

Mobile Phones – Green Public Procurement Product Sheet

Green Public Procurement (GPP) is a voluntary instrument. This Product Sheet provides a summary of the GPP criteria developed for the mobile phone product group. The accompanying Background Report provides full details on the reasons for selecting these criteria and references for further information.

The format for the purchasing recommendations comes in the form of two sets of criteria:

- The core criteria are those suitable for use by any contracting authority across the Member States and address the key environmental impacts. They are designed to be used with minimum additional verification effort or cost increases.

- The comprehensive criteria are for those who wish to purchase the best environmental products available on the market. These may require additional verification effort or a slight increase in cost compared to other products with the same functionality.

Within the core and comprehensive criteria, the guidance follows the various stages of a public procurement procedure and explains how best to integrate environmental criteria at each stage:

- **Subject matter.** It means the title of the tender, i.e. a short description of the product, works or service to be procured.
- **Technical Specifications.** Provide a clear, accurate and full description of the requirement and standard to which goods, works or services should conform. Description of the minimal technical specifications which all bids need to comply with. Set specific environmental criteria, including hurdles and levels that need to be met for specific products.
- **Selection Criteria.** It is based in the capacity / ability of the bidders to perform the contract. Assist in the identification of appropriate suppliers, for example to ensure adequately trained personnel or relevant environmental policies and procedures are in place.
- **Award Criteria.** The award criteria on the basis of which the contracting authority will compare the offers and base its award. Award criteria are not pass/fail criteria, meaning that offers of products that don't comply with the criteria may still be considered for the final decision, depending on their score on the other award criteria.
- **Contract Performance Clause -** Specify the conditions that must be met in the execution of the contract, for example as to how the goods or services are to be supplied, including information or instructions on the products to be provided by the supplier.

It should be noted that the contractor is bound by the existing legal framework.

Where the verification for the criteria states that other appropriate means of proof can be used, this could include a technical dossier from the manufacturer, a test report from a recognised body, or other relevant evidence. The contracting authority will have to satisfy itself on a case by case basis, from a technical/legal perspective, whether the submitted proof can be considered appropriate.

1. Definition and Scope

There are three main areas: the mobile phone itself, the charger (external power supply) and peripherals; spare batteries and headsets.

For the purpose of this GPP product sheet, mobile phones are defined as a portable battery powered device that is principally used for telephone communication and text messaging, but may include additional features, for example, internet capability and camera/video.

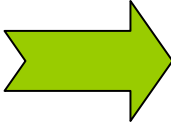
For the purpose of this GPP product sheet, a mobile phone charger is an external power supply specifically designed for charging an associated mobile phone. It will generally be supplied in the product bundle with the mobile phone, however it also includes the provision of spare chargers where these need to be purchased separately.

For the purpose of this GPP product sheet, peripherals include headsets and spare batteries only. Spare chargers are included above.

2. Key Environmental Impacts

During the life cycle of a mobile phone and its charger energy consumption is the key environmental impact, especially in the mobile phone manufacture and use phases. In addition, the use of various hazardous materials can pose a potential risk to the environment and the focus on recycling in the end of life phase is also key to reducing the environmental impact of mobile phones. Extending the lifetime of the product will naturally reduce resource consumption and disposal burdens. Several studies also focus on health concerns, however this is outside the scope of this environmental criteria. As a result:

- Core criteria focus on energy use (during use) in the mobile phone and charger system, and hazardous materials
- Comprehensive criteria address additional aspects related to hazardous materials, ecodesign and end of life management.

Key Environmental Impacts	GPP Approach
<ul style="list-style-type: none"> • Energy consumption, especially in manufacturing and from mobile phone chargers in the use phase • Pollution of air, land and water due to the use of hazardous materials in the manufacture and end of life stages e.g. flame retardants and components • Use / extraction of raw materials • Production of hazardous waste • Generation of waste material, including hazardous wastes and packaging and its disposal. 	 <ul style="list-style-type: none"> • Purchase energy efficient chargers • Communicate key issues to end users e.g. unplugging chargers / take back schemes • Purchase models that restrict the use of hazardous materials • Promote effective end of life management e.g. take back schemes / re-use / recycling • Purchase products designed to be easily dismantled and recycled. • Provision of replacement components / accessories to extend the life of the mobile phone • Promote use of recycled/recyclable/reusable materials in mobile phones

Please note that the order of impacts does not necessarily translate to the order of their importance.

