



Review of mobile handset eco-rating schemes

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Review of mobile handset eco-rating schemes

Executive summary

Sustainability and environmental issues are increasingly becoming more visible and significant to us all (e.g. climate change, ethical supply chains, toxic materials, resource scarcity and the management of Waste). To help move to a more sustainable society, we need to change our behaviour. As a result, a range of industries have developed schemes which provide information on a product's relative sustainability, especially with regard to environmental aspects, with the aim of empowering consumers and positively influencing their purchasing habits; thereby driving improvements in overall sustainability.

Over the past few years, this trend has reached the mobile handset industry as mobile telecom operators and standards bodies develop eco-rating schemes to communicate the sustainability and environmental performance of their products to consumers. The goal has been to achieve simple, comprehensive schemes, based on life cycle thinking, sound science and manufacturers' own sustainability and environmental research to deliver what consumers want – a single source of truth; a one-stop assessment of all the major sustainability parameters affecting handsets.

There are currently two approaches to the reviewed eco-rating schemes:

- The comparative approach applies a score to each device so that a comparison of performance can be reviewed by the purchaser;
- The certification approach provides a level of certification that a device meets a minimum level of performance but provides no method for further differentiation.

This report shows that there is no scheme that could be considered a perfect view of sustainability; however, each does attempt to provide a broad perspective of the sustainability impact of the manufacture, use and disposal of a mobile handset.

Based on this study, current eco-rating schemes have included the following to add additional credibility in the eyes of all stakeholders:

- An environmental performance evaluation of the mobile handset using a lifecycle approach;
- Use of independent third-party sustainability experts to assist in developing the scheme;
- A focus on corporate and supply chain issues and reducing the negative environmental sustainability impact associated with the ICT sector;
- A set of sustainability and environmental requirements that ensure that any device rated meets a minimum performance level;
- The inclusion of innovation credits within each scheme, leading to a process where competition among manufacturers could drive significant improvements in sustainability.

To drive further improvements, the best elements of each scheme could become integrated into a single scheme to simplify the process for consumers, mobile operators and manufacturers.

1 Background

One of the greatest challenges for today's society is to manage the impact from the way we live our lives and the products we consume. As more focus is put on the overall sustainability (social and environmental) impact that our lifestyle choices have, a number of organizations have responded by providing consumers with information on the impact of the products they buy and use.

"As consumers increasingly demand green products, there is an incentive for marketers to offer them. It is important for firms to understand when consumers choose these products, and how to market them effectively."¹

"When firms are innovative and have good product quality, corporate social responsibility (CSR) improves customer satisfaction, increasing financial returns. A firm's CSR, coupled with innovation and quality, make customers feel connected to it, which leads to customer loyalty. For a company with a market value of roughly \$48 billion, a modest increase in CSR ratings resulted in about \$17 million more average profits in subsequent years"²

"Research finds consumers are willing to pay more for ethically produced goods and less for unethically produced ones. Further, the punishment imposed by consumers for unethical practices is greater than the reward for ethical practices. Practices need not be 100% ethical to obtain a premium. One implication is that the information consumers receive on production practices – good or bad – is of key importance to the price they are willing to pay for a company's products."³

This trend has reached the mobile telecom sector where organizations have developed (or are developing) a number of methods to communicate the sustainability impact of handsets to the consumer.

The result has been that there are now a number of publicly promoted eco-rating programmes that are being used to try and provide an objective and comparative score on the overall sustainability (focusing particularly on the environmental aspects) of individual mobile handsets. As the number of handsets in use exceeds 6 billion, improvements in the overall sustainability performance of individual mobile handsets can make a significant net cumulative effect on overall global sustainability and potentially a reduction in associated negative environmental impact.

1.1 Consumer perspective

Consumers today are becoming more aware of that the choices they make have an impact on the environment and also that those same choices can influence how companies manage their overall supply chains for sustainability issues (which includes environmental, social and labour aspects) and how they sell products. Research by Laroche, Bergeron, Barbaro-Forleo found that a key method is for companies to *"Tell consumers why they should buy green products. In The Body Shop stores, info cards, window displays and*

¹ Lauren Rakowski & The Network Team, Network for Business Sustainability Research Insights, Firms attract consumers who will pay more for green products by showing them they are making a difference, summarized from Schaefer, Anja, & Crane, Andrew. (2005). Addressing Sustainability and Consumption. Journal of Macromarketing, 25(1): 76-92.

² Lauren Rakowski & The Network Team, Network for Business Sustainability Research Insights, CSR in innovative companies improves customer satisfaction, which leads to better financial performance, summarized from Luo, Xueming, & Bhattacharya, C.B. (2006). Corporate Social Responsibility, Customer Satisfaction, and Market Value. Journal of Marketing, 70(4): 1-18.

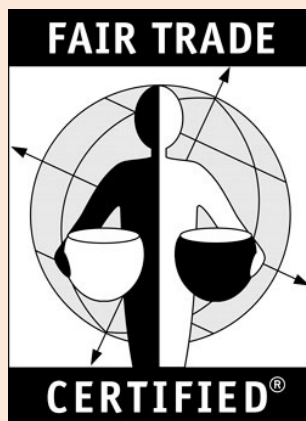
³ Pam Laughland & The Network Team, Network for Business Sustainability Research Insights, Consumers reward – and punish – companies for ethical or unethical production summarized from Trudel, R., & Cotte, J. (2009). Is It Really Worth It? Consumer Response to Ethical and Unethical Practices. MIT/Sloan Management Review, 50(2): 61-68.

videos inform people about the environmental and social effects of purchasing decisions. The Body Shop also educates consumers about the company's natural ingredients, earth-friendly manufacturing and policy of purchasing from developing countries.⁴ Further research from Schaefer, & Crane, also indicates that "Consumers buy products as a way to fulfill needs like self-identity and social relationships. Firms that market green products as a way to help 'save the planet' or improve health of loved ones encourage consumers to fulfill these needs. Consumers who care about the environment choose green products when given sufficient choice and product information. These consumers often make purchasing decisions by weighing the environmental cost of a product in combination with considerations of price, quality and convenience."⁵

Consumers are starting to migrate to product choices that enhance sustainability or minimize the environmental impact of the products they buy. Consumers, particularly those who are looking to make more sustainable choices, now expect that products come labelled with enough information for them to make informed choices. Consumers also expect that the labelling systems employed are an accurate indicator of a product's sustainability credentials and provide them with the ability to make more sustainable sources. Examples abound in many other sectors of the economy including:

- Fair Trade Products;
- Organic Foods;
- MPG, l/100km and CO2 emissions for automobiles;
- Energy Star certification for electronics, appliances, homes, etc.;
- Energy Guide labelling for appliances.

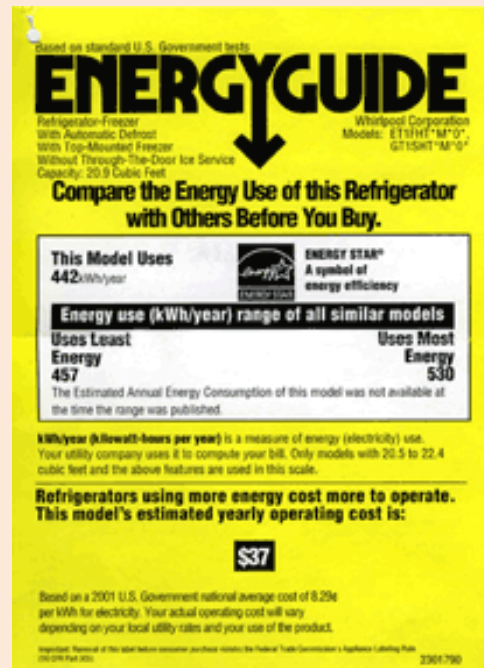
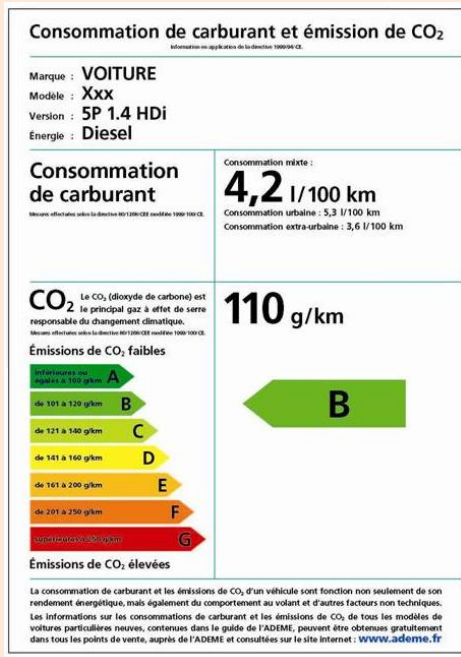
Figure 1: Example of eco labels



⁴ Lauren Rakowski & The Network Team, Network for Business Sustainability Research Insights, Firms attract consumers who will pay more for green products by showing them they are making a difference, summarized from Laroche, Michel, Bergeron, Jasmin, & Barbaro-Forleo, Guido. (2001). Targeting consumers who are willing to pay more for environmentally friendly products. *Journal of Consumer Marketing*, 18(6): 503-520.

⁵ Lauren Rakowski & The Network Team, Network for Business Sustainability Research Insights, Firms can successfully market green products as a way to fulfill consumers' needs, summarized from Schaefer, Anja, & Crane, Andrew. (2005). Addressing Sustainability and Consumption. *Journal of Macromarketing*, 25(1): 76-92.

Figure 2: Examples of eco labels



1.2 Mobile telecom operator perspective

From the perspective of the mobile telecom operator, as consumers become more aware of the impact of their purchases, a preference for purchasing products that produce a lower environmental impact and/or enhance sustainability. As identified for example in a research conducted by Telefónica that showed that in the United Kingdom “sustainability credentials have some influence on the purchasing decisions of 44% of consumers.”⁶

In response to this change, various global operators are developing or have developed public eco-ratings to measure the sustainability and environmental performance of mobile handsets which are then used to inform the public of that performance.

The eco-rating programmes developed measure the sustainability and environmental performance of a mobile handset in a number of ways but generally in three broad categories:

- Company – a rating based on criteria that determines the sustainability of the handset manufacturer at a corporate level based on factors such as Greenhouse Gas emissions, environmental policies, etc.;
- Supply Chain – a rating based on criteria that measures the sustainability of the supply chain elements based on factors such as contract manufacturing, transportation distances, mineral sourcing, etc.;
- Handset – a rating based on criteria that measures actual performance of a handset based on factors such as the components used, energy consumption, recyclability, packaging etc.

