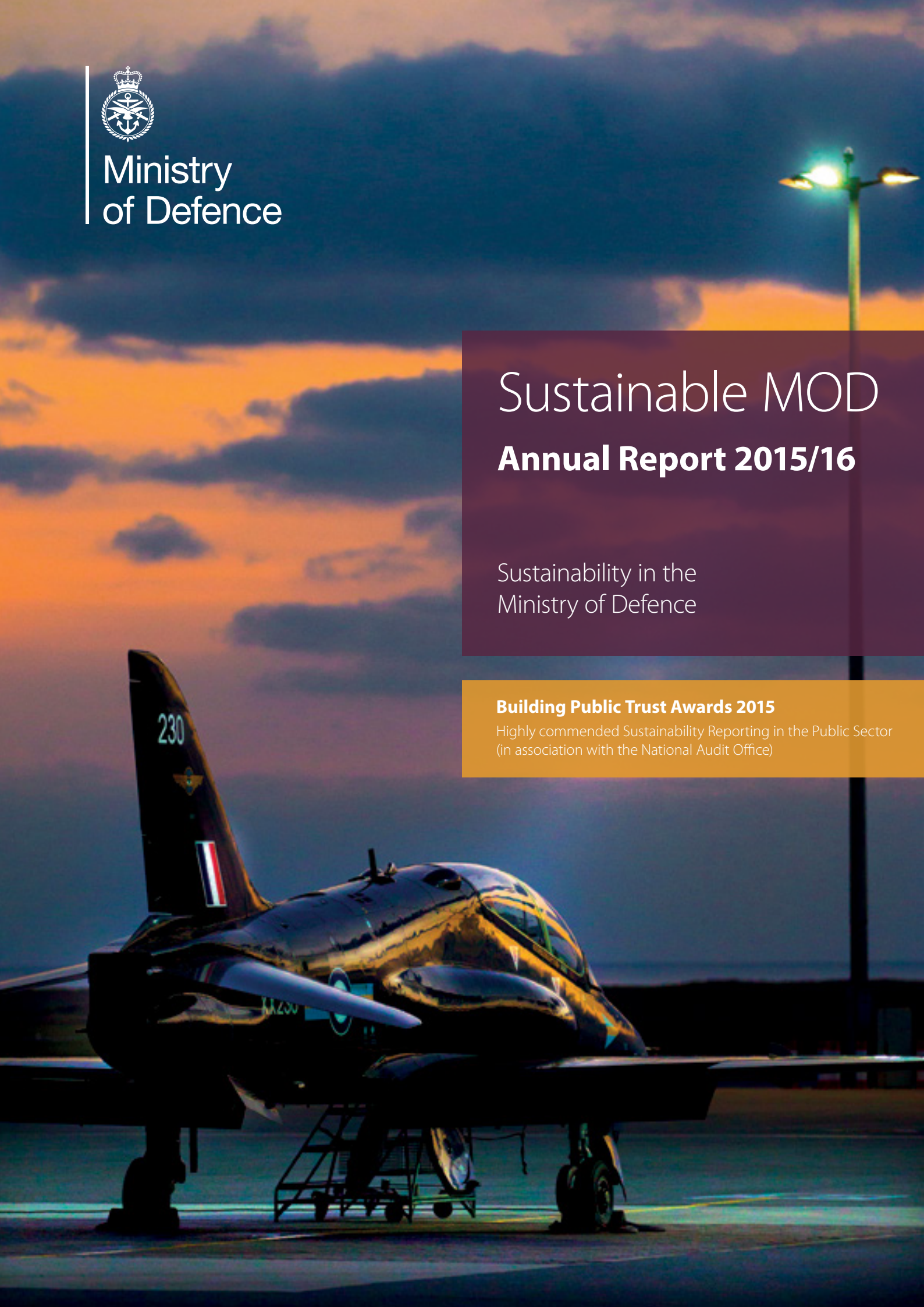


Ministry of Defence

Sustainable MOD

Annual Report 2015/16

Sustainability in the Ministry of Defence

Building Public Trust Awards 2015

Highly commended Sustainability Reporting in the Public Sector (in association with the National Audit Office)

…highly commended by the National Audit Office and PWC in the 2015 Building Public Trust Awards…

our performance in 2015/16

Foreword by **Julie Taylor**

As the new MOD Sustainability Champion, I am pleased to see how MOD is approaching sustainability, looking beyond the Greening Government Commitments to those areas which will help make MOD a truly efficient, resilient and sustainable department.

2015-16 has been a key year for the sustainability agenda, with the United Nations adopting the Sustainable Development Goals for the next 15 years, and last October the Climate Change Conference in Paris agreeing commitments to reduce greenhouse gases, where MOD's Minister for Reserves gave a key note speech at the Climate and Defence Conference ahead of the summit on making Defence resilient to the impacts of climate change. As well as the implications of climate change on global defence and security, mitigating and adapting to climate impacts on the home base will remain a key priority for this department over the next few years.

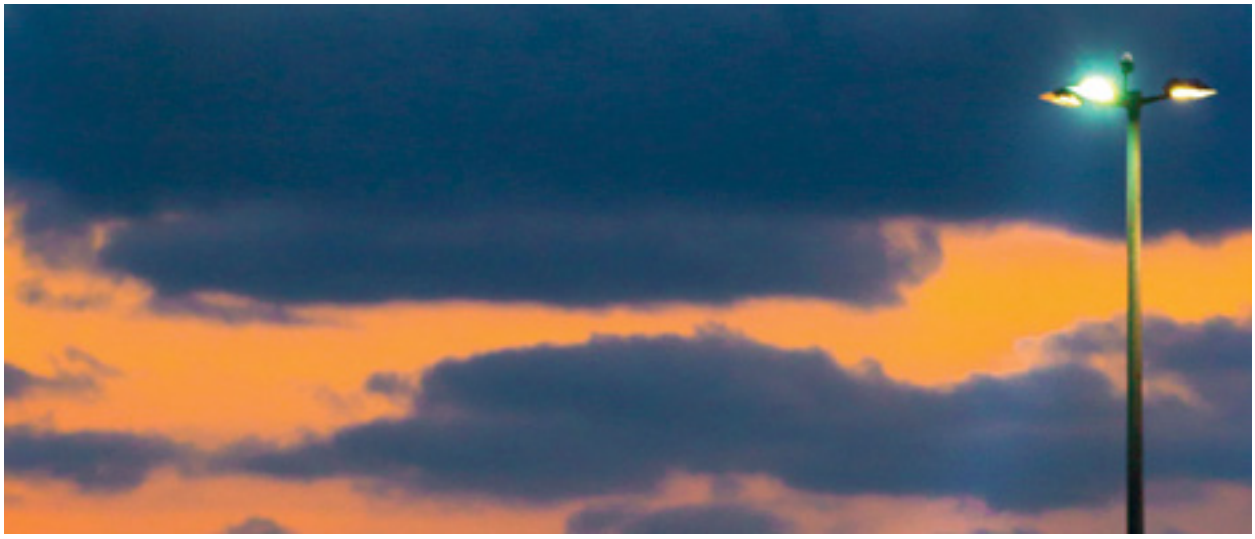
Following the Strategic Defence and Security Review, our new Sustainable MOD Strategy has been published, setting out our priority areas for the next 10 years, and continuing to evolve our business to ensure sustainability informs our decisions.

As you'll see from the performance section, within the MOD we have continued to make progress against our key priorities of energy use and diverting waste from landfill, though the ongoing delivery of key defence programmes continues to affect the amount of waste we generate, and the energy and water demands on the estate, particularly as a consequence of the Army Basing Programme and equipment programmes including the Queen Elizabeth Carriers. We have also made good progress towards getting our SSSIs into the 'Favourable' target condition.

Whilst there has been some good progress made over recent years, we are not yet satisfied. Looking forward, we will be considering how we take our priorities forward over the next four years, along with the new Greening Government Commitment and targets due to be announced shortly; and ensuring that we embed sustainability into our developing Footprint Strategy for the estate.

I am also pleased to report the Department was 'Highly Commended' by the National Audit Office and PWC in the 2015 Building Public Trust Awards (public bodies category) for last year's annual report, and hope you will agree that this report reflects our continuing aim to improve our sustainability standards and transparency. I commend this 2015/16 report to you.

Julie Taylor
Director General of Head Office and Commissioning Services and MOD Sustainability Champion



Contents

Performance at a glance 5

1. Introduction 8
- 1.1 Sustainability in the Ministry of Defence 8
- 1.2 Greening Government Commitments 8
- 1.3 Governance 10
- 1.4 Assurance 11

2. Sustainable MOD Strategy 14
- 2.1 Sustainable MOD Strategy 2015-2025 – "Act and Evolve" 14
- 2.2 Related Strategies and Programmes 14
  - 2.2.1 Capability Energy Strategy 14
  - 2.2.2 Defence People and Training Strategy 14
  - 2.2.3 Armed Forces Families Strategy 16
  - 2.2.4 Defence People Health and Wellbeing Strategy 16
  - 2.2.5 Strategy for Defence Infrastructure & Footprint Strategy 17
  - 2.2.6 Sustainable Information and Communication Technology (ICT) Strategy 17

3. Performance 2015/16 20
- 3.1 Energy Efficiency and Security 20
  - 3.1.1 Capability and Equipment Energy 20
  - 3.1.2 Estate Energy and Greenhouse Gas Emissions 22
- 3.2 Climate Resilience 24
  - 3.2.1 Estate and Infrastructure Adaptation 24
  - 3.2.2 Resilience Research Programme 24
  - 3.2.3 Equipment 25
- 3.3 Utilities 25
  - 3.3.1 Waste 25
  - 3.3.2 Water 27
  - 3.3.3 Office Water Use 29
- 3.4 Acquisition and Infrastructure Systems 30
  - 3.4.1 Supply Chain 30
  - 3.4.2 Sustainable Equipment Acquisition 31
  - 3.4.3 Sustainable Infrastructure System 32
  - 3.4.4 Appraisal Tools 32
  - 3.4.5 Sustainable Construction 33
- 3.5 Ways of Working 33
  - 3.5.1 Information and Communication Technology (ICT) 33
  - 3.5.2 Infrastructure Management System (IMS) 34
  - 3.5.3 Business Travel 34
  - 3.5.4 Domestic Air Travel 36
  - 3.5.5 Paper Demand 38
- 3.6 Estate Stewardship 39
  - 3.6.1 Biodiversity 39
  - 3.6.2 Heritage 41
  - 3.6.3 Access and Recreation 44

4. Next Steps and Challenges 48
- 4.1 GGC 2016-2020 48

Annexes 53
- Annex A: Energy and Carbon Emissions data 2009/10 - 2015/16 53
- Annex B: Water and Waste data 2009/10 - 2015/16 54
- Annex C: Caveats and Explanatory Notes 55
- Annex D: List of Acronyms 58

List of Tables

Table 1: Greening Government Commitments and Targets 2010-2015
Table 2: Capability & Equipment Energy Consumption
Table 3: Total GHG emissions – Comparison to 2009/10 baseline
Table 4: Waste generated - Comparison to 2009/10 baseline
Table 5: Estate-wide water consumption – Comparison to 2009/10 baseline
Table 6: Office water consumption
Table 7: Offices in scope and removed during the 2010-15 period
Table 8: DREAM assessments undertaken in 2015/16
Table 9: Carbon Emissions from Administrative Business Travel - All
Table 10: Domestic (UK) air travel – total number of flights
Table 11: Domestic (UK) air travel – number of flights split between the Front Line Commands and the Administrative organisations in MOD
Table 12: Paper demand – Comparison to 2009/10 baseline
Table 13: Condition status of SSSIs/ ASSIs under MOD management
Table 14: Condition of MOD Scheduled Monuments
Table 15: Condition of MOD Listed Buildings - Comparison
Table 16: GGC 2016-2020

List of Figures

Figure 1: Material high priorities
Figure 2: Capability & equipment energy consumption
Figure 3: Total GHG emissions – Comparison to 2009/10 baseline
Figure 4: Waste generated - Comparison to 2009/10 baseline
Figure 5: Estate-wide water consumption – Comparison to 2009/10 baseline
Figure 6: Carbon Emissions from Administrative Business Travel - All
Figure 7: Domestic air travel – Comparison to 2009/10 baseline
Figure 8: Paper demand – Comparison to 2009/10 baseline
Figure 9: Condition status of SSSIs/ ASSIs under MOD management
Figure 10: Condition of Listed Buildings - Comparison

Performance at a glance

90% of waste diverted from landfill, up from 88% diverted last year

TRIAD campaign delivered savings of 21,426 KWh, 66 tCO_2e and £230,249

7% increase in "Favourable" condition of Sites of Special Scientific Interest in England since April 2015

Highly Commended in the Building Public Trust Awards for Sustainability Reporting in the Public Sector

21% reduction in domestic air travel for the administrative parts of the MOD, up from 20% reduction in 2014/15

4% reduction in domestic air travel for the whole of the MOD down from 5% reduction in 2014/15

7 sites assessed for climate resilience and 9 sites reviewed as part of five year cycle

13.8m³ office water benchmark, showing decreased use from 14.3m³ in 2014/15

16% reduction in waste generated, increased from 12% reduction in 2014/15

9% reduction in water demand showing increased demand from 10% reduction achieved in 2014/15

Nearly 99% of ICT waste reused or recycled

13% reduction in GHG emissions from all travel including international air travel compared to 2009/10, up from 9% reduction in 2014/15

23% reduction in paper consumption, increased from 12% reduction in 2014/15

22% reduction in GHG emissions from estate & business travel, up from 19% reduction in 2014/15

1. Introduction

1. Introduction

This annual report provides an overview of the Department's progress against both the Sustainable MOD requirements and the Greening Government Commitments and Targets (GGC) during 2015/16, and fulfils our obligations to report sustainability performance under the Department's Annual Report and Accounts. It also looks beyond the GGC targets, to wider activity within MOD that supports creating a more sustainable Department.

1.1 Sustainability in the Ministry of Defence

The importance of sustainability to the Ministry of Defence is not purely for its own sake, but because managing socio-economic and environmental effects at an organisational level supports a modern military and achievement of the Department's strategic objectives. This was recognised in the Strategic Defence and Security Review 2010, and reiterated again with the inclusion of sustainable development within the National Security Strategy and Strategic Defence and Security Review 2015. At its most simple, sustainability is being efficient in the use of assets and resources, our material security and supply chain, and planning for the long term to take account of environmental and socio-economic risks and opportunities.

During the past year, we published an updated Sustainable MOD strategy setting out the future direction of our sustainability agenda, and our key areas for focus over the next 10 years, called "Act and Evolve". We have also continued to integrate our sustainability principles into Departmental business, and have been working with Department for the Environment, Food and Rural Affairs (Defra) and other Departments in the development of the new Greening Government Commitments and Targets for 2016-2020.

