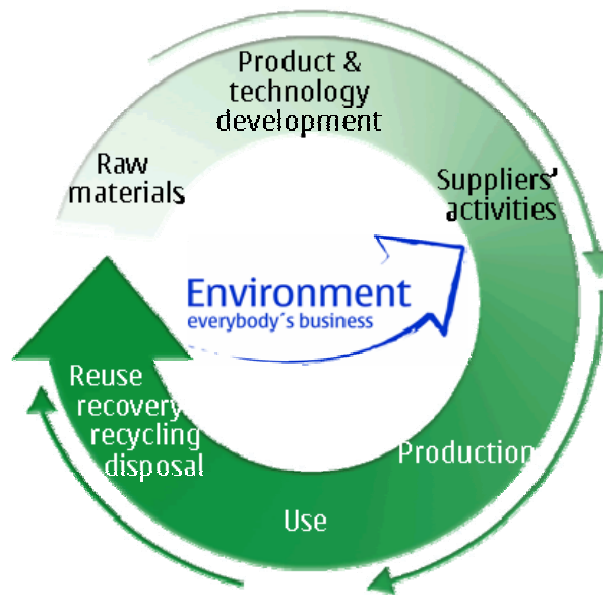


# Integrated Product Policy Pilot on Mobile Phones

## Stage IV Final Report:

New Environmental Initiatives & Experiences from the pilot



# NOKIA

Espoo, Finland, September 2006

With contributions from:

**European Commission, AMD, Spansion, BEUC, DEFRA, Epson, France Telecom / Orange, Intel, Motorola, Panasonic, SYKE, TeliaSonera, Umicore, Vodafone and WWF**

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## Executive Summary

The Integrated Product Policy (IPP) pilot project of Nokia was initiated as a part of European Commission's (EC) effort to work together with stakeholders to further develop the IPP approach. The objective of the EC's IPP approach is to “reduce the environmental impacts from products throughout their life-cycle, harnessing, where possible, a market-driven approach, within which competitiveness concerns are integrated”. This pilot project on mobile phones is being carried out in five stages. Presently the pilot is in its fifth stage.

### Stage I

In stage I, environmental issues in all the life-cycle phases of mobile phones were identified and evaluated. The use phase and components manufacture phase were identified as the biggest contributors to the life-cycle environmental impacts, and energy consumption was identified as the most significant environmental aspect. The most important life-cycle environmental issues as identified in stage I<sup>1</sup> report include energy consumption in the components manufacturing phase, no-load power consumption of the charger in the use phase, presence of some materials of concern in the mobile phones<sup>2</sup>, collection of unwanted mobile phones and their recycling. From the perspective of a mobile system<sup>3</sup>, the energy consumption of radio base stations during the use phase was identified as most significant. The lack of appropriate methods for carrying environmental assessments to assist companies in practical eco-design work was also identified.

As the IPP pilot project was planned to be completed in a year's time, the scope of the project was narrowed down to address selected most significant aspects of the mobile phones after the stage I. Three focus areas were selected for further work: Energy consumption during the life-cycle of mobile phones; Material related environmental issues in the life-cycle, and Methods/Tools for assessing life-cycle environmental performance/impacts. The pilot comprehensively covers the life-cycle environmental issues and improvements for the mobile phones but for the network infrastructure, only improvement options for reducing the impacts from energy consumption in use phase were identified and analysed.

### Stage II

In this stage<sup>4</sup> numerous improvement options were identified under eight themes in discussion with the participating stakeholders that can lead to improvements in the environmental performance in various life-cycle phases of mobile phones especially in the focus areas. These solutions encompass all technological, behavioural and policy solutions and require actions by several stakeholders in various life-cycle phases.

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<sup>1</sup> See Nokia's stage I final report at: [http://europa.eu.int/comm/environment/ipp/pdf/nokia\\_mobile\\_05\\_04.pdf](http://europa.eu.int/comm/environment/ipp/pdf/nokia_mobile_05_04.pdf)

<sup>2</sup> These materials do not present any environmental or human health hazard when the phone is in use but they might be released into the environment from landfills, incinerators or recycling facilities if the end-of-life processes are not managed properly.

<sup>3</sup> The mobile system consists of mobile phones, a radio network with radio base stations and radio network control equipment, and a core network with switches, routers, servers and workstations.

<sup>4</sup> See stage II final report at: [http://europa.eu.int/comm/environment/ipp/pdf/nokia\\_st\\_II\\_final\\_report.pdf](http://europa.eu.int/comm/environment/ipp/pdf/nokia_st_II_final_report.pdf)

## Stage III

In this stage<sup>5</sup>, over 50 improvement options identified by the stakeholders in stage II were analysed and then screened/classified to identify those that can be further analysed and worked upon. The options were analysed for economic, environmental and social impacts, feasibility, geographic reach of improvements, time required for implementation and the related ongoing initiatives in the sector<sup>6</sup>. The participating stakeholders analysed the improvement options relevant for them based on their expertise, experiences and judgements.

## Stage IV

The stage IV of the IPP pilot project has resulted in setting up of five environmental initiatives which have the potential of eliminating a very large portion of life-cycle environmental impacts of mobile phones. These initiatives cover most of the options that after the brief analysis in the stage III were classified as ‘Qualified-High Priority’.

The initiatives are led by task forces comprising of several participating stakeholders. The task force leaders are representatives from the organisations who have the most direct influence on the initiative and are committed to report the progress on a regular basis. The initiatives are:

### 1. Information and Communication – Nokia & France Telecom/Orange Lead

- Product Environmental Facts & Communications – Nokia Lead

This aims to develop a suitable product environmental information scheme for mobile phones including ways to communicate it to the consumers in the most effective way. The information scheme shall assist consumers in identifying products with good environmental performance and help them make environmentally sound choices while buying phones.

- Usage and Disposal Information & Communications - France Telecom/Orange Lead

This aims at development and communication of information to consumers on environmentally sound practices during the use and end-of-life (EoL) phases of mobile phones to minimise the environmental impact.

### 2. Reduce Energy Consumption (in Use Phase) – Nokia Lead

This aims to develop and implement a suitable solution for adding reminders in phones to inform/advice consumers to unplug chargers from the wall after the phone is fully charged. It is estimated that if this measure led to only 10% of the world’s mobile phone users not leaving their chargers on no-load, it would save enough energy to power 60 000 European homes for a year.

### 3. Reduce/Eliminate Agreed Materials of Concern – Epson Lead

This aims to reduce and eliminate the use of certain flame retardants, and phthalates in plastics from mobile phones.

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<sup>5</sup> See stage III report at: [http://ec.europa.eu/environment/ipp/pdf/report\\_02\\_08\\_06.pdf](http://ec.europa.eu/environment/ipp/pdf/report_02_08_06.pdf)

<sup>6</sup> See appendix B for the various aspects considered for analysing the improvement options.

#### 4. Take-back of Phones – Vodafone Lead

This initiative aims to analyse, identify and share good practice incentives that drive consumer behaviour toward increased return of used/unwanted mobile phones, devices and batteries in a select number (to be determined) of different countries/markets. The initiative will also include piloting of selected ‘new’ incentives for the return of used/unwanted phones, devices and batteries and communication of the results from the pilot across industry with the intention of using new incentives, if successful, into existing return schemes where appropriate.

#### 5. Environmental Assessment Methods/Tools – SYKE Lead

This initiative aims to further develop and standardise a practical eco-design approach like KEPs for use in industry for environmental assessments.

Overall the participating stakeholder group found that the IPP approach has the potential to provide an efficient, effective and quick way to drive environmental improvements. During the project, a common understanding was reached among the participants on environmental issues of significance for mobile phones, feasible improvement solutions, and roles of the different stakeholders in implementing these solutions.

In conclusion, the IPP approach should be used for bringing in the environmental improvements in products. The project has shown that a voluntary and market-driven approach can bring the relevant stakeholders around the table to proactively reduce the environmental impacts of production and consumption.

The process followed in this pilot is one model of how to put IPP approach in practice. This process can be used by public authorities as well as other stakeholders. However, success of the approach relies heavily on engaging stakeholders and ensuring that a lead organisation is driving the process. Therefore, incentives such as recognition for front-runners will need to be considered when moving forward with this approach.



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# 1. Introduction

## 1.1 Integrated Product Policy Pilot Project on Mobile Phones

The Integrated Product Policy (IPP) pilot project of Nokia was initiated as a part of European Commission’s (EC) effort to work together with stakeholders to further develop the IPP approach. The objective of the EC’s IPP approach is to “reduce the environmental impacts from products throughout their life-cycle, harnessing, where possible, a market-driven approach, within which competitiveness concerns are integrated”<sup>7</sup>.

This pilot project on mobile phones has been carried in five stages as shown in the figure. The pilot has recently concluded the stage IV and is now in stage V.