The programmes are not only meant to provide consumers with the information needed, if they so choose, to make more sustainable choices, but to also drive improvements in overall sustainability with manufacturers and throughout the supply chain.

⁶ www.o2.co.uk/assets2/thinkbig/O2EcoratingbriefAugust2010v2.pdf

A review of current and proposed eco-rating schemes or initiatives from Orange/France Telecom, Telefónica, Sprint, Underwriters Laboratories Inc. Vodafone and AT&T is provided in Appendix A.

Also included is a review of the eco-rating scheme from UL. This is included in the review as it is used as part of the Sprint rating system.

These schemes have been chosen as they represent carriers and standards bodies whose scope of operations include Europe, Africa, North and South America, and therefore can be considered a representative of what is occurring within a global context.

Further reviews of other schemes as they are developed by other global carriers, particularly within the Asia Pacific market, could be the next step in this review process.

1.3 Device manufacturer perspective

From a device manufacturer perspective, eco-ratings can be seen as an objective method for promoting the sustainability performance of their handsets. Many manufacturers have already implemented comprehensive programmes around sustainability (including such areas as eco design, responsible supply chain management, energy efficiency and recycling programmes, etc.) so that eco-ratings can become a method for publicly reporting the achievements of those programmes. In addition, eco-ratings can be used as the basis for improvement activities within device manufacturer's sustainability programmes as areas that score poorly can be targeted for improvement.

A potential drawback for manufacturers is that with the current differences between the various eco-rating schemes, there is the potential that each manufacturer has to collect information in a number of different ways duplicating efforts and therefore adding to workload and expense.

Selected examples of manufacturer programmes are provided in Appendix B and discussed in the following sections, and they are meant to demonstrate that manufacturers are addressing many, if not most, areas that are part of the eco-rating evaluations. These examples are taken from the public websites of selected manufacturers from North America, Europe and Asia Pacific to attempt to provide a broad perspective on trends in sustainability from a manufacturer's perspective.

2 Review of current mobile handset eco-ratings

This section of the report reviews the general categories that are used within eco-ratings and includes details of the eco-ratings implemented or planned to be implemented by mobile operators.

The general categories evaluated are:

- Company performance;
- Supply chain performance;
- Device performance.

Further details of each eco-rating are reviewed and the similarities and differences in the rating categories are discussed and highlighted. Included within this section will be the overall governance structure and the scoring structure used in each eco-rating scheme.

This evaluation is based on publically available information and from information provided by various mobile operators.

This evaluation will provide suggested baselines that could, be part of any eco-rating scheme providing comprehensive sustainability and environmental information to consumers. These baselines are generally used within all or a majority of the current eco-rating schemes.

This evaluation will also propose considerations for enhancement that when integrated as part of an eco-rating scheme; provide consumers with additional information on environmental and sustainability performance and a method for manufacturers to demonstrate improved sustainability performance.

2.1 *Company performance*

Within the reviewed eco-rating schemes, those with the largest scope have some measure of the overall corporate sustainability performance of a mobile device manufacturer. This part of the eco-rating scheme rates a manufacturer on issues such as disclosure of GHG emissions, environmental performance, policies and initiatives and overall social (including labour and health & safety) performance, policies and initiatives.

2.1.1 **Greenhouse Gas (GHG) emissions**

In this part of the evaluation, a handset manufacturer is evaluated on disclosure of Greenhouse Gas Emissions (specifically Scope 1 and Scope 2 as defined within the GHG protocols). This measure is used as part of the company performance section to demonstrate transparency in GHG reporting, performance in managing and also potentially reducing GHG emissions and their associated public commitments.

- e.g. response to Carbon Disclosure Project.

Table 1

Scheme	Requested information upon which assessment is made
AT&T	Public reporting of GHG emissions reductions targets and performance towards targets.
Orange/France Telecom	Eco-rating is specific to the product assessed and it does not take into account the global CSR policy of the manufacturers.
Sprint	Requires handsets be assessed by UL, the UL bullets also apply for Sprint.
Telefónica	Assessment based on: <ul style="list-style-type: none"> • Board support for progressive climate change action in tougher legislation or stretching greenhouse gas emissions reduction target; • Measurement of GHG emissions of global operations (Scope 1 and 2); • Public carbon reduction targets; • Renewable energy use.
UL	Indirect assessment based on: <ul style="list-style-type: none"> • Requirement for ISO 14001 through which companies may introduce a GHG reduction plan.
Vodafone	Assessment based on: <ul style="list-style-type: none"> • Evidence that the supplier manages the risks and opportunities associated with climate change; • Participation in CDP or similar; • Public carbon reduction targets; • Energy management.

Suggested baseline:

Reporting of a company’s GHG emissions through a recognized international scheme (e.g. Carbon Disclosure Project) and to a recognized assessment process (e.g. GHG Protocol, ITU-T L.1420 Methodology for energy consumption and greenhouse gas emissions impact assessment of Information and Communication Technologies in organizations) can be considered a baseline requirement for an eco-rating.

Considerations for Enhancement:

A method to differentiate performance, additional criteria that evaluate GHG reduction activities and advocacy and engagement in climate change by the manufacturer.

2.1.2 Environmental performance

In this set of questions in the assessment, a handset manufacturer is evaluated on a number of factors that relate to how their company operations impact on the environment. The factors that are assessed include:

- implementation of environmental management systems;
 - ◊ e.g. ISO 14001:2004
- implementation of waste generation and minimisation strategies, targets and policies;
- implementation of water management and minimisation strategies, targets and policies.

Table 2

Scheme	Requested information upon which assessment is made
AT&T	ISO 14001 or EU Eco-Management and Audit Scheme (EMAS).
Orange/France Telecom	Eco-rating is specific to the product assessed and it does not take into account the global CSR policy of the manufacturers.
Sprint	Requires handsets be assessed by UL, the UL bullets also apply for Sprint.
Telefónica	Assessment based on: <ul style="list-style-type: none"> • Alignment to ISO 14001 implementation; • Published policy designed to minimise the environmental impacts of operations; • Published global solid waste management and reduction targets; • Published global water management policies and reduction targets; • External recognition.
UL	Assessment based on: <ul style="list-style-type: none"> • Requirement for ISO 14001 for original equipment manufacturer OEM engineering or headquarters.
Vodafone	Assessment based on: <ul style="list-style-type: none"> • Environmental certification; • Pollution prevention; • Environmental management system targets; • Water footprinting and disclosure of targets; • Waste management targets.

Suggested baseline:

As a broad measure of environmental performance the implementation of an Environmental management system such as ISO 14001 or equivalent within both corporate operations and manufacturing should be seen as a baseline requirement in any eco-rating scheme.

Considerations for Enhancement:

Further details of a manufacturer’s performance and commitments to reduce their direct environmental impacts (such as energy, water, waste and pollution) and the extension of an environmental management system to include design activities.

2.1.3 Social, ethical, labour, health and safety performance

In this part of the evaluation, a handset manufacturer is measured on a number of factors that relate to how they manage social and ethical issues within the organization. These factors include:

- Implementation of health and safety strategies, targets, policies and management systems;
 - ◇ e.g. OHSAS 18001
- Implementation of overall sustainability or corporate responsibility strategies, targets, policies and management systems;
- Implementation of labour strategies, targets, policies and management systems;
 - ◇ e.g. SA8000
 - ◇ International Labour Organization (ILO) Conventions.

Table 3

Scheme	Requested information upon which assessment is made
AT&T	GRI-aligned sustainability reporting, including GRI index.
Orange/France Telecom	Eco-rating is specific to the product assessed and it does not take into account the global CSR policy of the manufacturers.
Sprint	Requires handsets be assessed by UL, the UL bullets also apply for Sprint.
Telefónica	<p>Assessment based on:</p> <ul style="list-style-type: none"> • Published business principles designed to ensure good ethical behaviour have been implemented; • Published policies on labour, safety, environment and business principles; • Alignment to OHSAS 18001 Occupational health and safety management systems; • Alignment to SA8000 Social Accountability; • Alignment to ethical purchasing policy including: child labour, forced labour, etc.; • External recognition.
UL	<p>Assessment based on:</p> <ul style="list-style-type: none"> • Corporate sustainability action plan; • Publishing of the corporate sustainability report; • Third-party review of the corporate sustainability report; • Publicly available EHS policy; • Formal Environmental Management Systems (EMS) programme and certification.
Vodafone	<p>Assessment based on:</p> <ul style="list-style-type: none"> • Ethical supply chain management; • Conflict minerals; • Ethical purchasing; • Labour standards and risks; • Health and safety management; • Public disclosure and reporting; • Zero-tolerance bribery controls; • Adoption of E-TASC, an industry tool to manage supply chain standards effectively and efficiently.

Suggested baseline:

As a broad measure of performance within this rating category, the implementation of the following elements should be considered as baseline requirements:

- Health and safety management system;
- Labour management system;
- Ethical business principles;
- Ethical purchasing principles;
- Public reporting of sustainability.

Considerations for Enhancement

In order to provide further differentiation and highlight superior performance, additional credit could be given to companies with independently assessed management systems and third-party assured sustainability reports.

2.2 Supply chain performance

Within the reviewed eco-rating schemes, the most comprehensive schemes have some measure of how a manufacturer manages its supply chain. This is an essential component of sustainability as many manufacturers now have extensive global supply chains. In many cases, a significant portion of manufacturing has been outsourced to third parties, resulting in significant parts of the environmental impact within the supply chain.

This part of the eco-rating rates manufacturers on the requirements they place on their supply chain partners on issues such as disclosure of GHG emissions, environmental performance, policies and initiatives and overall social (including labour and health & safety) performance, policies and initiatives.

2.2.1 GHG Emissions

In this part of the evaluation, a handset manufacturer is measured on the disclosure of Corporate Greenhouse Gas Emissions within the supply chain (Scope 3). This measure is used as part of the supply chain performance section to demonstrate a company's performance in managing and potentially reducing the GHG emissions associated with the transportation of the product and the public commitments in this area.