1.2 Greening Government Commitments

During 2015/16 we continued to work towards the previous 2010-2015 GGC targets, which were retained for a further year with a commitment to strive for further improvement; whilst Government undertook work to develop new targets for the period 2016-2020.

The Army Basing Programme (ABP) to enable the drawdown from Germany, and ongoing estate activity has resulted in an increase in our energy and water demand in the UK. Due to the types of energy used, and our ongoing spend to save programmes that continue to improve efficiency; we are still able to report a 23% reduction in carbon emissions from estate and business travel, and a small reduction in our office water benchmark.

…At its most simple, sustainability is being efficient in the use of assets and resources, our material security and supply chain…

Table 1: Greening Government Commitments and Targets 2010-2015

The Greening Government Commitments are a set of 5-year targets (April 2010-March 2015 with 2009/10 as baseline) that central government departments and their agencies must strive to achieve.	
1	Reduce greenhouse gas emissions by 25% from a 2009/2010 baseline, from the whole estate and business-related transport This target includes: (a) Cutting domestic business travel flights by 20% by 2015 from a 2009/2010 baseline
2	Reducing the amount of waste we generate by 25% from a 2009/2010 baseline This target includes: (a) Cutting our paper use by 10% from April 2011 to March 2012
3	Reduce water consumption from a 2009/2010 baseline, and report on office water use against best practice benchmarks For non-office water use, departments will set their own water reduction targets This target includes: Percentage of offices meeting best / good / poor practice benchmark
4	Ensure government buys more sustainable and efficient products and engages with its suppliers to understand and reduce the impacts of its supply chain This target includes: (a) Embedding the Government Buying Standards in departmental and centralised procurement contracts, within the context of government's overarching priorities of value for money and streamlining procurement processes
5	Beyond the targets Government's impact and ability to show leadership stretches beyond the headline commitments, for example through the way we promote and conserve biodiversity on our estate, and the standards we set for construction projects. Departments will therefore be open and transparent on the steps they are taking to address the following areas: • Climate Change Adaptation; • Biodiversity and Natural Environment; • Procurement of food and catering services; • Sustainable Construction; and • People.

'Delivering sustainability for the RAF is an opportunity to make a difference and to ensure we are more resilient in our operations, as well as doing our bit for the environment. It is still early days, but if you can measure it, you can influence it and that is a big focus at the moment'.

Wg Cdr Andy Hindley, RAF

Following the SDSR 2010 decisions to reduce stock levels and retire some equipment capabilities; we continue to see significant fluctuations in the amount of waste generated, with reduction over the past year, but also a continuing improvement in the amount of waste diverted from landfill including through recycling or energy generation from waste, achieving a 90% of waste diverted from landfill last year.

Our estate stewardship over the past year has also generated a further increase in the number of our SSSIs in England reaching "favourable" condition – more than any other major landowner; and the DIO specialists have spent a significant focus of effort during 2015/16 working with relevant statutory bodies and local authorities to ensure the protection of heritage and biodiversity as we progress the ABP, and to manage the anticipated increase in demand for access.

1.3 Governance

The Director General Head Office and Commissioning Services (DG HOCS) is the Department's sustainability champion, supported by the Deputy Chief of Defence Staff for Military Capability (DCDS (Mil Cap)), particularly in relation to the Department's energy programme.

We coordinate our sustainability agenda through a Sustainable MOD and Energy Steering Group, chaired by the DG HOCS and DCDS (MilCap). The Steering Group is responsible for setting the direction for MOD's sustainability agenda and priorities; and also for monitoring and driving progress against our sustainability priorities, as set out in the Sustainable MOD Strategy 2015-2025 – Act and Evolve.

The steering group members are drawn from across the Department's business areas including key Arm's Length Bodies and Trading Funds. The steering group is in turn supported by a number of working groups (listed below) that focus on specific sustainability programmes;

- Sustainable MOD Working Group
- Energy Programme Board;
- Defence Utilities Group;
- Sustainable Information and Communication Technology (ICT) Working Group;
- Equipment Energy Working Group; and
- MOD-Industry Sustainable Procurement Working Group.

1.4 Assurance

A Sustainable MOD team provides oversight of performance against our sustainability objectives and priorities. Defence Internal Audit (DIA) works with this team providing independent assurance to the MOD's sustainability champion and senior managers by ensuring that sustainability governance and performance reporting are in line with internal policies, follow government policy, and continuously evolve in line with industry best practice. Our 2015/16 GGC reports were also scrutinised by Carbon Smart on behalf of Defra to validate our reported performance against the GGC.

During 2015/16, DIA, working with PwC, undertook audits into the MOD's overarching governance arrangements for sustainability, and into our work on Climate Resilience and adaptation, and we are developing an action plan to take forward recommendations over the coming year.

2. Sustainable MOD Strategy

2. Sustainable MOD Strategy

2.1 Sustainable MOD Strategy 2015-2025 – "Act and Evolve"

The second edition of the strategy was published in February 2016. It evolves our approach, bringing increased focus on the contribution sustainability can make to supporting Defence capability and outputs.

The two principles that will guide us are to:

- **Act** to make our resource use and assets sustainable; and
- **Evolve** to make our business resilient to the current and future social, economic and environmental changes.

Following a materiality analysis undertaken in 2014[1] (see figure 1); the strategy focuses on priority areas that are either not already dealt with by other existing strategies and programmes or where an additional focus of activity can provide additional benefits to Defence. The strategy can be viewed at:

https://www.gov.uk/government/publications/sustainable-mod-strategy-2015-to-2025

2.2 Related Strategies and Programmes

Of MOD's priority areas, many already have mature strategies and programmes which contribute to the successful and sustainable functioning of the Department. These regularly report on progress, and this annual report does not seek to duplicate these reports or updates, and only summarise or signpost them.

Other strategies and programmes which contribute both directly and indirectly to achieving MOD's sustainability priorities include:

2.2.1 Capability Energy Strategy

Energy is a critical capability, without which we would not be able to deliver military capability. A strategy for our capability energy was developed in 2015/16 to provide a framework for the strategic direction of MOD's energy portfolio, the priorities, and strategic objectives for the management of our energy portfolio.

The strategy sets out a range of short, medium and long term objectives to improve our understanding of our energy demand and ability to forecast, increase the use of alternative energy, and increase the energy efficiency of our current and future equipment capabilities, and construct stringent departmental energy targets (see also Section 3.1). These include a broad range of analysis to capture everything from cost modelling through to future fuels technology and the continued development and use of synthetic training.

2.2.2 Defence People and Training Strategy

People lie at the heart of Defence capability and the delivery of Defence Outputs. Since April 2013, the Chief of Defence People (CDP) has overseen the whole Defence workforce, integrating the management of all personnel, whether Regular or Reserve, Civil Servants, or contractors. This allows decisions to be taken using a 'Whole Force Approach' (WFA).

1 Based on the Global Reporting Initiative (GRI) - www.globalreporting.org/reporting/reporting-framework-overview/Pages/default.aspx

…Energy is a critical capability, without which we would not be able to deliver military capability…

Figure 1: Material high priorities

The recruitment and retention of a capable, motivated, balanced and sustainable workforce, to deliver Defence outputs provides the People component of Defence capability. This supports the Departmental Objective 'Protect our People'. The Defence People Strategy and Plan detail the key activity and work that underpins this intent. CDP manages delivery against these through his chairmanship of the Defence People and Training Board.

We place heavy demands on our people and they will always be critical in achieving a culture of sustainability within the MOD. There are a number of strategies and initiatives that focus on our people which include:

- On 1 April 2016 we introduced a simpler and more efficient pay model (Pay 16);
- The Department has accepted a military recruitment target that 10% of recruits will come from Black, Asian or Minority Ethnic backgrounds, as announced by the Prime Minister prior to the 2015 election. Additionally, the Minister for the Armed Forces has agreed a 15% female recruitment target. The date for both targets to be realised is 2020;

- Developing a Flexible Engagement System in order to: improve recruitment, retention, and diversity; enable the Services to deliver the most cost effective mix of personnel to meet Defence outputs under a WFA; and better utilise the knowledge, skills, and experience of Regulars and Reservists;
- The SDSR announced that we would make a new, more flexible accommodation offer to help more Service personnel live in private accommodation and meet their aspirations for home ownership; we are looking at how best to do this; and
- Work is currently underway to consider options for the New Offer for New Joiner. This will seek to improve recruitment and retention, particularly of key skills (and improve agility to respond to future skill shortages), by developing the most efficient method of targeting reward at Service personnel.

The Armed Forces Covenant[2] is enshrined in law and puts our people at the front and centre of policy making and delivery. We have introduced a range of initiatives to improve Service life, including improved welfare support and a permanent commitment to the Armed Forces Covenant through a £10 million per annum fund which started this year.

This strategy, the Armed Forces Families strategy, and the Health and Wellbeing strategy all support MOD's sustainability priorities, and focus on our people and the communities where we live, our Service Personnel and their families, Defence training and learning, equality and diversity, and the health and resilience of personnel (both military and civilian).

2.2.3 Armed Forces Families' Strategy

We have launched the first UK Armed Forces Families' Strategy[3] which is the Department's articulation of the relationship between Operational Capability, recruitment and retention and the Service person's family.

2.2.4 Defence People Health and Wellbeing Strategy

To deliver the MOD's priorities and objectives we need motivated, engaged and healthy people, both military and civilian. Healthy and well-motivated employees have a positive impact on the productivity and effectiveness of any organisation and the MOD is no different. Likewise, the working environment also impacts on the health and wellbeing of its workforce.

Defence developed a Defence People Health and Wellbeing Strategy and Plan in July 2015, which articulates the health objectives, targets and timelines required to deliver the Strategy. This Strategy, as a subset of the Defence People and Training Strategy, supports the delivery of Defence Tasks through targeted objectives. A further strategy is being developed for the period 2016-2020.

2 Covenant can be viewed at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/491590/20160112-AFC_AR__2015_Ver_12_WEB_VER2.pdf
3 https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/492121/20160108-UK_Armed_Forces_Families_Strategy_2016.pdf

'I see the main challenge for sustainability as translating the concept into something tangible for MOD. Within ISS, the delivery of ICT presents two main sustainability outcomes; procuring the most resource efficient ICT services and utilising innovative technology to optimise ways of working opportunities'.

Adam Turner
Sustainable Technology Lead, JFC ISS Service

2.2.5 Strategy for Defence Infrastructure & Footprint Strategy

In summer 2016, MOD will be publishing its Strategy for Defence Infrastructure (SDI) to address the challenges faced by the estate and infrastructure we use, to enable us to maximise its contribution to defence capability, outputs and communities in a way that is more efficient, affordable, adaptable, and offers best value for money.

A key principle is that we will develop our infrastructure to become sustainable and enable estate resilience. A sustainable estate meets our users' needs whilst taking into account economic, environmental and social impacts, is adapted to future climates and is not reliant on constrained or depleting energy supplies and materials.

The SDI is supported by the Footprint Strategy due to be published in Autumn 2016, which sets out the future lay down for Defence, aims to achieve a 30% reduction in built estate, to consolidate onto fewer sites focused around centres of gravity and specialisation. This supports Defence's sustainability objectives through increasing the utilisation of every building to increase efficiency (including energy, water and waste), to reduce the reliance on building new facilities when re-providing space (reducing Defence's carbon footprint) and to enable adaptation and resilience to future climates.

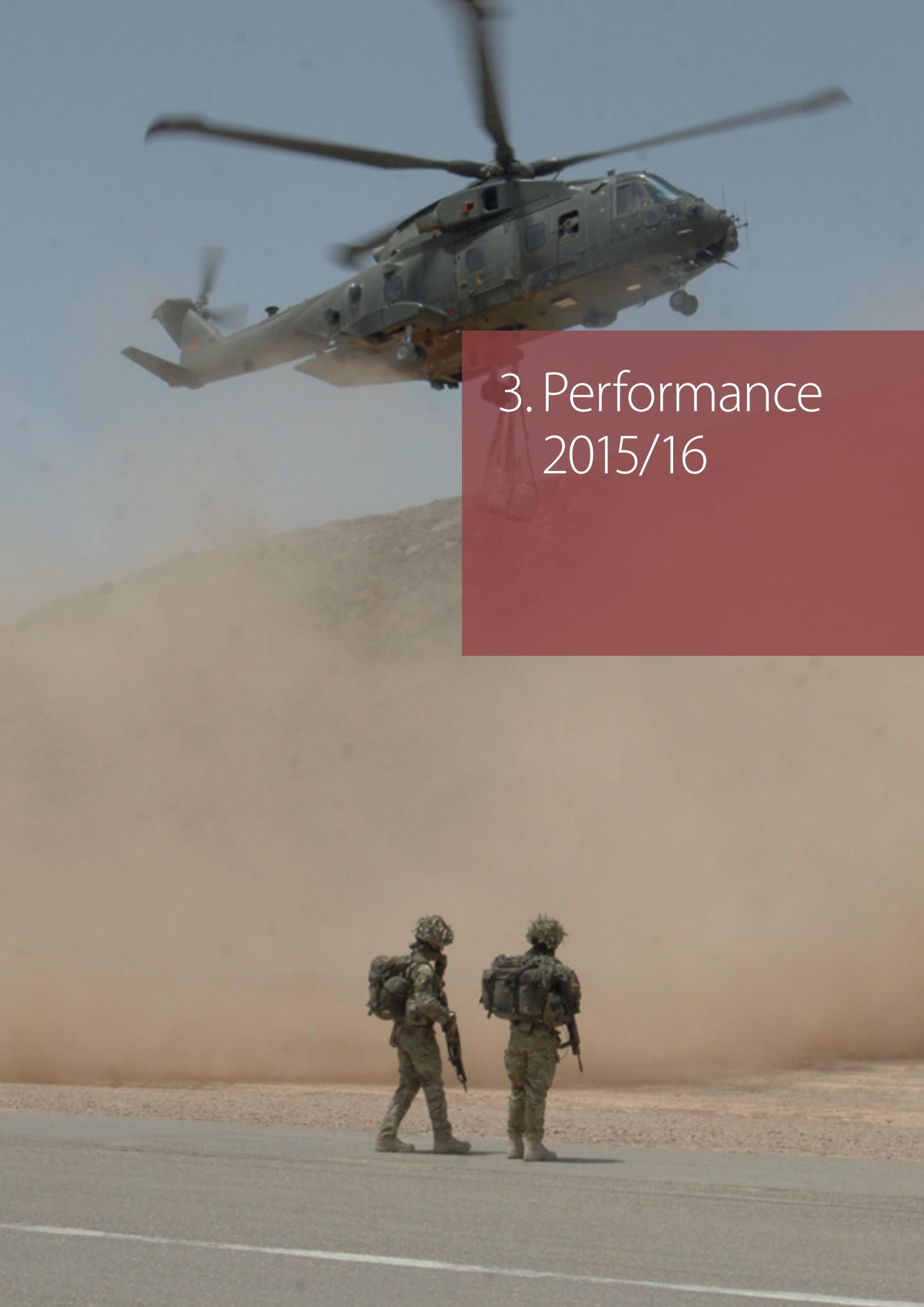
2.2.6 Sustainable Information and Communication Technology (ICT) Strategy

Over the past few years, MOD has been progressing work on the maturity of our ICT sustainability, achieving maturity level 3 – "Practising" on the Sustainable ICT Maturity Model, and meeting the Greening Government ICT Strategy 2015 target. We also completed ten of the 14 key Government Roadmap activities for improving our Green ICT practices. MOD aims to exploit ICT as an enabler to become more sustainable as well as to exploit our ICT more sustainably, which will support progress against the Greening Government Commitments. During 2015/16 we have reviewed our sustainable ICT priorities, part of our overall ICT strategy.