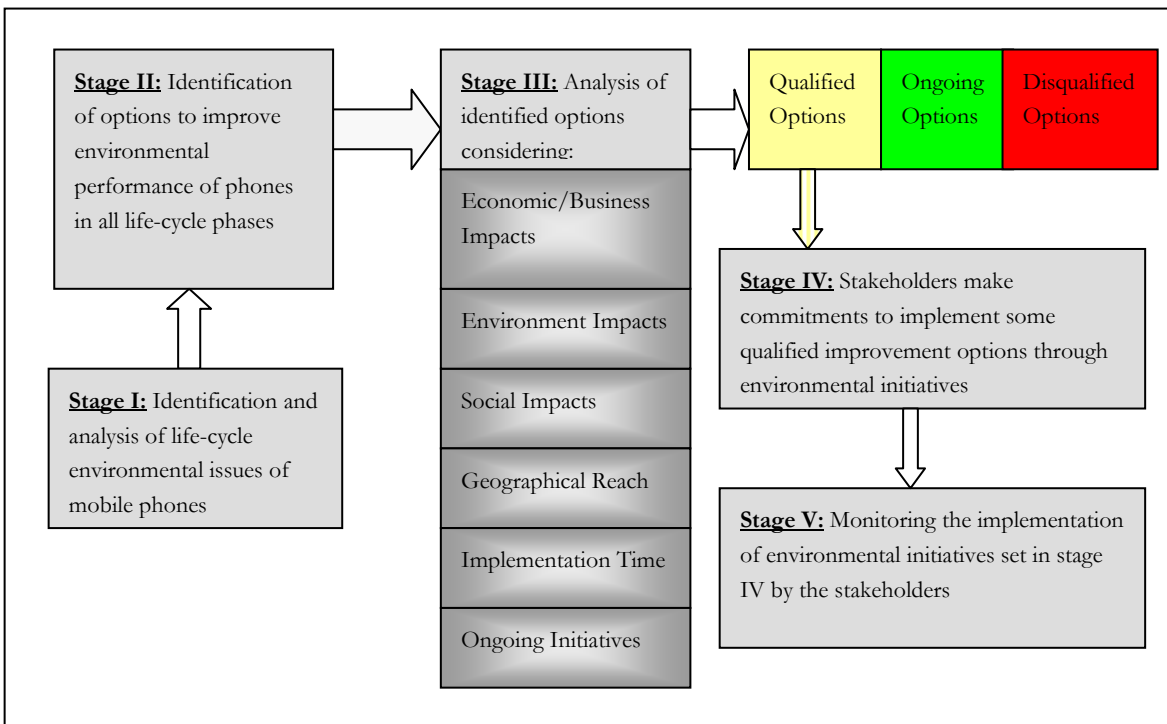


Figure 1-1: Stages in Nokia’s IPP Pilot on Mobile Phones

In the stage I of the pilot, environmental issues during the various life-cycle phases of mobile phones were identified and analysed. The stage I report<sup>8</sup> was discussed with the participating stakeholders<sup>9</sup> and three focus areas were selected for further work: Energy consumption during the life-cycle of mobile phones; Material related environmental issues in the life-cycle, and Methods/Tools for assessing life-cycle environmental performance/impacts. These areas are not exclusive with regard to the environmental impacts, but as the project was running for a limited time period the areas they are most significant for mobile phones were considered. In the stage II, numerous improvement options were identified in discussion with the

<sup>7</sup> See EC’s IPP at: <http://europa.eu.int/comm/environment/ipp/home.htm>

<sup>8</sup> See stage I final report at: [http://europa.eu.int/comm/environment/ipp/pdf/nokia\\_mobile\\_05\\_04.pdf](http://europa.eu.int/comm/environment/ipp/pdf/nokia_mobile_05_04.pdf)

<sup>9</sup> See appendix A for the list of stakeholders participating in this pilot.

participating stakeholders that can lead to improvements in the environmental performance of phones especially in the focus areas<sup>10</sup>.

In the stage III, a brief analysis of these improvement options was done to identify the ones that can be further analysed and worked upon<sup>11</sup>. The improvement options were classified in three categories: ‘Qualified’, ‘Ongoing’ and ‘Disqualified’, on the basis of the analysis.

In the recently concluded stage IV of the pilot, the participating stakeholders have set and committed to new environmental initiatives covering most of the options that after the brief analysis in the stage III were classified as “Qualified-High Priority”.

## **1.2 Scope of the Pilot**

Nokia’s IPP pilot project is focused on mobile phones and its life-cycle, and has a global dimension. The pilot comprehensively covers the life-cycle environmental issues and improvements for the mobile phones but does not cover all the life-cycle phases of the network infrastructure. For the network infrastructure, only improvement options for reducing the impacts from energy consumption in use phase were identified and analysed. Improvements options during the production and end-of-life (EoL) phase of the network infrastructure are not in the scope of this pilot. As the IPP pilot project was planned to be completed in a year’s time, the scope of the project was narrowed down to address selected significant aspects of the mobile phones after the stage I.

## **1.3 Objectives in Stage IV**

The main objectives in stage IV included:

- Development of new environmental initiatives to cover most of the options that were classified as “Qualified – High Priority” in stage III. A single initiative covers one to several related options.
- Identification of the task forces responsible for further development and implementation of these new initiatives.
- Development of action plans for implementation of new initiatives by the task forces.
- Documentation of the experiences of the participating stakeholders.

## **1.4 Methodology in Stage IV**

Nokia initiated the development of environmental initiatives by creating lists of the qualified options that could be implemented by the participating stakeholders both individually and in cooperation with others. The lists were based on the conclusions made during stage III.

Several meetings were held between the participating stakeholders to discuss the relevant options, commitments and to build a consensus on the most suitable environmental initiatives. A one-day workshop was held for the final agreement on the new initiatives and to identify the

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<sup>10</sup> See stage II final report at: [http://europa.eu.int/comm/environment/ipp/pdf/nokia\\_st\\_II\\_final\\_report.pdf](http://europa.eu.int/comm/environment/ipp/pdf/nokia_st_II_final_report.pdf)

<sup>11</sup> See stage III final report at: [http://ec.europa.eu/environment/ipp/pdf/report\\_02\\_08\\_06.pdf](http://ec.europa.eu/environment/ipp/pdf/report_02_08_06.pdf)

members and leaders of the task forces that would further develop and implement these new initiatives. In all five new initiatives and task forces were established.

The task forces developed action plans for the development and implementation of the new initiatives. These action plans were discussed and agreed in the fourth stakeholder meeting in Brussels on 3 May 2006 and are described in the chapter 2. The experiences from the pilot were also discussed by the stakeholders during the meeting. These experiences and lessons are mentioned in the chapter 3.



## 2. New Environmental Initiatives

Five new environmental initiatives have been set up in the stage IV<sup>12</sup>. These initiatives cover most of the options classified as “Qualified – High Priority” in the earlier stage III. It is estimated that a significant portion of environmental impacts related to mobile phones can be eliminated through successful implementation of these initiatives. The following table highlights the link between the initiatives and the improvement options analysed in stage III.

Table 2-1: Improvement options addressed by the initiatives

New Environmental Initiatives	Improvement Options from Stage II, III Reports
Information and Communications a) Product Environmental Facts & Communications b) Usage and Disposal Information & Communications	<ul style="list-style-type: none"> <li>– Inform consumers on the environmental aspects of the mobile phones to enable them to make informed environmental choices by using an effective eco-information tool.</li> <li>– Inform and educate the consumers on sustainable behaviour.</li> <li>– Study consumer behaviour from the perspective of buying, usage and disposal patterns.</li> <li>– Develop consumer guides to advise the consumers on sustainable behaviour in use and disposal phase.</li> </ul>
Reduce Energy Consumption (in Use Phase )	<ul style="list-style-type: none"> <li>– Equip the phones/chargers with sound or visual reminders that go on if the chargers are left connected to the power supply after the phone batteries are charged.</li> </ul>
Reduce/Eliminate Agreed Materials of Concern	<ul style="list-style-type: none"> <li>– Eliminate the use of chlorinated, brominated, and antimony trioxide based flame-retardants in PWBs, components, modules and parts.</li> <li>– Eliminate the use of certain phthalates (used as softeners) in plastics.</li> <li>– Declare the material composition of components to the phone manufacturers.</li> </ul>
Take-back of Phones	<ul style="list-style-type: none"> <li>– Research what incentives to consumers (like money back system, loyalty card reward points, ring tones, games, screen savers etc.) could attract the return of significant quantities of used/unwanted mobile phones. Also assess the potential of deposit-refund scheme for mobile phones.</li> <li>– Provide incentives, based on research findings, to consumers to return their unwanted mobile phones for recycling.</li> </ul>
Environmental Assessment Methods /Tools	<ul style="list-style-type: none"> <li>– Further develop and standardise the KEPIs approach for environmental assessment.</li> <li>– Develop tools for assessing the environmental and social impacts of different materials and substances.</li> <li>– Provide life-cycle inventory data to phone</li> </ul>

<sup>12</sup> These initiatives and commitments may be subject to review in cases where there are new conflicting legal requirements in prospect.

	manufacturers in line with the requirements of agreed environmental assessment methods/tools.
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**2.1 Information and Communications Initiative**

The stakeholder group had in the previous stage identified that information flows in various life cycle phases are critical for improving the life cycle environmental performance of the mobile phones. The stage III report in section 6.4 discussed the various kinds of information flows needed during the different life cycle phases. The report delineated that in particular the information flows from the manufacturers/retailers to the consumers need to be strengthened so that the consumers are aware of the environmental characteristics of the mobile phones when they are buying them, and the environmentally sound practices on using and disposing the phones so as to minimise their environmental impacts.

The information and communications initiative was set up to strengthen the information flows from the manufacturers/retailers to the consumers. Two sub-initiatives were set under this initiative a) Product Eco-Facts & Communications and b) Usage and Disposal Information & Communications.

The first sub-initiative focuses on information which consumers can use to make environmentally sound choices and to differentiate the products on the basis of their environmental impacts/performance. The second sub-initiative focuses on information that should be provided to consumers to stimulate actions for reducing the impacts in use and end-of-life phases. The content and the channels of communication of the information pertaining to these subgroups differ due to the difference in the end objectives and the times of interventions in the life cycle stages.

**2.1.1 Product Eco-Facts & Communications – Nokia Lead**

The stage III IPP report strongly supports the strengthening of information-based instruments to create consumer demand for environmentally sound products. A successful consumer information scheme for example is the EU energy label for house-hold appliances. This scheme has effectively shifted the consumer behaviour towards the purchase of more energy and water efficient household appliances (European Environment Agency, 2005). The stage III report identifies the following attributes of a good information scheme.