Table 4

Scheme	Requested information upon which assessment is made
AT&T	No information or not assessed.
Orange/France Telecom	Assessment based on: <ul style="list-style-type: none">Greenhouse Gases emitted during manufacturing and distribution of device.
Sprint	No information or not assessed.
Telefónica	No information or not assessed.
UL	Assessment based on: <ul style="list-style-type: none">Greenhouse Gases emitted during manufacturing and distribution of device.
Vodafone	No information or not assessed.

Suggested baseline:

As a broad measure of performance within this rating category, the implementation of requirements for the supply chain to report on their GHG emissions should be considered as baseline performance.

Considerations for enhancement

To provide further differentiation and highlight superior performance, the rating could include scoring for companies that have a defined programme for supply chain emissions reduction targets, goals and timelines.

2.2.2 Environmental performance

In this section of the assessment, a handset manufacturer is measured on a number of factors that relate to how they have put in place measures to determine the impact on the environment from outsourcing facilities and major parts suppliers. The factors that are assessed include:

- implementation of waste generation and minimization strategies, targets and policies within the supply chain;
- implementation of water management and minimization strategies, targets and policies within the supply chain;
- implementation of environmental management systems within the supply chain.
 - ◇ e.g. ISO 14001:2004

Table 5

Scheme	Requested information upon which assessment is made
AT&T	No information or not assessed.
Orange/France Telecom	Eco-rating is specific to the product assessed and it does not take into account the global CSR policy of the manufacturers.
Sprint	Requires handsets be assessed by UL, the UL bullets also apply for Sprint.
Telefónica	Assessment based on: <ul style="list-style-type: none"> • Contractual requirement for ISO 14001 implementation; • Published policy designed to minimize the environmental impacts of operations within the supply chain; • Published global water management plan for the water used in the manufacture of products; • Supplier assessment programme.
UL	Assessment based on: <ul style="list-style-type: none"> • Corporate sustainability action plan applied to contract manufacturers; • Manufacturing facilities certified to ISO 14001 or EMAS.
Vodafone	Assessment based on: <ul style="list-style-type: none"> • Supplier assessment programme based partly on corporate responsibility; • Evidence that the supplier manages environmental issues in its own supply chain; • Adherence to Vodafone’s Code of Ethical Purchasing; • Adoption of E-TASC.

Suggested baseline:

As a broad measure of performance, the requirement for a manufacturer’s supply chain to implement Environmental management systems, policies and practices (based on ISO 14001 or an equivalent) should be seen as a baseline for assessment.

Considerations for enhancement:

- GHG reporting to a defined international standard;
- Specific plans for reductions, goals, targets or management plans for:
 - ◇ GHG emissions;

- ◇ Water;
- ◇ Waste;
- ◇ Other pollutants.

2.2.3 Social, ethical, labour, health and safety performance

Handset manufacturers are measured on a number of factors that relate to how they manage their suppliers and outsourced facilities. These factors include:

- Implementation of a supplier code of conduct;
 - ◇ e.g. EICC supplier code of conduct ⁷
- Implementation of a supplier assessment and audit programme;
 - ◇ e.g. E-TASC (Electronics - Tool for Accountable Supply Chains)⁸
- Implementation of health and safety strategies, targets, policies and management systems within the supply chain;
 - ◇ e.g. OHSAS 18001
- Implementation of overall sustainability or corporate responsibility strategies, targets, policies and management systems within the supply chain;
 - ◇ e.g. SA8000
- Management of conflict minerals such as tin, tantalum, tungsten and gold;
- Implementation of policies to manage ethical behaviour applicable to the supply chain.
 - ◇ e.g. whistle-blower policies, anti-bribery policies, anti-harassment policies.

⁷ www.eicc.info/EICC%20CODE.htm

⁸ <http://e-tasc.achilles.com/>

Table 6

Scheme	Requested information upon which assessment is made
AT&T	No information or not assessed.
Orange/France Telecom	Assessment based on: <ul style="list-style-type: none"> Traceability of sensitive resources (gold, silver, tin, tantalum).
Sprint	Requires handsets be assessed by UL, the UL bullets also apply for Sprint.
Telefónica	Assessment based on: <ul style="list-style-type: none"> Published business principles designed to ensure good ethical behaviour applicable to the supply chain; Published policies on labour, safety, and business principles applicable to the supply chain; Contractual requirement for OHSAS 18001 implementation; Use and control of conflict minerals; Supplier assessment programme; Notification programme for major incidents in the supply chain; Published policies on labour, safety, environment and business principles that align with the published Telefónica policies.
UL	Assessment based on: <ul style="list-style-type: none"> Conflict minerals restriction; Corporate Sustainability (CS) Action Plan Applied to Contract Manufacturers; EICC Code of Conduct.
Vodafone	Assessment based on: <ul style="list-style-type: none"> Environmental Principles for handset suppliers include a requirement to demonstrate progress in developing systems to track and disclose the sources of four conflict minerals (tin, tantalum, tungsten and gold); Evidence that the supplier manages labour and health and safety issues in its own supply chain; Adherence to Vodafone’s Code of Ethical Purchasing; Adoption of E-TASC.

Suggested baseline:

For evaluation within an eco-rating scheme, the following elements when implemented or required within the supply chain (contract manufacturers, parts suppliers) would provide a good baseline to indicate that a manufacturer is operating an ethical supplier chain:

- Supplier Code of Conduct;
- Health and safety management system;
- Labour management system;
- Ethical business principles;
- Ethical purchasing principles;
- Conflict minerals policy.

Considerations for enhancement:

- A contractual mandate for integration of the above discussed points in the supply chain would provide a method for highlighting superior performance;
- Implementation of a supplier audit and improvement programme;
- A rating of manufacturers' public policy and advocacy activities on supply chain issues.

2.3 Evaluation of the devices

Within all of the reviewed eco-rating schemes, there is an evaluation measure of the sustainability and environmental impact of the mobile device. This evaluation measure constitutes the majority of the scoring and therefore has an immense impact on the final eco-rating score. This part of the eco-rating scheme attempts to determine how the various elements of environmental aspects are addressed, with three of the five schemes putting some emphasis on the ability of mobile devices to enhance a user's own sustainability and environmental behaviour. The approach taken is to represent the lifecycle impact of a device through the measurement of various indicators.

2.3.1 GHG Emissions/ Carbon Footprint

In this section, a handset is measured on a number of factors that correlate to an estimation of the embedded carbon within the device.

Table 7

Scheme	Requested information upon which assessment is made
AT&T	No information or not assessed.
Orange/France Telecom	Assessment based on: <ul style="list-style-type: none">• Distances for travel and size of major components to estimate CO2 emissions.
Sprint	Requires handsets be assessed by UL, the UL bullets also apply for Sprint.
Telefónica	No information or not assessed.
UL	Should be captured in LCA of mobile product.
Vodafone	Assessment based on: <ul style="list-style-type: none">• Life cycle assessment of carbon footprint; for example, distances travelled (and mode of transport) for components and final products, product power consumption in use phase, size and nature of components.

2.3.2 Materials

In this section, a handset is measured on a number of factors that relate to the efficient and environmentally advantageous use of materials. These factors include:

- Amount of materials used;
- Size of integrated chips;
- Use of sustainable materials in the device and inbox accessories.

Table 8

Scheme	Requested information upon which assessment is made
AT&T	Assessment based on: <ul style="list-style-type: none"> • Recycled metal contents and percentage; • Percentage of post-consumer waste plastic in housing.
Orange/France Telecom	Assessment based on: <ul style="list-style-type: none"> • The amount of non-renewable materials (gold, silver and tin) in the handset; • The use of recycled materials (specifically recycled and/or bio plastics).
Sprint	Assessment based on: <ul style="list-style-type: none"> • Recycled plastic or renewably sourced plastic content in the device and inbox accessories; • Use of unbundled parts assemblies to reduce waste during handset repair; • Requires handsets be assessed by UL, the UL bullets also apply for Sprint.
Telefónica	Assessment based on: <ul style="list-style-type: none"> • Physical area of environmentally significant parts of the handset; • Use of recycled and/or bio plastics.
UL	Assessment based on: <ul style="list-style-type: none"> • Post-consumer recycled plastic and/or bio-based plastic content in device and power supply; • Criteria for the sustainable use of Metals.
Vodafone	Assessment based on: <ul style="list-style-type: none"> • Use of raw materials such as gold, silver, copper, tin, aluminium and oil or rare metals including tantalum, tungsten and cobalt, the mining of which has a high environmental impact; • Use of recycled/reused materials.

Suggested baseline:

A baseline for evaluation should include:

- An evaluation of resource management (using less material to produce a device with the same functionality).

Consideration for enhancement:

- Highlight and provide better scores for those devices that also minimize the use of resources that are particularly scarce. In particular, the evaluation of the use of rare earth metals is appropriate as it impacts both financial and sustainability issues.

2.3.3 Hazardous materials management and elimination

In this section, a handset is measured on a number of factors that relate to the use of materials that are considered hazardous:

- Beryllium;
- Antimony;
- Polyvinyl Chlorides (PVC);
- Phthalates;
- Brominated Fire Retardants (BFRs);
- Bisphenol A;
- Triphenyl Phosphate (TPP);
- Halogenated Flame Retardants (HFRs);
- Other Halogenated Compounds.

