mandatory, with a refresh every three years. In the last year, 1,309 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 walking or cycling), eating carbon-intensive processed foods and 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; from the way we do business, through our role in co-ordinating science, contributing to policy, and through advocacy:

- by reducing risks and vulnerability (eg extreme events and disaster reduction, improved air quality, safer roads, reduced emissions, smarter ways of preventing the preventable)
- by improving resilience and developing sustainable assets (eg education, good housing, life-enhancing public spaces, empowered communities and people, vibrant cultures)
- by ensuring safe, sustainable, and resilient public health and care services (eg 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 progress with clearer and well-monitored corporate sustainability policies, all of which have been reviewed and revised this year. Members of 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.

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

PHE continues to embed sustainability into its contracts helping to highlight risks arising from our procurement activities. PHE also continues 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 last 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.

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, which is 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 2016/17, several capital projects were undertaken to help us meet our reduction targets and where possible exceed them.

In line with the government's estates strategy, PHE continues with the consolidation of its estate. This consolidation strategy has contributed to reducing our overall carbon emissions burden. In addition, PBL will no longer be reported upon by PHE; PBL is responsible for some 7% of Porton's emissions and is reporting its carbon emissions independently to PHE.

This figure includes the carbon emissions from business travel as well as water usage from PHE's reportable and non-reportable sites. (Non-reportable sites are those offices or laboratories that are being reported separately by the premises' landlord.)

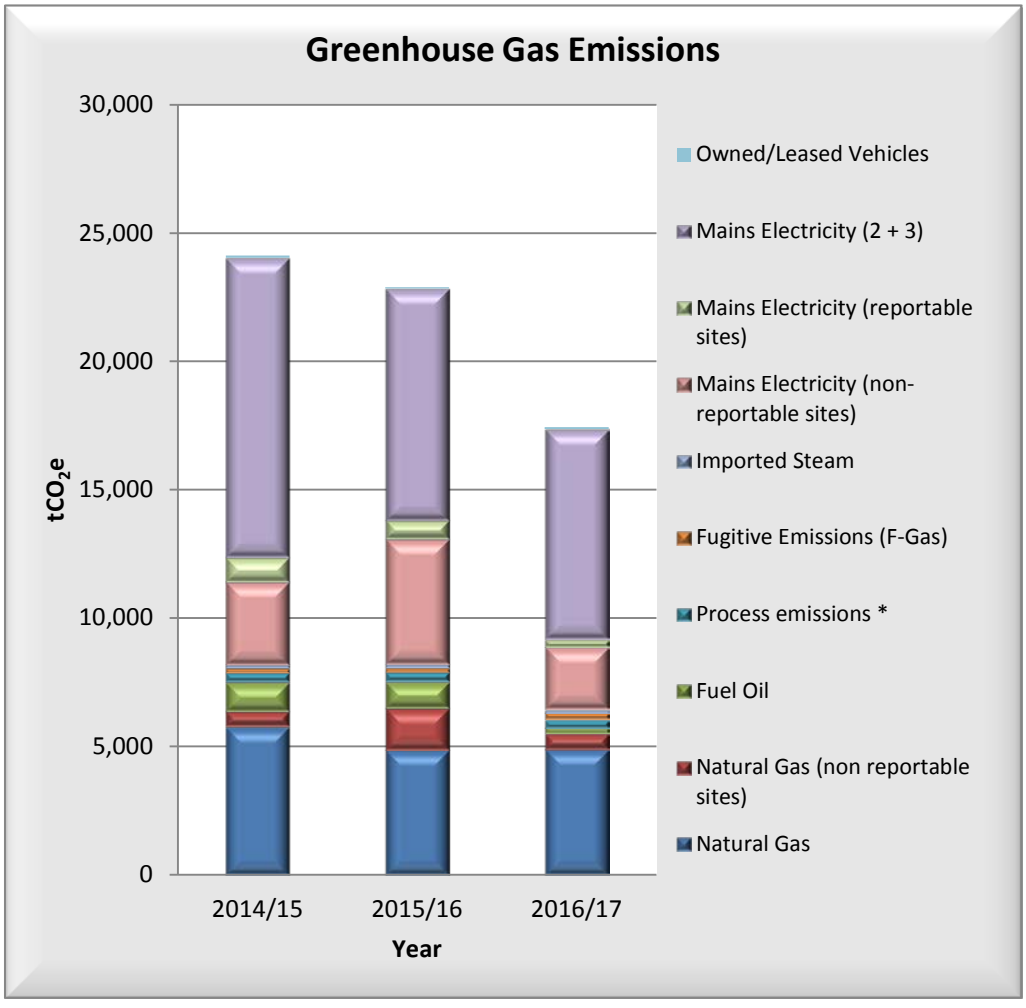
PHE owns six of its premises and has a direct relationship with the utility provider at a further one. It also has shared facilities embedded in government-owned property (including hospitals) and in other tenanted accommodation. There is no direct relationship with the utility provider in these premises 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.

GGC reporting requires PHE to report its scope one, two and three 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.



* Process emissions from Porton Incinerator Waste

GREENHOUSE GAS EMISSIONS		2014/15	2015/16	2016/17
SCOPE 1 + 2				
Non-financial indicators (tCO_2)	Natural gas	5,757	4,873	4,896
	Natural gas (non-reportable sites)*	603	1,572	623
	Fuel oil**	1,131	1,026	230
	Process emissions***	362	365	319
	Fugitive emissions (F-Gas)	192	184	259
	Imported steam	140	150	135
	Mains electricity (non-reportable sites)*	3,215	5,503	2,426
	Mains electricity (reportable sites)	966	544	304
	Mains electricity (green tariff) (2 + 3)	11,670	9,028	8,173
	Owned/leased vehicles	88	58	68
Renewable Electricity tCO_2				307
Related energy consumption (kWh)	Natural gas	31,122,541	26,418,276	26,609,714
	Natural gas (non-reportable sites)*	3,301,240	8,811,147	3,384,729
	Fuel oil**	5,758,424	1,328,909	831,506
	Process emissions***	1,967,390	1,983,696	1,733,696
	Imported steam	756,667	812,223	736,233
	Electricity (non-reportable sites)*	5,768,624	10,663,221	5,398,338
	Electricity (reportable sites non green tariff)	2,010,903	1,086,342	676,416
	Electricity (green tariff)	21,712,905	18,043,598	18,190,192
Renewable Electricity kWh				684,097
Related consumption (kg) Fugitive emissions (F-Gas)		192,424	184.186	98330
Related Scope 1 travel (km) Owned/leased vehicles		442,976	301,851	352,791
Financial indicators (£)	Natural gas	1,332,346	1,043,937	616,520
	Fuel oil**	305,699	63,309	48,380
	Owned/lease vehicles (fuel/i-expenses)	18,271	19,923	17,130
	Fugitive emissions (F-Gas)****	2,669	58,407	58,320
	Imported steam	51,057	17,115	18,920
	Mains electricity (reportable)	2,642,677	1,986,886	1,970,817
	Renewable Electricity saving			66,069
Total Emissions Scope 1 + 2 (tCO_2)		**20,305**	**16,225**	**14,385**
Total gross emissions from non-reportable sites Scope 1 + 2 (tCO_2)		**3,818**	**7,122**	**3,048**
Renewable Energy (tCO_2)		**0**	**0**	**307**

* Other reportable sites are those that we occupy and pay directly to the utility provider for services
** Fuel oil only calculated for reportable sites
*** Process emissions from the Porton incinerator waste (kWh x 0.184 conversion factor)
**** F-Gas costs from PHE's major owned sites are absorbed as part of the service contract

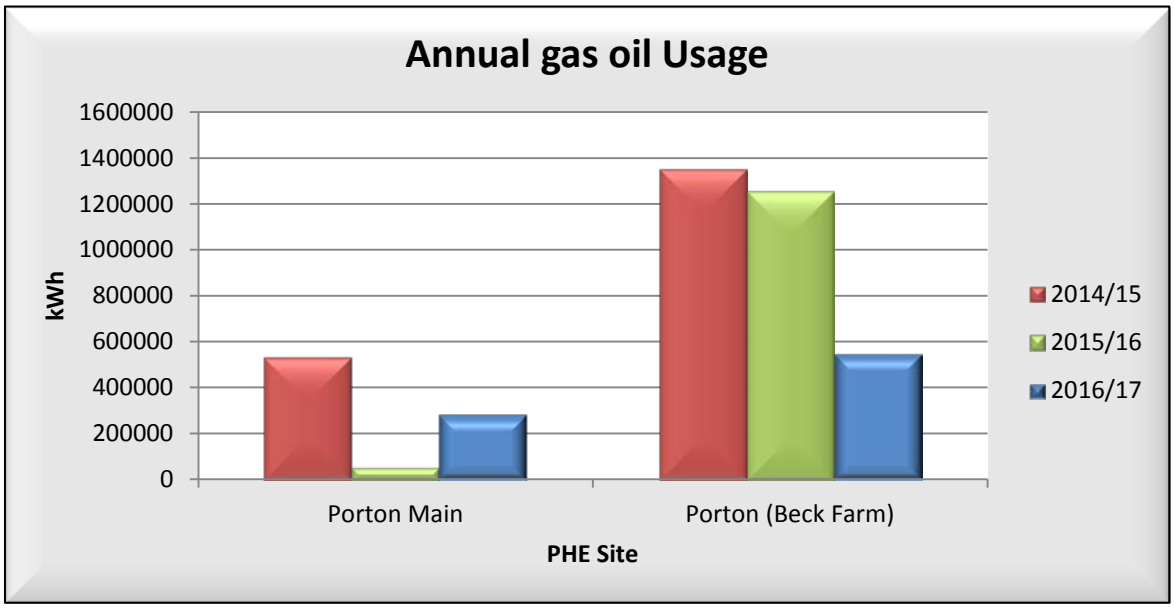
Energy consumption

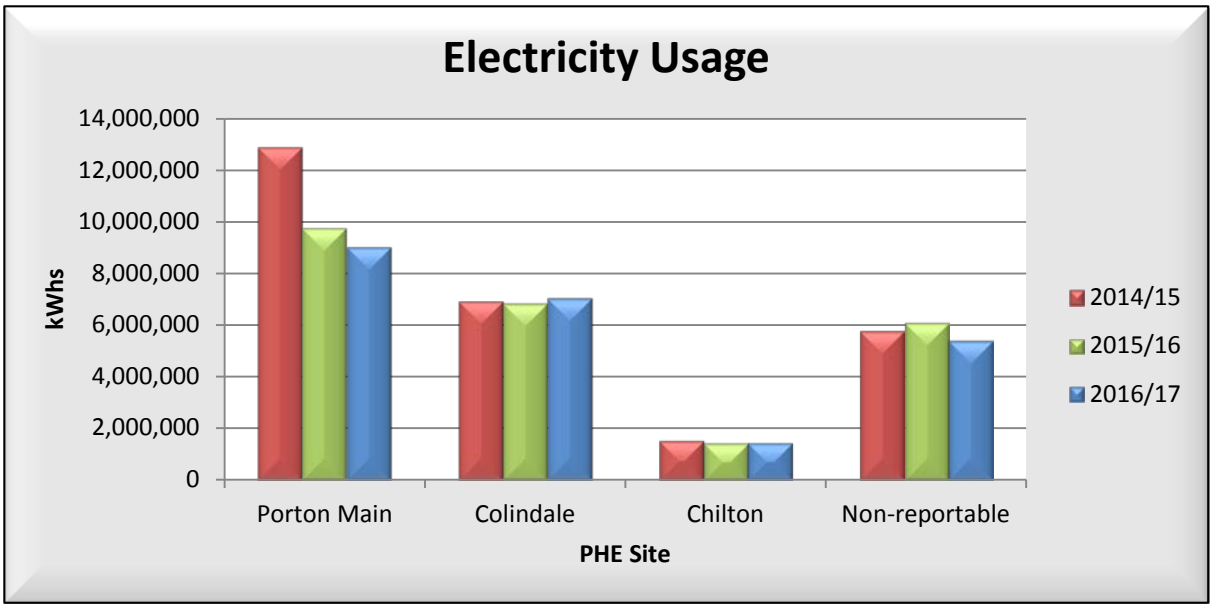
PHE's energy consumption for 2016/17 for our reportable and non-reportable estate is given below.

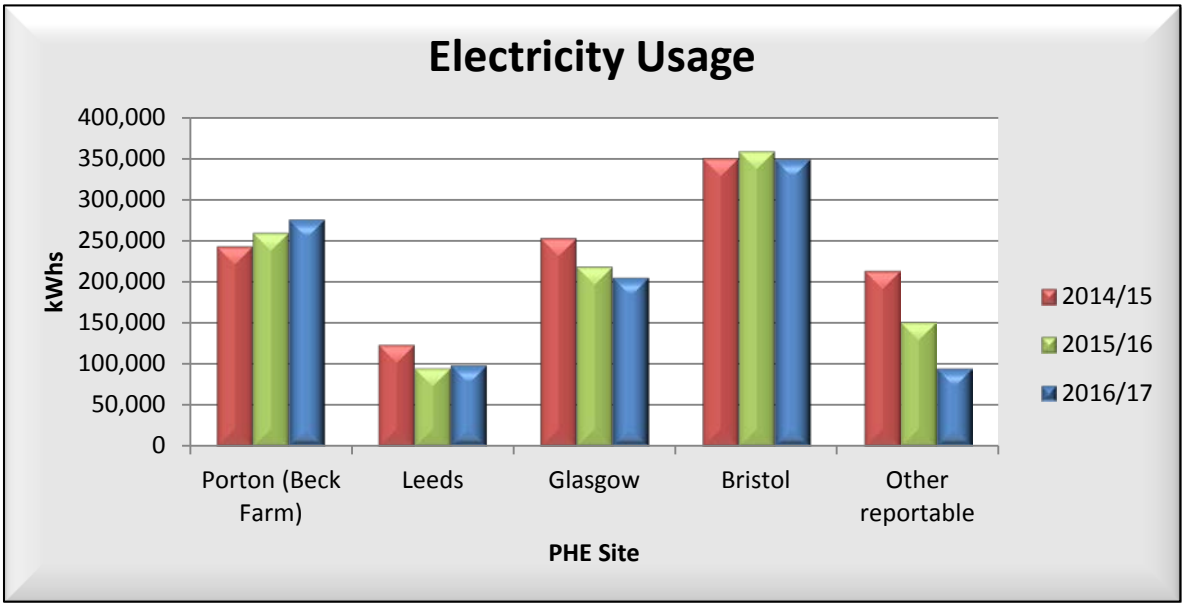
kWh's	Electricity	Natural gas	Gas oil
Porton Main**	9,012,796	18,197,017	283,998
Porton (Beck Farm)	276,100	0	546,853
Colindale**	7,042,035	6,280,664	0
Chilton	1,451,264	1,949,610	655
Leeds	99,416	149,051	0
Glasgow	205,598	309,364	0
Bristol	304,897	0	0
Other reportable*	95,302	5,016	0
Non-reportable	5,398,338	3,384,729	0
Total	**24,569,843**	**29,994,443**	**831,506**

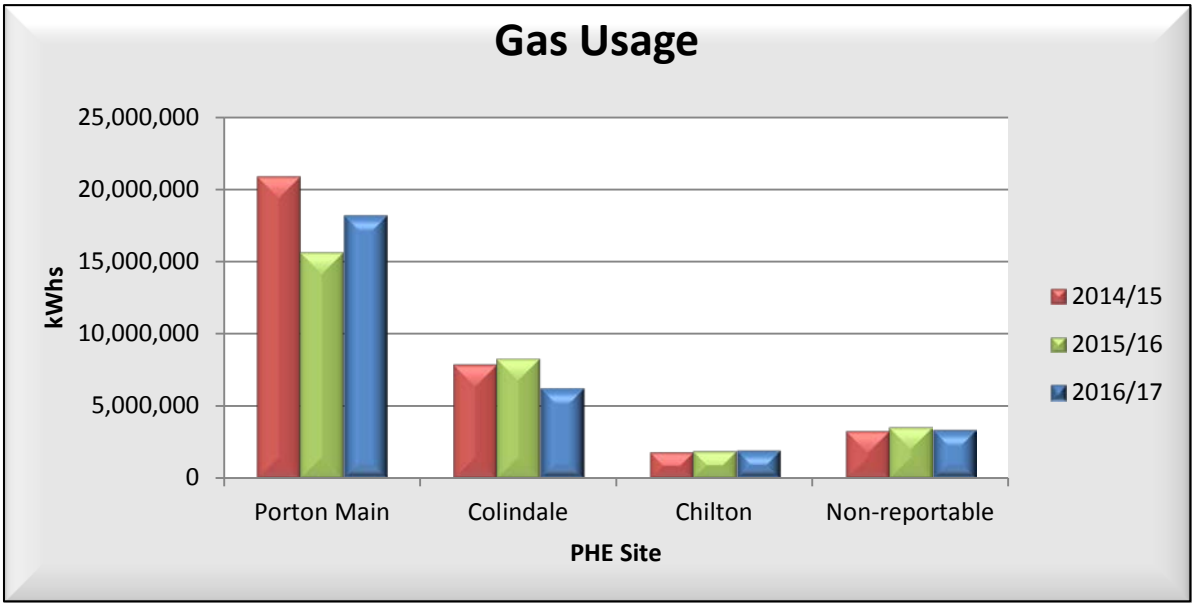
* Other reportable sites are those that we occupy and pay directly to the utility provider for services
**Electricity generated from their photovoltaic equipment has been taken away from the total usage figure.

The following graphs illustrate utility usage over the last three 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
400,000
350,000
300,000
250,000
200,000
150,000
100,000
50,000
0
kWhs
Porton (Beck Farm)
Leeds
Glasgow
Bristol
Other reportable
PHE Site
2014/15
2015/16
2016/17


Gas Usage
25,000,000
20,000,000
15,000,000
10,000,000
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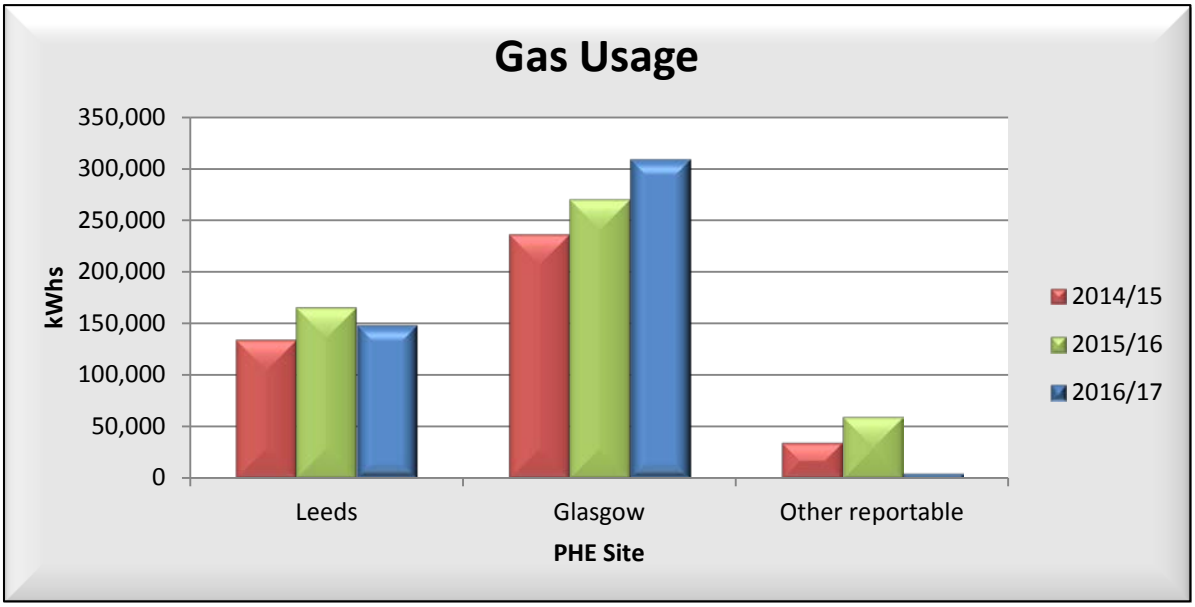
kWhs
Porton Main
Colindale
Chilton
Non-reportable
PHE Site
2014/15
2015/16
2016/17


Gas Usage
350,000
300,000
250,000
200,000
150,000
100,000
50,000
0
kWhs
Leeds
Glasgow
Other reportable
PHE Site
2014/15
2015/16
2016/17

Carbon emissions: Chief Operating Officer directorate

		Porton (Main)	Porton Building 1	Beck Farm	Colindale	Bristol	Other**	Wellington House	Total
Emissions type	**Emissions source**	**tCO_2e**	**tCO_2e**	**tCO_2e**	**tCO2e**	**tCO2e**	**tCO_2e**	**tCO_2e**	**tCO_2e**
Emissions from our properties and the operations carried out therein	Natural gas	3348.00	7.30	0.00	1156.00	0.00	453.00	61.30	5025.60
	Gas oil	78.50	0.00	151.00	0.00	0.00	0.00	0.00	229.50
	Emissions from electricity use	4313.00	155.00	124.00	3209.00	180.00	1704.00	195.20	9880.20
	Emissions from import of heat or steam	0.00	0.00	0.00	0.00	150.00	0.00	0.00	150.00
	Process emissions (refrigeration)	50.09	0.00	0.00	207.49	0.00	0.00	0.00	257.58
	Water supply	23.20	0.40	0.50	14.00	0.44	3.56	0.49	42.59
	Water (waste)*	51.20	0.80	0.90	27.30	0.87	8.53	0.95	90.55
	Sub total	**7863.99**	**163.50**	**276.40**	**4613.79**	**331.31**	**2169.09**	**257.94**	**15676.02**

*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: Chief Knowledge Officer and Health and Wellbeing directorates

		Chief Knowledge Officer				Health and Wellbeing		
		Oxford	Blenheim House	Other**	Total	Skipton House	Other	Total
Emissions type	**Emissions source**	**tCO_2e**	**tCO_2e**	**tCO_2e**	**tCO_2e**	**tCO_2e**	**tCO_2e**	**tCO_2e**
Emissions from our properties and the operations carried out therein	Natural gas	0.00	46.10	25.09	71.19	41.50	21.99	63.49
	Gas oil	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Emissions from electricity use	14.48	89.00	80.80	184.28	346.60	70.85	417.45
	Emissions from import of heat or steam	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Process emissions (refrigeration)	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Water supply	0.07	0.50	0.17	0.74	0.80	0.17	0.97
	Water (Waste)*	0.15	0.40	0.39	0.93	1.50	0.83	2.33
	Sub total	**14.69**	**136.00**	**106.45**	**257.14**	**390.40**	**93.84**	**484.24**

*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 and 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	358.70	56.9	27.40	5.27	396.57
	Gas oil	0.10	0.00	0.00	0.00	0.10
	Emissions from electricity use	652.10	92.40	44.70	16.97	806.17
	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	**1015.80**	**149.60**	**72.60**	**22.32**	**1208.62**

*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 government's Greening Government initiative. The reportable usage of water for the whole estate was 124,187 m^3, with a further estimated 17,478 m^3 being used by our non-reportable sites. For our reportable sites, this represents an 8.63% increase in consumption from last year, although overall it is still a 29.40% reduction compared to our baseline year. The increase, in part, was due to a water leak that we had at one of our major sitesch; unfortunately the leak was not identified for some time and is therefore reflected in the figures.

