

Guildford Branch

Surrey University

23 May 2013



uk green ict programme - the virtuous triangle

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Not only Climate Change but also...



- Energy is in short supply
- Materials are in short supply
- Manufacture of ICT and development of ICT services consume both &
- ICT is growing 2% +, typically 10-15% of a business CO2 footprint &
- Moving to an economy based on services and information...accelerating growth!
 - Data centre services now make up some 12% of UK GDP
 - UK industrial strategy, with its emphasis on energy-efficient computing as one of the 8 areas for UK technical leadership

ICT is part of the solution (Mitigation and Adaptation)

Brundtland: *“A development is sustainable if it meets the needs of the present without compromising ability of future generations to meet their own needs”*

The Virtuous triangle for Green ICT...



UK Government ICT...

Some figures...

- UK Public Sector ICT spend
 - £16b per annum, central government spend £7b
 - 9% of total Public Sector spend
 - 1% of entire UK economy
 - 90% of ICT technology spend with supply chain, including some £1.2b on hosting
- => A great opportunity for ICT efficiency
- => Essential to engage with suppliers

UK Government response...

A Government ICT strategy

= workstreams driving efficiency and sustainability gains..

– End user device

- Build & procure single devices fitted to job roles/use profiles
- Reduce device proliferation – Laptop, Tablet, Blackberry, etc

– Public Sector Networks

- Sharing network enables sharing buildings

– Hosting

- Virtualising servers and consolidating Data Centres

– Capability

- Professional development, build in Green ICT skills

– G-Cloud services bring in from large and small enterprises

– Digital by Default

- Saving paper, call centres

– &....

An HMG Greening government ICT Strategy

- Vision: 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 staff, organisation & customers



Reduce the Environmental
Impact of ICT Systems

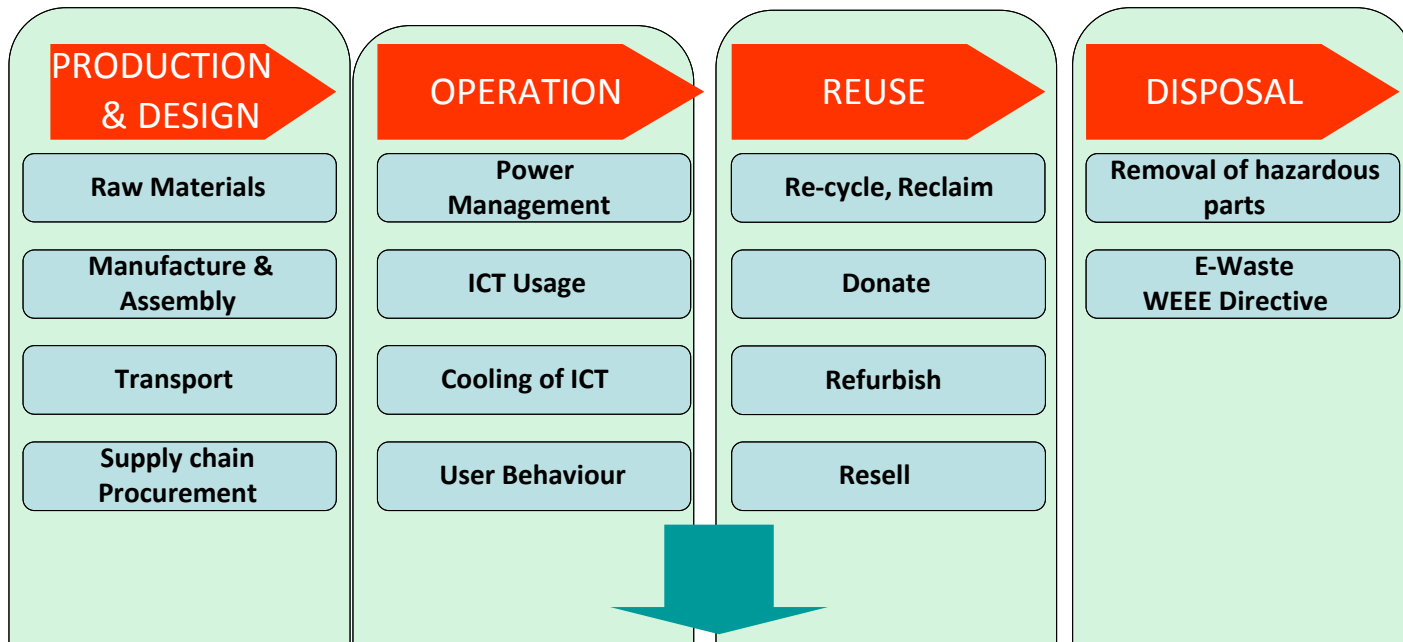
Use ICT to Facilitate More
Sustainable Processes

Use ICT to Measure &
Control Sustainability

And what are we doing centrally...

