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# Policy Brief: Improving the energy performance of consumer electronics products

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# A Policy Brief for improving the energy performance of consumer electronics products

## Evidence, analysis, targets and indicative standards

### Overview

1. This Policy Brief represents the outcome of the public consultation on consumer electronics products, which was carried out earlier this year. This is in accordance with the announcement in the Energy White Paper of 23 May 2007 where the Government said it would publish a series of consultation papers setting out its analysis of how the performance of energy using products will need to improve over the next 10–20 years, including proposals for product standards and targets to phase out the least efficient products<sup>1</sup>. This forms part of a wider annual review and policy development process, supporting delivery of the Government's objectives for energy and sustainable consumption and production.
2. To achieve the product standards and targets, a range of measures and approaches are required. These may include: international agreements, European and domestic legislation, and voluntary action through the supply chain to enhance markets for the most cost-effective energy efficient goods and services. In the Energy White Paper, the Government announced a range of policies to support delivery.
3. We believe that the standards will provide retailers, manufacturers and service providers with a benchmark to improve the performance of products they provide. In addition, we are encouraging industry to deliver improvements in product standards.
4. This Policy Brief addresses the in-use energy consumption of the following consumer electronics products:
  - Televisions.
  - Video recorders/players.
  - Digital television adapters (set-top boxes (STBs)).
  - External power supply units (ePSUs)/battery chargers.
5. These products account for a significant proportion of the energy use and carbon emissions associated with consumer electronics products. There are other products that are thought to be less significant, in terms of consumption, so they have not been analysed to the same level. It is estimated that these could add a further 10% onto the consumer electronics total energy consumption. The scope of this Policy Brief could be extended to include other products such as audio equipment and wider aspects of sustainable consumption and production if there is a case to do so.

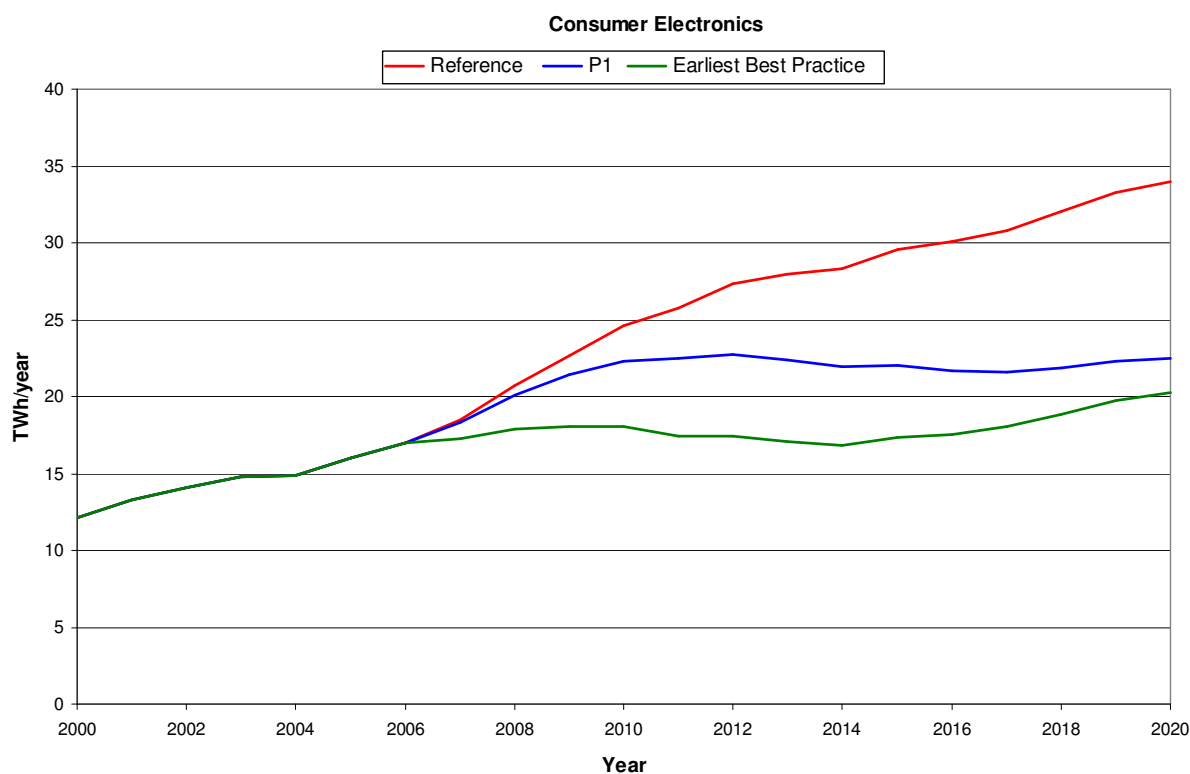
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<sup>1</sup> See Energy White Paper (23 May 2007), para. 2.102.

## How we expect consumer electronic products to contribute to future energy consumption

6. The following graph shows the Government's projections for energy use by consumer electronics products.

### Total in-use energy consumption of UK consumer electronic products (see scope in paragraph 4)



7. The Reference<sup>2</sup> projection takes into account underlying trends in markets and technologies and the estimated or implicit impacts of historical and current policy measures. It does not, as yet, take account of the impact of the policies announced in the Energy White Paper, which are still being developed and are not targeted at specific products (eg the Carbon Emissions Reduction Target (CERT)) and successor schemes).

8. The Earliest Best Practice (EBP) projection shows what would happen if all new UK sales were based on the most resource efficient options, taking into account design and production cycles, but not taking account of price or other market barriers.

<sup>2</sup> The Reference line or 'REF' is included as a baseline against which progress towards absolute consumption targets can be monitored. It also permits us to measure the impact of market changes in response to published targets and delivered policy measures, and to assess the need for additional action. REF is updated to estimate the aggregate impact of existing policy measures, superimposed on underlying market trends, on the supply, sales and use of domestic lighting products – and, therefore, on household energy consumption. The effectiveness of market transformation policy, taken as a whole, may be assessed as the extent to which it modifies REF.

9. The P1 projection sets a target level of ambition that the Government is proposing could be delivered at a reasonable cost, taking into account such things as current UK and global performance benchmarks, economies of scale and the capacity of the supply chain to take coherent action to deliver more energy efficient products<sup>3</sup>.

10. Reference: If underlying trends continue and if none of the identified actions are taken, we estimate there is a risk that energy use in this sector could rise by 64% from 20.7 TWh<sup>4</sup> in 2008 to 34.0 TWh in 2020. This could mean an increase in carbon emissions from 3.0 million tonnes of carbon (MtC) (11 MtCO<sub>2</sub>) in 2008 to 3.9 MtC (14.3 MtCO<sub>2</sub>) in 2020. We can expect this projection to revise downwards as commitment to the proposed actions is secured.

11. EBP: With the fastest practicable rate of technological and market innovation, we estimate there is a theoretical potential that energy use could be as low as 18.0 TWh (2.6 MtC (9.5 MtCO<sub>2</sub>)) in 2010 and 20.3 TWh (2.3 MtC (8.4 MtCO<sub>2</sub>)) in 2020. This is a reduction on consumption over the reference expectations for 2020 of 13.7 TWh (1.7 MtC (6.2 MtCO<sub>2</sub>)). EBP projections assume that the current or expected best practice is introduced into the market at the earliest opportunity, taking into account current design and production cycles, but not considering price or other market barriers.

12. P1: Our current assessment is that we should aim to achieve target energy use from these products lower than 22.3 TWh (3.2 MtC (11.7 MtCO<sub>2</sub>)) in 2010 and 22.5 TWh (2.6 MtC (9.5 MtCO<sub>2</sub>)) in 2020. This target represents a real challenge against a background of increasing demand for new products and functions. Compared with our Reference projection, this would avoid consumption of up to 11.5 TWh (1.4 MtC (5.1 MtCO<sub>2</sub>)) in 2020. The Government would seek to improve on this target where the evidence suggests that would provide a cost-effective route to achieving its policy objectives.

13. Our modelling suggests that the P1 target would be achieved if, on average, products supplied and brought into use each year were to meet the indicative performance standards in the Appendix. The P1 targets and product standards take into account:

- Benchmark product designs and technologies.
- Underlying market and technology trends.
- The scope for delivering policy benefits at low cost.

14. For example, the performance standards for digital STB adapters in 2008 are 7.1 watts (W) (on-mode) and 6.4 W (passive standby). Although many products are

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<sup>3</sup> These market-based estimates for P1 are cross-compared with the performance improvements that could be envisaged through a set of ambitious but feasible policy options, over and above those included in the Reference line to check their feasibility. Section 3 of this Policy Brief (Policies, risks and measures) describes these along with the associated risks and proposed strengthening initiatives.

