

Greening Government ICT

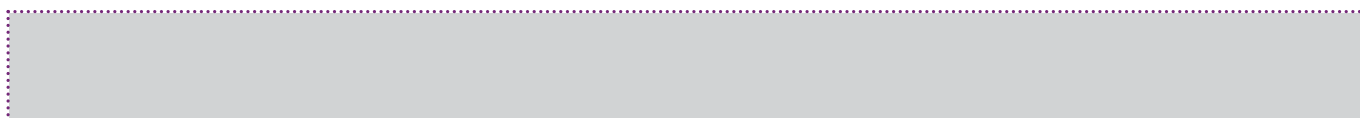
Efficient, Sustainable, Responsible

One year on:

**A progress report on the Government's
Greening Government ICT Strategy**

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Ministerial Foreword

The Information and Communication Technology (ICT) industry has a sizeable carbon footprint comparable with that of the aviation industry. The UK Government runs some of the world's most extensive computer systems, which enable delivery of essential public services. We have a duty to minimise the impact of these systems on the environment and the 'Greening Government ICT' Strategy, launched in July 2008, has set us on the way to achieving just that.

One year on, we have made significant progress in the way we use our ICT, with demonstrable reductions in our carbon emissions. This report lays out how we have achieved this and how we plan to deliver further improvements across the lifecycle of Government ICT.

From decreasing our hardware's redundancy rates and switching machines off at night to increasing server efficiency, we have adopted a range of green solutions. I would like to thank all those who have worked hard to implement the Strategy, particularly the team in the CIO/CTO Council Green ICT Delivery Unit.

We will not rest on our laurels and are committed to a vigorous programme of activity to embed Green ICT best practices throughout Government and the wider public sector. New research and technology developments will redefine what is possible and help us lead the country to a greener, more sustainable future.



Angela Smith
Minister of State for the Cabinet Office

The Strategy and Progress Report in Context

In July 2008, we launched the Greening Government ICT Strategy, becoming one of the first Governments in the world to announce plans to reduce the carbon footprint of our ICT. As one of the most significant users of ICT in the UK, Government has taken a lead in producing and delivering a set of specific steps to drive down the carbon footprint generated by the use of our computers and other ICT equipment.

The Strategy set a clear list of actions for HMG Chief Information Officers (CIOs) and Chief Technology Officers (CTOs) to deliver. These have had a significant impact on Government departments' ICT plans and strategies which have begun to address the impact of the carbon cost and sustainability of their ICT. A recent survey⁰¹ found that 83% of public sector IT managers have either acted on the Strategy or are in the process of implementing changes to their department's ICT plans to reduce the carbon footprint and increase sustainability of their ICT assets and business services.

Green ICT Vision

Government recognises the critical importance of ICT - both as a large consumer of energy and primary resources and also as an enabler for environmental and cultural change. We will continue to use our ICT to reduce the carbon emissions generated by the business of Government.

This report is a summary of the progress made since the launch of the Greening Government ICT Strategy, highlighting success areas, relevance to Government's wider sustainability goals and the direction we will be taking in the coming year.

⁰¹ <http://www.globalactionplan.org.uk/upload/resource/Cisco%20report.pdf>

Green ICT Strategic Objectives

Strategic Objective	Action taken since launch
<p>By January 2009 all departments are to address and consider the impact on carbon emissions of all new ICT purchases, building on existing 'Quick Wins'⁰² standards for certain aspects of sustainable ICT purchasing across Government.</p>	<p>Government ICT Services model contract now incorporates sustainability requirements. We have recently completed a Green ICT tool which enables scoring of suppliers bidding on Government contracts. Office of Government Commerce (OGC) has been working closely with Buying Solutions (an Executive Agency of the Office of Government Commerce in the Treasury) to implement the GreenTicks Campaign. This is the visual Green Tick sign against ICT equipment that conforms to Department for Environment, Food and Rural Affairs (DEFRA) Quick Wins Standards, and is being rolled out across Buying Solutions ICT frameworks. Department for Culture, Media and Sport (DCMS) and OGC are also working collaboratively to deliver a pan-Government ICT Power Management framework.</p>
<p>The Sustainable Operations for the Government Estates (SOGE)⁰³ targets state that Central Government's office estate will be Carbon Neutral by 2012. This will be supported by Government ICT in lowering the power consumption of equipment used, including outsourced contracts and services.</p> <p>ICT will also support the wider sustainability agenda and the SOGE targets, for example reducing emissions through changes in business processes and working practices, minimising transport and reducing waste through minimising paper use.</p>	<p>A Green ICT SOGE Map is available on-line⁰⁴ to assist Departments in mapping Green ICT against mandatory SOGE targets.</p> <p>110 public bodies (including central Government Departments, wider public sector and local Government bodies, and devolved administrations) have begun to implement the actions in the 18 recommended areas of carbon reduction. They, in turn, are lowering the power consumption of equipment used and reducing carbon emissions through business process changes. The consultation on carbon neutrality, carried out by the Department of Energy and Climate Change (DECC), closed on 21st May 2009. It set out the Government's proposed definition of the term 'carbon neutral' alongside recommendations for its use. A summary of the consultation responses and accompanying guidance will be published later in the autumn.</p>