Water		2014/15	2015/16	2016/17
SCOPE 3 (Water)				
Non-financial indicators (m^3)	Water from office estate (reportable)*	572	538	262
	Water from whole estate (reportable) [excluding office estate]	177,528	113,780	123,925
	Total for reportable estate (m^3)	178,100	114,318	124,187
	Water from office estate (non-reportable)	8,431	9,556	10,389
	Water from whole estate (non-reportable) [excluding office estate]	17,067	86,080	7,089
	Total for non-reportable estate (m^3)	25,498	95,636	17,478
Financial indicators (£)	Water supply costs	164,156	107,190	132,714

* Estimated usage from our six reportable sites

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

Water consumption on our owned estate is illustrated below.

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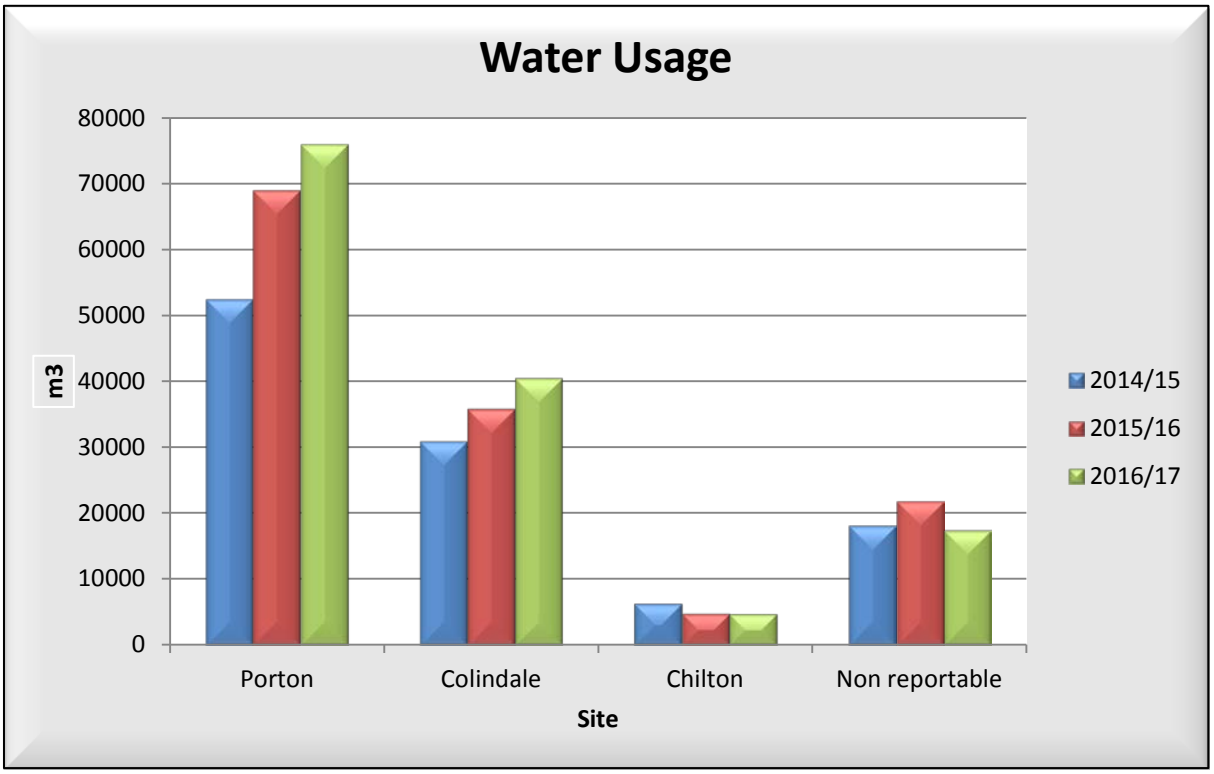
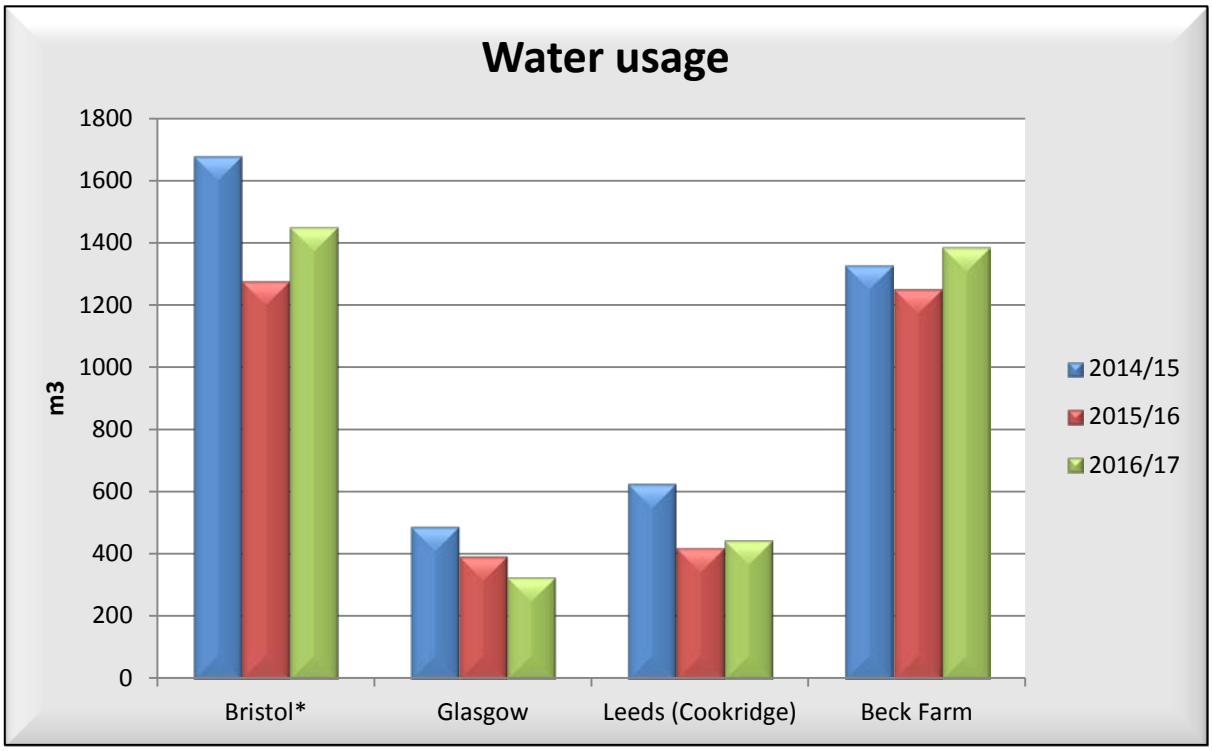


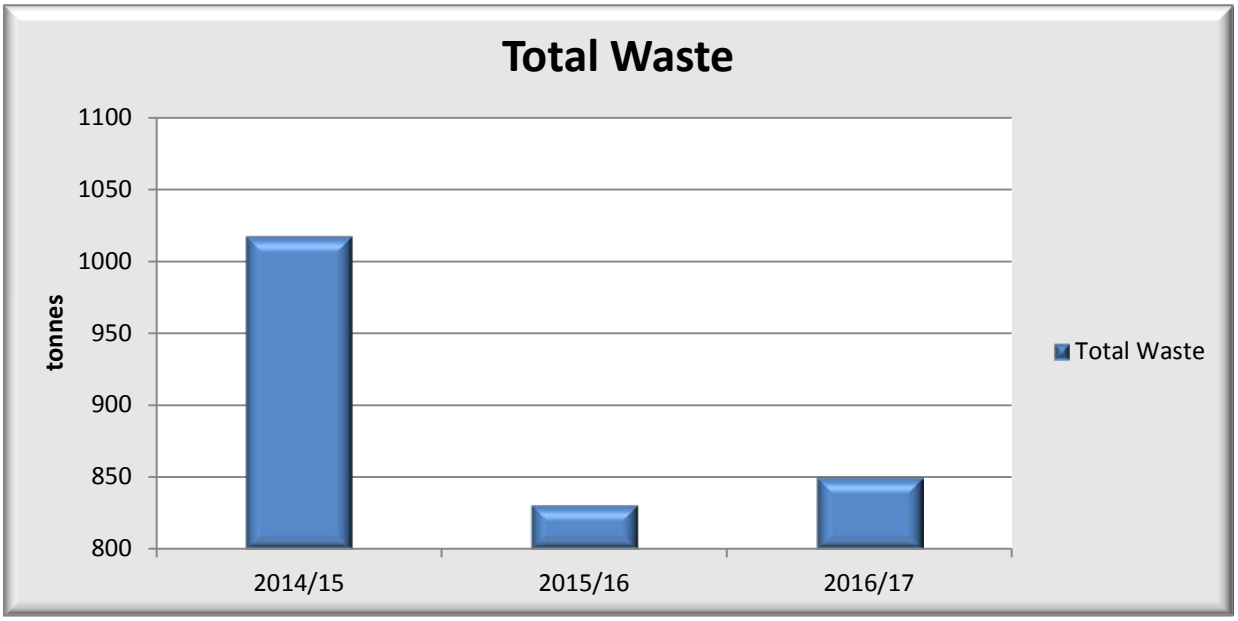


*Estimated usage.

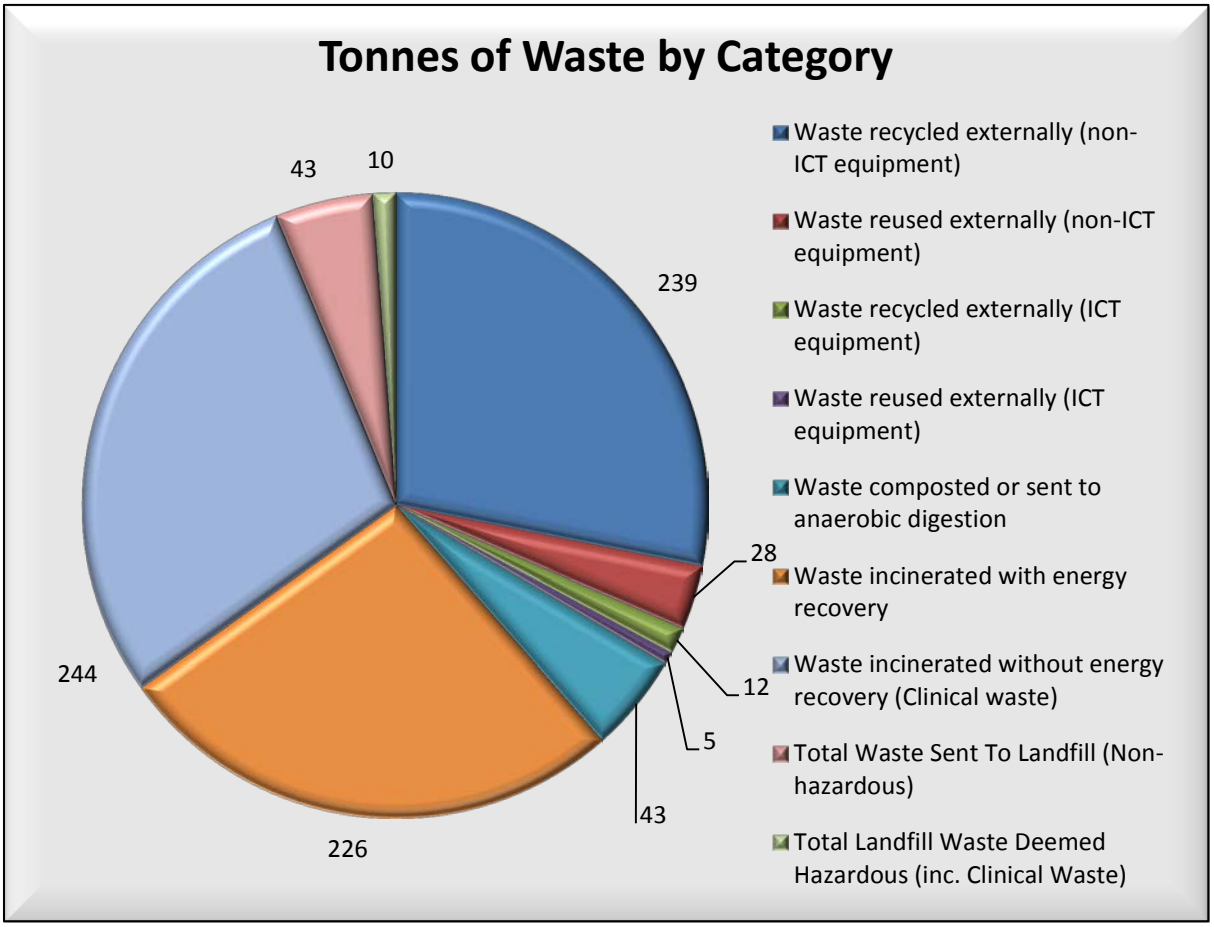
Waste

PHE has set a total waste reduction target of 2% annually to March 2020, in line with the Greening Government initiative. Analysis indicates that PHE's total waste figure for 2016/17 was 850 tonnes, a 2.3% increase in total waste compared with 2015/16, although overall it is still an 8.59% reduction compared to the baseline figure.

	2014/15	2015/16	2016/17
	tonnes	tonnes	tonnes
Waste recycled externally (non-ICT equipment)	331	243	239
Waste reused externally (non-ICT equipment)	4	6	28
Waste recycled externally (ICT equipment)	21	7	12
Waste reused externally (ICT equipment)	17	6	5
Waste composted or sent to anaerobic digestion	34	31	43
Waste incinerated with energy recovery	225	178	226
Waste incinerated without energy recovery (Clinical waste)	314	293	244
TOTAL ICT WASTE	38	13	17
Total waste not sent to landfill	937	764	797
Total waste sent to landfill (non-hazardous)	47	41	43
Total landfill waste deemed hazardous (inc. clinical waste)	36	31	10
Total waste	**1018**	**831**	**850**



A number of initiatives have been introduced to reduce waste at all PHE locations, though due to some refurbishment work being undertaken at our main sites and the closure of one of our laboratories, there was a slight increase in the 2016/17 total waste figure.



PHE continues with its policy of reducing the amount of waste it sends to landfill; it is therefore very unfortunate to see a slight rise in this waste stream in the last year, this is believed to have risen due to the closure of one of our laboratories.

We continue to incinerate, the majority of our waste. The majority of this waste has energy recovery as a bi-product of this process, with the minority having no energy recovery.

We have reduced the hazardous waste (incinerator ash) we sent to landfill last year by 15 tonnes, compared to the previous year and by 8 tonnes compared with the baseline year.

We saw a 7% increase in the amount of waste, that is not ICT, being sent offsite for recycling or reuse.

A total of 17 tonnes of ICT waste was produced last year with some 61% being recycled and the other 39% being reused by CDL, our ICT waste contractor.

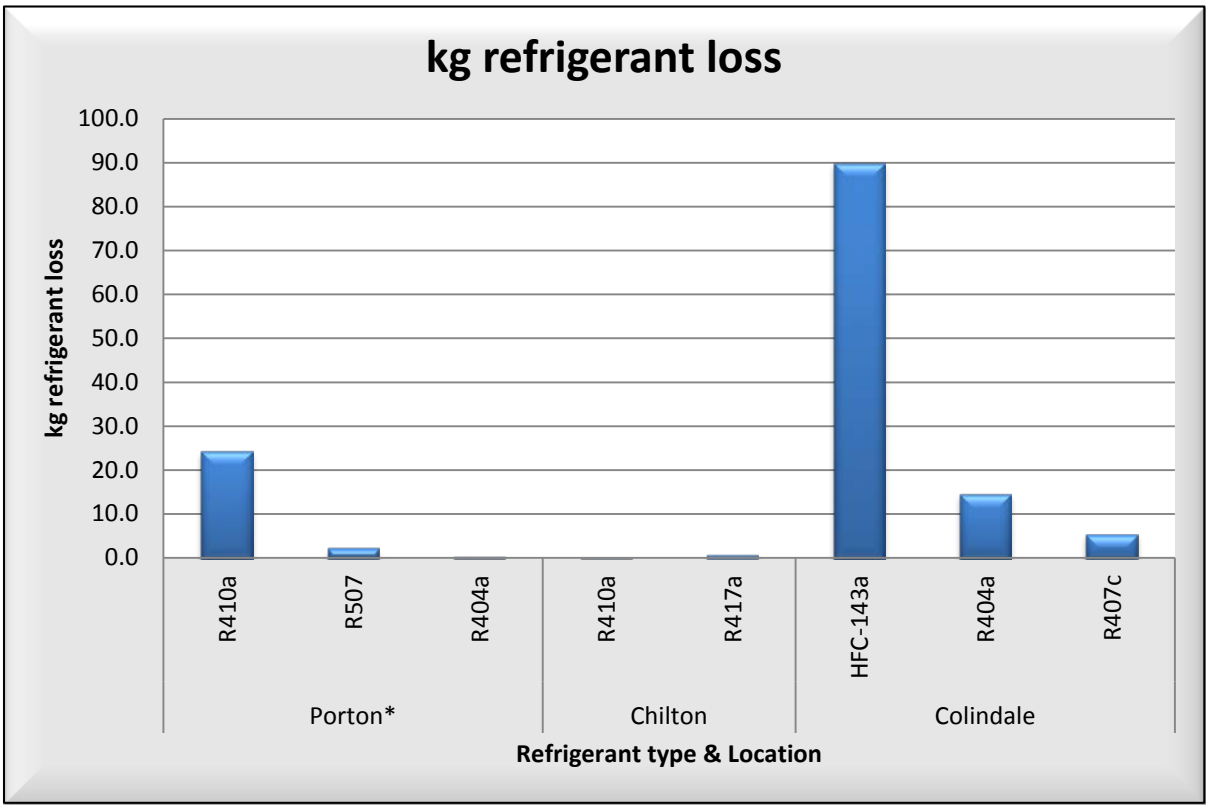
Refrigerant losses

The losses of refrigerant on PHE's estate, with the associated carbon emissions, are illustrated below. It should be noted that, currently, it is very difficult to separate out the reporting areas of the Porton site, therefore PBL is included.