*Table 2-2: Attributes of a good scheme for informing consumers on the environmental aspects of products*

Consumers' Perspective	Manufacturer's Perspective
Information should be: <ul style="list-style-type: none"> <li>– Easily understandable</li> <li>– Easily accessible</li> <li>– Comparable for products in same category</li> <li>– Provided in a suitable format</li> <li>– Credible</li> <li>– Widely accepted</li> <li>– Verifiable</li> </ul>	Information scheme should: <ul style="list-style-type: none"> <li>– Cover significant life-cycle environmental aspects</li> <li>– Support continuous improvements and innovations</li> <li>– Not increase the time to market products</li> </ul> Information should be: <ul style="list-style-type: none"> <li>– Easy and fast to produce</li> <li>– Format can be updated and modified regularly in line with technological developments</li> <li>– Cost-efficient to produce</li> </ul>

## **Task force**

The task force for developing a Product Eco-Facts scheme consists of:

- Ms. Minna Lindholm (Nokia): Task force leader
- Ms. Catherine Cachard & Ms. Zubaria Lone (France Telecom / Orange)
- Mr. Siegfried Pongratz (Motorola)
- Mr. Julian Lageard (Intel)
- Mr. Jyri Seppala (SYKE - Finnish Environmental Institute)
- Mr. Matthew Wilkinson (WWF)
- Ms. Silke Hermanns (AMD)

## **Objectives**

The main objectives of this sub-initiative are:

- To develop a suitable product eco-facts scheme for mobile phones including ways to communicate it to the consumers in the most effective way. The task force group will also define the format for declaring product eco-facts and agree on what information it shall contain. Ideally, the information should assist consumers in identifying the products with good environmental performance by comparing most significant environmental characteristics of products.
- To develop a long term communications and awareness plan for the product eco-facts scheme so that it is widely used by the consumers before making purchase decisions.

## **Approach**

The development of this sub-initiative will use the following approach.

- Stakeholder Engagement: Presently the task force comprises of phone manufacturers, operator, component manufacturer, research institute and an NGO.
- Study of Existing Schemes: The task force shall identify and analyse the already existing eco-information schemes relevant for mobile phones. This analysis will provide the group with insights on what may and may not work and identify the existing good practices. The task force shall also identify the linkages of this work with related initiatives and approaches. The task force will consider the work done by the IPP Working Group on Product Information Needs<sup>13</sup>, EU - RoHS, WEEE, EuP - directives and the work done in the Mobile Phone Partnership Initiative (MPPI) under Basel convention, UNEP.
- Format Development: The task force shall develop a format to declare the environmental facts about the products in the best possible way. The format shall include most significant facts based on life-cycle environmental impacts such as no-load power consumption of chargers, presence of materials of concern in the phone. It has been

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<sup>13</sup> See: [http://ec.europa.eu/environment/ipp/ipp\\_wg.htm](http://ec.europa.eu/environment/ipp/ipp_wg.htm)

agreed within the group that EMF/SAR issues will not be listed as they are already being communicated through other means<sup>14</sup>.

- Piloting the Scheme: The task force shall run a small pilot after developing the format. The developed format will be consulted with the consumers to know their views about it and assess if they will be able to effectively use it in their purchase decisions.
- Communicating and Awareness Raising: The taskforce shall identify and agree on the ways and means for providing the product eco-facts to the consumers so that they can use them before making the purchase decisions. The measures that need to be taken to raise the awareness on the scheme will also be identified. Raising awareness about the scheme will be proposed to be a shared responsibility between the public authorities, businesses and the NGOs.
- Credibility through surveillance: The task force team proposes - market surveillance - as the tool for the verification of information declared in the product eco-facts by the manufacturers. Market surveillance could be carried to ensure the credibility of the environmental facts being declared by the manufacturers and operators. Market surveillance is already used in many other important areas like electrical safety.
- Voluntary agreement: The phone manufacturers and operators could agree on a voluntary agreement to use the product eco-facts scheme. The product eco-fact sheet should be readily available to the consumers when they are buying the products. To raise the status and build awareness about this scheme, the European Commission could verify it and also acknowledge the voluntary agreement between the phone manufacturers and the network operators if it meets the appropriate requirements. The initiative would comply with the rules of competition.
- Consumer and public procurement decision-making: The declared environmental facts can be used by consumers for making environmentally sound choices. The facts can also be used by public authorities for Green Public Procurement (GPP) and identification of environmentally superior products and the industry front-runners. According to the Commission, the work that will be done in this initiative could feed into the development of EU Eco-Label Scheme.

## **Timeframe**

A total time frame of one year may be required for the development of the scheme. Building awareness on the product eco-facts scheme would take a longer time.

*Table 2-3: Timeframe for development of Product Eco-Facts scheme*

Task	Responsible person	Target	Target date
Stakeholder engagement	Task force team	Nominate task force team, team members commit to targets.	April 2006
Study of existing schemes	Task force team	Identify and analyse already existing eco-information schemes. Capture the good practices.	June 2006

<sup>14</sup> See for example: <http://sar.nokia.com/sar/index.jsp>

Communications	Task force team	Identify and agree on the ways and means of communicating the product eco-facts to the consumers.	August 2006
Format development	Task force team	Agree what information is to be presented and in what format.	September 2006
Piloting	Task force team	Draft format shall be piloted within the task force group companies.	November 2006
Feedback collection and analysis	Task force team	Feedback shall be collected and analysed from the pilot. Improvements will be identified and format updated accordingly.	December 2006
Communication and Awareness raising	Task force team	Agree on how to develop awareness in the market about the product eco-facts scheme. (Might require some funding for NGOs)  Agree how format is marketed/ communicated to selected phone manufacturers, retailers and network operators to enable a wider use of the eco-facts scheme.	December 2006  Communication: February 2007
Voluntary agreement	Task force team	The phone manufacturers and operators voluntarily commit to use the product eco-facts scheme to provide information to the consumers in the agreed way	April 2007
Reporting	Task force team/Minna	Progress reports published on the European Commission's website	Quarterly

The timeline mentioned in the above table is indicative and can be subject to changes.

### **Reporting on the Progress**

Summary of the quarterly reports on the progress of this initiative will be published on the Commission's IPP Pilot web-pages to bring transparency to the whole process.

### **Other Stakeholders Joining this Task Force**

The group has decided to invite directly some other mobile phone manufacturers and network operators to join this scheme. However, this is an open initiative and any other interested stakeholders who are committed to contribute to the development of the scheme and raising awareness about it on a voluntary basis are welcome to join the task force.

## **2.1.2 Usage and Disposal Information & Communications - France Telecom / Orange Lead**

This sub-initiative looks at information relevant to influence consumer behaviour in the use and disposal phase.

### **Task force**

The present task force consists of:

- Ms. Catherine Cachard & Ms. Zubaria Lone (France Telecom / Orange): Task force leader
- Ms. Minna Lindholm (Nokia)
- Ms. Silke Hermanns (AMD)

- Ms. Vivian Mikalsen (BEUC)
- Mr. Siegfried Pongratz (Motorola)
- Mr. Julian Lageard (Intel)
- Mr. Jyri Seppala (SYKE - Finnish Environmental Institute)
- Mr. Matthew Wilkinson (WWF)

## **Objectives**

The main objectives of this sub-initiative are:

- Development of information to be communicated to customers/consumers to help them in adopting environmentally sound practices during the use and EoL phases of mobile phones to keep the environmental impact at minimal.
- Identify the most effective channels for this communication over the long run.

## **Approach**

The development of this sub-initiative will use the following approach.

- Define key environmental focus areas linked to desirable customer/consumer behaviours with respect to environmentally responsible mobile phone use and disposal.
- Gather knowledge about existing customer/consumer needs with respect to environmental information across Europe from participating stakeholders.
- Seek input from other stakeholders and trade associations (not directly participating in this IPP pilot) about existing good practice for communicating environmental information.
- Establish suitable communication channels to target customers/consumers.
- Prepare proposed content and messages for customers/consumers tailored for particular communication channels.
- Test, the format, content and messages to be adopted.
- Introduce environmental information.
- Review and update the environmental communication for customers/consumers.

## **Timeframe**

A time of one year may be required for this initiative.

*Table 2-4: Timeframe for development of environmental information relevant for use and end-of-life phases*

Actions	Target date
Define key environmental focus areas linked to desirable customer/consumer behaviours with respect to environmentally responsible mobile phone use and disposal	Done

Gather any knowledge about existing customer/consumer needs with respect to environmental information across Europe from participating stakeholders	August 2006
Seek input from other stakeholders and trade associations (may not be currently participating in IPP) about existing good practice for communicating environmental information	September 2006
Establish suitable communication channels to target customers/consumers	End of October 2006
Prepare proposed content and messages for customers/consumers tailored for particular communication channels	December 2007
Test the format, content and messages to be adopted	January - March 2007
Introduce environmental information	From April 2007
First review of how well environmental messages have been received and then repeated at pre-agreed intervals – possible by representatives of this workstream or as part of a voluntary agreement	End 2007

The timeline mentioned in the above table is indicative and can be subject to changes.

### **Reporting on the Progress**

Summary of the quarterly reports on the progress of this initiative will be published on the Commission's IPP Pilot web-pages to bring transparency to the whole process.

### **Other Stakeholders Joining this Task Force**

The group has decided to directly invite some other mobile phone manufacturers and network operators to join this scheme. However, this is an open initiative and any other interested stakeholders who are committed to contribute to the development of the scheme and raising awareness about it on a voluntary basis are welcome to join the task force.

## **2.2 Reduce Energy Consumption (in use phase) Initiative – Nokia Lead**

This initiative aims at reducing the energy consumption of mobile phones during the use phase. Mobile phone is a complicated device and one of the crucial product development criteria is to optimise energy consumption when phone is in use (long standby and talk times). Longer standby and usage times are very important features for the phone users and thus crucial drivers during the product development. As illustrated in figure 2-5 in IPP stage I report, there has been a big improvement in these factors, especially if we compare it to the increase in the number of functions a current phone provides.

For the IPP pilot it was decided there will not be any new initiatives for reducing the energy consumption of the mobile phone as it is a business-as-usual issue. Instead the focus would be on reducing the energy consumption of the chargers in the use phase as their energy consumption, especially no-load energy consumption, is significant.

As discussed in stage I report, approximately 30% of the life cycle energy consumption of a mobile phone is wasted as no-load power consumption of the charger (assuming that the in-use life time of a mobile phone is 2 years and the charger is left plugged in after the phone is charged). This energy can be saved by a) reducing the no-load power consumption of the charger and b) by unplugging the chargers from the wall after the phone is charged.

There is a voluntary code of conduct for reducing the no-load power consumption of the chargers. Owing to this code, the no-load energy consumption has gone down from 1.3 watts for 1999 chargers to less than 0.3 watts for present generation of chargers. The phone

manufacturers participating in this pilot are signatories amongst others to this code of conduct.

