

IT Carbon Action Plan 2013/14 (2 Years) --- Progress and Actions

V0.1 October 13

REF #	ACTION	INITIAL PLAN	STATUS	NEXT ACTIONS	FUNDING SOURCE	
	Management and Planning					
MPL01	Educate and influence all IT Services staff on the importance of carbon minimisation and the basics of doing the right thing.	<ol style="list-style-type: none"> 1. Win hearts and minds 2. Produce a simple guide 3. Deliver briefing sessions 4. Publicise action plan (on intranet and elsewhere) 5. Publish regular progress report 6. Add carbon management demands to Service Release Checklist 	<ol style="list-style-type: none"> 1. Continuing dialogue at strategic opportunities 2. Carbon summit held for core IT Services involved in large scale ICT deployments (22nd June 11) 3. Briefing to IT Strategy Planning Day – 17th Aug 2011 4. Article for October IT Services newsletter 5. Second Carbon Summit held on Friday 21st October. 6. Develop IT Services Intranet pages : Pages published Dec 11 7. Third Carbon Summit scheduled for January 2012: Feb 28th 2012 8. Action Plan available on Intranet (with progress) 9. Green Impact Awards 2011/12. Achieved Gold Star (#1 on campus) 10. Good Practice Guide published on ITS Intranet. Link circulated 	<ol style="list-style-type: none"> 1. Planning Carbon Summit #5 for Autumn 2013. 2. Change of focus to Procurement and Application efficiency. 3. Brief and influence new Head of Project Office to take carbon considerations seriously. 4. Provide annual report on carbon to OMT 	N/A	Q

			<p>to all IT Services staff March 2012</p> <ol style="list-style-type: none"> 11. Carbon Summit #4 set for October 18th 2012 12. Green Impact Awards 12/13 Gold Award. 13. Carbon assessment form part of standard project process 14. Planning for Environment Day in Great Hall 8th Oct 2013. 15. Update to IT Services newsletter (to include BEAR etc) Due for publication end Oct 13 16. Publish updated action plan (October 13) 			
MPL01A	Educate and influence all staff on the importance of carbon minimisation and the basics of doing the right thing (within the context of desktop ICT).	<ol style="list-style-type: none"> 1. Produce policy for endorsement by UEB Sustainability Task Group 2. Ensure all College IT Managers on board 3. Publicize through existing Task Group mechanisms 	<ol style="list-style-type: none"> 1. Draft policy requested by June Sustainability Task Force Group, with commitment to publicize and promote key messages. 2. Produce Good Practice Guide in consultation with College and Corporate Services IT Managers: Approved by UEB STG in Feb 12 3. Team mobilised for University's Environment Day in Nov 11. 4. Team prepared for Environment Day on 2nd Oct 2012 5. Good Practice Guide 	<ol style="list-style-type: none"> 1. Review Good Practice Guide in light of developments such as SCCM. 2. Get Good Practice Guide published on University Sustainability web pages 3. Develop further content for University Sustainability web pages (for example in Emissions Progress report pages) 4. Colleges coming to us for hosting 	N/A	Q

			<p>accepted by College Boards or equivalent</p> <p>6. Some researchers already investing in HPC nodes and incorporating into BlueBEAR infrastructure, thus sharing overheads, making most efficient use of equipment, in making a power and carbon saving</p>			
MPL02	Carbon Assessment of each 'IT Strategy' goal	<ol style="list-style-type: none"> High level holistic initial assessment as strategy develops implementation plans Standard carbon assessment as part of individual project plans will refine the view 	<ol style="list-style-type: none"> Planning underway Project Carbon Assessment Form went to second Carbon Summit for discussion. Approved at Strategy workshop and on Intranet. Patchy success at getting strategy leads to complete carbon assessment for each strategy goal (eg HPC) 	<ol style="list-style-type: none"> For Strategy Part 2, get strategy leads to complete carbon assessment for each strategy goal. Enlist John Heath for support at the most senior level. 	N/A	Q
MPL03	Carbon Assessment of all formal IT Services' projects	<p>Carbon Impact Assessment (CIA) will be added as part of formal project planning methodology:</p> <ol style="list-style-type: none"> Create CIA (JGO/CHS) Approval by ITS PCG Adopted by Project Office Create examples and guidance Brief all ITS Enforced by ITS PCG; informed by data collection and analysis by Carbon Manager Regular monitoring and managing 	<ol style="list-style-type: none"> Project Carbon Assessment Form approved. Promote adoption Process to be bound in with standard project management methodology, promoted and administered by Project Office. Accepted at ITPCG 10 August 2011 	<ol style="list-style-type: none"> Request LPK to take to other authority groups such as BSSG for adoption. Waiting for experience from ITS projects. Encourage and check for compliance; check at ITPCG monthly Raise again at OMT in November 13 	N/A	Q

