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# Summary of responses to the consultation entitled 'Improving the energy performance of ICT products'

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# 1 Introduction

1. On 5 December 2007, following the publication of the Energy White Paper, the Government launched an Information and Communication Technology (ICT) products consultation paper<sup>1</sup>. Interested parties were invited to provide comments by the end of February 2008. AEA Energy and Environment managed this consultation, as lead contractor of the Government's Market Transformation Programme (MTP).

2. The paper (chapter 5 of the consultation paper) set out the Government's current evidence, analysis, indicative targets and eco-design standards for ICT products that are sold and brought into use in the UK. The consultation paper was directly circulated to over 350 organisations and individuals. In addition, it was published on the MTP website and open to all interested parties for comment. This consultation is part of a wider annual review and policy development process, supporting delivery of the Government's objectives for energy and for sustainable consumption and production.

3. The responses have been reviewed and are reported in the following sections:

- Section 2 summarises the quantity and nature of responses received.
- Section 3 gives a summary of the responses by consultation question followed by the Government's response.
- Section 4 details the next steps in the process.

4. Appendix 1 lists the stakeholders who provided a response (excluding those who wished to remain anonymous).

## 2 Overview of responses

5. A total of seven responses were received from a variety of organisations and individuals; these ranged from detailed comments on the consultation document to brief submissions relating to just one or more issue. A number of those stakeholders who responded attended an ICT products consultation meeting, which took place on the 9 January 2008. It should be noted that some organisations chose to have their opinions put forward via trade bodies.

6. Of the seven responses received, four represented submissions from the ICT industry (of which two were trade bodies). All of the respondents chose to provide comments directly to the questions presented in the consultation document; two stakeholders also submitted general comments.

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<sup>1</sup> The original ICT products consultation document (Sustainable Products Policy Brief, Energy in use: ICT Products. Evidence, analysis, targets and indicative standards) can be downloaded at [www.mtprog.com/cms/whitepaper/](http://www.mtprog.com/cms/whitepaper/).

7. A number of factors influencing the ICT market and the potential for improved energy performance were highlighted by stakeholders. These ranged from the current high level of energy wasted from PCs being left on overnight and at weekends (and the important role here for power management software) to the consideration that monthly print volumes can affect the relative performance of different printer products. It was commented that games consoles were not adequately addressed as a product type and that several types of print cartridges needed to be considered separately in view of their differing waste impacts. The challenge of developing appropriate projections and standards within the fast-moving area of ICT was also noted in several responses.

8. While the graphs and indicative performance standards were felt to cover the right products and set at the right levels by some stakeholders, a variety of concerns were noted. For example, the targets for standby power consumption were felt to be extremely conservative by one participant whilst another suggested that the target values for laptop computers would be very challenging to meet within the stated time period. One stakeholder questioned the basis for the development of some of the projections and suggested they were not in alignment with recent EU-level studies developed as part of the Energy Use of Products (EuP) process.

9. A key theme across the responses was the role of harmonisation in policy approaches, and the appropriate actions to be taken at international and national levels. One stakeholder expressed concerns that national labelling and public procurement standards would be contradictory to efforts to drive global standardisation and EU harmonisation and that Government should instead focus on actions to raise awareness and influence consumer behaviour. Several participants agreed that ENERGY STAR<sup>®</sup> would become the de facto standard for performance of ICT products.

10. Several developments of relevance to the sector were described by stakeholders including the Environmental Technology Evaluation initiative being developed by the European Commission, and the use of energy efficiency rebates by utilities implemented in the US. Additional measures identified included the use of product/solution awards to help stimulate innovation in the market. Concerns in relation to disposal of obsolete ICT products were also noted, in particular the cost to consumers of recycling unwanted computers.

### 3 Summary of topics raised and the Government's response

**Question 1: Are there any other market or technological trends or factors that should be taken into account in this market overview?**

### Summary table for Question 1

Key topics raised	Number of comments
Energy waste resulting from the large number of PCs left switched on overnight or at weekends and potential for power management savings	1
Miniaturization will reduce energy consumption	1
Relative energy and cost performance of inkjet and laser printers are influenced by monthly volumes	2
Different laser cartridge products have significantly different waste impacts	1
External power supplies for ICT may be very inefficient	1
Convergence trends and need to address games consoles within ICT sector	1
Need to account for ENERGY STAR / ECMA energy efficiency approach in energy projections	1
Challenge of developing energy projections upon fast-moving product technology	1

11. Six participants responded to this question. A number of additional market and technological trends were identified in the responses.

12. One stakeholder noted that a large number of PCs are left switched on overnight or at the weekend, either as a result of individual behaviour or due to organisations stipulating policies for employees to leave their PCs on at all times to enable IT updates. In this context, attention was drawn to a review undertaken by the National Energy Foundation (NEF) of the current UK environmental agenda in relation to IT, specifically focusing on the behaviour of employees in relation to switching off PCs. This research identified that one-sixth of all computers in the UK are never switched off at night or weekends, with a further 15 per cent not switched off on some days each week; it was noted that these PCs are wasting approximately 1.5 billion kWh of electricity per year, which equates to 700,000 tonnes of CO<sub>2</sub> - all of which could be avoided through installing PC power management software.

13. Several comments were made in relation to imaging equipment. The trend towards colour printing and miniaturization was highlighted by one respondent who noted that whilst colour printing requires additional power compared to monochrome printing due to technological limitations, miniaturization will reduce energy consumption. It was further noted that whilst the rated power of laser based equipment is indeed higher than that of inkjet equipment, laser based equipment is often preferred by customers who have higher monthly volumes and that the cost and energy per print may be lower for either inkjet or laser-based products. It was also stressed by one participant that the link between end user price and print speed is not based on exhaustive evidence and that the intended monthly volume is a key parameter in choosing an imaging device, rather than a focus solely upon product speed.

14. One participant highlighted that the description of cartridge types in the related document BNICT23 defined only a single type of laser cartridge, whereas in fact three quite distinct technologies are currently in use. It was noted that, in addition to the 'composite cartridge', 'separate 'print drum' and 'permanent print drum' cartridges are also available, and that each of these products have quite different impacts from a waste point of view (noting in particular the difference in the number of components and materials contained within the cartridges, and their weight).

