National Eco-Innovation Forum

25 November 2010

Operational Efficiency through ICT

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Lead for Green IT

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Aim to cover..

- Understand where we start from
- Identify and grasp the opportunities
- Examples of print and travel
- Delivering efficiency and agility ...

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Where to start from ...

- Energy footprints, key areas typically

  ICT
  - Office ICT
  - Networking
  - Data Centres/Servers/Storage

  Business
  - Travel
  - Accommodation
  - Customer transactions, and don't forget their footprint!

- Measurement – focus on energy costs

  - Asset lists, sampling
  - Operational stats, PAS 2050 for lifecycle, ISO 14000 for energy
  - Or the balance sheet using Kg/CO2 for each area of operation
  - Factor in current developments

- IBM/Defra studies... first in 2008 using ISO 14000 methods...

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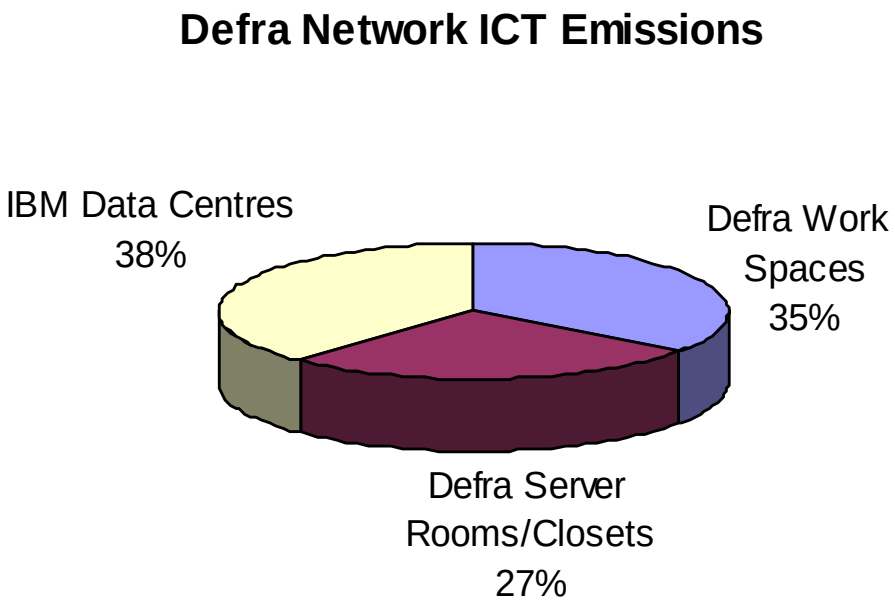
IT itself...

Defra Network ICT 2009 baseline was estimated at 10,500 tCO2 p.a. for 10,700 staff

A head-count extrapolation from detailed measurement for core dept, AH & MFA

- - 6,700 tCO2 p.a for 4,500 staff



Establishing a trajectory

- IBM study March 2009
- See http://www.ibm.com/ITefficiency/uk
- Addressed
  - Energy use and carbon emissions for existing assets, including off-site data centres
  - Impact of current developments
  - Opportunities for further carbon saving initiatives
- Found
  - 25% saving from current developments
    - Applications rationalisation leading to server efficiencies
    - Print management
  - New initiatives could not easily be cost justified on their own
- Set out a trajectory…

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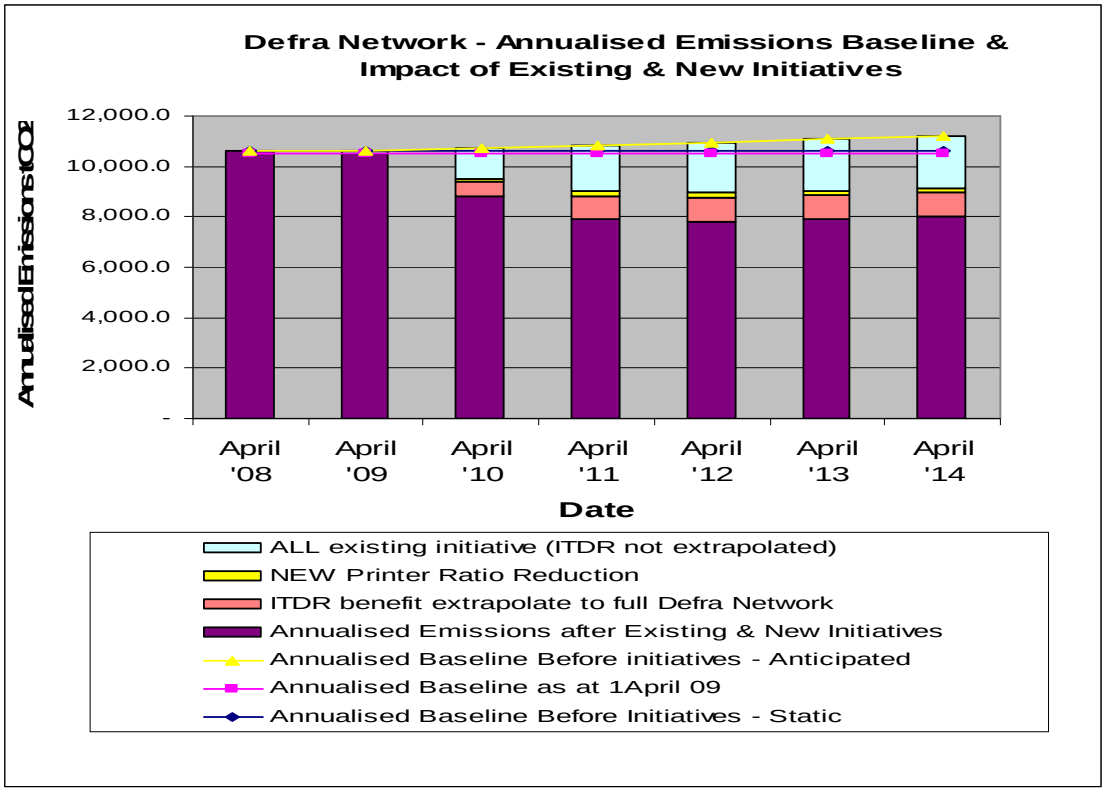
Trajectory…