		by ITS PCG	<ul style="list-style-type: none"> 4. Publicize within IT Services, starting with creation of Intranet pages 5. Take discussion back to Dec ITPCG so process is in place for all new projects. 6. Briefing provided for Network Upgrade PM 6. Being promoted within the ITS Project Office. 			
MPL04	<p>Carbon efficiency is a key consideration in all major IT procurement</p> <p>Buy only energy/carbon efficient equipment, services and applications (ensure embodied / supply chain carbon is counted)</p> <p>Consider carbon when evaluating outsourced service options</p>	<ul style="list-style-type: none"> 1. Talk to Barry about ramping up standard requirements in tenders 2. Produce standard questions and guidance for ITTs 3. Maintain a 'what not to do' list 4. Framework in place with suppliers with track records for highly efficient kit and good environmental credentials. 5. Put in place system for tracking adherence and success 	<ul style="list-style-type: none"> 1. New Procurement process will promote carbon efficient purchases. 2. Meeting with Procurement (Barry) 18th Oct 2011. Enthusiastically endorsed 3. Advice and questions contributed to Library procurement (DP); and being developed for network procurement (with JT) and HPC procurement (with PSH) 4. Network and HPC tenders published with relevant questions. 5. Carbon Assessment form supports this goal. 6. Committed resource funded by IT Services from Procurement was consumed in other ways and so not available to progress carbon agenda within procurements. Action needs to be re-visited. 	<ul style="list-style-type: none"> 8. Finish development of standard set of questions and advice. 9. Include Carbon questions in Application Support's standard procurement document (currently being worked on to include infrastructure/security requirements) 10. Open dialogue with new Head of Procurement on carbon issues. 	N/A	Q

			7. Barry left before identifying contacts and training			
MPL05	Evaluate and use shared services when feasible and justified (carbon is a key consideration)	<p>Nottingham</p> <ol style="list-style-type: none"> 3. Develop discussions with Nottingham 4. Identify possible sharing initiatives 5. Develop a number of action plans for pilots 6. Do some things! 7. Follow up on joint SAN investigation with HP <p>Other Opportunities</p> <ol style="list-style-type: none"> 1. Create and maintain reference list of existing shared services eg JANET and Service Now 2. Continue to gather sector and industry intelligence to identify exciting and viable propositions and partners. 3. Conduct similar pilots on opportunities eg Amazon and HPC service 4. Create and maintain list of options investigated and findings. 5. Move swiftly to test out opportunities 	<ol style="list-style-type: none"> 11. EPSRC funding won for a regional HPC and research archive service (MidPLUS), jointly with Warwick and Nottingham. Equipment installed, Compute Service operational and being exploited by UOB researchers. Archive solution live. 12. Carbon Assessment Form completed for MidPlus 13. Meetings between Senior Management Teams of 2 Universities 14. Amazon HPC service evaluated 15. Begin reciprocal data centre discussions with Warwick. Initial meeting scheduled for 5th August 13 16. Initial discussions of M5 shared services for HPC/storage funding opportunities. Meeting scheduled for 29th July 13 	<ol style="list-style-type: none"> 1. Implement the solution with suitable governance. 2. Create and maintain reference list of existing shared services eg JANET and Service Now 3. A proof of concept of sharing with Warwick under investigation. Follow up meeting Q4 2013 4. M5 follow up meeting in Q4 2013 	<ol style="list-style-type: none"> 1. Each option will need to be costed separately. 2. Significant seed-corn funding may be required 3. ROI calculations essential. 	I U
MPL06	Report by organizational unit or service or client group	<ol style="list-style-type: none"> 1. Carbon report provided by Colleges/Schools, Corporate Services. ITS 			N/A	Q
MPL07	Investigate the carbon impact of appropriate home working for ITS and identify the wider	<ol style="list-style-type: none"> 1. Identify regular home workers 2. Investigate on-line form with automatic calculation of carbon 			N/A	Q