- Set up Cross-Public Sector Green Delivery Unit (GDU)
- Compiled work book of best practices
- Identified 14 key target outcomes across the lifecycle
 - Depts to choose and achieve 10 by April 2015
- Compiled Maturity Model for embedding Green ICT, in processes
 - Depts to achieve level 3 by April 2015, and provide plans to get there by April 2013

Across the lifecycle ...



Green ICT Efficiency Principles

Energy efficient Design
 Componentise
 Support interoperability for reuse
 Fit capacity to spec
 GBS standards compliant

Power management
 Consolidate/Virtualise/Share
 Energy efficiency

Extend Life of ICT
 Cradle to cradle
 Reuse, resell, redeploy
 Asset management

Removal of hazardous material
 WEEE Directive

Sourcing ICT... Buy less, share more

- Extend life and maximise use of existing systems
- Go for single richer devices
 - Printers
 - End user devices (PC, laptop, iPADS, Blackberries...)
- Go for Services not Assets
 - Cloud-store of services
 - Virtualise and consolidate
- Align assets used with environmental standards
 - Government Buying Standards
 - EU Codes of Conduct for
 - Energy efficient data centres
 - Broadband
 - International Standards for network and server kit
- Close the Loop
 - Buy stuff that is constructed from recycled materials
 - Buy stuff that can be recycled

Targets

- ⇒ GBS/International standards in all new contracts from July 2013
- ⇒ DC CoC Endorser status by April 2013
- ⇒ DC Participant status for all DCs used to host new services from April 2014

Operating ICT... Lean and Mean

- Minimise power consumption
- Reduce paper consumption
- Follow standards for efficient operations
 - EU Code of conduct
- Change behaviours
- Embed in operational practices and services

Targets :

=> Measure and set trajectory for reducing footprint
from April 2013

=> Equipment and applications rationalisation by April
2014

Getting rid of ICT

– follow the Waste hierarchy

- If broke fix it !
- Re-use, Re-furbish for other purposes
- Recycle elsewhere
 - Clean and re-sell
 - Charities/Schools
- Reclaim components, consumables and materials
- Dispose in line with regulations
 - WEEE, licensed sites etc

Targets :

=> Zero landfill from government ICT by April 2015, with full tracking of all disposals from April 2013

Roadmap – 14 key areas for improving practice(5)

Key target outcome

1. ICT equipment and services procured using **Government Buying or International Standards** where appropriate.

2. Decisions to **replace equipment** based on business utility rather than set refresh points.

3. **Power consumption** minimised for end user access devices.

4. **Number of end user access** devices reduced to minimum necessary for business needs

5. **Number of printers and volume of print reduced** to minimum necessary for business needs

Description

At initial procurement or next refresh point for purchase/lease GBS applied where available. Where not available international standards for greener electronics applied , with use of accreditation schemes such as (eg EPEAT, or ECMA) to confirm compliance

At refresh points, process in place to review whether to refresh equipment, balancing the footprint from continuing to use and support, against the footprint from procuring, installing and running more efficient kit and disposing of the existing devices

energy management strategies in place across ICT Estate encompassing as appropriate

- behaviour change
- operating system settings
- networked automated energy saving tools

Device intensity reduced through sharing and device reduction initiatives, adopting for example:

- device pools
- virtual desktop technologies
- thin clients
- PC hives
- VOIP
- Soft Phones

Print reduction strategy developed and adopted incorporating

- behaviour changes
- print settings e.g. duplex
- consolidation of print functions e.g. MFDs
- technologies for efficiencies e.g. proximity printing, print volume reporting by organisation and individual
- settings to reduce use of toner
- measures to minimise colour printing

Roadmap – 14 key areas for improving practice(6)

6. **Networks audited**, reduced and shared with due regard to resilience needs.