By 2012, against a baseline that could have grown to almost 11,000 tCO2 existing & new initiatives could leave 7,800 to 8,800 tCO2 to be neutralised



Defra Print optimisation

A London site

Current Costs

	MFPs	Printers	Faxes	Scanners	Total
No of Devices	18	60	22	4	**104**
Mono Volume	464,376	3,794,136	39,204	0	**4,297,716**
Colour Volume	0	764,748	0	0	**764,748**
Total Volume pa	**464,376**	**4,558,884**	**39,204**	**0**	**5,062,464**
Colour %age	0%	17%	0%	0%	15%
Costs pa					
Capital	£28,723.56	£14,686.80	£6,784.80	£270.48	**£50,195.16**
Service	£945.00	£0.00	£0.00	£0.00	**£945.00**
Consumables	£999.96	£110,384.04	£443.52	£0.00	**£111,827.52**
Other Costs	£0.00	£0.00	£0.00	£0.00	**£0.00**
Total Costs pa	**£30,668.52**	**£125,070.84**	**£7,228.32**	**£270.48**	**£162,967.68**
Average cost/A4	6.6p	2.74p	18.44p	0p	3.22p

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Proposed Costs

	MFPs	Copiers	Printers	Faxes	Scanners	Total
No of Devices	23	0	12	1	3	**39**
Mono Volume	3,325,596	0	972,120	0	0	**4,297,716**
Colour Volume	336,792	0	427,956	0	0	**764,748**
Total Volume pa	**3,662,388**	**0**	**1,400,076**	**0**	**0**	**5,062,464**
Colour %age	9%	0%	31%	0%	0%	15%
Costs pa						
Capital	£32,990.16	£0.00	£5,383.80	£0.00	£253.68	**£38,373.96**
Service	£33,971.73	£0.00	£4,036.35	£0.00	£0.00	**£38,008.08**
Consumables	£118.80	£0.00	£29,533.68	£0.00	£0.00	**£29,652.48**
Other Costs	£0.00	£0.00	£0.00	£0.00	£0.00	**£0.00**
Total Costs pa	**£67,080.69**	**£0.00**	**£38,953.83**	**£0.00**	**£253.68**	**£106,034.52**
Average cost/A4	1.83p	0p	2.78p	0p	0p	2.09p

Save 60 devices, save 1p per sheet, save £50k pa

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Applications rationalisation

- 1,000 applications
- Removing/consolidating into 300 apps
- Virtualising as part of a server rationalisation programme seeing reduction of some 700 servers
- Tiering to ensure 24/7, high resilience, Gold service for apps requiring it, Silver and Bronze levels to reduce costs of operations