	issues	(web form) 3. Develop a survey form to assess carbon impact (eg lack of travel, home heating etc) 4. Maintain running total				
MPL08	Collect data on IT Services travel carbon	1. Enhance travel request and expensed forms 2. Investigate on-line form with automatic calculation of carbon (web form) 3. Maintain running total	17. This is also being explored at University level. 18. Katie and Liz are collecting data f on ITS business travel. 19. Data collected during first year (to end July 12) collated and analysed.	1. Need to assess impact of changes to account coding on which we rely to provide analysis 2. Report on annual travel data (12/13)	N/A	Q
MPL09	Keep data centre temperature and humidity ranges under review to minimize the cooling required (without service risk)	1. Cooperate with Estates to measure and review 2. Agree a metering strategy to cover the diverse and heterogeneous environment of the data centre 3. Balance environmental factors to find optimal set points 4. Keep a watching brief on industry recommendations (ASHRAE) 5. Use Data Centre Managers Forum to learn from the experience of other similar operators	20. Set points increased significantly in last 2 years (Elms Road and B Block) – Note – progress partly undone by appointment by Estates of new maintenance contractors. 21. Watching brief on ASHRAE standards 22. Metering advances have been made, including connection to BMS or our own monitoring network. Data now needs to be organized and analyzed. 23.	24. Continue to review as installed equipment evolves – opportunity limited by legacy data centre constraints 25. Cold aisle containment proof of concept 2013/14 26. Investigating opportunities of DCIM in cooperation with Estates. Air con unit UPS and PDUs to be connected to BMS by end 2013 27. Get review of state of air con in ER before modifying set points further (order raised Oct 2013).	1. Additional metering - potentially shared costs with Estates 2. Data centre management tools to collate, analyse and forecast. Circa £100K	Q U
	Develop Existing Service/Infrastructure					
ESI01	Standardize student cluster provision to enable efficient redistribution during quiet periods	1. Develop initial plan with RFA			??	
ESI02	Enforced carbon/energy	1. Lots of good practice already in	1. Considerable progress	4. Collect and quantify data on	?? Licensing costs	I

	management on desktops as standard	<p>ITS and College clusters</p> <ol style="list-style-type: none"> 2. Agree a standard 3. Implement across campus (with few and justified exceptions) 4. Monitoring and metering to demonstrate efficacy of scheme 	<p>already achieved by Corporate Services and College IT Managers</p> <ol style="list-style-type: none"> 2. Phil Dimmock (MDS) leading an inter-College team to investigate software-based solutions and quantify the benefit. On hold due to resource constraints 3. Report received from the team with clear recommendation to implement. Pilot project in preparation. On hold 	<p>coverage</p> <ol style="list-style-type: none"> 5. Collect data and estimate impact 6. Identify further areas for action 7. Incorporate in policy for UEB Sustainability Task Force 8. Promote and gain cooperation 9. *Salix and other funding options being investigated for software solution. 10. Formal project initiation documentation under construction. <p>ALL ON HOLD</p>	<p>Management s/w VDI???</p> <p>Investigate alternative funding sources: Salix; John Heath.</p> <p>ROI expected to be impressive.</p>	
ESI03	Replace Blue BEAR; Assess Carbon implications	<ol style="list-style-type: none"> 1. Tender for BB replacement (cub) must include carbon assessment 2. Critical analysis of returns alongside other key considerations 3. Discussions begun with firm focus on carbon saving 4. Develop sustainable plan for transition from old to new HPC and ongoing investment 	<ol style="list-style-type: none"> 11. Project manager briefed and committed on carbon agenda 12. Procurement update: Supplier appointed, equipment installed, configuration underway. Power/.energy consumption data looks encouraging. 13. Assess full load during Acceptance Tests 14. Ensure energy monitoring is configured and all appropriate energy conservation measures are implemented. 15. Major success in reducing energy consumption associated with HPC. Approx 80% saving for initial configuration. 	<ol style="list-style-type: none"> 1. Cold Aisle containment to be installed in BB aisle and server aisle at rear is outstanding. Will be considered as and when configuration grows and this becomes a viable proposition. 		F