<sup>4</sup> 1 terawatt-hour (TWh) = 1 billion kilowatt-hours (kWh)

consuming more energy than this at present, there are products available on the market, at a competitive price, which achieve 3.8 W and 1.5 W in these two modes.

15. If we are on track to deliver the P1 targets, we would expect to observe the following milestones in the performance of products supplied and brought into use in the UK:

2010: All products other than those deemed to be 'complex'<sup>5</sup> (eg advanced set-top boxes) consume 1 W or less in standby (passive) mode.

2012: Satellite set-top boxes<sup>6</sup> – average on-power 15 W and standby (active)<sup>7</sup> 11 W.

2012: Cable set-top boxes – average on-power 10.8 W and standby (active)<sup>7</sup> 9.5 W.

2014: Basic terrestrial set-top boxes – average on-power 4.2 W and standby (passive) 1 W.

2015: Video recorders and players – average on (play) power: DVD players 7.2 W; analogue DVD recorders 11 W; and digital recorders 14 W.

2020: Television display screens average on power of  $(0.0328 \times S)^8 + 18.6$  W (compared with  $(0.0455 \times S) + 15.0$  W in 2006).

16. Actions that may be necessary to achieve P1 targets include:

- 2008: Commitments by UK retailers, manufacturers and service providers to supply consumer electronics products in line with the indicative standards (building on the announcement in Budget 2006).
- 2008: Updating of Government procurement requirements in line with the indicative standards, including digital television equipment specified for digital switchover support programmes.
- 2008: Agreement on international harmonised measurement standards for complex STBs.
- 2009: Agreement on EU-wide mandatory performance requirements for ePSUs as part of the implementation of the Eco-design of Energy-using Products (EuP) Directive.
- 2009: Agreement on EU-wide mandatory performance requirements for standby power as part of the implementation of the EuP Directive.
- 2009: Agreement on EU-wide mandatory performance requirements for simple STBs as part of the implementation of the EuP Directive.
- 2010: Implementation of horizontal global '1-Watt' indicative standards for the most important products.

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<sup>5</sup> The term 'complex' is increasingly used (somewhat loosely) to describe either products that fulfil more than the basic functionality of the product type or a product in which several different functions and technologies have been converged. For example, a basic set-top box (STB) is one that converts a digital television signal for viewing on an analogue television set, while a complex STB has additional features such as recording, video streaming, broadband access, etc.

<sup>6</sup> This assumes current configurations and functionality. MTP is monitoring the development of these rapidly changing products and milestone targets may be adjusted to reflect future functionality.

<sup>7</sup> Most cable and satellite set-top boxes have no (or negligible) passive standby operating mode. The performance milestones for these products reflect the fact that, if left unchecked, their expanding functionality is likely to result in increased active standby consumption. Policy actions for cable and satellite set-top boxes focus first on 'pegging' product performance at current levels and then on working with key stakeholders to identify future product developments and opportunities for improvement.

<sup>8</sup> Where S is the screen area in cm<sup>2</sup>.

- 2011: Agreement on EU-wide (EuP) standards for all remaining important consumer electronics products.

17. Risks and critical issues that may require a policy response include:

- Decisions to implement actions listed above might be delayed for example, due to insufficiencies in the evidence or by a lack of consensus.
- P1 targets might be considered insufficient to deliver future Government policy objectives.
- Voluntary commitments in the supply chain might be inconsistent or, in aggregate, insufficient to provide confidence that the P1 indicative targets, milestones and standards will be delivered.
- Policy instruments such as the EuP framework directive might deliver standards lower than the UK indicative standards and could detract from the ambition of the Government's own P1 targets.
- Lack of practical co-operation at EU and international levels in developing product policy (eg for delivering '1-Watt' standards), might slow global innovation processes, delay delivery of efficient products into UK markets and reduce the long-term potential.
- Insufficient market surveillance and policing and unfair competition lead to a reduction in effectiveness of policies.
- Consumer behaviours and price might remain a barrier to deploying the most energy efficient and sustainable technology and solutions.

18. In this Policy Brief, we set our P1 target and indicative standards based on our current understanding of what is necessary and deliverable. That analysis may change over time, for example, if new efficient technologies enter the market faster than expected; or if consumer trends change; or through international or EU action; or through policies on carbon emissions reduction more generally. We intend to maintain a continued active dialogue with businesses in the supply chain. The aim will be to review progress and to annually update this analysis, the P1 target and the indicative standards for domestic lighting products, among others, following consultation and review.

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## 1 Status of Policy Brief

19. This Policy Brief is issued as part of an annual process, as announced in the Energy White Paper, to review and update the Government's published analysis, projections, P1 target and indicative standards for more sustainable products. This updated version takes into account new market evidence and the views received following the first consultation and, so far as possible, addresses substantial issues raised.

## 2 Market overview

20. This Policy Brief addresses energy consumption in use and carbon emissions associated with the following consumer electronic products:

- Televisions.
- Video recorders/players
- Digital television adapters (set-top boxes (STBs)).
- ePSUs/battery chargers.

### 2.1 Trends

21. Overall, there is strong demand both for entertainment services and for the electronic products needed to deliver them. Development rates are fast and many products become obsolete before wearing out, stimulating upgrading and early replacement of household equipment. This raises the potential for waste, but also provides an opportunity for inefficient solutions to be taken out of use.

22. An important future trend is convergence of the functions provided by traditionally separate entertainment products such as digital STBs with the broader range of functions provided by computers, games players and other household information and communication technologies.

23. In some areas, there is growth in 'personal' products (eg personal battery-powered video players). Such innovations might result in an additional load rather than displacing sales or the use of mains-powered devices.

24. At present, most in-use energy in this sector is consumed by the four types of products listed above

#### 2.1.1 Televisions

25. The cathode ray tube (CRT) is still the most common television technology found in use in UK homes. However, plasma and liquid crystal display (LCD) screens are the preferred technologies for new products; sales of CRTs accounted for about 50% of total television sales in 2007 – down from more than 90% in 2000.

26. The trend to larger screens and the relative immaturity of plasma and LCD technologies is leading to a rise in the consumption of the 'average' mains-powered

television sold and brought into use. The demand for the largest screen sizes is being satisfied by LCD and plasma technologies, rather than CRT technology which is more cumbersome and not easily manufactured at larger sizes.

27. CRT technology is mature and further efficiency improvements are unlikely to have a significant impact on UK energy consumption. However, there is good potential to improve the energy efficiency of plasma and LCD displays through better electronic design and, for example, the use of light-emitting diodes (LEDs) to backlight LCD screens. New direct light-emitting screen technologies have a further potential to deliver efficiency improvements. The specifications included in the Appendix anticipate this improvement potential.

#### 2.1.2 Video recorders/players

28. Technology continues to diversify with hard-drive (PVR<sup>9</sup>), recordable DVD<sup>10</sup> (DVD-R), and Blu-ray recorders replacing DVD players that in turn have largely replaced video cassette recorders (VCRs). The majority of new video recorders will have a digital television tuner integrated into the unit to allow recording of digital television signals. These are often referred to as digital television recorders (DTRs).

29. Additionally, personal recording functionality will be delivered more through STBs and PC-based home theatre systems. Here, there is scope for energy saving through improvements in standby performance and power management. The impact of video on demand and other broadband services has not yet been assessed, but could lead to increased energy consumption per unit.

#### 2.1.3 Set-top boxes

30. Without further action, the energy consumed by STBs is set to more than triple by 2020 due to demand for digital services and for increased functionality. The regional timetable for the Digital Switchover Programme<sup>11</sup> is an important driver of this trend. There is some scope for:

- Optimising product design – especially on-mode, standby and power management.
- Encouraging volume sales of more efficient solutions (eg integrated digital televisions (IDTV)).
- Restricting the sales of inefficient products.

31. However, legacy products and a persistent market for new, low-cost analogue products pose a particular challenge as both require the use of an additional STB.

#### 2.1.4 External power supplies (including battery chargers)

32. Efficient and competitively priced ePSUs are already available on the market for many applications, although some of the latest consumer electronics products are still supplied with very basic, inefficient power supplies.

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<sup>9</sup> Personal Video Recorder

<sup>10</sup> Digital Versatile Disc

<sup>11</sup> [www.digitaltelevision.gov.uk/swt\\_programme/dig\\_swtpgrm.html](http://www.digitaltelevision.gov.uk/swt_programme/dig_swtpgrm.html)

33. More sophisticated designs and power management techniques offer scope for further energy savings in the future. Although the energy consumption of the average ePSU used for many applications in the UK is estimated to be 2.29 W in no-load mode, there are many available that use less than 0.5 W.