15. It was noted by one stakeholder that power supplies may be integrated into ICT products or via an external unit (typically a "black box" that interfaces between the national ac mains and the dc voltage required by the product) and that these external supplies may be very inefficient and dissipate significant power, even when the product serviced is off. It was commented that rewarding the manufacturer for low standby power when the external supply dissipates as much as 10W in the standby state creates an illusion of energy savings and that (noting a growing number of ICT products that draw power from a central supply via USB 2.0 interfaces) an integrated approach to power supply needs to be encouraged to reduce the number of external power supplies used in a typical domestic situation.

16. One participant noted the increasing convergence between consumer electronics and ICT equipment. It was also noted that at present games consoles fall into a 'gap' between the energy focus on CE and ICT sectors. In this context, it was suggested that consideration should be given to embracing them as a specific product within the ICT sector. It was stated that the ENERGY STAR energy efficiency performance metric approach (currently being developed by USEPA, ECMA TC38 TG2 and BAPCo), for evaluating the energy consumption of PCs based on their performance and capabilities under different usage patterns should be taken into account in the PC-related energy projections.

17. Noting the rapid pace of technology change for ICT products, one stakeholder commented that because the projections are based on "business-as-known-now" any technical step change, of which there is a high likelihood, will render the projections highly suspect. In view of this uncertainty, the need for greater flexibility in analysis and resulting policy development was highlighted.

## **Government response**

### **Power management:**

18. There is potential for a number of approaches to improve power management, Section 3.2.3 of the consultation document chapter on ICT addresses "Initiatives to improve power management". This section has been partially rewritten to highlight the considerations raised by respondents regarding power management.

### **Printing trends and miniaturisation:**

19. Section 2.1.3 has been updated to highlight the trend towards colour printing and miniaturisation. A statement regarding different print volumes and the variability of cost/energy per print depending upon application has been included in this section. Similar text has also been added to section 2.2.3 on Imaging Equipment price.

### **Printer cartridges:**

20. Printer cartridges are not discussed in the consultation document itself. However, they are discussed in detail in BNICT23. This has now been updated to take into account the stakeholder comments, defining three distinct laser cartridge types with different components, materials, and weight. See: <http://www.mtprog.com/cms/product-strategies/subsector/office-equipment>

### **Power supplies:**

21. For the ICT products addressed in this brief, MTP evidence shows standby consumption due to external power supplies is on average substantially lower than the 10W stated by the respondent, and as power supply standby consumption is included in off/standby figures, all predicted energy savings are considered realistic. The combination of products into multi functional devices and the move towards standardised power supply designs (such as mini USB for phone chargers<sup>1</sup>) is likely to result in a reduction in the number of external power supplies used in the home in future. A paragraph explaining power supply considerations in more detail has been added to section 3.3.5 of the consultation document.

This explains the following:

- ICT products may have an external or internal power supply, depending upon product design. Most laptop PCs have an external power supply. Desktop PCs tend to have internal power supplies, which are enclosed within the main product casing. For ICT products, the efficiency of power supplies (both internal and external) is addressed predominantly via the ENERGY STAR specifications for the relevant products.
- For the main ICT products addressed in this document, power supplies tend to be reasonably efficient – in the region of 65 to 85% efficiency. For other miscellaneous products, not addressed by the EU-US ENERGY STAR agreement, supplies can be less efficient. The EU Code of Conduct on external power supplies provides a means of addressing the efficiency of miscellaneous external power supplies. External power supplies are also being addressed under the Energy Using Products Directive
- The combination of products into multi functional devices and the move towards standardised power supply designs (such as mini USB for phone chargers) is likely to result in a reduction in the number of external power supplies used in the home in future.

22. A footnote has been added at the start of section 3 to explain that data on off/standby power used to develop the scenarios and Government Indicative Standards include any standby consumption of the power supply (whether internal or external). A footnote has also been added under section 2.1 on trends to explain that although a growing number of ICT peripheral products draw power from a central supply via USB interfaces, these have not currently been shown to increase overall consumption to such an extent that it merits more in-depth energy modelling.

### **Convergence trends:**

23. Considerations of convergence between ICT and consumer electronics devices (i.e. in terms of stock transitions to combined PC/media players etc) are currently being assessed in a specialist modelling exercise. Due to the uncertainties, and many possibilities in convergence scenarios it has not yet been possible to integrate convergence considerations into the main modelling framework, but as trends become more defined, the core models can gradually be updated in line with convergence trends. However, some related considerations such as increased use

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<sup>1</sup> <http://www.eetimes.com/rss/showArticle.jhtml?articleID=199800238>



of ICT to download and view media in the home have been taken into account in new usage scenarios within the core models for financial year 2008/2009.

**Games consoles:**

24. Games consoles are not currently modelled by MTP. However, an evidence base is being built to enable these to enable at least an initial model to be developed in 2008/2009.

**ENERGY STAR / ECMA energy efficiency performance metric:**

25. A note has been added in the consultation document under Figure 3.1 to explain the rationale behind the modelling approach: "Revisions to the current version 4.0 ENERGY STAR requirements for computers are currently under way. These "Tier 2" revisions will include an "Energy Efficiency Performance Metric" approach<sup>1</sup>. This will require a benchmarking tool to be run upon the computer, in order to output a kWh per year consumption figure. As this tool is still in the process of being developed, it has not been possible to account for potential impacts of this in the current modelling (it has instead been assumed that the revised specification will have a similar impact to downward revisions of the current 3 category approach). Once the energy efficiency performance metric has been finalised, modelling will be update to reflect this."

**Rapid pace of technology change:**

26. Due to the rapid pace of technology change for ICT products, it is necessary to make well-founded assumptions around how technology will develop into the future, and regularly re-evaluate these assumptions in light of technological developments. The indicative government performance standards have been based upon projections of when current best-practice and class-leader technology (as indicated from detailed data sets) might become the standard market average. This results in ambitious but practical scenarios. Where a step-change in technology becomes more certain, the models will be adapted to account for this – ensuring that the figures remain robust.

**Question 2: Do these graphs accurately illustrate how key existing policy instruments could support delivery of more efficient new products?**

**Summary table for Question 2**

Key topics raised	Number of comments
Yes; graphs accurately reflect existing policy support as far as is possible	2
Scope for power management to influence overall energy consumption	1
Changes to ENERGY STAR standards will change the overall method of measuring energy consumption of both desktops and laptops	2
On-Idle mode power is not necessarily the most representative metric for energy efficiency	2
Not all computers will gradually move into higher consuming categories	2
Other comments (expressing concerns with graphs)	4

27. This question refers to the graphs describing the indicative performance targets and policy options (see pages 13 to 17 in the original consultation document). Five responses were received to this question; two agreed that the graphs were as

<sup>1</sup> Currently being developed for the US EPA by ECMA TC28 TG2 and BAPCo.

accurate as could be expected given the unknown nature of technological change whilst three questioned their basis and/or commented on alternative figures.