			16. Old BlueBEAR equipment decommissioned and removed.			
ESI04	Default to a position where servers revert to very low power states when idle	<ol style="list-style-type: none"> 1. Audit current installed base 2. Develop policy accordingly and identify justified exceptions 3. As servers are replaced progress towards full compliance with policy 	Significant investment in new servers during FY 11/12 so transition from old hardware to new should result in efficiency and carbon savings.	ASK CG	<ol style="list-style-type: none"> 1. Audit costs small 2. Server replacement cost should be met through normal replacement cycle or new projects 	Q
ESI05	Decommission redundant kit without delay. Minimize parallel running with prudence	<ol style="list-style-type: none"> 1. Data centre audit and retire redundant kit 2. Promote policy on parallel running and plan projects to minimise this 	<p>17. Big improvements noted. Increased general awareness. In the case of BlueBEAR II – part of original cluster removed to make headroom before new cluster installed.</p> <p>18. Generally kit is removed promptly so default position is not to have redundant kit in the DC</p>	1.	1. Should be met from project costs	Q
ESI06	Re-visit the feasibility of the enclosure of aisles in the data centre and deploy selectively	<ol style="list-style-type: none"> 1. Small scale pilot (after consultation with insurers, Estates etc) 2. Recommend further deployment 3. Fund, plan, do. 4. Review 	1.	1. Refer to ESI03 above.	<ol style="list-style-type: none"> 1. Pilot circa £5K 2. BB replacement from project fund 3. Estimate £50K for wide scale deployment 	U F
ESI07	Actively assess carbon footprint of >3 year old kit and replace where justified (consider embedded carbon as well as energy consumption)	<ol style="list-style-type: none"> 1. Audit to identify all kit > 3 years old 2. Identify all that are already scheduled to be replaced 3. Assess remaining kit for carbon efficiency 4. Ensure embedded carbon costs 	1.	1.	1. Accelerated spend may be required for server replacement	Q U

		<ul style="list-style-type: none"> are taken into consideration 5. Prioritise for investment and replacement based on carbon footprint and ROI 6. Action plan costed and approved 7. Implement change programme 				
	Major New Projects					
MNP01	A managed print service for campus	<ul style="list-style-type: none"> 1. Pilot service already in MDS 2. Pilot to be rolled out in ER 3. Implement plans with Procurement (RFA) 	<ul style="list-style-type: none"> 1. Scoping and feasibility project commencing to be managed by Rob Aldridge 	<ul style="list-style-type: none"> 1. Project plan with timescales and carbon assessment. 2. Investigate funding options. 3. ON HOLD – unavailability of staff resources 	<p>ROI expected to pay back within (tbc) months.</p> <p>Investigate alternative funding sources: Salix; John Heath.</p>	U
MNP02	De-duplication for Back and Front ends	<p>Back-end de-dupe</p> <ul style="list-style-type: none"> 1. Win approval for costed implementation plan 2. Implement for ITS 3. Promote to Colleges 4. Demonstrate success <p>Front-end de-dupe</p> <ul style="list-style-type: none"> 1. Investigate technical options 2. When technology sufficiently mature put forward proposals 	<p>Back-end de-dup</p> <ul style="list-style-type: none"> 1. Implementation for IT Services and CAL operational; fully funded. 2. Extended de-dupe to selected Colleges; 3. Additional capacity purchased during 12/13 4. All Colleges (except CoSS) now using some centralised filestore and hence receiving benefits of de-dupe. <p>Front-end</p> <ul style="list-style-type: none"> 5. Keep watch on technical developments. Not yet a mainstream technology 	<ul style="list-style-type: none"> 1. Strategic plan to develop research data store which will take the benefits of de-dupe. 2. CoSS willing to join when their storage is renewed. 3. Explore additional funding requirements to encompass remaining College requirements during 13/14 	<p>Back-end</p> <ul style="list-style-type: none"> 1. 2. Significant investment since 2010 and ongoing. <p>Front-end</p> <ul style="list-style-type: none"> 3. Not funded 4. Seed-corn money required for pilot 	F Q U I
MNP03	New Data centre with state of	<ul style="list-style-type: none"> 1. Complete feasibility study in 	<ul style="list-style-type: none"> 1. Provisional acceptance 	<ul style="list-style-type: none"> 5. Options analysis for 	<ul style="list-style-type: none"> 1. 2012 Feasibility 	I