Working towards the vision of "A cost effective and energy efficient ICT estate, which is fully exploited, with reduced environmental impacts to enable new and sustainable ways of working for Defence" we are focussing on delivering the following outcomes:

- Sustainability will be embedded and measurable within ICT procurement processes, improving resilience; and
- ICT services will enable modern working environments and modern working practices and support the meeting of the 2016-2020 Greening Government Commitments.

Over the next period, we will be working towards achieving these outcomes, and maximising the contribution of MOD's ongoing ICT refresh programme, called MODnet (see also section 3.5.1).



3. Performance 2015/16

3. Performance 2015/16

3.1 Energy Efficiency and Security

Energy efficiency and security, both now and in the future is critical to our business and military capability. We have metrics and targets in place to ensure operational, equipment, estate and infrastructure energy performance continues to improve.

3.1.1 Capability and Equipment Energy

The MOD continues to derive savings from its energy portfolio through our target to reduce equipment energy and fuel use by 18% against a 2009/10 baseline. During 2015/16, we have continued to drive further reductions in our use of fossil fuels; however we know this level of improvement is not likely to continue at the same rate, and will be affected by the introduction of new equipment coming into service, including the QE carrier, and the Maritime Patrol aircraft. Additional capabilities that will be developed or enhanced as a result of the SDSR, will require a more refined approach, and so we are in the process of identifying revised intelligent targets; once energy consumption of our equipment is understood in more detail.

Each of the Front Line Commands have now introduced measures to reduce their use of fossil fuels which are supported by a science and technology programme which is working to understand both the different types of energy demand, behavioural change, and adjustments to current equipment, and support to new equipment programmes.

Over the next couple of years, we will have a focus on developing a strong understanding of our energy portfolio, the energy needs of the Future Force 2025, construction of intelligent targets to replace the current 18% target, and a continued drive for efficiency within our current equipment.

MOD has also been working with NATO partners and the European Defence Agency (EDA) Energy and Environment Working Group along with other partner nations to promote collaborative working on energy and environmental issues in military capability including on learning from experience, data collection and analysis, training, and development of specific projects.

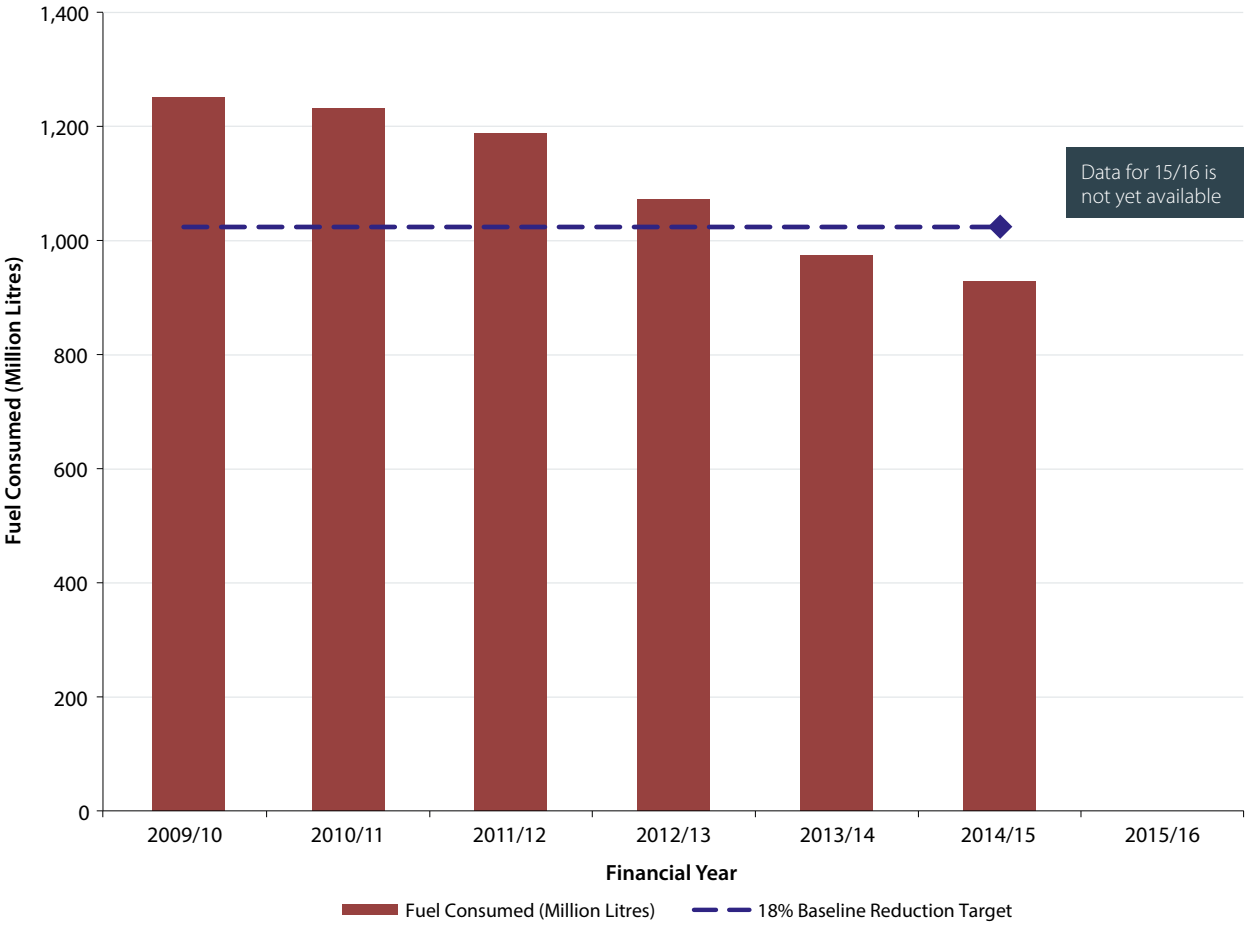
Data for 2015/16 is not available at time of writing this report, and will be updated in future reports.

Table 2: Capability & Equipment Energy Consumption

Capability & Equipment Energy[4]	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15
Fuel in million Litres	1,250	1,231	1,187	1,071	974	928
% change from baseline		-2%	-5%	-14%	-22%	-26%

4 Previous performance figures may differ with those in this table due to improvements in data availability

Figure 2: Capability & Equipment Energy Consumption



Case Study: Dstl/Air Command Sustainable Military Aviation Research Initiative (SMARTI) Programme

Sustainability is ultimately about making sure MOD can continue to develop defence capability. Inevitably, because of what sits within it, the RAF is the largest single user of fuel within the MOD, accounting for over half of total MOD fuel use. Analysts and engineers working under Dstl's Resilience programme have been working closely with Air Command to understand where this energy is used, identify opportunities to reduce energy usage, and establish "smart" targets to try and drive down energy use within the RAF where possible.

Over the past year the programme has evolved to cover not just the RAF's consumption of aviation fuel, but also electricity and gas usage at RAF bases. This has identified a number of "hot spots" - areas of high energy use. Whilst many of these areas will always be associated with high energy use, because of the nature of the activity carried out, there are other areas where the reasons for high energy use aren't so clear. Further examination of these areas will help Air Command to better understand what energy it uses, where, and why. In parallel, the programme has identified a number of potential technological interventions that might potentially reduce the fuel used by certain platforms. Work is

3.1.2 Estate Energy and Greenhouse Gas Emissions

During 2015/16, our overall energy demand on the UK estate has increased, due to estate and personnel basing changes. However, our reported carbon emissions have continued to decrease. The MOD has now reduced emissions from the estate and domestic business travel by 22% from our 09/10 baseline. This equates to a reduction from estate energy and domestic business travel by 318,097 tCO_2e (Table 3 and Annex A). The most recent decrease is mainly the result of increased consumption of energy from low carbon and renewable sources, reflected in changes to the carbon conversion factors used for GGC reporting, which are set by Defra and Carbon Smart.

The Defence Infrastructure Organisation (DIO) continues to lead the department's work to deliver estate energy efficiency and reduce both consumption and carbon emissions. Key to this work is the combination of strategic investment and co-ordinated awareness and behaviour change initiatives and campaigns. Last year, DIO repeated the TRIAD and Red DuOS[5] campaigns between November and February, when the charges for using electricity are at their highest. The TRIAD campaign delivered savings of 21,426 KWh, 66 tCO_2e and £230,249.

To continue focussing investment in reducing energy demand and increasing efficiency, 52 surveys were undertaken to identify retrofit opportunities across the MOD establishments that use the most energy (i.e. those where the annual utilities costs exceed £1M); together with a further 25 surveys of Training Estate sites. This information was used in conjunction with the energy performance benchmarking of 769 establishments to develop the Built Environment Improvement Measures Programme (BEIM). In 2015/16, BEIM has invested of £13M in a range of projects including: lighting upgrades, building energy management systems and improvements to heating, ventilation and air conditioning (HVAC). The estimated annual savings this investment will generate equate to approximately 16,500 tCO_2e and £3M, with an average payback period of four years.

To help individual establishments and MOD organisations better manage their energy usage, DIO provides monthly consumption figures in the form of Head of Establishment reports, and is investing in improving data quality. To this end, DIO is working with the meter operating companies to replace manual fiscal meters with smart meters that will deliver Automated Meter Reading (AMR) and commenced work on developing a sub metering strategy that will be delivered from FY 2016/17. All of which will improve both data quality and our ability to target the investment and interventions necessary to maximise gains in energy efficiency, reduce demand and increase resilience.

As well as continuing our investment in 'spend to save' measures, our next steps include a Strategic Behavioural Change Plan. This covers the non-operational elements of the Defence estate and a plan has been developed that will be progressively rolled out during the course of 2016/17. This will establish Behaviour Change Champions, enable more effective targeting of effort and build on the good work undertaken to date.

5 DUoS significantly increases the MOD electricity costs during red hours (approximately 16:00 -19:00) every weekday (Monday to Friday)

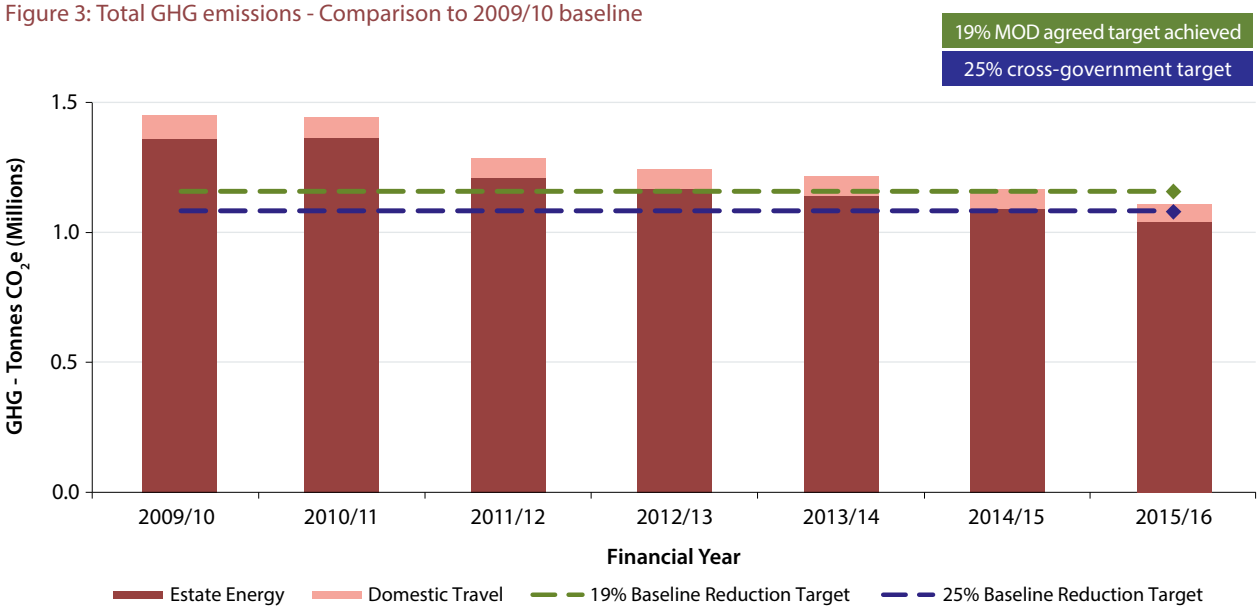
ongoing to assess whether the savings justify the cost of these interventions.

Whilst the programme reduces cost (an additional and important benefit) it is primarily about increasing strategic resilience. As a large user of energy, the RAF is very exposed to certain risks - for example, increases in fuel price. Better understanding of how energy is used will help make sure that our energy use can be managed both now and in the future, minimising these risks and leading ultimately to an increase in the RAF's ability to provide valuable and cost effective capability.

Table 3: Total GHG emissions - Comparison to 2009/10 baseline

GHG - tonnes CO_2e[6]	**2009/10**	**2010/11**	**2011/12**	**2012/13**	**2013/14**	**2014/15**	**2015/16**
Estate Energy[7]	1,342,257[8]	1,364,055	1,210,328	1,168,036	1,141,033	1,090,872	1,050,751
Domestic Business Travel[9]	89,748	78,338	75,347	76,447	76,956	75,116	63,158
GHG Total	**1,432,006[10]**	**1,442,393**	**1,285,675**	**1,244,483**	**1,217,989**	**1,165,988**	**1,113,909**
% change from baseline		1%	-10%	-13%	-15%	-19%	-22%

Figure 3: Total GHG emissions - Comparison to 2009/10 baseline



6 Conversion factors for estate energy and GHG are calculated and set by Carbon Smart on behalf of Defra.
7 Estate energy refers to emissions from mains electricity, natural gas, gas oil and LPG - Annex C item 10
8 A minor error was identified in Jun 2016. This has been corrected in the above table
9 Domestic business travel: emissions from air flights, white fleet, grey fleet and rail travel. See Annex C item 11 for definitions
10 This is a revised GGC baseline figure – previous baseline for 2009/10 was 1,448,791. Percentage changes for 2010/11 to 2012/13 were calculated using the 2009/10 previous baseline figure

Case Study: The Movements Detachment (MovDet) project in Kathmandu

The MovDet is a small building located at Kathmandu international airport to enable us to manage the movement of UK MoD personnel and cargo into and out of the country. The national power supply is very unstable and as with all buildings, the MovDet is subject to daily power cuts. To mitigate against these outages a standby generator was installed to allow the operations to continue during the outages. While diesel

3.2 Climate Resilience

3.2.1 Estate and Infrastructure Adaptation

Responding and adapting to the potential impacts of climate on the operational outputs of our establishments is a priority area for MOD. We have continued to develop our understanding of the risks and opportunities related to our estate and infrastructure and where improvements to our processes, tools and skills can help to increase resilience and capability.