This initiative aims to further reduce the energy lost in no-load power consumption by stimulating consumer action on unplugging the chargers from the wall or switching off the electricity supply to the chargers after the phone is charged.

The stage III IPP report strongly supports the idea of informing consumers to unplug chargers from the wall after the phone is fully charged. This initiative aims at changing consumer behaviour globally and save the energy lost in no-load consumption during the in-use life of a mobile phone.

For phone chargers with no load standby power consumption less than 0.3 watts approximately 17 MJ/year to 26 MJ/year of energy is lost in no-load power consumption depending upon the usage profile. There were over 2.2 billion mobile phone subscribers worldwide in 2005. Using some approximations, it is estimated that the yearly amount of energy saved by switching off the electricity supply to all the 2.2 billion chargers used worldwide will be sufficient to power around 600 000 European dwellings for a year<sup>15</sup>. This estimation is based on the assumption that all the 2.2 billion chargers used worldwide are connected to the power supply after the phone is charged.

In the stage III of this IPP pilot two options were briefly analysed by the phone manufacturers for adding reminders to stimulate consumer action<sup>16</sup>.

1. Sound reminder in charger: A sound reminder requires addition of a few components like speaker, small circuit etc. in the charger, which may cause an increase in the environmental load (in raw material acquisition and component manufacture phase) as well as an increase in the costs of the charger. This added environmental load of few components may offset some of the environmental benefits achieved from saving energy (in use phase). The sound of the reminder may also be annoying for some consumers especially if they put the phone to charge before going to sleep.
2. Visual reminder in phone: In this case, the phone may, after the battery is charged, e.g. give a beep once and then flash a message for some time on its screen, like "Phone is full charged; you may unplug the charger from the socket". This option will require changes in the software but no additional components need to be added. The environmental gains will be higher in this case as compared to addition of a sound reminder in the charger.

*Table 2-5: Attributes of a good solution for adding reminders*

Consumers' Perspective	Manufacturer's Perspective
The reminder should : – Be easily understandable	The solution should: – Be implementable and cost-effective

<sup>15</sup> The average energy consumption in the EU 15 for 2003 was 1.711 toe/dwelling. Source: <http://www.odyssee-indicators.org/>

<sup>16</sup> In addition an alternative to completely eliminate the no-load power consumption, by adding an intelligent circuit in the charger which automatically switches the charger off when a phone is fully charged, was also evaluated. See the option 1 in section 4.1 in the IPP Stage III Report available at: [http://ec.europa.eu/environment/ipp/pdf/report\\_02\\_08\\_06.pdf](http://ec.europa.eu/environment/ipp/pdf/report_02_08_06.pdf)

<ul style="list-style-type: none"> <li>- Not cause problems with normal phone usage / charging</li> <li>- Acceptable</li> </ul>	<ul style="list-style-type: none"> <li>- Compatible with user interface and other design styles and decisions</li> <li>- Cause no/minimal additional environmental impacts</li> <li>- Implementable - possible exemptions should be taken into account (e.g. if a display size in some special type of phones is physically too small)</li> </ul>
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**Task force**

At present the task force consists of:

- Mr. Olli-Pekka Mäkirintala (Nokia) – Task force leader
- Ms. Catherine Cachard & Ms. Zubaria Lone (France Telecom / Orange)
- Mr. Ramana James (Vodafone)
- Mr. Siegfried Pongratz (Motorola)

**Objectives**

The main objectives of this initiative are:

- To develop and implement a suitable solution for adding reminders in phones to inform / advise consumer to unplug chargers from the wall after the phone is fully charged.
- Raise consumer awareness of no-load energy consumption.
- Ensure as much as possible that majority of the phones in the market use such reminders in the phones.

**Approach**

1. Stakeholder engagement: At present the task force consists of phone manufacturers and operators. However, the taskforce is open for participation by other stakeholders including manufacturers and operators.
2. Development of a solution: This taskforce shall develop and agree on a solution for informing consumers. The method shall include agreed basic requirements for reminders. However final implementation details, like design related issues, shall be left for individual companies.
3. Voluntary agreement: The phone manufacturers and operators could launch a voluntary agreement to implement and require this feature for phones developed and purchased. The companies who join this voluntary agreement will also be encouraged to participate in the “Code of Conduct on Energy Efficiency of External Power Supplies” (European Commission, 2004). Network operators shall also require this reminder from their suppliers in order to ensure that most of the phones in the markets have such reminders. To raise the status, build awareness and encourage other manufacturers and network operators to participate in this scheme, the European Commission could verify and also acknowledge the voluntary agreement between the phone manufacturers and the network operators, if it judges that the agreement complies with all the relevant requirements. This initiative would comply with the rules of competition.

## **Timeframe**

A total time frame of one year may be required for full implementation. The implementation can be expected to start in 6 months after the agreement on the solution. The goal is that new models have this feature by end of April 2007. However, this may depend on product development / market launch cycles. The goal is that the agreement on solution shall be ready latest by October 2006.

## **Reporting on the Progress**

Summary of the quarterly reports on the progress of this initiative will be published on the Commission's IPP Pilot web-pages to bring transparency to the whole process. For the follow-up meeting (in one year's time) task force will produce a report describing the implementation status.

## **Other Stakeholders Joining this Task Force**

The group has decided to directly invite some other mobile phone manufacturers and network operators to join this scheme. However, this is an open initiative and any other interested stakeholders who are committed to contribute to the development and implementation of this initiative on a voluntary basis are welcome to join the task force.

## ***2.3 Reduce/Eliminate Agreed Materials of Concern Initiative – Epson Lead***

This task force has been set up as an outcome of the stage III of this project with an aim to reduce and eliminate the use of certain flame retardants, heavy metals and phthalates in plastics from mobile phones. This will be done by the phone manufacturers in close cooperation with the component manufacturers as they have control over the design and the manufacturing phase.

## **Task force**

The present task force consists of:

- Ms. Anna Marij van der Meulen and Mr. Eelco Smit (Epson) – Task force leader
- Ms. Silke Hermanns (AMD)
- Ms. Line Andersen (BEUC)
- Mr. Siegfried Pongratz (Motorola)
- Mr. Julian Lageard (Intel)
- Mr. Jarkko Epailys (Nokia)
- Mr. Matthew Wilkinson (WWF)
- Mr. Olli Vaananen (Spansion)

## **Objectives**

The main objectives of this initiative are:

- Identify and agree on what materials of concern should be eliminated.

- Discuss and verify possibilities for information flows between the suppliers and manufacturers on the material composition data of components.

**Approach**

1. Stakeholder engagement: This multi-stakeholder taskforce shall develop and agree which substances will be reduced / eliminated and be replaced with other substances based on agreed assessment criteria. The process for selecting assessment criteria will be scientifically based on currently available comprehensive data and information.

Existing data from EU and international risk assessments and scientific studies, as well as data from the substance manufactures, shall be used to identify the risks of the substances in use today and their potential substitutes. Furthermore, the taskforce shall aim at agreeing on a standardised system for exchanging component/part material composition declarations.

The taskforce shall follow the following steps:

- Identify all projects that are investigating / have investigated flame retardants, and phthalates (in plastics) of most concern from an environment, health and safety perspective and their eventual suitable replacements.
  - Review assessment criteria that can be used for the identification of flame retardants, and phthalates (in plastics) of most concern from an environment, health and safety perspective.
  - Based on the above, draw up commonly agreed assessment criteria that can be used for the identification of most hazardous flame retardants, and phthalates and the suitable replacements.
  - Develop replacement plans for identified materials of most concern taking into consideration the life cycle environmental impacts and consider possible targets.
  - Verify possibilities for sharing part material composition declarations from supplier to customer with existing standardised tools (RosettaNet PIP 2A13; IPC 1752).
2. Voluntary agreement: The phone manufacturers and component manufacturers could launch a voluntary agreement to reduce/eliminate materials of concerns and identify suitable alternatives.

**Timeframe**

*Table 2-6: Timeframe for reduction/ elimination of agreed materials of concern*

<b>Actions</b>	<b>Target date</b>
Proposal for a criterion to select flame retardants for phase out.	November 06
Criteria agreed with participating companies and the flame retardants selected.	December 06
Possibilities for sharing part material composition declarations from supplier to customer with existing standardised tools (RosettaNet PIP 2A13; IPC 1752) verified within the participating companies. If implementation possible, schedules defined.	December 06
Agreement on schedules for phase out	March 07
Follow-up for the phase out implementation	June 07

Considerations for further actions & follow-up of phase out implementation	June 07
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The timeline mentioned in the above table are indicative and can be subject to changes.

**Reporting on the Progress**

Summary of the quarterly reports on the progress of this initiative will be published on the Commission’s IPP Pilot web-pages to bring transparency to the whole process.

**Other Stakeholders Joining this Task Force**

The group has decided to invite directly some other mobile phone manufacturers and component manufacturers. However this is an open initiative and any other interested stakeholders who are committed to contribute to the development and implementation of this initiative on a voluntary basis are welcome to join the task force.

**2.4 Take-back of Phones – Vodafone Lead**

This initiative focuses on identification and use of certain incentives to encourage consumers to return mobile phones, devices and batteries for reuse and recycling.