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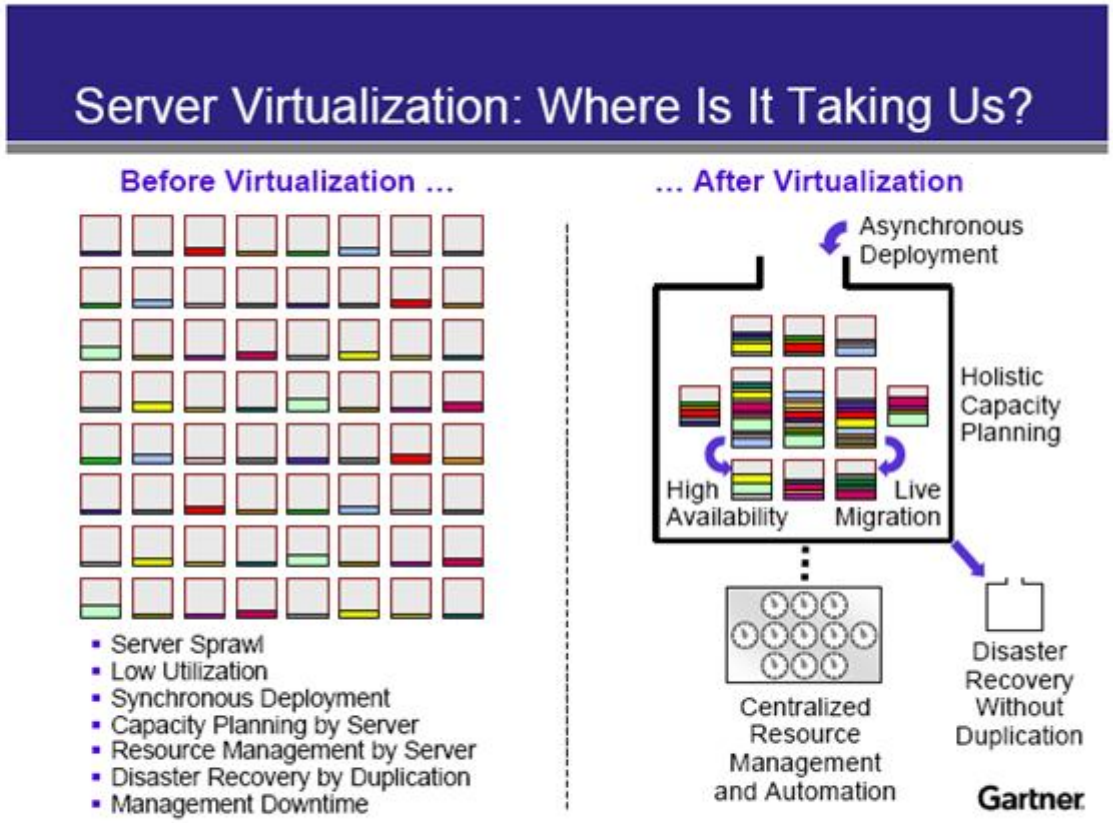
Virtualisation

Advantages of virtualisation include:

- Faster time to deploy new "servers" or to increase resource (CPU and memory) to existing "servers"
- Reduction of data centre space occupied and thus power and cooling resources consumed. Refer to the IBM House of Carbon initiative and the joint Defra and IBM study *Cutting the carbon footprint of IT*.



Virtualisation is not a "golden bullet" which can solve every problem!

Where are you going ...

- Put in place regular updating to establish progress
- Ensure no back-pedalling, embed ‘Greening’ into processes
- Make the case and establish a Carbon account?
  - Value of Carbon for the business –
    - Reducing Carbon => lower energy bills => greater efficiency
    - For larger businesses => £12/tCO2 from CRC, ETS, CCA
    - Less waste…
  - Who pays and who saves?
  - ‘Save to Spend’…

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Natural England travel savings

2,700 staff in NE across some 50 locations

Overall seeking 50% reduction in footprint

Huge travel mileage or around 14m kms!

For every kilometre travelled emitted 157 g of carbon

Average distance between all NE offices is 159 miles => a round trip for an attendee of 318 miles or 512km = 512 x 157 = 80 kg of CO_2

Estimate each attendee would spend approximately £44.52 to attend a meeting based on a round trip of 318 miles.

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Proposed rationale

1. Average distance between all NE offices is 159 miles This would mean a round trip for an attendee of 318 miles or 512km

2. Our total carbon footprint for 2007 was 2327 tonnes of CO2 with staff travelling a total distance of 14,803,346 km, for every kilometre travelled emitted 157 g of carbon.

3. Therefore the carbon saving of each attendee will be 512 x 157 = 80 kg of CO2

4. We should assume that the meeting initiator would not have travelled anyway as they would have invited everyone to their office.

5. HMRC indicate the cost of fuel at an average of £0.14 per mile (see http://www.hmrc.gov.uk/cars/advisory_fuel_current.htm)

6. We can posit that each attendee would spend approximately £44.52 to attend a meeting based on a round trip of 318 miles.
7. 2,700 staff in NE across some 50 locations