Table 9

Scheme	Requested information upon which assessment is made
AT&T	Assessment based on: <ul style="list-style-type: none"> • Restriction of lead, cadmium and mercury in battery; • RoHS Compliance and restriction of BFR, PVC, chlorine compounds • Restriction of extractable nickel; • Restriction of antimony trioxide/antimony compounds and beryllium compounds.
Orange/France Telecom	Assessment based on: <ul style="list-style-type: none"> • The replacement and the substitution of these dangerous substances (Beryllium, Antimony, Polyvinyl Chlorides (PVC), Phthalates, Nickel, Bisphenol A, Triphenyl Phosphate (TPP), Halogenated Flame Retardants (HFRs)) in the device; • The replacement and the substitution of these dangerous substances (Polyvinyl Chlorides (PVC), Phthalates, Nickel, Halogenated Flame Retardants (HFRs)) in the accessories.
Sprint	Assessment based on: <ul style="list-style-type: none"> • RoHS Compliance, low levels of PVC, BFRs, Phthalates, Beryllium; • Requires handsets be assessed by UL, the UL bullets also apply for Sprint.
Telefónica	Assessment based on: <ul style="list-style-type: none"> • Compliance with the European RoHS Directive (2002/95/EC); • Prohibition or reduction plans for PVC, Brominated flame retardants, Chlorine & compounds, Antimony Trioxide, Beryllium & compounds, Phthalates, Other Bromine compounds, Other Antimony compounds.
UL	Assessment based on: <ul style="list-style-type: none"> • Compliance with the European REACH Directive (Regulation (EC) No 1907/2006); • Compliance with the European RoHS Directive (2002/95/EC); • Nickel on contact surfaces; • DEHP, DBP, and BBP Restriction; • Restriction of Bromine and Chlorine in mobile phone, accessories and external power supply; • Restriction of Lead, Cadmium, and Mercury in the mobile phone battery cell; • Textile and leather accessories; ◇ Pentachlorophenol; ◇ Dibutyltin and dioctyltin; • Azo dyes, Point Dimethylfumarate Dermal Toxicological Assessment of Exterior Surfaces of Mobile Phone.
Vodafone	Assessment based on: <ul style="list-style-type: none"> • Compliance with the European RoHS Directive (2002/95/EC); • Compliance with the Ozone Depleting Substances Regulation (EC Regulation 1005/2009) and Fluorinated-Gases EU Regulation (842/2006), including in non-EU markets; • Phasing out of specific materials, e.g. PVC, phthalates, antimony, beryllium, and halogenated flame retardants. Also substances of very high concern (as defined under the EU Registration, Evaluation, Authorisation and restriction of Chemicals (REACH) Directive), substances on the candidate list and those that have been considered for exclusion under RoHS, e.g. short and medium chain chlorinated paraffins, nonyl-phenols, bisphenol-A, etc.

Suggested baseline:

The baseline for this section would be:

- Compliance to a regulation/legislation on the use of hazardous materials (e.g. RoHS and REACH);
- Elimination (or a roadmap to elimination) of a number of other materials including PVC, halogenated fire retardants, other halogenated compounds, phthalates, antimony and beryllium (elimination is considered environmentally preferential and, in some cases, may reduce potentially hazardous e-waste).

Considerations for enhancement:

Extending these requirements to include accessories as well as mobile handsets and addressing the use of hazardous materials within the battery such as cadmium, lead and mercury (elimination of these substances is considered environmentally preferential and reduces potentially hazardous e-waste).

2.3.4 Packaging

In this part of the evaluation, a handset is measured on a number of factors that relate to how the manufacturer develops more sustainable packaging solutions. These factors include:

- packaging minimization;
- packaging void space reduction;
- use of more sustainable materials e.g.;
 - ◇ use of recycled content;
 - ◇ forest-based products packaging that is certified through a scheme such as FSC or PEFC;
 - ◇ elimination of plastics or non-recyclable plastics;
 - ◇ use of compostable or recyclable materials.

Table 10

Scheme	Requested information upon which assessment is made
AT&T	Assessment based on: <ul style="list-style-type: none"> • AT&T environmentally preferable packaging criteria.
Orange/France Telecom	Assessment based on: <ul style="list-style-type: none"> • Minimization of packaging materials including supplementary packaging; • Use of sustainable sources for paper (FSC) and use of recycled content; • Expanded Polystyrene Packaging (EPS) Restriction.
Sprint	Assessment based on: <ul style="list-style-type: none"> • Packaging that is fully recyclable, conforms to standard box sizes, includes post-consumer materials, reduced in-box materials, and reduced chemical impact; • Reduction of packaging volume and size; • Minimize the use of glues, inks, labels and plastics; • Increase in recycled fiber, post-consumer waste, and chlorine-free bleach in paper packaging materials; • Elimination of plastic laminate; • Use of vegetable-based or low VOC (volatile organic compound) inks; • Use of water-based or other environmentally friendly adhesives.
Telefónica	Assessment based on: <ul style="list-style-type: none"> • Minimization of packaging materials including supplementary packaging; • Void space minimization; • Use of sustainable sources for paper (FSC) and use of recycled content; • Solvent free/vegetable inks.
UL	Assessment based on: <ul style="list-style-type: none"> • Use of recyclable fibre based packaging materials; • Expanded Polystyrene Packaging (EPS) restriction; • Environmentally preferable paperboard packaging; • Heavy metal restrictions in packaging; • Avoiding petroleum based Inks in packaging; • Avoiding petroleum based adhesives in packaging; • Reduced packaging volume.
Vodafone	Assessment based on: <ul style="list-style-type: none"> • Reducing the environmental impacts of packaging.

Suggested baseline:

The baseline for evaluation should include:

- Minimization of all packaging and inbox materials (less materials used);
- Maximization of recycled content or sustainable forest-based products within all packaging and inbox materials;
- Full recyclability of all packaging (allows for material reuse);
- Minimization of inks based on volatile organic compounds (VOC) (reduction of pollution).

Considerations for enhancement:

An evaluation of packaging that allows for postal shipment of devices so that the cost and carbon footprint of the delivery programme would be reduced.

2.3.5 Energy efficiency

A handset is measured on a number of factors that relate to the use of energy of a device and the use of energy during the charging process. These factors include:

- energy used during operation;
- energy used during the charging process;
- energy efficiency of the charger;
- device compatibility with universal charging solutions.

Table 11

Scheme	Requested information upon which assessment is made
AT&T	Assessment based on: <ul style="list-style-type: none"> • Full charge notification or power-based monitoring/management of applications; • GSMA/OMTP universal charging solution and meets no-load consumption threshold.
Orange/France Telecom	Assessment based on: <ul style="list-style-type: none"> • Embedded energy reduction applications in the devices (e.g., auto screen off, end of charge); • Reducing energy consumption during the use phase of a handset.
Sprint	Assessment based on: <ul style="list-style-type: none"> • Energy Star qualification; • Visual alert for full charge; • Power saving information in user materials; • Standardized connector.
Telefónica	Assessment based on: <ul style="list-style-type: none"> • Compatibility with GSMA universal charger; • Embedded energy reduction applications in the devices (e.g. auto screen off, end of charge); • Charger Efficiency.
UL	Assessment based on: <ul style="list-style-type: none"> • Universal connector for external power supply output; • External power supply average efficiency and no-load power.
Vodafone	Assessment based on: <ul style="list-style-type: none"> • Energy-saving settings that are simple to activate or automatic; • Supplying the customer with a smart charger that switches itself off when the phone is fully charged; • The amount of power needed to make a call and use data, and how long it takes the phone to charge.

Suggested baseline:

A baseline for evaluation would include:

- Compatibility with a universal charger scheme including the use of a universal charger connector (Micro USB), or the ability to connect via an adaptor (to reduce e-waste and allow for the possibility of removing chargers from the point of sale box);
- Inclusion of a charger that meets the maximum no-load power requirements and the maximum charging efficiency (reduce energy usage);
- Embedded power saving applications within the device (reduce energy usage).

Considerations for Enhancement:

Scoring of the energy consumption of the use phase of the handset to drive improvement in the area, and to allow manufacturers to highlight those devices that use power more efficiently. This measurement should conform to a defined standard.

2.3.6 Innovation, enabling effect and dematerialization

A handset is assessed on a number of factors that relate to how the device can enhance the sustainability behaviour of the user and reduce the need for other products. These factors include:

- Applications for sustainability;
 - ◇ E.g. walking maps, transit maps, carbon calculators.
- Built-in high resolution camera;
- Built-in high definition video recorder;
- Built-in voice recorder;
- Built-in music player.

Table 12

Scheme	Requested information upon which assessment is made
AT&T	No information or not assessed.
Orange/France Telecom	No information or not assessed.
Sprint	Assessment based on: <ul style="list-style-type: none"> • Eco-friendly applications; • Innovation.
Telefónica	Assessment based on: <ul style="list-style-type: none"> • “Green” applications; • NFC capability; • Video conferencing capability; • Capability to replace: <ul style="list-style-type: none"> ◇ Camera; ◇ Video camera; ◇ GPS; ◇ MP3 player; ◇ Voice recorder.
UL	Assessment based on: <ul style="list-style-type: none"> • Innovative environmental efforts, actions, programmes, policies, achievements as supported by documented improvements in sustainability performance; • Specific innovation points for comparative LCA showing improved materials performance without significant degradation of other LCA reporting aspects.
Vodafone	No information or not assessed.

Suggested baseline:

In this part of the evaluation, there can be no practice that would be considered as standard or baseline. There are different ways for each scheme to provide manufacturers with the opportunity to improve their eco-rating devices score by highlighting and giving credit for innovation.

Consideration for enhancement: Highlight the possible dematerialization benefits of a handset that includes the elements of other ICT devices so that consumers can avoid the purchase of other devices if they so choose.

2.3.7 Device life and recycling

In this part of the evaluation, a handset is measured on a number of factors that relate to how the useable life of a device can be extended and to how the device can enhance the sustainability behaviour of the user and reduce the need for other products. These factors include:

- Availability of hardware and software upgrades;
- Availability of device take-back programmes.

Table 13

Scheme	Requested information upon which assessment is made
AT&T	Assessment based on: <ul style="list-style-type: none"> • Battery removability and device disassembly by recycler; • Device materials recyclability rate; • Provision of recycling information and promotion on device.
Orange/France Telecom	Assessment based on: <ul style="list-style-type: none"> • Opportunities for repair of the product; • GHG Emission during recycling.
Sprint	Assessment based on: <ul style="list-style-type: none"> • High recyclability rate, recycling envelope included in box; • Reparability through unbundles assemblies; • Requires handsets be assessed by UL, the UL bullets also apply for Sprint.
Telefónica	Assessment based on: <ul style="list-style-type: none"> • Upgradeability of hardware; • Upgradeability of software; • Recyclability; • Low-tech disassembly and reuse of components; • A published strategy on addressing the obsolescence of devices and extending their useful lifetimes; • Operation (or participation) in a device collection & recycling scheme for end of life products.
UL	Assessment based on: <ul style="list-style-type: none"> • Mobile phone take-back and/or refurbishing programme; • Mobile phone recyclability rate; • Availability of replacement parts; • Primary recyclers certified to R2, e-stewards or equivalent; • Battery removability at end of life; • Ease of removing external enclosure of mobile phone; • Use of similar or compatible plastic materials; • Feature to erase user data from mobile phone; • Public availability of repair manuals.
Vodafone	Assessment based on: <ul style="list-style-type: none"> • How easy it is to replace individual components, such as the battery, to keep the phone in use for longer; • How easily materials can be separated and recovered for recycling is also considered.