02 <http://online.ogcbuyingsolutions.gov.uk/bcm/sustainableolutions/quickwins/>

03 <http://www.defra.gov.uk/sustainable/government/gov/estates/targets.htm>

04 http://www.cabinetoffice.gov.uk/cio/greening_government_ict.aspx

Strategic Objective	Action taken since launch
<p>By 2020 Government aims to comply with and where possible lead and go beyond global best practice for sustainability across the whole ICT lifecycle. This will cover carbon neutrality and sustainable processes for use of materials, water, accommodation and transport, in the manufacture, use and disposal of ICT.</p>	<p>In collaboration with OGC and DEFRA we have used EU and global standards to derive leading best practice to tackle the end-to-end carbon cost of Government's ICT and are beginning to tackle the wider sustainability agenda.</p> <p>Examples include:</p> <ul style="list-style-type: none"> • PAS 2050⁰⁵ specifies a consistent way of counting the greenhouse gas emissions embedded in goods and services throughout their entire life cycle - from sourcing raw materials, through to manufacture, distribution, use and disposal. The Carbon Trust and DEFRA have co-sponsored the development of PAS 2050 by BSI British Standards and piloted its use across a range of goods and services, including ICT; • supporting the launch of the EU Code of Conduct for Data Centres⁰⁶ in the Strategy, which was led by the European Commission Joint Research Centre (EU JRC)⁰⁷. The Code was developed with the broadest, global, expert input of any data centre initiative to date. Both DEFRA and the British Computer Society (BCS) deliver key roles, leading working groups of the Code. Work is now underway to fully incorporate best practices into the revised list of recommended actions; • working with a Waste Electrical and Electronic Equipment (WEEE) subgroup in extending the standard to improve arrangements for the re-sale of ICT assets; and • inclusion of Electronic Product Environmental Assessment Tool (EPEAT) and European Computer Manufacturers Association (ECMA) standards and methods in a major revision by DEFRA of the Quick Wins procurement criteria for ICT assets.
<p>Offsetting to be seen as a last resort and should be done using offsets approved by the Government's Quality Assurance Scheme for Carbon Offsetting or sourced via the Government Carbon Offsetting Fund (GCOF)⁰⁸.</p>	<p>Since the launch of the Strategy no carbon offsetting has been used and we have been working closely with The Carbon Trust and DEFRA to fully understand and develop best practice.</p>

⁰⁵ www.bsigroup.com/pas2050

⁰⁶ http://re.jrc.ec.europa.eu/energyefficiency/html/standby_initiative_data_centers.htm

⁰⁷ <http://ec.europa.eu/dgs/jrc/index.cfm>

⁰⁸ http://decc.gov.uk/en/content/cms/what_we_do/lc_uk/co2_offsetting/co2_offsetting.aspx

Progress to Date

All Members of the CIO and CTO Councils have completed **Green ICT Action Plans**. The roadmaps contain a full set of action plans that directly map against the 18 recommended areas of carbon reduction in the Strategy. An aggregated version of these departmental action plans has prioritised and identified opportunities for wider cross-departmental exploitation of particular technologies or initiatives.

The **Green ICT Scorecard Pilot** is complete - 8 key Public Bodies (Ministry of Defence, Department for Transport, HM Revenue and Customs, Department for Environment and Rural Affairs, Driver and Vehicle Licensing Agency, Department of Health, NHS Connecting for Health, Department for Work and Pensions) and the Scottish Executive have now been measured against 32 key metrics - 18 from the Green ICT Strategy, plus SOGE targets. The Scorecard collected data on:

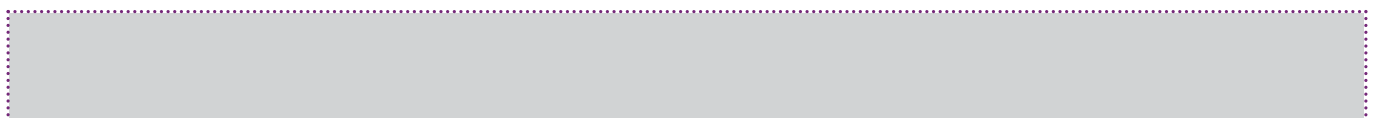
- Green Policy;
- Governance of Policies;
- Energy Efficiency;
- Waste Management;
- Supplier Management;
- Procurement;
- Buildings; and
- Behaviours.

It assessed how green issues impacted the business and customers, the positioning of ICT within an organisation for managing sustainability and energy efficiency, and the existence of organisational programmes for carbon emission reductions.

The exercise has highlighted the scope for ICT carbon emission savings and energy efficiencies. It also identified the scope of potential savings, efficiencies and opportunities for lowering carbon and also acted as a starting point for departments to plan and deliver a greener approach to ICT.

A **Green ICT SOGE Map** identifies where and how public bodies can meet SOGE targets with Green ICT efficiencies. As the SOGE targets evolve in the coming year so will the Green ICT SOGE Map to incorporate changes and developments.

A **supplier scoring model** has been developed to assess the Strategy's specific green ICT objectives in line with a supplier's Strategy. The tool provides a clear metric identifying which suppliers meet or surpass basic Green ICT requirements. The scoring is transparent to suppliers and procurers of ICT products and services. Buying Solutions recently used the model in their Managed Desktop Solutions Framework to review and short list suppliers competing for a pan-Government contract.



The UK has recently been praised by the Director General of the OECD for our progress on a Green ICT specific measurement and CO2 scoring system. We have been working with the international community to **share best practice by:**

- supporting the **European Commission Code of Conduct** for the operation of Data Centres and working with DEFRA, OGC's Centre of Expertise in Sustainable Procurement (CESP) and the British Computer Society (BCS);
- **providing and endorsing guidance to departments** participating in the Code of Conduct and also incorporating the Code's best practices within the 18 recommended core areas of carbon reduction;
- working with the **Waste Electrical and Electronic Equipment (WEEE) Directive** sub group to complete the final draft of the standards and specifications for the resale of used electronic goods and encouraging refurbishment prior to disposal; and
- in collaboration with UK industry leaders, recyclers and DEFRA, working on procurement policy with the US Government in reviewing changes and improvements to its Green ICT procurement standard **Electronic Product Environmental Assessment Tool (EPEAT)**.

Government and industry are **refreshing the recommended actions and top tips** in line with evolutions and best practice in the technology and environmental sectors. This process ensures we continue to have a viable and current list of actions focused on constantly increasing energy efficiency and reducing carbon emissions.

Working in Partnership: Departmental ICT Action Plans

110 HMG public bodies have produced Green ICT Action Plans establishing measures for improving the energy consumption and carbon cost of their ICT using 22 specific actions¹⁰ recommended in the Greening Government ICT Strategy.

The action plans not only clarify what steps have been completed but also set out actions with delivery dates for the remaining steps during the next 18 months.

The information we have received from departments and agencies demonstrates a range of carbon savings that can be achieved - both simple and complex - from duplex printing through to server optimisation.

Achievement of actions was measured as 'complete', 'in progress' and 'planned'. Delivery dates have been provided in line with new tenders and/or contract renewal stages to facilitate supplier adoption and compliance with value for money requirements. A full summary of action plans received can be found in Appendices A-C together with HMG Public Body groupings in Appendix D.

110 Action Plans have been collated consisting of:

- 17 from central civil Government
- 32 from the wider public sector
- 3 from the devolved administrations
- 58 from local Government

All of these organisations have fully endorsed and demonstrated the principles of the Strategy through implementing changes to the organisation's working culture, processes and ICT.