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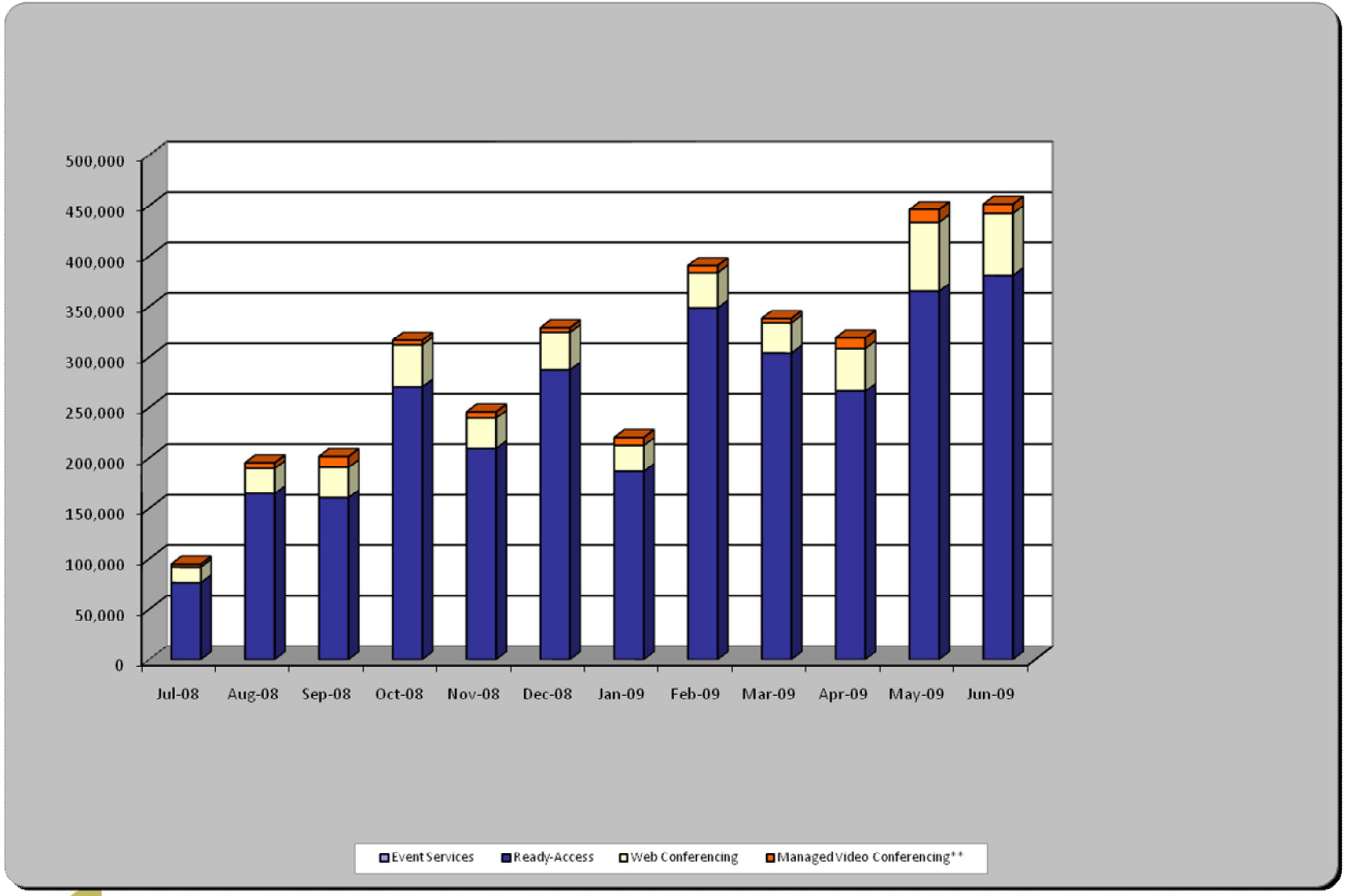
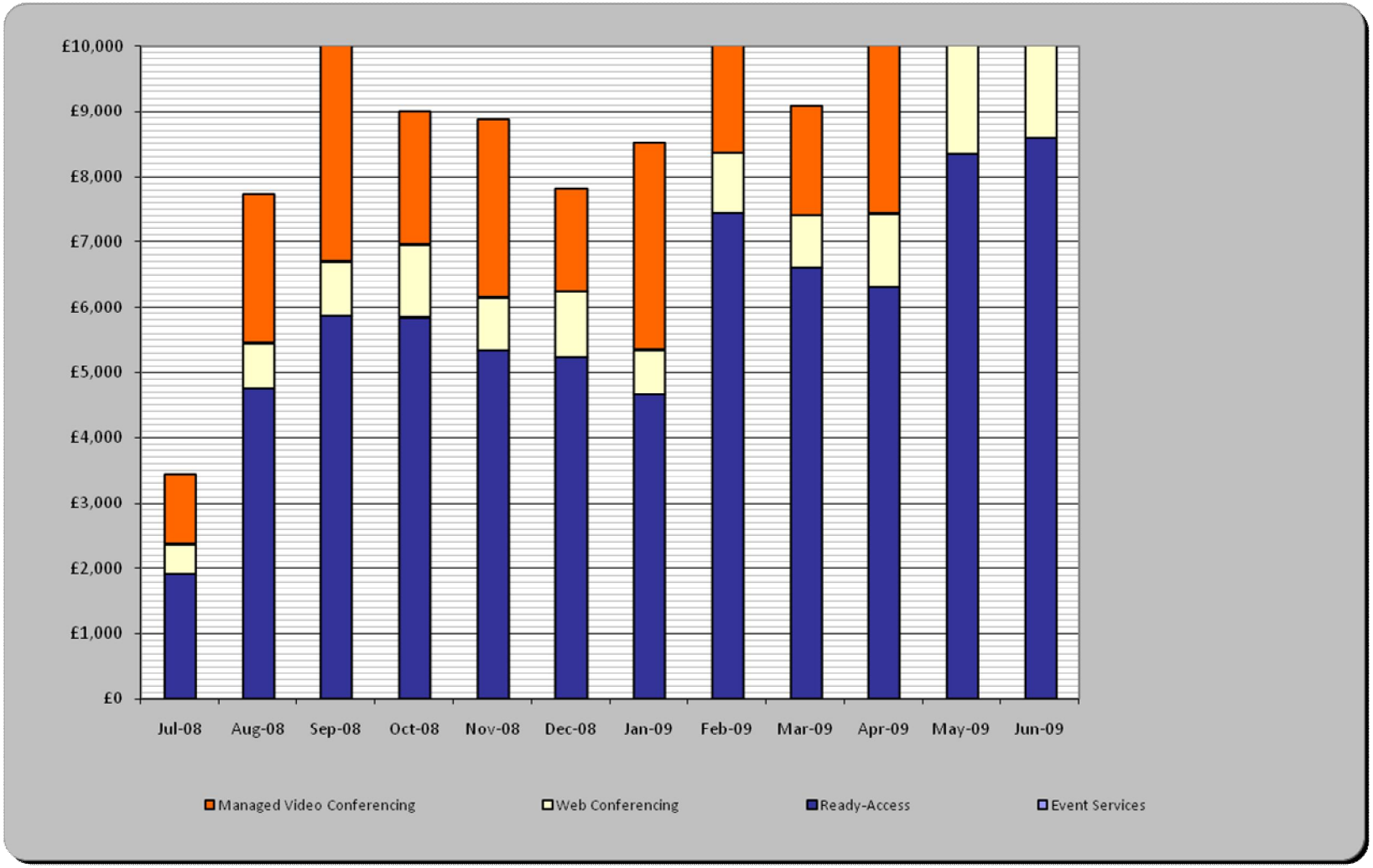
Initial trial run