34. The scope for reducing energy consumption lies in encouraging manufacturers and retailers to specify these more efficient designs. Intelligent or remote-controlled power distribution boards offer another route to reducing standby consumption by switching off groups of products together when not in use.

## **2.2 Price**

35. In general, the market is extremely price sensitive with manufacturers under pressure to offer products at the lowest possible initial cost. This has been a barrier to improving energy efficiency as anything that is perceived to have the potential to add cost, such as the inclusion of best practice components, is treated with caution. In many cases, however, the price deadlock is overcome when a new low-cost best practice design enters the market as has happened with STBs, for example, where some of the most efficient new products are very competitively priced.

## **3 Policies, risks and measures**

36. In the Energy White Paper 2007, the Government said it would:

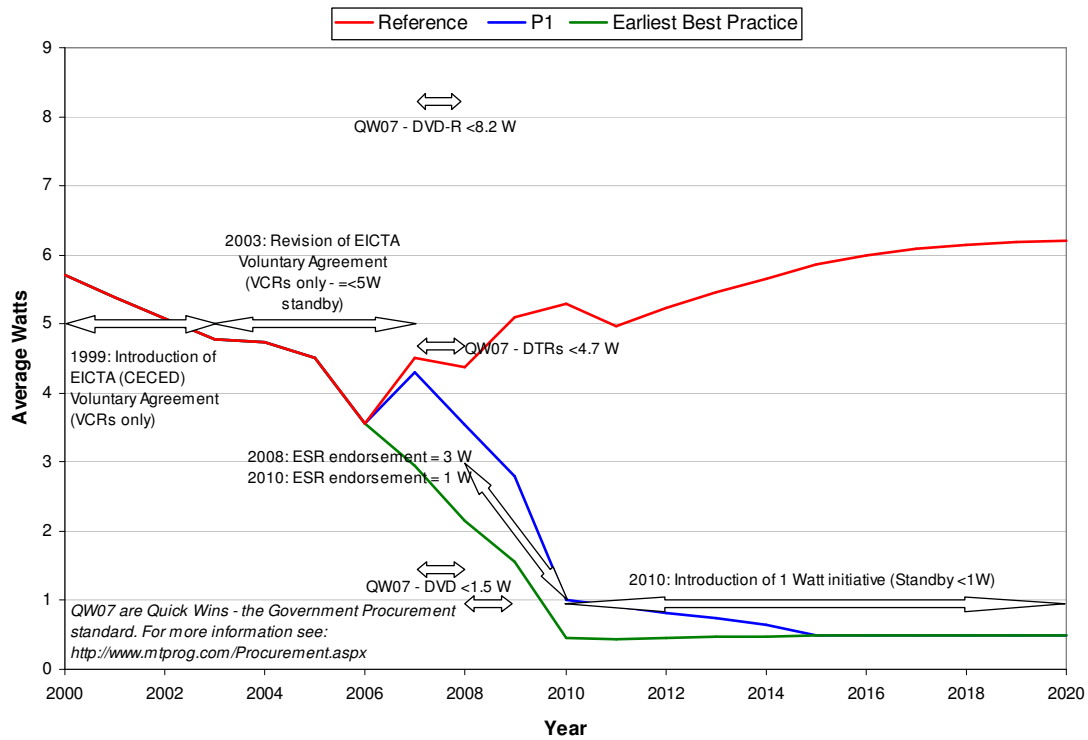
- Take steps, domestically to improve take up of energy efficient products and work internationally, and through the EU to stimulate global innovation and competition to raise standards and to bring a greater choice and efficient products to UK consumers.
- Deliver on our Gleneagles G8 commitments to promote international co-operation on product labelling and standards and help develop practical standards to reduce standby power.
- Work with the UK supply chain and seek commitments from manufacturers, retailers and service providers to deliver more efficient goods and services.
- Publish a series of consultation papers setting out our analysis of how the performance of energy using products will need to improve between now and 2020, including proposals for product standards and targets to phase out the least efficient products.

37. In this Section, we identify policies that we believe are already helping to deliver higher product environmental performance standards. This analysis includes:

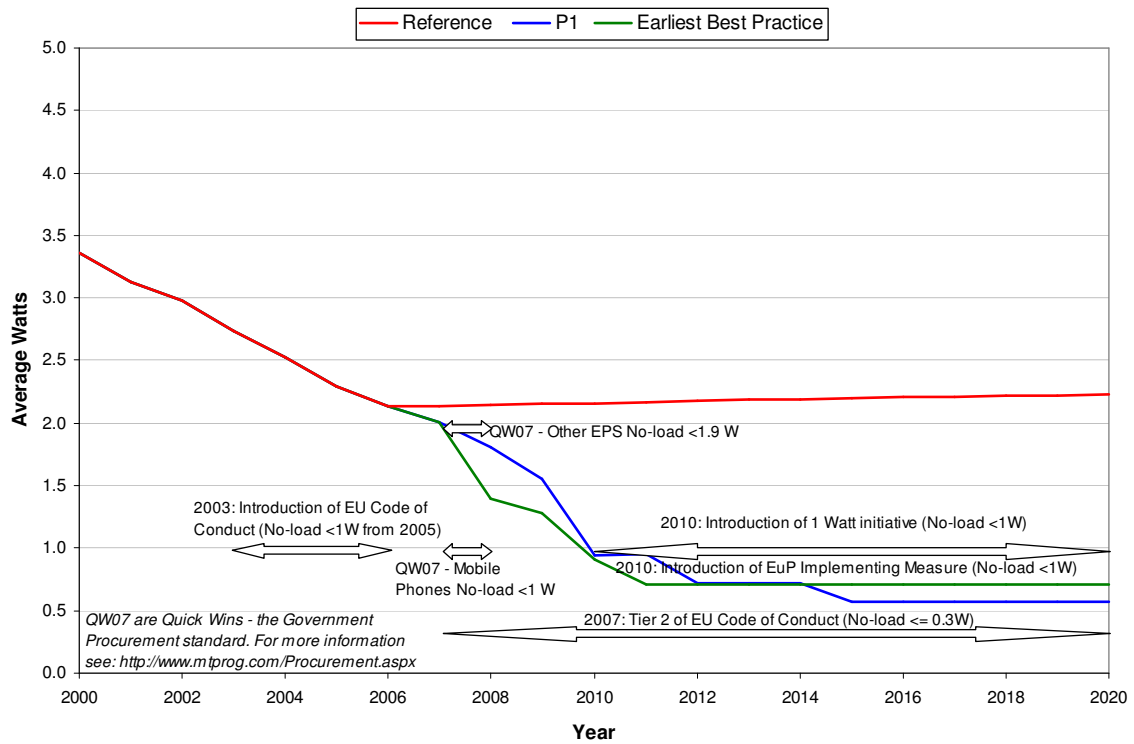
- Their current status.
- The critical risks and issues around these policies that may require action.
- Further actions that may be necessary to achieve the P1 target.

38. Figures 3.1–3.4 illustrate how existing policy instruments and initiatives could support delivery of more efficient new products – specifically video recorders, ePSUs, terrestrial STBs and televisions.

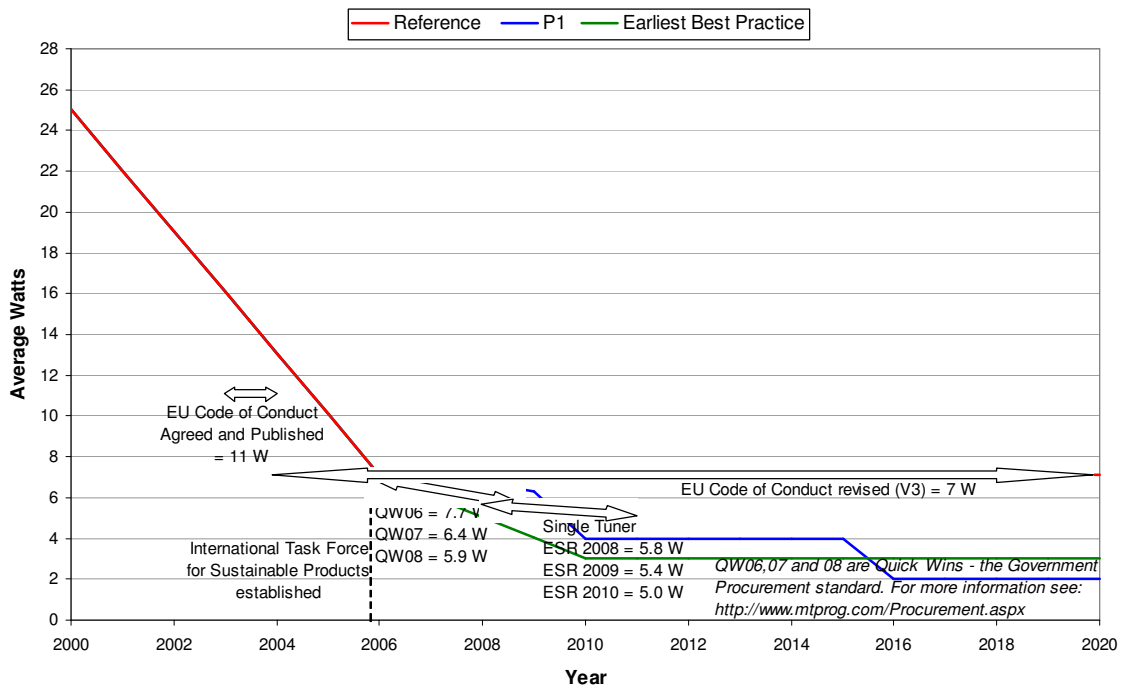
**Figure 3.1 Indicative standby power consumption for new video recorders**