Network infrastructure rationalised and shared

- Audit existing provisions and resilience arrangements
- Align networks and remove duplication
- Match provisions to requirement
- Power management efficiencies
- Use shared/cloud based services and migrate to PSN provisions where appropriate

7. Suppliers engaged in monitoring and improving environmental performance of the **ICT supply chain**.

Improved environmental performance of the ICT supply chain through

- incentivised contracts to deliver greener products, services and innovative behaviours
- adoption of GBS for product types covered
- reporting of energy/carbon footprints for products and services

8. Business needs met through **shared applications** hosted in-house, or as services on the web

Existing applications and services and business reqs , are audited and rationalised, those apps and services not required being decommissioning, and new development avoided by sharing those available within organisation and beyond

9. **Applications are virtualised and consolidated** onto fewer servers.

Applications virtualised where appropriate, removing/reducing hardware dependencies, and consolidated onto fewer servers that are loaded to maximum levels of utilisation with due regard to resilience needs

10. **EU Data Centre Code of Conduct** endorser status adopted.

Programme of energy efficiency improvements drawn up and implemented and Endorser status gained under EU CoC for energy efficient data centres and server rooms

11. **Server rooms** are run energy efficiently

The impact of data centres and server rooms on the environment is understood and managed with active supplier engagement continuously seeking efficiencies and reduced impacts.

Roadmap – 14 areas for improving practice(3)

12. **Storage capacity** minimised with due Data storage capacity, deployment and growth is controlled and managed regard to resilience and availability needs. with

- policies and guidance in place for managing emails and documents,
- use of tiering and compression technologies
- availability of collaboration spaces

13. Minimal levels of land-fill from **disposal of ICT** kit at end of life.

Disposals reduced through policies and practices for re-using and re-cycling ICT kit at end of useful life

Key Target Outcome (KTO)	CPS	DCLG	DECC	Defra	DfID	DoH	DWP	FCO	HMRC	HO	MOD	MoJ
KTO1. Use of Green ICT standards in procurement	4	4	6	5	5	6	5	3	5	4	4	4
KTO2. Replace for business utility not refresh	3	6	6	5	6	6	3	3	4	4	5	4
KTO3. Power consumption minimised for end user access devices.	4	6	6	5	5	4	5	3	5	4	4	4
KTO4. Minimise end user access devices	4	4	4	5	5	4	5	2	4	4	4	4
KTO5. Minimise and consolidate print	5	6	4	5	4	5	5	3	5	5	3	4
KTO6. Rationalise networks	4	6	2	4	3	4	3	2	4	4	6	4
KTO7. Tackle supply chain	3	4	2	5	3	4	4	3	4	3	3	3

Key Target Outcome (KTO)	CPS	DCLG	DECC	Defra	Dfid	DoH	DWP	FCO	HMRC	HO	MOD	MoJ
KTO8. Share services and systems	3	4	4	4	4	4	5	3	5	4	4	4
KTO9. Virtualise and consolidate hosting arrangements	4	4	3	4	5	4	5	3	5	4	3	4
KTO10. EU Data Centre Code of Conduct endorser status	4	3	2	4	3	N/A	5	3	4	3	1	3
KTO11. Server rooms are run energy efficiently	4	5	4	2	4	4	4	3	4	3	4	4
KTO12. Storage capacity minimised	4	6	4	2	5	4	3	4	5	4	4	2
KTO13. Minimise need for disposal and land-fill	5	6	2	6	6	6	5	3	5	5	5	3
KTO14. Reduce business travel	4	4	5	4	6	5	5	4	5	4	4	4

And achieved by April 12..