Initial trial run



What are about the new opportunities IT brings for efficiency gains...?

- **"Eat less"**
  - Behaviours (Switch off, printing, screen settings...)
  - Power supply (Smoothing, Renewables, CHP units ...)
  - Device consolidation and sharing
- **"Exercise more",**
  - Reduce need for paper – 'paperless office' at last?
    - Printing
    - Electronic records
  - Reduce need for 'presence'
    - In the office
      - Mobile comms
    - At meetings
      - Instant messaging, audio, web and video conferencing
  - Re-assess refresh points (sweat the asset, procure for re-use, upgradability, ease of recycling ..)
- **"Be the fittest - an Olympic athlete"**
  - Business planning – IT as key tool for monitoring, modelling and prediction
  - Customer transactions
    - Agility
    - Responsiveness / availability
  - Use IT to become a 'Virtual Business'?

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UK HMG directions

- Too much replication, unique specific solutioning

⇒Consolidate

⇒Share

⇒Dematerialise assets to services => move to Service and Cloud models…

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A Cloud is …

Services purchased and delivered through a browser over own network (Private) or Internet (Public)

- Self service
- Don’t worry about how, concentrate on what & outcomes
- Charge by use – a utility
- Scaleable in light of demand
- Resilient

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How will G-Cloud help the Public Sector

By providing smarter, cheaper and safer IT for the Public Sector

Smarter

-Improve operational efficiency through standardisation and automation

- Encourage innovation by creating new G-Cloud services where none exist to meet a specific need

Cheaper

-Consolidate buying power

- Buy for use, avoiding purchasing equipment for temporary requirements

- New applications will re-use pre-existing components reducing design costs

Secure

-G-Cloud Services will operate from security levels Impact Level IL 0 to IL 3 inclusive

-The Cloud will be made up of segregated multi-tenanted clouds to allow for operation at different Threat, Impact and Compliance levels