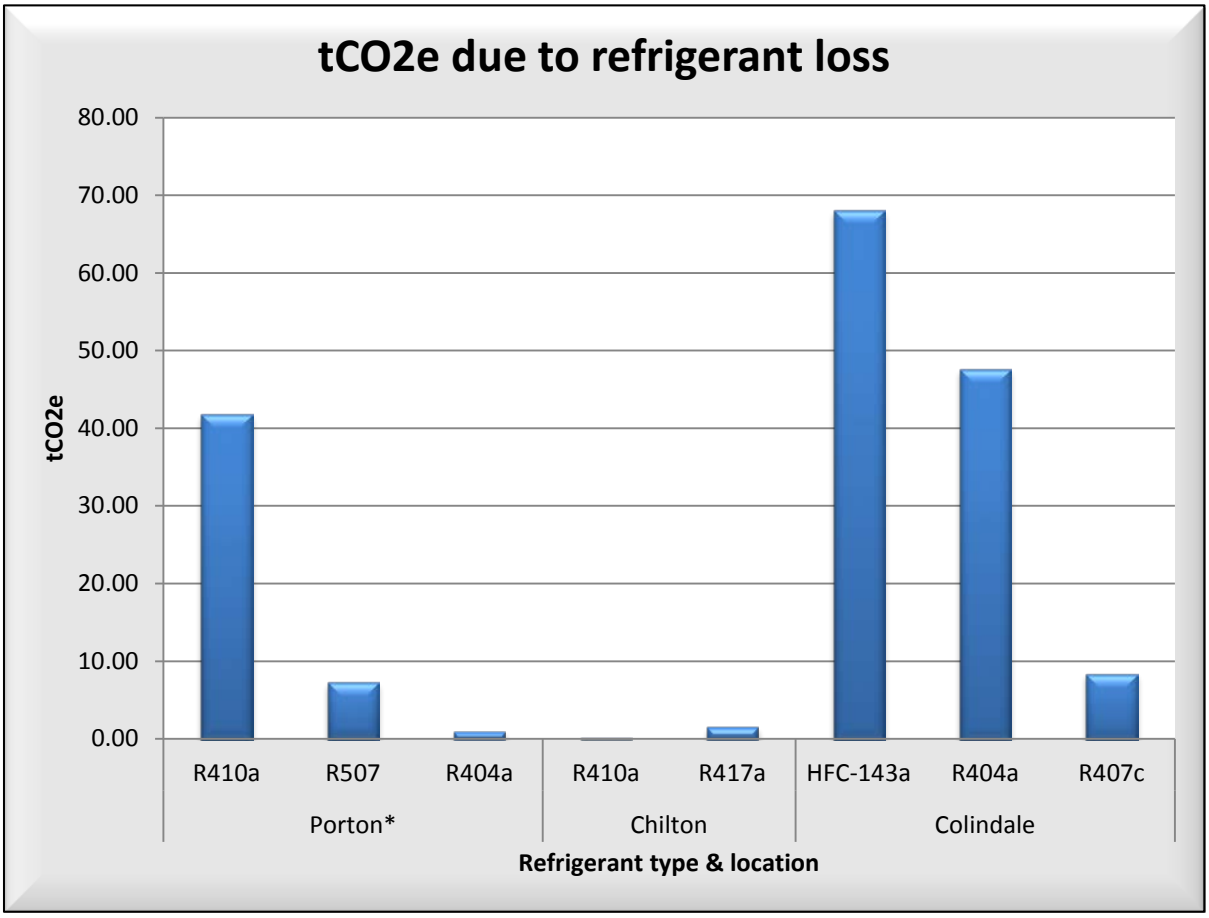
Facility / source description	Type of Refrigerant	Refrigerant Loss	GWP of refrigerant	CO_2 emissions
		kg	CO_2e	tonnes CO_2
Porton*	R410a	24.3	1,725	41.85
	R507	2.2	3,300	7.26
	R404a	0.3	3,260	0.98
Chilton	R410a	0.1	1,725	0.17
	R417a	0.8	1,938	1.55
Colindale	HFC-143a	90.0	756	68.04
	R404a	14.6	3,260	47.60
	R407c	5.5	1,526	8.39

*data for the whole of the Porton site (including PBL)

Due to the global warming potential (GWP) of each specific gas emitted, the carbon equivalent of each kg of gas emitted is significantly higher. As less harmful CFC equivalents come on to the market these are being taken up across industry.



There is a legal requirement to monitor and measure the amount of refrigerants (F-gases) that are lost to 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 the Department of Health and Social Care as part of PHE's GGC return.



Paper usage

PHE continues to have an active programme to reduce paper usage, in line with government targets. We are pleased to report that 89% of paper used by PHE in 2016/17 comprised of recycled paper.

In 2016/17, PHE used 21,439 reams of A4 paper, 244 reams of A3 paper and 98 reams of A5 paper – A3 and A4 usage reduced by some 19% and 32% respectively, with A5 increasing by 15%, compared with the previous year. PHE's paper usage is summarised below, demonstrating a continuing downwards trend with a 25% reduction in A4 paper usage from our baseline year.

	Ream		
Year	**A5**	**A4**	**A3**
2014/15	180	27,097	479
2015/16	85	26,353	359
2016/17	98	21,439	244
Change	+15%	-19%	-32%

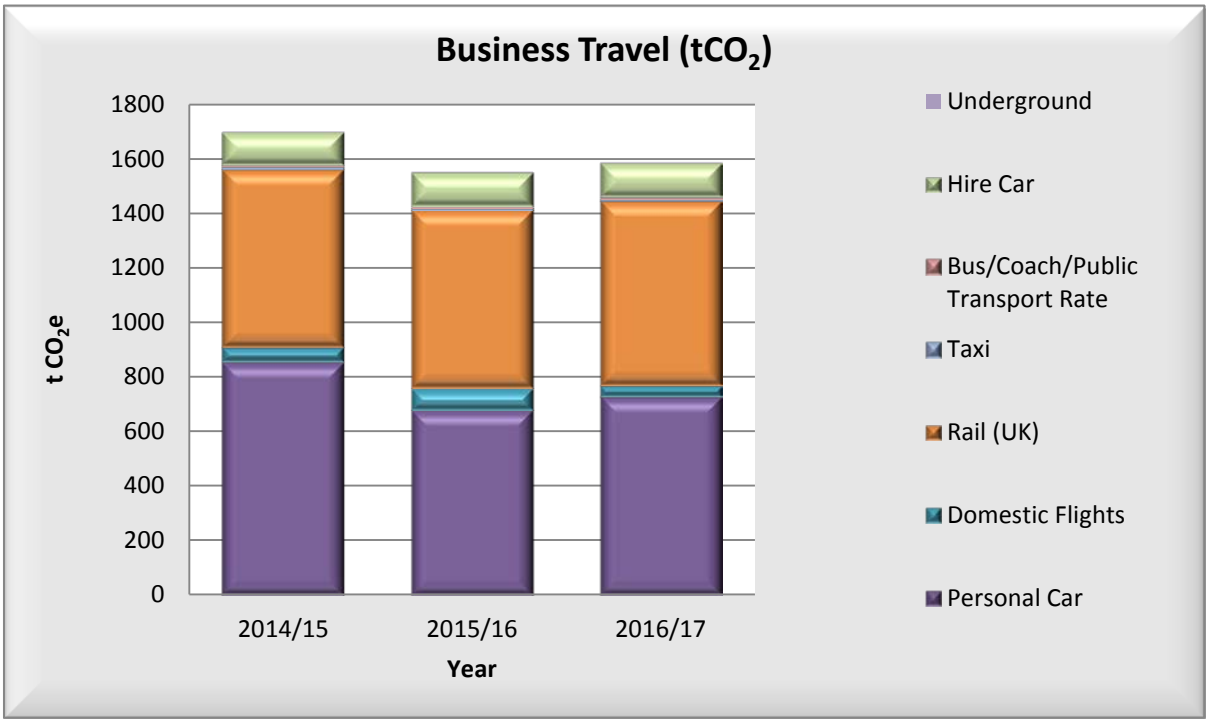
The move to multi-function devices for printing continues across the business and 'follow me' printing is being introduced on an increasing number of our sites. This reduces waste, ensuring printing only occurs when needed. Paper usage is being further reduced through improved signage and messages about minimising printing wherever possible.

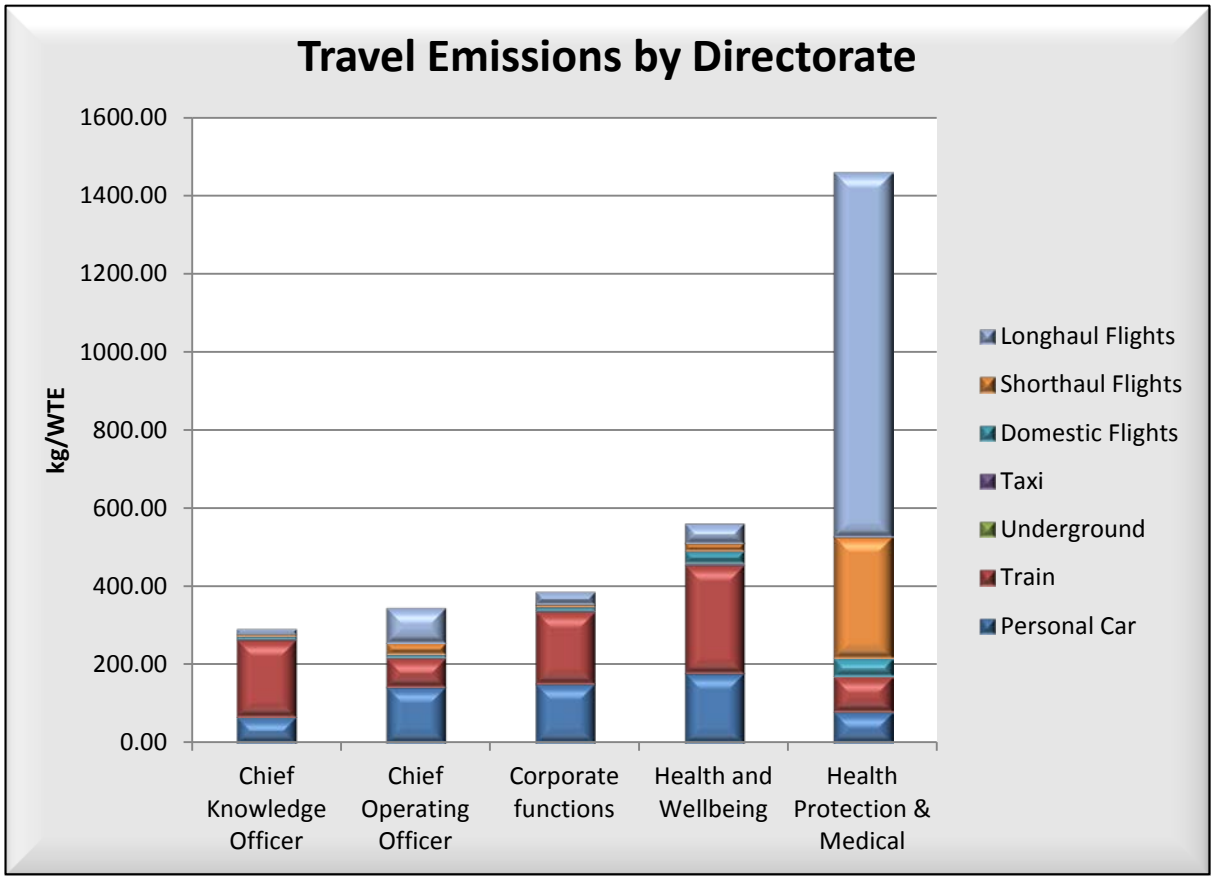
Our travel footprint

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. However, to meet our travel commitments, members of staff are encouraged to travel only when necessary and, when they must travel, to use the most sustainable modes of transport. Despite this, business travel rose by 2% during 2016/17, although there was however a significant reduction in the number of staff flying both domestically and internationally last year, this was due in part to PHE's response to the Ebola crisis in West Africa, being wound down.

A breakdown of the impact of the various types of business travel is given below.





The chart above summarises the carbon emissions per WTE, from business travel, undertaken by each PHE directorate. Operational requirements abroad, undertaken by the Health Protection and Medical directorate, facilitate its staff to travel extensively oversees, as illustrated above, and explained in more detail in the following paragraphs.

SCOPE 3 Business travel		2014/15	2015/16	2016/17
Non-financial indicators (tCO2)				
	Personal car/regular user	854	678	727
	Domestic flights	56	83	42
	Rail (UK)	652	653	677
	Taxi*	10	8	7
	Bus/coach/public transport Rate*	7	7	8
	Hire car	121	125	125
	Underground*	1.01	0.88	1
	Total	**1,702**	**1,554**	**1,589**
Related Scope 3 travel (km)				
	Personal car/regular user	4,510,395	3,637,801	3,890,555
	Domestic flights	361,677	524,039	288,386
	Rail (UK)	13,759,549	14,460,906	13,867,076
	Taxi	55,507	50,468	45,943
	Bus/coach/public transport Rate	65,791	72,150	83,213
	Hire car	640,602	668,295	668,882
	Underground	16,063	15,672	15,183
	Total	**19,409,584**	**19,429,331**	**18,859,238**
Financial Indicators (£)				
	Personal car/regular user	1,264,866	1,028,793	1,101,425
	Domestic flights	75,084	92,970	55,376
	Rail (UK)	3,705,995	3,882,894	3,692,035
	Taxi	123,353	112,143	102,096
	Bus/coach/public transport Rate	17,552	33,986	32,608
	Hire car	88,216	102,068	116,109
	Underground	74,365	71,237	69,012
	Total	**5,349,431**	**5,324,091**	**5,168,661**
Other business travel (km)				
	Short haul international Average	1,962,413	1,991,556	1,693,778
	Long haul international Average	5,215,474	6,210,706	4,588,511
	Rail - Eurostar	95,444	98,988	101,482
Other business related information				
	Domestic flights undertaken	788	869	627
	Total gross emissions Scope 3	**1,702**	**1,554**	**1,589**
	Total financial cost Scope 3 business travel	**5,349,431**	**5,324,091**	**5,168,661**
	Total other financial cost	**636,887**	**875,565**	**485,165**

*Figures calculated using PHE's 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 59%
- emissions per wte from international flights are down by 39%
- emissions per wte train use per wte are up by 21%
- emissions per wte from personal car use are up by 43%
- emissions per wte from taxi use are down by 43%
- emissions (tCO_2e) from use of PHE owned/leased vehicles are up by 17%

PHE's targets for reducing travel to meetings have been supported by a number of directorates over the last year. Microsoft's Skype continues to be a well-supported tool in this initiative. PHE recognises that less business travel will not only benefit public health by preventing air pollution, support PHE's plans to reduce carbon and save money, but also benefit the health and wellbeing of our staff.

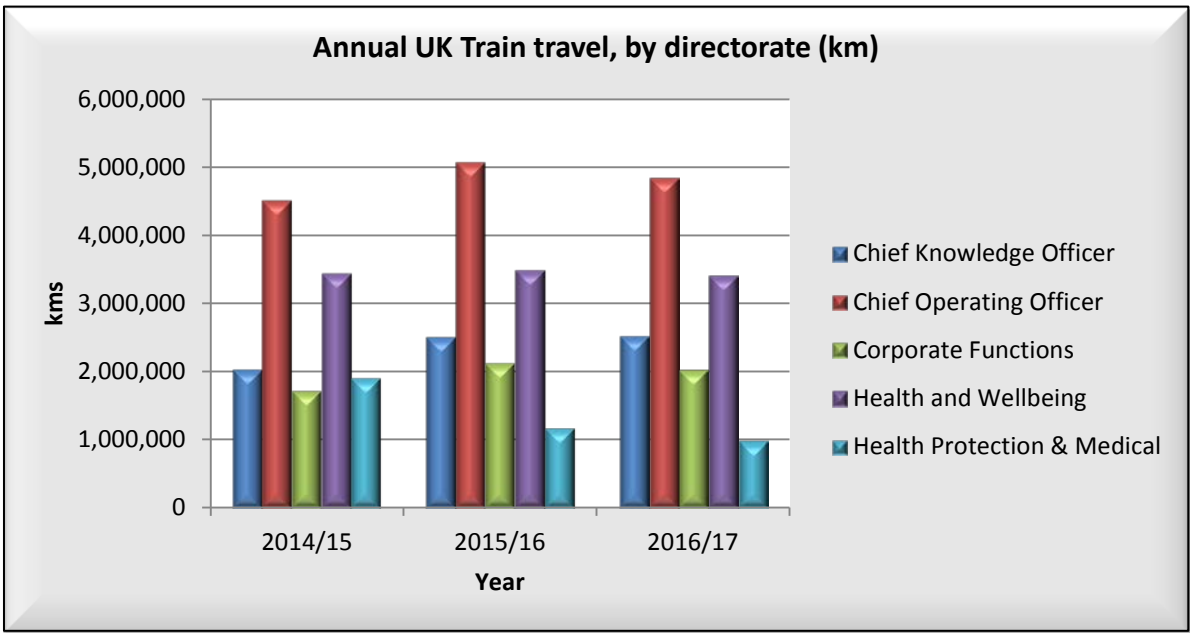
Active travel initiatives across the whole of PHE are one of the ways we have been asking staff to consider whether they actually have to attend a meeting. If travelling locally, walking or using a bicycle where practicable are examples of how carbon savings can be made while contributing to improving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

Rail travel

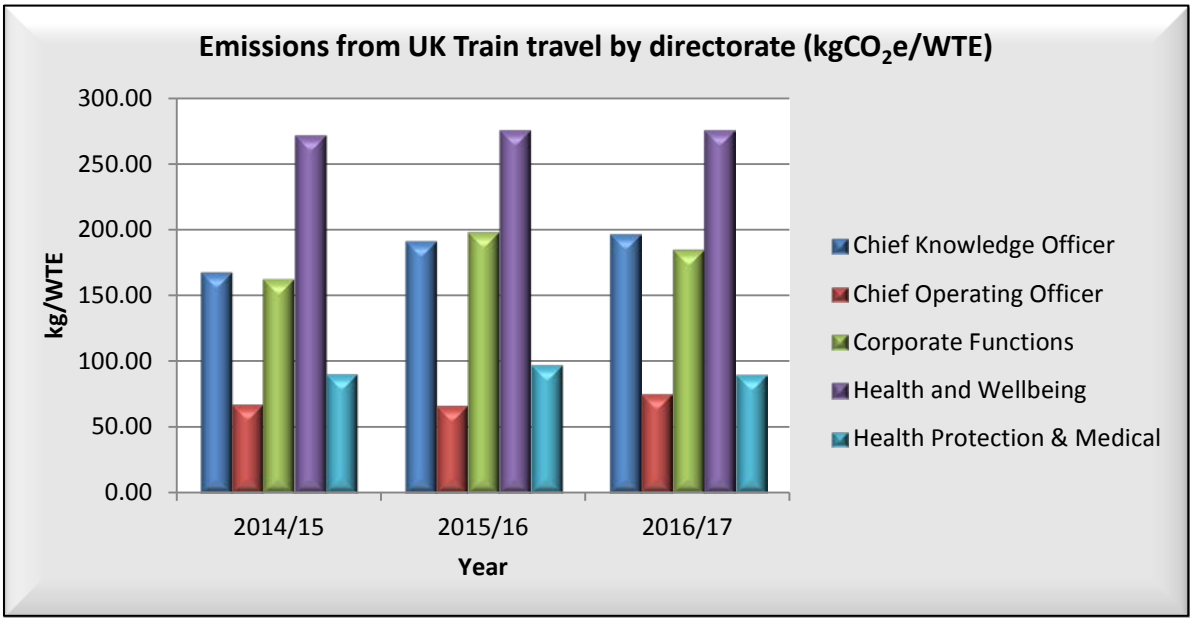
During 2016/17, PHE staff travelled 13,867,076 km by train, representing a 4.1% reduction on the previous year. The Chief Operating Officer's directorate continues to undertake the most travel by rail, travelling nearly five million km. PHE's total spend on UK rail travel amounted to £3,692,035 (inclusive of data from i-expenses). The following table summarises PHE's carbon footprint due to rail travel.

Directorate	Distance km	WTE	tCO2	kgCO2/WTE
Chief Knowledge Officer	2,527,147	619	123	199
Chief Operations Officer	4,851,014	3,145	237	75
Corporate Functions	2,090,150	524	102	195
Health and wellbeing	3,412,735	596	167	280
Health Protection and Medical	986,030	518	48	93
Total	13,867,076	5,402	677	842

Our rail travel in 2016/17 is summarised below, 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 Health and Wellbeing directorate generated highest emissions per person (280 $kgCO_{2e}$/wte) as a result of rail travel, up 1.35% on last year. This compares with members of staff from the Chief Operating Officer's directorate, who generated 75 $kgCO_{2e}$/wte, up by 14.2% compared to last year's figures.

Air travel

PHE fully recognises its public health commitments, not only in the UK but also on the international scene. Therefore travelling by air to meet these commitments is somewhat 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.

A large proportion of our international work is undertaken by the Health Protection and Medical director's staff; for example Sierra Leone, Pakistan, and recently undertaking hurricane disaster relief work in the West Indies, this is illustrated in the data below.