28. It was commented in one response that while Figures 3.1 and 3.2 accurately illustrated how existing policy instruments could support the delivery of more efficient new products, there was scope within the figures to produce an overall effect on energy consumption through power management<sup>1</sup> options.

29. Two respondents commented that no reference is made in the document to the energy efficiency standard within ENERGY STAR which will change the overall method of measuring energy consumption of both desktops and laptops. It was also stated by two respondents that on-Idle mode power is not necessarily the most representative metric for energy efficiency; these two stakeholders expressed their disagreement with the claim that computers will gradually move into higher consuming categories; while it was expected that there would be some rationalisation where some computers will use higher power due to media rich functionality, some will not (also, more powerful processors will be relatively more efficient due to downscaling of integrated circuits). It was stressed here that the proportion of the split between these two areas is unknown because the consumer requirements for each sector cannot be accurately defined.

30. One respondent commented specifically that the graph illustrating low power consumption by Laser-MFDs (Figure 3.4) was outdated because Laser-MFDs are (under ENERGY STAR criteria effective since April 2007) characterized by the TEC metric, which represents an overall estimate of energy consumption. It was noted here that sufficient TEC-data is available from the EU-ENERGY STAR website to perform calculations and trend predictions. This stakeholder commented further that domestic laser based products were expected to gradually move to colour as well, when price reduction enables this.

31. The basis for the data behind the Figures 3.4 and 3.5 was questioned by one stakeholder, in particular further explanation was requested regarding how these linked to ENERGY STAR and ESR<sup>2</sup> requirements (noting that EST is known to be more stringent than ENERGY STAR). It was also commented that Figures 3.4 and 3.5 seemed to suggest that the UK was aiming for an agreement with retailers only to sell ENERGY STAR qualified equipment from 2010 onwards. In this context, it was noted that this would make ENERGY STAR obligatory inside the UK and would thus be contrary to EU market competition policy.

## **Government response**

### **Power management influence:**

32. It is recognised that power management can have a positive influence on energy consumption as a whole. The charts shown in the Section 3 of the consultation document relate to power consumption in each mode. These are then combined with usage and stock figures to enable overall energy consumption to be calculated. Usage figures take into account the level of power management

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<sup>1</sup> Note – original comment stated “power reduction options”. This has been interpreted in context as referring to power management options.

<sup>2</sup> ESR refers to the Energy Saving Recommended label, run by the Energy Saving Trust.

enabling (percentage of computer stock set to enter low power / sleep modes automatically), and the P1 scenario incorporates expectations for increased levels of power management.

**ENERGY STAR “Energy Efficiency Performance Metric”:**

33. The ENERGY STAR “Energy Efficiency Performance Metric” approach currently being developed by US EPA by ECMA TC28 TG2 and BAPCo is discussed in detail in the MTP briefing note BNICT18:

<http://www.mtprog.com/cms/product-strategies/subsector/office-equipment>

34. In addition, a note has been added in the policy brief under Figure 3.1 to explain the rationale behind the modelling approach (see previous section).

**On-idle:**

35. On-idle or “Idle State” has been accepted as a metric of consumption in the Tier 1 Version 4.0 ENERGY STAR specification for Computers – which had considerable input from industry stakeholders. It is considered under ENERGY STAR as “the state in which the operating system and other software have completed loading, the machine is not asleep, and activity is limited to those basic applications that the system starts by default.” However, testing has shown that power consumption in this mode is also broadly representative of non-intensive active use of the PC (i.e. for word processing and internet browsing). For modelling purposes, on-idle provides a means of assessing overall PC energy consumption. Although the Tier 2 ENERGY STAR specification will move towards an energy efficiency performance metric / benchmarking approach, it will still be necessary to track on-idle consumption in order to evaluate how energy consumption of PCs is changing.

36. The current ENERGY STAR approach defines three categories of desktop PC, and two categories of laptop PC, based upon the level of specification. Higher specified PCs are allowed higher consumption. MTP has analysed the contents of the ENERGY STAR database and other datasets over time, and has observed a definite transition from lower specification, lower consumption ENERGY STAR idle categories to higher consuming idle categories, resulting in ENERGY STAR allowing an overall increase in total average power consumption over time. The MTP models take a conservative approach to projecting currently observed trends between on-idle categories into the future.

**TEC for imaging:**

37. The graph illustrating Laser-MFDs (Figure 3.4) does not depict the TEC metric, as it is necessary for modelling purposes to assess the power consumption in each operational mode before energy consumption can be calculated. A calculator tool is used to derive individual modal power consumption figures from declared TEC values in order that average consumption in each mode can be calculated<sup>1</sup>. The usage profile included in the TEC test method has been highlighted by industry in EuP discussions as being over estimated – therefore if TEC kWh values were input directly to the models, power consumption of imaging products could be vastly over estimated.

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<sup>1</sup> It should be noted that quoted figures account for a distribution between colour and monochrome printers, for which the colour printer share gradually increases over time.

38. We will review our model in this respect during the coming year.

**Concern regarding ESR and ENERGY STAR contributions to graphs:**

39. Figures 3.4 and 3.5 suggest actions to encourage the sale of ENERGY STAR products – this does not indicate that the UK would aim to encourage the sale of ENERGY STAR qualified equipment alone. Rather, it means that (in line with announcements made in the Energy White Paper) the Government will encourage the supply of ICT products in line with the Government indicative standards. These indicative standards would be set at the appropriate market coverage level, using standardised approaches (to defining modes, testing approaches etc) as defined in ENERGY STAR or similar initiatives.

40. The ENERGY STAR label provides the test methods and definitions, on which other national initiatives such as the Energy Saving Recommended (ESR) label build. There is no intention to make ENERGY STAR or ESR obligatory in the UK

**Question 3: Do the performance values shown in the tables in the Appendix cover the right products and are they set at the right levels?**

**Summary table for Question 3**

Key topics raised	Number of comments
Tables cover the right products	1
Tables will need to be revised as sound and vision streaming around the home becomes the norm	1
Assumption that energy consumption decreases until the non-operating mode power is virtually zero is not based on technical evidence	1
Targets for standby power consumption are extremely conservative for the timescales considered	1
Target values for laptop computers are very challenging with a very aggressive timeline	1
Other technologies must be factored into targets	1
Other comments	2

41. This question refers to the tables describing the indicative performance targets in the Appendix (see pages 39 to 44 in the original consultation document). Five stakeholders responded. One participant stated that the tables in the Appendix did cover the correct products, although they were unqualified to state whether they were set at the correct levels. A second participant noted that the values would need to be revised as sound and vision streaming around the home becomes the norm. The remaining three participants expressed a range of concerns relating to the proposed values.