	the art PUE (measure of highly efficient facility plus pervasive metering and control systems)	<p>partnership with Estates</p> <ol style="list-style-type: none"> 2. Funding committed asap 3. Develop design 4. Build 5. Migrate 6. Review existing DC facilities 	<p>of need for new primary data centre on campus.</p> <ol style="list-style-type: none"> 2. Further papers submitted and discussed. Feasibility study agreed. 3. Feasibility study currently out to tender with an ETA of Easter 2013 for completion. With full support of PVC 4. Feasibility study tender completed Christmas 2012; shelved – Easter 2013 	<p>expansion/modernisation in Elms Road Computer Centre underway. Consultants appointed Oct 2013</p>	<p>study funded from Estates Planning Budget (approved)</p> <ol style="list-style-type: none"> 2. Funding is in the Capital Plan for 2016/17 	
MNP04	Ensure next generation campus network is highly efficient and carbon optimized e.g. power down when idle	<ol style="list-style-type: none"> 1. Incorporate into tender (JT) 2. Critical analysis of returns alongside other key considerations 3. Discuss with Estates about implications for building environments (eg for PoE) 	<ol style="list-style-type: none"> 1. Competitive dialogue process completed. 2. JGO/CHS met with JT about carbon assessment in final tender, agreed approach; draft procurement questions supplied. 3. ITT included elements of energy, cost and carbon efficiency. 4. Contract awarded; planning underway 5. Carbon assessment for new network completed and submitted to ITPCG Oct 2013. 	<ol style="list-style-type: none"> 1. Suggest TCO and carbon analysis, once operational. 2. 		F
MNP04A	*Increase efficiency of cooling in network telecoms closets across campus.	<ol style="list-style-type: none"> 1. Discussion with Chris Lea 2. Prioritise areas for action 3. Analyse issues and quantify the energy and potential savings. 	<ol style="list-style-type: none"> 1. Discussions starting 2. Review of needs: Head of Networks advises no additional cooling required. Anticipated 	<ol style="list-style-type: none"> 1. Need to agree funding (capital and recurrent) at University level for air con upgrades and maintenance 	<ol style="list-style-type: none"> 1. Telecoms closets are being surveyed as part of network refresh project. 	

			load of new network is lower than for the old.			
MNP05	Consolidate server rooms and servers into highly efficient data centre space	<ol style="list-style-type: none"> 1. Review existing data centres for any existing capacity. (Limited at best) 2. Commission new data centre 3. Formulate plans to migrate and consolidate appropriately 4. Migrate 5. Shut down redundant server rooms 6. Measure carbon savings 	<ol style="list-style-type: none"> 1. Some centralization of research computing capacity noticeable, as we move forward with the BB II Project. 2. Kit installed within BB for several researchers and in discussion with others. 	<ol style="list-style-type: none"> 1. EPS looking to rationalise their server room provision and seeking space in capacity challenged ER data centre 	<ol style="list-style-type: none"> 1. Much will be provisioned within DC build costs 2. Migration costs 3. Potentially new shared infrastructure eg blade enclosure, SAN, tapes. 	I
MNP06	Virtualise and consolidate servers	<ol style="list-style-type: none"> 1. Formulate explicit policy that default provision should be on servers hosting multiple services, and running at high utilisation. 2. Plan as part of normal funded project cycle to consolidate 3. Ensure sufficient capacity for agile deployment 4. Look for opportunities to accelerate consolidation, bidding for funding as appropriate. 5. Track technology developments and innovate 	<ol style="list-style-type: none"> 1. Funding agreed within IT Capital Budget to expand on foundations already made. 2. BIRO infrastructure completed and Live. 3. Chris Grant installing additional virtual capacity as the basis for further Windows virtualisation 4. Some services now running on KVM e.g. Enterprise Search 1. Chris Grant to continue drive to virtualize servers where appropriate. 5. Chris Bayliss to continue migrating services to Unix-based virtualisation (KVM) and test out Linux on VMWare. 6. Default is that all servers are deployed as virtual unless specific needs 	<ol style="list-style-type: none"> 1. Plan has changed as a result of resilience project. Remainder of Business Systems applications to migrate to BIRO or VI (to enable the de-commissioning of old servers and storage). In progress – complete Christmas 2013 ? 2. Ongoing annual investment in IT Services capital plan. 3. (Beware virtual server sprawl) 	Should be met from existing project and capital budgets	U F