During 2015/16, we have:

- Completed assessment of a further 7 establishments using our Climate Impacts Risk Assessment Methodology (CIRAM). This has included working closely with QinetiQ to assess climatic risks to our test and evaluation ranges;
- Reviewed 9 CIRAM assessments as part of the 5 year review cycle;
- Publication of updated climate resilience policy (in JSP 850);
- Updated the CIRAM methodology taking into account lessons learnt from its application and reinforced climate resilience within MOD Sustainability Appraisal process;
- Issued guidance to improve how Flood Risk Assessments to support MOD planning applications should consider future climate resilience; and
- We have continued to address climate resilience through the scrutiny of business cases as part of the Investment Appraisal process.

We are working to build capacity within the organisation through the provision of climate resilience training and advice to infrastructure project and requirements managers, contractors, site safety and health and environment advisors. MOD has also been working with the rest of government on the UK Climate Change Risk Assessment 2017, and the next generation of climate change predictions (UK Climate Projections 2018).

Over the next year, we intend to develop a climate resilience and adaptation strategy and delivery plan for our infrastructure; to continue to undertake assessments of climate resilience and risks to our sites, and to continue to improve our business processes to take account of climate impacts.

3.2.2 Resilience Research Programme

The Resilience Science and Technology (S&T) Programme, funded by MOD's Chief Scientific Advisor and delivered by Dstl, provides a sound technical evidence base to support decision making around resilience issues such as energy use and targets, critical and strategic materials stewardship and the impacts of climate change and global legislation on MOD's freedom of action. Outputs from the programme include the annual Operational Energy Baseline Report, which analyses fuel use in each of the Front Line Commands as well as tools such as the Maritime Future Energy Use Assessment Tool currently being used in the Navy to help predict and manage its future energy demand. Current tasks include work on "Maximising MOD Energy Efficient Behaviours" which aims to provide options for behavioural interventions that will help enable MOD to meet its fuel reduction targets, and analysis to understand the potential risk to UK air platforms from the US introduction of alternative (synthetic) fuel blends; and the development of the Defence Security of Supply Model.

generators ordinarily provide a reliable standby power, parts for servicing are costly and diesel is in itself an unstable, imported, energy source which is affected by border controls and recently affected by the civil unrest.

In 2015, a project to install Solar PV (with energy storage) began. Unfortunately, work was interrupted by the 2015 earthquakes, however this tragic event only highlighted the importance of the MovDet and the need to establish a more resilient and stable energy source.

Installation work was completed in Jan 16 and the system brought online. The power being generated by the Solar PV has proved sufficient to allow the standby diesel generator to be decommissioned and removed. Whilst it is too early to show how much imported electrical and diesel energy is being saved, the project has proved a major success at improving the operational resilience of the building and demonstrated a positive effect on maintaining operational output in an unstable energy environment.

3.2.3 Equipment

Understanding and planning for where the Armed Forces are likely to operate in future and under what environmental conditions will ensure capability is designed for the changing environments in which the Armed Forces will operate and ensure the safe operation of military platforms.

Addressing the impact of climate change in procurement decisions ensures capability is designed for the changing environments for current and future operating in increasingly extreme environments. For example the Chinook helicopter 714 engine was developed and introduced to help improve performance, specifically around the requirement to operate hot and high at greater all up mass than was previously possible.

In 2015/16, Dstl were also commissioned to undertake research to assess the implications of climate changes on the Defence industry's international supply chain.

3.3 Utilities

Ensuring our utilities are efficient not only helps us meet government commitments but also helps the Department to save money and improve its facilities.

3.3.1 Waste

As an operational department, the amount of waste generated continues to fluctuate relative to the activity during the year. Our performance shows a reduction in the amount of waste generated from 12% below the 09/10 baseline in 2014/15, to 16% below this year. Of this waste, we diverted 90% from landfill through a mix of reuse, recycling and recovery. This was a further improvement from the 88% of waste diverted from landfill 2014/15.

To improve our waste management our focus remains on embedding a consistent and collaborative approach to embed good waste management and reporting practices across the Defence estate. During 2015/16 we have been focussing on improvements in our management information systems, and have:

- Made waste management data available centrally for users and standardised the data capture formats within MOD and from Industry Partners and Service Providers;
- Embedded in the new Soft FM contracts the need for waste management and data capture across key sector supply chain.

Other work is developing pilots across the estate; to allow us to engage with site users and partners in understanding existing waste management practices, share best practice, centralise facilities and undertake audits, testing and monitoring the findings. This will be done locally before implementing more widely across the department.

Case Study: Shoeburyness Sea Wall Works

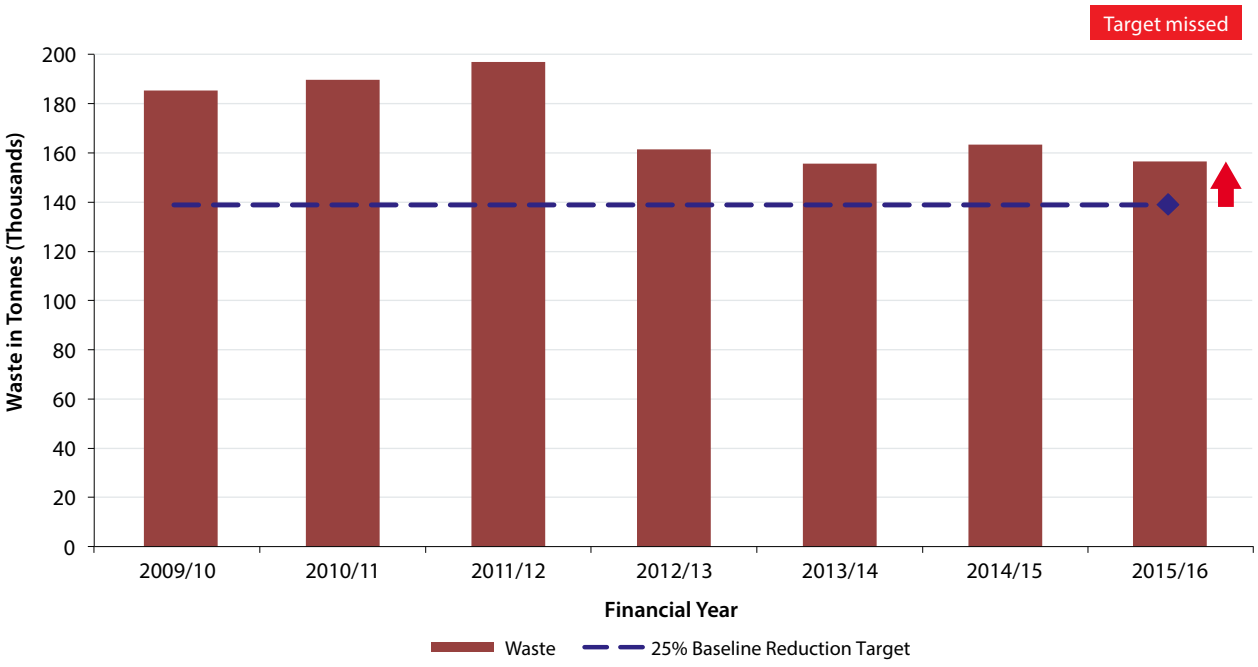
The coastal test and evaluation ranges at MOD Shoeburyness in Essex are unusual in that MOD is responsible for the 40km of sea defences. The constant erosion of the sea wall coupled with sea level rise has led to an increased risk of 'over-topping' and of the wall being breached, which presents a risk to the important Defence capabilities delivered by the site and also to residents of Foulness Island, employees, contractors and livestock. In operational terms, loss of the Environmental Test Centre would impact on a number of significant MOD munition procurement projects and prolonged flooding of magazine storage areas could lead to a safety hazard from immersion of ammunition.

Detailed condition surveys of the existing defences and flood risk modelling identified potential breach points and longer term risks, and in 2014 recommended a series of urgent remedial works, and a wider investment programme to improve the flood defence standard. Detailed design has involved substantial liaison with regulators to agree ecological impact avoidance and mitigation measures and secure statutory approvals. At the local scale works are phased to avoid disturbing breeding or overwintering birds, and habitat is being provided to maintain populations of rare plants and invertebrates. At the regional scale the forecast loss of intertidal habitat due to coastal squeeze outside the sea walls will be compensated

Table 4: Waste generated - Comparison to 2009/10 baseline

Waste Generated	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16
Tonnes	185,437	189,713	197,034	161,346	155,587[11]	163,309[11]	156,390
% change from baseline		2%	6%	-13%	-16%	-12%	-16%

Figure 4: Waste generated - Comparison to 2009/10 baseline



11 A minor error was identified in Jun 2016. This has been corrected in table 4

by managed realignment schemes, including parts of the defence estate.

At Shoeburyness the urgent works began in 2015/2016, and the programme of wider improvements is scheduled to start in 2016/17. These works, supported by regular site inspections, particularly after adverse weather conditions, will provide substantially increased resilience, at least in the short and medium term. The longer term future will depend in part on global efforts to limit climate change, as under some projections the current policy of 'holding the line' will eventually become unsustainable.

3.3.2 Water Use

The MOD has set targets for increasing water efficiency and reducing water demand, and we monitor water consumption and report on performance quarterly as part of the GGC targets. Our activity during 2015/16 continued to implement a combination of estate rationalisation, ongoing spend-to-save projects, and work to improve our management information and data, through the new DIO Infrastructure Management System.

In 2014/15, MOD had achieved a 10% reduction in water demand across the UK estate (Table 5). Our estate water demand has increased during the last year, with performance changing to 9% reduction against our 09/10 baseline. This is for a number of reasons, including:

- The ongoing Army Basing Programme (ABP), which is increasing UK water demand as a direct result of the draw-down of troops and their families from sites in Germany back to the UK;
- Data improvements – the Aquatrine Service Providers for Package A (Kelda Water) and Package C (Severn Trent) have installed a significant amount of additional metering across their respective areas. This has improved the suppliers measurement arrangement accuracy; and
- HMS Caledonia – the presence of additional personnel and the works associated with the ongoing construction of the two future aircraft carriers, has increased water demand consumption at the site.

The DIO has continued to drive forward the Water Consumption Reduction Programme (WCRP) to reduce water consumption in support of the GGC targets and to deliver water and cost efficiency. The programme is targeting 150 high demand sites (where consumption is greater than 10,000m^3 per annum) across the three Aquatrine Private Finance Initiative (PFI) contracts. 55 site surveys were completed in 2014/15, and a further 65 surveys were completed over the last year, with the remaining sites due to be surveyed by the end of 2016.

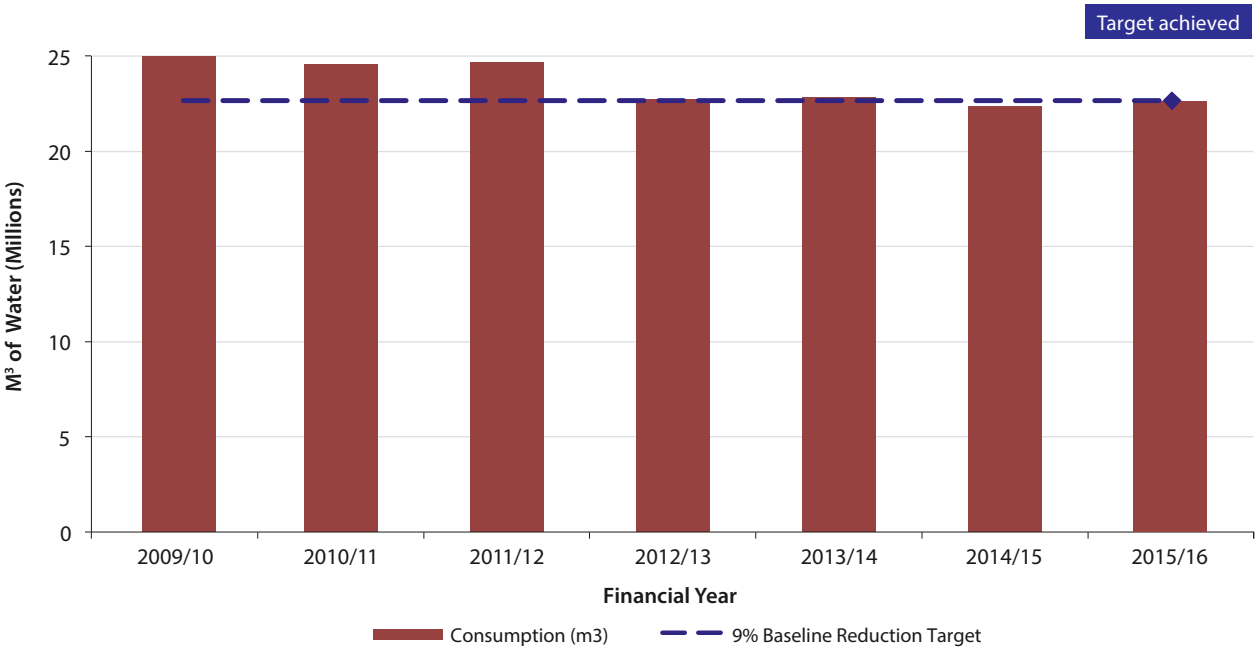
During 2015/16, improvements identified by the site surveys were being progressed onto the in-year Additional Works Services programme. The focus is the replacement of large numbers of faulty cistern control systems which have contributed to unnecessary water consumption. At the end of FY 2015/16, WCRP works had been completed at 18 sites, with further works in progress at other sites. Full implementation of the WCRP is expected to lead to cost savings of over £15M over the remainder of the Aquatrine contracts, which expire between 2028 and 2030.

Looking forward, we have set our future water demand reduction target to support the GGC water commitment, and aim to achieve a 15% reduction by 2020 (from the 2009/10 baseline).