Suggested baseline:

The baseline for evaluation should include factors such as:

- Recyclability of the device (increases potential recovery of materials) to a defined standard or methodology;
- Support of recycling programmes for the end user at the end of life of the product (prevents e-waste) when not managed by local legislation;

- The ability to extend the life of the product through hardware and/or software upgrades (longer life span decreases need for additional production);
- Reparability (ability to extend product life).

Considerations for enhancement:

- Removable⁹ batteries (which may allow for product life extension and easier recycling);
- Ease of disassembly for recycling (allows for easier recycling particularly in less developed areas which have little access to high tech tools).

2.3.8 Life cycle assessment

Table 14

Scheme	Requested information upon which assessment is made
AT&T	The combination of the scores for other categories is considered a life cycle assessment, and the categories were established based on a life cycle approach. This approach was taken rather than the specification for a specific use of a life cycle methodology.
Orange/France Telecom	The combination of the scores for other categories is considered a life cycle assessment, and the categories were established based on a life cycle approach. This approach was taken rather than the specification for a specific use of a life cycle methodology.
Sprint	The combination of the scores for other categories is considered a life cycle assessment, and the categories were established based on a life cycle approach. This approach was taken rather than the specification for a specific use of a life cycle methodology.
Telefónica	The combination of the scores for other categories is considered a life cycle assessment, and the categories were established based on a life cycle approach. This approach was taken rather than the specification for a specific use of a life cycle methodology.
UL	Assessment based on: <ul style="list-style-type: none"> • Product level life cycle assessment; • Based on Environmental management – life cycle assessment – principles and framework, ISO 14040, and; • Environmental management – life cycle assessment – requirements and guidelines, ISO 14044; • Independent peer review of product level life cycle assessment; • Major impacts of life cycle assessment included in the corporate sustainability plan.
Vodafone	The combination of the scores for other categories are analysed and the environmental impact of the phone is calculated following the International Organization for Standardization’s lifecycle assessment framework – ISO 14040:2006.

⁹ See definition in Directive 2006/66/EC of the European Parliament and of the Council

Suggested baseline:

Only one of the reviewed eco-rating schemes requires the use of a specific life cycle methodology. Since all the eco-rating schemes take a life cycle approach and have developed questions and scoring systems to approximate and simplify the life cycle assessment process, the relative merits and extra cost of a separate life cycle assessment may not provide any additional value.

Considerations for enhancement:

The communication of elements of a either a life cycle assessment or an eco-rating that has a significant impact on the environment and plans to address and minimize those impacts.

2.4 Governance model and independent review

In any eco-rating scheme that wants to communicate the environmental performance of a product or service to the consumer, it is essential that there be a solid scientific basis for the evaluation and some manner of external consultation, evaluation and verification.

2.4.1 External consultation

Table 15

Scheme	Requested information upon which assessment is made
AT&T	BSR.
Orange/France Telecom	WWF, BIO Intelligence Service.
Sprint	Green electronics NGOs and corporate responsibility advisory services.
Telefónica	Forum for the Future.
UL	Standards Technical Panel, a broad team that includes device manufacturers, wireless carriers, suppliers, retailers and other experienced stakeholders.
Vodafone	Codde Bureau Veritas (LCA), SKM Enviro.

2.4.2 Audit and verification activities

Table 16

Scheme	Requested information upon which assessment is made
AT&T	AT&T Engineering.
Orange/France Telecom	All suppliers are audited monthly by PricewaterhouseCoopers & France Telecom sourcing department.
Sprint	UL Environment; Quarterly environmental scorecard review with OEMs.
Telefónica	Telefónica.
UL	UL Environment.
Vodafone	Codde Bureau Veritas – Product; SKM Enviro – Corporate; KPMG provides a statement of limited assurance of the process.

Suggested baseline:

To form the basis of a strong and consumer acceptable eco-rating scheme, there should be a method of external consultation with trusted parties known for their sustainability expertise, as well as a process for the verification of the information that is provided by the handset manufacturer. These two steps can be seen as essential to ensure consumer acceptance and maintain the integrity of any process.

Considerations for enhancement:

Have the information provided to determine the eco-rating score to be verified by an independent third party.

2.5 Benchmarking and analysis of eco-rating scoring schemes

2.5.1 AT&T

With the AT&T rating system, the attributes are given points based on a targeted set of pre-determined criteria to rank each device's environmental score. In assigning ratings, device manufacturers will submit an assessment of each device to determine how many of 15 key criteria are met. AT&T engineering will confirm the score as a part of the lab testing process and assign an eco-rating. Accompanying the on-package rating will be a website consumers can use to learn more about how AT&T devised these ratings, to evaluate phones, and to learn more about what comprises the overall mobile device sustainability scale. The rating does not rate supply chain performance.

2.5.2 Orange/France Telecom

Orange/France Telecom eco-rating provides a final score from 0 – 5 based on a calculation of the scores within the three categories. Points are awarded in each category based on the performance within each category. The score is based on 39% weighting for CO₂ footprint (by approximating the CO₂ embedded within the manufacturing and distribution process and estimating potential emissions from the use and end of life phases), 34% for the amount of materials used and 27% for eco-friendly design considerations. The rating does not rate corporate performance.

2.5.3 Sprint

The Sprint Eco-Logo and use of UL Environment certification are not comparative schemes and no weighting system is employed. Within each category there are several line required and optional items. Each optional item carries a maximum value but overall a device requires a minimum point score of 70 to obtain the Sprint Eco-Logo. The point allocation approach for UL Environment certification is described in Section 2.5.5 below.

2.5.4 Telefónica

Telefónica eco-rating is a point-based system (from 0.0 to 5.0) that is based on a combination of scores obtained from two (2) categories: Corporate Performance and Product Rating.

The questions in the 'Corporate' Eco rating section are based on O2's corporate assessment questionnaire, plus sustainability leadership principles derived from their partners, Forum for the Future's, work with business and industry.

The product rating takes a whole-life thinking approach to handset environmental impacts and functionality.

This eco-rating scheme uses a point system in conjunction with a gating process and a weighted scoring process.

- A gate within a category is a question whereby a manufacturer must provide mandatory minimum information to be eligible for the eco-rating programme. An example of a gate within the eco-rating is that the sales packaging is required to be below a certain weight relative to the product's weight;
- If the product passes the gating a raw score is provided to the manufacturers that reflects their answers to either numerical or binary (yes/no) questions. The areas covered are detailed above in section 2.3;
- The system then applies a weighting to the raw scores providing an eco-rating that reflects the most up-to-date knowledge, and the sustainability or strategic importance accorded to each issue and impact. The weighting system is such that corporate factors comprise 11% of the total score, device factors constitute 89% of the score.

2.5.5 UL

The UL eco-rating is not a comparative scheme but requires minimum points to be obtained so that a device can be labelled as either Certified (55% of points obtained (60points)) or Platinum (73% of points obtained (80points)) based on a possible total of 109 points. The employed weighting system is incorporated into the scoring structure by allocating more points to criterion that have a larger impact or for which the stakeholders determine have a larger significance for sustainability. There are certain categories that are considered mandatory requirements for which no points are awarded, but if a manufacturer does not comply then the device is not eligible for participation in the rating scheme (e.g. batteries shall be readily removed for separate treatment at EOL - Expanded Polystyrene (EPS) shall not be used in Point of Sale (POS) packaging).

2.5.6 Vodafone

The Vodafone eco rating's final score ranges between 1.0 and 5.0 and is based on a corporate section, responsible for 20% of the final score, and a product section with a weight of 80% of the final score based on the answers to 162 questions about the environmental and social impact of a phone. The scores in each area are combined for an overall rating. Eco rating scores for mobile phones are split into two categories, smartphones and non-smartphones, to allow for a like to like comparison.

3 Overall analysis of eco-rating schemes

An overall review of the eco-rating schemes demonstrates that while there are many areas of overall agreement there do exist certain differences that can have an impact on the perception of the schemes and on the how improvements in sustainability can be realized.

In all the reviewed cases, the eco-rating scheme brings a life cycle and human health based approach for setting the criteria for each of the areas of evaluation attempting to measure the environmental impact associated with the manufacture, use and disposal of the product.

The first key difference is that the Vodafone, Orange/France Telecom and Telefónica eco-rating schemes use a comparative scoring system that allows each device to have a score, while the Sprint and UL schemes use a certification system that requires minimum scores to be obtained for labelling. To date, AT&T has not released information as to whether their eco-rating will follow the comparative or certification systems.

For the comparative schemes, all devices can be rated allowing consumers to see the relative scores. The certification systems determine a score which could be communicated to the consumer if desired. Typically only the performance level is communicated to the consumer. The comparative systems may be more valuable overall as manufacturers can aim to improve their ranking, potentially driving improvements. With a certification system once a device has been certified to the highest level, there may be no further incentive to improve the sustainability performance even where opportunities exist. The Orange/France Telecom and Telefónica eco-rating schemes were developed in conjunction with recognized sustainability experts (WWF and Forum for the Future respectively). AT&T used an external consultancy firm BSR. Vodafone used two external agencies for development and scoring of the rating scheme Codde Bureau Veritas and SKM Enviro. The current version of the UL draft has been reviewed by a standards technical panel representing many stakeholders Sprint has stated that there was third- party involvement in the development of the scheme, there was no full public disclosure of the parties involved as of yet) Full disclosure and use of recognized and independent third-party experts provides Vodafone, Orange/France Telecom, AT&T and Telefónica schemes with additional credibility. France Telecom has engaged PwC to provide independent third-party review and audit of the information provided by the handset manufacturers. Vodafone has engaged KPMG to provide a limited assurance review of their methodology.

The Telefónica scheme has implemented a rating system to ensure that a minimum level of performance is required in certain categories for a score to be obtained. The gated criteria are part of the overall score. This setting of mandatory minimum requirements ensures that any product evaluated within this scheme meets some minimum level of sustainability performance.

There is a similar feature in the UL eco-rating scheme with the difference being that the mandatory requirements are not part of the overall score, but are requirements that must be achieved in a number of categories including health and safety, manufacturing, product stewardship and packaging for a device to be considered for inclusion into the evaluation process.