42. One stakeholder commented that the assumption in the tables seemed to be that energy consumption decreases until the non-operating mode power is virtually 0 (zero) watts. It was suggested that this assumption was not based on technical evidence presented in e.g. the preparatory studies on imaging equipment within the EuP programme and that therefore the resulting predictions based on the tables were speculative and should not be used as a basis for policy making.

43. One stakeholder viewed the targets for standby power consumption as being extremely conservative for the timescales considered. It was further noted that there are already computer configurations that approach the capability of mainstream desktop computers that comfortably exceed the specification set in the proposed targets. This stakeholder also commented that the setting of maximum power dissipation in standby mode is challenging since it is clear that the technology already exists in the mobile market to meet the requirements of the static ICT application market. In this context, it was stated that the most successful approach would probably be to enforce the publication of waiting, standby, and off power dissipation in mW with a simple message to the consumer that 'smaller is better'; it was felt that the choice of mW as the standard would ensure easier interpretation of the figures involved (this would also apply to the external power supply so that consumers would have the choice of purchasing more efficient ac to dc units).

44. Referring to Table A2 (Laptop Computers), one participant expressed the view that the targets are very challenging with a very aggressive timeline. It was commented that making projections out to 2020 was extremely ambitious given the pace of new technologies entering the market. In this context, it was suggested that a range of issues needed to be factored into the projections, including:

- changes driven by processor manufacturers (greater performance and improved energy consumption);
- changes driven by usage patterns influenced by software (graphics drivers, Bluray optical drivers etc.);
- interactive software and additional features such as the ability to stream audio and video, wireless technologies; and
- the addition of DTT tuners and the incorporation of PVR software.

45. It was suggested that in order to develop more accurate targets, consideration needed to be given to evaluating two possible streams: one for products incorporating media-rich technology and another for the potential growth in the simple laptop market for web browsers etc.

## **Government response**

### **Accounting for media capability in Government indicative standards:**

46. The need to frequently update models in order to retain an accurate evidence base is recognised – please refer to “rapid pace of technology change” response in Question 1. Model assumptions will be revised as there becomes more clarity on convergence trends and media streaming in the home. Additional considerations such as processor improvements and DTT tuners will be accounted for through changes in the evidence base over time, and consumption values will be updated accordingly. It is not possible to model the impact of individual technology developments, as this would add considerable complexity and introduce greater uncertainty to the models.

47. Media and basic PCs are not currently separated in the analysis as the values developed in the model represent an overall average for power consumption and usage taking into account these two different market segments. It is likely that the benchmarking approach being developed by ENERGY STAR for the Tier 2

Computer specification revision may develop profiles for a media rich and basic PC. In this case, more data may become available which could enable MTP to better account for these 2 product types in the analysis that inputs to the model.

**Consumption expectations in sleep / off / standby modes:**

48. Feedback on the consumption levels specified in the consultation brief was mixed, with some stakeholders claiming scenarios were too ambitious, and others claiming they were not sufficiently ambitious. Modelling was based on rigorous analysis of real data sets. In some cases these were more detailed and wider ranging than the data sets used in the EuP studies, though in many cases similar data sets were used. In general, a more thorough approach to analysis was taken than that attempted within the limits of the EuP studies. Assumptions for future trends based on current market data were made. In the majority of cases, the best practice line moves towards the level of the current best performing product (“class leader”) by 2020, and the policy (Government targets) line moves towards current best practice levels as the average in future (therefore it is assumed that the full range of products will perform around, but not exclusively at these levels). It is believed that this approach achieves a balance between ambition and what can be achieved in reality, and therefore provides a solid foundation for policy-making decisions. Where scenarios move very close to zero values, this is only because current evidence shows that this is already achieved for a number of products. MTP would always welcome the opportunity to discuss additional evidence with stakeholders and refine the specific data-sets and analysis in question.

**Measurement of sleep / off / standby modes in mW rather than W:**

49. The suggestion was made that measurement of power consumption in non-active modes should be in mW. For current purposes the “Watt” is used as a consistent unit across products and in different modes, as this is the standard across industry, labelling initiatives and standard committees. Using the Watt as a unit across different modes ensures comparability and readability of consumption values. Standards would usually only require an accuracy of up to 0.01W, or 10mW, so quoting figures to the accuracy level of 1mW may also appear misleading.

**Question 4: In the areas of market analysis, projections and targets, should consideration be given to any additional measures, risks or strengthening initiatives?**

**Summary table for Question 4**

Key topics raised	Number of comments
No further considerations required	1
Measures should be embedded in EU legislation schemes (e.g. EuP Directive)	1
Consider and support opportunity of voluntary agreements	1

50. Only three participants provided comments in response to this question. One participant stated that consideration of further measures, risks or strengthening initiatives was not required. The other two stakeholders both made the following points:

- All measures for promoting or stimulating (the development of) energy efficient products should be embedded in EU legislation schemes (e.g. the EuP proposals)
- Given the compactness of the ICT-industry, the opportunity of voluntary agreements (“Code of Conduct”) should be strongly considered and supported (both EICTA and ECMA International are platforms suitable for this purpose).

### **Government response**

#### **Focus of policy measures on EU legislation (National vs European level):**

51. Efforts are made to harmonise national, European and international product policy initiatives to ensure high rates and low costs of compliance. The UK is fully engaged in European and appropriate international product policy developments. We will also consider taking action at national level when appropriate through initiatives such as those detailed in section 3.4 (e.g. Procurement Action Plan, ESR Label), as implementation timescales can be more flexible, and there may be opportunities for the UK to set an example for the rest of Europe.