Our air travel in 2016/17 is summarised below:

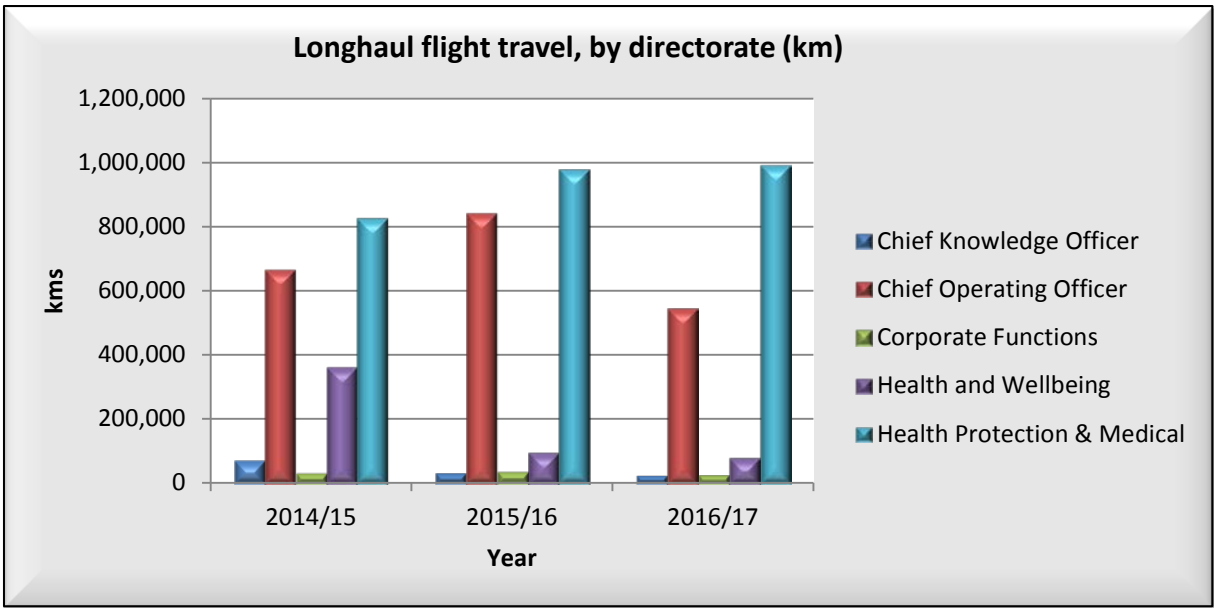
Directorate	WTE	$kgCO_2$/WTE		
		Domestic	Short haul	Long haul
Chief Knowledge Officer	619	7.77	7.05	14.52
Chief Operations Officer	3,145	8.36	29.16	91.83
Corporate Functions	524	9.77	7.97	33.59
Health and wellbeing	596	32.00	23.00	52.63
Health Protection and Medical	518	45.47	311.23	933.26
Total	5,402	103.37	378.42	1,125.84

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

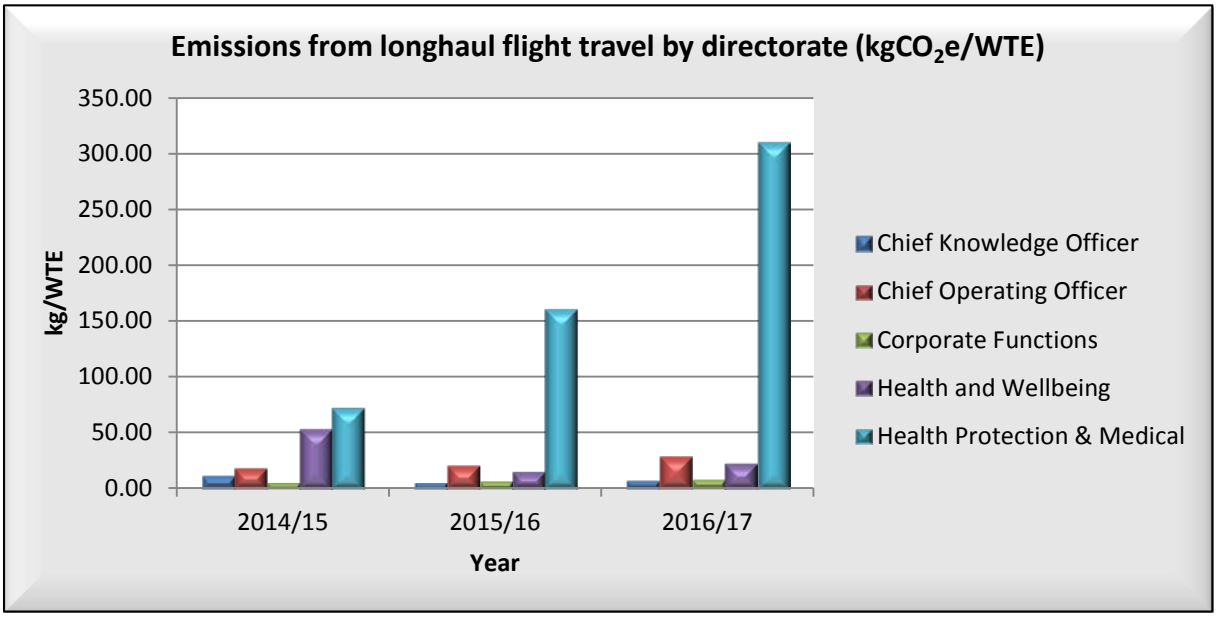
Directorate	Distance travelled (km)				
	Q1	Q2	Q3	Q4	Annual total (km)
Domestic flights (<500 km)					
Chief Knowledge Officer	9,021	3,017	4675	824	17,537
Chief Operating Officer	27,425	10,417	28,159	28,945	94,946
Corporate functions	5,337	3,751	6,173	3,595	18,857
Health and Wellbeing	16,287	18,240	19,582	15,244	69,353
Health Protection & Medical	18,851	18,724	27,186	22,933	87,694
Total domestic flights	**76,921**	**54,149**	**85,775**	**71,541**	**288,386**
Short-haul flights (500-3,700 km)					
Chief Knowledge Officer	3,288	2,892	5,133	15,013	26,326
Chief Operating Officer	133,361	133,562	189,197	91,487	547,607
Corporate functions	0	4,076	11,316	10,060	25,452
Health and Wellbeing	24,792	20,691	21,426	15,574	82,483
Health Protection & Medical	290,458	229,728	294,612	178,364	993,162
Total short-haul flights	**451,899**	**390,949**	**521,684**	**310,498**	**1,675,030**
Long-haul flights (>3,700 km)					
Chief Knowledge Officer	0	33797	13872	0	47,669
Chief Operating Officer	402,490	397,588	303,074	412,847	1,515,999
Corporate Functions	17,644	20,123	22,907	33,597	94,271
Health and Wellbeing	56,005	43,747	66,134	0	165,886
Health Protection & Medical	559,610	430,049	930,289	697,875	2,617,823
Total long-haul flights	**1,035,749**	**925,304**	**1,336,276**	**1,144,319**	4,441,648
TOTAL ALL FLIGHTS	**1,564,569**	**1,370,402**	**1,943,735**	**1,526,358**	**6,405,064**

Long-haul flights

Compared with last year there was a 39% decrease in the amount of international air travel undertaken. The Health Protection and Medical directorate was the greatest user of long-haul flights; this was due to PHE's operational commitments oversees.

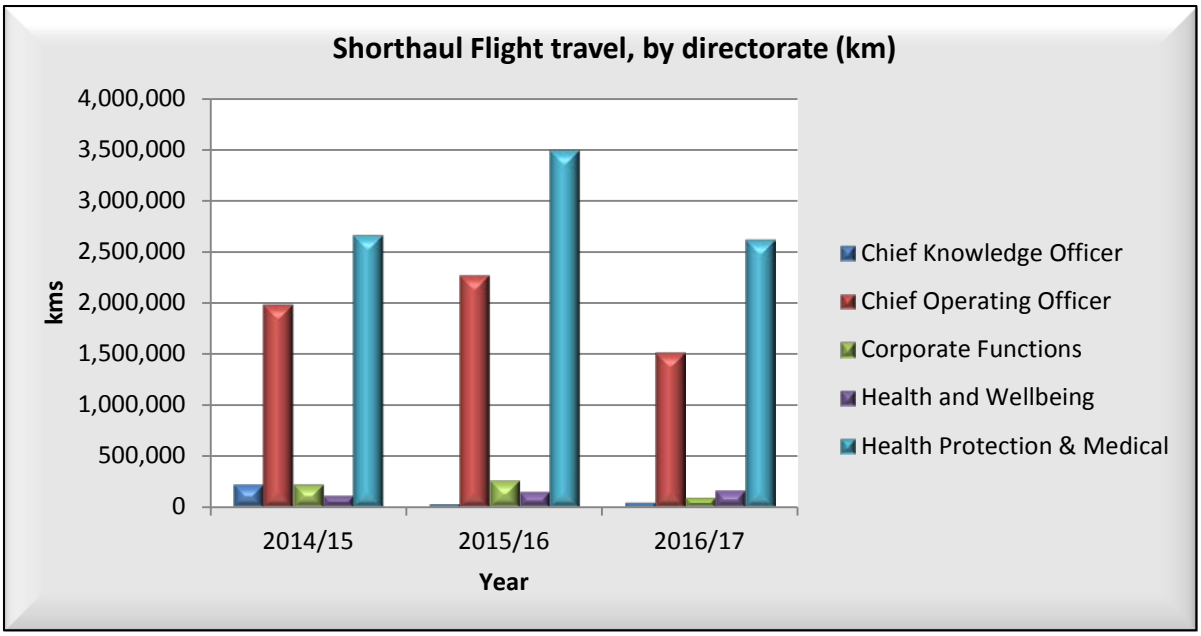


The emissions due to long-haul air travel are expressed as $kgCO_2e$ per wte. This gives the following distribution:



Short-haul flights

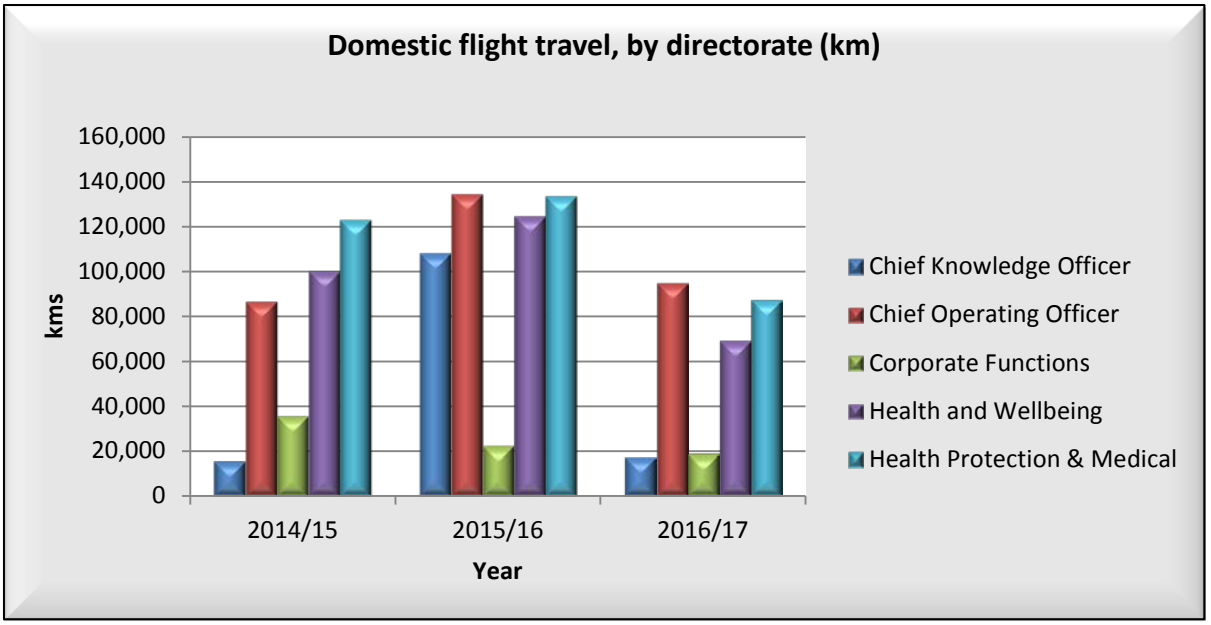
Short-haul between the UK and Europe, reduced by some 15% compared with 2015/16. The Health Protection and Medical directorate and the Chief Operating Officer directorates continue to be the greatest users of short-haul air travel.



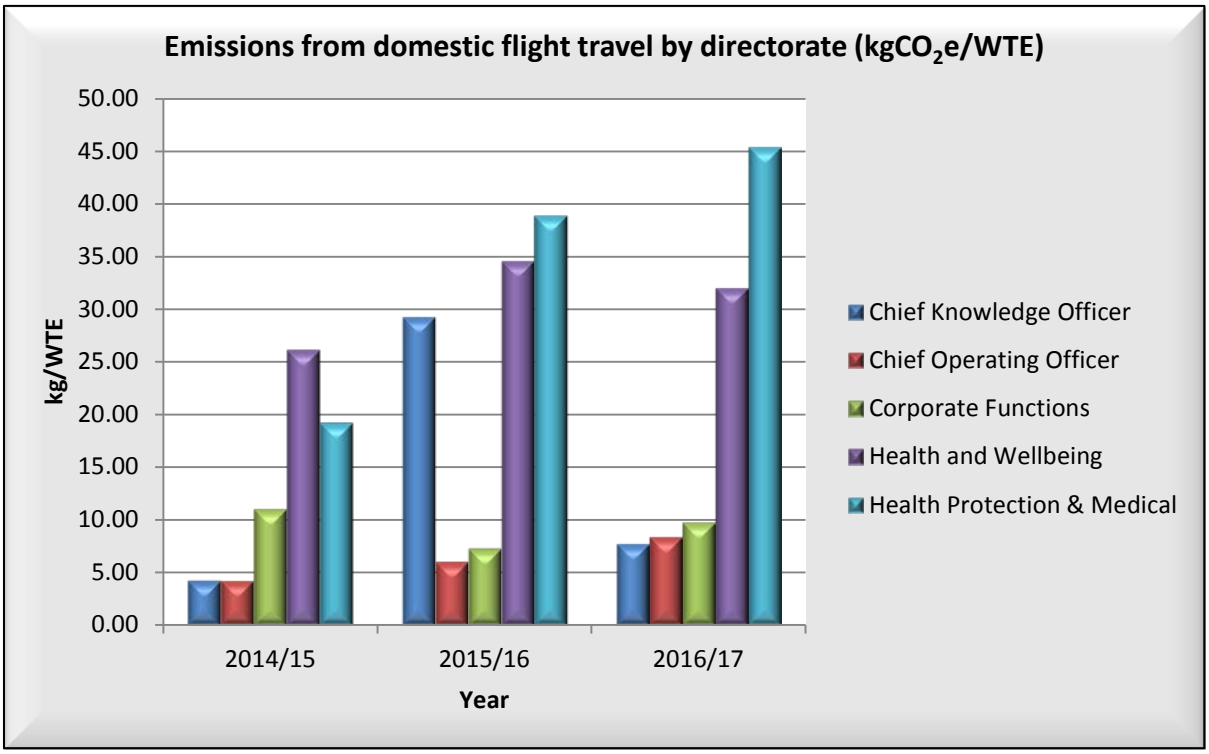
To facilitate comparison across PHE directorates the emissions due to short-haul air travel are expressed as $kgCO_2e$ per wte. This gives the following distribution:

Domestic flights

The government has indicated that air travel within the UK must be reduced significantly and this will be reflected in the new GGC targets. Distance travelled by PHE staff using domestic air travel reduced some 45% from the previous year.



Although there was an overall reduction in domestic air travel in 2016/17, as illustrated above, when the data is calculated as $kgCO_2e$ per wte, as illustrated in the graph below; the distribution reflects the recent reorganisation of staff across PHE and clearly shows which directorate utilises this form of travel per headcount.


Emissions from domestic flight travel by directorate (kgCO2e/WTE)
50.00
45.00
40.00
35.00
30.00
25.00
20.00
15.00
10.00
5.00
0.00
kg/WTE
2014/15
2015/16
2016/17
Year
Chief Knowledge Officer
Chief Operating Officer
Corporate Functions
Health and Wellbeing
Health Protection & Medical

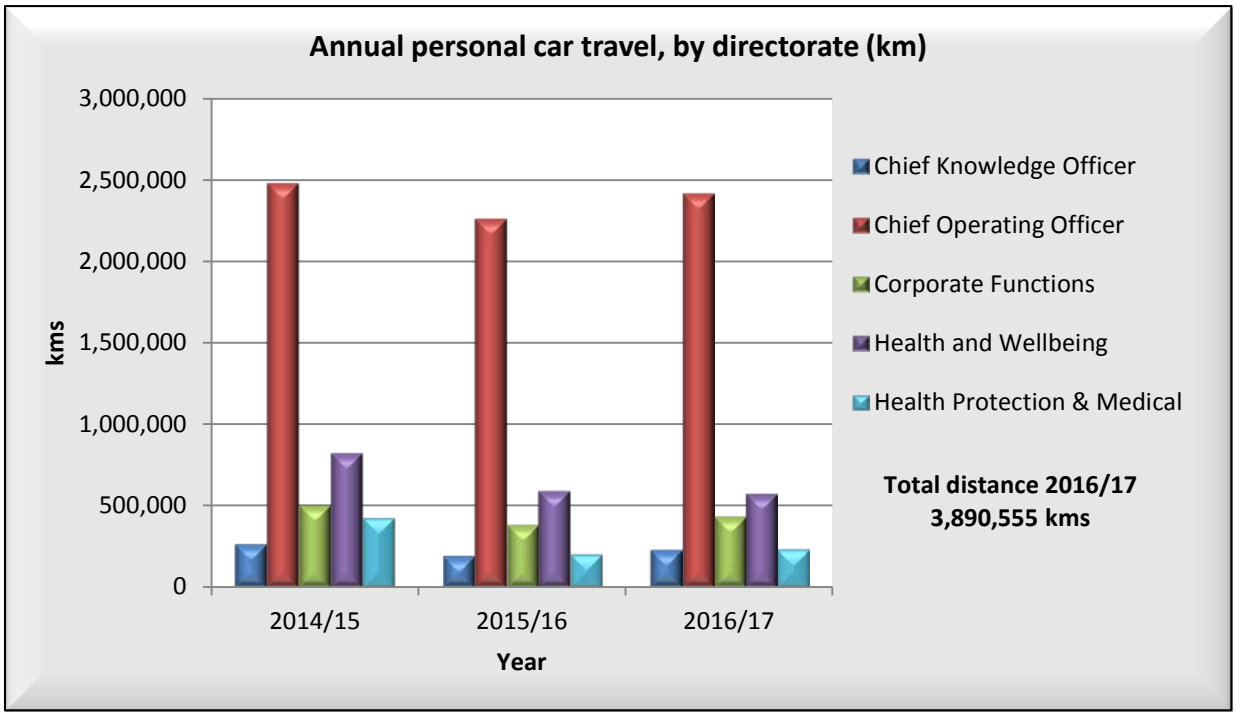
Car use for business travel

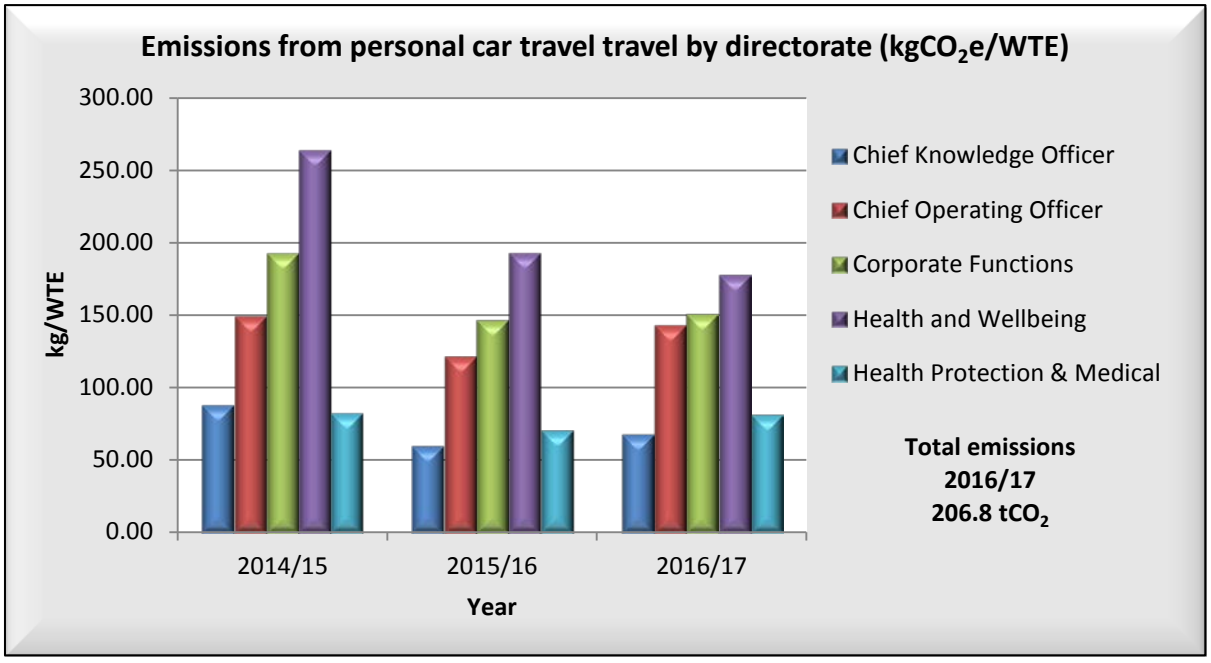
PHE continues to undertake a significant amount of business travel by car, the majority of it in personal cars. For 2016/17 we travelled some 3,890,555 km in our own cars at a cost of £1,101,446 (i.e. 28p/km). The distance travelled, compared with last year, has increased by some 7%.The method for calculating 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 Knowledge Officer	48,127	49,952	62,509	67,236	227,824	64,620
Chief Operating Officer	480,340	542,897	683,048	714,227	2,420,512	684,112
Corporate functions	97,953	121,630	113,942	101,210	434,736	121,932
Health and Wellbeing	125,325	133,737	156,445	159,333	574,840	163,527
Health Protection & Medical	54,105	43,858	70,327	64,354	232,645	67,255
Total Personal Car	**805,851**	**892,074**	**1,086,271**	**1,106,359**	**3,890,555**	**1,101,446**

Business travel, by PHE staff in 2016/17, using personal cars is shown below.