- Average PUE for 10 depts of 1.87
- At least 232ktCO2 savings from individual dept initiatives, saving £1.3m pa
- GDU Cross dept working groups for
 - Metrics
 - Procurement
 - Share/re-use

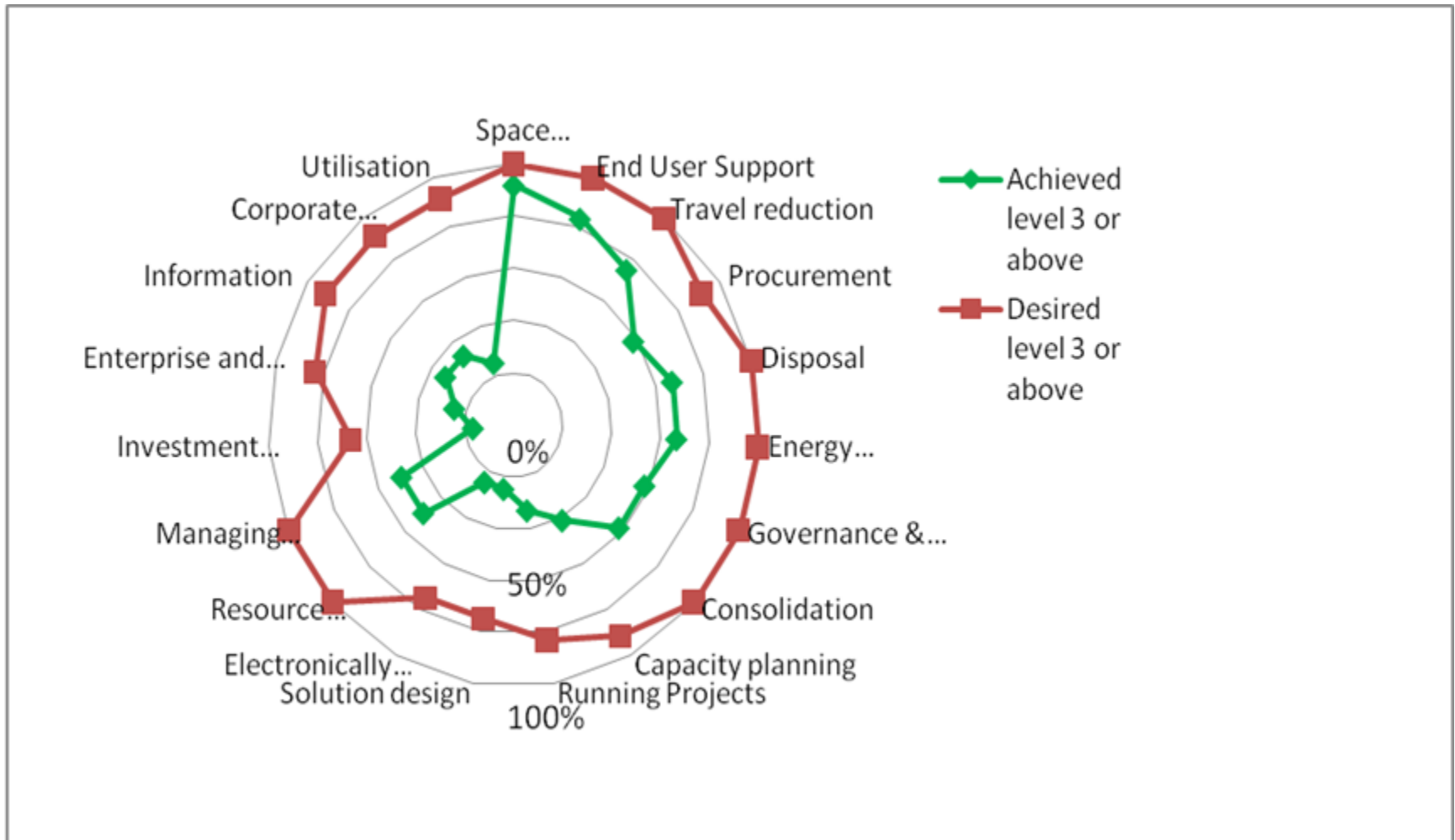
Not forgetting the Service wrap

- Service management
 - Help desk
 - Break/fix
- Change
 - Upgrades
- New builds
 - Development
 - Testing
 - Delivery

Maturity model* levels...

1. Foundation
 - evidence and intelligence gathering to inform actions, agreed plans
2. Embedded
 - show commitment and basic initial development, basic processes in place
3. Practised
 - moving forward taking actions to improve, repeatable actions
4. Enhancing
 - pushing for new opportunities, adoption of best practice, improving capability
5. Leadership
 - taking control, having own vision, optimising performance

Summary of Depts Baseline position and aspirations @ April 2012...