#### **Potential for Codes of Conduct in the ICT area:**

52. ENERGY STAR is a dominant mechanism in the area of ICT, providing clear test methodologies and metrics to evaluate and transform power consumption of products. Where there is insufficient current policy in place, a Code of Conduct (CoC) can provide a useful tool to transform the market (such as the Data Centre CoC) – but for the ICT products covered here, there has been no demand for a Code of Conduct to date. Minimum performance standards for ICT products are also likely to be set under EuP and the EU Commission has indicated in the past its willingness to look at proposals for Voluntary Agreement that industry would be putting forward ahead of any potential Implementing Measures. If industry are interested in developing a Code of Conduct or any other Voluntary Agreement for a specific ICT product or product aspect (for example internal power supply units) the Government would be happy to hear about it and, providing the timing and ambition seem right, the EU Commission would certainly be able to facilitate such a development.

#### **Question 5: In the area of engaging the supply chain, should consideration be given to any additional measures, risks or strengthening initiatives?**

##### **Summary table for Question 5**

<b>Key topics raised</b>	<b>Number of comments</b>
Important role for centralised power management software	1
Further research and measures needed to address over-specification of ICT equipment	1
Need to clarify parameters to be used in Red-Green calculator	1

53. Four respondents provided comments relating to this question. Two stakeholders commented on the requirement for greater measures to improve power management of ICT equipment, noting in particular the current levels of energy wastage and the forecast growth in product usage.

54. One stakeholder commented at length on the considerable potential for energy savings that could be achieved by ensuring that PCs go into sleep mode automatically when not in use through the installation of centrally administered

software solutions. It was commented that although there is no Government initiative in place to improve the power management of ICT equipment, there is appetite to improve the energy usage of PCs across local and central government. It was noted whilst a number of local authorities and central government departments (including the Department for Children, Schools and Families, the Department for Work and Pensions) are already using power management software to manage their energy usage, budgetary constraints often act as a barrier to their further use. Although the use of education and awareness-raising was recognised as being of importance, it was commented that the use of such software presented a simpler and more tangible solution to achieving energy reductions.

55. The tension existing between functionality, cost and energy efficiency relating to ICT equipment was highlighted by one response. The view was expressed that, except for business machines, the need for equipment to be “fit for purpose” alone does not apply: it was commented that a majority of domestic machines are likely to be over-specified and that this trend would be difficult to change. To this end, it was suggested that further research on this issue and consideration of potential solutions should be considered.

56. One stakeholder sought clarity over which parameters other than power consumption would be used by the Red-Green calculator to judge the impact of products over their lifetime, and also questioned how retailers would be encouraged to use it.

## **Government response**

### **Greater measures to improve power management of ICT equipment:**

57. We are aware that in many circumstances better power management can reduce the overall energy used by ICT products. Government Departments are currently considering how to make progress in this area in respect of their own estate. The issue is also being raised in various proposals for implementing measures currently being considered under the EuP framework directive. The consultation document text has also been amended to state that “There is an increasing awareness of the importance of power management, with software solutions being offered to improve power management capability, and case studies being implemented to determine holistic approaches to best practice usage<sup>1</sup>”.

### **Overspecification of products:**

58. The Government would welcome data from stakeholders to support the statement that “the majority of domestic machines are likely to be over-specified” so that the issue might be quantified and potential policy solutions considered if necessary.

### **Clarification of Red-Green Calculator parameters:**

59. The Red-Green calculator has yet to be developed for ICT products. It is likely that initially the calculator would mainly focus on energy considerations, widening to consideration of other environmental impacts in later iterations.

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<sup>1</sup> For example, activities for Global Action Plan on “Employee and Student Behaviour and Greener ICT” <http://www.globalactionplan.org.uk>



60. The Ecopoints methodology behind the Red-Green calculator provides the potential mechanism for assessment of wider environmental impacts associated with products. For example, with some additional development, future versions of the Red/Green calculator could assign Ecopoints to products based on design-for-recycling attributes<sup>1</sup>. However, given the current lack of data surrounding manufacturing energy it is unlikely that any calculator would be able to address the full product lifecycle.

**Question 6: In the area of EU and international policy actions, programmes and initiatives, should consideration be given to any additional measures, risks or strengthening initiatives?**

**Summary table for Question 6**

Key topics raised	Number of comments
Measures and initiatives currently in place are adequate	1
Preference for the ENERGY STAR (US EPA/ECMA INTERNATIONAL/BAPCo) approach as the basis of standardisation	2
Centrally administered software solutions can ensure that corporately set power settings cannot be disabled by users.	1
Concern that the UK will implement measures on energy efficiency before official approval by the EU institutions	1
ENERGY STAR energy efficiency performance metric provides good approach for comparing top-performers with average products.	1
ENERGY STAR is rapidly becoming the de facto standard for ICT products	1
Other comments	3

61. This question was answered by five participants. Whilst one participant commented that the measures and initiatives currently in place were adequate, the other four discussed a wide range of issues for further consideration.

62. Two stakeholders welcomed Government's intention to work at the international level to promote action to bring about more sustainable products and noted the importance of international collaboration. In this context the industry's preference for the ENERGY STAR (US EPA/ECMA INTERNATIONAL/BAPCo) initiative as the basis of standardization efforts was noted; it was commented that focus on the International Task Force for Sustainable Products (ITFSP) would cost a number of years to catch-up with this initiative conglomerate and would possibly lead to discussions developing between different sets of standards.

63. The role of mandatory standards was discussed by two participants. One stakeholder commented on the statement made in the consultation document that mandatory power management enabling can be disabled by the user at any time and that savings are therefore not guaranteed. It was commented here that while this is true for the majority of power management solutions, this can be easily mitigated through a centrally administered software solution which ensures that corporately set power settings cannot be disabled by users. In relation to the 'preparatory study on standby' a second stakeholder noted that the working document on standby/off-mode implementing measures (published by the EC on 19 September 2007) differs

<sup>1</sup> Design-for-recycling seeks to increase the amount of recoverable material at the end of product life.

from the quoted proposals and that the standby/off-mode requirements are still subject to business impact assessment.

64. In relation to the 'acknowledged risks' associated with mandatory standards presented in the consultation document a concern was also expressed that the text suggests the UK will implement measures on energy efficiency before official approval by the EU institutions, whereas this could lead to complicated situations due to differences in national legislation.

65. A concern was also noted in relation to the discussion of 'acknowledged risks' associated with the ENERGY STAR label. It was commented that the text in this section suggests that faster, top performing "power hungry" devices should be discouraged whereas top performers usually include a lot of functionality within a single device, so that although the energy consumption of the device may be high compared to others, the energy efficiency (energy needed for the functions) will be better than the sum of a number of products which together perform the same function as the single top performer. It was noted that therefore the ENERGY STAR energy efficiency performance metric for computers provides a good approach for comparing top-performers with average products.