*Table 2-7: Existing work related to this initiative*

Stakeholders	Locations	Incentives used
WEEE Directive	All member states should be in the implementation stage	1:1 exchange; Rebate
Vodafone	Albania, Australia, Greece, Malta, Germany, UK, Italy, Netherlands, Hungary, Spain, New Zealand, Portugal, Ireland, Egypt	Airtime, discounts on handset upgrades, donations to charity, branded giveaways , Vodafone points
France Telecom/ Orange	UK, France, Switzerland, Portugal, Egypt, Romania, Slovakia, Belgium, Netherlands, Spain, Poland	Donations to charity, discounts on handsets, environmental incentive (no financial incentive), and airtime
Nokia – Take-back pilots, Nokia Stores	Some form in all EU states, China, US	Rebates off new purchase, ring-tones, tickets to football
Recharge Battery Association Battery collection schemes:	Austria, Belgium, Czech Republic, Denmark France Germany Hungary Luxembourg Holland, Norway, Poland, Portugal, Switzerland, Sweden and Turkey	Lottery (Belgium personalised incentive, mail bag with name) Schools network and rewards Bonus points and vouchers
	Japan, US, Hong Kong	TV advertisement but not incentives

**Task force**

At present the task force consists of:

- Mr. Ramana James (Vodafone) – Task force leader
- Ms. Helena Castren and Ms. Pia Tanskanen (Nokia)
- Ms. Catherine Cachard & Ms. Zubaria Lone (France Telecom / Orange)
- Mr. Siegfried Pongratz (Motorola)

- Ms. Vivian Mikalsen (BEUC)
- Mr. Christian Hagelueken (Umicore)
- Mr. Jean-Pol Wiaux (RECHARGE)

**Objectives**

The main objectives of this initiative are:

- To analyse, identify and share good practice incentives that drive consumer behaviour toward increased return of used/unwanted handsets, devices and batteries in a select number (to be determined) of different countries / markets.
- To pilot the use of selected ‘new’ incentives for the return of used/unwanted handsets, devices and batteries.
- To communicate the results of pilots across industry with the intention of these, if successful, being adopted into existing return schemes where appropriate.

**Approach**

- Complete an analysis of existing incentives (including links to information and communications initiative) within return schemes in different continents and countries and identify and share good practice incentives.
- Complete a business case and project plan to pilot two ‘new’ incentives within existing return schemes that vary in location, market type and typical consumer behaviours.
- Set stretch return targets for pilot programs that are agreed by all stakeholders participating in this initiative.

**Timeframe**

*Table 2-8: Timeframe for identifying good practices on take-back and running pilots*

<b>Task</b>	<b>Budget</b>	<b>Resource</b>	<b>Milestones</b>
Collection, analysis, and sharing of good practice	Minimal and to be covered by participating members	Each participating member to provide dedicated resource to gather and collate data – lead organisation to be identified	December 06
		Develop a method / tool for sharing good practice amongst industry	March 07
Complete market research into consumer behaviour around incentives to return. This is to be dependant on the outcomes of the above	Through existing surveys and research	Potentially through BEUC questions and other research and surveys of initiative members	January 07 – April 07

and should focus on potential new incentives to inform the proposed pilots		If required – tailored market research through a specialist research organisation	January 07 – April 07
Pilot phase 1	Will depend on the nature of the incentives selected	Dependant on outcome of initial work. Develop business case and planning for pilot incentive projects. Targets to be agreed during this phase	April 07 – July 07
Pilot phase 2	Will depend on the nature of the incentive selected	Dependant on outcome of initial work. Run pilot incentives	July 07 – July 08
Progress reporting	NA	Initiative participants to cover	As a minimum quarterly

The timeline mentioned in the above table is indicative and can be subject to changes.

**Reporting on the Progress**

The reporting will be based on the key milestones and the associated documents. Summary of the quarterly reports on the progress of this initiative will be published on the Commission’s IPP Pilot web-pages to bring transparency to the whole process.

**Other Stakeholders for Joining this Task Force**

Any interested stakeholders who are committed to contribute to the development and implementation of this initiative on a voluntary basis are welcome to join the task force.

***2.5 Environmental Assessment Methods /Tools Initiative – SYKE Lead***

The task force has been set up as an outcome of the stage I of the IPP pilot project on mobile phones. In the pilot project, it was shown that the use of environmental impact assessment methods and tools such as life cycle assessment (LCA) for the everyday eco-design of mobile phones is not an easy task. Therefore, the involved participants have agreed to solve the difficulties, especially to set the inventory data for all important components on a broader base and to find a consensus about the best suitable impact assessment methods. In the market, there are several competitive impact assessment methods that may produce different results. In practice, the difficulties related to databases and impact assessment methods concern the whole electronic industry.

Since the methodologies and available data for conducting Life Cycle Assessments (LCAs) are constantly developing, it is important for the companies to be actively involved in methodology development and common industry efforts to collect and publish data where practicable. For these reasons, Nokia together with other companies had voluntarily worked to develop suitable methods for environmental assessments of electronic products, an example of this being the Key Environmental Performance Indicators (KEPIs) (Singhal et al., 2004).

KEPIs, a small number of product environmental performance indicators validated as representatives of the most important environmental impacts of an electronic product’s life cycle, based on LCA studies, may provide a good and simple assessment and eco-design tool for use in the electronics industry. Environmental performance indicators for a mobile phone

could be for example the total area of PWB (Printed Wiring Board), the area of the LCD (Liquid Crystal Display) and the amount of bromine compounds in the phone.

The report of stage I of the IPP pilot project identifies some of the limitations and benefits of KEPIs listed in the table below. It is expected that KEPIs are easy to use, and require little time and data. The use of KEPIs also reduces the reliance on the supply chain for data on the purchased materials, and allows the manufacturers to easily assess the relative environmental performance of their products and alternative solutions.

*Table 2-9: Limitations and benefits of KEPIs*

Limitations	Benefits
<ul style="list-style-type: none"> <li>– The weaknesses of LCAs are inherent in KEPIs.</li> <li>– KEPIs do not always replace detailed studies, in particular if detailed assessments are required for new technology or new process.</li> <li>– Peer review body and agreed timescale for periodic re-validation of KEPIs is required.</li> <li>– KEPIs may not be appropriate for policy making and monitoring purposes.</li> </ul>	<ul style="list-style-type: none"> <li>– KEPIs provide a simple approach for conducting environmental assessments within a company.</li> <li>– They are easy to communicate internally in a company.</li> <li>– They are easy to use by non-experts and are easily understood by product designers.</li> <li>– The KEPIs can be used to compare mobile phones and their components.</li> <li>– They can be used during product development.</li> </ul>

However, KEPIs, which have been very recently developed, have not yet been put in practical application at companies. They also lack a fully scientific background based on environmental impact assessment and an established procedure for stakeholder consultation. For this reason, there is a need to test, develop and standardise the KEPI approach. When industry has a right set of tools on a sound and consistent basis, then products with better environmental performance can be developed with reasonable efforts.

To develop the approach, full Risk Assessment (RA)/LCA studies of different materials and substances with reliable and approved impact assessment tools are required. There are several ongoing activities to improve the LCA/RA data of materials/substances and impact assessment methods. For example, the Joint Research Centre has started Commission project “European Platform on LCA” to strengthen the quality of life cycle inventory (LCI) databases and the impact assessment methodology<sup>17</sup>. One task of the new platform is the development of a European reference database (ELCD) and a web directory for LCA tools, data and databases as well as services and service providers. In addition, it seems that the EPIC-ICT approach<sup>18</sup> developed by a consortium of research institutions, industry and consultancy in an EU funded project offers a good starting point for the development work.

### **Task force**

The present task force consists of:

- Mr. Jyri Seppälä (SYKE - Finnish Environmental Institute) – Task force leader
- Ms. Silke Hermanns (AMD)

<sup>17</sup> See <http://lca.jrc.it>

<sup>18</sup> See [www.epic-ict.org](http://www.epic-ict.org)

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- Ms. Anna-Marij van der Meulen (Epson)
- Mr. Christian Hagelueken (Umicore)
- Mr. Siegfried Pongratz (Motorola)
- Mr. Julian Lageard (Intel)
- Ms. Salla Ahonen and Mr. Pranshu Singhal (Nokia)

The organisation of the task force includes the establishment of a research group and a management group. SYKE will be leading the task force. The task force may be expanded with e.g. technology experts of member states and non-governmental organisations after securing the funds required for carrying this initiative.

## **Objectives**

The main objectives of this initiative are:

- Further develop and standardise the KEPIs approach for environmental assessment
- Provide life-cycle inventory data for electronics in line with the requirements of agreed environmental impact assessment methods/tools

Thus, the aim of this research study is to find/develop the KEPIs including also stakeholder consultation and an agreement in the mobile phone sector, and to arrange/integrate different databases and tools in a usable way. The study also aims to be a learning process in which further research and development needs will be identified.

## **Approach**

### **Overview**

A management (multi-stakeholder) group guides the work of a research group, gives feedback and makes the final decisions on the basis of results produced by the research group. The research group reports the results and progress of the research work to the management group. The contents of the research work are shortly described in a figure later.

A starting point for developing KEPIs is that two different product groups related to the current mobile phone technology are clearly defined. Within both product groups a representative product is selected for a case study. Subsequently a comprehensive full LCA study per product is carried out. In the inventory analysis (LCI), the main assemblies of a mobile phone are broken down into sub-assemblies and components. Furthermore, sub-assemblies are modelled with “Generic Modules”: Parameterised, flexible, reliable and consistent partial LCA models, which already include design options.

The ELCD data will be used for general background data (such as electricity, materials). At manufacturer level, existing data will be gathered from the task force members’ companies and evaluated regarding their consistency, quality and usefulness.

The resulting two LCI models will include parameters of the most relevant product group/ life cycle specifics with regard to environment. This allows carrying out sensitivity analyses to prove and broaden the applicability of the environmental performance indicators which will be identified later. An assessment of existing public LCA data sources for sub-assemblies,

components and other processes regarding consistency with the ELCD database will be carried out and reported. Also, data gaps and needs to improve the present situation will be reported.

Proposals for intelligent and appropriate data management structures will be provided in order to support LCA based information. A starting point is that LCI data developed within the project uses the ELCD data format.

The impacts of the full LCI studies will be assessed by several alternative impact assessment methods. The life cycle impact assessment methods will be selected on the basis of the latest recommendations given by the international LCA community. The methodology also includes the use of valuation, i.e. the aggregation of different impact category indicator results into a single value. For this purpose a weighting task will be conducted. In this process the environmental experts give weights for different environmental problems/categories such as climate change, acidification etc. Finally, environmental interpretation and identification of environmental performance indicators will be carried out - on main assembly level, on sub-assembly level and on specific product characteristic level.

The interpretation stage also includes sensitivity, completeness and consistency checks. This stage will make use of the methodological findings from the EPIC-ICT project.