3. GPP Criteria for Mobile phones

3.1. Core GPP Criteria for Mobile phones

SUBJECT MATTER
Purchase of efficient mobile phones using environmentally sound materials.
TECHNICAL SPECIFICATIONS
<p>1. Materials:</p> <ul style="list-style-type: none"> • The carrier material of printed circuit boards must not contain substances or preparations that are classified according to Directive 1999/45/EC and 67/548/CEE or Regulation (EC) No 1272/2008 as follows: <ul style="list-style-type: none"> • R40(/H351) (limited evidence of a carcinogenic effect) • R45(/H350) (may cause cancer) • R46(/H340) (may cause heritable genetic damage) • R48(/H372) (danger of serious damage to health by prolonged exposure) • R50/53(/H400 and H410) (very toxic to aquatic organisms / may cause long-term adverse effects in the aquatic environment) • R60(/H360F) (may impair fertility) • R61(/H360D) (may cause harm to the unborn child) • Beryllium oxide (BeO) must not be used in electronic components <p>Verification: Products holding a relevant Type 1 ecolabel fulfilling the listed criteria will be deemed to comply. Other appropriate means of proof will also be accepted.</p>
CONTRACT PERFORMANCE CLAUSES
<p>1. In addition to the most important technical data and instructions for use, consumer information shall also include the following:</p> <ul style="list-style-type: none"> • The product manufacturer must publicly provide information on product take back for example in user guide documentation, embedded in the user interface of the device or on the internet • Information on battery/accumulator disposal • Instructions on how to avoid power draw of adaptors when the mobile phone battery is not being charged <p>Verification: Products holding a relevant Type 1 ecolabel fulfilling the listed criteria will be deemed to comply. Other appropriate means of proof will also be accepted.</p>

3.2. Comprehensive GPP Criteria for Mobile Phones

SUBJECT MATTER
Purchase of efficient mobile phones using environmentally sound materials.
TECHNICAL SPECIFICATIONS
<p>1. Materials:</p> <ul style="list-style-type: none"> • Plastic case parts (exceeding 10 grams) must be marked according to ISO 11469 or equivalent. Other case materials must be named¹. • The carrier material of printed circuit boards must not contain substances or preparations that are classified according to Directive 1999/45/EC and 67/548/CEE or Regulation (EC) No 1272/2008 as follows: <ul style="list-style-type: none"> • R40(/H351) (limited evidence of a carcinogenic effect) • R45(/H350) (may cause cancer) • R46(/H340) (may cause heritable genetic damage) • R48(/H372) (danger of serious damage to health by prolonged exposure) • R50/53(/H400 and H410) (very toxic to aquatic organisms / may cause long-term adverse effects in the aquatic environment) • R60(/H360F) (may impair fertility) • R61(/H360D) (may cause harm to the unborn child) • Beryllium oxide (BeO) must not be used in electronic components <p>Verification: Products holding a relevant Type 1 ecolabel fulfilling the listed criteria will be deemed to comply. Other appropriate means of proof will also be accepted.</p>
<p>2. Mobile phones shall be designed so that they can be easily dismantled for recycling purposes in order to separate and if possible recycle case plastics and accumulators as fractions of materials of other functional units.</p> <p>Dismantling shall be able to be carried out using common tools and the specialised firms entrusted by the manufacturer with the reuse/recycling of waste products shall be provided with information on the dismantling of the devices.</p> <p>Verification: Products holding a relevant Type 1 ecolabel fulfilling the listed criteria will be deemed to comply. Other appropriate means of proof will also be accepted.</p>
<p>3. Flame retardants must not contain substances or preparations that are classified according to Directive 1999/45/EC and 67/548/CEE or Regulation (EC) No 1272/2008 as follows:</p> <ul style="list-style-type: none"> • R40(/H351) (limited evidence of a carcinogenic effect) • R45(/H350) (may cause cancer) • R46(/H340) (may cause heritable genetic damage) • R48(/H372) (danger of serious damage to health by prolonged exposure) • R50/53(/H400 and H410) (very toxic to aquatic organisms / may cause long-term adverse effects in the aquatic environment) • R60(/H360F) (may impair fertility)

¹

This requirement is relevant to the main material, not the grade material.