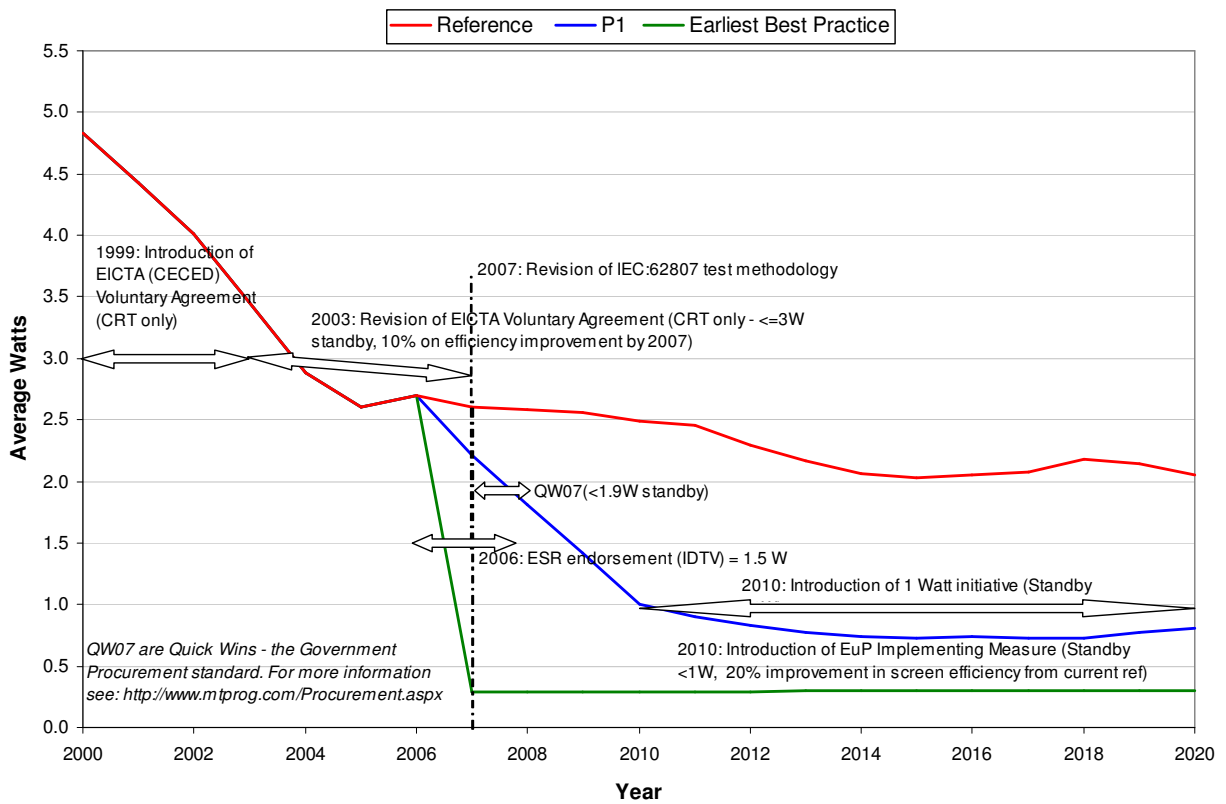
**Figure 3.2 Indicative no-load power consumption for new external power supply units**



**Figure 3.3 Indicative on power consumption for new terrestrial set-top boxes**



**Figure 3.4 Indicative standby power consumption for new televisions**



### 3.1 Market analysis, projections and targets

#### Current status

39. In the Energy White Paper 2007, the Government said it would publish a series of consultation papers setting out our analysis of how the performance of energy using products will need to improve between now and 2020, including proposals for product standards and targets to phase out the least efficient products. These standards will, for example, guide Government's priorities for European action and for commitments we are seeking from UK business.

40. Tables showing the target average performance levels each product group needs to achieve to realise the P1 scenario projection are provided in the Appendix. These tables also provide a metric against which developments in the market can be measured.

41. The intention is to monitor progress against the current projection for technology and market development, to consult on the evidence and, annually, to review and update the published analysis and policy response, including indicative product performance levels for new products supplied to the UK market.

**Policy:** Publish and update UK market and technology plans annually.

**Start date:** 2007

**Reference:** Announcement in Energy White Paper 2007

**Next deliverables:**

- 2008: Publish updated P1 targets and indicative product standards.
- 2008/09: Monitor market developments, refine models and consult on possible amendments to the current published Sustainable Products Policy Brief.

#### Risks

42. There is a risk that products will develop in a direction that differs from that which was initially expected in Market Transformation Programme (MTP) projections (ie P1 scenario targets will not be met). To offset this risk, the Government may consider:

- Whether or not more ambitious performance target schedules could be set as part of the review process.
- Pursuing measures designed to further accelerate the use of innovative technologies.

43. Weaknesses in knowledge about market and technology trends, and the relationship between the performance of products measured under test conditions and what is achieved in real life could all lead to reduced effectiveness of the policy programme.

## Strengthening initiatives

- 2008: Government could do further work to assess the risks/benefits of setting targets for compliance with the proposed performance standards.
- Ongoing: it may be beneficial to strengthen our evidence base on consumer procurement and usage of external power supply units, trends in television screen size and emerging display technologies, and the convergence trends in STB products.

## 3.2 Engaging the supply chain

### 3.2.1 Supply chain commitments

#### Current status

44. In line with its policy on energy efficiency and climate change, the Government has asked major UK retailers if they will make firm commitments to sell more energy efficient products. The practical aim is to agree volume and efficiency targets for sales of new products that correspond with delivery of the P1 target scenario. Therefore, retailers might commit to:

- Setting average efficiency targets for a basket of goods.
- Removing the least efficient products from sale.
- Using their procurement and specifying power to encourage their suppliers to bring forward innovative, better performing products.

45. The Government proposes to ask manufacturers and service providers to make corresponding commitments which would:

- Build confidence in the market for products that meet the Government's indicative standards.
- Encourage innovation and competition to offer good value and a greater choice of energy efficient products to UK consumers.

46. Initial priorities for this initiative are:

- Televisions.
- ePSUs and chargers.
- Video players and recorders.
- STBs.

47. In addition to asking retailers and manufacturers to make firm commitments to sell more energy efficient products, the Government has asked for their views on what actions by Government or by others would allow them to commit to more ambitious targets and product standards.

**Policy:** Seek supply chain commitments.

**Start date:** Initiative announced March 2006.

**Reference:** Announcement in Budget 2006.

**Next deliverables:**

- 2008/09: Delivered formal commitments by retailers and manufacturers.

## Risks

48. Retailers and/or manufacturers might not be prepared to commit to meet the Government's targets or product standards.

## Strengthening initiatives

- 2008/09: Support could be provided to encourage retail best practice, for example, by providing buyers guides and through the Energy Saving Trust's (EST's) Energy Saving Recommended (ESR) scheme for retailers (see Section 3.4.2) to include procurement training and advice. This could help to sustain successful supply chain commitments.

### 3.2.2 Metrics: market development

#### Current status

49. For manufacturers, retailers and service providers to respond to the Government's request for commitments on product standards, it is important that they can easily assess if individual products, or a basket of goods, will meet the Government's target performance levels.