The use and results of relevant impact assessment methods for the full LCA studies may open a need to gather new inventory data. These needs and other key inputs for the inventories will be documented. Furthermore, the key data shall give a starting point for the discussion on how the phone manufacturers can get it from other partners in the manufacturing chain. During the course of the work, the procedure for procuring this data will be determined. In addition, a recommendation on the data format and a proposal on responsibilities of the affected partners to provide information will be given.

After the full analysis, the rules/criteria for the selection of KEPIs will be determined with the help of the results of impact assessment and inventory data. In the selection process the following requirements should also be taken into account:

- KEPIs can be used for simple assessment in product design phase.
- KEPIs can be usefully applied in component purchase decision-making.
- KEPIs directly offer environmental data for product eco-facts and communication (see the first initiative discussed earlier).

On the basis of the experiences obtained from the process, the limitations and application possibilities of KEPIs will be assessed and documented. For example, the scope for improving the KEPI results may be very limited in some areas because products are technically optimised according to market defined characteristics (e.g. size of LCD, type of ICs needed). On the other hand, the LCA results of the KEPIs may create benchmarks for various components/modules to which product designers can rapidly compare the performance of a new construction. In addition, the use of KEPIs for conducting simple LCAs should be clarified.

The same KEPIs, evidently, can be valid only for a period of time (according to product development cycles). Thus, the underlying full-scale LCA needs to be updated after regular, defined periods and the KEPIs revised based on the results obtained. Also large changes in

the product (e.g. technology shifts) may require the updating of LCI and LCA. Altogether, this means that the project must produce rules for revision of KEPIs.

Although research can produce proposals for scientifically based KEPIs and also proposals of reasonable rules for the revision of KEPIs, it is clear that the voice of manufacturers, retailers and stakeholders like EU, member states and NGOs needs to be listened. The project will take this formally into account by introducing the research results and proposals to a ‘management group’, which after thorough discussions will make the decisions. The project also involves the coordination and preparation of a voluntary agreement in the mobile phone sector to accept and use the KEPIs that have been produced by using the rules for preparing and revising KEPIs.

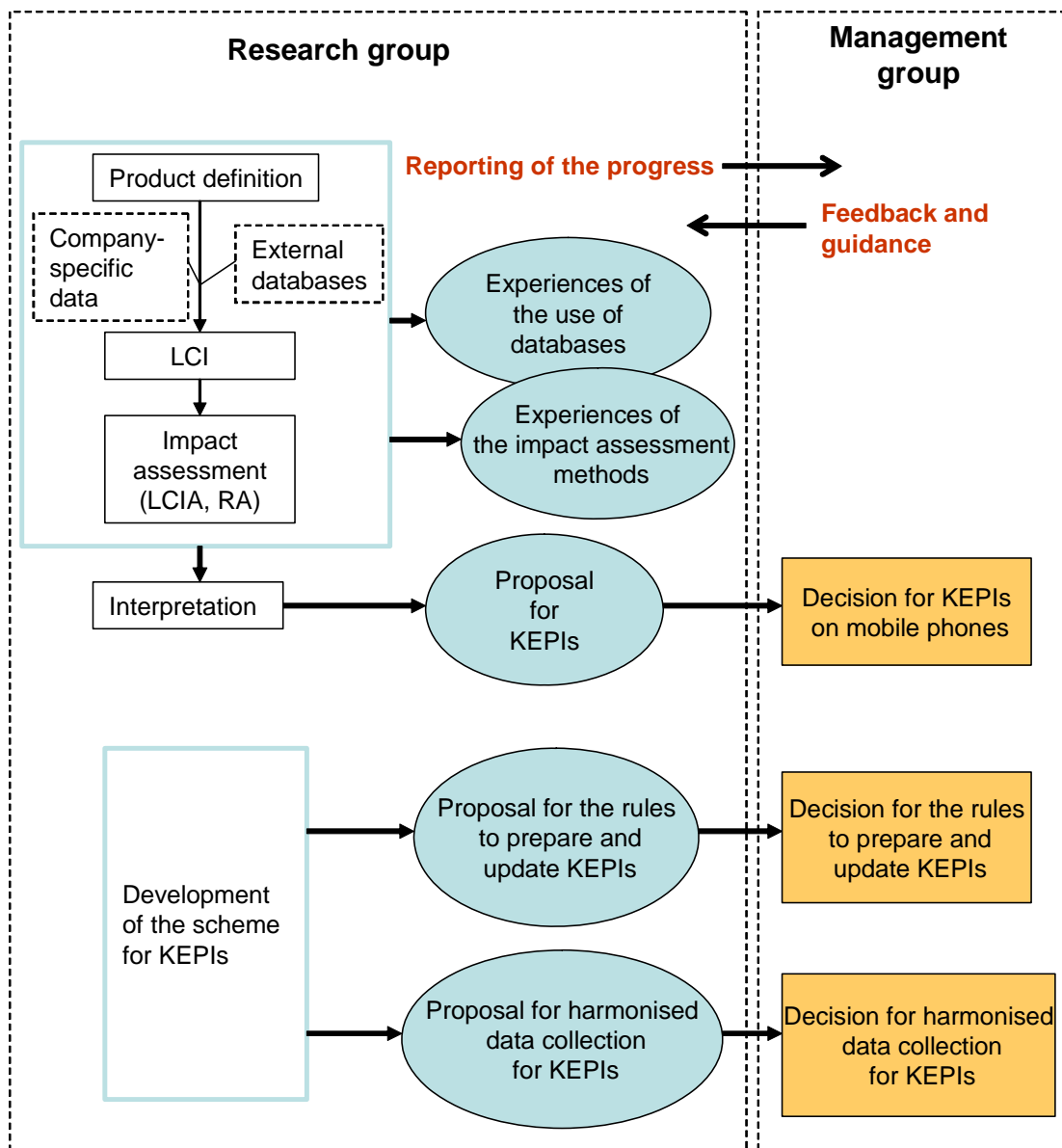


Figure 2-1: Tasks and results of the research group and management group in the project

**Other requirements/aspects**

1. Linkage to the other initiatives and works: This task force shall produce data for other task forces relevant for other initiatives for “Product Eco-Facts” and vice versa. This supports

preparing an appropriate data management structure for information on sub-assemblies and components with defined responsibilities. Furthermore, the task force may offer experiences that can be utilised in the IPP activities (see the figure2-2).

2. Utilisation for decision-making: The developed KEPIs can then be used by designers for making environmentally rational choices and support resource efficient and environmental relevant eco-design.
3. Reliable databases: The phone and component manufacturers could gather their inventory data to a database(s) which is/are available for the whole mobile phone industry. A starting point is that underlying data, methods and formats should come from the European Platform on LCA to ensure consistency and data compatibility. During the project there is a need to decide the following issues: one or several databases; who will maintain it or them; is it or are they public; is it worth to develop it/them together with other electronic industries; who is responsible to provide data; which data is sensitive and needs further improvement; is average data on company level appropriate or are specific data sets needed to reflect the companies' needs. This information could be used for a further project in which the aim is to prepare management system for harmonised and consistent data collection for KEPIs.

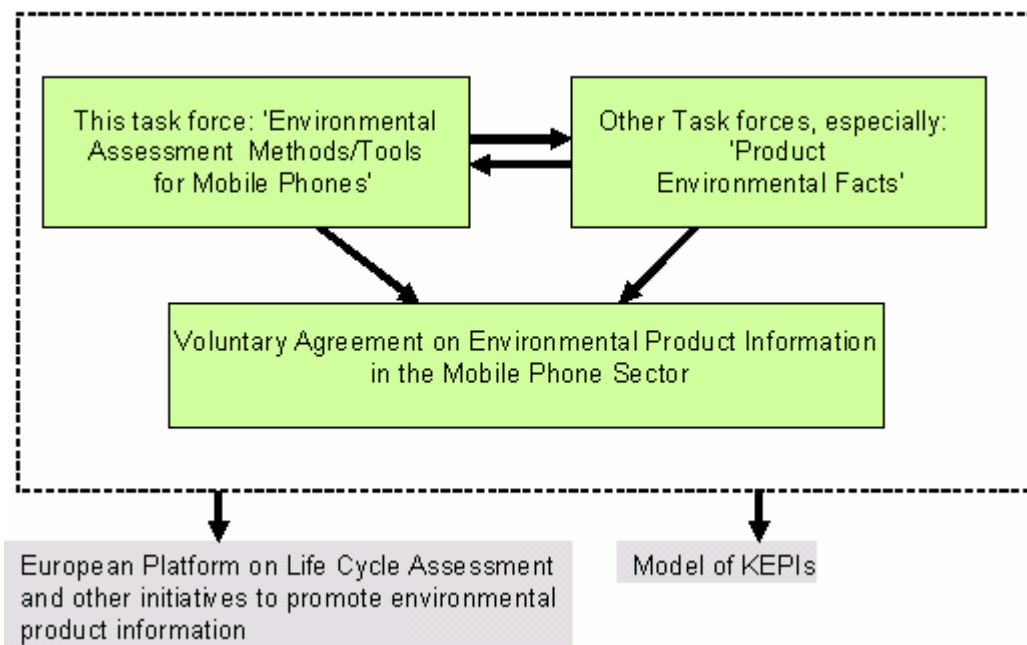


Figure 2-2: Relations of this project to other task forces and transferability to other product sectors and information schemes

**Key targets**

The key targets of this initiative are:

- Create KEPIs for supporting the eco-design of mobile phones
- Create the rules to prepare and update KEPIs
- Harmonise data collection for KEPIs

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- Identify the R&D needs for LCI data and impact assessment methods from the viewpoint of KEPIs
- Create to the scheme for managing KEPIs

## **Time frame**

A time frame of over two years may be required for the development of KEPIs followed by another year for building awareness in industry about them.