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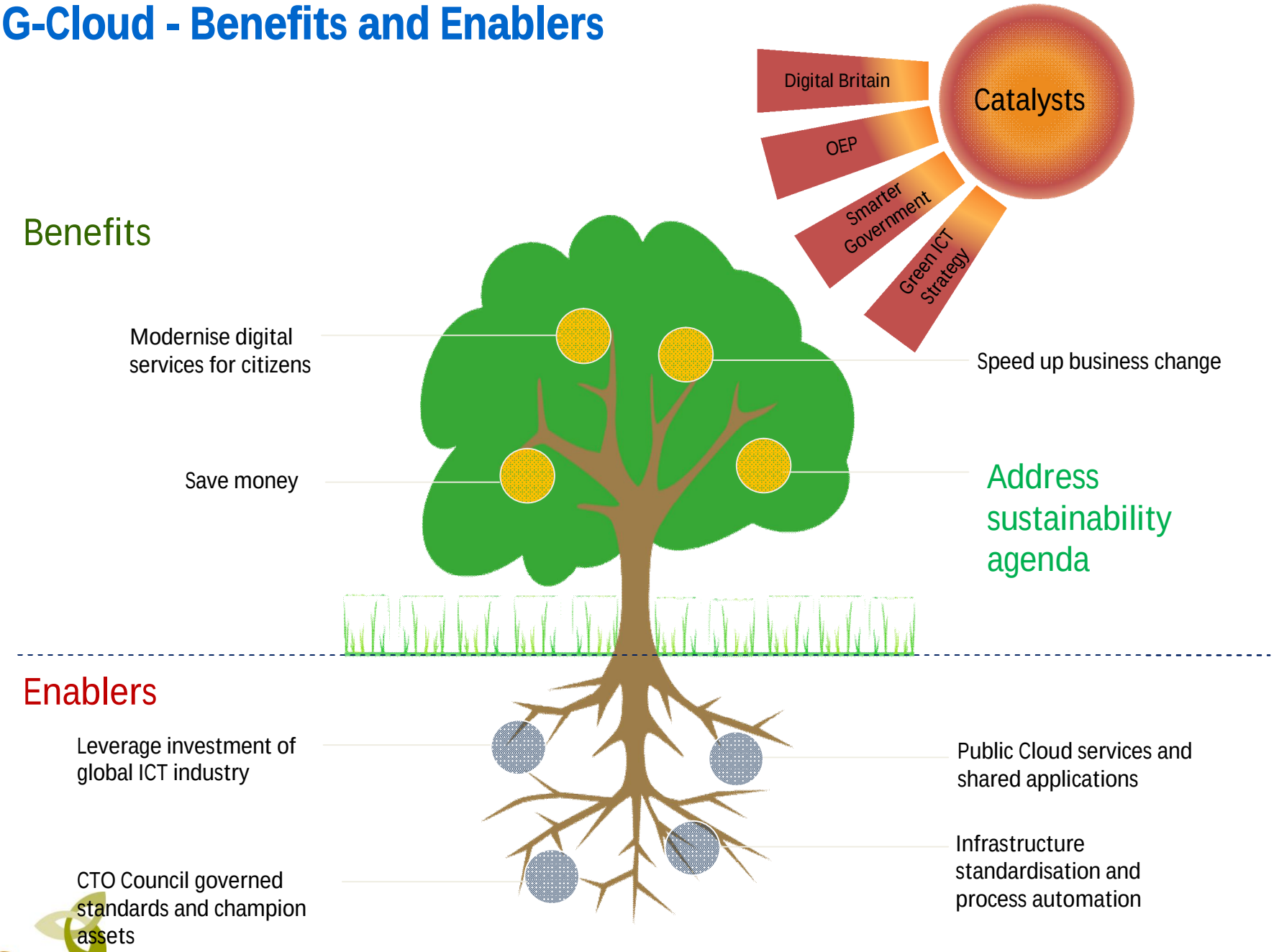
G-Cloud - Benefits and Enablers



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Assess sharing capabilities...

⇒ Can we add other users to a service ?

⇒ Can we add/replace a service for our users?

⇒ Need to consider many things

- Security
- Resilience
- SLAs
  - Availability
  - Performance
  - Support/fix...

Assess sharing capabilities(2)…

And also

– Finance eg charging – P x Q?