From aggregating the action plans we found:

- Over 80% of the actions have been delivered, in progress or planned by 60% or more of the Public Bodies;
- Over 90% of Public Bodies are either planning or have set in place arrangements to ensure serviceable equipment is reused;
- Over 75% of Central Government Departments have completed or have in progress 11 or more of the recommended actions; and
- 69% of Wider Public Sector (WPS) have 11 or more of the 22 actions completed or in progress.

¹⁰ 22 specific actions derived from 18 Areas of Carbon Reduction

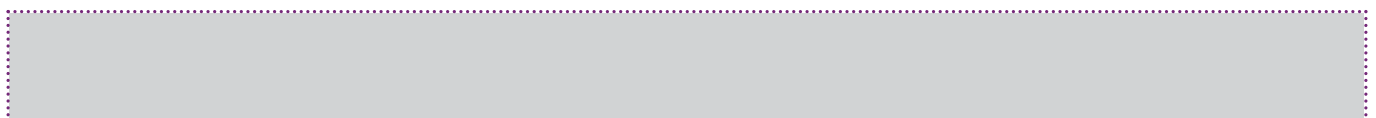
Two of the recommended actions that were completed by less than 15% of departments are:

- Apply thin client technology; and
- Apply timer switches to non-networked technology and printers.

In refreshing the list of recommendations these areas will be reviewed against emerging research material, industry and policy changes. The Green ICT Delivery Unit (GDU) will then re-assess the viability of these recommendations.

Using this information we can now:

- **Identify opportunities** where pan-Government programmes and projects could be implemented to avoid duplication of effort;
- **Create strong case studies** to demonstrate the benefits and carbon reduction of the actions; and
- **Identify barriers and constraints** to further progress.



Case Studies - The Strategy in Action

Public Bodies agreed to implement the maximum possible actions from the list of 18 Areas for ICT Carbon Reduction in order to deliver our strategic objectives. The following case studies illustrate how Public Bodies are successfully delivering the Strategy and reducing their carbon footprint through tackling five key areas. By implementing actions recommended in the Strategy, this small collection of case studies alone successfully delivers over **£6.8 million savings** and a reduction of **over 12,000 tonnes of CO2**.

1. Extend the lifecycle of all ICT purchases

to their natural demise either caused by failure, inability to support the business objectives of the organisation, excessive maintenance costs or excessive carbon footprint and energy consumption, rather than frequent automatic refresh and replacement programmes. This should occur where such extension will have environmental benefits across the product lifecycle and re-deployment of the equipment is not envisaged.

Crown Prosecution Service has decided to replace 9,500 computers and 2,500 printers every 5 years rather than 3. This **delivers £2.35 million in savings** which is being reinvested in other greening Government ICT programmes, such as video conferencing.

This enables changed business processes that will contribute to reducing the Department's carbon footprint.

Department for Work and Pensions have agreed with their service provider to postpone the contractual upgrade of 130,000 PCs from a 3 year refresh cycle to 5 years. This delivers **carbon reduction** whilst maintaining the ability of the Department to deliver increased services.

Department for International Development is in partnership with an organisation that refurbishes computers and distributes them for reuse in education, health and not-for-profit organisations in developing countries - to manage the **redistribution and re-use of obsolete IT equipment**. Once data is securely wiped, equipment is redistributed safe in the knowledge that it will have a second life helping to provide training and new skills in developing countries, fighting poverty and social exclusion. The scheme also takes responsibility for the disposal of the equipment **in accordance with the Waste Electrical and Electronic Equipment** directive.

2. Reduce the overall number of PCs and laptops

used by the organisation to reach as close to a 1:1 ratio as possible unless there are exceptional circumstances¹¹.

¹¹ Exceptional circumstances to include Health and Safety concerns, formal on-call arrangements, business continuity arrangements, security requirements and accessibility or special needs circumstances such as caring duties

Home Office have set up a cross-functional team to ensure ICT resources are used to best effect. The team has delivered a **saving of more than £2.4 million in 2008-9** by identifying and removing unused IT hardware and telephones, renegotiating with suppliers, and tracking down unused laptops and software.

DEFRA has replaced previous mixed PC desktop devices with a corporate laptop device and a common desktop suite of software, equipped with WIFI communications. This new laptop provides a power saving of some 60% over the old desktop - for 4,500 staff this is the equivalent to some **160 tonnes of CO2 emissions saved** per annum, equivalent to a **£40,000 saving** in power bills for the department.

In addition, DEFRA took the opportunity to implement a single device policy - enabling staff to move from an estate of some 11,000 user devices or a 1.5: 1 device to staff ratio to a **1.1 : 1 ratio**; where business or personal needs have dictated retention of a 2nd device and thus prevented a pure 1:1 ratio being attained.

3. Implement a range of active device power management actions as detailed in the Areas for ICT Carbon Reduction to significantly reduce power consumption.

HM Revenue and Customs are currently introducing Wake On LAN to over 75,000 PCs - expected to **reduce HMRC's CO2 emissions by 12,000 tonnes, and save £2 million per annum** in energy costs. This programme puts PCs into low power mode overnight, at weekends and at other times when they are not in use. HMRC still provide a secure and stable desktop infrastructure by allowing remote activation of machines to deploy security patches and software updates remotely.

Department for Communities and Local Government are implementing a Replacement Telephony Service to 2,500 users across three locations based on the Internet Protocol Telephony (IPT) standard. At the heart of the solution, the new handsets and switches to be deployed are some of the most energy efficient available on the market today and provide a power saving of some 60% over the existing equipment. Once deployment is complete, this will translate into a **saving of £21,000 in power bills and over 100 tonnes of CO2 emissions per year**.

4. Reduce the overall number of printers used by the organisation and replace with multi-function devices where security issues allow and use green printing defaults wherever possible (such as double-sided and multiple pages printing).

Department of Health have replaced 1,500 end of life local and networked printers, scanners and fax machines with 330 energy efficient and optimised multifunctional devices. The managed print service now provides statistics on print consumption across the department. Default settings are duplex and greyscale. A 'Think Before You Print' campaign has run for 3 months to drive **down print volumes by around 15%** and encourage sustainable best practice for printing. A pilot of print management software by users and an accounting group is in progress and deployment will enable quota setting and other controls.

Department for Work and Pensions has commenced a Departmental wide consolidation of its printer estate moving to a managed service. When complete, the DWP will have replaced over 30,000 printers, copiers and fax machines with less than 10,000 devices, primarily multi-function printers.