50. Where a number of design parameters are involved (increasingly the case), this can become a complicated task. A pragmatic and flexible approach to setting performance standards that can adapt to new information and understanding is needed, especially given the move towards giving attention to the whole-life impacts of goods and services, and where the science of lifecycle impacts is less well established.

51. Defra has developed a 'Red-Green calculator' which could provide a convenient tool for product designers and specifiers to assess design performance against Government targets. By adopting a simple points-based currency for ranking the impact of products over their life, the tool can be adapted, in principle, to take into account any product design differentiator as and when the science allows.

52. In its practical application, the tool returns a simple red or green verdict on each parameter, product or a basket of goods, taking into account sales-weighted averages. The tool could be used by retailers, manufacturers and service providers to assess and, possibly, to report progress against their public commitments. The tool is designed to be used in a 'what-if' planning mode to explore how changing design parameters or volumes of goods sold will affect the achievement of overall annual targets.

**Policy:** Development of Red-Green calculator  
**Start date:** 2006 (developed alongside Retailers Initiative).  
**Reference:** Energy White Paper 2007  
**Next deliverables:**

- 2008: Improved web-based tool.
- 2008/09: Links to manufacturers' data.

## Risks

53. The technical complexity of this area may deter the adoption of these standards by the supply chain.

## Strengthening initiatives

- Ongoing: The Government will work closely with retailers and manufacturers to develop suitable tools (for example the Red-Green calculator) to enable them to adopt standards at low cost.

## 3.3 EU and international policy actions, programmes and initiatives

54. These products are internationally traded goods where unilateral UK policy actions may have only a limited impact on the design of products placed on the UK market. Therefore, the Government has committed to work at international level to promote international action to bring forward more sustainable products.

### 3.3.1 International collaboration

#### Current status

55. The UK is committed to promoting international co-operation<sup>12</sup> on product labelling and standards and, generally, on policy towards more sustainable products.

56. Defra has been instrumental in establishing the International Task Force for Sustainable Products (ITFSP) which seeks to ensure the harmonisation of policy options with those of other countries to maximise impact in a global market led by the supply chain. Defra operates the secretariat for the ITFSP.

57. Within the ITFSP, product working groups called Global Sustainable Product Networks (GSPNs) have been established for televisions, 'simple' and 'complex' STBs. These are developing test standards (where needed) and a harmonised set of product performance standards.

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<sup>12</sup> For example, the International (Marrakech) Task Force on Sustainable Products (see [www.itfsp.org](http://www.itfsp.org)).

**Policy:** Supporting the ITFSP

**Start date:** June 2006

**Reference:** See [www.itfsp.org](http://www.itfsp.org)

**Next deliverables:**

- Set-top boxes  
2008: Proposed metric and methodology for the performance measurement of complex STBs for presentation at International Energy Agency (IEA) meeting.
- Televisions  
2008: Approved revision to television test methodology (International Electrotechnical Commission (IEC) TC100 Working Group).

## Risks

58. There is a risk that commitment to the ITFSP and the GSPNs will not be sustained by all international partners or that insufficient implementation support will be provided.

## Strengthening initiatives

- Ongoing: Government may need to continue to review the effectiveness of this initiative. Alternative options, such as strengthening voluntary agreements or EuP criteria may be considered should a robust international approach not materialise. It may also be feasible to run the GSPNs on a more informal basis to continue influencing major international partners.

### 3.3.2 Mandatory standards

#### Current status

59. The EuP Framework Directive (EuP) (2005/32/EC)<sup>13</sup>, adopted in 2005, allows the European Commission to set performance requirements for products placed on the EU market. Preparatory product studies are completed for:

- Televisions.
- ePSUs/battery chargers.
- 'Simple' set-top digital television adapters.
- Standby – a cross-product study looking at all products that consume energy while in standby mode.

60. Draft implementing measures have been proposed for:

- ePSUs/battery chargers.
- 'Simple' set-top digital television adapters.
- Standby – a cross-product study looking at all products that consume energy while in standby mode.

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<sup>13</sup> See MTP Briefing Note BNXS03;  
[www.mtprog.com/ApprovedBriefingNotes/pdf.aspx?intBriefingNoteID=389](http://www.mtprog.com/ApprovedBriefingNotes/pdf.aspx?intBriefingNoteID=389)

61. A further preparatory study for 'complex' set-top digital television adapters is expected to be completed in 2008.

62. The UK is contributing information and opinion to the preparatory studies and will be pushing for ambitious targets to be adopted.

**Policy:** EU Framework Directive for Eco-design of Energy-using Products

**Start date:** 2005 (Framework Directive adopted)

**Reference:** [http://ec.europa.eu/energy/demand/legislation/eco\\_design\\_en.htm](http://ec.europa.eu/energy/demand/legislation/eco_design_en.htm)

**Next deliverables:**

- 2008: EuP implementing measure setting horizontal requirements for passive standby power.
- 2008: EuP implementing measure setting requirements for simple STBs
- 2008: EuP implementing measure setting requirements for ePSUs/battery chargers.

### Risks

63. Timing for delivery of standards via EuP is uncertain. Delivery of the UK's preferred standards via EuP is also uncertain.

64. There is also a significant risk that current regulatory processes will not be able to respond sufficiently to a rapidly changing market, leading to ineffective regulation and market drivers.

### Strengthening initiatives

- 2008: The UK Government could seek to ensure that a mechanism for the regular review and updating of product criteria is embodied into the product implementing measure.
- UK Government could encourage EuP to:
  - Address stable components such as power supplies.
  - Apply a power budget approach to setting targets.
  - Address product-common issues such as standby power.

### 3.3.3 International Energy Agency's 1-Watt initiative

#### Current status

65. The IEA's 1-Watt initiative (also called 'Action on 1-Watt')<sup>14</sup> seeks to establish an international target of reducing the standby load of many products to 1 watt or below by 2010. The Gleneagles Accord<sup>15</sup> committed the G8 to support this initiative.

66. The potential is to adopt nominal 1 W or other ambitious target standards into suitable policy delivery measures (eg Government procurement) and as policy milestones. As yet there is no international framework for implementing this target, but the IEA will seek support for its proposals to develop horizontal standards for standby that could be adopted internationally.

<sup>14</sup> [www.iea.org/textbase/subjectqueries/standby.asp](http://www.iea.org/textbase/subjectqueries/standby.asp)

<sup>15</sup> [www.g8.gov.uk](http://www.g8.gov.uk)

**Policy:** International Energy Agency's 1-Watt initiative

**Start date:** 2002 (initiative first announced)

**Reference:** IEA, G8 Gleneagles Accord

**Next deliverables:**

- 2010: 1 W standby performance standards introduced for all products other than those deemed to be 'complex' (ie advanced STBs).

## Risks

67. The risk is that lack of practical international co-operation could delay delivery of effective global standards and policies for standby.

## Strengthening initiatives

- Ongoing: To address these risks, the Government could work through the ITFSP and with the IEA to:
  - Monitor progress.
  - Encourage global networks on this issue and action to develop the technical prerequisites.
- The Government could push for early action on standby under EuP.

### 3.3.4 Product information

#### Current status

68. At present there are no effective mandatory or voluntary energy labelling schemes for consumer electronics across the EU.

## Risks

69. Proliferation of labelling schemes could confuse consumers and create a barrier to trade.

## Strengthening initiatives

- 2008: UK Government continues to press for the EC (via EC Energy Labelling Framework Directive<sup>16</sup> and the EuP Directive (see Section 3.3.2)) and suppliers to provide harmonised product information.

### 3.3.5 Voluntary Codes of Conduct

#### Current status

70. The EU currently operates industry 'Codes of Conduct' (CoCs)<sup>17</sup> for:

- Digital television equipment ('set-top boxes')<sup>18</sup>.

<sup>16</sup> MTP Briefing Note BNXS37;

[www.mtprog.com/ApprovedBriefingNotes/BriefingNoteTemplate.aspx?intBriefingNoteID=396](http://www.mtprog.com/ApprovedBriefingNotes/BriefingNoteTemplate.aspx?intBriefingNoteID=396)

<sup>17</sup> [http://ec.europa.eu/energy/demand/vol\\_agreements/conduct\\_en.htm](http://ec.europa.eu/energy/demand/vol_agreements/conduct_en.htm)

<sup>18</sup> Code of Conduct on Energy Efficiency of Digital TV Service Systems. Version 4 of 5 October 2006.

- Broadband equipment<sup>19</sup>.
- ePSUs<sup>20</sup>.
- Uninterruptible power systems<sup>21</sup>.

71. These CoCs set voluntary performance targets for these products. In most cases, these agreements have been developed using information and support from MTP. A further code covering data server systems is under development.