And now for the 2nd vertex

Reduce the Environmental
Impact of ICT Systems



Use ICT to Facilitate More
Sustainable Processes

Use ICT to Measure &
Control Sustainability

Greening ICT Strategy targets ...

- To report 'bottom-up' on operational energy consumption from April 2013
- To adopt standards for consistent measurement and reporting from April 2015 (building on Carbon Trust led GHG Protocol sector guidelines)

JISC's tool for Higher Education Sector



SustelT ICT Energy and Carbon Footprinting Tool

INTRODUCTION and INSTRUCTIONS

This tool is designed to help Further and Higher Education (FHE) Institutions estimate the in-house energy use and costs and carbon footprint of their non-residential ICT usage.

The tool can be used in two ways:

1. The **'quick and simple'** method (blue area of the worksheet). This only requires a number (which can be estimated) for each of the different types of ICT device.
2. The **'thorough'** (and more accurate) method (yellow area of the worksheet). In addition to numbers of devices, this enables users to enter institution-specific data on the power rating/typical usage hours or energy consumption of equipment.

For each item on the right, click on the link to go to the appropriate sheet and fill in the details for your institution. Measure your progress by indicating when you have completed a section.

Each section allows you to return to this menu, or from each page you can a) click a link to take you to another section or b) click the Tab for the section you want to go to.

When you have completed all sections you can see your totals and an analysis of your results by clicking on the 'Totals and Analysis' button.

HPC

Completed? Yes

Servers

Completed? Yes

PCs and monitors

Completed? Yes

Networks

Completed? Yes

Phones

Completed? Yes

Imaging

Completed? Yes

AV

Completed? Yes

Totals and analysis



SustelT ICT Energy and Carbon Footprinting Tool © SustelT 2012

INSTRUCTIONS

Type in the blue areas - nominal figures only have been entered.

Areas in yellow are default figures which can be altered if data specific to the institution is available.

NOTES

The letters in brackets correspond to explanations in the User Guide and the worksheet "Assumptions" on how the default assumptions were derived.

MENU

PCs & Monitors	Number	Watts (Active, idle) (f)	Watts (Standby) (f)	Hours/y (Active, idle) (g)	Hours/y (Standby) (g)	Total Energy Consumption kWh/y per PC (h)	Total Energy kWh/y
PCs							
High performance PCs & workstations	1					400	400
Medium performance, standard PCs	1					200	200
Low power, green PCs	1					100	100
Managed standard PCs	1					120	120
Student green PCs	1					65	65
Student standard PCs	1					117	117
Other Devices							
Portable PCs (laptops)	1					60	60
Thin clients	1					50	50
Other PC devices	1					0	0
Monitors							
CRT Monitors	1	70	5	2,080	6,680	179	179
Flat (LCD or TFT) Monitors	1	25	1	2,080	6,680	59	59
Adjustments							
Aircon overhead for computer suites (i)						0.00	0
PCs & monitors energy sub-total							1,350