14 Case Studies - The Strategy in Action

Mono, duplex printing will be set as standard on all devices and the Department anticipates **saving 200 million sheets of paper a year.**

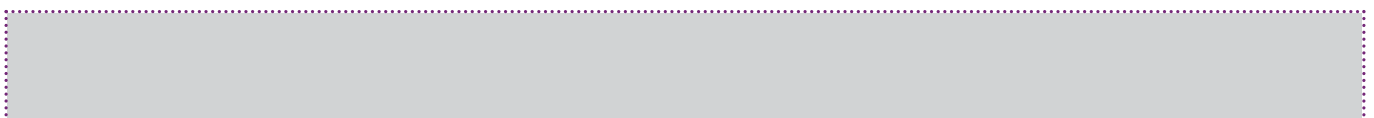
DEFRA have adopted networked multi-function print devices (MFD's), enabling staff to print to any printer in their office as well as providing a confidential print service enabling printing on presence at the printer. This initial printer rationalisation exercise **removed 2,044 printers**, and deployed some 600 MFDs - reducing the estate from 3,399 printers to 1,350 for some 8,000 staff in the core Department and its Agencies both inside and outside London.

Based on the faceplate ratings for the printers involved this **saved around 10 tonnes of CO2** when compared with power consumption in idle mode. As in use power consumption is roughly 5 times standby mode - the **saving** would have amounted the equivalent of **50 tonnes of CO2 or £12,000 per annum.**

5. Increase average server capacity utilisation to achieve a minimum of 50% where possible, as part of a commitment to comply with the forthcoming European Code of Conduct for the Operation of Data Centres.

Department for Children, Schools and Families has started an audit and rationalisation of servers within the Department. They have **decommissioned 14 servers** with another 14/15 due to be removed shortly. They are in the process of **virtualising their data centres** and will be introducing a new Storage Area Network later this year which will improve server capacity and will help to deliver server virtualisation.

10% of the **Department of Health's** 450 file servers are being targeted for **virtualisation** onto a small number of energy efficient devices as a **proof of concept** for potential wider optimisation in the future.



Where Do We Go From Here?

Key Points for Greening Government ICT Strategy 2010/11

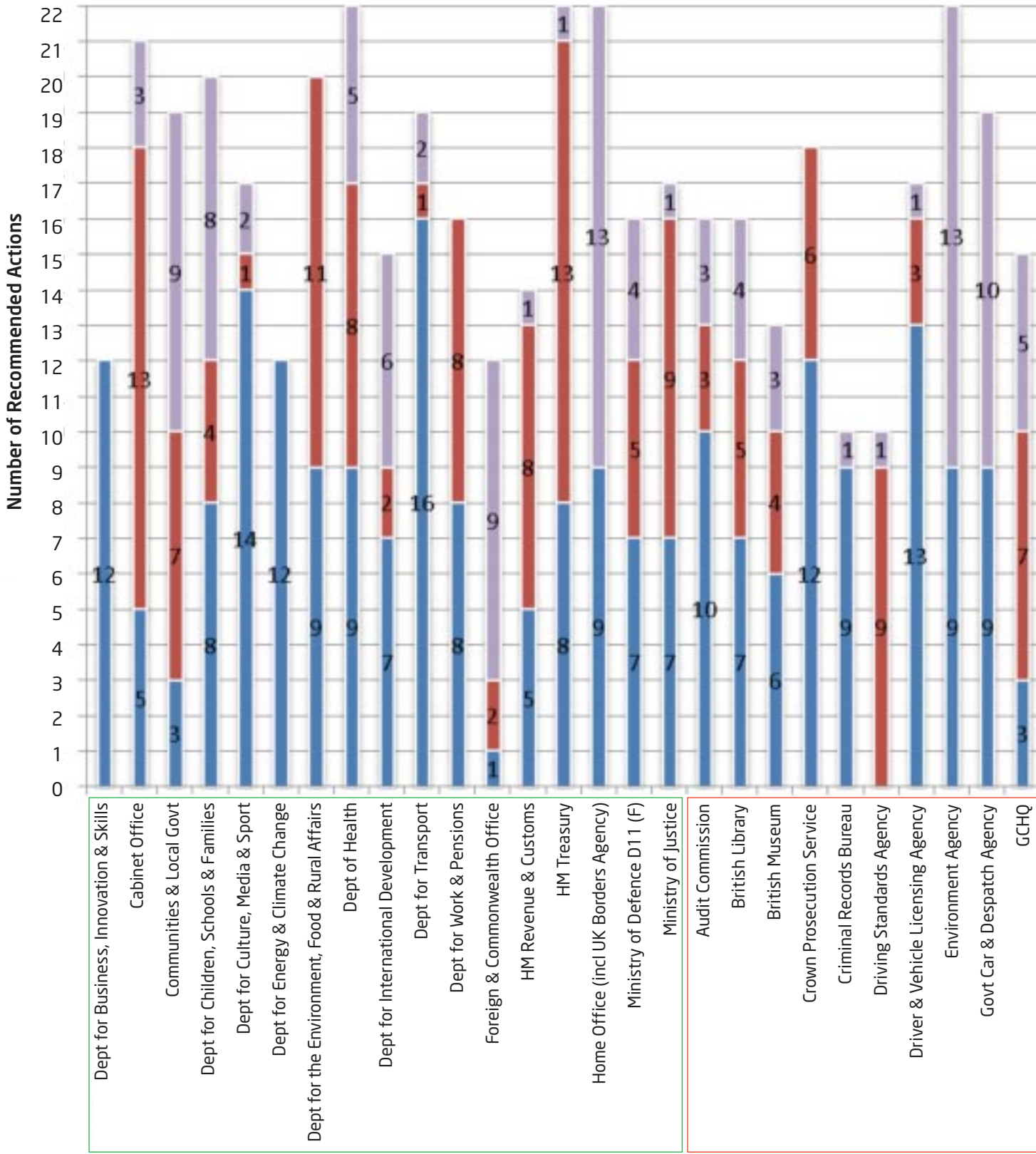
Actions taken so far concentrate on directly reducing the environmental impact of Public Sector ICT. In the coming year, we will utilise these as a starting point to build pan-Government programmes and approaches which will provide sustainable business through wider organisational changes.

This is a continuous programme of activity.