MNP07	Enterprise SAN and Virtual Infrastructure offering a campus cloud service (fast, efficient and cost-effective)	<ol style="list-style-type: none"> 1. Already happening in Corporate IT Services 2. Investigate with partners options for optimal architectures. 3. Develop cost models 4. Develop service offering to meet the business need. 5. Extend model to Colleges <p>Development may be constrained by existing DC and network capability</p>	<ol style="list-style-type: none"> 1. Chris Grant leading exploratory discussions. 2. Identified and installed a cloud management software suite. (Embotics) 3. Pilot completed. 	<ol style="list-style-type: none"> 1. Complete the campus cloud service 2. Review access, performance and charging 3. Use experience to inform tender for new server / storage framework. Project being initiated 4. Extend the model to Colleges 	<ol style="list-style-type: none"> 1. Ongoing annual investment in IT Services capital plan. 	U
MNP08	Rationalize and simplify applications e.g. 1 not 42 timetabling systems	<ol style="list-style-type: none"> 1. Complete audit begun by LPK to include all ITS applications 2. Review 3. Recommend, including ROI analysis 4. Establish policy and ensure application sprawl is managed and future developments are done in coherent and strategic manner 5. Negotiate with the business 6. Implement 	<ol style="list-style-type: none"> 1. ITSMP project progressing. 2. Enterprise service bus project progressing 3. Standard desktop being rolled out selectively 	<ol style="list-style-type: none"> 1. Get progress report from 'Complexity Reduction' strand of IT strategy. 	<ol style="list-style-type: none"> 1. Potentially major investment 2. Potential savings from rationalisation 	U
MNP09	Architected data	<ol style="list-style-type: none"> 1. Data audit and analysis 2. Data Management – don't keep what we don't need 3. Design architecture, ensuring energy efficiency is one of key considerations eg data tiering 4. Plan 5. Action plan costed and approved 6. Implement 	<ol style="list-style-type: none"> 1. Architecture team in place 2. Funding for first tranche of research data infrastructure agreed 	<ol style="list-style-type: none"> 1. Agree standards and plan roll out of Research Data Store. Project underway. 2. Dropbox facility to be included in service. 	<p>Unknown</p> <p>Data repository will be major component of cost but could also yield savings from consolidating distributed infrastructure.</p>	U I
MNP10	Tiered storage infrastructure – appropriate to the data but minimizing the carbon and running costs	<ol style="list-style-type: none"> 1. Analyse data to understand the need and identify categories to determine the service offerings. 2. Produce costed proposal 3. Approval, plan, implement 	<ol style="list-style-type: none"> 1. Tiered storage in place for IT Services and CAL and use expanding. 2. Additional capacity added. 3. Needs data categorisation exercise 	<ol style="list-style-type: none"> 1. Extend tiered storage to rest of the Colleges 2. Major upgrade to storage infrastructure planned for 14/15. (Money set aside in IT Services capital budget) 3. Looking at Hierarchical Storage 	<ol style="list-style-type: none"> 1. Subsequent phases will require additional funding 2. Possible need for external 	U F