Some of the assessed schemes proved to be more comprehensive than others assessed in this review, including corporate and supply chain issues, and not just environmental issues. While the value of the corporate score for all the rating schemes is a minor component of the overall score, the inclusion of a broader sustainability view of the manufacturer should be an incentive to drive improvements in sustainability throughout the supply chain, which in the end may have the largest overall impact on decreasing the impact of a mobile handset.

In the reviewed schemes, the majority of the requirements and scoring relates to the actual device. This is appropriate as the majority of the environmental impact of a device is related to the actual manufacture, use and disposal of the device. There was also a general agreement that the environmental sustainability

should include a measurement of the efficient use of materials, reduction of hazardous substances, packaging and energy efficiency.

In the majority of the schemes assessed, there is a provision for recognition of innovation as part of the overall evaluation. This part of the evaluation may be considered key to driving improvements in environmental innovation of the handheld mobile device. If manufacturers are rewarded for significant environmental efforts (e.g., the elimination of a hazardous material before other manufacturers), a culture can be developed where manufacturers strive for innovation and the result can be advances in overall sustainability.

The UL scheme ensures that the methodology and scoring system are fully available to the public; however the UL certification is the only scheme that is a commercial product that requires a fee for certification. The other eco-rating systems do not fully disclose the methodology and scoring system to the public.

As with reporting of any type, the public recognizes that the process is potentially more effective if there is a verification process for the output. Any eco-rating scheme should have an audit or verification process to ensure that the final outputs are trusted by the consumer. France Telecom has taken the step of engaging independent third-party audits of the information provided. Vodafone uses Codde Bureau Veritas and SKM Enviros verify the information provided.

What follows is a matrix of the general areas addressed by the eco-rating schemes. The matrix does not differentiate or rank the detail that is addressed by each scheme, but only that the topic is included within the evaluation.

Table 17

Eco-rating includes information on:	AT&T	Orange/France Telecom	Telefónica	Sprint	UL	Vodafone
Company Performance						
GHG Emissions	√		√	√	√	√
Environmental Management	√		√	√	√	√
Health and Safety			√	√	√	√
Labour Management			√			√
Ethical Business Principles			√			√
Corporate Sustainability	√		√	√	√	√
Supply Chain Performance						
GHG Emissions		√				√
Environmental Management			√	√	√	√
Health and Safety			√	√	√	√
Supplier Code			√	√	√	√
Labour Management			√	√	√	√
Ethical Business Principles			√			√
Conflict Minerals		√	√	√	√	√
Supply Chain Auditing			√			√
Handset						
GHG Emissions		√				
Material Usage	√	√	√	√	√	√
Hazardous Materials	√	√	√	√	√	√
Packaging	√	√	√	√	√	√
Energy Efficiency	√	√	√	√	√	√
Innovation			√	√	√	
Recycling and Device Life	√	√	√	√	√	√
Other						
External Consultation		√	√	√	√	√
Audit and Verification			√	√	√	√

4 Next steps

ITU-T Study Group 5 is encouraged to lead a process, in conjunction with mobile operators, manufacturers, countries, NGOs and other interested sustainability stakeholders, to develop a unified global eco-rating standard for communicating the sustainability and environmental attributes of mobile handsets.

This is an opportunity for the ICT sector to develop a world leading mechanism to provide consumer facing information on this increasingly critical issue.

There is also the opportunity for various ministries of communications and/or environment globally focusing on issues of emerging health risks to use this eco-rating for handsets used within their respective countries.

As part of that process, ITU-T Study Group 5 should consider to:

- Define what a successful outcome would be;
- Agree on the areas of evaluation or the questions that would form the basis for an eco-rating scheme;
- Join forces with active alignment initiatives (GSMA Eco rating working group and UL working group);
- Agree on a methodology for scoring or ranking;
- Agree on what should be the mandatory minimum environmental sustainability attributes of a mobile phone;
- Consider whether there are differences between smartphones and regular mobile phones;
- Coordinate the eco-rating development work stream;
- Maintain ownership of the tools developed and the accompanying data;

The benefits to a single standard would be:

- Consistency in messaging to the consumer and other interested stakeholders.

Reduction in effort for manufacturers to compile data and for mobile operators to review and maintain that data.

- Reduction in effort for mobile operators to develop and maintain internally developed eco-ratings;
- With a specific reference to Recommendation ITU-T L.1000: Universal power adapter and charger solution for mobile terminals and other hand-held ICT devices, within a single eco-rating. This could provide manufacturers with certainty for charger requirements and would provide the maximum environmental benefits through the standardization of chargers and potential reduction in e-waste;
- The inclusion of Recommendation ITU-T L.1410: Methodology for environmental impact assessment of information and communication technologies goods, networks and services, within a single eco-rating would provide a level of consistency in determining the climate change impact of a mobile handset;
- The inclusion of a reference to ITU-T L1420 Methodology for energy consumption and greenhouse gas emissions impact assessment of Information and Communication Technologies in organizations;
- Provide direction to the suppliers in the ICT sector, steering them to common sustainability and environmental goals as set out by the tool;
- A single global eco-rating scheme should build upon the current work developed by mobile carriers and manufacturers.

A summary of a potential framework that could be considered as the basis of a single global eco-rating is included within Appendix C.

5 Appendix A: Eco-rating scheme review

5.1 AT&T

The following includes both a summary and direct content sourced from:

www.att.com/gen/landing-pages?pid=7735

www.att.com/Common/about_us/files/csr_2011/2010_CSR_Report.pdf

On February 23, 2012 AT&T announced the launch of an eco-rating system to help consumers learn about environmental features of mobile devices which was developed in collaboration with [BSR](#), a global business network and consultancy focused on sustainability.

The new system is a response to customer wants and needs. According to a [Deloitte study](#)¹⁰ on consumer trends in the purchase of sustainable products, 54 percent of surveyed shoppers consider sustainability to be one of their decision making factors.

AT&T's eco-rating system will cover attributes such as: environmentally preferable materials, [energy efficiency](#), responsible end-of-life treatment and environmentally-responsible manufacturing. In assigning ratings, device manufacturers will submit an assessment of each device to determine how many of 15 key criteria are met. These criteria cover everything from the percentage of recycled metals used in the device, to restriction of compounds such as lead, cadmium, mercury, nickel and antimony trioxide/antimony compounds. The overall rating represents the composite score of these environmental attributes.

AT&T plans to add the ratings icon to in-store collateral later this year. Consumers will also be able to visit a website to obtain detailed information about how AT&T and BSR devised the ratings, learn more about what makes up the overall sustainability scale for mobile devices and see available products.

AT&T plans to evolve the rating system as technological innovations, industry norms and sustainability need change.

¹⁰ www.deloitte.com/assets/Dcom-Lebanon/Local%20Assets/Documents/Consumer%20Business/DeloitteGreenShopperStudy_2009.pdf

5.2 Orange/France Telecom

The following is a summary sourced and translated from:

http://orange-en-france.orange.fr/Developpement_durable/etiquetage_ecologique.html?p=4.3.5

In 2008, Orange introduced a publicly available assessment scoring of the environmental performance of mobile handsets and fixed handsets. The assessment scoring was developed in conjunction with WWF. It has been deployed in France, Spain, Romania and Orange Business Service (B2B) and it will be deployed into other European Orange countries (for example Poland...).

The main goals of the programme are:

- To raise awareness of the environmental impact of the handset;
- To orient customer choices, in a voluntary manner through the communication of assessment scores, to the most environmentally friendly handset within a particular category;
- Encourage manufacturers to produce more eco-friendly handsets.

The scoring system (from 0 – 5 is based on the following three criteria:

1. CO2 footprint which measures the amount of greenhouse gas emitted during the main stages of the life of the product: manufacturing, distribution, use, recycling.
2. The preservation of natural resources which measures the amount of non-renewable materials (gold, silver and tin) in the composition of the product.
3. Eco-responsible design which measures other environmental performance improvement initiatives such as limited use of hazardous substances, traceability of sensitive resources (gold, silver, tin, tantalum), opportunities for repair of the product and the use of recycled materials.

Figure 3: Example of an Orange Eco Logo



Source: http://orange-en-france.orange.fr/Developpement_durable/etiquetage_ecologique.html?p=4.3.5

5.3 Sprint

The following includes both a summary and direct content sourced from:

http://newsroom.sprint.com/article_display.cfm?article_id=2159
www.sprint.com/responsibility/ouoperations/sustainproductdev.html
www.sprint.com/responsibility/ouoperations/devicemarkercriteria.html

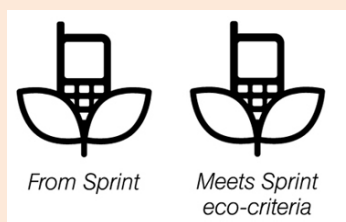
Sprint has made a commitment to reduce the environmental impact of products and services and strive to enable customers to reduce their environmental impact through those same products and services.

Three key goals set in this programme include the establishment of environmental criteria for devices and gradually improve the performance against these environmental criteria, increase the sustainability of product and accessory packaging, and offer product and service solutions to customers that enable them to make greener choices in their own lives and businesses.

Sprint decided to establish a set of criteria that would indicate what Sprint considered to be a mobile handset that was environmentally preferable when compared to an average mobile handset. This process involved research and discussions with green electronics NGOs and corporate responsibility advisory services.

An expected outcome was that the criteria had to be relevant for consumers and environmentally meaningful. The result of the programme was that mobile handsets could be labelled with either of the following labels if the criteria were met.

Figure 4: Sprint eco label



In January 2012, Sprint announced a revised Environmental Scorecard to include 3 new requirements – UL Certification, use of unbundled assemblies for both recyclability and reparability, and extensive sustainable packaging requirements. These requirements will apply to all handsets.

- o Reparability requirements are intended to demonstrate that life extension is as important as recyclability.*
- o The new packaging criteria spans all factors, including reducing packaging volume and size, improving material composition and structure, minimizing the use of glues, inks, labels and plastics.*
- o Other scorecard metrics include universal charger, charger energy efficient rating, high recyclability rate, and providing an easy means for customers to return their old phone/accessories.*

TM

5.4 Telefónica

The following includes both a summary and direct content sourced from: www.o2.co.uk/assets2/thinkbig/O2Ecoratingbrief_Aug2010.pdf

In 2010, O2 (the UK arm of Global Telefónica SA) produced a publically available eco-rating of mobile devices in conjunction with Forum for the Future.