Further work will:

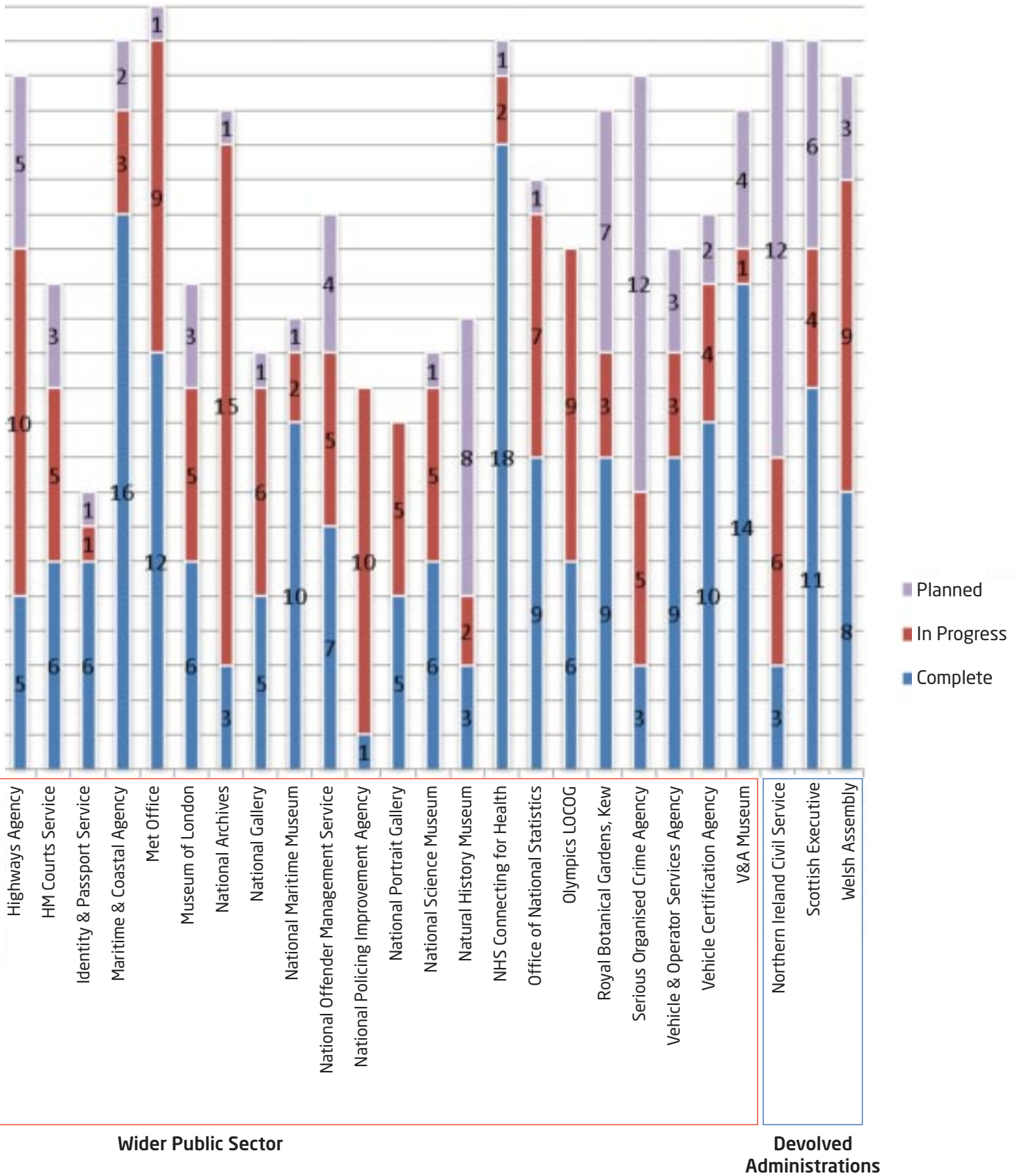
- **address more complex options** in the light of more evolved research, including identifying the pros and cons of different recommendations, and reassessing recommendations already in the strategy – such as the viability of thin client technology and ways to apply timer switches to stand alone printers;
- **identify Green ICT standards and measurement criteria** to define common measures and reporting at both UK and European levels;
- continue to **embed Green ICT best practices and environmental impact assessments** into mainstream departmental and industry operational supply chains and reflect these in Public Sector procurement standards;
- encourage the **use of ICT to help reduce energy consumption in other parts of the organisation** and the wider community e.g. reducing occupancy, minimising travel and ending the need to print documents;
- **assess the carbon impact of delivery**, support and project development of ICT services;
- **mandate central Government departments** to deliver a minimum of 10 recommended actions;
- look to engage and promote the Greening Government ICT Strategy best practice into **Local Government and the wider public sector**;
- **refresh the Strategy** in line with, once published, the carbon neutrality guidance from DECC and DEFRA's voluntary reporting guidelines; and
- **address barriers to delivery** through refreshed actions and top tips, improved guidance on carbon neutrality and agreed methods and measures of delivery.