66. Whilst agreeing that at present there are no effective EU-wide mandatory energy labelling schemes for ICT products, one participant noted that ENERGY STAR is rapidly becoming the de facto standard for ICT products and that although a number of non-compliant products are on the market, this number was expected to be small compared to the number of compliant products. Another stakeholder noted that ECMA INTERNATIONAL TC38-TG2 has the intention to continue to develop energy efficiency standards for other ICT products after finalizing the computer energy efficiency performance standard.

67. One response commented generally that improving power management was an area where a relatively big win could be achieved if the appropriate international agreements/legislation could be obtained and should be progressed accordingly. It was suggested that at present the Carbon Emissions Reduction Target (CERT) would be unlikely to lead to major uptake of more energy efficient ICT equipment.

## **Government response**

### **ENERGY STAR as a basis for standardisation:**

68. The Government is involved in product policy at an international level to ensure harmonisation of policy approaches. One of the most important initiatives on an international level is the ENERGY STAR label for office equipment. This is headed by the US EPA, and implemented through an agreement with the European Commission.

### **Role of the ITFSP:**

69. The ITFSP does not seek to be a standards setting initiative or to create parallel initiatives that could potentially conflict with or overlap existing efforts. It is focused on increasing the sustainability of products. It aims to encourage and facilitate improved dialogue, information sharing and international collaboration where these do not currently exist, and where more cooperative efforts would deliver

benefits. For example, increased harmonisation of standards and test methodologies, improved market surveillance and compliance with standards and labels.

**Power management:**

70. Section 3.2.3 of the consultation document chapter on ICT addresses "Initiatives to improve power management". The increasing awareness of the importance of power management and related software solutions is now listed in this section. Detail has been added to the footnote relating the EuP study into computers and monitors in section 3.3.2 to explain that "in some cases a centrally administered software solution can ensure that corporately set power settings cannot be disabled by users". Power management initiatives are at an early stage, and further work would be required before international agreements / legislation around implementation of power management could be achieved. However the UK will participate in these discussions with a view to improving the energy efficiency of systems that could benefit from such an approach.

**EuP Preparatory study on standby:**

71. Section 3.3.2 clearly states the status of the standby EuP requirements. A note has been added to highlight the differences in proposals, and explain that definitions of modes are not yet finalised, and so cannot be harmonised with the Government standards. The UK is not in a position to implement mandatory requirements on energy efficiency as those would be implemented in accordance and coordination with EU approaches. To avoid misinterpretation, the phrase "in an effort to phase in new standards in advance of this measure" has been replaced with the phrase "to encourage striving towards new standards in advance of this measure."

**Balancing the trend towards higher specification, higher consuming products:**

72. There is a need to strive not only towards efficiency, but also to mitigate future increases in consumption. Therefore, a failure to cap consumption of higher specification products could result in a considerable risk of future consumption increases. The phrase in question: "and there will be no mechanism to discourage moves towards higher specification, higher consuming devices" has been reworded to: "This implies a risk that as the market moves to more highly specified products, there is potential for overall energy consumption to increase in the future" for clarity. Therefore, approaches such as the US EPA energy efficiency performance metric should be reassessed over time to ensure that they continue to mitigate future increases in energy consumption.

**ENERGY STAR as a mandatory label / industry standard:**

73. It is noted that some stakeholders perceive ENERGY STAR to be the de-facto standard for ICT products. However, it is important to note that whilst ENERGY STAR is often specified in procurement requirements, it is a voluntary labelling initiative. At the point of a new ENERGY STAR specification being defined, it covers around the top performing 25% of the market.

74. The role of ECMA and BAPCo in development of the revised ENERGY STAR specification for computers has been explained further in the consultation document under section 3.3.6, where it has now been mentioned that ECMA International TC38-TG2 has the intention of continuing to develop energy efficiency standards for

other ICT products after finalizing the computer benchmark / energy efficiency standard.

**Potential of the Carbon Emissions Reduction Target (CERT) in the ICT area:**

75. The CERT is an obligation on energy suppliers to achieve targets for reducing carbon emissions in the household sector through encouraging take-up of energy efficiency measures. The scheme is administered by Ofgem, which holds an agreed list of measures that contribute specific scores towards suppliers' targets. The list covers a range of technologies in the ICT area. However, suppliers will tend to focus predominantly on the most cost-effective measures in pursuit of their targets, which typically includes loft and cavity wall insulation, low-energy lighting and white goods.

76. An illustrative mix of measures developed prior to the launch of CERT in April 2008 projects that about one million integrated digital TVs and nearly three million "PC mains panels" could be delivered under CERT by 2011.

**Question 7: In the area of UK policy actions, programmes and initiatives, should consideration be given to any additional measures, risks or strengthening initiatives?**

**Summary table for Question 7**

Key topics raised	Number of comments
SPAP does not address the innovation of alternative low carbon products	1
Need for a coordinated initiative across Government to adopt power management initiatives as standard practice	1
Government should set an example in sustainable procurement	2
ESR scheme will need to closely match ENERGY STAR standards	1
Need for one common European labelling scheme instead of several different national labelling schemes	1
National initiatives should focus on increasing consumer awareness and influencing consumer behaviour	1
Faster-moving mandatory standards better suited to pace of technological change than A-G energy labelling	1

77. Comments were received from five stakeholders. Several comments were made in relation to the role of public procurement. One participant commented that whilst the Sustainable Procurement Action Plan (SPAP) is aligned with the energy efficiency proposals and should help targets to be reached, there was a risk that it does not address the innovation of alternative low carbon products. Another concern expressed was that initiatives to explore power management solutions are being led at a departmental level rather than being co-ordinated across Government. In view of this, it was suggested that there was scope for a coordinated initiative across Government to adopt power management initiatives as standard practice thereby leading industry by example. This point was also made by another stakeholder who agreed that Government should set an example by purchasing energy efficient products. Finally, another response stressed the need to focus on outcome based specifications, leaving maximum freedom of design and room for proprietary technologies.

78. One stakeholder expressed their support for the objectives of the EST's Energy Saving Recommended (ESR) scheme but expressed the view that ENERGY STAR

will become the de facto standard for ICT products, and that therefore the two standards will need to become closely matched for the ESR scheme to remain meaningful. Another participant highlighted the need to support one common European labelling scheme instead of several different national labelling schemes and noted current efforts led by the European Commission to develop the EU Energy Label. The same stakeholder proposed that national initiatives aimed at reducing energy consumption should focus on increasing consumer awareness and influencing consumer behaviour. One response commented that the pace of technological change in the ICT market was such that a relatively fast-moving mandatory standard, along the lines of ESR has more potential to move the market than the relatively cumbersome A-G labelling scheme.