Annual personal car travel, by directorate (km)
3,000,000
2,500,000
2,000,000
1,500,000
1,000,000
500,000
0
kms
2014/15
2015/16
2016/17
Year
Chief Knowledge Officer
Chief Operating Officer
Corporate Functions
Health and Wellbeing
Health Protection & Medical
Total distance 2016/17
3,890,555 kms


Emissions from personal car travel travel by directorate (kgCO2e/WTE)
300.00
250.00
200.00
150.00
100.00
50.00
0.00
kg/WTE
2014/15
2015/16
2016/17
Year
Chief Knowledge Officer
Chief Operating Officer
Corporate Functions
Health and Wellbeing
Health Protection & Medical
Total emissions
2016/17
206.8 tCO2

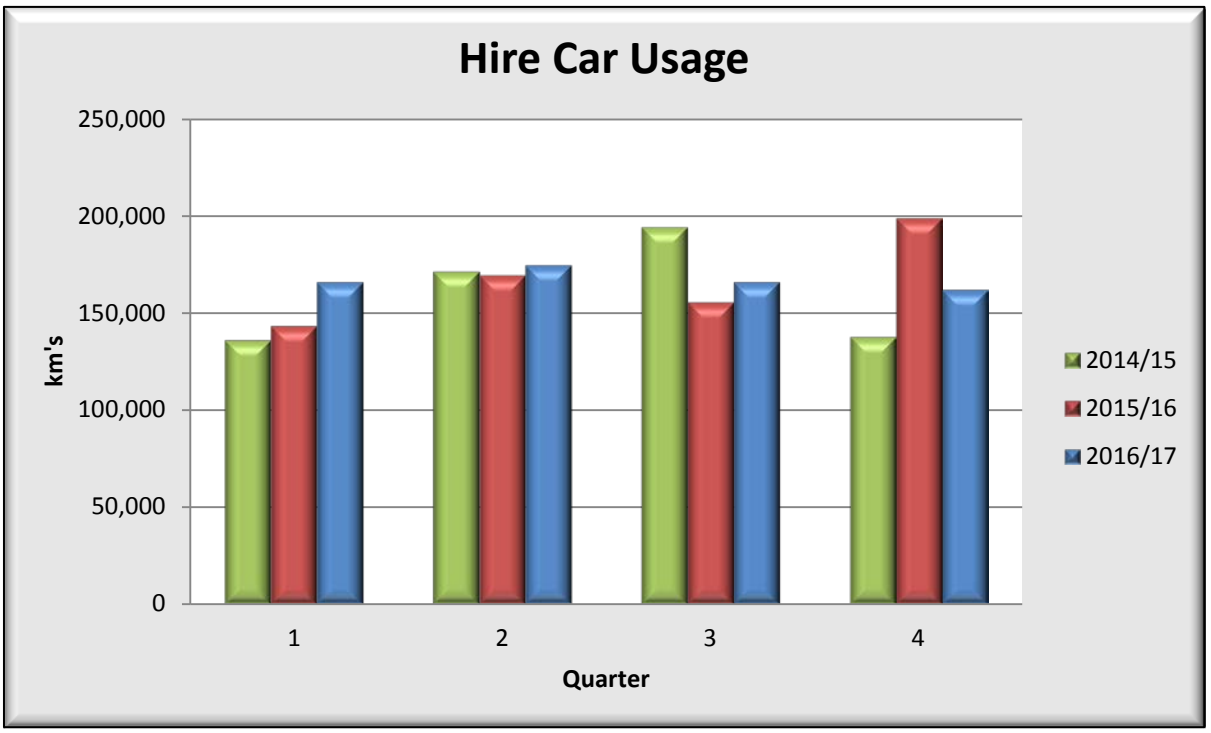
Hire car versus personal car use

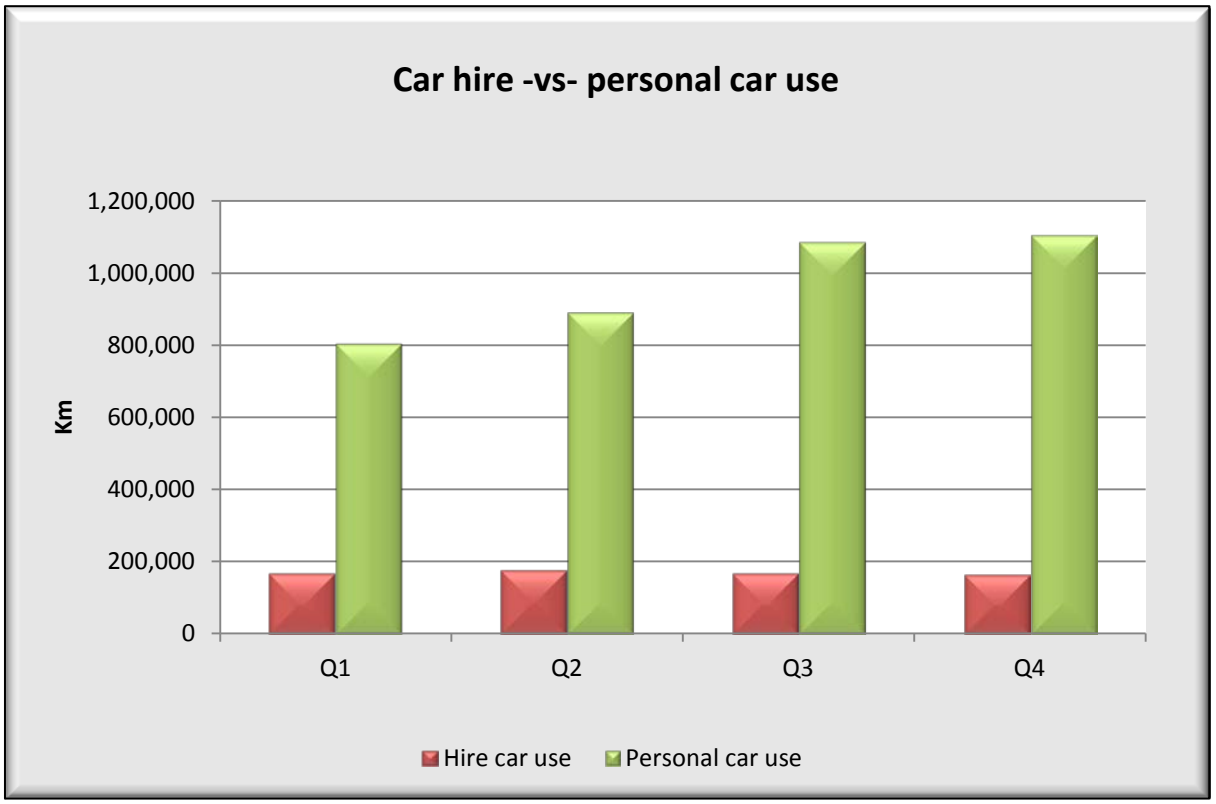
PHE continues to have a contractual arrangement with Enterprise Cars for the supply of hire cars across the country. PHE policy states that members of staff should, where practicable, use hire cars for journeys over 100 miles, instead of using their own vehicles, with travelling via public transport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

PHE staff using hire cars travelled a total of 668,882 km, at a cost of £116,109 (i.e. 17p/km) in 2016/17, an increase of some 0.08% compared with the previous year and a 4.25% increase on our baseline.

The principal cost difference is due to the higher cost per km travelled by staff in personal cars, because the reimbursement rate set by government is significantly higher than the cost of using a hire car. PHE recognises it has more to do in this area, and that there is potential not only for grater 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.


Hire Car Usage
250,000
200,000
150,000
100,000
50,000
0
km's
1
2
3
4
Quarter
2014/15
2015/16
2016/17

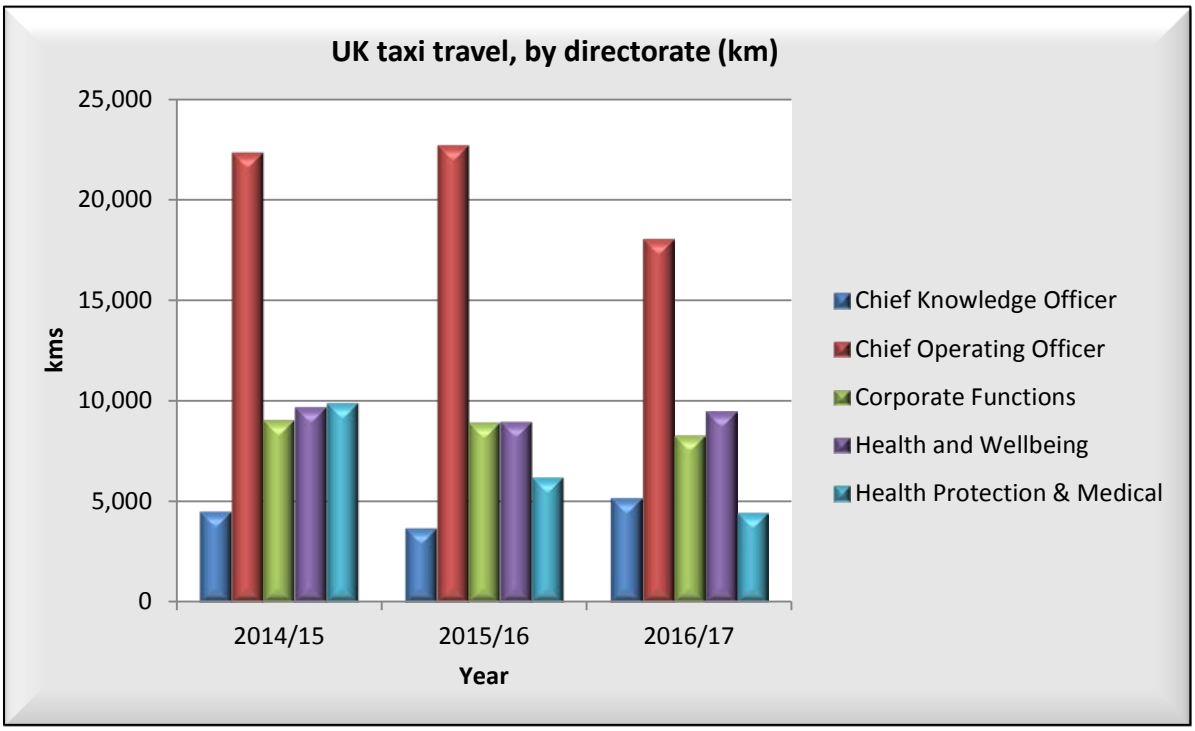

Car hire -vs- personal car use
1,200,000
1,000,000
800,000
600,000
400,000
200,000
0
Km
Q1
Q2
Q3
Q4
Hire car use
Personal car use

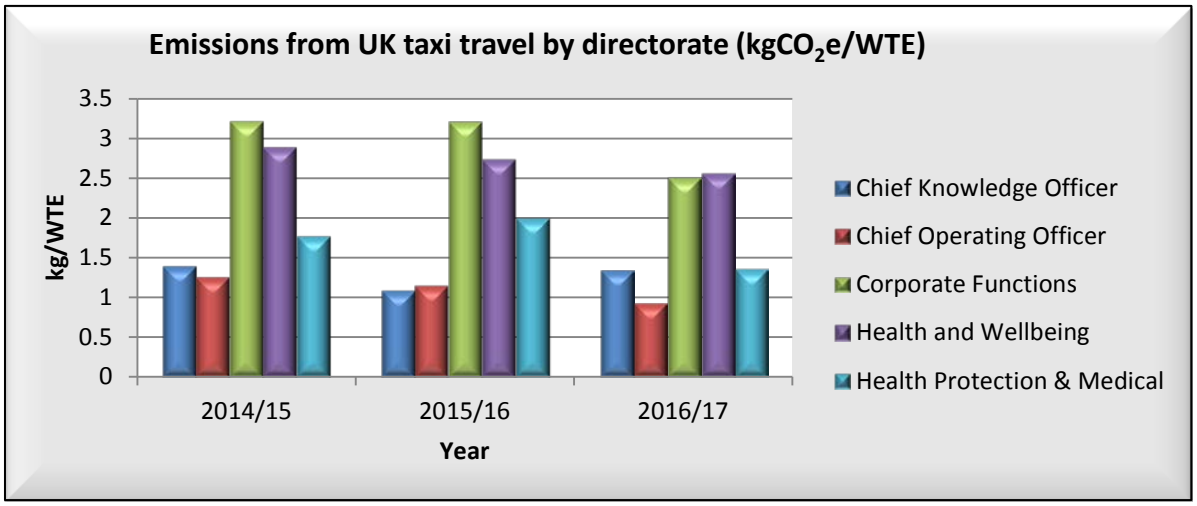
Underground and taxi travel

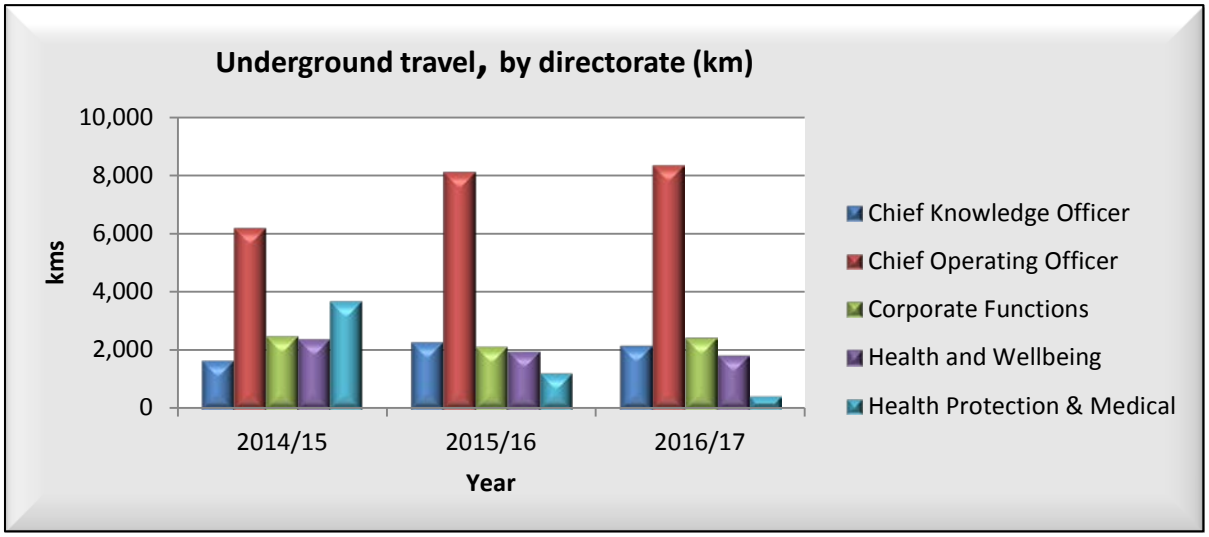
We continue to use an algorithm developed in-house for calculating distance from the cost of a taxi, bus and underground journey. This method gives us a general estimate. However, it is still difficult to distinguish journeys by bus and underground where either an Oyster or rail travel card has been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

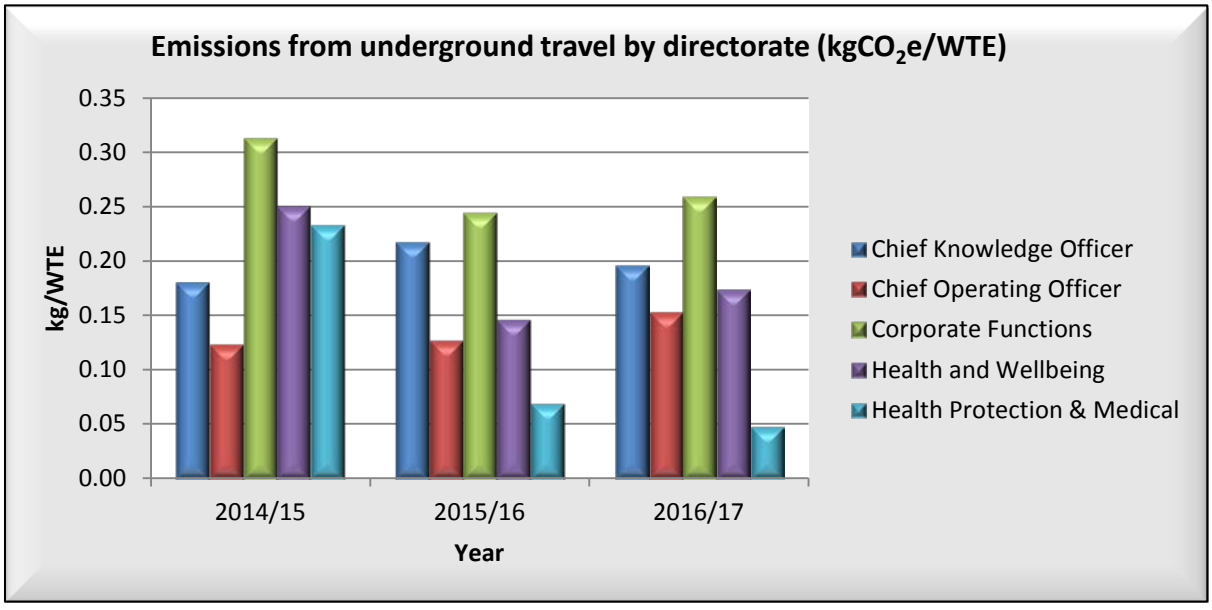
For journeys specifically identified as being by bus or underground, the data is presented below. Emissions per WTE from our use of taxis have reduced by 43% over the previous year, to 7.47 tCO_2e. The cost has also reduced by 9%, to £102,096 compared to £112,143 in 2015/16. Analysis of the data indicates that the majority of taxi journeys are undertaken outside of the capital.

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)
kg/WTE
3.5
3
2.5
2
1.5
1
0.5
0
2014/15
2015/16
2016/17
Year
Chief Knowledge Officer
Chief Operating Officer
Corporate Functions
Health and Wellbeing
Health Protection & Medical


Underground travel, by directorate (km)
kms
10,000
8,000
6,000
4,000
2,000
0
2014/15
2015/16
2016/17
Year
Chief Knowledge Officer
Chief Operating Officer
Corporate Functions
Health and Wellbeing
Health Protection & Medical


Emissions from underground travel by directorate (kgCO2e/WTE)
kg/WTE
0.35
0.30
0.25
0.20
0.15
0.10
0.05
0.00
2014/15
2015/16
2016/17
Year
Chief Knowledge Officer
Chief Operating Officer
Corporate Functions
Health and Wellbeing
Health Protection & Medical

Ethical and sustainable procurement in PHE

The procurement department, supported by internal stakeholders seeks to use its buying power to positively support key public health and social agendas reinforced 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 four 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, Modern Slavery Act and payment of the Living Wage.

In addition, 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. The 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 tendering is managed through e-tendering and our documentation is stored electronically. There is an environmental section in our tender documents which asks specific questions about a company's environmental management system. This includes elements relating to their impact on energy and water 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 for commercial staff across PHE involved in developing specifications and managing contracts are being developed so that our purchases can positively support PHE's social and public health agenda.

Biodiversity and wellbeing

PHE fully recognises the importance of biodiversity and health and wellbeing and the role these things play in our everyday lives. We continue undertaking biodiversity projects on our sites where we can (especially on our sites in rural settings) although PHE does not own significant suitable land. In the last year, our beehives at Colindale suffered from disease, but it is hoped that a new colony of bees can be quickly installed.

Guided walks and cycling events are promoted across the estate. We also have an active programme related to ‘healthy people, healthy places’ with a number of health and wellbeing groups 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 are also being run across the estate to help staff, to cope with the stresses and strains of everyday life.