- R61(/H360D) (may cause harm to the unborn child)

Verification: Products holding a relevant Type 1 ecolabel fulfilling the listed criteria will be deemed to comply. Other appropriate means of proof will also be accepted.

AWARD CRITERIA

1. **Mobile Phones:** Additional points shall be awarded in proportion to the amount of recycled content in main casing materials of mobile phones. The use of materials containing recycled content should not affect the performance of the mobile phone

Verification: The bidder must provide a written guarantee that this criterion will be met. The supplier must provide a declaration regarding the recycled content of the product. The declaration shall be made in accordance with the methodology outlined in ISO 14021:2001, or equivalent.

Note: ISO 14021:2001 defines recycled content as follows:

The proportion, by mass, of recycled material in a product. Only pre-consumer and post-consumer materials shall be considered as recycled content, consistent with the following usage of terms.

- Pre-consumer material: Material diverted from the waste stream during a manufacturing process. Excluded is reutilisation of materials such as rework, regrind or scrap generated in a process and capable of being reclaimed within the same process that generated it.
- Post-consumer material: Material generated by households or by commercial, industrial and institutional facilities in their role as end-users of the product, which can no longer be used for its intended purpose. This includes returns of material from the distribution chain.

CONTRACT PERFORMANCE CLAUSES

1. In addition to the most important technical data and instructions for use, consumer information shall also include the following:

- The product manufacturer must publicly provide information on product take back for example in user guide documentation, embedded in the user interface of the device or on the internet
- Information on battery/accumulator disposal
- Instructions on how to avoid power draw of adaptors when the mobile phone battery is not being charged
- Information on the recoverable/recyclable properties of the materials used in the mobile phone and its packaging.

Verification: Products holding a relevant Type 1 ecolabel fulfilling the listed criteria will be deemed to comply. Other appropriate means of proof will also be accepted.

2. Compatible accessories including headsets, replacement batteries and chargers for the mobile phone shall be available. This requirement is limited to 5 years.

Verification: The bidder must provide a written guarantee that this criterion will be met.

3. The availability under the contract to replace individual parts of the mobile phone product package instead of the whole package. This includes the individual replacement of the mobile phone, charger, battery or sub components such as keypads and covers only when required instead of the whole package.

Verification: The bidder must provide a written guarantee that this criterion will be met.

3.3. Explanatory Notes

- Award Criteria: Contracting authorities will have to indicate in the contract notice and tender documents how many additional points will be awarded for each award criterion. Environmental award criteria should, altogether, account for at least 10 to 15 % of the total points available.
- The contracting authority should ensure that the needs of the end user are taken into account. This may include elements going beyond the scope of the GPP criteria, for example related to ergonomics.
- It should be noted that this is not an exhaustive list and other evidence may also be applicable. The contracting authority should be satisfied that the evidence presented demonstrates that the criteria have been met.
- The contracting authority should consider the upgrade period in the contract to ensure the mobile phone life time is maximised and that upgrades are only undertaken where necessary.
- **Packaging:**

Article 3 of the Directive 94/62/EC of 20 December 1994 on packaging and packaging waste, defines packaging as being:

- All products made of any materials of any nature to be used for the containment, protection, handling, delivery and presentation of goods, from raw materials to processed goods, from the producer to the user or the consumer. 'Non-returnable' items used for the same purposes shall also be considered to constitute packaging.

The extent to which packaging is an important environmental consideration for a product depends on a number of variables including product lifetime and packaging material. For example, for a short lived product, packaging is more likely to be important than it is for a long lived product. Similarly, packaging is less likely to be significant in life cycle terms for an energy using product.