72. Voluntary agreements for televisions and some video recorder technologies<sup>22</sup> are run by European Information and Communications Technology Industry Association (EICTA)<sup>23</sup>. However, EICTA has indicated it no longer wishes to operate the agreements for televisions and video recording equipment, and the European Commission is exploring the options for continuing the forum/agreement.

73. The dialogue that takes place between stakeholders in a 'voluntary' context has proven to be of a different nature than that which tends to occur during the course of developing a mandatory standard. In general, stakeholder discussions are more open and more constructive when they centre around a voluntary agreement, and stakeholders tend to be more willing to share information and evidence. This has been helpful in developing an accurate a picture of best available and best practice technologies when developing policy criteria.

**Policy:** EU Codes of Conduct

**Start date:** 1999 (televisions/videos), 2003 (ePSUs), 2004 (STBs), 2006 (broadband)

**Reference:** EU Standby Initiative

([http://re.jrc.ec.europa.eu/energyefficiency/html/standby\\_initiative.htm](http://re.jrc.ec.europa.eu/energyefficiency/html/standby_initiative.htm))

**Next deliverables:**

- 2008: Establishment of new television/video recorder agreement mechanism/forum.
- 2009: Expanded television/video recorder agreement to include new technologies.
- 2008: Revised STB CoC to account for new STB functionality.

## Risks

74. In light of EICTA's decision to terminate its voluntary agreement, there is a risk that replacement activities may not be taken up by an alternative steering body. This may result in the redundancy of the voluntary agreement and its associated technical discussion forum. If this is lost, then the development of future policies for the products covered by the current voluntary commitments will be made more difficult, and it is likely that the evidence gathered would be less robust leading to less reliable and less cost-effective policy measures.

<sup>19</sup> Code of Conduct on Energy Consumption of Broadband Equipment. Version 1 of 29 June 2006.

<sup>20</sup> Code of Conduct on Efficiency of External Power Supplies. Version 2 of 24 November 2004.

<sup>21</sup> Code of Conduct on AC Uninterruptible Power Systems (UPS). Version 1 of 22 December 2006.

<sup>22</sup> Industry Self-Commitment to Improve the Energy Performance of Household Consumer Electronic Products Sold in the European Union from 1 July 2003.

<sup>23</sup> [www.eicta.org](http://www.eicta.org)

## Strengthening initiatives

- 2008: Government could ask the European Commission to consider if it would be appropriate to formally adopt or re-form the existing voluntary fora under the aegis of the consultation arrangements that support the EuP Framework Directive.
- Ongoing: Government could continue to engage with industry to explore the scope for implementing standards in advance of mandatory EuP measures.

### 3.3.6 Metrics: test and measurement

#### Current status

75. Adequate performance test and measurement methodologies are a critical prerequisite for all product policy. In fast-moving product sectors such as consumer electronics, it is important that formal standards keep pace with the development of new technologies, products and patterns of usage.

76. In the consumer electronics sector, where products are designed for global markets, harmonised standards are likely to encourage competition and investment in improved designs.

77. There are currently adequate harmonised test standards available for:

- Standby performance – IEC 62301: 2005 Household Electrical Appliances – Measurement of Standby Power.
- ePSUs – Test Method for Calculating the Energy Efficiency of Single-Voltage External AC-DC and AC-AC Power Supplies published by Calwell, Foster, Reeder and Mansoor (11 August 2004)<sup>24</sup>.

**Policy:** Developing harmonised test methodologies

**Start date:** Ongoing

**Reference:** MTP Briefing Note BNCE3: Standards Relevant to the Testing and Conformance of Domestic Electronic Equipment

([www.mtprog.com/ApprovedBriefingNotes/PDF/MTP\\_BNCE3\\_2007April3.pdf](http://www.mtprog.com/ApprovedBriefingNotes/PDF/MTP_BNCE3_2007April3.pdf))

**Next deliverables:**

- 2008: Approved revision to television test methodology (IEC TC100 Working Group).

#### Risks

78. Development of formal test standards may not keep pace with policy needs. For example:

- The harmonised test standard for ePSUs is not an internationally 'recognised' methodology (ie it is not endorsed by the International Organization for Standardization (ISO)) and would benefit from being standardised through the ISO route if the risk of it not being widely adopted is to be fully averted.

<sup>24</sup> [www.efficientpowersupplies.org/methods.asp](http://www.efficientpowersupplies.org/methods.asp)

79. The test methodology IEC 62087: 2002 (Methods of Measurement for the Power Consumption of Audio, Video and Related Equipment) is adequate for video players/recorders and STBs, but does require some development to cater for emerging products with increased functionality.

#### Strengthening initiatives

- UK Government to identify areas where standards are a critical issue and work with appropriate formal bodies to agree effective and reliable performance measurement methodologies. For example, the Government could encourage the adoption of IEC 62087 (development of this standard is being supported by the UK through the GSPN for televisions (see Section 3.3.1)).

### 3.4 UK policy actions, programmes and initiatives

#### 3.4.1 Public procurement

##### Current status

80. The Government published its Sustainable Procurement Action Plan (SPAP) in March 2007, re-affirming its commitment to use Government procurement to drive the market for energy efficient products. Alongside the SPAP, it published updated and extended standards for an increased range of products that are mandatory for Central Government departments. Defra consulted on energy efficient products, which has informed the minimum mandatory standards for this product group in the revised Buy Sustainable Quick Wins (published in July 2008). We are reviewing the approach to setting mandatory standards with the newly formed Centre of Expertise for Sustainable Procurement.

81. Guidance on energy efficiency and energy savings as possible assessment criteria in public sector tendering was published in July 2008 as part of the Energy Services Directive. The Directive also sets out a number of options relating to public sector procurement of energy using products, buildings and energy services, which the Government consulted on during the winter of 2007.

82. The NHS (England) published its Sustainable Procurement Action Plan in August 2007. Similar action plans for local authorities are being produced.

**Policy:** UK Government Sustainable Procurement Action Plan.

**Start date:** 2007.

**Reference:** [www.sustainable-development.gov.uk/publications/pdf/SustainableProcurementActionPlan.pdf](http://www.sustainable-development.gov.uk/publications/pdf/SustainableProcurementActionPlan.pdf)

**Next deliverables:**

- 2008: Revised Government procurement standards announced.

#### Strengthening initiatives

- 2008: The Government will consider including standards specifically for the procurement of consumer electronics, where applicable, within its formal

procurement guidelines that are at, or above, the indicative standards in the Appendix.

- Strengthened leadership and scrutiny of performance on sustainable procurement throughout Government as set out in the SPAP.
- Transforming Government procurement agenda will build procurement capabilities and capacities within Departments and improve delivery of agreed policies.
- 2008: The Government could include standards and overall targets for the procurement of consumer electronics within its formal procurement guidelines which are at, or above, the performance targets in the Appendix.
- 2008: The Government could consider other opportunities to embed energy efficiency requirements in other areas of public expenditure (eg in the procurement of digital television equipment for eligible households<sup>25</sup> within the Government's Digital Switchover Programme).

### 3.4.2 Product information

#### Current status

83. At present, there is no mandatory energy labelling scheme for consumer electronics in the UK.

84. The EST's ESR scheme<sup>26</sup> is a voluntary labelling scheme that endorses products that comply with specified product performance criteria. It serves both as a recognition of manufacturers' efforts towards efficiency best practice and as a straightforward consumer label.

85. Of consumer electronics products, IDTVs and simple (terrestrial) STBs have been included in the scheme. In addition standards have been set for digital television recorders (DTRs).

**Policy:** Energy Saving Recommended scheme

**Start date:** 2006 (endorsement of IDTVs)

**Reference:** [http://www.energysavingtrust.org/energy\\_saving\\_products/](http://www.energysavingtrust.org/energy_saving_products/)

**Next deliverables:**

- 2008: Revised endorsement criteria and expand product coverage.

#### Risks

86. The lack of reliable or effective consumer information could prevent consumers making an informed choice and prevent effective competition on energy efficiency issues.

#### Strengthening initiatives

- 2008: Government could consider asking the EST to increase the level of support it provides to retailers to improve consumer information. This could include retail staff training and energy saving calculators for consumers to compare running energy consumption costs of consumer electronic products.