Table 5: Estate-wide water consumption - Comparison to 2009/10 baseline

Estate Water Demand	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16
Consumption m^3	24,973,623	24,549,642	24,659,000	22,726,362[12]	22,826,349	22,391,762[13]	22,642,615
% change from baseline		-2%	-1%	-9%	-9%	-10%	-9%

Figure 5: Estate-wide water consumption - Comparison to 2009/10 baseline



12 A minor error was identified in Jun 2016
13 An error was identified in Jun 2016. This has been corrected in table 5 and figure 5

3.3.3 Office Water Use

Office water use accounts for less than 1% of the MOD's total water consumption. Along with more modern buildings, some of our benchmarked offices are older and sometimes listed buildings with challenges to improving energy and water efficiency. During 2015/16 our effort has continued to focus on reducing water consumption at the high demand sites due to the potential to accrue greatest benefit in water efficiency and savings.

Although we exceeded our water reduction target from whole estate, we did not meet the GGC office water use benchmark of less than 6 cubic metres (m^3) per full time equivalent (FTE) per year in offices as shown in Table 6 below.

Table 6: Office Water Consumption per Full Time Equivalent (FTE)

Office Water Consumption	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16
Total consumption in m^3	206,029	186,101	190,101[14]	172,354[14]	183,490	228,040[14]	220,535
FTE	16,629	15,710	15,710	14,658	15,111	16,002[14]	15,990[14]
Use per FTE	12.4m^3	11.8m^3	12.3m^3	11.8m^3	12.1m^3	14.3m^3 [15]	13.8m^3

Table 7: Offices in scope and removed during the 2010-15 period

Offices in scope as at Mar 2016	Offices removed from scope during reporting period
Abbey Wood North	Blandford House, Aldershot
Abbey Wood Main	Bacchus House, York
CPRO Cheadle Hulme	Cerium Building, Glasgow
Kentigern House, Glasgow	Caledonia House, Rosyth
St Georges House, Sutton Coldfield	Delta 800, Swindon
Blandford House, Aldershot	Delta 900, Swindon
MOD Main Building	Stirling House, Waterbeach
Tomlinson House, Blackpool	

14 A minor error was identified in Jun 2016. This has been corrected in the above table

15 An error was identified in Mar 2016, that the previously 2014/15 performance of 12m^3 had excluded some of the figures for offices. A revised benchmark is 14.3m^3, leading to an inaccurate end of year performance figure. This has been corrected in table 6

'One of the most important pieces of work being done is educating decision makers in the MOD and broader Defence supply chain about sustainable procurement'.

Air Vice Marshal Mike Quigley
Director Technical, Defence Equipment and Support

The GGC office water benchmark target applies to eight MOD office sites, and the current combined water demand across these sites is 13.8m^3 per full time equivalent (FTE) per year. This represents a reduction of 0.5m^3 per FTE per year over the previous year, though remains significantly higher than the target benchmark.

Part of the the change in office water benchmark between 2013/14 and 2014/15 is due to improvements in our data, where previously we had been using estimated figures for MOD Main Building and we had been underreporting for MOD Main Building as a result.

The main reason for the significant change to the performance between 2013 and 2016 is a result of the lake at Abbey Wood, which forms part of the security measures at the site, being refilled, three times during the reporting period.

We are also seeing changes in FTE performance from the beginning of the reporting period where offices have been removed from scope due to disposal and estate rationalisation.

3.4 Acquisition and Infrastructure Systems

3.4.1 Supply Chain

Our supply chain is a key element to achieving our sustainability objectives, and we continue to work collaboratively with suppliers to develop and embed sustainable procurement principles and processes into acquisition and through life capability management policy and practices.

Supporting our work to make our equipment and infrastructure systems more sustainable we have two key engagement forums:

- The joint **MOD-Industry Sustainable Procurement Working Group** works to consider how best to promote and embed sustainability into equipment and support procurement. DE&S has been consulting with key suppliers to identify and mitigate cross cutting sustainable procurement risks; and
- The **DIO Suppliers Sustainable Development Working Group** was revitalised in 2015, as a quarterly forum for DIO and its principal infrastructure Industry Partners to share information on new policy commitments and initiatives, develop solutions to issues impeding sustainability delivery, and share best practice case studies and successful initiatives. The group is looking to strengthen its focus and performance in 2016 by developing an action plan and KPIs to channel efforts against some of their contract commitments, clarify Industry Partners' contributions to the updated Greening Government Commitments, Sustainable MOD Strategy and other policy commitments, and other actions of mutual benefit to DIO and Partners' sustainability goals.

3.4.2 Sustainable Equipment Acquisition

- Sustainable procurement in the acquisition of military equipment and support solutions provides a framework for increasing resilience to the impacts of energy considerations, materials security, and climate change on military capability and the Defence supply chain. This enables MOD to meet Government commitments, reduce through life-costs and realise potential benefits including increased operational effectiveness and enhanced mission endurance.

Our priorities for sustainable procurement (SP) are:

- Understanding the risks to the security of supply of resources (materials and energy) and the impact of climate change and wider global developments on capability performance and supply chain vulnerabilities;
- Developing mitigation and adaptation strategies. Examples include exploring alternative options for scarce materials and maximising recycling opportunities; and increasing the profile of energy management and sustainable options during equipment design and technological refresh/upgrade to deliver more energy efficient outputs while maintaining military readiness and effectiveness; and
- Exploiting the through life capability benefits of developing sustainable solutions by building sustainable procurement in to equipment acquisition interfaces between the Front Line Command capability directorates and DE&S operating centres / delivery teams, as well as the technological and industrial supply base on.

Key activities during 2015/16 were:

- As part of our work to raise the profile of sustainability and sustainable procurement, DE&S held the second annual Sustainable Procurement Symposium conference at Abbey Wood on 1 October 2015. The event highlighted key topics including the benefits of improving energy efficient technologies and behaviours, command perspectives, the importance of material security and climate resilience, and highlighting research, current developments and technical innovations;
- Developing an Aerospace, Defence, Security and Space (ADS) hosted sustainable procurement portal to improve sharing of information across industry;
- As part of the Acquisition Safety and Environment Management System update, work has been undertaken to ensure sustainability is more closely aligned with compliance with environmental protection legislation to ensure that sustainability can be applied throughout the entire acquisition cycle;
- Sponsoring research into the resource security and the resilience of the supply chain (to climate change, natural hazards, and geopolitical developments) elements of Defence Science and Technology Laboratory's (Dstl) Resilience Research Programme;
- Sponsoring the sustainable procurement training programme delivered by the Defence Academy. On-going work has been taking place to refresh this training package in parallel with an update of the systems environmental courses delivered by the Defence Academy; and
- Working collaboratively with other Ministries of Defence internationally on the management of hazardous substances and a common approach to meeting environmental legislation.

Case Study: Landmarc Awarded UK's First Social Value Award

In partnership with the Defence Infrastructure Organisation, Landmarc Services manages and operates military training facilities across the UK. Following Lord Young's review of adoption of the Public Services (Social Value) Act 2012 (PSSVA) MOD has supported the Cabinet Office in their commitment to promote social value across central government.

Landmarc joined forces with Social Enterprise UK to pioneer the UK's first Social Value Summit in 2013, to bring together business leaders and campaigners to plan how to implement the Act. At the third annual Summit in 2015, the Cabinet Office and KPMG awarded the first Social Value Awards to recognise and celebrate good practice, Landmarc won the "Promoting and Mainstreaming the Social Value Act" category.

The nature of their work means that Landmarc are closely integrated with local communities, often in remote areas. Many of their contractual services include deliverables that enhance the environment for local communities (e.g. management of heritage, nature conservation and public access), along with a commitment to employ and upskill local labour and use local suppliers where possible. Landmarc have also undertaken many initiatives outside the contract, which reflect their wider business ethos.

3.4.3 Sustainable Infrastructure System

DIO Sustainability and Commercial teams have been liaising closely to ensure sustainability is embedded in new facilities management contracts. This has included refining the requirements and evaluating sustainability pre-qualification questions for the seven Regional Soft FM contracts and the RAF Waste Management contract under the Hestia programme, and injecting sustainability requirements to the new overseas Total Facilities Management contract under the Future Overseas Procurement programme. Sustainability questions have also been used in the evaluation of bids submitted by Partners on the National and Regional Capital Works Frameworks hoping to deliver new construction projects.

The DIO has improved the sustainability elements of Capital Infrastructure project business cases via implementing robust scrutiny management practices.

3.4.4 Appraisal Tools

Sustainability and environmental appraisals are key tools to inform decisions on projects and procurement, as well as those required to meet legal obligations. MOD developed a handbook in 2002 to aid the application of appraisals, including Strategic Environmental Assessments, sustainability appraisals, habitats regulations assessments or Defence Related Environmental Assessment Method (DREAM) assessments.

In 2015, the MOD Sustainability and Environmental Appraisal Tools (SEAT) Handbook was revised and updated, to provide concise guidance for assessing the sustainability effects of programmes, plans and projects and aid decision-making. Scrutiny of all business cases for infrastructure projects requiring investment approval was undertaken to ensure identified sustainability issues have been addressed, and the provision of training to improve the application of the tools within the DIO has been increased.

The MOD uses the DREAM tool to assess all new builds and major refurbishments. DREAM provides an equivalent to the industry standard Building Research Establishment's Environmental Assessment Methodology (BREEAM), specific to the Defence construction requirements and Defence projects and allows us to assess the environmental impacts of our construction activities.

Over 90% of DREAM assessments carried out in 2015/16 reached their target rating of "excellent" for new build and "very good" for major refurbishments. The most common reason for a project not reaching target rating is when doing so conflicts with the obligation to achieve through life value for money or meet specific defence needs, such as security requirements. This is a particular challenge when applying DREAM to novel or highly specific MOD buildings.

Aside from pioneering Social Value through the annual Summits, activities include:

- Setting up a Community Interest Fund in each of their delivery regions to spend on community initiatives;
- Launching a rural investment scheme (Landmarc 100) to provide money and/or mentoring for local rural entrepreneurs;
- Working with Business in the Community (BITC) to appoint a rural "Business Connector" in Northumberland;
- Setting up a rural apprenticeship scheme;
- Hosting educational workshops with tenant farmers on agricultural policy;
- Providing a Rural Business Hub in Netheravon, Wiltshire;
- Developing a volunteering scheme for employees, to better identify and record opportunities for staff to invest time in community projects; and
- Engaging in community and youth health activities by supporting Cycle Wiltshire.

Table 8: DREAM assessments undertaken in 2015/16

Result	Number	Percentage
Excellent	28	88%
Very Good	3	9%
Good	1	3%
Total	**32**	**100%**

3.4.5 Sustainable Construction

As well as the use of the DREAM assessments, in 2015/16 we have continued to look at ways to improve our infrastructure systems to embed sustainability and efficiency requirements into our construction projects, linked to the Government's Construction Strategy. Effort in 2015/16 has been to focus on:

- reducing construction costs without impacting on quality through cost led procurement and using benchmarking;
- embedding process changes that will deliver more sustainable solutions through the use of Building Information Modelling (BIM) and the use of post occupancy valuation and Government Soft Landings;
- reviewing of construction related policy documents (such as the Joint Service Publications 315 and 850), aimed at bringing industry standards into our procurement; and
- embedding the importance of data to support business management, driving the understanding of data as an asset.

3.5 Ways of Working

The MOD continues to work collaboratively with industry partners and other government departments to make improvements to the work place through improvements in technology and our ways of working.

3.5.1 Information and Communication Technology (ICT)

MOD has a major programme underway (called MODNET), which will upgrade our legacy ICT system for over 200,000 users with enhanced and "evergreen" functionality (i.e. with Office 365 the software will always be up-to-date). This provides the opportunity for improved, more mobile ways of working. The ICT services rolled out in 2014/15 are already proving their value; for example the usage of Defence Connect, the MOD's new communication and collaborative working tool has increased significantly over the past year to more than 30,000 users.

Development of the new system has continued through 2015/16 with a focus of effort on the O365 Alpha where 1,450 users have been working collaboratively and gathering success stories of how Office 365 capabilities could assist MOD to work more productively. Using the Cloud, MODNET will store data in more efficient government UK data centres

…MODNET will upgrade our ICT system... this provides the opportunity for improved, more mobile ways of working…

which will dramatically increase data storage capacity. Roll-out of this new capability is scheduled to begin in July 2016.

Although not available in time for this report, our fifth year of assessment against the governments Sustainable ICT Maturity Model is being completed. MOD along with government CTOs agreed this year's assessment will prepare the ground for a new 2020 Sustainability Strategy for Government Technology in line with the contemporaneous programme of new GGCs.

3.5.2 Infrastructure Management System (IMS)

Over the past couple of years, DIO has been developing a fully integrated Infrastructure Management System (IMS) to assist in managing the Defence Estate in a more strategic and efficient way. Specific functionality within the IMS has been developed to enable data on Utilities to be captured and recorded centrally in a controlled manner. Utilities consumption data for the entire defence estate is sourced, validated, verified and maintained within the IMS, enabling targeted management reports to be produced to enable users to understand and review current Utility consumption rates against future planned targets.

To date, consumption data for water, gas, electricity and delivered fuels has been captured, recorded and reported. A new addition in 2015/16 has been the sourcing and processing of data on waste generation from sites across the estate. Once collated, data on Utilities can be used to shape and influence behaviours towards reducing MOD's energy and water consumption, the benefits of which are environmental and sustainable as well as financial.

The IMS also facilitates pre-ordering of Utilities capacity and enables a process for consulting with Sustainability advisers at the correct point in the project development lifecycle. This ensures the right advice on sustainability information aspects and impacts is delivered to Project Managers at the right time. This in turn, supports ongoing improvements for evidence-based decision-making and consequently a more sustainable Defence estate, providing better value for money for our Armed Forces.

3.5.3 Business Travel

The MOD travel policy discourages avoidable business travel and encourages personnel to use video teleconferencing and/or telephone conferencing wherever practicable. If travel is necessary, the cheapest/ most cost effective available means should be used, and the number of people attending meetings and events from a single area kept to an absolute minimum.