Where the contracting authority views packaging as a significant issue they may wish to seek information from potential suppliers to confirm they have taken into account the environmental impact of their packaging option and that the supplier is consistent with the contracting authority's policies.

4. GPP Criteria for Mobile Phone Chargers (External Power Supplies)

4.1. Core GPP Criteria for Mobile Phone Chargers (External Power Supplies)

SUBJECT MATTER
Purchase of energy efficient chargers (external power supplies).
TECHNICAL SPECIFICATIONS
1. Mobile phone chargers (external power supplies) shall meet the following requirements for both no-load power consumption and energy efficiency for the active mode:
No-load Power Consumption for external power supplies up to 8W for mobile handheld

battery driven applications²:

Rated Output Power (Pno)	No-load power consumption
≥ 0.3W and ≤ 8.0W	0.25W

Average active efficiency for external power supplies shall not be less than the following limits³:

	AC-AC and AC-DC external power supplies, except low voltage external power supplies	Low voltage external power supplies ⁴
Pno ≤ 1.0 Watt	0.480 * Pno + 0.140	0.497 * Pno + 0.067
1.0 Watt < Pno ≤ 51.0 Watts	[0.063 * Ln (Pno)] + 0.622	[0.075 * Ln (Pno)] + 0.561
Pno > 51.0 Watts	0.870	0.860

Verification: The bidder must provide a written guarantee that this criterion will be met.

Note: The no-load condition power consumption and the average active efficiency shall be established by a reliable, accurate and reproducible measurement procedure, which takes into account the generally recognised state of the art.

Measurements of power of 0.50 W or greater shall be made with an uncertainty of less than or equal to 2 % at the 95 % confidence level. Measurements of power of less than 0.50 W shall be made with an uncertainty of less than or equal to 0.01 W at the 95 % confidence level.

4.2. Comprehensive GPP Criteria for Mobile Phone Chargers (External Power Supplies)

SUBJECT MATTER

Purchase of energy efficient chargers (external power supplies).

TECHNICAL SPECIFICATIONS

1. Mobile phone chargers (external power supplies) shall meet the following requirements for both no-load power consumption and energy efficiency for the active mode:

No-load Power Consumption for external power supplies up to 8W for mobile handheld battery driven applications²:

Rated Output Power (Pno)	No-load power consumption
≥ 0.3W and ≤ 8.0W	0.15W

² Based on Version 4 of the EU Code Conduct on Energy Efficiency for External Power Supplies

³ Based on Energy Star requirements and the ecodesign regulation for external power supplies, which was published in April 2009 (Commission Regulation 278/2009)

⁴ A low voltage model is an external power supply with a nameplate output voltage of less than 6 volts and a nameplate output current greater than or equal to 550 milliamps

Average active efficiency for external power supplies shall not be less than the following limits:

	AC-AC and AC-DC external power supplies, except low voltage external power supplies	Low voltage external power supplies⁴
$P_{no} \leq 1.0 \text{ Watt}$	$0.480 * P_{no} + 0.140$	$0.497 * P_{no} + 0.067$
$1.0 \text{ Watt} < P_{no} \leq 51.0 \text{ Watts}$	$[0.063 * \ln(P_{no})] + 0.622$	$[0.075 * \ln(P_{no})] + 0.561$
$P_{no} > 51.0 \text{ Watts}$	0.870	0.860

Verification: The bidder must provide a written guarantee that this criterion will be met.

Note: The no-load condition power consumption and the average active efficiency shall be established by a reliable, accurate and reproducible measurement procedure, which takes into account the generally recognised state of the art.

Measurements of power of 0.50 W or greater shall be made with an uncertainty of less than or equal to 2 % at the 95 % confidence level. Measurements of power of less than 0.50 W shall be made with an uncertainty of less than or equal to 0.01 W at the 95 % confidence level.

AWARD CRITERIA

1. Additional points shall be awarded where mobile phone chargers exceed the comprehensive criteria specification for energy consumption in no load mode. Points should be awarded in relation to the improved performance with maximum points awarded for zero energy consumption in no-load mode.

Verification: The bidder must provide appropriate proof that this criterion is met.