Sustainability in the regions

Approaches to sustainability

Within PHE there are four regions, the North; Midlands & East; South; and London. Outside of London the other three regions are made up of eight PHE centres. London is an integrated Centre and Region.

Each of the four PHE regions has its own approach to sustainability networks and partnership engagement, developed to best serve local and regional needs. All regions have networks in place across their region and in addition every PHE centre and region has a sustainability lead.

Conferences and events

Conferences and events are often used to raise awareness on sustainability issues and connect key people who work on this agenda both internally and externally. Some examples of the conferences, events and sustainability sessions that have taken place or are planned across the

Each of the regions are highlighted below:

North Region

The membership of the Northern Sustainable Development and Health group has continued to increase with over 130 people now on the email distribution group. The steering group has continued its work and will be having a face to face meeting in September 2017 to refresh its action plan and develop new impetus and initiatives particularly following Trevor Hancock's visit.

The steering group has been working to implement the Sustainable Development Ambassador programme. We have secured funding and are working with Health Education England to develop the leadership and development programme and are aiming to launch the programme in the autumn.

There were two masterclasses held in the region over the past year:

Fairness and Environmental Sustainability:

Opportunities for Public Health and the Health and Social Care System masterclass were held in Darlington in November 2016. As well as looking at the role of economics and emotions in sustainable development it also included a workshop on how to

develop and implement a good Sustainable Development Management Plan (SDMP). This built on previous work undertaken by the network investigating whether NHS organisations in the North had an SDMP and reviewed their quality.

The masterclass in May 2017 focussed on sustainable healthcare showcasing some of the work undertaken in this area and particularly the work of the University of Lancaster on institutional rhythms; showing that energy use is dependent on the timing of various activities in large institutions e.g. shift changes, patients discharges, deliveries and how these might be influenced to improve energy efficiency.

Further workshops were also took place to benefit from the visit of Professor Trevor Hancock to the UK from the University of Victoria in Canada. One workshop was for a wider audience of invited attendees and the other for network members. Trevor spoke about the Anthropocene, one planet living and the Happy Planet Index. He shared some of his work in Victoria including developing a vision of what sustainable development would mean for Victoria, a so called “One Planet Region” – what would the region look like is it became completely sustainable?

Colleagues from the North West Centre attended and presented at a National Clean Air Day event in Manchester in June.

Midlands and East Region

The first regional conference run by PHE was held in November 2016 which was entitled “Whole System Approach and Sustainable Development”. This event was organised to reconnect the enthusiasts and experts while looking at a whole systems approach to sustainable development across the health system and in particular the role of systems leadership. The conference attracted a cross section of professionals from a range of organisations across the Midlands and East region.

The conference concluded that health system leadership is needed for all approaches to sustainable development:

- recognising that currently, social and political complexity prevents progress more than technical complexity
- understanding the fast pace of development and change affecting almost every aspect of life and that there are many different approaches to problem solving
- remembering that sustainability problems almost always cross governance boundaries hence solving them will involve multiple organisations working in partnership
- knowing that solutions will almost certainly involve changing behaviour with all the challenges that this presents

South Region

The Southern region's Sustainability and Health Network held its 3rd annual conference in November 2016, in collaboration with the Local Nature Partnership. The focus of this conference was on delivering the health and wellbeing benefits of the natural environment, an event to support STP implementation.

The event covered how sustainable working is core to sustainability and transformation plans; evidence for the benefits of the natural environment to health and wellbeing; ways of integrating these benefits into service provision to support a more sustainable health and care system; and case studies that demonstrate how nature-based health care is delivering real health and wellbeing benefits.

A short film about the conference was produced and is available from the network website.

We continued our programme of sustainability masterclasses, in the autumn our masterclass focussed on engaging clinicians and nurses in Sustainability and Food and nutrition: a tool for clinical engagement. Our network asked for the next masterclass to be on using digital advancements within the sustainability agenda, and we delivered 'The Power of Digital Technology to Sustainably Transform Health and Social Care', in March 2017, which included speakers from NHS Improvement and NHS England.

Details of these events including copies of presentations or recordings of webinars are available at http://www.sduhealth.org.uk/delivery/engage/regional-and-local-networks/south-region-sustainability-and-health-network.aspx

The region has continued to champion new ways of working that promoted sustainable working patterns, for example, by actively encouraging the use of Skype for internal and external meetings and webinars.

London Region

Public Health England London EPRR team led on the review of the Adverse Weather Framework on behalf of the London Resilience Partnership. 'The Severe Weather and Natural Hazards Framework', was ratified by the London Resilience Forum on 19 June 2017 and will be published shortly on the London Prepared website.

Following consultation with category 1 and 2 responders the framework has now been revised. 'The Severe Weather and Natural Hazards Framework', was ratified by the London Resilience Forum on 19 June and will be published shortly on the London Prepared website.

Key stakeholders as part of the review group included PHE, London Resilience Group, Greater London Authority, Environment Agency, Met Office, local authorities and Transport for London.

Changes to the framework include:

- improved readability and a framework which will be useful for all partners, providing clear and simple information for members of the public on the different alerting systems
- introduction of natural hazards as well as weather – space weather, air pollution, volcanic ash etc. This is based also on the London Risk Register as those risks that are High, Very High
- introduction of level 0 – Promoting all year round planning, community resilience tips for the public, and outlining what the key things that should happen at each level are for borough and multi-agency planning, preparedness and response
- including reference to social inequalities for consideration as drivers for future developments for climate change. Engagement across resilience and planning development for the future

Members from the London team are active members of the London Climate Change Partnership, including raising awareness on the Health and Care Sustainable Development strategy. We are also one of the partners on the Urban Heat, a community-led approach to the heatwaves project delivered by Westminster University.

At the last London all staff away day, we delivered an environmental awareness session looking at Bees and their role in environmental sustainability.

We have been actively encouraging our staff to take advantage of London's active travel programme, including an event promoting Cycle Scheme. Since the move to the City of London we have seen a significant increase in number of staff choosing to walk to business meetings within Central London (PHE Wellington and Skipton House, City Hall and Westminster) than using public transport.

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 networks that are in place with our partners and work undertaken are highlighted below:

North Region

A Sustainability and Health Network for Northern England has been created to help NHS organisations, PHE centres and public health and social care teams in local authorities implement the Sustainable Development Strategy for the Health and Social Care system.

This network provides opportunities for representatives from public health and the health and social care systems to collaboratively work towards a sustainable health, public health and social care system. An action plan is in place for the network to monitor progress on this work and resources to the network include a quarterly newsletter, regular sharing of best practice and masterclasses

A number of presentations have been delivered across the region to support sustainable development:

Airedale General Hospital Executive Group, emphasising the impact that a hospital can have both in terms of its carbon footprint and also the influence it has on the local community and its economy and its employees, eg travel plans, diet and exercise.

West Yorkshire and Harrogate STP, pointing out the opportunities that SD initiative have to reduce costs and emphasising that these aspects should be considered in any reconfiguration.

Midlands and East

We have a relatively new virtual network for sustainable development established in January 2017 and this is an agreed outcome from the regional conference held in November 2016. Members come from a range of organisations including the NHS, local government and academia.

The purpose of the network is to provide leadership and co-ordination for:

- supporting the development of the existing local SD networks
- promotion of shared learning and good SD practice across the Midlands and East of England
- ensuring dissemination of national guidance, strategy and policies on sustainability
- identify topics where we lack information as potential opportunities to innovate
- development of regular masterclasses and training opportunities
- development an annual network business plan to focus resources into agreed areas for action and development.

There are 3 active local networks that have a close relationship with each of the PHE centres in Midlands and East.

West Midlands

The local multi-agency network is well established and has a strong focus on sustainable travel. It currently is proposing to undertake a survey on the development opportunities for the local SD ambassadors. The new mayor for the WM combined authority is interested in sustainable development and we are likely to see a greater focus on sustainable outcomes.

East Midlands

The centre supports 2 local networks: Good Food East Midlands which promotes sustainable food (and hopes to apply for recognition as the first ‘sustainable food region’ later this year); and a healthy places network. An event was held in early June for the new SD ambassadors. East Midlands has a reasonable network of these although there remain a few gaps. The ambassadors come from a range of organisations and back grounds and the centre hopes to offer a development programme to support this project.

East of England

The centre has developed a Sustainable Development Strategy, following a period of engagement with staff and internal workshop that will contribute to PHE’s overall ambitions set out in the SDMP 2017-20. The project is led by Linda Hillman, consultant in dental public health and sustainable development champion, with support from Ben Brown, speciality registrar public health.

Drawing on the principles of change management theory, the plan was created through a process of staff engagement. SD ‘reps’ from each directorate were recruited and asked to consult with their colleagues on three key questions.

- are there any quick actions PHE East of England could take to become more sustainable in its day to day operations?
- where do you think you could have the biggest impact in your role with regard to promoting and supporting sustainable development?
- what help would you like from PHE to better ‘live’ the principles of sustainable development in your role?

Suggestions boxes were also deployed to gather anonymous views from colleagues. The feedback was discussed at a workshop at which key priorities were set (travel and

use of Skype) and a draft action plan agreed. This will be taken forward through a new SD working group reporting to the centre senior team.

It is planning an event to promote the internal SDMP but also examine the relevant external issues, ie STP plans and provider organisations. The centre is also hoping to run a development event for local ambassadors jointly with the NHS led East of England network.

South

As part of our network we have recruited 18 Sustainability and Health Ambassadors in the South region on a voluntary basis, with ambassadors working in different parts of the health and care system, including local authorities, acute trusts and primary care. Our ambassadors bring an exciting mix of skills and experiences to the capacity and capability within the South.

We brought the ambassadors together for a leadership development weekend to ensure we have a shared understanding of the opportunities and challenges of sustainability in today's health context. As part of this programme ambassadors are being supported by peers and regional leads and accessing leadership development support through collaboration with the Leadership Academy.

Our vision is that our ambassadors will support the transition of the NHS and social care in the south region to a more sustainable system and be local champions within their communities and health systems.

Support for sustainability and transformation partnerships

The sustainability transformation partnerships (STPs) and Five Year Forward View provided a focus for much of our work plan in 2016-17 including our annual conference.

Colleagues from the South region undertook a rapid review of the 13 STPs to review the social, environmental and clinical sustainability commitments. These were reviewed based on the criteria of the Sustainable Development Unit's Good Corporate Citizenship (GCC) framework (SDU, 2012).

The review considered plans against the following areas: travel, procurement, facilities and building management, workforce, community engagement, adaptation and models of care. It was encouraging to find there was a strong focus in the STPs on "new models of care" and workforce sustainability. STPs also included footprint-wide estate strategies and programmes to ensure best use of the public estate.

Most STPs have programmes and leads for clinical sustainability, workforce, estates and digital infrastructure. However, the review identified there is more to be done to support delivery of STPs and the Five Year Forward View around sustainable procurement and also areas such as the environmental benefits of bringing care closer to home and the potential use of technology in self-care.

Since the publication of NHS planning guidance in December 2015, PHE centres and regions have worked closely with NHS England to co-ordinate the offer of support and advice to the developing STP footprints.

Our rapid review mentioned above, of STPs, also reviewed plans for their commitment to travel.

Sustainable development in the Health and Wellbeing directorate

A fundamental role for 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. It has recently published two guides for local authorities to support the planning and designing of healthier places and a guide to help public health teams identify when and how to contribute to environmental impact assessments. The emerging evidence increasingly supports a broad narrative for PHE: what is good for the environment is good for health of individuals and communities – and good for the economy, now and in the future.

Spatial planning for health

An evidence resource that is a practical tool for use by local planners, public health teams and local communities to help them develop local plans and deliver building projects on the ground, which demonstrates the links between good design and health. The guidance, summarised in a series of innovative infographics, is based on an evidence review undertaken by the University of the West of England on behalf of PHE and summarises the quality and strength of the evidence concentrating on five key built environment topics, including: neighbourhood design, housing, access to healthier food, natural and sustainable environment, and transport. The diagram for each of these areas takes us through the planning principles, modifiable features, impacts, and health outputs.

The second publication, Health and Environmental Impact Assessment briefing note, aims to raise awareness among directors of public health (DsPH) and their public health teams about environmental impact assessment (EIA) and the May 2017 changes. It identifies when and how public health teams can contribute to the EIA process. This guide is part of PHE's work to describe and demonstrate effective, practical local action on a range of the wider determinants of health.

As our Spatial Planning for Health review demonstrates, there is a very significant and strong body of evidence linking contact and exposure to the natural environment with improved health and wellbeing. Reduced exposure to environmental hazards in the built environment and resilience to climate change are two reasons for this effect, but moreover we see that, for example, access to, and engagement with the natural environment is associated with numerous positive health outcomes, including improved

physical health (reduced risk of cardiovascular disease, diabetes and obesity), promotion of good mental health and wellbeing, and social cohesion.

However, access to green spaces is unequally distributed across the country and that many of our most deprived and vulnerable populations live in areas of multiple deprivation which are often characterised by a stark lack of access to green spaces. For example, People living in the most deprived areas are 10 times less likely to live in the greenest areas compared to people living in the least deprived areas[1], hence why our work with National Parks England is so important.

Together National Parks England and PHE have been working to try and improve access to the green spaces, and unlock the huge potential of our national parks to help keep people healthy. The ten national parks have been undertaking a range of innovative projects and programmes for some of our most deprived populations not only to provide places of beauty and serenity for all, but to support confidence building and skills development – as well as supporting activities for walking and cycling for people of all abilities.

At the PHE 2016 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.

Over the past year, 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 co-ordinated 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).

[1] PHE/IHE: improving access to green spaces (2014) (reporting on: Mitchell R, Popham F. Effect of exposure to natural environment on health inequalities: an observational population study. Lancet. 2008;372(9650):1655-60.)

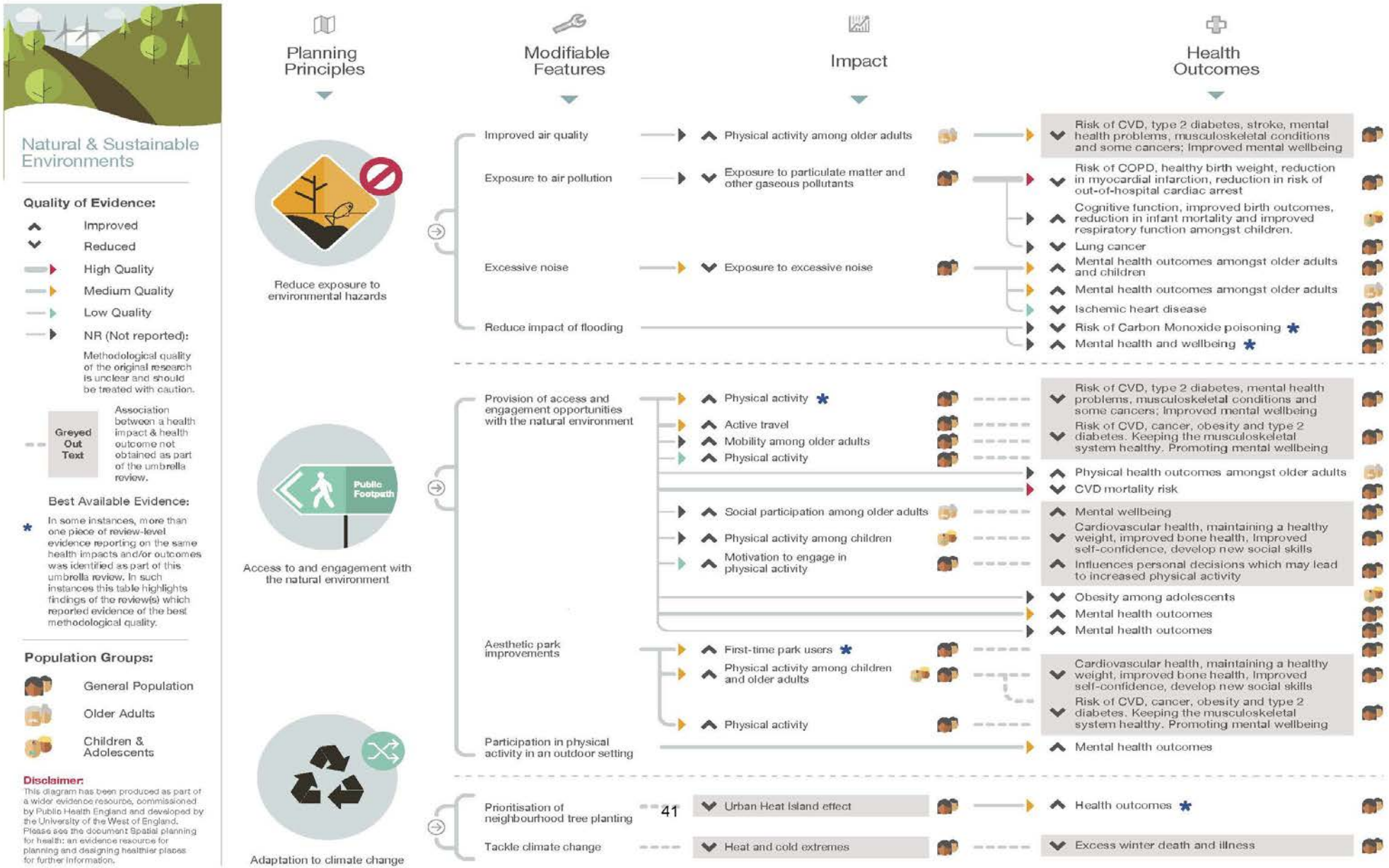


Diagram: Natural and Sustainable Environments – Spatial Planning for Health

PHE has actively supported the development of the NHS England 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 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 eg, 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 (https://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.

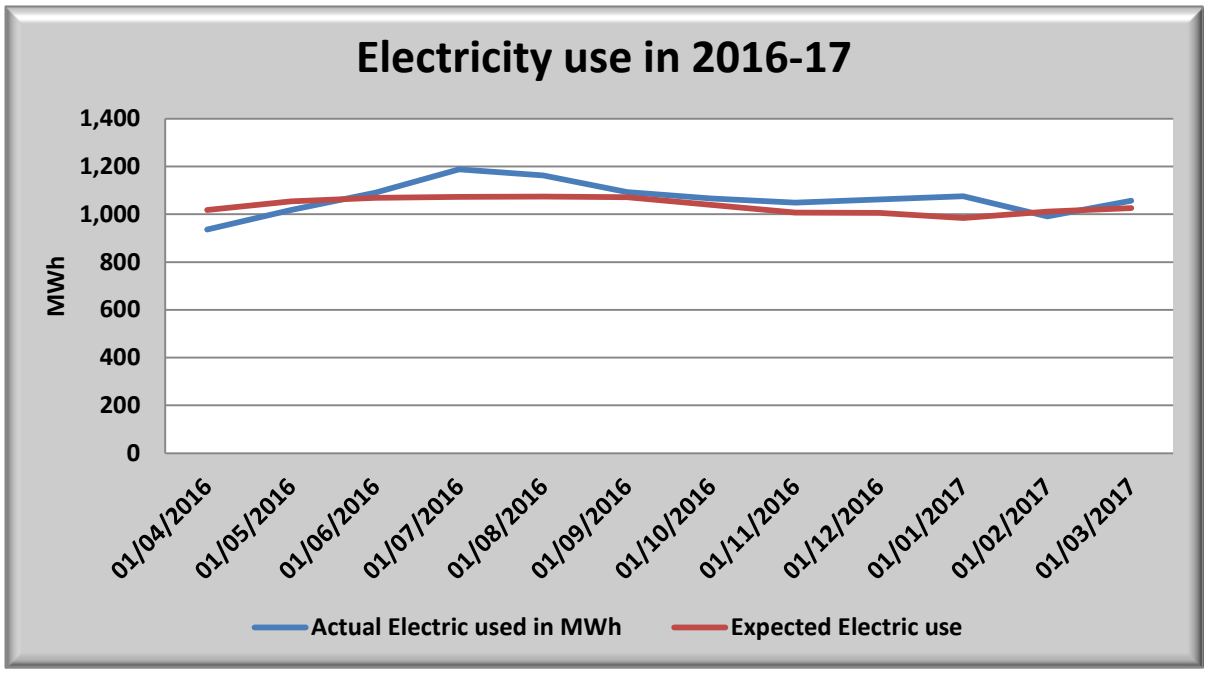
Sustainability at PHE Porton

Introduction

The Porton site is a large operational site with a variety of complex and resource intensive activities, there has been a number of projects undertaken on site in the last year which have helped to reduce Porton's carbon impact. In addition to PHE's operational activities, PBL continues to operate a significant proportion of the site and is supported operationally by PHE.

Energy

There was a 3% reduction in measured grid electricity used at Porton during 2016-17. The graph below illustrates that when actual electricity use was compared to expected use, using degree days that the usage is close to what would be expected, indicating further efficiencies to site usage.