## **Government response**

### **Public procurement:**

79. Government will be required under the Energy Services Directive to procure products that contribute to a reduction in energy use. Outcome based procurement specifications can allow the market to suggest innovative solutions to government requirements. However, there is also a potential need to compare the environmental characteristics of products or services accurately in order to make informed decisions. Any comparison will therefore be reliant on accepted methodologies for assessing the environmental impacts of the different solutions.

### **Power management:**

80. Power management considerations are discussed under questions 1, 2, 5 and 6.

### **Energy Saving Recommended (ESR):**

81. ENERGY STAR<sup>1</sup> and ESR both deal with products at the top energy efficiency end of the market, but the two labels have slightly different aims. Whilst ENERGY STAR aims to qualify only the top performing 25% at the time of specification (and this market penetration increases over time until the next specification revision after approximately 2 to 4 years), ESR aims to be a best practice label, qualifying only the top performing 20% of products in any one year (with potential to revise specifications on a yearly basis). As such ESR uses ENERGY STAR test methodologies and approaches, but sets criteria that are slightly more stringent than ENERGY STAR on an ongoing basis. ESR is focused upon the domestic consumer, whereas ENERGY STAR in Europe tends to be more focused on non-domestic buyers. It is likely that ESR would have a higher profile with domestic buyers in the UK than ENERGY STAR, as the EST invest in awareness raising publicity campaigns and work to ensure label visibility at the individual store level.

82. Efforts are made to harmonise national, European and international labelling initiatives to ensure high rates and low costs of compliance. The UK is fully engaged in European product policy developments. However, there are additional opportunities to transform the market at a national level (through the initiatives detailed in section 3.4), as implementation timescales and awareness raising

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<sup>1</sup> Please see previous discussion under question 6 regarding ENERGY STAR as a de-facto standard.

activities can be more flexible, and there are opportunities for the UK to set an example for the rest of Europe.

### Consumer awareness

83. The Government's efforts to promote pro-environmental behaviour are detailed in section 3.5.2. It is acknowledged that national efforts to increase consumer awareness and influence consumer behaviour play a part in sustainable product policy. However, in order to maximise improvements in energy consumption, a suite of policy approaches is required depending upon the product in question. In some cases, due to the rapid technological change in ICT products, non-mandatory national initiatives have the potential to transform the market where EU initiatives such as the EU Energy Label would find it difficult to keep up with the pace of change.

### Question 8: Are there any other policies likely to impact on ICT products that should be taken into account?

#### Summary table for Question 8

Key topics raised	Number of comments
Environmental Technology Evaluation initiative being developed by the European Commission	2
Potential for the use of integrated domestic appliance control via ICT hub with roll-out of smart metering	1
Use of energy efficiency rebates by utility companies	1
Budget controllers need to have visibility of potential cost/energy savings	1

84. Four stakeholders responded to this question. Two participants highlighted the role of the Environmental Technology Evaluation initiative being developed by the European Commission. Another stakeholder noted that as the national roll-out of smart metering begins there would be potential for the use of integrated domestic appliance control via ICT hub.

85. Commenting on the promotion of pro-environmental behaviour, one participant stressed the merit of incentivising organisations, and specifically IT teams, to purchase ICT products on the basis of energy efficiency. It was noted that increasing take-up of energy efficiency rebates by utility companies is being observed in the UK, and that some utility companies are even offering specific PC power management rebates that reward consumers for implementing energy efficiency solutions. It was commented that those controlling budgets available for ICT solutions directly aimed at reducing energy consumption needed to have visibility of the potential savings in order to allow them to purchase such solutions.

### Government response

#### Environmental Technology Evaluation initiative:

86. Further information is awaited from the stakeholder in question regarding this initiative.

### **Smart Metering:**

87. Smart metering is discussed in section 3.5.4. The potential for roll out of integrated domestic appliance control via an ICT hub as part of a smart metering initiative is noted, although implementation is not currently at this advanced stage.

### **Supplier side initiatives (CERT potential):**

88. CERT has a component that could be used by suppliers to influence behaviour, but it is the suppliers that decide which routes they will use to meet their obligation.

### **Savings visibility to influence procurement:**

89. Savings due to the purchase of ENERGY STAR products can be determined via the calculator on the EU ENERGY STAR website:

[http://www.eu-energystar.org/en/en\\_calculator.shtml](http://www.eu-energystar.org/en/en_calculator.shtml)

90. A footnote has been added to the consultation document to highlight this information source in section 3.4.1 on procurement.

### **Question 9: What additional measures would you suggest developing to drive forward sustainability in ICT products?**

91. Comments from three stakeholders were received in response to this question. The following additional measures were suggested / supported:

- Introduction of an 'environmental' product award to help stimulate innovation competition between manufacturers (this could be developed to include an award specifically for 'solutions' which increase the energy efficiency of ICT products)
- Incorporation of sustainability into 'Product Design' in secondary education at GCSE Level so as to enable continuation of eco-friendly innovation.
- Promotion of the global ENERGY STAR schemes for ICT products and increased customer awareness of the value of these schemes.

### **Government response**

#### **Introduction of an 'environmental' product award:**

92. This is already included in the consultation document.

#### **Incorporation of sustainability into 'Product Design' in education:**

93. This has been incorporated as a potential measure in Section 4.

#### **Promotion and awareness raising of the ENERGY STAR label:**

94. This suggestion has been included in section 3.3.3, though it should be noted that promotion of the scheme in Europe would only be based around the "Office Equipment" specifications that are part of the EU-US agreement on ENERGY STAR.

### **Question 10: Are there any other potential impacts resulting from these proposals that should be taken into account?**

95. Only one comment was received, noting that when new domestic computers are bought, the equipment replaced is often not recycled under the WEEE legislation (especially monitors).

## Government response

### WEEE directive issues:

96. Section 5.3.2 highlights organisations such as StEP, who are working with the European Commission to evaluate the effectiveness of the WEEE directive and to address failures in the process to ensure recycling/reuse.