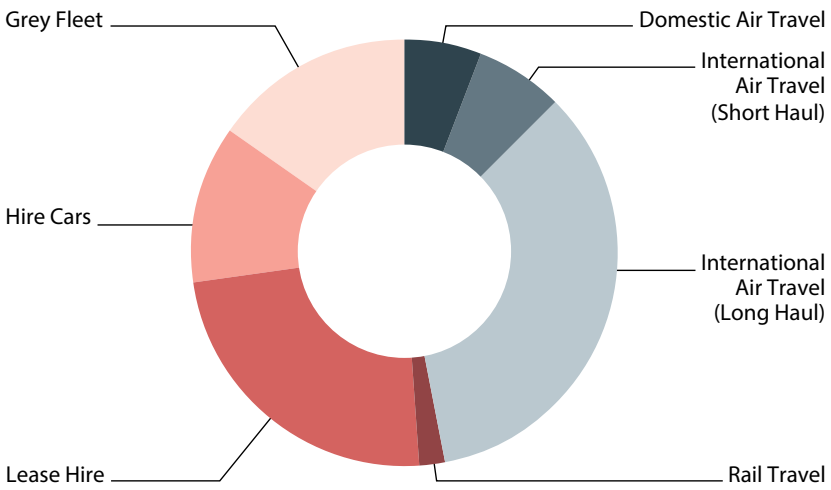
As a department that operates UK-wide, as well as overseas, we will always require a certain amount of business travel. Our efforts and challenge is to find the right balance of travel avoidance, methods of travel around the UK to often remote locations, and the best value for money choices where travel is required. Table 10 below shows CO_2e emissions performances by different modes of transport used by our people used for administrative business travel.

In 2014/15, we reduced GHG emissions from all travel including international air travel by 13% compared to 2009/10. All UK domestic travel achieved a 22% reduction in GHG emissions.

Table 9: Carbon Emissions from Administrative Business Travel - All[R]

Type of Business Travel tCO_2e	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16
Domestic Air Travel	10,508	8,310	8,310	8,390	8,382	7,380	7,246
Rail Travel	4,546	2,937	3,210	2,747	2,553	2,529	2,477
Lease Hire	27,842	27,229	26,706	26,715	26,360	28,128	28,078
Hire Cars	14,920	13,090	14,013	19,517	17,386	17,065	14,248
Grey Fleet[16]	31,931	26,773	23,107	19,078	21,606	19,408	17,974
GGC Reportable	**89,747**	**78,339**	**75,346**	**76,447**	**76,287**	**74,510**	**70,023**
International Air Travel - short haul[17]	6,008	4,761	8,345	5,904	6,985	7,492	7,651
International Air Travel - long haul[17]	40,215	32,269	42,184	42,435	42,419	41,365	40,940
Other Business travel	**46,223**	**37,030**	**50,529**	**48,339**	**49,404**	**48,857**	**48,591**
All	**135,971**	**115,368**	**125,876**	**124,785**	**125,691**	**123,367**	**118,616**

Figure 6: Carbon Emissions from Administrative Business Travel - All



16 Business travel by civilian and Armed Forces personnel using their own cars
17 International short haul and long haul travel is not in scope for the GGC targets
R Table has been revised due to improvements in data availability

3.5.4 Domestic Air Travel

The MOD's ongoing business and operational requirements continues to determine levels of domestic air travel, particularly for the Front Line Commands. Approximately 93% of our domestic air travel is to to and from Scottish and Northern Ireland destinations where air travel remains value for money taking account of both the ticket cost, and the consequent additional costs of accommodation, subsistence and time that would be incurred if rail or car travel were used. Where we have had greater ability to reduce flights, we have made good progress in reducing air travel.

The administrative parts of MOD reduced their domestic air travel by 21% during 2015/16, exceeding the GGC target by 1% (see table 11 below). Our Front Line Commands (who took over 78% of the domestic flights reported for 2015/16) have seen an increase in domestic air travel due to ongoing major organisational changes resulting from SDSR 2010 and SDSR 2015 including army rebasing and ship building programmes.

Table 10: Domestic (UK) Air Travel – total number of flights[18 R]

Domestic Air Travel (no. of flights)	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16
MOD Total	122,077	98,451	103,104	112,173	118,095	116,326	116,907
% change from baseline		-19%	-16%	-8%	-3%	-5%	-4%

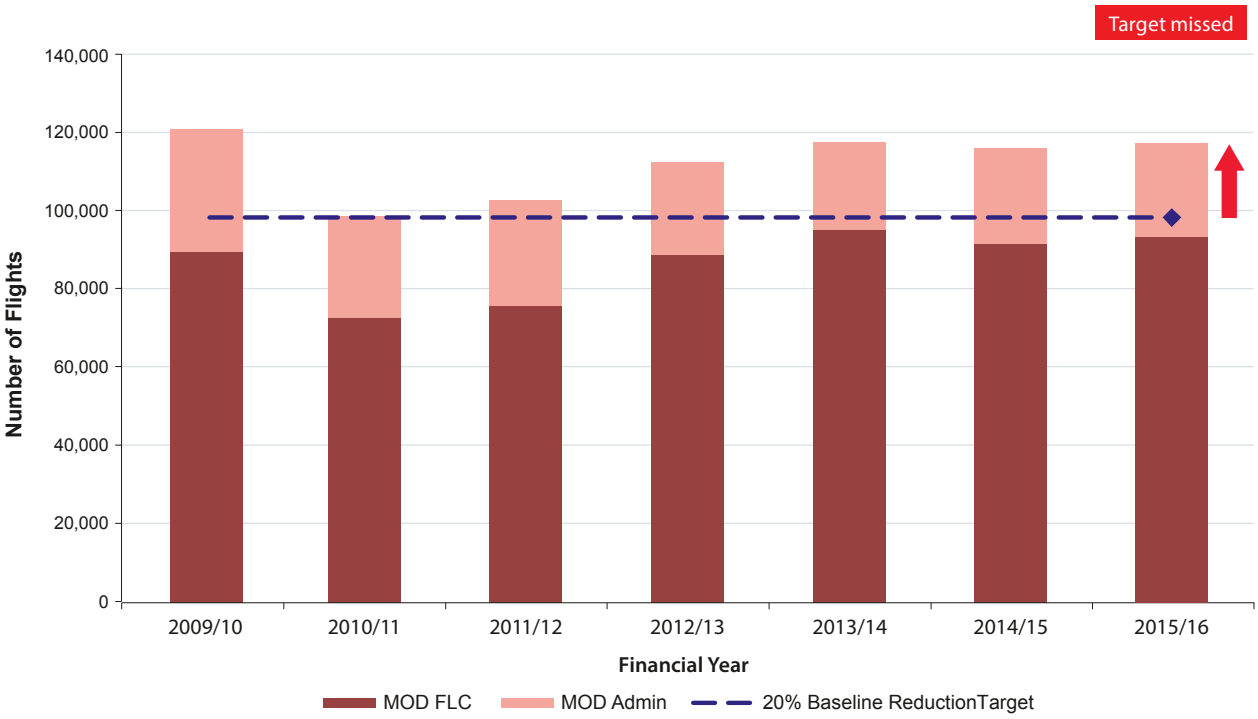
Table 11: Domestic (UK) Air Travel – number of flights split between the Front Line Commands and the Administrative organisations in MOD

Domestic Air Travel (no. of flights)	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16
MOD Front Line Commands	89,961	72,507	76,144	88,751	92,925	90,613	91,570
% change compared to 2009/10 baseline		-19%	-15%	-1%	3%	1%	2%
MOD Administrative	32,116	25,943	26,960	23,422	25,170	25,713	25,337
% change from baseline		-19%	-16%	-27%	-22%	-20%	-21%

18 Each individual flight is reported. E.g. return travel is recorded as two flights
R Table has been revised due to improvements in data availability.

In October 2015, the MOD identified a software error in the way management information on domestic air travel was reported by our travel provider, and a proportion of flights were not being included in our reported figures. The error has been corrected for previous years and tables 10 and 11 now reflect the corrected figures. Whilst these data issues mean that a proportion of MOD's domestic flights had been underreported, this has not affected reported carbon emissions in relation to the GHG target.

Figure 7: Domestic air travel - Comparison to 2009/10 baseline



'Sustainability in the MOD is about us all doing things in such a way that we (and generations to come) can carry on doing them tomorrow, and way into the future.

In our daily working lives we can all make a difference, no matter how small, to a common future that sustains the Defence Mission and our natural inheritance.

I always look for ways to reduce my paper and energy use and keep colleagues informed about conservation and sustainability initiatives'.

Chris Gale, Acquisition Safety & Environmental Assurance at ISS

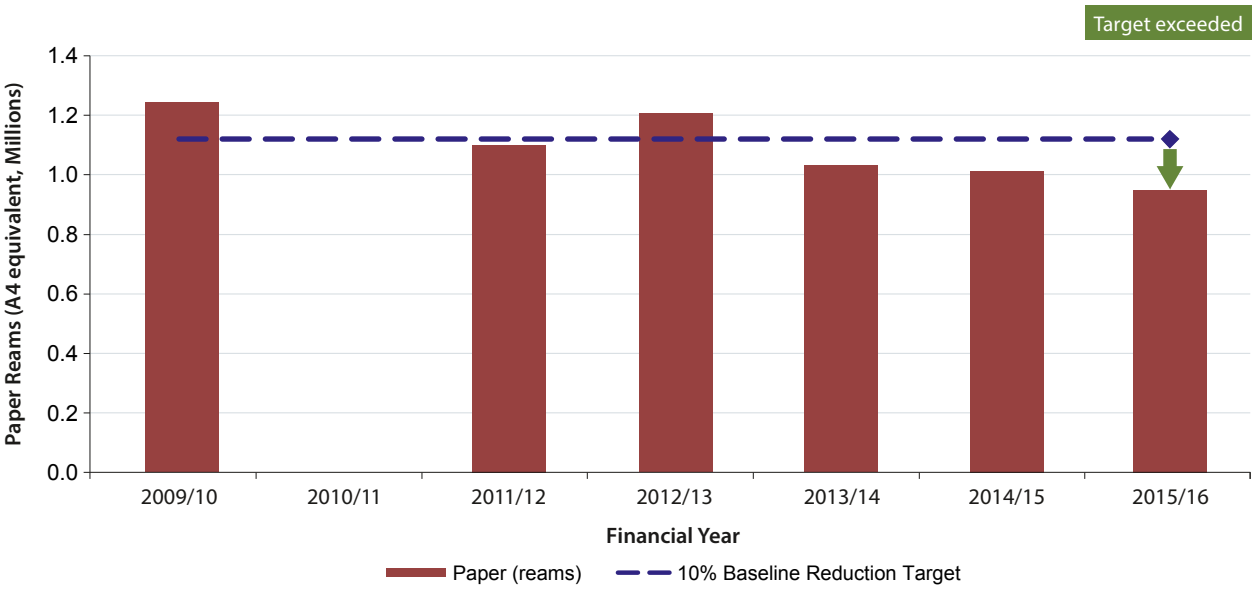
3.5.5 Paper Demand

In 2015/16, the MOD reduced paper demand by 23% compared to the 2009/10 baseline.

Table 12: Paper Demand - Comparison to 2009/10 baseline[19]

MOD Paper Purchased	baseline	2011/12	2012/13	2013/14	2014/15	2015/16
Paper reams (A4 equivalent)	1,242,363	1,099,866	1,206,435	1,030,417	1,012,637	951,072
% change from baseline		-11%	-3%	-17%	-18%	-23%

Figure 8: Paper demand - Comparison to 2009/10 baseline



19 Paper consumption data was not collected in 2010/11

3.6 Estate Stewardship

3.6.1 Biodiversity

The Defence estate remains an important biodiversity and wildlife asset, the variety of habitats found across the military training areas are not only beneficial for biodiversity, but accommodate a variety of military training requirements, ranging from upland terrain to extensive grassland plains and watermanship training areas, which are all essential for Armed Forces contingency training and battle preparedness.

MOD is responsible for 127 Sites of Special Scientific Interest (SSSI) sites in England, 22 SSSIs in Scotland, 20 SSSIs in Wales and 2 Areas of Special Scientific Interest (ASSI) in Northern Ireland; many of which are also designated as important sites internationally as Special Areas of Conservation, Special Protection Areas or Ramsar sites, as well as other areas designated as locally important for biodiversity.

The Government's Biodiversity 2020 targets for SSSI condition in England are to achieve 50% 'favourable' and at least 95% 'unfavourable recovering' by 2020. Current figures and future projections indicate MOD is well on the way to exceeding these. This highlights a genuine and significant shift in the condition of habitats and species at a site level in response to targeted effort and investment. The MOD estate is often described as one of the finest estates for wildlife in the UK and it is valuable to us that rigorous judgements about the condition of the estate are made by the statutory conservation bodies, and provides an assurance that military training demands are being effectively integrated with management of biodiversity across protected sites.

DIO has invested £920,000 in SSSI improvement work during 2015-16 at 60 SSSIs, to maintain current condition or improve condition of SSSIs across the estate (see Table 14). The majority of this work was carried out by industry partners through MOD's 'prime contracts'.

Performance in 2015/16 includes:

- Several years of continuous funding has culminated in a significant increase in the proportion of SSSIs in 'favourable' condition in England in 2016, as assessed by Natural England. The area of SSSIs in favourable condition has increased from 36% to 44% in the past year, which represents an improvement across 5,405 hectares moving in to favourable condition on Salisbury Plain. There has also been investment at several MOD SSSIs including at Shoeburyness, Eskmeals, Yardley Chase and Lulworth Ranges;
- Over 98% of SSSI units in Wales are meeting objectives with no change in condition statistics this year but large scale work has been carried out on coastal habitats at Pembrey Air Weapons Range, and the Test & Evaluation site at Pendine;
- In Northern Ireland all ASSIs features on MOD sites remain in target condition with management work carried out at both Ballykinler and Magilligan this year. DIO has also entered a two year partnership agreement with Ulster Wildlife to secure additional support from this key stakeholder in delivering ASSI management; and
- In Scotland 98% of SSSI features are meeting MOD targets and work has continued on all SSSIs. There has been significant investment in the Test & Evaluation site at West Freugh where aerial bracken spraying and other tasks have been carried out to tackle longstanding issues.

Case Study: Barrow Clump Excavation

The Ministry of Defence is mandated to minimise its holdings of 'Heritage At Risk'. One of the most longstanding assets deemed to be within this category on the MOD estate was the burial mound of Barrow Clump on Salisbury Plain. As highlighted in the previous report, excavations had taken place on this monument to recover all the archaeological remains before they were destroyed by burrowing animals – this included 75 Anglo Saxon graves with very special grave goods; from drinking vessels to spears and a sword from the 6th Century AD.

The DIO Conservation Stewardship Fund (CSF) allocated funding to enable the results of this fieldwork to be published and the finds assessed

As with other activity around the sustainability and stewardship of the defence estate, a significant amount of biodiversity work has been associated with the Army Basing Programme, which includes the development of a biodiversity offsetting plan around the Salisbury Plan which has been agreed with Wiltshire Council. This will result in calcareous grassland restoration on numerous County Wildlife Sites to improve links between existing areas that are important for biodiversity both within and outside the SSSIs.