HPC

Servers

Networks

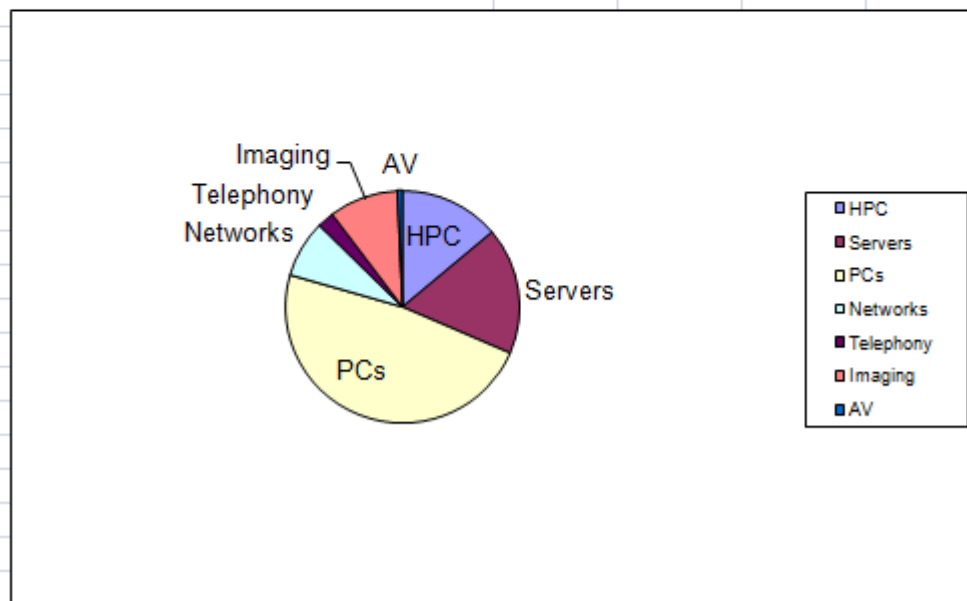
Phones

Imaging

AV

PUE and metrics

Category	Energy Use (kWh/y)	%	Energy Cost (£/y)	CO ₂ emissions (kg/y)
HPC	1,208,617	14%	157,120	649,052
Servers	1,520,736	18%	197,696	816,666
PCs	4,164,477	48%	541,382	2,236,408
Networks	687,362	8%	89,357	369,127
Telephony	202,356	2%	26,306	108,669
Imaging	835,659	10%	108,636	448,765
AV	61,598	1%	8,008	33,080
TOTAL	8,680,806	100%	1,128,505	4,661,766



Using ICT to measure and control sustainability at work

- Server rooms and Data centres energy management systems and practices
- Asset lists and footprint calculations
 - Identify hot-spots
- Building management and sensing systems
- Scrunching office space
- PC energy monitors

Use data from control and management systems

- Positive feedback
 - => your sacrifices and behaviour changes are making a difference !
- PR for having a green business organisation
- Competitive advantage
 - Reduced overheads
 - Become a virtual business for customers
 - Eg BA, HMG Digital by Default

And the 3rd ...

Reduce the Environmental
Impact of ICT Systems



Use ICT to Facilitate More
Sustainable Processes

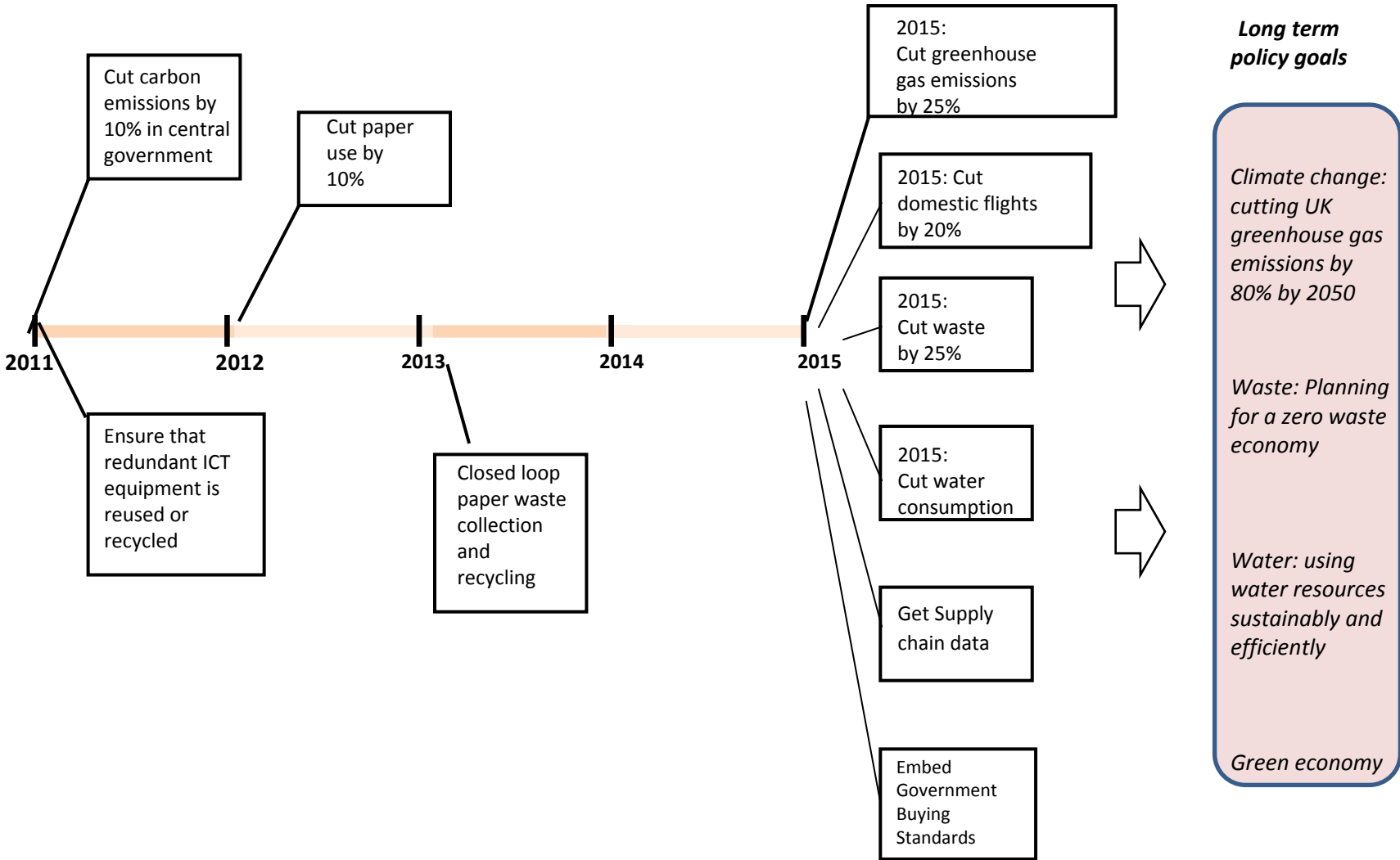
Use ICT to Measure &
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For government processes