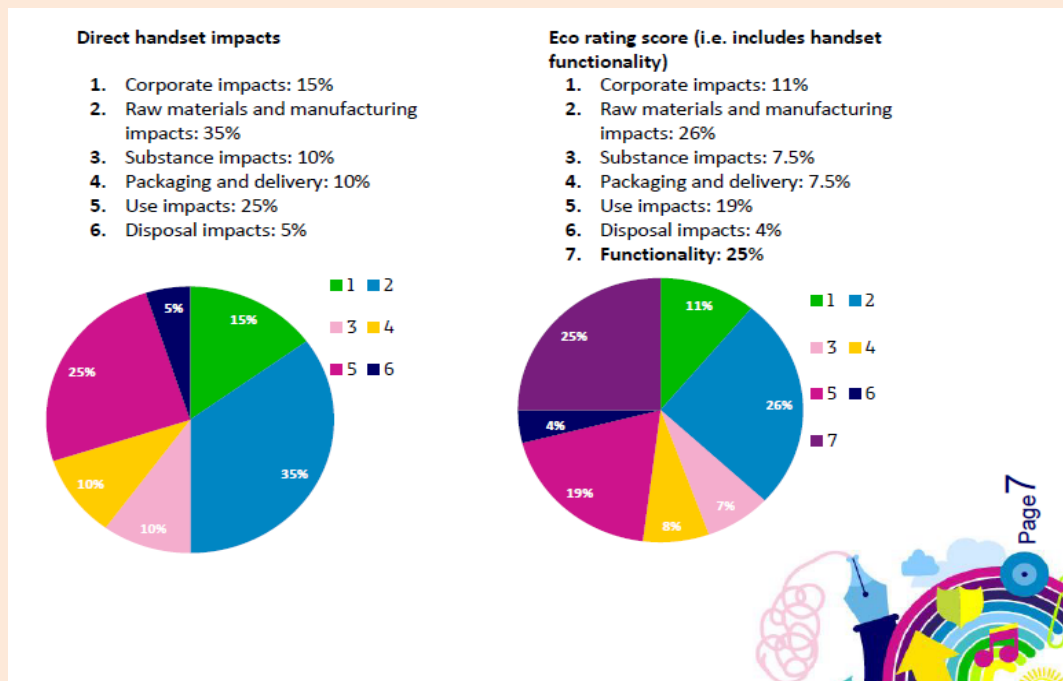
O2's research showed that sustainability credentials have some influence on the purchasing decisions of 44% of consumers with 11.5% stating that this would have a strong influence on the decision to buy a particular phone.

The goal of the O2 eco-rating programme is to inform customers on a broad range of sustainability performance indicators as indicated by their research. The research showed that the areas that consumers wanted to see indicators on performance included within the eco-rating are:

- Climate Change;
- Environment as a whole;
- Ethical performance;
- Supply chain performance.

The eco rating score (from 0 – 5) for each handset is based on a scoring system as outlined in Figure 5.

Figure 5: Detail of the Telefónica eco-rating scoring system



5.5 UL Environment (UL)

The following includes both a summary and direct content sourced from:

www.ULnvironment.com/ULnvironment/eng/documents/env/UL_ISR_110-eng.pdf

UL Environment, a firm involved in environmental evaluation and certification to develop sustainability standards for handheld consumer electronic products is cooperating with Sprint in developing standards for electronic devices.

The initial standard will focus on mobile phones, including basic models and “smart” phones, as well as the external power supply, cables and other accessories. The intent is that the standard will assist manufacturers, consumers and retailers in identifying more sustainable options when purchasing these types of devices.

The requirements are based on the environmental assessment of a product’s entire life cycle. Sustainability factors considered in the standard are: materials, packaging, manufacturing and operations, energy efficiency of the external power supply, health and the environment, product performance, disposal and innovation.

The first version of this standard, the interim sustainability requirements (ISR) for mobile phones was released in June of 2011 for immediate use within the mobile phone industry. The full requirements are known as UL ISR 110 and the scoring system is illustrated in Table 1.

www.sprint.com/responsibility/docs/UL-ISR110PointsMatrix.pdf

Table 18

Proposed Point System	
Materials Use	15 pts
Energy Use	24 pts
Health and Environment	27 pts
End of Life Management	12 pts
Packaging	13 pts
Manufacturing and Operations	18 pts
Innovation	10 pts
Total	109 pts
Associated Tiers	
Platinum	> 80 pts
Certified	> 60 pts

Source: www.ulenvironment.com/ulenvironment/eng/documents/env/UL_ISR_110-eng.pdf

5.6 Vodafone

The following includes both a summary and direct content sourced from:

www.vodafone.com/content/index/about/sustainability/eco-efficiency/eco-rating.html

Vodafone wants its customers to be able to make informed decisions about the mobile phone they choose to buy. Each phone is scored from one to five for sustainability (five being the best). And that score is displayed next to the product, whether you are buying online or in store.

The score is based on answers to 162 questions about the environmental and social impacts of the mobile phone. These cover:

The impacts of the phone throughout its life, from mining of raw materials to produce components, to production of the phone by manufacturers, use by consumers and disposal when the phone comes to the end of its life.

How committed the manufacturer is to managing its own environmental and social impacts.

Vodafone plans to make these questions more difficult over time to encourage manufacturers to design phones that are better for the environment and society.

The Eco-rating was launched in the Netherlands in 2011 and will be introduced to other European markets in 2012.

Awareness of environmental issues is growing among consumers and this is becoming an important selection criterion in many purchasing decisions. As yet, few people are prioritizing 'green' products when they choose a mobile phone or service provider, but we expect this to change in the medium to long term. By making the environmental credentials of our products clearer, we can address this emerging trend and support consumers in making more environmental purchasing choices.

Source: www.vodafone.com/content/dam/vodafone/about/sustainability/reports/2010-11_vodafone_sustainability_report.pdf

5.7 NGO perspective - Greenpeace

The following includes both a summary and direct content sourced from:

www.greenpeace.org/international/en/campaigns/climate-change/cool-it/Guide-to-Greener-Electronics/

Greenpeace produces a semi-annual “Guide to Greener Electronics”. While this eco-rating looks at companies from all areas of the ICT industry (not specifically mobile handset device manufacturers), it does produce a public rating that is based mainly on the performance of a company with respect to the overall sustainability criteria and advocacy positions. A rating from 0 – 10 is based on:

- Disclosure of own operational GHG emissions;
- GHG emissions reductions and targets;
- Clean Electricity Plan (CEP);
- Clean Energy Policy Advocacy;
- Product Energy Efficiency;
- Avoidance of Hazardous Substances in Products;
- Use of Recycled Plastic in Products;
- Product Life Cycle;
- Measure and reduce energy consumption in the supply chain;
- Chemicals Management and Advocacy;
- Policy and practice on sustainable sourcing of fibres for paper;
- Policy and practice on avoidance of conflict minerals;
- Provides effective voluntary take-back where there are no EPR laws.

This is not reviewed within this report, but it is noted that there is alignment in general terms between the Greenpeace guide and the mobile operator’s eco-rating programmes.

6 Appendix B: Manufacturer review

6.1 Apple

The following includes both a summary and direct content sourced from:

www.apple.com/environment/progress/
www.apple.com/environment/

Apple has publically stated that all their products exceed Energy Star guidelines and that all products are at least twice as energy efficient as the appropriate guidelines.

From a supply chain perspective, Apple has a public supplier code of conduct which commits to safe working conditions, treatment of workers with respect and dignity and environmentally responsible manufacturing processes in their supply chain.

Apple has made a commitment to design greener products by considering the environmental impact of the materials used in the product and packaging with a goal of leading the industry in reducing /eliminating environmentally harmful products.

Apple also produces an environmental report for their mobile handsets (see Appendix A for an example).

http://images.apple.com/environment/reports/docs/iPhone4S_Product_Environmental_Report_2011.pdf

6.2 Bell Canada

As of yet Bell Canada has not developed a public facing eco –rating scheme. However; Bell Canada has implemented what could be considered the first step in the development of a program by developing environmental criteria for mobile devices that OEMs must adhere to. Examples of criteria specified include:

- *Bell requires its suppliers to comply with a Supplier Code of Conduct which is aligned with the EICC code. In addition, suppliers are required to complete a Corporate Responsibility and Environment questionnaire that addresses, amongst other things, their environmental management and performance. Use of a universal charger;*
- *Chargers must be Energy Star certified;*
- *Bell's eco-criteria require suppliers to have a public policy on conflict minerals and sourcing practices that support this policy;*
- *Compliance with the European RoHS Directive (2002/95/EC) or China RoHS;*
- *Compliance with the European REACH Directive (Regulation (EC) No 1907/2006);*
- *Compliance with the European directive 94/27/EEC Nickel on contact surfaces;*
- *Intentionally free of PVC, Brominated Flame Retardant and Phthalates;*
- *Compliance with EU 2006/66/EC directive that aims to reduce the environmental impact of batteries and expand the recycling of used batteries.*

6.3 Nokia

The following includes both a summary and direct content sourced from:

www.nokia.com/global/about-nokia/people-and-planet/sustainable-devices/sustainable-devices/
www.nokia.com/global/about-nokia/people-and-planet/impact/products/products/
www.nokia.com/global/about-nokia/people-and-planet/apps/apps-and-services/

Nokia has committed that all mobile handsets and accessories are required to fulfill their internal and environmental criteria and that the design process is to be guided by life cycle thinking.

Nokia's sustainable device life cycle process commitments include:

- *The use of only internally approved, tested and sustainable materials;*
- *The continual improvement in energy efficiency;*
- *The development of smaller, lighter, less wasteful packaging.*

Nokia has also highlighted a number of eco applications that are intended to raise awareness of environmental issues and help consumers lower their carbon footprint.

In addition, Nokia provides an Eco profile covering material use, energy efficiency, packaging and recycling (see Appendix A for an example).

http://nds1.nokia.com/eco_declaration/files/eco_declaration_phones/EcoDec_770.pdf

6.4 Samsung

The following includes both a summary and direct content sourced from:

www.samsung.com/us/aboutsamsung/sustainability/environment/eco_products/eco_design.html
www.samsung.com/us/aboutsamsung/sustainability/environment/chemicalmanagement/supplychainmanagement.html

Samsung has developed a system called 'Eco-Design Assessment' to manage mobile handsets with internal environmental criteria that is based on resource efficiency, energy efficiency and eco-friendly materials.