<sup>25</sup> [www.mtprog.com/ApprovedBriefingNotes/PDF/MTP\\_BNCE6\\_2007April3.pdf](http://www.mtprog.com/ApprovedBriefingNotes/PDF/MTP_BNCE6_2007April3.pdf)

<sup>26</sup> [www.energysavingtrust.org.uk/energy\\_saving\\_products/](http://www.energysavingtrust.org.uk/energy_saving_products/)

## 4 Average product performance

87. Figure 4.1 shows how energy consumption by consumer electronics is predicted to change:

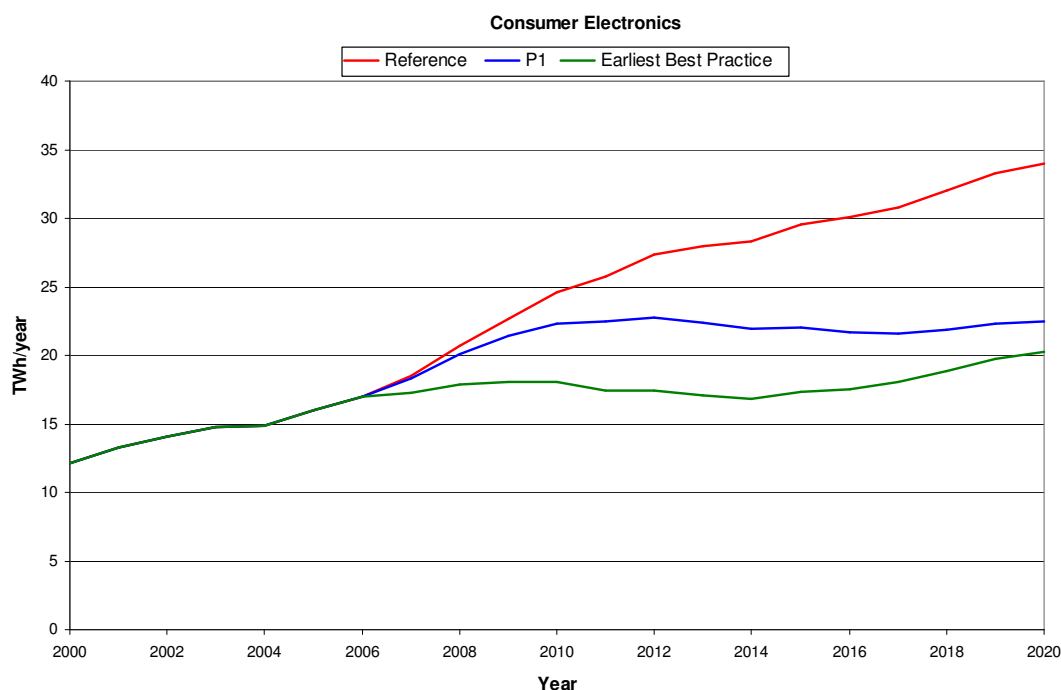
- If only current policy commitments are delivered (Reference)<sup>27</sup>.
- If improved products are developed and delivered at the earliest possible opportunity (EBP).
- If the actions proposed in this Policy Brief are implemented (P1).

for the following consumer electronic products:

- Televisions.
- Video recorders/players.
- Digital television adapters (set-top boxes).
- ePSUs/battery chargers.

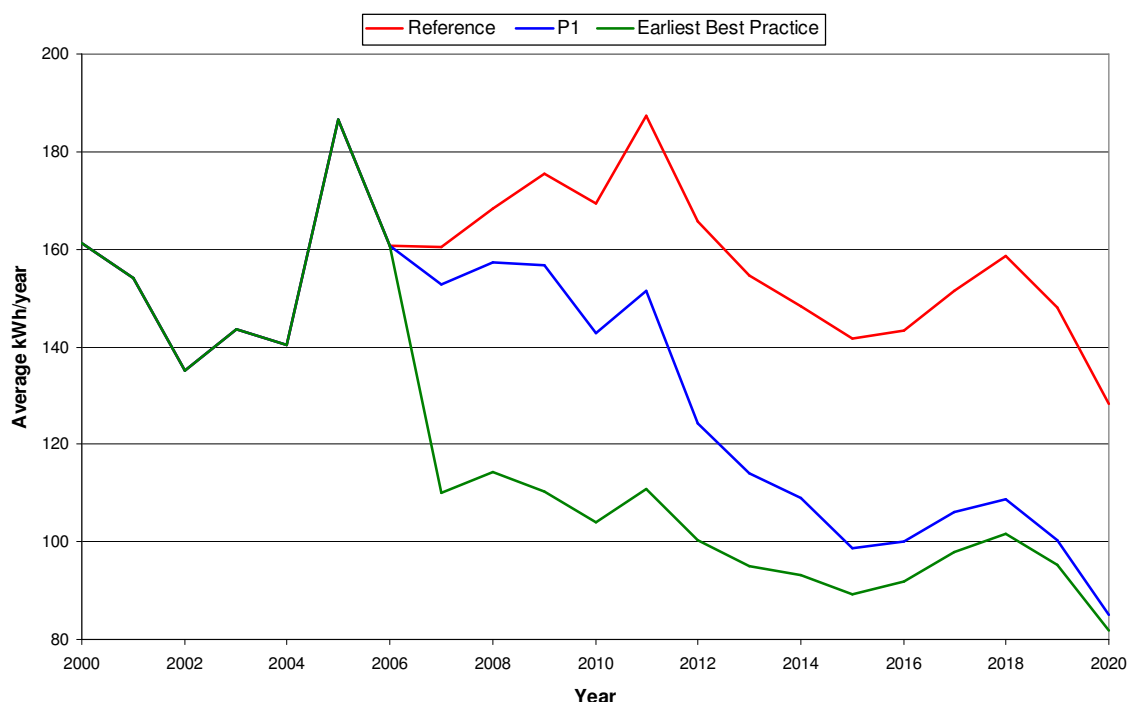
88. These products account for a significant proportion of the energy use and carbon emissions associated with consumer electronics products. There are other products which are thought to be less significant, in terms of consumption, so they have not been analysed to the same level. It is estimated that these could add a further 10% onto the consumer electronics total energy consumption.

**Figure 4.1 Total energy consumption of UK consumer electronics**



<sup>27</sup> See the Overview Section for the definitions of 'Reference', 'P1' and 'EBP'

**Figure 4.2 Average energy consumption of all newly sold consumer electronics (all power modes)**



89. Figure 4.2 shows how the average performance of all new consumer electronics products would need to change to achieve the energy performance for the Policy projection shown in Figure 4.1. The sharply varying plots<sup>28</sup> in Figure 4.2 are partly due to the approach used to predict future sales. However, they do describe the overall energy consumption trends.

## 5 Other potential measures

90. This Section looks towards other measures that may need to be developed to address savings gaps should the proposals described earlier not fulfil their potential.

91. Within the consumer electronics sector, innovation remains one of the key focus areas to take forward product sustainability.

92. In the longer term, delivery of carbon savings depends on continuing investment in innovation to achieve more resource-efficient products and services. For example, efforts to improve the efficiency of digital STBs have been frustrated until recently by the fiercely price competitive market for these products. However, recently, a design innovation from a new market entrant has pointed to a route by which all manufacturers can reduce energy consumption while maintaining a low unit price and, in effect, has set a new eco-design benchmark.

93. Despite the relatively small amount of actual consumer electronic manufacturing in the UK, it remains a strong design and ‘corporate’ base for

<sup>28</sup> Some degree of smoothing may be advantageous before utilising the trends illustrated.

consumer electronics producers. UK-based manufacturers have been among the most pro-active and co-operative in international action to reduce the energy consumption of consumer electronics and the UK has been the 'hatchery' for several best practice product designs. But such innovations, which emerge most frequently from component producers or from individual designers within larger organisations, appear to have difficulty reaching the market. There could be scope to expose and promote latent or hidden innovations that could provide more efficient solutions.

94. Two ideas for initiatives which could help bring forward more innovative product designs and, indirectly allow higher targets to be set are:

- A simple 'environmental' product award specifically for consumer electronics which would stimulate innovation competition between manufacturers.
- A support scheme could continue to identify and support ad-hoc opportunities, working with manufacturers and within collaborative arrangements, to bring forward and promote promising generic design routes.

## 6 Further Information

95. The following MTP publications are linked to this Sustainable Products Policy Brief and present the underlying evidence base of information such as further explanations, definitions, assumptions and important background information:

BNCE3	Standards Relevant to the Testing and Conformance of Domestic Electronic Equipment
BNCE6	Energy Performance Recommendations for Digital TV Equipment Procured For Vulnerable Households and for other Public Purposes
BNDA3	Digital TV Adapters in the UK – Rationale/Assumptions for Projecting Future Energy Consumption
BNTV1	Changes and Trends in Television Technologies
BNXS1	Carbon Emission Factors for UK Energy Use

## Appendix

### Indicative performance standards for consumer electronics products

96. Tables A1–A4 show the target average performance specifications for new products supplied to UK end-users. These correspond with the Government’s underlying published stock models and projected energy consumption in each sector (the P1 data presented in this Policy Brief).