HMG 14th Best practice

Achieve Business travel reductions
through adoption of audio, web and video
conference facilities, social media and
collaboration tools

UK Greening Government commitments



And so far...

2010/11 : achieved 10% reduction in estate footprint

	Emissions 2009/10 tCO2 (May Baseline)	Weather Corrected Emissions 2009/10 tCO2 (May Baseline)
Baseline 19 depts May 10-	764,141	749,547
Achieved Apr 11	659,609	646,231
Reduction	104,532	103,316
%	13.6796743	13.78379208

And so far...

April 11– March 12 : reduced paper consumption by 10%

2012 Olympics – aimed for a 50% reduction in Public Sector travel (commuting and business) figures being audited but looking good!

Digital by default

- 1 billion government transactions per annum, across 650 different types
- In 2011 82 % of population are on line
 - 86% of them carry out purchases on the net
 - 60% banking
 - 57% pay bills
- But only 46% carried out a government transaction online
- Predominant success with
 - Company House : 89% for search and file of returns
 - HMRC : 80% for self assessments
- On-line is cheaper (SOCITM)
 - F2F - £8.62
 - Phone - £2.83
 - Online – 15p
- HMRC estimate of £14.70 per hour of interaction with government

Digital by default – key targets

By April 2013 :

- All 24 central depts publishing on Gov.UK

- Cab Office to publish standards for Digital

From April 2014:

- All arms length bodies and agencies publishing on Gov.UK

- All new customer services to be Digital

By April 2015 :

- 3 key exemplar legacy services transitioned to digital

- Service managers appointed and digitally trained for all transactional services

- All transaction types > 100k pa to be re-designed

Behaviour change?

- Need behaviour changes throughout
 - How we get hold of things
 - Quickly and off the shelf => Apps, Cloud services
 - Fit process to solution
 - How we use ICT more efficiently
 - Less power
 - Less support overheads
 - Less consumables
 - How ICT is used to do things more efficiently
 - Less travel
 - Less paper
 - Less space
 - Quicker, more embracing, better quality decision making
 - Set Digital as default

But we're all too human!

Shock!

Sustainability just another movie show until it suddenly becomes real for an individual?



Source:

<http://www.grforum.org/userfiles/image/GRF%20Services%20and%20Products/Background%20information/Australia%20Floods/Australia%20flood.jpg>
http://t3.gstatic.com/images?q=tbn:ANd9GcQtCCh5QHqBL8bqjUITOzREVvZ0wC3dtLqERWtHZsje_9SF0tlxA&t=1

Thank you