– Contractual obligations/strictures

– Governance eg change controls

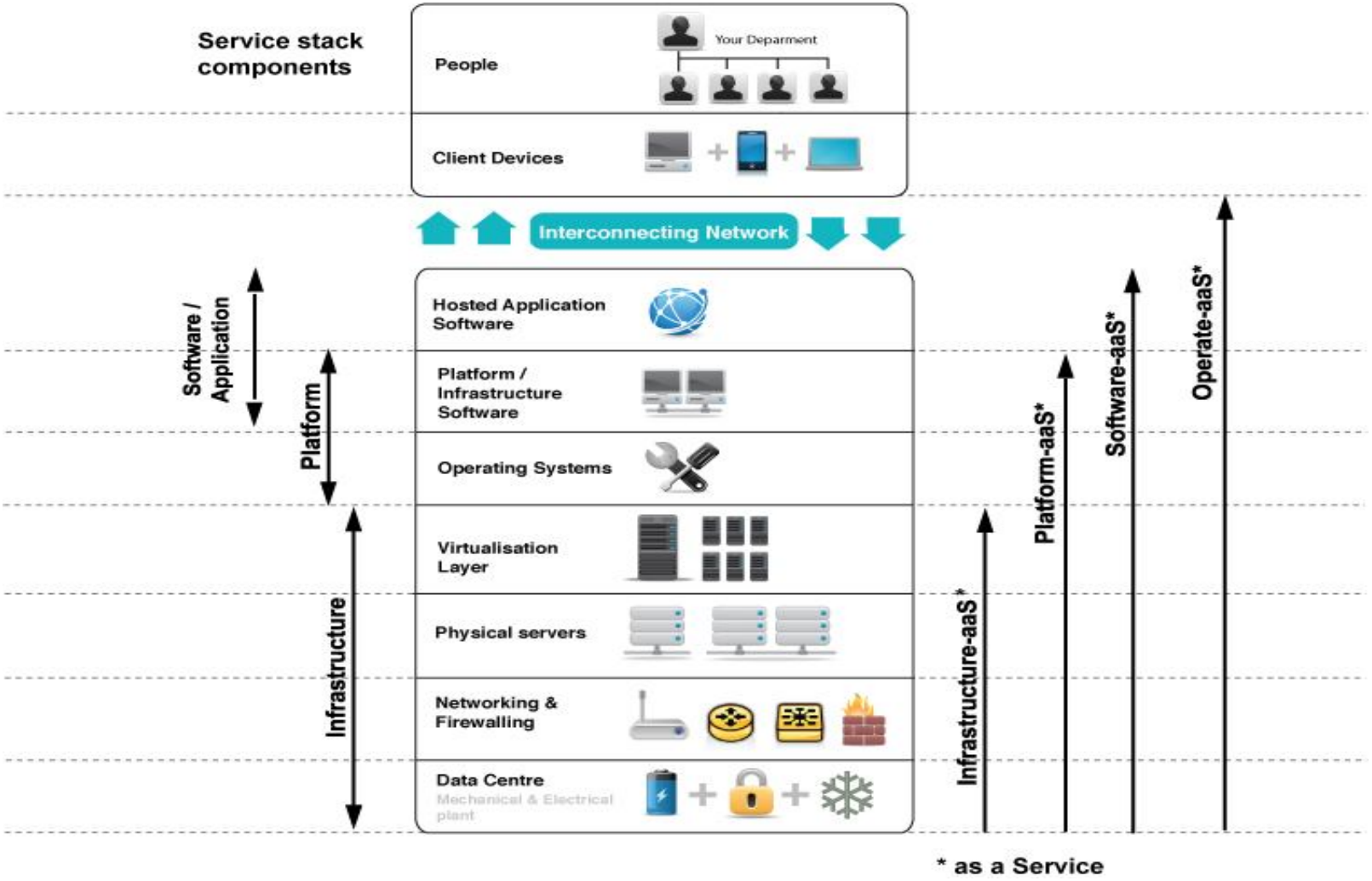
– The infrastructure for sharing

- Desktop
- Network
- Architecture
- Degree of virtualisation/materialisation
- …

And share what...

- Infrastructure: eg Networks, data centres
- Applications : eg Sharepoint, email
- Platforms : eg .Net development
- Business Processes: eg payment service

An IT Cloud – Outline architecture



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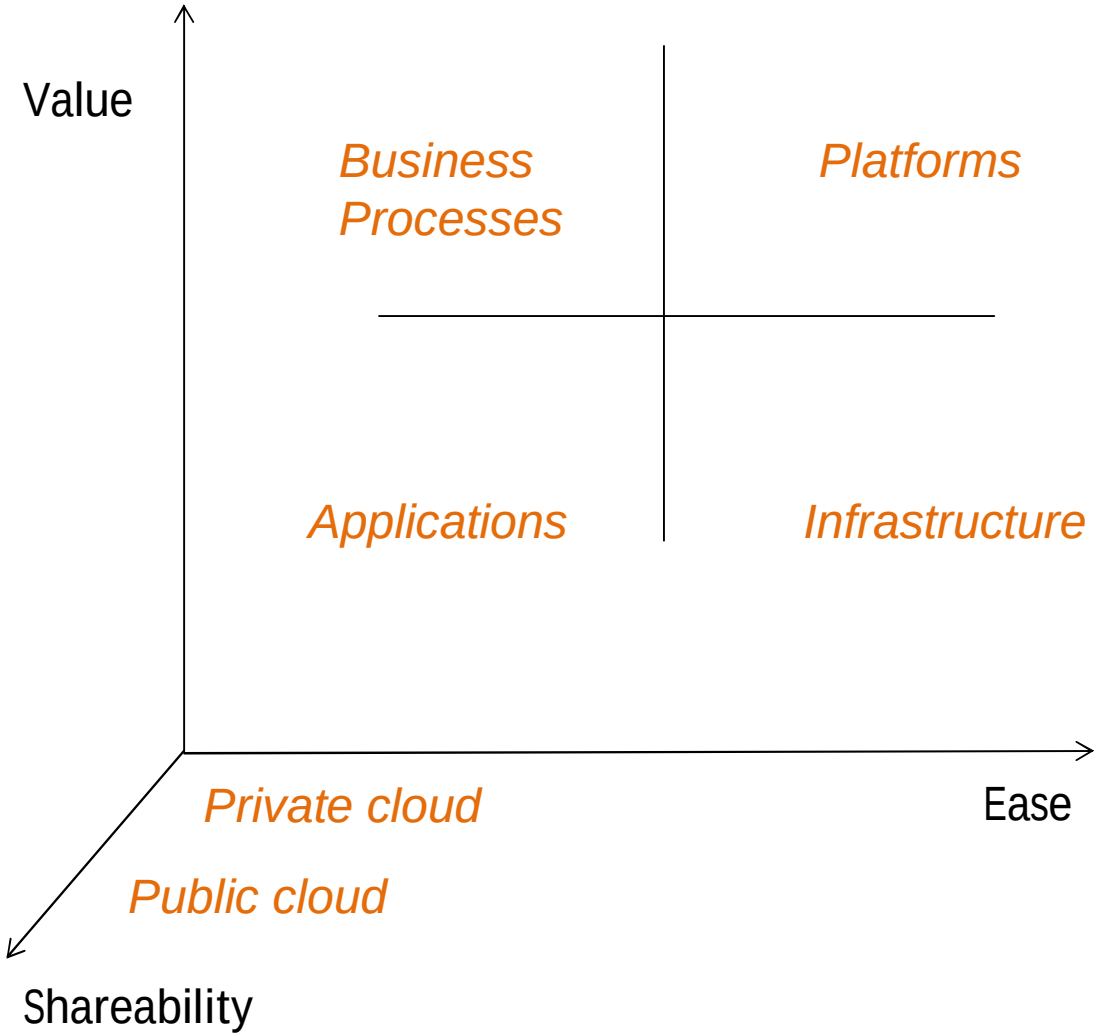
And draw the threads together eg...