Beyond the work to improve our SSSIs and ASSIs, the MOD has been working with a number of other organisations to improve biodiversity across the defence estate (and wider) including:

- Working with the RSPB to protect Stone curlew nests at Sculthorpe;
- Supporting Penrith and District Red Squirrel Group work at Warcop;
- Working in partnership with Butterfly Conservation on the Sussex Emerald Moth Project at Lydd;
- Undertaking river restoration work with the Wessex Chalk Stream project;
- Carrying out a survey of sea caves at Castlemartin, to look for hibernating bats and archaeological interest;
- Working with the Yorkshire Dales River Trust to implement mire restoration work at Catterick;
- Hosting a red squirrel reintroduction Project at Ballykinler, Northern Ireland; and
- Scrub control in Cyprus.

Table 13: Condition status of SSSIs/ ASSIs under MOD management

	Percentage in Target Condition[20 21]										
Country	**2005/06**	**2006/07**	**2007/08**	**2008/09**	**2009/10**	**2010/11**	**2011/12**	**2012/13**	**2013/14**	**2014/15**	**2015/16**
England	78	82	85	92	97	99	99	99	99	99	99
Scotland	69	69	68	68	94	94	94	94	87	98	98
Wales	69	69	68	68	94	94	94	94	87	98	98
Northern Ireland	57	57	57	57	70	100	100	100	100	100	100

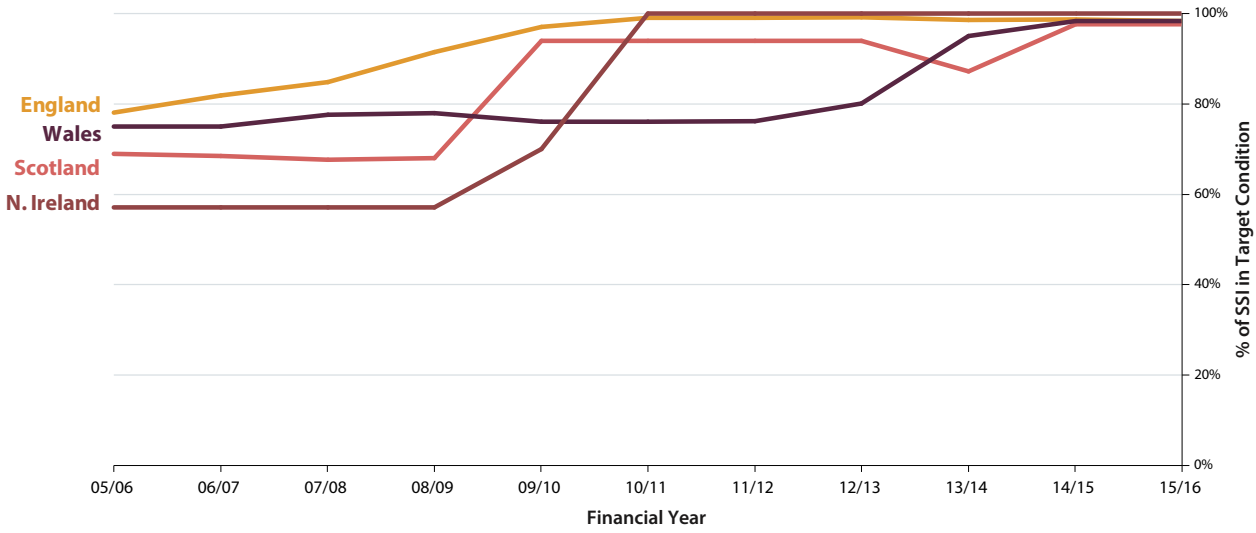
20 Direct comparison is difficult because each devolved administration monitors site condition in a different way but MOD continues to strive to improve these figures by identifying priorities for management with statutory bodies and targeting investment where it is most required

21 Target condition in England and Scotland is "Favourable" or "Unfavourable Recovering", in Wales is "Under Appropriate Conservation Management", and in Northern Ireland is "Favourable' or 'Recovering Due to Management Change"

and conserved. This work is incorporating a chapter written by military participants on the dig as part of their recovery process post operational tours to highlight what they found and enjoyed about the process. During this process of conservation, the archaeologists discovered that one of the brooches from a grave was 'Visigothic' – from France or Spain. This is the very first such brooch found in a grave in Britain.

The fact that MOD has demonstrated such commitment to heritage and the funding of the results which will be published in Spring 2017 has meant that this monument will finally be removed from the 'At Risk' list, and all the artefacts found will be viewable in the Wiltshire Heritage Museum in Devizes.

Figure 9: Condition status of SSSIs/ ASSIs under MOD management



3.6.2 Heritage

Heritage is very much part of the fabric of the MOD, both from the historic assets we manage and the contribution it can make to military ethos. The Department is responsible for around 836 listed buildings, 770 scheduled monuments and over 10,000 archaeological monuments. Stewardship not only extends to iconic facilities such as the Royal Naval Dockyards, MOD Main Building in Whitehall, Royal Military Academy at Sandhurst or the well recognised Battle of Britain heritage and RAF airfields but to many accommodation blocks, historic Keeps, museums, castles and houses which MOD aspires to remain in modern use whilst protecting the historic features. Other designated assets include conservation areas, battlefields, crashed aircraft, registered parks and gardens and some railway items.

In 2015/16 there has been a major focus on ensuring that the heritage requirements have been integrated into the Army Basing Programme (where we are bringing personnel back from Germany), and the historic environment teams achieved the target of completing site surveys by Historic England of such sites as Larkhill, Bulford and Tidworth by March 2016.

Table 14: Condition of MOD Scheduled Monuments - Comparison[22]

Year	Good		Fair		Poor		Unknown		Total
2009/10	364	49%	222	30%	149	20%	2	<1%	**737**
2010/11	357	49%	224	31%	151	21%	2	<1%	**734**
2011/12	359	49%	222	30%	155	21%	2	<1%	**738**
2012/13	355	47%	250	33%	158	21%	0	0	**763**
2013/14	363	48%	244	32%	154	20%	1	<1%	**762**
2014/15	364	48%	246	32%	154	20%	2	<1%	**766**
2015/16	311	41%	295	38%	164	21%	0	0	**770**

The past year also saw some further changes in the numbers of Scheduled Monuments and Listed Buildings, with listed buildings increasing from 825 to 836 with disposals of buildings around Salisbury Plain and with new listings including memorials in the Royal Navy cemetery at Clayhall, Gosport and of the Garrison churches in Bulford, Tidworth and Larkhill. The number of Scheduled Monuments under our management also changed from 762 to 770 last year with Historic England scheduling new sites at Ballykinler and Dartmoor (see Table 15).

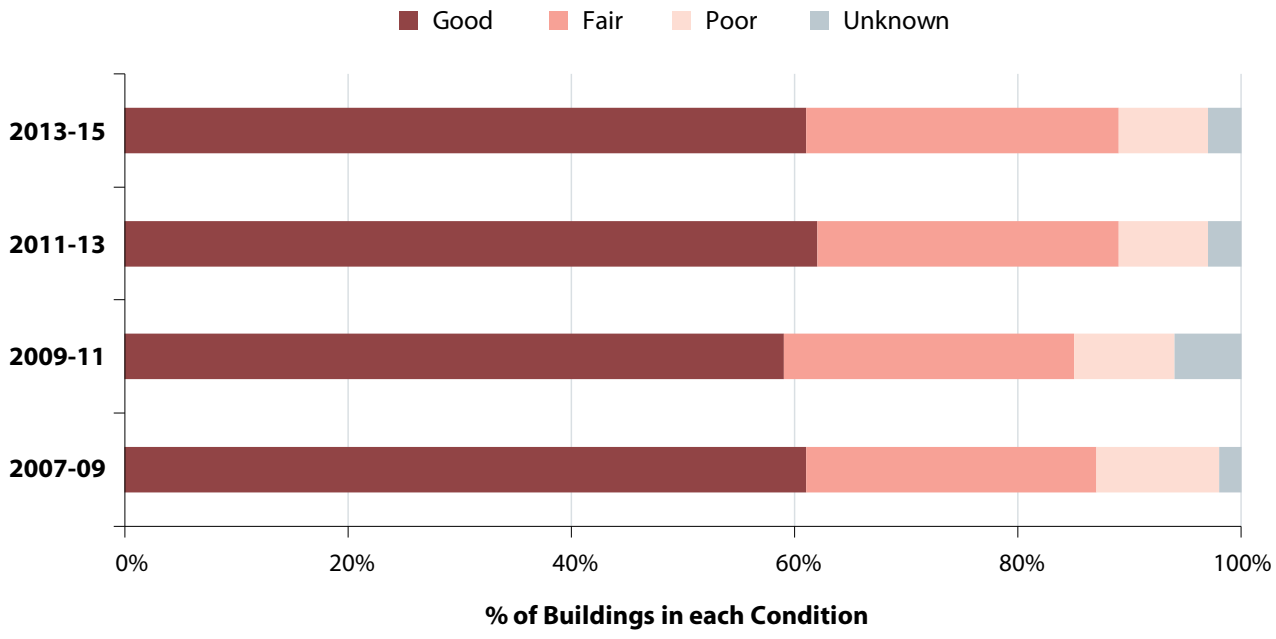
Mitigating Heritage at Risk remains an important part of our work with the MOD working with Historic England and other devolved administrations to address these important, but often difficult, issues. The Historic England Heritage at Risk (HAR) register is published every two years, and in the 2013/15 reporting period, MOD had 71 assets on the register. Eight cases were resolved and removed from the register, and five new entries were added. Further details on MOD's heritage management can be seen in the MOD Biennial Heritage report 2013-15 which will be published later this year on gov.uk. Since the last report there have been works to some Heritage At Risk assets, which have included the Dymchurch Redoubt in Hythe and detailed proposed plans for the renovation of Arborfield stables.

22 Percentages may not add to 100% due to rounding

Table 15: Condition of Listed Buildings - Comparison

Year	Good		Fair		Poor		Unknown		Total
2007-09	489	61%	206	26%	87	11%	15	2%	**797**
2009-11	477	59%	210	26%	77	9%	51	6%	**815**
2011-13	519	61%	231	27%	69	8%	26	3%	**845**
2013-15	507	61%	232	28%	64	8%	22	3%	**825**

Figure 10: Condition of Listed Buildings - Comparison



3.6.3 Access and Recreation

The Defence estate offers a wealth of public access opportunities, available via public rights of way or under military byelaw.[23] Some sites can only occasionally be accessed by the public for safety or security reasons.

There are a number of significant projects which we have been working on during 2015/16 to improve and aid the management of the public access across the training estate, including provision of coastal access and as part of development to support the Army Basing Programme around Salisbury Plain. On Salisbury Plain, we have also been working to mitigate against the anticipated increase in demand for access and the subsequent potential impact on important habitats and species, and in particular, the Stone Curlew; through linking existing public rights of way, provision of new permissive routes and raising awareness of access opportunities. In Scotland, we have been working on a circular route around Tain, linking with the Forestry Commission in order to provide new access where previously none existed, which should be opened during 2016/17.

As part of a wider objective to provide clarity of information to the public and those accessing the Defence estate; on-site information and panels covering site and safety information have designed for Browndown, Predannack, and Wittington ranges, for installation in 2016. We have also been improving our online information, with access publications for Castlemartin and Salisbury Plain; and looking forward, we will be engaging with the Kennel Club to develop a national guide for dog walkers seeking to use the Defence estate.

During 2015/16, a parallel piece of work has been looking at streamlining some of our processes, and ways in which information is collated to support and inform the Department's Byelaws Review, which will continue over the next few years, to inform decisions about where byelaws are required.[24]

23 https://www.gov.uk/guidance/public-access-to-military-areas
24 https://www.gov.uk/guidance/ministry-of-defence-byelaws

…Through the DIO Conservation Stewardship Fund, MOD continues to jointly fund the Castlemartin Ranger post…

Case Study: Pembrokeshire Coast National Park Ranger

Through the DIO Conservation Stewardship Fund, MOD continues to jointly fund the Castlemartin Ranger post, along with the Pembrokeshire Coast National Park and Natural Resources Wales. The post provides an essential interface between these stakeholders, effectively balancing military requirements alongside numerous environmental designations and the ever present need to manage recreational pressure in the National Park. Site experience and well established internal and external working relationships ensure resources are applied in the most cost effective manner, delivering best value for money and continuously contributing to the positive reputation of Castlemartin and the other military ranges and establishments within the National Park boundary. The Ranger fills a fundamental role, ensuring the sites continue to fulfil MOD Access policy 'presumption in favour of public access' where it is compatible with training and operational requirements, safety, security, conservation and the interests of our tenants.

The Conservation Stewardship Fund also pays to maintain the Castlemartin Range Trail (managed by the Ranger) which enables users of the Pembrokeshire Coast Path to divert around military activity on a safe and sustainable route when live firing is occurring on Castlemartin Range. Other routes are made available during non-firing periods and the Ranger is paramount for managing recreational pressures from walkers, climbers, horse riders, surfers and fishermen. The Ranger also monitors nesting birds, seal populations and many other protected species to ensure that the impact of military use and recreational pressure is minimised and that opportunities for natural environment improvements are maximised through the partnership work.

4. Next Steps and Challenges

4. Next Steps and Challenges

With a department the size of MOD, management information can be a challenge. In 2010, an audit by the NAO highlighted that MOD lacked sufficient management information on the estate to allow us to make the most efficient use of the estate and inform decisions. Since then significant work has been underway to address this, culminating in a new Infrastructure Management System which nearing completion of roll out. 2015/16 is the first year we have been able to report on our GGC performance on the estate using the new IMS system, and we will be the continuing roll out of the IMS, and to migrate data onto it.

Effort over the next year will be to continue to progress ongoing programmes for fuel and estate energy demand, waste and water, and to look into how we can maximise our ICT programme to support these and the targets for business travel and paper demand; and our climate resilience programmes.

As well as implementing ongoing programmes, and putting in place measures to take forward the new Greening Government Commitments and targets, we will be looking at how we integrate the new targets within our wider sustainability strategy and delivery plan. We will also be considering ways to best measure our progress against our strategy priorities.

4.1 GGC 2016-2020

The next set of Greening Government Commitments were announced in 2016, and work will be undertaken to progress ongoing programmes and initiatives to deliver against the new targets. Where the GGC targets or reporting requirement has changed from the previous GGC framework, we will be considering how we can best report performance; particularly in relation to sustainable procurement through our supply chains.

Table 16: GGC 2016-2020

Greening Government Commitments and Targets 2016-2020 (against a 2009/10 baseline).
Reduce greenhouse gas emissions by at least 31% from a 2009/10 baseline (in line with individual departmental targets. MOD specific target – to reduce GHG emissions by 30% from estate and business travel.
Reduce the number of domestic business flights by at least 30% from an 2009/10 baseline. (excluding front line command flights. Departments which are already exceeding a 30% reduction will be expected to set their own internal targets for further reductions).
Reduce the amount of waste going to landfill to less than 10%, and continue to improve waste management by reducing the overall proportion of waste generated and increasing the proportion which is recycled.
Reduce government paper use by at least 50% from a 2009/10 baseline.
Continue to further reduce waste consumption. Each department will continue to improve on the reductions they had made by 2014/15.
Continue to buy more sustainable and efficient products and services with the aim of achieving the best long term, overall value for money for society.
Departments will be open and transparent by reporting publicly on the steps they are taking to address the following areas: • Climate change adaptation; • Biodiversity and the natural environment; • Procurement of food and catering services; • Sustainable Construction; and • On any other issues that department consider to be most significant to reducing the environmental impact of their activities.