Performance of Central Civil Government, Wider Public Sector

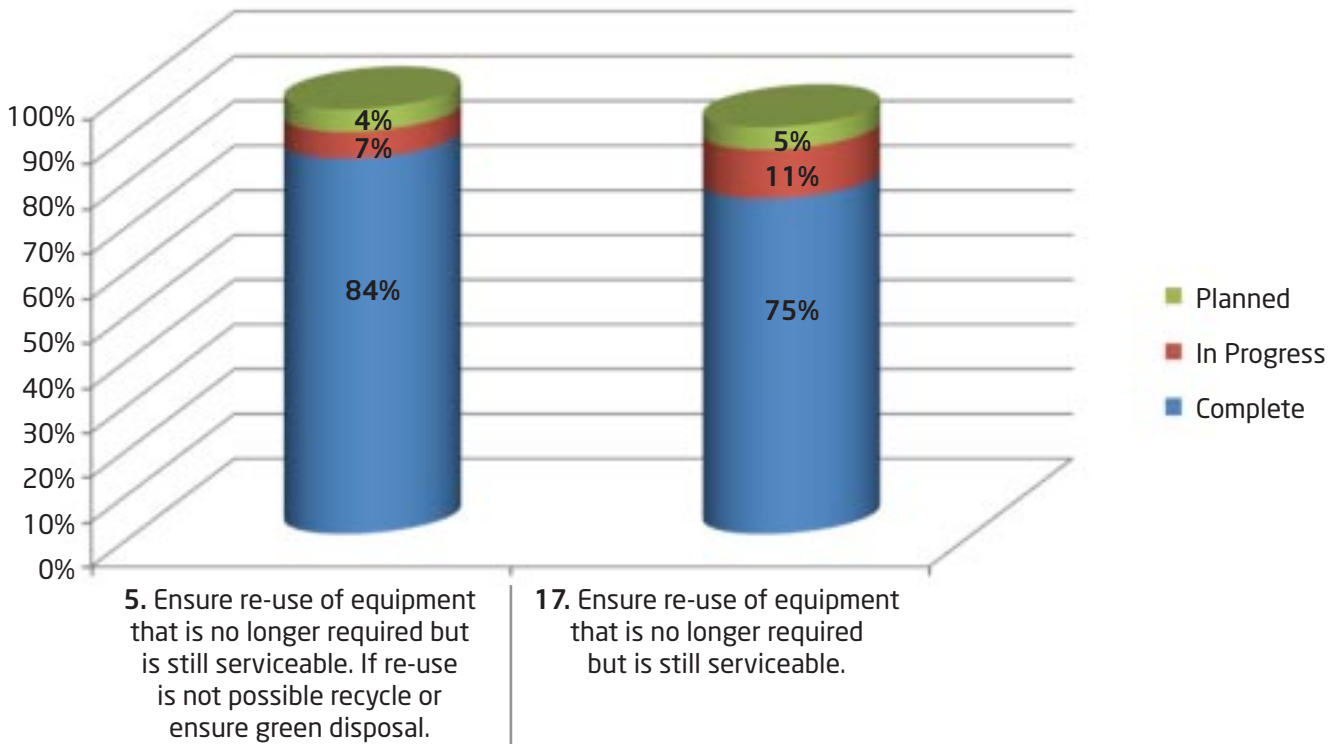


Central Civil Government

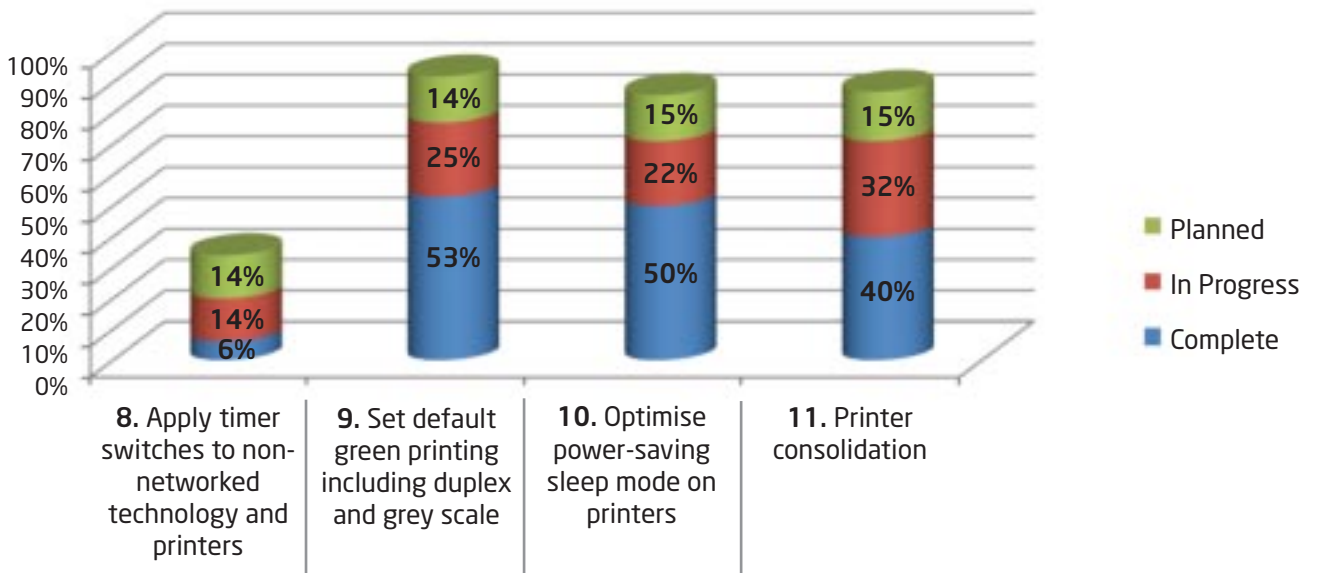
and Devolved Administrations Against Recommended Actions



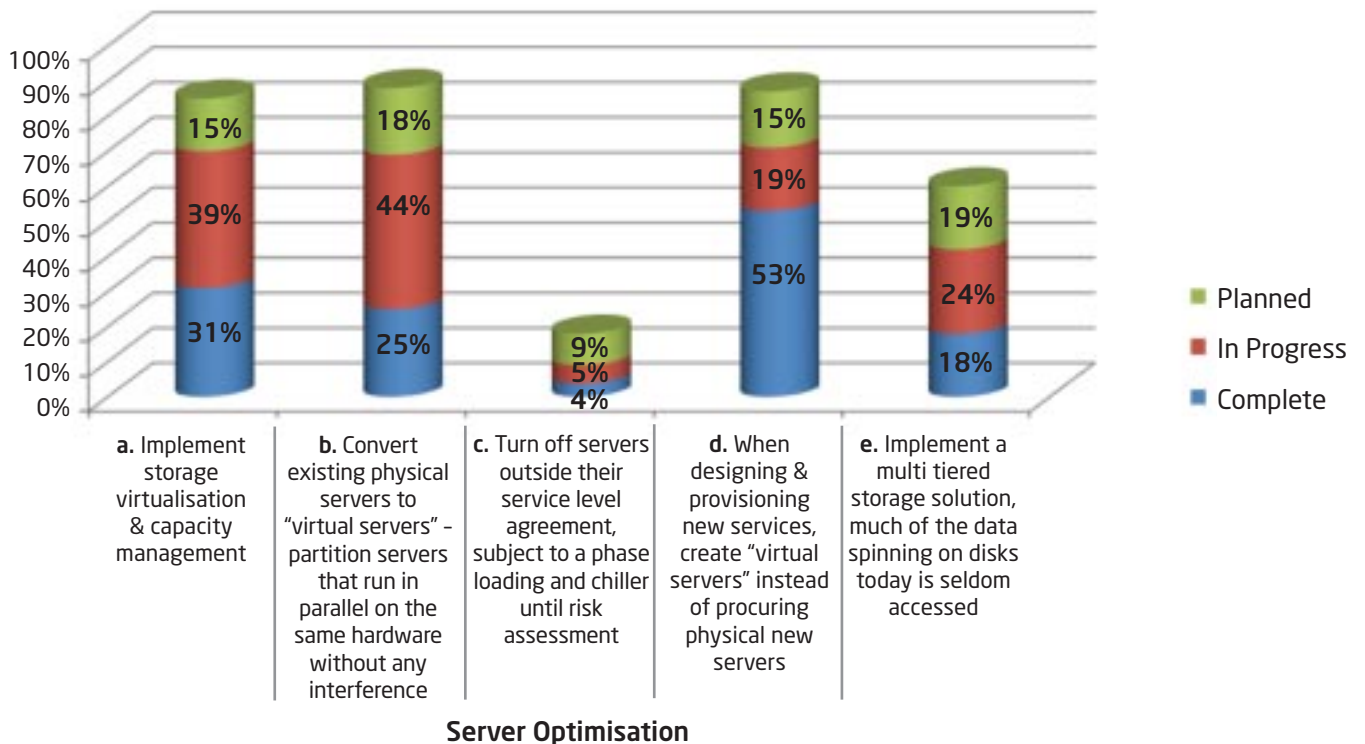
Extending the Lifecycle of ICT Purchases - Performance of Central Government, Wider Public Sector, Devolved Administrations and Local Government