## General responses

### Summary Table for General responses

Key topics raised	Number of comments
Need to address the practise of shops charging customers to take back old ICT products	1
Games consoles are currently falling between energy policies and should be addressed	1
ENERGY STAR programme should be the preferred framework for developing energy efficiency standards for ICT products	1
Many national policies and measures contradict global standardisation efforts and EU harmonisation policy	1
Labelling schemes and public procurement standardisation should be developed only at EU-level	1
Concerns relating to the basis of figures/standards provided in the consultation document	1

97. Two participants chose to submit general responses in the area of domestic lighting in addition to, or as an alternative to, answering specific questions.

98. The first participant noted that shops are currently charging customers a transportation fee to take back old products when they deliver the new replacements; it was felt that this undermines the WEEE Directive as the shops are placing the onus upon their customers where those customers are unable to pay the charges. It was noted that this was an unintended consequence of the WEEE Directive that required attention. The same respondent also repeated a concern made earlier that games consoles are currently falling between energy policies and should be addressed.

99. The second respondent provided extensive comments, some of which repeated issues raised in relation to the specific consultation questions. The response welcomed the active participation of the UK Government in the EuP process and the references to the ENERGY STAR being the de facto global standard for energy efficiency of ICT-products. It was commented that the ICT industry and the national enforcement authorities have a common interest in formulating sound legal standards on energy efficiency and that this is a necessary condition for a level playing ground within the EU while helping to achieve the EU-goals of reduction of energy consumption. The international harmonisation of energy efficiency measuring standards was also welcomed and the central role of the ENERGY STAR programme in the development of these standards was noted. In this context, it was commented that the ENERGY STAR programme should be the preferred framework for developing energy efficiency standards for ICT products rather than the ITFSP.



100. The second respondent expressed their concern that many of the national policies and measures outlined in the document (e.g. a national labelling scheme and national standards for energy efficiency to be used in public procurement and retailers) contradict efforts to move towards global standardisation and a level playing ground within the EU. The view was strongly expressed that the EU was the only appropriate level for labelling schemes and public procurement standardisation and that national initiatives tend to, and will probably lead to, increased costs and the promotion of free-riding.

101. It was proposed that UK policy on energy efficiency of ICT products should focus on the following areas:

- A well-founded position in the EuP and ENERGY STAR discussions. These discussions will benefit from arguments based on the interest of the UK government as a complement to contributions from other EU member states.
- Public procurement policy (for ICT products) developed at the European level for use in tenders issued by the Commission and national governments.
- National campaigns directed towards consumer awareness and influencing end-user behaviour promoting the reduction of energy consumption by ICT equipment.

102. The second stakeholder also expressed concern relating to the basis of many of the figures provided in the document, including the underlying origin of the aggregate energy consumption of UK ICT products (computers and imaging equipment) which was felt to be unclear. It was commented that much of the information was not in agreement with the EuP preparatory studies for computers. In view of these concerns, it was stated that the weak foundation of the indicative standards poses a severe risk when they are used as qualifying criteria in public procurement tenders, as few or no products will be compliant within a few years leading to unnecessarily complication of the public tendering process.

## **Government response**

### **WEEE directive issues:**

103. Any organisation that sells new electrical and electronic equipment to householders is classed as a “distributor” under the WEEE Directive. All distributors must provide facilities for customers to return old equipment free of charge on the purchase of a replacement item. Distributors can meet the obligation to offer free take-back by either joining the Distributor Take-back Scheme (DTS) or by offering in-store take back of old equipment. Whilst distributors are required to provide routes for free recycling of old equipment they are permitted to charge for transport costs when collecting from customers’ premises. More information about the WEEE Directive and retailers’ obligations can be found on the BERR website at <http://www.berr.gov.uk/sectors/sustainability/weee/Factsheets/page41148.html>

104. As discussed under question 10, it is suggested that stakeholders make direct contact with organisations such as StEP as mentioned in section 5.3.2 of the consultation document to follow up on potential issues with the WEEE directive.

**Games consoles:**

105. Please see the response regarding games consoles under Question 1.

**ITFSP:**

106. Please see the discussion of the ITFSP under Question 6.

**Focus of policy measures on EU legislation (National vs European level):**

107. Please see the discussion on reasons for a suite of sustainable product policy measures under Questions 4 and 6, and comments on consumer awareness under Question 7.

**Government indicative performance standards and procurement:**

108. Government indicative standards are intended as an indication for average levels the Government would like to see reach the UK marketplace (whilst recognising that for some products there can be a wide range of specification levels and consumption). They are not currently intended as absolute procurement specifications for each product since the Government indicative standards address product groups as a whole and not products of a defined level of performance within each product group.

**Modelling approach:**

109. Please see discussion under Question 1 – on how the rapid pace of technology change is accounted for, and discussion under Question 3 on the strong foundation of detailed data analysis inputting to the models. Government analysis takes a more detailed approach than that of the EuP study on Computers and Monitors (though the UK was involved as a stakeholder throughout this study). The evidence base provides a solid foundation to the indicative standards and takes into account information from a range of recognised sources such as the ENERGY STAR database and manufacturer's environmental product declarations, as well as MTP originated testing. In some cases, the EuP approach is not in agreement with the approach taken as the basis of figures for this consultation, but it is believed that the approach taken here is correct. The Government would welcome more detailed discussions with stakeholders on any specific aspects of the indicative standards that they would like to query, especially where data can be provided to improve the evidence base that acts as a foundation of the analysis.

## 4 Next Steps

110. The Market Transformation Programme has carefully reviewed the existing evidence and taken into account these stakeholder responses and any new information or data. The original projections for the future performance of ICT products are being reviewed along with options for the ongoing improvement.

111. The outcome of this process is published in the separate document entitled 'Policy Briefing Document for improving the energy performance of information and communication technology products' which provides an update of the baseline information provided in the original Consultation Document. While the formal consultation process has closed, engagement on the standards will continue as part

of an annual reviewing and updating process.

112. In terms of ICT, this includes the intention to specify standards for TEC category printers (laser printer/MFD and copiers) as a kWh TEC requirement. The revised standards will be published later this year. These revised performance standards will constitute the new published indicative Government targets for ICT products. Defra will be keeping those under review as part of an annual reviewing process.

## Appendix 1 - List of respondents

<b>1E</b>
<b>European Information &amp; Communications Technology Industry Association (EICTA)</b>
<b>Joe Green, ICT Consultation Event Attendee 09/01/08</b>
<b>Kyocera Mita UK Ltd</b>
<b>Loughborough University</b>
<b>Energy Saving Trust (EST)</b>
<b>Sony UK Ltd</b>