Note: The no-load condition power consumption and the average active efficiency shall be established by a reliable, accurate and reproducible measurement procedure, which takes into account the generally recognised state of the art.

Measurements of power of 0.50 W or greater shall be made with an uncertainty of less than or equal to 2 % at the 95 % confidence level. Measurements of power of less than 0.50 W shall be made with an uncertainty of less than or equal to 0.01 W at the 95 % confidence level.

2. Additional points shall be awarded where mobile phone chargers exceed the comprehensive criteria specification for energy consumption / efficiency in the active mode. Points should be awarded in relation to the improved performance with maximum points awarded for highest efficiencies.

Verification: The bidder must provide appropriate proof that this criterion is met.

Note: The no-load condition power consumption and the average active efficiency shall be established by a reliable, accurate and reproducible measurement procedure, which takes into account the generally recognised state of the art.

Measurements of power of 0.50 W or greater shall be made with an uncertainty of less than or equal to 2 % at the 95 % confidence level. Measurements of power of less than 0.50 W shall be made with an uncertainty of less than or equal to 0.01 W at the 95 % confidence level.

4.3. Explanatory notes

- Award criteria: Contracting authorities will have to indicate in the contract notice and tender documents how many additional points will be awarded for each award

criterion. Environmental award criteria should, altogether, account for at least 10 to 15 % of the total points available.

- Packaging:

Article 3 of the Directive 94/62/EC of 20 December 1994 on packaging and packaging waste, defines packaging as being:

- all products made of any materials of any nature to be used for the containment, protection, handling, delivery and presentation of goods, from raw materials to processed goods, from the producer to the user or the consumer. 'Non-returnable' items used for the same purposes shall also be considered to constitute packaging.

The extent to which packaging is an important environmental consideration for a product depends on a number of variables including product lifetime and packaging material. For example, for a short lived product, packaging is more likely to be important than it is for a long lived product. Similarly, packaging is less likely to be significant in life cycle terms for an energy using product.

Where the contracting authority views packaging as a significant issue they may wish to seek information from potential suppliers to confirm they have taken into account the environmental impact of their packaging option and that the supplier is consistent with the contracting authority's policies.

- Chargers Material Use:

Where the contracting authority feels it is appropriate they should consider the materials used in the mobile phone charger. Consideration should be given to the use of less material in chargers when compared to other typical mass-market equivalent mobile phone chargers. This could include the following aspects:

- Reduced weight / size of coils, transformers
- Reducing Printed Wiring Board size
- Reducing weight of copper and other materials in cables
- Reducing weight / size / number of diodes
- Reducing weight / size of big capacitors
- Use of recycled materials

Reducing the use of materials should not compromise the charger's performance e.g. efficiency.

5. Cost Considerations

Energy use for the life cycle of a mobile phone in the use phase is dominated by energy used by mobile phone chargers, especially no-load power consumption. No-load power consumption of chargers has already been reduced in the past and has the potential to be reduced further resulting in additional energy savings.

It is difficult to specifically quantify these savings as end user behaviour can significantly influence no-load power consumption of chargers. However in the EuP Lot 7 Preparatory Report it is calculated that EU-25 expenditure for the 2005 stock of mobile phone external power supplies in total was in the region of 1170 million Euros. Of this total cost approximately 20% (229 million Euros) was spent on electricity, with the remainder the product price.

Whilst a number of mobile phone chargers already have low no-load power requirements, it is clear that further reductions can be made following Version 3 of the Code of Conduct, which came into force in 2009 and includes progressively more stringent no-load power

consumption levels from 2011. The details and background to this Code of Conduct are outlined in Section 7 of the Technical Background Report.

A key element in savings from mobile phone chargers can be achieved through behavioural changes. This was highlighted in the Integrated Product Policy (IPP) Study and the proposed GPP criteria therefore require information to be provided on how to reduce power draw from chargers when not in use, for example unplugging them. Given the widespread use of mobile phones and the large number of chargers in use it is estimated that if just 10 % of the world's mobile phone users switch off or unplug their chargers when not in use, it would save enough energy to power 60,000 European homes annually⁵.