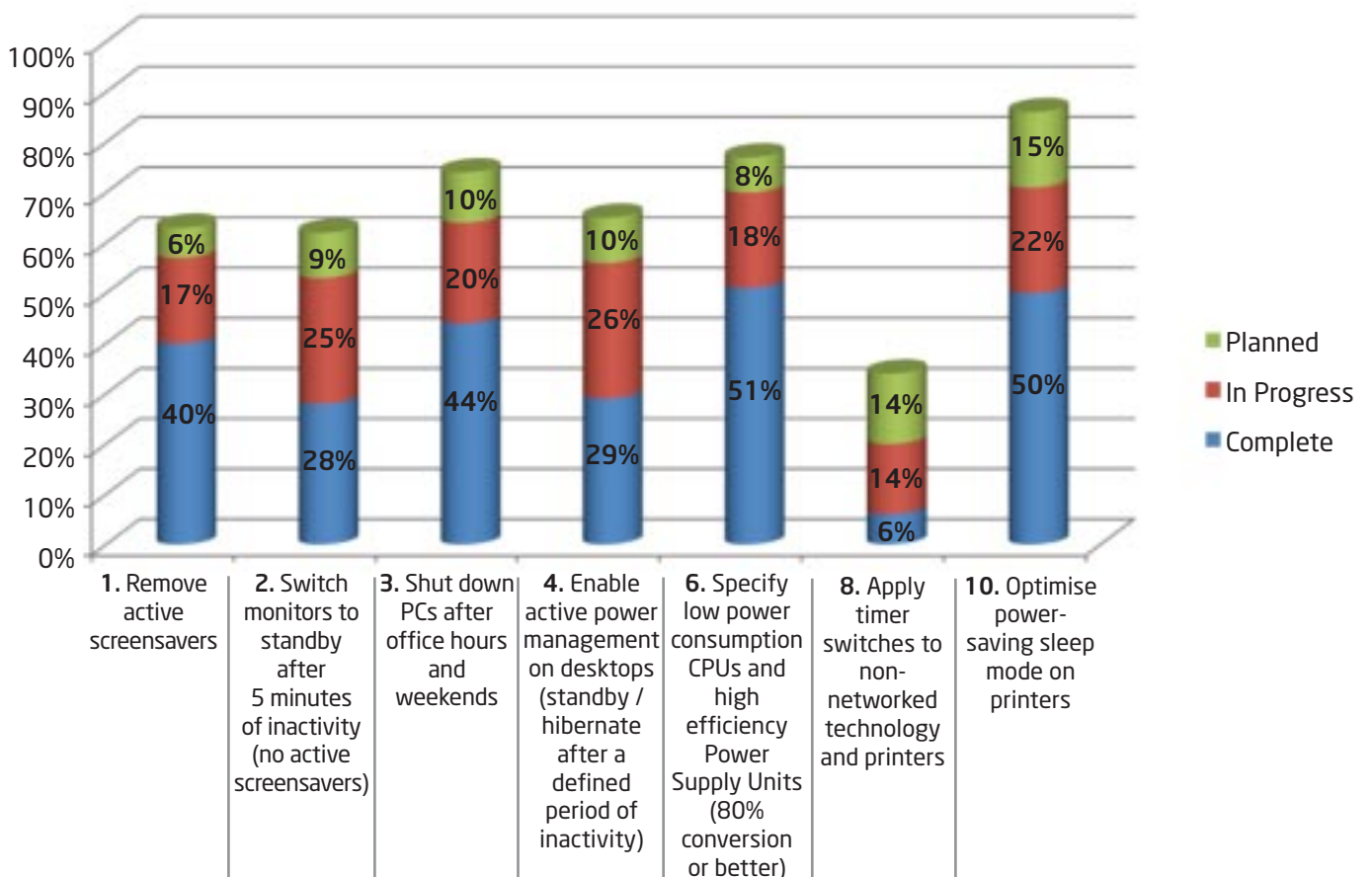
Reduce the Overall Number of Printers - Performance of Central Government, Wider Public Sector, Devolved Administrations and Local Government