97. These specifications may be used directly in suitable policy instruments (eg voluntary commitments) and provide a metric against which developments in the market can be measured.

98. The underlying stock modelling is subject to an ongoing consultation and review process. More detail on the modelling, current market analysis and data downloads are available via the MTP’s What-If tool (<http://whatif.mtprog.com>)

**Table A1 External power supply units ((ePSUs)**

Mobile ePSUs		Other ePSUs	
Year	No load (W)	Year	No load (W)
2000	3.3	2000	3.4
2001	2.8	2001	3.3
2002	2.5	2002	3.2
2003	2.0	2003	3.1
2004	1.5	2004	3.0
2005	1.0	2005	2.9
2006	1.0	2006	2.7
2007	0.9	2007	2.5
2008	0.9	2008	2.2
2009	0.8	2009	1.9
2010	0.8	2010	1.0
2011	0.8	2011	1.0
2012	0.5	2012	0.7
2013	0.5	2013	0.7
2014	0.5	2014	0.7
2015	0.5	2015	0.5
2016	0.5	2016	0.5
2017	0.5	2017	0.5
2018	0.5	2018	0.3
2019	0.5	2019	0.3
2020	0.5	2020	0.3

**Table A2 Televisions**

<b>Year</b>	<b>On mode (W)</b>	<b>Passive standby (W)</b>
2000	= 0.0510 x S + 15	4.8
2001	= 0.0510 x S + 15	4.4
2002	= 0.0490 x S + 15	4.0
2003	= 0.0530 x S + 15	3.5
2004	= 0.0600 x S + 15	2.9
2005	= 0.0610 x S + 15	2.6
2006	= 0.0455 x S + 15	2.7
2007	= 0.0434 x S + 14.3	2.2
2008	= 0.0425 x S + 22.9	1.8
2009	= 0.0408 x S + 22.0	1.4
2010	= 0.0393 x S + 21.2	1.0
2011	= 0.0376 x S + 20.3	0.9
2012	= 0.0366 x S + 19.8	0.8
2013	= 0.0358 x S + 19.3	0.8
2014	= 0.0357 x S + 19.3	0.7
2015	= 0.0357 x S + 18.9	0.7
2016	= 0.0357 x S + 18.9	0.7
2017	= 0.0357 x S + 18.9	0.7
2018	= 0.0345 x S + 18.6	0.7
2019	= 0.0328 x S + 18.6	0.8
2020	= 0.0328 x S + 18.6	0.8
<b>Where S = Screen area in cm<sup>2</sup></b>		

**Table A3 Set-top boxes**

<b>Cable digital adapters</b>		
<b>Year</b>	<b>On mode (W)</b>	<b>Active standby (W)</b>
2000	26.0	26.2
2001	24.0	24.3
2002	22.0	22.5
2003	20.0	20.7
2004	18.0	18.8
2005	18.0	16.8
2006	16.6	15.2
2007	16.4	15.0
2008	16.0	14.6
2009	15.2	13.8
2010	14.0	12.7
2011	12.6	11.2
2012	10.8	9.5
2013	10.8	9.5
2014	10.8	9.5
2015	10.8	9.5
2016	9.8	8.0
2017	9.8	8.0
2018	9.8	8.0
2019	9.8	8.0
2020	9.8	8.0

<b>Satellite digital adapters</b>		
<b>Year</b>	<b>On mode (W)</b>	<b>Active standby (W)</b>
2000	26.0	26.2
2001	24.0	24.3
2002	22.5	22.5
2003	20.7	20.7
2004	18.8	18.8
2005	18.0	16.8
2006	20.4	15.0
2007	21.6	14.1
2008	22.6	12.6
2009	22.2	12.0
2010	20.4	11.8
2011	18.0	11.4
2012	15.0	11.0
2013	15.0	11.0
2014	15.0	11.0
2015	15.0	11.0
2016	15.0	11.0
2017	15.0	11.0
2018	15.0	11.0
2019	15.0	11.0
2020	15.0	11.0

<b>Terrestrial digital adapters</b>		
<b>Year</b>	<b>On mode (W)</b>	<b>Passive standby (W)</b>
2000	25.0	24.9
2001	22.0	21.8
2002	19.0	18.7
2003	16.1	15.7
2004	13.1	12.6
2005	10.1	9.5
2006	7.1	6.4
2007	7.0	6.1
2008	6.7	5.1
2009	6.3	3.4
2010	4.0	1.0
2011	4.0	1.0
2012	4.0	1.0
2013	4.0	1.0
2014	4.0	1.0
2015	4.0	1.0
2016	2.0	1.0
2017	2.0	1.0
2018	2.0	1.0
2019	2.0	1.0
2020	2.0	1.0

**Table A4 Video recorders**

<b>DVD recorders (without digital tuners)</b>			
<b>Year</b>	<b>On play (W)</b>	<b>On idle (W)</b>	<b>Passive standby (W)</b>
2000	25.4	9.4	9.4
2001	25.4	9.4	9.4
2002	25.4	9.4	9.4
2003	25.4	9.4	9.4
2004	25.4	9.4	9.4
2005	25.4	9.4	9.4
2006	25.4	9.4	9.4
2007	16.7	8.9	8.9
2008	16.2	7.3	7.3
2009	15.4	4.7	4.7
2010	14.2	1.0	1.0
2011	13.6	1.0	1.0
2012	12.9	1.0	1.0
2013	12.3	1.0	1.0
2014	11.6	1.0	1.0
2015	11.0	1.0	1.0
2016	11.0	1.0	1.0
2017	11.0	1.0	1.0
2018	11.0	1.0	1.0
2019	11.0	1.0	1.0
2020	11.0	1.0	1.0

<b>Digital television recorders (recorders with integrated digital tuners)</b>			
<b>Year</b>	<b>On play (W)</b>	<b>On idle (W)</b>	<b>Passive standby (W)</b>
2000	28.2	6.2	6.2
2001	28.2	6.2	6.2
2002	28.2	6.2	6.2
2003	28.2	6.2	6.2
2004	28.2	6.2	6.2
2005	28.2	6.2	6.2
2006	28.2	6.2	6.2
2007	27.8	5.9	5.9
2008	26.6	4.9	4.9
2009	24.7	3.3	3.3
2010	21.9	1.0	1.0
2011	20.3	0.9	0.9
2012	18.7	0.8	0.8
2013	17.2	0.8	0.8
2014	15.6	0.7	0.7
2015	14.0	0.5	0.5
2016	14.0	0.5	0.5
2017	14.0	0.5	0.5
2018	14.0	0.5	0.5
2019	14.0	0.5	0.5
2020	14.0	0.5	0.5

<b>DVD players</b>			
<b>Year</b>	<b>On play (W)</b>	<b>On idle (W)</b>	<b>Passive standby (W)</b>
2000	9.0	5.7	5.7
2001	9.0	5.4	5.4
2002	9.0	5.1	5.1
2003	9.0	4.8	4.8
2004	9.0	4.6	4.6
2005	9.0	4.0	4.0
2006	9.0	1.9	1.9
2007	9.0	1.8	1.8
2008	8.8	1.7	1.7
2009	8.6	1.4	1.4
2010	8.2	1.0	1.0
2011	8.0	0.9	0.9
2012	7.8	0.8	0.8
2013	7.6	0.7	0.7
2014	7.4	0.5	0.5
2015	7.2	0.3	0.3
2016	7.2	0.3	0.3
2017	7.2	0.3	0.3
2018	7.2	0.3	0.3
2019	7.2	0.3	0.3
2020	7.2	0.3	0.3

<b>VCRs</b>			
<b>Year</b>	<b>On play (W)</b>	<b>On idle (W)</b>	<b>Passive standby (W)</b>
2000	16.8	5.7	5.7
2001	16.8	5.4	5.4
2002	16.8	5.1	5.1
2003	16.8	4.8	4.8
2004	16.8	4.6	4.6
2005	16.8	4.0	4.0
2006	16.8	4.0	4.0
2007	16.7	3.7	3.7
2008	16.2	3.2	3.2
2009	15.4	2.2	2.2
2010	14.2	1.0	1.0
2011	13.6	1.0	1.0
2012	12.9	1.0	1.0
2013	12.3	1.0	1.0
2014	11.6	1.0	1.0
2015	11.0	1.0	1.0
2016	11.0	1.0	1.0
2017	11.0	1.0	1.0
2018	11.0	1.0	1.0
2019	11.0	1.0	1.0
2020	11.0	1.0	1.0