*Table 2-10: Steps for development of KEPIs*

<b>Getting organised</b>
Management group (MG) established, and gives first guidance to the research group (RG) about the detailed design of the project plan
<b>Development of KEPIs</b>
Product definition made (2 examples of mobile phones)
Usable company-specific data identified and assessed
Usable external databases identified and assessed
Life cycle inventories finished and reported to MG
Relevant impact assessment methods identified, assessed and reported to the MG
Interpretation of the results and proposal of KEPIs reported to the MG
Final reports and proposals of KEPIs to MG
MG makes decision of the first version of KEPIs for the mobile phones
<b>Reporting of experiences to conduct the full LCAs</b>
Experiences of the usability of the various data sources used
Experiences of the usability of the applied impact methods
<b>Development of the scheme for KEPIs</b>
Proposal of rules to prepare and update KEPIs reported to MG
MG makes decision for the rules to produce and update KEPIs
The proposal to harmonize data collection for KEPIs reported to MG
MG makes decision for the rules to harmonized data collection for KEPIs
Final report of the development work

## **Expected contributions from the participants**

### Management group

All the organisations involved in the task force are the members of the management group. In the management group there is one member from each organisation, preferably also supplemented by a technology expert representative of member states and a non-governmental organisation like European Environmental Bureau (EEB).

The role of members of the management group is to guide the work of the research group and make the final decisions on the basis of materials produced by the research group. In practice, the management group corresponds to the need of stakeholder engaged. The management group develops and agrees on suitable criteria for determining the KEPIs. The group shall

also identify and agree on the ways and procedures for using KEPIs and for gathering the relevant inventory data along the whole manufacturing chain.

### Research group

The research group consists of members from each organisation. In addition, there are partners for specific research tasks funded by external assistance money. The management group will decide the use of the assistance money on the basis of suggestions made by the research group.

*Mobile phone and component manufacturers:* The most important role is to offer life cycle inventory based information on mobile phones.

*SYKE:* Responsibility for overall management and impact assessment methods including RA, LCIA and valuation. SYKE will also be responsible for the interpretation of LCA, proposals for KEPIs, and for preparing the rules to develop and update KEPIs.

### **Communications about the Initiative**

It is important to communicate about the starting of this project to the mobile phone sector and to the experts and stakeholders interested in IPP. Thus a description of the project objectives and expected outcomes will be communicated 1) to the associations of IT technology manufacturers and retailers, and 2) at the internet-page of EU commission on IPP.

At the end of the project it is important to get larger audience to the matter, and a press release could be given.

### **Reporting On the Progress**

After the funding for this initiative is secured and it is started, the summary of quarterly reports on the progress of the initiative will be published on the Commission's IPP Pilot web-pages to bring transparency to the whole process.

### **Other stakeholders who can be invited for joining the task force**

The management group can decide what other stakeholders who can be invited for joining the task force. However this is an open initiative and any other interested stakeholders who are committed to contribute to the development of the scheme and raising awareness about it on a voluntary basis are welcome to join the task force.



### **3. Experiences & Recommendations of the Stakeholders**

This chapter discusses the observations, lessons learnt, critical success factors and overall recommendations of/by the stakeholders based on their experiences in this pilot project.

#### **3.1 Observations**

- Common understanding was reached among the participants on environmental issues of significance for mobile phones, feasible improvement solutions, and roles of the different stakeholders in implementing these solutions.
- The brainstorming of the improvement options provided a good starting point for the improvement process.
- The stakeholder engagement process offered the possibilities to understand opinions and capabilities of other participants.
- The engagement and consultation process was transparent with constructive dialogue between the participating stakeholders.
- The participating stakeholders found the approach very useful, interesting and informative.
- The project demonstrated that commitment to improvement of the environmental impact of products can also be achieved by companies on a voluntary basis. However, it is difficult to quantify the actual environmental improvements that can be achieved from all the initiatives and commitments. In many cases, it can only be quantified after their implementation.
- The project has helped in dissemination of know-how on environmental issues related to mobile phones and the solutions.
- The IPP process in this pilot has demonstrated that through enhanced stakeholder dialogue environmental improvements can be achieved in such a way that all players play roles in the areas of their influence. The project demonstrated the practical functioning of IPP principle on stakeholder cooperation. Environmental actions from stakeholders from the different parts of the life cycle reinforcing each other can be successful and lead to better environmental results than one company acting on its own.
- The IPP process has demonstrated that close cooperation between all stakeholders can lead to innovative environmental proposals ranging from improvements in information flow strategies, market-based instruments and regulatory tools. For all stages of the life-cycle, the report emphasises the need to create incentives for all stakeholders to create supply and demand for products with lower environmental impacts.
- The IPP process of stakeholder engagement brings with it the possibility to bring substantial amounts of knowledge and perspectives on products, their environmental issues and possible solutions.

- The project highlighted several challenges in undertaking such an exercise, for example, the complexity of assessing the impacts and the improvement options. At the same time, it demonstrated clearly that application of life-cycle thinking was beneficial.
- The IPP process was found to be very resource intensive. Around 2 person years from Nokia as the lead organisation were involved in addition to the time spent by participating stakeholders. Conclusion for the European Commission is that this type of IPP exercise is a resource intensive task but the outcome can be rewarding. The Commission estimates that 1 person from the Commission side could run 2-3 IPP projects/year depending on the level of the Commission's involvement. However, the Commission has yet to analyse whether this approach is to be continued in the future.
- The project has been very challenging and required a multi-disciplinary perspective. The timeframe for the project was felt to be short at times e.g. there was insufficient time to comprehensively evaluate and consult external experts on all the improvement options in the stage III. However, the group made significant progress in the duration of about 18 months for which the project was carried. In this period, the life cycle impacts of the phones were evaluated, over fifty improvement options were identified and analysed, and five initiatives were set to address many of the high priority improvement options.
- The involvement of all different stakeholders from the life-cycle is crucial to the process. For instance, the presence of a retailer in the stakeholder group of this pilot would have brought more insights as the retailers have a direct interface with the consumers.
- This pilot project showed that environmental work does not only stop for businesses at the product development level, and at the shelf of a retailer but the consumers also have to be considered by taking into account the environmental impacts at the use and end-of-life phase of the products, and encouraging the consumption of greener products in order to have business benefits from green production.
- According to Intel and AMD, IPP is supposed to be about gathering relevant and interested stakeholders round a table in order to 1) identify environmental problems and 2) work together to solve those problems by taking on commitments and deploying a range of policy tools to achieve the goals. The mobile phone project followed this approach.
- According to WWF, the lead organisation and author have great influence on the work done and the reports produced. In the interests of maximum objectivity, WWF suggests that the Commission plays a more obvious lead role in future IPP projects. More clear independence would strengthen the credibility of the work.

## **3.2 Lessons Learnt**

- As the leading organisation has a high influence on the outcome of the project, it has to play a significant role in ensuring the participation of stakeholders, retaining their interest, keeping the focus, and ensuring that the stakeholders contribute to the process.
- While initiating the project it should be considered how best to secure participation of representatives from relevant stakeholders. It should be ensured that target organisations are identified for both direct participation and for commenting. For including target organisations, who may not participate directly, a process should be put in place to inform them in a timely manner about the work done and ask their comments. In this pilot, no

target organisations were identified for commenting on the reports though the reports were available for public review on the European Commission's IPP pilot web-pages.

- Without being funded, it is difficult for non-profit organisations like NGOs, public universities or research institutes to participate in such projects and the initiatives that emerge from them. Thus, the possibilities of funding the work of such organisations should be considered by the stakeholders who carry this approach forward. The initiatives emerging from these projects may provide solutions relevant for the whole sector rather than just the participants.
- Stakeholders generally found it useful to have a thorough review of both the effectiveness and efficiency of existing regulations during the course of the project. This can assist in identifying the areas voluntary agreements and initiatives can be used as complementary tools and what kind of changes are required (if any) in the existing regulations. According to most stakeholders, the policy review process from strictly an IPP perspective is an integral part of an IPP approach and should be included in the IPP project.

According to the Commission however, the IPP projects should not only emphasise the analysis of already existing policy tools, but should also concentrate on the aim to improve the environmental impact of products and should focus on actions. There are already existing systems in place for assessing the different individual legislation and expressing stakeholders' views on them, for example stakeholder consultation and different stakeholder meetings.

- IPP projects require very good project management and continuous monitoring as they are multi-disciplinary in nature. Team building activities should be carried in the beginning stages of the project.
- A clear and transparent process for group decision making should be developed.
- According to the European Commission, it has learned about the process of IPP and its practical application through the two pilot projects it has been carrying out with Nokia and Carrefour. The content of the reports produced throughout this pilot project will be of assistance in different activities of the European Commission for example: the revision of the EU Ecolabel, Energy Using Products Framework directive (EuP), the revision of the WEEE and RoHS Directives, the forthcoming Sustainable Production and Consumption action plan.
- The European Commission acknowledges that the participating stakeholders have expressed in the report that according to them recognising the environmental frontrunners and awarding them is largely missing from the IPP toolbox. There are already existing Commission initiatives to award frontrunners, for example, the European Business award for the Environment, Sustainable Energy Partnership initiative, Ecolabel, EMAS and performance targets. The Commission could, however, further analyse in the future the use of an overarching mechanism for this and how much added environmental benefit this would bring.
- The project also contributed to understanding the needs of business for practical eco-design tools. There are already some works ongoing in this area both by industry and by public authorities including the European Commission. The Commission could assess if in the future the result of the ongoing work of the European Platform on Life Cycle Assessment could be developed further into the application of practical eco-design tools.

In addition to this, research opportunities under the seventh research framework programme could be useful to further advance this area.

- According to the European Commission, if it decides to keep running similar IPP projects in the future, as it is a resource intensive process, it is important to consider the role of the Commission in this process and that these projects should focus on a pre-determined list of products with great environmental importance. The Commission's work to prioritise products according to their potential for environmental improvement under IPP must be considered in this area.

### **3.3 Critical Success Factors**

- Identification and participation of a relevant and proactive stakeholder group with a win-win partnership approach.
- Willingness from the companies' side to carry out voluntary IPP projects is necessary to make them successful. Within this, a lead company is important to drive the process and encourage also other stakeholders to bring issues forward and make commitments to improve environmental performance.
- Clear guidance for the participation organisations on what and how they are expected to contribute.
- Making the process very transparent to stakeholders who are not participating in the project and developing a system to obtain their feedback.
- Stakeholders directly responsible should take the ownership of the initiatives established and the analysis of the improvement options.