It is important to communicate effectively with mobile phone users and influence their behaviour where possible. Effective communication of the potential energy savings, and therefore money in the form of lower electricity bills, by switching off or unplugging mobile phone chargers when they are not in use is a key factor in influencing the behaviour of mobile phone users and reducing the energy use impact of mobile phone use. This could be implemented with advice and guidance from the supplier in user manuals for example.

One of the aims of ecodesign is to use fewer types of material. In doing so for a device such as a mobile phone will be advantageous at the recycling and recovery stage as there will be fewer materials to segregate. In addition the reduction in the use of hazardous materials will potentially allow more components to be recovered and recycled or reused. This should generally result in lower costs.

Awareness of environmental issues related to mobile phones is increasing, especially from the manufacturer's perspective. Many companies⁶ provide accessible information, for example on their websites, regarding the environmental characteristics of their products in the form of environmental declarations.

6. Relevant EU legislation and information sources

6.1. EU legislation

- Directive on Waste Electrical and Electronic Equipment 2002/96/EC:
<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:32002L0096:EN:HTML>
- Directive on the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment 2002/95/EC:
<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:32002L0095:EN:HTML>
- Directive on Batteries and Accumulators and Waste batteries 2006/66/EC:
<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2006:266:0001:0014:EN:PDF>
- Directive establishing a framework for the setting of Ecodesign Requirements for Energy-related Products 2009/125/EC:
<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:285:0010:0035:en:PDF>
- The Radio and Telecommunications Terminal Equipment Directive (R&TTE) 1999/5/EC
<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:1999:091:0010:0028:EN:PDF>
- The Packaging Directive 94/62/EC
<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:31994L0062:EN:HTML>

⁵ <http://www.nokia.com/A4136001?newsid=1076996>

⁶ Examples include Nokia <http://www.nokia.com/A4211062> and Sony Ericsson http://www.sonyericsson.com/cws/corporate/company/aboutus/sustainability/environment#environmental_product_declaration

- Directive amending Directive 94/62/EC on packaging and packaging waste 2004/12/EC
<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2004:047:0026:0031:EN:PDF>
- Commission Decision (97/129/EC) of 28 January 1997 establishing the identification system for packaging materials pursuant to European Parliament and Council Directive 94/62/EC on packaging and packaging waste
<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:31997D0129:EN:HTML>
- Regulation (EC 1907/2006) concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC:
<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2006:396:0001:0849:EN:PDF>
- The CLP Regulation (EC) No 1272/2008. The Regulation of 16 December 2008 on classification, labelling and packaging of substances and mixtures
<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2008:353:0001:1355:en:PDF>
- Regulation (EC 106/2008) on a Community energy-efficiency labelling programme for office equipment
<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2008:039:0001:0007:EN:PDF>
- Regulation (278/2009) with regard to ecodesign requirements for no-load condition electric power consumption and average active efficiency of external power supplies
<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:093:0003:0010:EN:PDF>
- Agreement between the Government of the United States of America and the European Community on the coordination of energy-efficiency labelling programs for office equipment:
http://ec.europa.eu/energy/demand/legislation/doc/l_38120061228en00260104.pdf
- UNECE Convention on Long-range Transboundary Air Pollution (CLRTAP)
<http://www.unece.org/env/lrtap/>

6.2. Ecolabels and other criteria sources

- TCO '01 – Mobile Phones: <http://www.tcodevelopment.com/>
- Blue Angel – Mobile Phones RAL-UZ 106:
http://www.blauer-engel.de/englisch/vergabe/download_uz_e/e-UZ-106.pdf
- EU Code of Conduct on Energy Efficiency of External Power Supplies:
http://re.jrc.ec.europa.eu/energyefficiency/html/standby_initiative_External%20Power%20Supplies.htm
- Energy Star External Power Adaptors:
http://www.energystar.gov/index.cfm?c=ext_power_supplies.power_supplies_consumers
- Nordic Swan – Rechargeable batteries and battery chargers
<http://www.svanen.nu/Default.aspx?tabName=CriteriaDetailEng&menuItemID=7056&pgr=30>