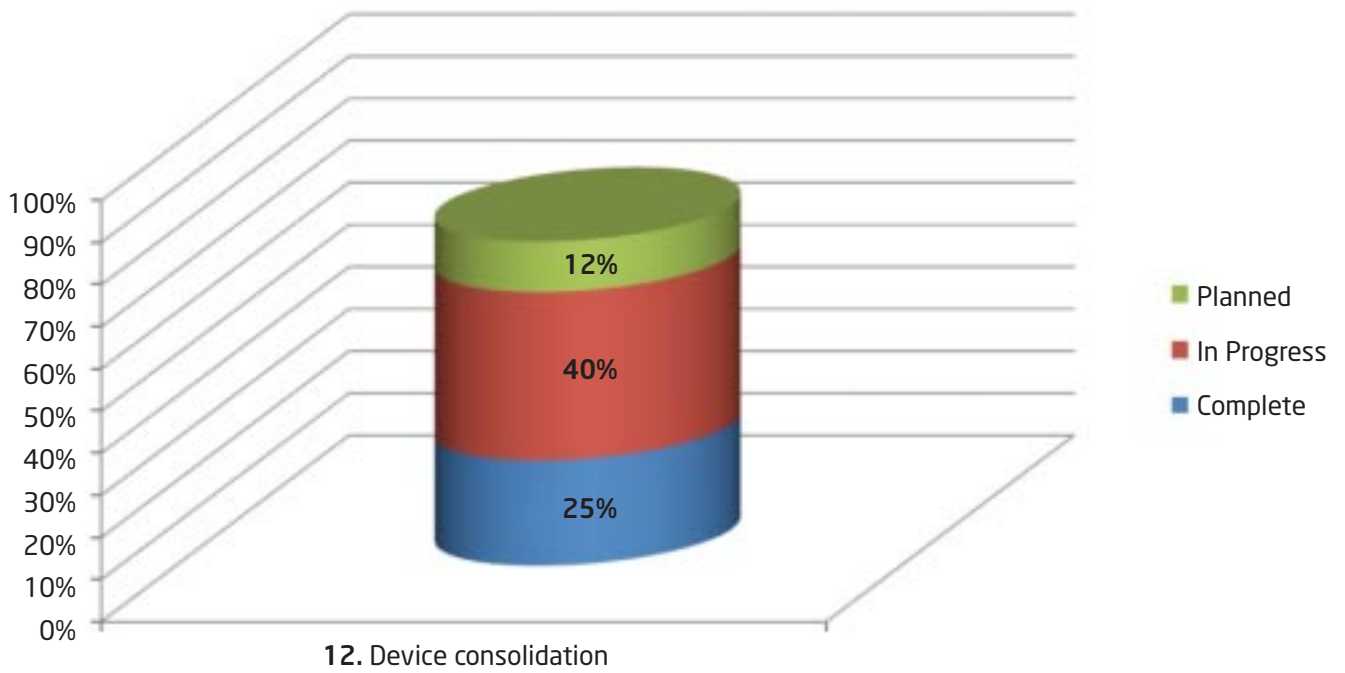
Increase Server Optimisation - Performance of Central Government, Wider Public Sector, Devolved Administrations and Local Government



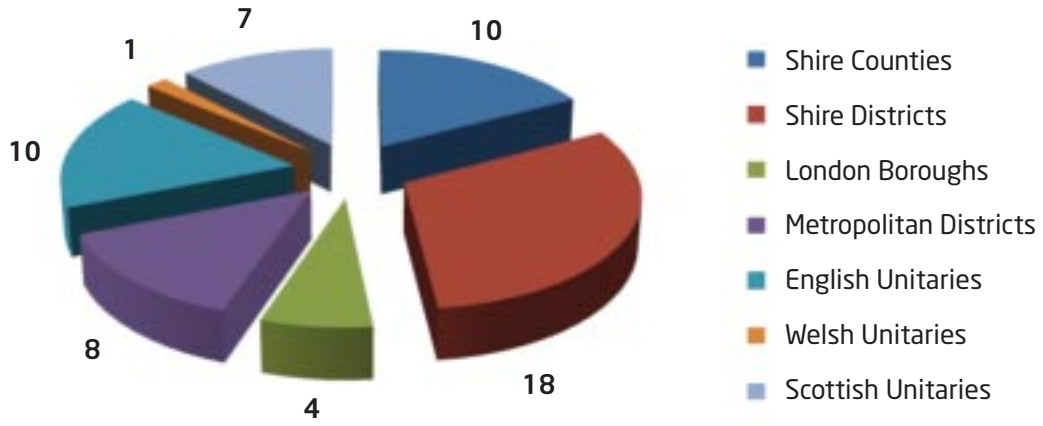
Active Device Power Management Actions - Performance of Central Government, Wider Public Sector, Devolved Administrations and Local Government



Reduce the Overall Number of PCs and Laptops - Performance of Central Government, Wider Public Sector, Devolved Administrations and Local Government



Response Composition by Council/Organisation Type



HMG Public Body Contributors		
CIO/CTO Council Green ICT Delivery Unit	Pan-Government representatives	
Central Civil Government	Department for Business, Innovation and Skills Cabinet Office Department for Communities and Local Government Department for Culture, Media and Sport Department for Children, Schools and Families Department for Energy and Climate Change Department for the Environment, Food and Rural Affairs Department for International Development Department for Transport Department of Health Department for Work and Pensions Foreign and Commonwealth Office HM Revenue and Customs HM Treasury Home Office (Including UK Borders Agency) Ministry of Defence DII(F) Ministry of Justice	
Wider Public Sector	Audit Commission British Library British Museum Crown Prosecution Service Criminal Records Bureau Driving Standards Agency Driver and Vehicle Licensing Agency Environment Agency Government Car and Dispatch Agency GCHQ Highways Agency HM Courts Service Identity and Passport Service Maritime Coastal Agency Met Office Museum of London National Archives National Gallery National Maritime Museum National Offender Management Service	National Policing Improvement Agency National Portrait Gallery National Science Museum Natural History Museum NHS Connecting for Health Office of National Statistics Olympics LOCOG Royal Botanical Gardens, Kew Serious Organised Crime Agency Vehicle and Operator Services Agency Vehicle Certification Agency V&A Museum

HMG Public Body Contributors

Local Government	<p>Aberdeenshire Council Borough of Poole Bracknell Forest Braintree District Council Broxton Borough Council Calderdale Castle Point Borough Council Chelmsford Borough Council Cheshire councils Crawley Borough Council Derbyshire County Council Devon County Council Dudley Metropolitan Borough Council East Ayrshire Council East Hertfordshire East Lothian East Renfrewshire Council East Riding of Yorkshire Council East Staffordshire Borough Council East Sussex County Council East Dunbartonshire Eden District Council Epsom and Ewell Erewash Borough Council Gloucestershire County Council Guildford Borough Council Hampshire County Council Hertfordshire County Council Knowsley Metropolitan Borough Council London Borough of Hillingdon London Borough of Brent London Borough of Newham London Borough of Lewisham N E Derbyshire Newcastle-u-Lyme Borough Council Newport City Council Norfolk City Council</p>	<p>North Tyneside Council Northamptonshire County Council Northumberland County Council - Berwick Office Peterborough City Council Plymouth City Council Reading Borough Council Renfrewshire Rotherham Metropolitan Borough Council Ryedale District Council Shropshire Council South Lanarkshire Spelthorne Borough Council Staffordshire City Council Stoke City Council Tameside Metropolitan Borough Council Tandridge District Council Telford & the Wrekin Tewkesbury Borough Council Wakefield Metropolitan District Council Welwyn Hatfield Borough Council Wolverhampton City Council</p>
Devolved Administrations	<p>Northern Ireland Civil Service Scottish Executive Welsh Assembly</p>	