Conclusions

- Know where your hotspots are – measure/assess your footprint of assets and the service wrap
- Tackle by managing power, sharing and consolidating assets
- Get ready to move to Cloud-type service solutions, are you ready to share?
- And don’t forget to exploit what you have...

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Some metrics…

Number of tCO2 per KwH

See URL http://www.defra.gov.uk/environment/business/reporting/pdf/ghg-cf-guidelines2008.pdf

Nov 2010 fig 0.543 kgCO2 per KwH

Price per KwH:

See URL http://www.decc.gov.uk/en/content/cms/statistics/publications/prices/prices.aspx

Table 3.4.2 Prices of fuels

Over last 12 months average £0.08 per KwH

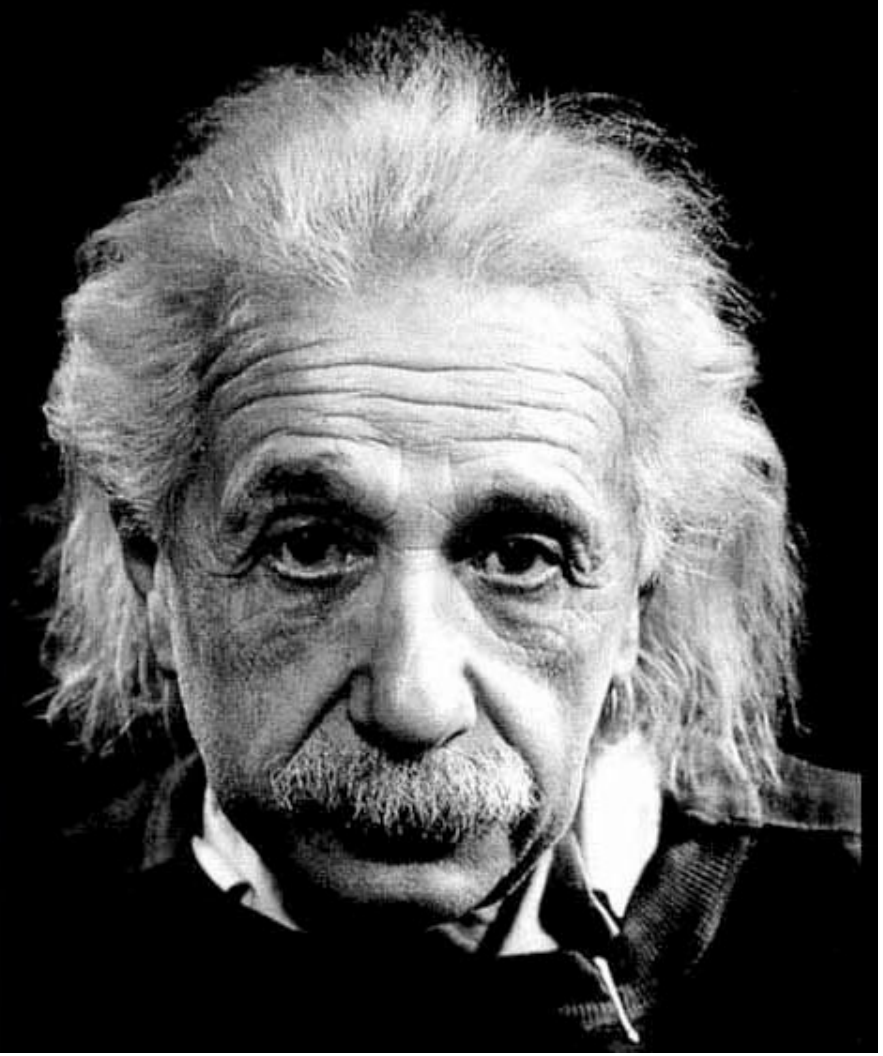
Carbon price

See URL http://www.decc.gov.uk/assets/decc/what%20we%20do/a%20low%20carbon%20uk/carbon%20valuation

Nov 2010 fig £12 per tCO2

‘It takes a new way of thinking
to solve the problems
that we created by the old way of thinking’

Albert Einstein



Thank you

Any questions?

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