The system is designed to ensure that products comply with the global environmental regulations to satisfy consumer demands for eco-friendly products.

The system is also used to assign developed products an eco-rating (Eco-Product, Good Eco-Product, or Premium Eco-Product) based on internal evaluation criteria. The public commitment is that 100% of products exceed Good Eco-Product criteria by 2013 with a focus on increasing both energy efficiency and the use of recyclable materials.

Samsung also has committed to a policy of providing product warranty and service parts availability that can extend the lifespan of a product.

Samsung also has developed an 'Eco-Partner Certification Program'. The intent of the programme is to support suppliers of core products, parts, components, packaging and raw materials in reducing the environmental impact of the products and associated manufacturing processes.

Samsung provides the Product Eco-Declaration (PED) of all products to stakeholders upon request.
www.samsung.com/us/aboutsamsung/sustainability/environment/eco_products/eco_labels.html

6.5 Sony Mobile Communications

The following includes both a summary and direct content sourced from:

www.sonymobile.com/cws/corporate/company/sustainability/
www.sonymobile.com/cws/corporate/company/sustainability/carbon-footprint
www.sonymobile.com/cws/corporate/company/sustainability/substance-control
www.sonymobile.com/cws/corporate/company/sustainability/greenheart

Sony Mobile Communications' approach to sustainability is based on the product life cycle. That means taking all aspects of materials, design, supply chain, manufacturing, logistics, product use and end-of-life treatment into consideration when developing products and the business.

Sony Mobile Communications' goals are:

- *By 2015 reduce the total greenhouse gas emissions from the full life cycle of Sony Mobile Communications' products by 15%*;*
- *By 2015 reduce the total greenhouse gas emissions from Sony Mobile Communications' internal activities by 20%*.*

** based on year 2008 levels*

From the start, with the launch of the Sony Ericsson C901™GreenHeart™ in 2009, the intention has always been to broaden GreenHeart™ across the portfolio. Sony Mobile Communications wants to ensure that every phone and accessory includes GreenHeart™ credentials and step-by-step they are working towards this goal.

Examples of GreenHeart™ credentials are post consumer recycled plastics, waterborne paint, chargers with a no-load power consumption of ≤ 30 mW and minimised packaging.

Sony Mobile Communications provides an environmental declaration for their mobile handsets (see Appendix A for an example).

See www-support-downloads.sonymobile.com/mk16/environmental_MK16_2011.pdf

6.6 LG Electronics

The following includes both a summary and direct content sourced from:

www.lg.com/global/sustainability/environment/greener-products/green-product-strategy.jsp
www.lg.com/global/sustainability/environment/greener-products/products-application/mobile-phone.jsp
www.lg.com/global/sustainability/environment/greener-products/environmental-label.jsp

LG Electronics' strategic direction for greener products is to minimize the environmental load in every stage of the product lifecycle. At the highest perspective, it is composed of three factors - Energy, Human, and Resources - as well as being based on a design of higher energy efficiency, reduction in raw/subsidiary materials, and improvements in the human wellbeing.

7 Appendix C: Eco-rating scoring review

Scheme	Category rated	Maximum points in each category	Weighting % of the category to final score	
Orange/France Telecom	CO2 footprint - manufacturing	5 pts	39%	
	CO2 footprint - distribution			
	CO2 footprint - usage			
	CO2 footprint - end of life use			
	Preservation of natural resources - depletion of non-renewable resources (gold, silver, tin)	5 pts	34%	
	Eco-friendly design, including limiting hazardous substances - presence of hazardous substances	5 pts	50% of 27%	
	Eco-friendly design, including limiting hazardous substances - origin of rare metals		25% of 27%	
	Eco-friendly design, including limiting hazardous substances - energy efficiency		5% of 27%	
	Eco-friendly design, including limiting hazardous substances - packaging and documentation optimization		10% of 27%	
	Eco-friendly design, including limiting hazardous substances - interoperability		5% of 27%	
	Eco-friendly design, including limiting hazardous substances - use of recycled plastics in handset		5% of 27%	
	Telefónica		Corporate Impacts	107 pts
Raw materials and manufacturing			10 pts	26%
Substance		29 pts	8%	
Packaging/Delivery		20 pts	8%	
Use		13 pts	19%	
Disposal		6 pts	4%	
Functionality		25 pts	25%	
UL	Material Use	15 pts	N/A	
	Energy Use	24 pts	N/A	
	Health and Environment	27 pts	N/A	
	End Of Life	12 pts	N/A	
	Packaging	13 pts	N/A	

Scheme	Category rated	Maximum points in each category	Weighting % of the category to final score
	Manufacturing and Operations	18 pts	N/A
	Innovation	10 pts	N/A
Sprint	Reduction of Environmentally Sensitive Materials	30 pts	N/A
	Life cycle Management	25 pts	N/A
	Energy Management	20 pts	N/A
	Sustainable Packaging	20 pts	N/A
	Eco-friendly applications	10 pts	N/A
	Innovation	10 pts (extra credit)	N/A
Vodafone	Corporate Level Environment and Social issues		20%
	Product		80%

8 Appendix D: Potential basis for a global eco-rating for mobile handsets

8.1 Overview

The development of a global eco-rating scheme for mobile handsets is being discussed within ITU-T Study Group 5 “Environment and Climate Change”.

ITU-T SG 5 should consider the following evaluation parameters:

- Provide a comprehensive and comparative ranking of the environmental performance of a mobile handset considering a lifecycle approach. It could also include the analysis of the company, supply chain sustainability performance;
- Establish minimum requirements within each area to ensure minimum environmental performance and sustainability credentials within the company, its supply chain and handset manufactured;
- Have a scoring point system that could provide additional credit for superior performance within each area of evaluation;
- Be based on an overall life cycle approach;
- Be simple to complete and to understand for all stakeholders;
- Generate a framework to incentivize manufacturers to improve performance;
- Provide for innovation in sustainability to be scored and promoted;
- Take into consideration the technical and market realities of the mobile handset sector.

8.2 Suggested baseline and considerations for enhancement for company performance

- Reporting of a company’s GHG emissions through a recognized international scheme (e.g. Carbon Disclosure Project) and to a recognized standard (e.g. GHG Protocol);
- Implementation of an environmental management system based on ISO 14001 or equivalent within both corporate operations and manufacturing;
- Implementation of a health and safety management system based on OHSAS 18001 or equivalent;
- Implementation of a labour management system;
- Implementation of ethical business principles;
- Implementation of ethical purchasing principles;
- Implementation of a corporate responsibility/sustainability programme based on ISO 26000 or equivalent;
- Additional scores for specific supply chain reductions, goals, targets or management plans for:
 - ◇ GHG emissions;
 - ◇ Water;
 - ◇ Waste;
 - ◇ Other pollutants.
- Public reporting of sustainability with additional points for third-party verification.

8.3 Suggested baseline and consideration for Enhancement for supply chain performance:

- Report on supply chain GHG emissions through a recognized international standard (e.g. ITU-T L.1420) and to a recognized standard (e.g. GHG Protocol);
- Implementation of a Supplier Code of Conduct;
- Flowdown of environmental management systems, policies and practices (based on ISO 14001 or an equivalent);
- Flowdown of health and safety management systems, policies and practices (based on OHSAS 18001 or equivalent);
- Flowdown of labour management systems, policies and practices;
- Flowdown of ethical business principles;
- Flowdown of ethical purchasing principles;
- Flowdown of corporate responsibility/sustainability management systems, policies and practices programme (based on ISO 26000 or equivalent);
- Supplier audit and continuous improvement programme;
- Implementation of a conflict minerals policy;
- Higher score for implementation of the preceding requirements with supplier contracts;
- Higher score for public reporting of supply chain audits and performance to supplier code of conduct;
- Additional scores for specific supply chain reductions, goals, targets or management plans for:
 - ◇ GHG emissions;
 - ◇ Water;
 - ◇ Waste;
 - ◇ Other pollutants.

8.4 Suggested baseline and Considerations for enhancement for handset performance

8.4.1 Environmental impact (GHG)

- Assessment based on ITU-T Recommendation L.1410: Methodology for environmental impact assessment of information and communication technologies goods, networks and services.

8.4.2 Materials

- The use of recycled plastics. Higher score for higher content.
- Resource efficiency measurement through the measurement of the amount of materials used in the housing and the surface area of integrated circuits.

8.4.3 Hazardous materials

- Compliance to RoHS and REACH;
- Elimination or management of PVC, halogenated fire retardants, other halogenated compounds, phthalates, antimony and beryllium within devices, batteries and accessories. Higher score for elimination rather than control.

8.4.4 Packaging

- Minimization of all packaging and inbox materials. Higher score for the least amount of packaging;

- Maximization of recycled content in paper and plastic packaging. Higher score for greater levels of recycled content. Higher score for proper labelling;
- Maximization of recycled content within all packaging and inbox materials. Full recyclability of all packaging. Higher score for labelling of recyclable materials to provide consumers with the correct information;
- No inks based on volatile organic compounds (VOC);
- Forest-based product packaging and inbox materials (i.e. paper and cardboard) only from sustainable sources (FSC/PEFC or equivalent). Higher score for higher content.

8.4.5 Energy Efficiency

- Compatibility with ITU-T L.1000 universal charger recommendation scheme;
- Embedded power saving applications within the device.

8.4.6 Innovation, Enabling Effect and Dematerialization

- Points awarded for innovative:
 - ◇ Applications;
 - ◇ Hazardous material elimination;
 - ◇ Power efficiency;
 - ◇ Etc.

8.4.7 Device Life and Recycling

- Minimum level of recyclability of a device. Higher score for higher recyclability;
- Minimum coverage for recycling programmes offered by the manufacturer in global markets. Higher score for greater coverage;
- Hardware and software upgradeability;
- Ability to repair and reuse parts during the repair process.

8.4.8 External Consultation & Audit and Verification Activities

- External consultation and review with ENGOs and other stakeholders;
- Review and audit of information provided on a sampling basis.

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An energy-aware survey on ICT device power supplies
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