			<p>to exploit full potential (needs Data Architect).</p> <p>4. MidPLUS Project is constructing a Research Archive, to provide a component part of the tiered architecture.</p> <p>5. Tier'ed storage options now taken up by all Colleges except SS. Likely to join central provision at renewal.</p>	Management (HSM) solutions, potentially for both research and corporate data	consultants	
	Investigation					
INV01	Investigate why videoconferencing take up is still limited. Promote use and measure take-up	<ol style="list-style-type: none"> 1. Identify and talk to key people running the services 2. Liaise with College IT managers & C&IT 3. Identify issues (cultural, technical, financial) 4. Find solutions and develop promotion strategy 5. Investigate next generation video conferencing options 6. Showcase through Nottingham collaboration and senior management involvement 	<ol style="list-style-type: none"> 1. OCS is being rolled-out, used and promoted as a desktop solution 2. Other options promoted at the Environment Day (2 Oct 2012) 3. Successful discussions with Jon Colbourne re exploiting existing VISTA facilities or developing new ones within his new lab plans. This could result in an exploration of 'next generation video conferencing options' 4. VISTA facility (now BEAR View) now under IT Services' management and is available free at the point of use 	<ol style="list-style-type: none"> 1. Plan is to follow up with John Colbourne and make exemplar for rest of campus. 2. Launch event of BEAR View being planned. 	<ol style="list-style-type: none"> 1. New technology would be expensive. 2. Investment may be required to improve take up 	QUI
INV02	Investigate carbon implications of VOIP	<ol style="list-style-type: none"> 1. Investigative project as part of network upgrade 2. Ensure specifically that carbon assessment is included in any recommendation 	<ol style="list-style-type: none"> 1. New Network switches are capable of supporting VOIP 	<ol style="list-style-type: none"> 1. Check timescales with network upgrade plan 	Investigation may require pilot	Q

INV03	Assess the carbon implications of the wider University use of HPC (distributed versus central model)	<ol style="list-style-type: none"> 1. Compile list of current HPC use outside of ITS 2. Meter electricity use in these areas, including cooling 3. Determine embedded carbon implications 4. Determine carbon impact of BlueBEAR and its successors 5. Determine workload and utilisation levels on all HPC kit 6. Analyse demand if all non-ITS HPC load was transferred centrally – would we need more capacity? Would it meet academic needs? Will be this be imposed by HEFCE anyway? 7. Calculate carbon saving of running (everything) centrally and recommend HPC policy 	<ol style="list-style-type: none"> 1. More than one approach received from researchers planning to put compute nodes into BlueBEAR rather than run locally. 2. Several researchers have now purchased nodes for BlueBEAR 	<ol style="list-style-type: none"> 1. Policy to continue to offer hosting for nodes on shared infrastructure for efficiency 	<ol style="list-style-type: none"> 2. Estates/ electrical contractors costs in metering <p>Note: Any significant move to central provision is dependent on commissioning of new data centre.</p>	Q
INV04	Evaluate the use of virtual desktop technology again and deploy appropriately (staff and students)	<ol style="list-style-type: none"> 1. Re-assess technology (in light of experience in MDS and more widely) 2. Determine cost and ROI of a large scale deployment 3. Determine carbon impact 	<ol style="list-style-type: none"> 1. Exploratory background paper completed 2. Demos of VDI have been delivered to John Colbourne 	<ol style="list-style-type: none"> 1. Selected Business Systems users being migrated to virtual desktop; use as pilot for data collection and further investigation. Pushing capacity of VMWare VI to limit 2. Investigating VDI solution for John Colbourne's new lab. 3. Campus wide deployment under evaluation. 	<ol style="list-style-type: none"> 1. Technology investigation costs 2. Will need additional infrastructure and data centre funding – from 12/13 capital budget. 3. Consultancy ? 	I
INV05	Co-operate with The Estate Management Office to minimize the carbon impact of IT in sensitive buildings e.g. ERI and Muirhead Tower	<ol style="list-style-type: none"> 1. Identify sensitive buildings with Estates 2. Evaluate IT installation and impact 3. Recommendations for options to make significant impact. 4. Action plan costed and approved 5. Implement changes 			Unknown at this stage – depends on number of buildings and action plan	U
INV06	Expand and develop data centre management capabilities e.g. by adding tools like HP's Insight Manager	<ol style="list-style-type: none"> 1. Investigate and recommend tools to give comprehensive capability 2. Make case and bid for funding 3. Plan and implement on approval 4. Review 	<ol style="list-style-type: none"> 1. Limited pilot concluded with Concurrent software 2. Joint discussion underway with Estates and a supplier 	<ol style="list-style-type: none"> 1. Test configuration to be set up to evaluate joint BMS / DCIM solution. 2. See MPL09 	<ol style="list-style-type: none"> 1. Data centre management tools to collate, analyse and forecast. Circa £100K (already mentioned above) 	U