### **3.4 Recommendations**

- IPP approach has the potential to provide an efficient, effective and quick way to drive environmental improvements.
- IPP approach should be used for bringing in the environmental improvements in products.
- The process followed in this pilot is one model of how to put IPP approach in practice to reduce the environmental impact of products. This process can be used by public authorities as well as other stakeholders.
- Prior to any future product environmental legislation, it would be useful some kind of IPP - type of analysis. The Commission has started this by using impact assessments and putting emphasis on the life cycle approach.
- The project re-emphasises the importance to look at the product life cycle in order to avoid shifting environmental impacts from one part to another part of the life cycle and to address the environmental impacts of products at the most important part of the life cycle where environmental improvement can be best achieved.

## **4. Continuation Plan**

The pilot project is now in the stage V which will last for a year. During this stage the progress of five new initiatives set in stage IV will be monitored. At the end of stage V, a review meeting will be held with all the participating stakeholders to discuss the progress of the initiatives.

Many of the initiatives will last longer than the time period of a year of this stage V e.g. reduction/elimination of materials of concern, take-back of phones depending on the intensity of the work to be done but their progress will be reviewed on a continuous basis.

In the stage V, Nokia will not be playing the role of leading organisation as it has in the previous four stages. The task force leaders (Nokia, France Telecom/Orange, Vodafone, Epson, Finnish Environmental Institute - SYKE) will, rather, be responsible for the respective initiatives and will ensure the progress of the work. Nokia will be involved in periodic monitoring of the initiatives which will be done every three months. The task forces will submit quarterly progress reports for the respective initiatives to Nokia and the European Commission. The European Commission is planning to publish the short progress report coming from the task force leaders on its website on the ongoing commitments, so that this process can be easily followed by other stakeholders. All external stakeholders can comment on the progress of the initiatives and submit them for consideration to the task force leaders. The Commission will also monitor the progress of the initiatives in a year's time.



## 5. Conclusions and Outlook

The stage IV of the IPP pilot project has resulted in setting up of five environmental initiatives which have the potential for eliminating a very large portion of life-cycle environmental impacts of mobile phones. These initiatives cover most of the options that after the brief analysis in the stage III were classified as ‘Qualified-High Priority’. The initiatives are led by task forces comprising of several participating stakeholders. The task force leaders are representatives from the organisations who have the most direct influence on the initiative. The initiatives are:

### 1. Information and Communication – Nokia & France Telecom/Orange Lead

This initiative has two sub-initiatives:

- Product Environmental Facts & Communications – Nokia Lead

This sub-initiative aims to develop a suitable product environmental information scheme for mobile phones including ways to communicate it to the consumers in the most effective way. The information scheme shall assist consumers in identifying products with good environmental performance and help them make environmentally sound choices while buying phones.

- Usage and Disposal Information & Communications - France Telecom/Orange Lead

This sub-initiative aims at development and communication of information to consumers on environmentally sound practices during the use and EoL phases of mobile phones to minimise the environmental impact.

### 2. Reduce Energy Consumption (in Use Phase ) – Nokia Lead

This initiative aims to develop and implement a suitable solution for adding reminders in phones to inform/advice consumers to unplug chargers from the wall after the phone is fully charged. This initiative will assist in further reducing the energy lost in no-load power consumption by stimulating consumer action on unplugging the chargers.

Nokia estimates that if this measure led to only 10% of the world’s mobile phone users not leaving their chargers on no-load, it would save enough energy to power 60,000 European homes for a year.

### 3. Reduce/Eliminate Agreed Materials of Concern – Epson Lead

This initiative aims to reduce and eliminate the use of certain flame retardants, and phthalates in plastics from mobile phones. The possibilities for information flows between the suppliers and manufacturers on the material composition data of components will also be discussed and verified.

### 4. Take-back of Phones – Vodafone Lead

This initiative aims to analyse, identify and share good practice incentives that drive consumer behaviour toward increased return of used/unwanted mobile phones,

devices and batteries in a select number (to be determined) of different countries/markets. The initiative will also include piloting of selected 'new' incentives for the return of used/unwanted phones, devices and batteries and communication of the results from the pilot across industry with the intention of using new incentives, if successful, into existing return schemes where appropriate.

## 5. Environmental Assessment Methods/Tools – SYKE Lead

This initiative aims to further develop and standardise a practical eco-design approach like KEPIs for use in industry for environmental assessments.

The IPP stakeholder group in this pilot has concluded that this approach for the product group of mobile phones has provided an efficient, effective and a relatively quick way to drive environmental improvements and that IPP approach should be used for improvements in products. The process followed in this pilot is one model of how to put IPP approach in practice. This process can be used by public authorities as well as other stakeholders.

According to the European Commission, it has gained experience on the process of IPP and how it works in practice from this pilot project on mobile phones. The Commission has also had some interesting learnings on the different issues described in the previous reports. The Commission will take this experience and learnings into account for its future work.

## Bibliography

- Commission of the European Communities. (2002). *Communication from the Commission on Impact Assessment*. Retrieved 20 July, 2005, from [http://europa.eu.int/eur-lex/en/com/cnc/2002/com2002\\_0276en01.pdf](http://europa.eu.int/eur-lex/en/com/cnc/2002/com2002_0276en01.pdf)
- Commission of the European Communities. (2003). Communication from the Commission to the Council and the European Parliament. *Integrated Product Policy – Building on Environmental Life-Cycle Thinking*. Retrieved 15 October, 2004, from [http://europa.eu.int/eur-lex/en/com/cnc/2003/com2003\\_0302en01.pdf](http://europa.eu.int/eur-lex/en/com/cnc/2003/com2003_0302en01.pdf)
- European Commission. (2004). *Code of Conduct on Energy Efficiency of External Power Supplies - Version 2*.
- European Commission. (2005). *Impact Assessment Guidelines*. Retrieved 20 July, 2005, from [http://europa.eu.int/comm/secretariat\\_general/impact/docs/SEC2005\\_791\\_IA%20guidelines\\_annexes.pdf](http://europa.eu.int/comm/secretariat_general/impact/docs/SEC2005_791_IA%20guidelines_annexes.pdf)
- European Commission. (2006). *European Platform on Life Cycle Assessment*. Retrieved 01 April, 2006, from <http://lca.jrc.it>
- Mäkirintala, O-P. (2003). *The New Challenge for the Industry: Material composition - integrated approach using RosettaNet*. Paper presented at the Recycling Electrical and Electronic Equipment 6, Leatherhead.
- MPPI. (2004). *Mobile Phone Partnership Initiative, project 3.1: Recovery and recycling of end-of-life mobile phones*. Retrieved 20 December, 2004, from [www.basel.int/industry/](http://www.basel.int/industry/)
- Singhal, P. (2005a). Integrated Product Policy Pilot Project. *Stage I Final Report: Life Cycle Environmental Issues of Mobile Phones*. Nokia: Espoo. 87 pp. Available at: [http://europa.eu.int/comm/environment/ipp/pdf/nokia\\_mobile\\_05\\_04.pdf](http://europa.eu.int/comm/environment/ipp/pdf/nokia_mobile_05_04.pdf)
- Singhal, P. (2005b). Integrated Product Policy Pilot Project. *Stage II Final Report: Options for Improving Life-Cycle Environmental Performance of Mobile Phones*. Nokia: Espoo. 31 pp. Available at: [http://europa.eu.int/comm/environment/ipp/pdf/nokia\\_st\\_II\\_final\\_report.pdf](http://europa.eu.int/comm/environment/ipp/pdf/nokia_st_II_final_report.pdf)
- Singhal, P. (2006). Integrated Product Policy Pilot on Mobile Phones. *Stage III Final Report: Evaluation of Options to Improve the Life-Cycle Environmental Performance of Mobile Phones*. Nokia: Espoo. 110 pp. Available at: [http://ec.europa.eu/environment/ipp/pdf/report\\_02\\_08\\_06.pdf](http://ec.europa.eu/environment/ipp/pdf/report_02_08_06.pdf)
- Singhal, P., Ahonen, S., Rice, G., Stutz, M., Terho, M., & van der Wel, H. (2004). *Key Environmental Performance Indicators (KEPIs): A new approach to environmental assessment*. Paper presented at the Electronics Goes Green 2004+, Berlin. Also available at: <http://www.lcainfo.ch/df/DF27/Stutz2KEPIPaper2004.pdf>



## **Abbreviations**

BEP	Best Environmental Practice
BAT	Best Available Technology
BEUC	The European Consumers' Organisation
CoC	Code of Conduct
DfE	Design for Environment
EC	European Commission
EEE	Electrical and Electronic Equipment
EIA	Electronics Industry Alliance
EICTA	European Information & Communications Technology Industry Association
EMAS	Eco-Management & Audit Scheme
EMS	Environmental Management System
EHS	Environment, Health and Safety
EuP	Energy using Products
EoL	End-of-Life
EU	European Union
GeSI	Global e-Sustainability Initiative
GPP	Green Public Procurement
ICs	Integrated Circuits
ICT	Information Communication Technology
IEC	International Electrotechnical Commission.
IPP	Integrated Product Policy
ISO	International Organisation for Standardisation
KEPIs	Key Environmental Performance Indicators
LCA	Life cycle Assessment
LCD	Liquid Crystal Display
MPPI	Mobile Phone Partnership Initiative

# NOKIA

MPWG	Mobile Phone Working Group
NGOs	Non Governmental Organisations
PVC	Poly Vinyl Chloride
PWB	Printed Wiring Board
UNEP	United Nations Environment Programme
VAs	Voluntary Agreements
VOC	Volatile Organic Compounds
WEEE	Waste Electrical and Electronic Equipment

## **Appendix A: List of Stakeholders Participating in Nokia’s IPP Pilot Project**

### **Phone Manufacturers**

- Motorola
- Panasonic

### **Components Manufacturers**

- AMD, Spansion
- Epson
- Intel

### **Network Operators**

- France Telecom/Orange
- TeliaSonera
- Vodafone

### **Recyclers**

- Umicore

### **Government Agencies**

- Department of Environment, Food and Rural Affairs (DEFRA), UK
- Finnish Environment Institute (SYKE), Finland

### **NGO**

- WWF

### **Consumer Organisation**

- The European Consumers’ Organisation (BEUC)