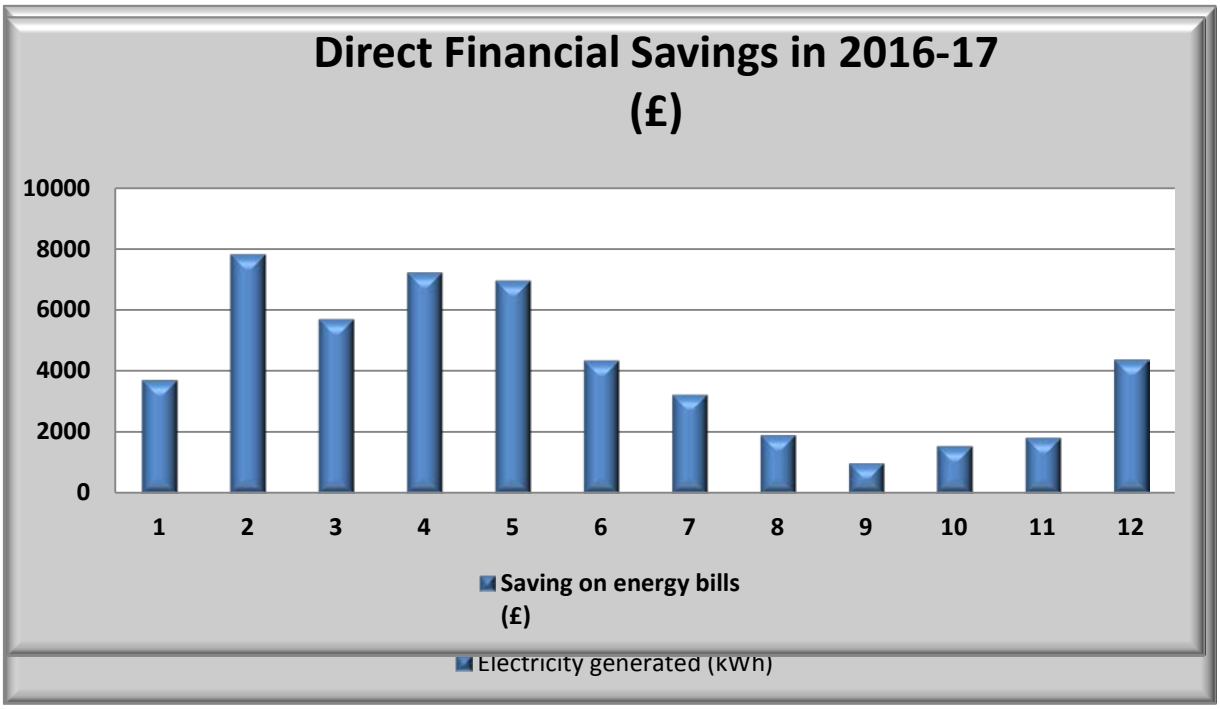
Lighting

Projects to replace older fluorescent lighting with proven quality LED fittings continued. These offer maintenance free operation; with the emergency lighting configured to integrate with the site wide emergency lighting platform for both routine testing and monitoring. During 2016-17, LEDs were installed in many areas of the site. The new fittings yield a 35-40% energy saving on average 40W per fitting.

Fluorescent lamps are also usually replaced after 2 years and take approximately 0.33 man hours to change costing around £6 per lamp change.

Photo-voltaic farm

Following its installation in March 2016, the graph below demonstrates the energy saved from the site's photo-voltaic solar farm:



Sub-meters

Work on the site's sub-metering is still continuing with the sub-meters reflecting the various types of work being undertaken across the site. Most of the data is now on the building management system and weekly monitoring is completed with reports on utility use recorded for each area.

Boilers

PHE Porton's main site boilers were in excess of 60 years old and were installed when the site was constructed in 1950. The boilers provide low 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. A project to replace these boilers with modern, more efficient units commenced in October 2015 and was completed with the commissioning of the new boilers in July 2016.

During 2016-17 gas use increased slightly however, this was due to the incinerator being out of use for a large percentage of the time. The incineration of waste produces the heat for the primary boiler as a consequence, without the incinerator the boilers alone were required to generate the heat.

Water

Total water usage at Porton is split into two data streams (PHE's and PBL's) for operational reasons. PHE's usage has remained virtually static, though PBL's usage has increased due to their manufacturing processes. A Porton campus stakeholder group has been organised to look at where the water is being utilised and work out methods to reduce water use.

Waste

Waste training has continued throughout 2016-17 on request. During the year, we investigated sending non-SAPO waste to an offsite clinical waste incinerator as an alternative contingency option. Quantities of polystyrene in the general waste bins were scrutinised to determine whether a polystyrene machine is required, which will reduce the volume of the waste.

Following this investigation, it was found that there was not enough polystyrene in the general waste to be cost-effective to have a machine onsite. The total quantity of waste produced on site increased from 471 tonnes in 2015-16 to 587 tonnes in 2016-17. This was mainly due to an increase in the amount of waste incinerated onsite by 50 tonnes.

Incinerator

During 2016-17, the incinerator had several upgrades to improve efficiencies and reliability. This included an automatic dosing system for the activated carbon and sodium bicarbonate powders, which are used as dry scrubbers on the gases produced from burning the clinical waste. This new system will enable the exact dose required to be used, reducing the amount of powder required.

This new dosage system should also lessen the hazardous waste ash produced and its associated costs. The rotary kiln, of the incinerator, was relined and other mechanical parts replaced. This has ensured that all waste is burnt properly inside the burn chamber. The burners were also replaced which will aide with energy efficiency.

A temporary analyser had been measuring the HCl as the previous analyser became obsolete. The broken and obsolete HCl analyser was replaced and the emissions monitoring software also updated, with staff being trained on the new systems.

Travel

In 2016-17, PHE Porton has continued to provide incentives to encourage sustainable travel to work as part of the campus' travel plan. These include 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

Given Porton's rural location, we have lots of wildlife living in close proximity to our site. To support a number of developments that are currently taking place on site, we have undertaken various ecological surveys and habitat risk assessments to ensure we are mitigating any impacts we may have on local wildlife habitats.

A project to plant trees to offset carbon sequestration was halted due to the discovery of three great crested newts seen by the gardeners in the proposed planting area. Another location is due to be found for the additional trees.

Sustainability Day

On 1 March 2017, PHE Porton held a site Sustainability Day. The event, held in the site's restaurant, focussed on all aspects of the environment and included displays informing staff about the sustainable sourcing of food in the restaurant, 'cycling to work' and a charity plant sale. The event was well attended with stands from EMCOR's suppliers, Bunzl, EMCOR energy, Biffa and Catering Academy.

WarpIT gave information on the recycling process on site, and TH White promoted the solar farm it had installed at Porton.

EMCOR celebrated International Women's Day to highlight equality and diversity by asking female staff to state ways in which they were going to be bolder in their attitude. Positive feedback was provided from all those staff that attended the show.

Sustainability at PHE Colindale

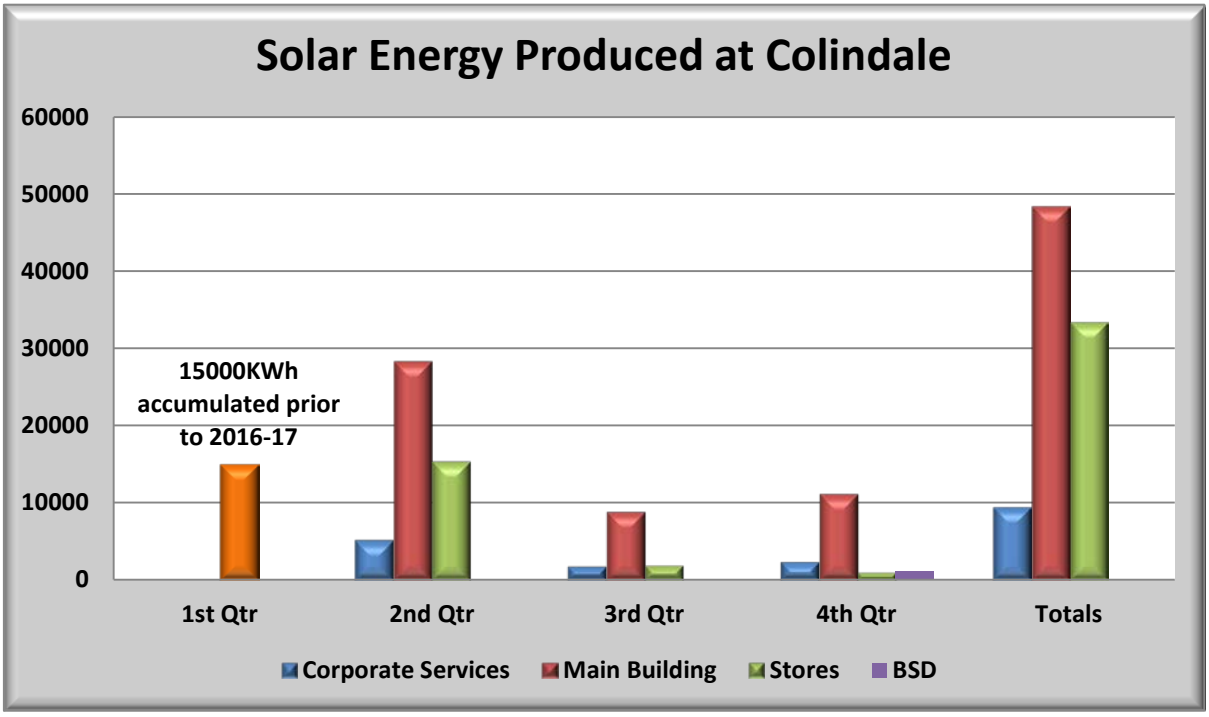
Introduction

Colindale has continued to pursue sustainability in all of the main site operations and where possible encourage managers to procure the most energy-efficient plant and laboratory equipment to undertake digital processes on site. During 2016-17, two very large containment level 3 laboratories have been built to accommodate an additional 20 people who have been relocated from Whitechapel. These laboratories have 9 new safety cabinets, HVAC and cooling systems. Hence, we anticipate additional resource use.

In addition, our operations take account of the health and social welfare of the staff working on site by addressing their mental wellbeing with an improved environment and better facilities.

Energy

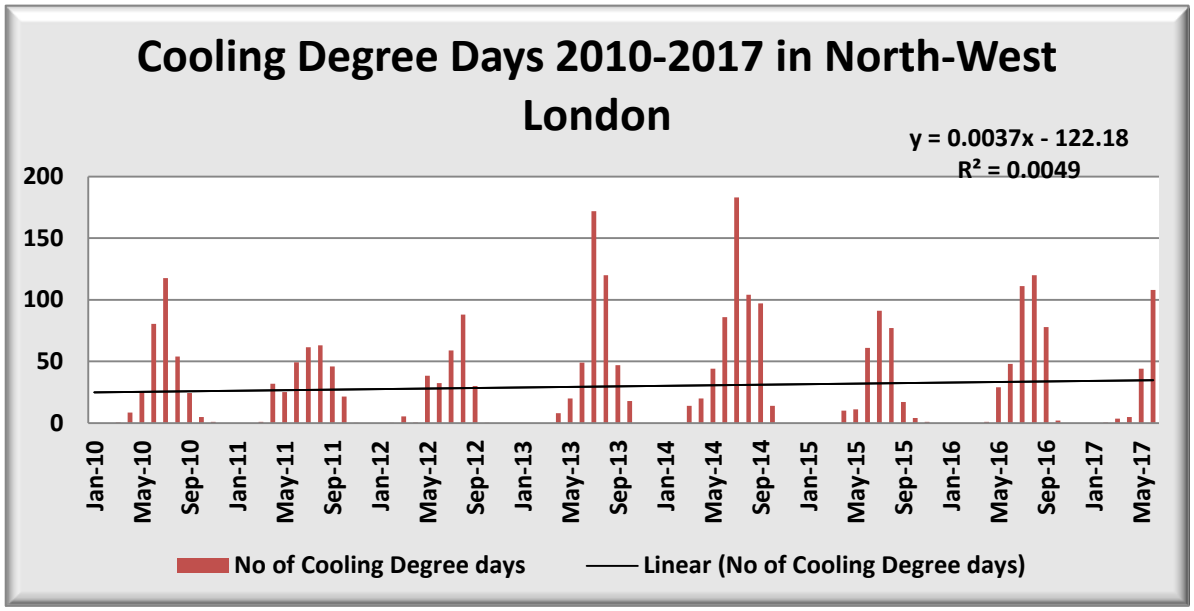
To date, we have installed 4 phases of solar photovoltaic panels on our south facing roofs to collect the sun's energy and produce power that goes back into the grid. The fourth phase having recently been installed.



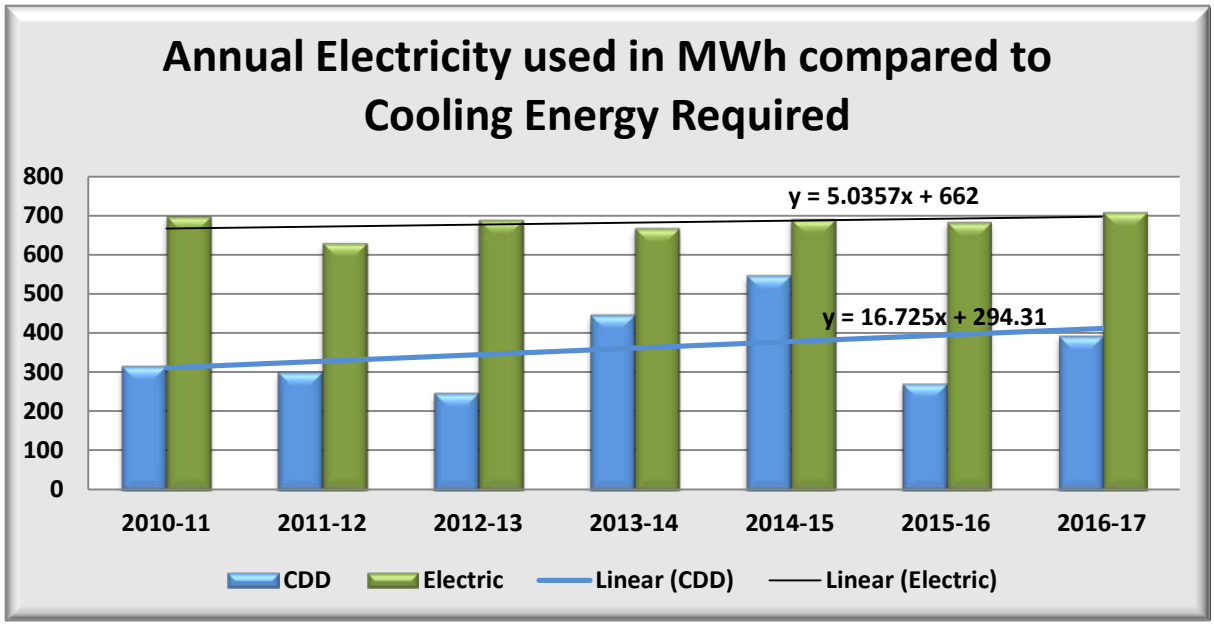
Graph 1: Energy produced through photovoltaic solar cells at Colindale.

NB: The energy shown during Qtr. 1 was the total produced to date by the panels installed during phase 1 on the stores building.

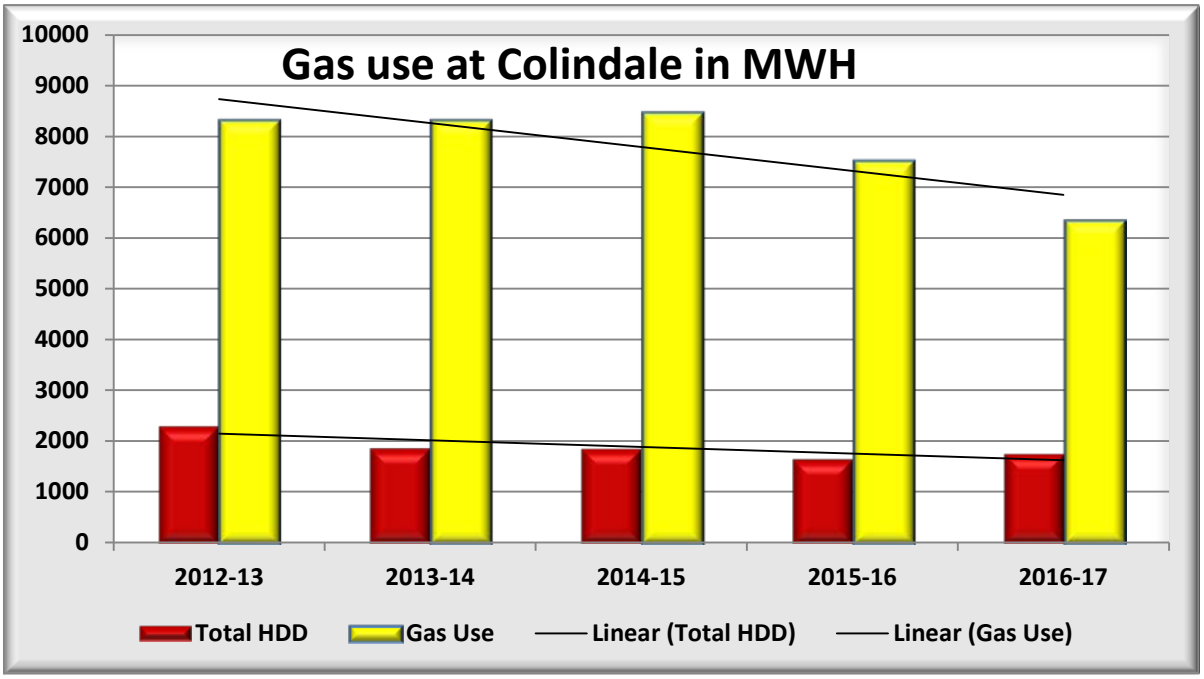
Electricity use at Colindale has been steadily increasing during the past few years as processes are becoming more electronic and as the number of cooling degree days has continued to upsurge as shown below.



Graph 2: The number of Cooling degree days in North-West London



Graph 3: shows how energy at Colindale has consistently been used more efficiently in spite of the rising trend in cooling required.



Graph 4: Gas use at Colindale compared to heating degree days illustrates the reduced number of heating degree days required and a larger reduction in gas use. The graph shows improved gas efficiency.

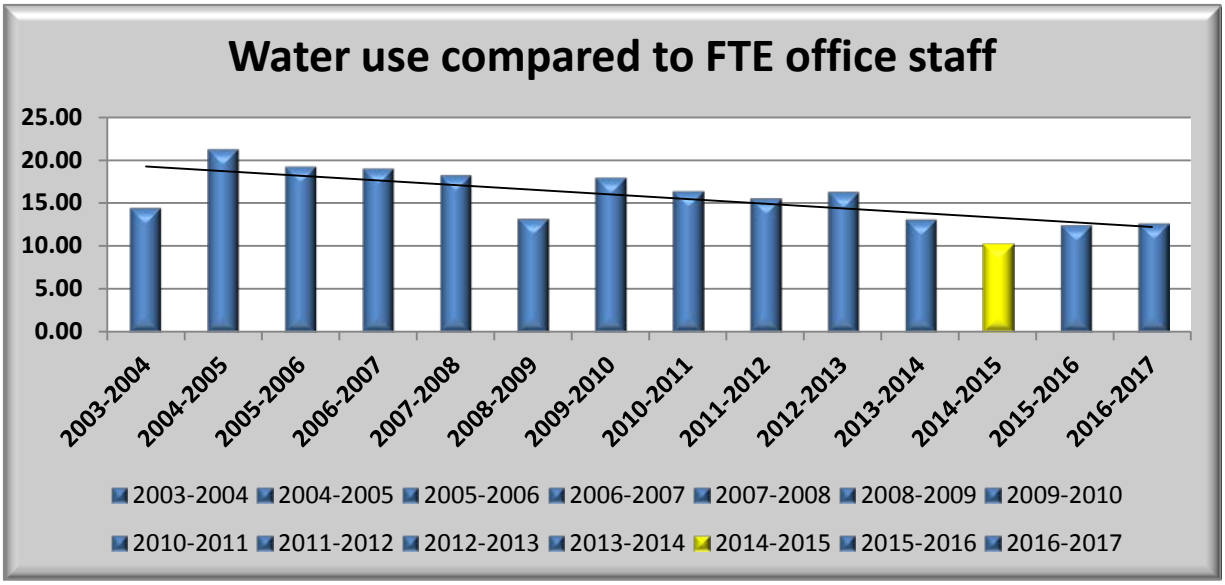
Colindale has continued to substitute fluorescent lighting, with LED lighting. Improved controls enable lights to dim automatically to reduce lighting when not in use without completely switching-off. The LED lights fitted are between 20-60% more energy-efficient and have an extended life which means there is less wastage and less maintenance required.

The boilers at Colindale are over 30 years old. There is a programme to replace the boilers burners over the next 18 months. This will improve their efficiency, enhance resilience and lessen maintenance.

Projects to improve spatial energy efficiency and reduce leaks include, coating the roof with a waterproofing sealant and covering the windows with an anti-blast film for additional security.