Annexes

Annexes

Annex A: Energy and Carbon Emissions data 2009/10 - 2015/16

GREENHOUSE GAS EMISSIONS		2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	Note
Non-Financial Indicators tCO_2e 000's	Total gross emissions for scopes 1, 2 & 3	1,495	4,696	4,406	4,109	4,275	2,997	1,097	13a&13f
	Total net emissions for scopes 1, 2 & 3	1,484	4,685	4,331	3,338	3,659	2,339	Not known	13a&13f
	Total gross emissions scope 1	578	3,796	3,557	3,238	3,558	2,236	460	13a&13f
	Total gross emissions scope 2 & 3	917	900	849	871	717	761	636	13a
Related Energy Consumption KWh 000's	Electricity: Non-renewable	1,460,770	1,464,106	1,282,421	0	0	0	1,212,917	13b
	Electricity: Renewable	20,440	20,486	142,491	1,481,564	1,384,227	1,223,272	0	
	Gas	2,482,020	2,475,352	1,952,488	1,740,426	1,971,184	1,804,037	1,931,147	
	LPG	80,070	80,403	82,000	79,391	79,425	53,247	38,375	
	Other	290,598	289,877	314,428	337,572	338,153	324,558	Not known	13e
Related Equipment Energy Consumption Litres 000's	Aviation fuel	827,800	792,400	767,100	693,097	627,420	584,022	Not known	13e
	Diesel (retail blend & mineral blend)	340,500	354,300	339,300	see below	see below	see below	Not known	13c&13e
	Diesel (retail blend)	0	0	0	118,394	105,318	85,125	Not known	13e
	Diesel (100% mineral)	0	0	0	214,154	215,965	157,390	Not known	13e
	Gas oil	74,300	79,700	74,900	40,602	34,329	33,976	Not known	13e
	Petrol	7,000	4,600	5,800	4,462	8,882	3,975	Not known	13e
Financial Indicators £000's	Expenditure on energy	195,715	280,563	294,676	243,266	261,124	317,074	267,979	13a
	CRC license expenditure (2012 onwards)	-	-	1	16,000	17,000	16,500	17,536	
	Expenditure on GCOF offsets	220	78	12	12	12	18	65	13d
	Expenditure on official business travel	198,747	165,467	161,632	161,632	163,107	163,859	Not known	13d&13e
	Expenditure on equipment energy (fuel)	481,934	627,850	635,354	758,809	731,045	574,681	332,502	
Normalisation	Total scopes 1, 2 & 3 - tCO_2e 000	1,495	4,696	4,406	4,109	4,275	2,997	1,097	13a
	Defence total Spend £000's	37,994,285	38,116,370	38,946,782	37,740,973	36,448,452	35,105,038	35,252,526	
	Normalisation - Scope 1 & Scope 2 emissions '000 / budget '000	0.00004	0.00012	0.00012	0.00011	0.00012	0.0009	0.00004	

Annex B: Water and Waste data 2009/10 - 2015/16

FINITE RESOURCE CONSUMPTION - Water		2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16
Non-Financial Indicators 000's m^3	Water consumption (office estate)	206	186	190	172	183	228	2201
	Per Full Time Equivalent	12.4	11.8	12.1	11.8	12.1	14.3	13.8
	Water consumption (office & non office estate)	24,974	24,550	24,659	22,726	22,826	22,392	22,643
Financial Indicators £000's	Water supply costs (whole estate)	100,236	98,667	107,369	104,804	101,043	112,869	116.600
Normalisation	Department total spend £000's	37,994,285	38,116,370	38,946,782	37,740,973	36,448,452	35,105,038	35,252,526
	Budget £000's	0.0007	0.0006	0.0007	0.0007	0.0006	0.0007	0.0006

WASTE			2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16
Non-Financial Indicators tonnes 000's	Total waste		185	190	197	161	156	163	157.6
	Hazardous waste		14	11	6	4	18	19	0.6
	Non hazardous waste	Landfill	55	48	43	29	35	18	15
		Reused/Recycled	91	95	122	101	94	99	100
		Composted	8	9	9	8	1	1	3
		Incinerated with energy recovery	10	18	12	18	5	24	37
		Incinerated without energy recovery	8	8	5	2	2	3	2
Financial Indicators £000's	Total disposal cost		Not known	Not known	Not known	Not known	Not known	Not Known	Not Known
Normalisation	Department total spend £000's		37,994,285	38,116,370	37,176,648	35,210,412	37,383,571	34,567,604	35,252,526
	Total spend £000's		0.000005	0.000005	0.000005	0.000005	0.000004	0.000005	0.000004

Annex C: Caveats and Explanatory Notes

1. The data in these tables are not Official Statistics because they have not been assessed as such by the Defence Authority for Statistics.
2. GGC data contained in this report is based on agreed baselines. The GGC targets are for UK data. The MOD has tried to include as much of the UK data as possible and for some data sets, we have included data from our overseas estate.
3. An 'R" indicates that a table has been revised due to improvements in data availability
4. Definition of emission scopes:
   a. Scope 1 emissions occur from sources owned or controlled by the organisation. Examples include emissions as a result of combustion in boilers owned or controlled by the organisation. This includes emissions from organisation-owned fleet vehicles.
   b. Scope 2 emissions result from energy consumed which is supplied by another party
   (e.g. electricity supply in buildings or outstations), and purchased heat, steam and cooling.
   c. Scope 3 relate to official business travel directly paid for by an organisation (i.e. not business travel re-charged by contractors).
5. DEFRA conversion rates have been used to account for carbon. A conversion factor review took place in 2013 and MOD updated all of its GHG figures back to the baseline year at the request of Defra.
6. Carbon data in this report is shown as CO_2e; this is the six greenhouse gases covered by the Kyoto Protocol. They are: Carbon Dioxide (CO_2); Methane (CH_4); Nitrous Oxide (N^2O); Hydro fluorocarbons (HFCs); Perfluorocarbons (PFCs) & Sulphur Hexafluoride (SF_6).
7. The MOD is large and complex with around 400 main sites and around 4,000 sites in total. A site may contain a single building or dozens of buildings. MOD's baselines include as much of the estate as possible but for reasons that include insufficient manpower and old contracts that do not provide the data required, our baselines covers from around 75% to 90% of the Defence estate. The finance data covers spend for a budget item and this may exceed the scope of the data being reported.
8. Sustainability data for: (1) travel, (2) waste and (2) water includes data from MOD's Trading Fund Agencies i.e. Defence Electronic Components Agency, Defence Science and Technology Laboratory and United Kingdom Hydrographic Office.
9. **Estate Energy**
   a. The Department of Energy and Climate Change agreed that the Greenhouse Gas target should apply to the 398 core establishments which MOD has decided to retain for the long term, and that MOD's contribution would be 19h, with an expected 6% being achieved from decarbonisation of the National Grid.
   b. The 398 sites are located in the UK and overseas. These core sites account for around 80% of MOD's energy consumption.
   c. MOD's Trading Fund Agencies are not included in the 398 core sites.
   d. Estate energy data is not weather corrected.
10. **UK Business Travel**
   a. The GGC target is for administrative business travel by Departments. We have defined business administrative travel as business journeys on behalf of MOD. Greenhouse gas emissions from other travel i.e. operations, support for operations, training for operations, welfare etc. have been removed where possible.
   b. Road travel consists of administrative businesses car journeys in either (1) a leased fleet vehicle; (2) personnel using their own personal car (grey fleet); and (3) hire cars
      i. Leased fleet vehicles: This data includes some non-business administrative use because it is not possible to separate out all journeys. Calculation of the lease fleet emissions are estimated based on an average mileage of 18,000 miles per car (from sampled data) multiplied by the average CO^2 emissions of all the vehicles in the fleet.
      ii. Grey Fleet includes travel by civilian and Armed Forces personnel using their own cars. Emissions are calculated using an "average" car from the Defra GHG conversion factors and the motor mileage distance claimed.
      iii. Hire car fleet emissions are based on an estimated journey of 250 miles per hire (based on sampled data) and Defra GHG conversion factors for the size of vehicle hired. If a vehicle type is unavailable any upgrade is not recorded.
   c. Rail travel. We monitor rail travel mileage booked centrally using the mandated contract. The emissions data is calculated for all journeys but we are able to exclude travel related to armed forces recruitment.

d. The travel data is from live databases. The data is correct on the date the report was made and cannot be replicated.

e. The data given is for commercial air travel, it does not include:

i. Military aircraft or

ii. Charter aircraft i.e. used for troop transport.

f. The travel data includes travel by MOD civilians, Armed Forces personnel and the Trading Fund Agencies (Defence Science and Technology Laboratory; UK Hydrographic Office and Defence Electronic Components Agency).

g. The number of UK domestic flights includes journey that start and finish in the UK. Domestic flights for onward connection to international flights have also been included.

11. **Waste**

a. Waste data shown is against the agreed GGC baseline, this is around 75% of MOD known waste. The 25% excluded is unreliable data because:

i. the waste contractor does not provide weighed waste data. The current contracts were signed before weighed waste data was required

ii. sites have insufficient manpower to monitor waste and estimate tonnage based on volume.

b. The waste data is from weighed waste data and volumetric conversion factors. Volumetric conversion estimates the weight of the waste based on the type of waste and size of the skip.

c. The waste data excludes the scrapping and recycling of ships. Ship recycling is not a regular occurrence and their large tonnage would adversely skew figures in either the baseline or the reporting year.

d. The 2010/11 waste data excludes the disposal of the Nimrod aircraft fleet. This was a one-off exceptional disposal. We have included disposals that are part of fleet upgrade/replacement i.e. Hercules c-130 aircraft and truck fleet replacement.

e. Waste data covers the UK, Trading Fund Agencies and sites in Germany.

f. Where data has not been provided then suitable estimates have been used based on historic data for that business area.

12. **Water**

a. Water is provided by Aquatrine, an MOD-wide Water and Wastewater Private Finance Initiative (PFI) project delivered through three separate contracts known as 'Packages'. Package A covers the Midlands, Wales and South West England, Package B covers Scotland, and Package C covers the North and East of England. Aquatrine provides water to over 4,000 site groups, which is approximately 90% of the Department's consumption.

b. The Department's office estate (administrative buildings that are not part of a military establishment) is relatively small, being 8 sites. The full Time Equivalent (FTE) is the number of personnel established at these sites and does not include (1) on site contractors and (2) visitors (MOD/Armed Forces personnel based elsewhere, public and other contractors).

13. Sustainable Development Performance Data, Annex A

a. Air travel data - due to data improvements this data has been revised for all years

b. All purchased electricity is from a renewable source.

c. Data improvement has allowed us to report separately retail diesel and mineral diesel from 2012-13.

d. This data has been estimated

e. This data is unavailable at this time

f. 2009/10 and 2015/16 do not include emissions from operational energy

14. MOD Arm's Length Bodies in scope for GGC.

MOD ALBs	Status	GGC Reporting status	Notes
Defence Academy of the United Kingdom	N/A	Full within MOD core	The Defence Academy ceased to be an Executive Agency in Apr 2012, and forms part of Joint Forces Command.
Defence Science and Technology Laboratory (DSTL)	Executive NDPB	Full within MOD core	
Defence Storage and Distribution Agency (DSDA)*	N/A	Full within MOD core	DSDA ceased to be an executive agency in 2010 when it became part of the Joint Support Chain Services. Now called Logistic Commodities and Services (LCS) Logistic Services.
Defence Support Group (DSG)	Executive NDPB & Trading Fund	Full within MOD core	DSG ceased to be an Executive Agency in 2015, when it formed part of DECA.
Defence Electronics and Components Agency (DECA)	Executive NDPB & Trading Fund	Full within MOD core.	DECA was formed as a 'trading' Executive Agency on 1 Apr 2015
Ministry of Defence Police and Guarding Agency(MoDPGA)*	N/A	Full within MOD core	MODPGA ceased to be an Executive Agency on 1 Apr 2012.
People, Pay and Pensions Agency (PPPA)	N/A	Full within MOD core	PPPA ceased to be an executive agency in Jul 2011, and subsumed back into MOD. Now called Defence Business Services (DBS).
Service Personnel and Veterans Agency (SPVA)	Executive NDPB	Full within MOD core	
UK Hydrographic Office (UKHO)	Executive NDPB & Trading Fund	Full within MOD core	

Annex D: List of Acronyms

ARAc	Annual Report and Accounts
ASSI	Area of Special Scientific Interest
BEIM	Built Environment Improvement Measures
BREEAM	Building Research Establishment Environmental Assessment Methodology
CIRAM	Climate Impact Risk Assessment Methodology
CDP	Chief of Defence People
DBS	Defence Business Services
DCMC	Defence Crisis Management Centre
DECA	Defence Electronics and Components Agency
Defra	Department for Environment, Food and Rural Affairs
DE&S	Defence Equipment & Supply
DG HOCS	Director General of Head Office and Commissioning Services
DIO	Defence Infrastructure Organisation
DREAM	Defence Related Environmental Assessment Method
Dstl	Defence Science and Technology Laboratory
DuOS	Distribution Use of System
EDA	European Defence Agency
FTE	Full Time Equivalent
GBS	Government Buying Standards
GGC	Greening Government Commitments
GHG	Greenhouse Gas
HaFSA	Hospitality and Food Service Agreement
ICT	Information and Communications Technology
IMS	Infrastructure Management System
JSP	Joint Service Publication
MB	Main Building
MILCAP	Military Capability
MOD	Ministry of Defence
NATO	North Atlantic Treaty Organisation
NGEC	Next Generation Estate Contracts
NTEP	National Training Estate Prime
PFI	Private Finance Initiative
PV	Photovoltaic
RAF	Royal Air Force
REACH	Registration, Evaluation, Authorisation and Restriction of Chemicals
RSPB	Royal Society for the Protection of Birds
DuOS	Distribution Use of System
SDI	Strategy for Defence Infrastructure
SDSR	Strategic Defence and Security Review
SSSI	Sites of Special Scientific Interest
tCO_2e	Tonnes of carbon dioxide equivalent
TLB	Top Level Budget
TRIAD	Tri Annual Demand
TW3	The Way We Work
UKHO	United Kingdom Hydrographic Office
VTC	Video Tele Conferencing
WCRP	Water Consumption Reduction Programme
WFA	Whole Force Approach
WRAP	Waste and Resources Action Programme