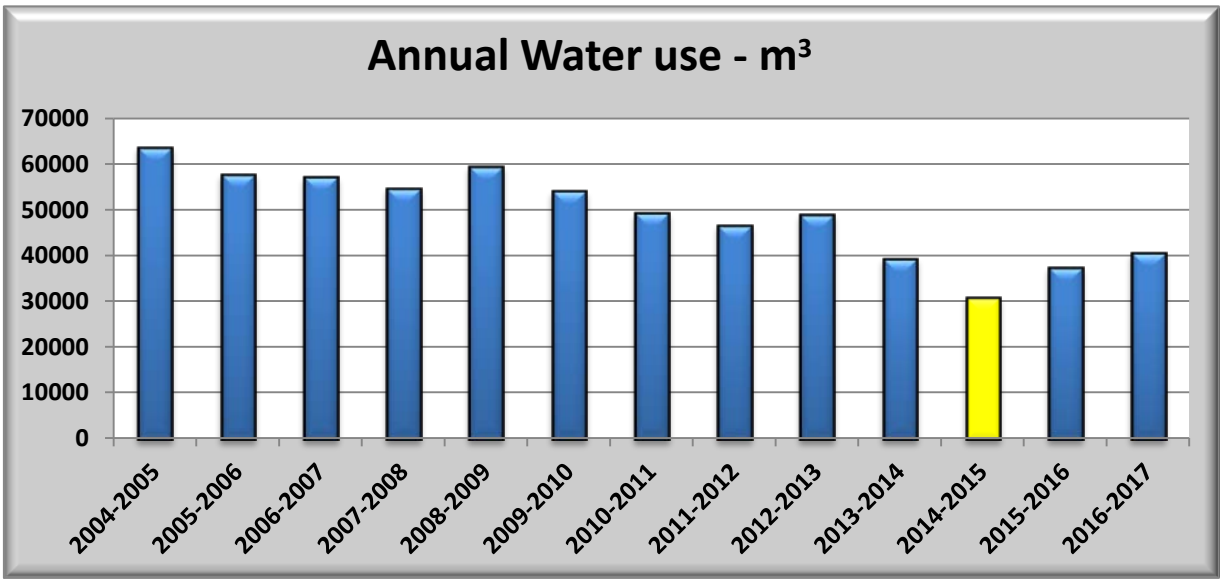
Water

Water use has reached a plateau at the moment whereby more investment would be required to reduce water use. When urinals become obsolete, they are replaced with waterless urinals.



Graph 5: Water use at Colindale in comparison to the number of FTE's onsite.

Please note that water levels during 2014-15 do not reflect true values as meter stopped working.



Graph 6: Colindale's annual water usage

Transport

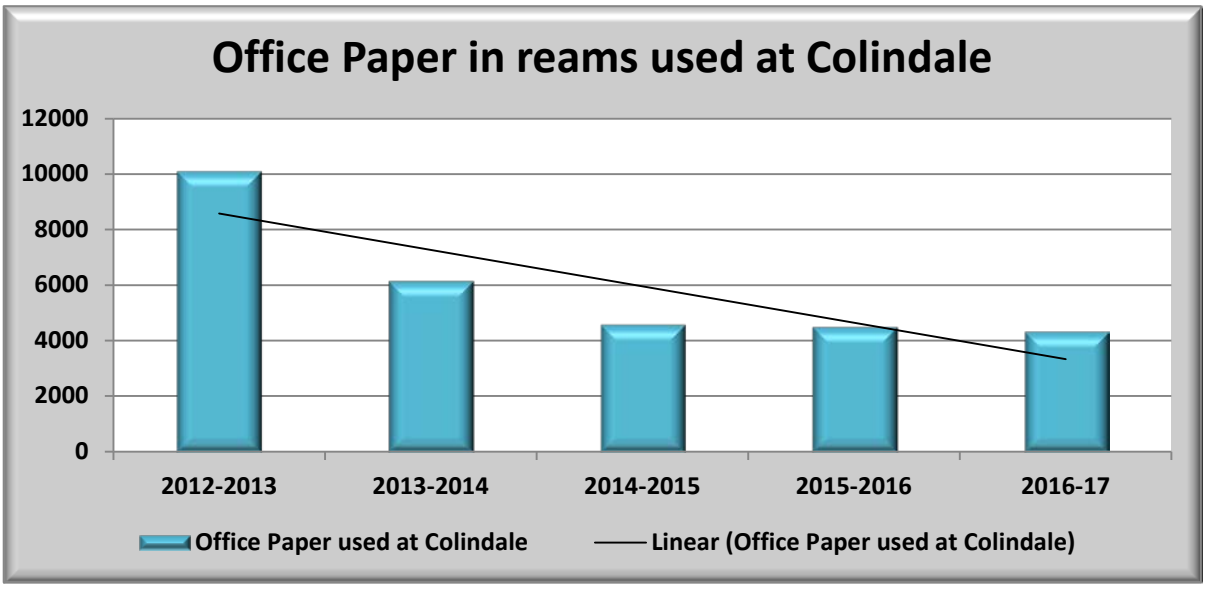
The Colindale site has sufficient public transport facilities, with frequent local buses and an underground tube station within 200m of the site. Although there are no cycle lanes around the roads of Colindale, there are a number of cyclists who make use of the busy streets to commute to work.

In March 2017, sustainable transport was encouraged with advocates from Brent Friends of the Earth whose promotion was driven entirely on air pollution. Roads around the site with unacceptable levels of air pollution were highlighted to staff with statistics and health issues that can occur as a consequence.

Electric bikes were also represented by the local 'Electric Bike Company', which is part of the government's cycle to work scheme. Staff members expressed aspirations to have cycle training lessons at Colindale. Barnet Council provided funding for cycle lessons during 2016-17 and lessons were offered to staff by 'Cycle Confident' in June.

Paper

We monitor our paper use and paper waste at Colindale. Our use of paper has reduced during the past few years, as shown by the graph below, which details how many reams of paper stores have provided to staff onsite.



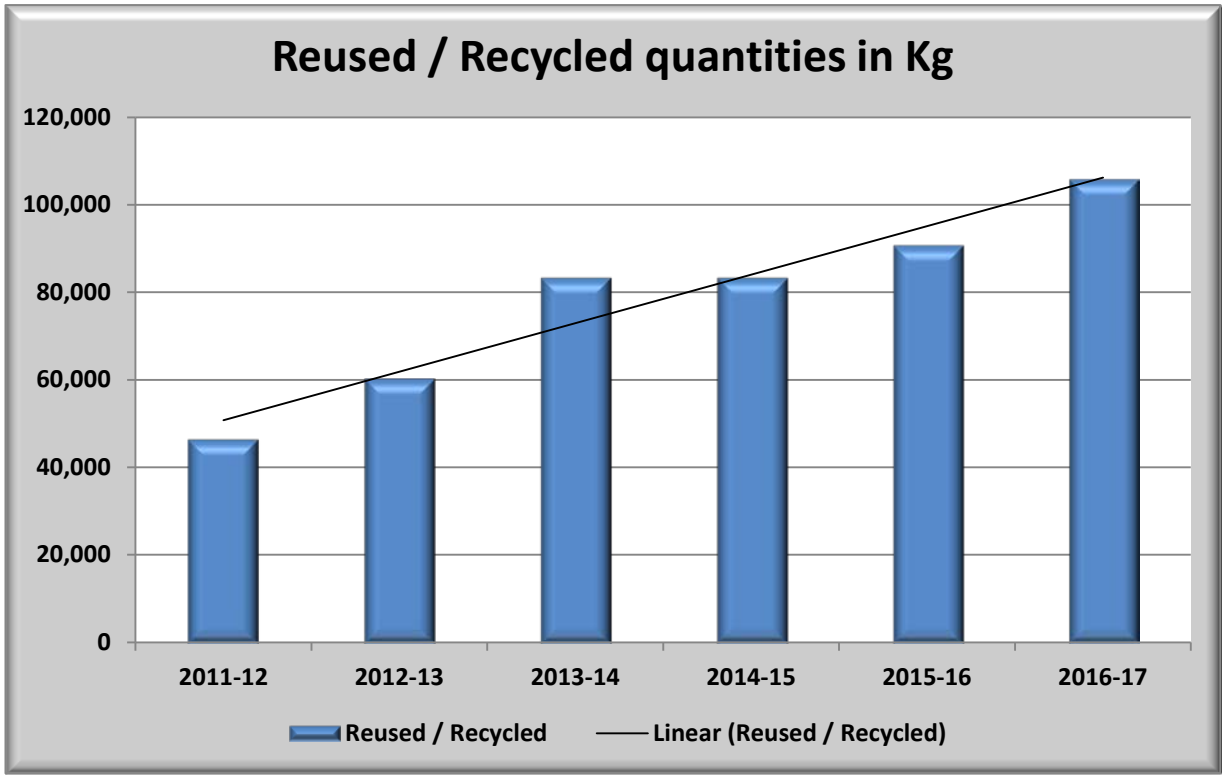
Graph 7: Colindale's annual paper usage

Waste

Waste projects have included cutting down on using paper cups in the refectory by encouraging staff to use reusable cups with a surcharge of 5p on each paper cup provided. Refectory management have reported that at least 6,525 paper cups have been saved due to the surcharge implemented.

In order to prevent large items of furniture from potentially becoming waste, the items were offered to a family in Malindi, Kenya who have built a hospital in order to treat poor local people who would otherwise have a lack of opportunity in healthcare.

Although the amount of total waste has not reduced onsite, during the past year, the amount of waste that is being recycled or reused has increased considerably as shown in the graph below. In order to make the laboratories as safe as technically possible, they have been using consumables that are almost entirely for one use only. This practice improves safety but also increases waste produced.



Graph 8: Colindale's increased recycled and reused waste usage

Biodiversity and the natural environment

In addition to the targets on resource use as shown above, PHE has to report on action taken to promote, conserve and enhance biodiversity, including use of biodiversity action plans.

The south perimeter of the site concludes along the edge of the Silk Stream, which runs downstream to Welsh Harp or the Brent Reservoir. This is 170 hectares of open water, marshes, trees and grassland which is a designated Site of Special Scientific Interest (SSSI).

Japanese knotweed is a non-indigenous plant that has invaded the banks of the Silk Stream. This species is particularly adept at surviving and moving deep underground through building foundations. PHE has initiated a programme to eradicate the knotweed onsite, however this will take several years to complete. The area occupied by the knotweed has shrunk during the past two years.

A wildlife group has been introduced at Colindale with a membership of 75 staff. There have been bird-watching sessions throughout the year and a notice board has been populated with the names of frequent bird visitors.

In addition, a stand is held at sustainability events with a quiz that encourages staff to identify wildlife. PHE has situated bird houses around the site, a house for insects and staff on site plant flowers that are attractive to the bees.

Areas around site are left aside for wild flowers and PHE hopes to re-introduce bees to the site again.

Flooding in the lower car park has become a problem in recent years as buildings have replaced infiltration land upstream and rain volumes increase with global warming. The raised beds housing the allotments were impacted upon as sleepers were picked up by the high water levels and moved. The raised beds were fixed in March 2017 and a physic garden has begun restoration of the area.

The raised beds and other uninhabited areas around site will be used for plants with medicinal features. The catalogue describes the plants and its uses and a map is underway to show exactly where they are planted. The areas are designated according to the main health aspects such as gastroenterology. Planting is under way as beds have been prepared and the Physic Garden will be opened during the October Sustainability Day.

Staff wellbeing

Colindale has its own craft group, which is recognised as a hobby that helps to maintain good mental health of its members. This group has raised funds for several charities throughout the year by producing items and then selling them during event days. £230 was raised from the Christmas craft fair with half the money going to the 7th Edgware Girl Guides and the other half going to the Colindale Christmas children's party.

A summer craft event was held collecting £120, which went to the charity 'Sane' and an autumn event raised £200 for the 'Mission Rabies' charity. A cake-baking event was also held in May, with £646 raised for Ovarian Cancer Action.

Mental health first aid training continued across the country, with a further 8 training sessions given to help staff recognise people suffering with a mental health issue and try to prevent subsequent long-term sick leave. 'Resilience training' has also been given to staff to help them with their personal welfare.

Procurement of food and catering services

PHE's Colindale site has a food forum group that meets monthly to discuss improvements in the catering services, supplied by Catering Academy and EMCOR. This has led to further carbon savings with the additional benefit of nutritional improvements in the staff restaurant. This has been highlighted by signage around the refectory and with displays during the sustainability days.

Environmental communications

Colindale had 3 sustainability events during 2016-17 to highlighting the environment and sustainability, beginning with an event on 17 June. Food waste and how to freeze leftovers and extend the life of your food was a highlight. RSPB was successful at gaining new members and the wildlife group extended its membership.

On 3 November we held another sustainability event and raised £170 for the housing and homeless charity Shelter through a baking competition. Project Search was represented with their team members who also produced posters for the day to highlight the plight of our planet and helped sell raffle tickets. Prizes included solar light-up bird feeders, eco-cleaning products, wine and gift vouchers

On 8 March 2017 another event was held which raised funds for the charity MIND. This event also celebrated gender equality as it was held on 'International Women's day'. *Fatsia Japonica* plants were given away to staff to encourage staff to get closer to nature. These plants are particularly good at absorbing the formaldehyde in the air so they are a good indoor plant.

Climate Change and Extreme Events

The information below outlines the work that has been undertaken by the Climate Change Group and the Extreme Events and Health Protection teams at PHE.

Heatwave Plan for England

PHE co-ordinates and publishes the Heatwave Plan for England on behalf of the health and social care sector. This sets 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 severe heat on health. The plan its self will remain extant until further notice while an independent evaluation of the plan, commissioned by the Department of Health and Social Care, is carried out by the Policy Innovation Research Unit at the London School of Hygiene and Tropical Medicine.

In March 2017 the annual Heatwave Plan for England seminar was held in London. A wide range of heat and health related work was presented to an audience that included individuals from government departments and agencies, local government, non-governmental organisations, academia and a number of international colleagues. The attendees also participated in a number of breakout sessions focussed on improving and further developing some of the materials published by PHE to support the implementation of the Heatwave Plan for England. This included the *Beat the Heat* public facing poster and leaflet published in 2016 and the new *Beat the Heat* resource, overheating in care homes poster and checklist, published May 2017.

During the 2016 hot weather season there were 10 Heat Health Alerts issued by the Met Office, of which at least one region of England was at level 2 for 4 days, and at least one region of England was at level 3 for 6 days. PHE responded by raising awareness among the public and professionals of actions to protect health, particularly of those most at risk. Routine health surveillance was undertaken and impacts observed in line with the raised temperatures.

Cold Weather Plan for England

PHE also co-ordinates and publishes the Cold Weather Plan for England. It aims to prevent the major avoidable effects on health during periods of cold weather in England by alerting people to the negative health effects of cold weather, and enabling them to prepare and respond appropriately. It recommends a series of steps to reduce the risks to health from cold weather for the NHS, local authorities, social care and other public agencies, professionals working with people at risk and individuals, local communities and voluntary groups.

The 2016 annual PHE Cold Weather Plan for England seminar was held in September 2016 in London. A series of presentations provided the audience with updates on policy and practice initiatives such as the PHE winter pressures pilot with Fire and Rescue Services.

During the 2016-2017 winter season, there were 32 cold weather alerts issued by the Met Office, of which at least one region within England was at level 2 for 37 days and at least one region within England at level 3 for 26 days. PHE undertook professional and public facing communications to raise awareness of health protective actions and cold weather messages also featured in the PHE and NHS social marketing campaign Stay Well This Winter.

Flooding

PHE is an active participant in the co-ordination and analysis of data from the National study of flooding and health. Outputs from this programme include the article 'The English national cohort study of flooding and health: cross-sectional analysis of mental health outcomes at year one', which was published in the BMC Public Health open access peer-reviewed journal in January 2017. In June 2017 a second output of the programme included the article '*Effect of evacuation and displacement on the association between flooding and mental health outcomes: a cross-sectional analysis of UK survey data'*, published in The Lancet.

A summary for policy makers has been written and published on the PHE website and can be found at:
https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/597846/NSFH_briefing_for_policymakers_and_practitioners.pdf

PHE has been involved in the emergency preparation, response and resilience (EPRR) work that has been a continuing area of work. For example, in January 2017 PHE contributed to the operational response to the forecast East Coast surge, by participating in the cross-governmental preparation and communications in anticipation of the flood event.

Emerging issues

PHE continues to work with colleagues across government, with academia and with 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, which PHE sits on.

PHE has previously undertaken a literature review of the health risks of drought, which is currently being updated.

Following a severe epidemic asthma event following a thunderstorm in Melbourne, Australia in November 2016, PHE has been working with Met Office and Australian colleagues to consider the best course of action to ensure that these impacts are reduced should a similar event occur in England.

Climate Change Risk Assessment and National Adaption Programme

The Climate Change Risk Assessment (CCRA) sets out the main risks from climate change, and priorities for adaptation in the UK, and is reviewed every five years as required by the Climate Change Act 2008. The six immediate priority areas identified by the most recent report are related to risks of flooding and coastal change, the impact of high temperatures in the built environment, risks to natural capital, risks of future water shortages, impacts on the global food system, and risks arising from new and emerging pests and diseases.

PHE has contributed to the CCRA reports, as the health sector champion for the first CCRA in 2012, and through authorship, workshop attendance, and reviewing for the evidence review for the second CCRA, published in 2016. The formal report (CCRA 2017) was published by Defra in January 2017. PHE have also been working with colleagues from the Department of Health, NHS England and the Sustainable Development Unit on reporting on the progress of the current National Adaption Programme (NAP). The CCRA 2017 will inform the next NAP, which is due early 2018.

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. The aim of the HPRU 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.

The HPRU in ECH helps PHE to fulfil its requirements under the National Adaptation Programme and other policies on sustainable development, and also produce research of relevance to other government departments such as BEIS, DCLG, and Defra, regarding the health co-benefits of environmental 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 (due 2017/18) 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 building overheating, as well as urban green space. This research also supports the “Healthy People Healthy Places” programme, and informs the PHE 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 Research and Applied Epidemiology Scientific Conference, held in Warwick in March 2017. PHE members presented their research on the Urban Heat Island and potential mitigation measures of this effect, flooding and health protection, and climate and infectious diseases.

Management and governance

Responsibility for delivering our sustainable development goals, and realising the opportunities that they can offer, lies with all of our members of staff from the most junior to the most senior.

Agreement and commitment to PHE's sustainability aspirations, obligations and legal requirements, are laid out in PHE's SDMP. This document enables us to demonstrate true leadership and highlights our ambition to be an exemplar organisation with regards to sustainability in the health sector.

Operational delivery of the sustainable development agenda has been devolved by PHE's Management Committee, to the Sustainable Development and Climate Change Programme Board (SDCCPB). They will monitor progress on the implementation of our sustainability objectives and targets and report on assurance to PHE's Resource and Prioritisation Group through the Chair on an annual basis. Where there are issues of strategic relevance, the Chair will report to PHE's Strategy Board.

The SDCCPB will enable existing activities on sustainability and climate change to gain value by providing a strategic platform through which work is shared, gaps identified and new work programmes agreed. All members of the SDCCPB will act as advocates of sustainable development and support PHE's role in communicating the health implications of climate change.

Sustainable Development has implications for all aspects of PHE's business. Therefore, management teams have a responsibility to include various aspects of the SDMP in their local, directorate and corporate business plans, where appropriate. Outcomes from the plan will enable us to measure our performance, achieve a better understanding of the actions that will make the biggest impact and help prioritise our medium and longer term commitments to this agenda.

Sustainable Development and Environmental Management Group

The Sustainable Development and Environmental Management Group (SDEMG) maintains oversight of corporate internal sustainability issues and their management within PHE's estate. The SDEMG is a sub-group of PHE's Sustainable Development and Climate Change Programme Board, and as such has responsibility for:

- advising the chair and membership of the SDCCPB and, where appropriate, other senior management teams, on any areas where the PHE may be at risk of not continuing to meet any statutory environmental management and sustainable development requirements
- developing strategy and policy to continually improve on the organisations environmental and sustainable development performance
- proposing achievable objectives and targets so PHE can meet and where possible exceed the governments 'Greening Government' sustainability targets, thus minimising its environmental impact (carbon footprint, travel, water, waste) and also ensuring our purchasing activities meet the government's standards for sustainable procurement
- engaging with staff across the whole organisation on sustainable development and advise on best practice where required

Membership in 2016/17 was:

Bernd Eggen	Centre for Radiation Chemical and Environmental Hazards
Brigitte Guile	Environmental Manager, Colindale/Porton
Peter Hammond	Head of Security and Sustainability
Jim McLauchlin	Microbiology Services: Laboratories
Steve Owens	Head of Sustainable Development (Chair)
Chris Smith	Procurement
Ross Thompson	Climate Change and Extreme Events

The following people also served on the group during the year:

Jo Campbell-Brown	Chief Knowledge Officer directorate
Natalie Glover	Operations Directorate and regional lead
Peter Gidman	Head of Estates and Facilities
John Thornes	Centre for Radiation Chemical and Environmental Hazards