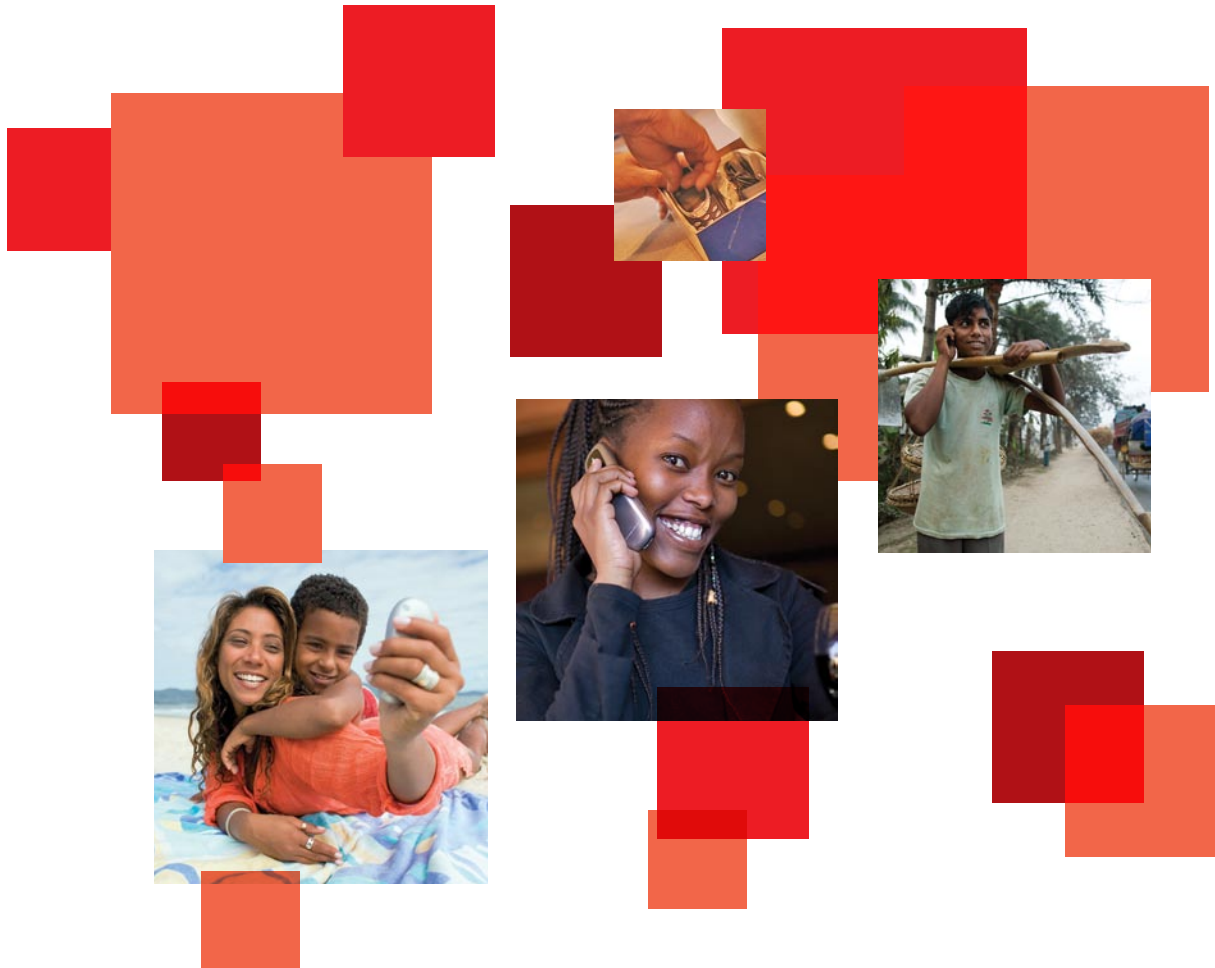




Mobile Phone Lifecycles

Use, Take-back, Reuse and Recycle



www.gsmworld.com

896 MILLION

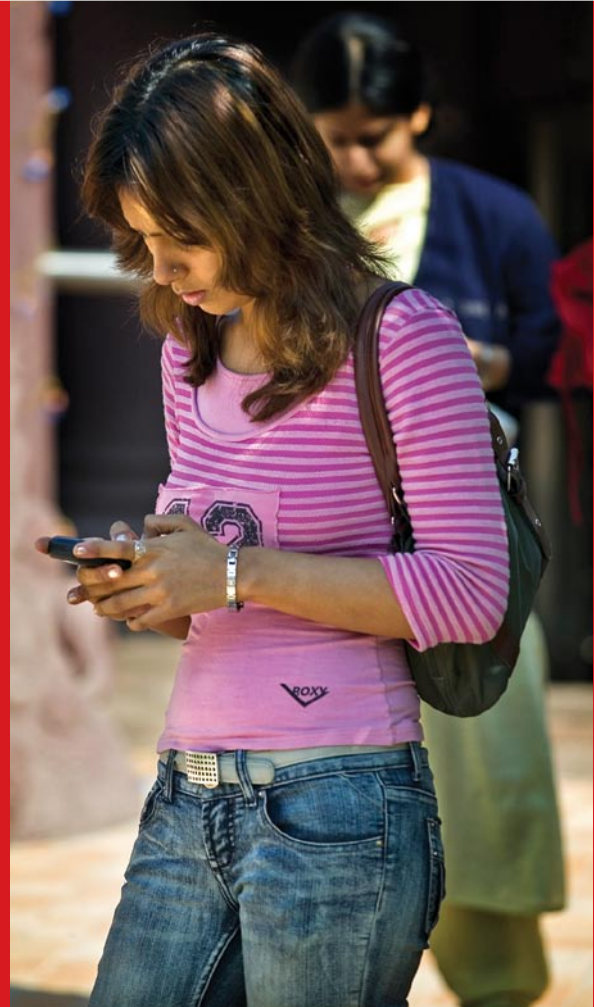
mobile phone handsets are estimated to be sold globally in 2006.

3.6 MILLION

jobs in India are dependent on the mobile services industry.

75%

of all phone connections in the least developed African nations are mobile phones.

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Acknowledgments

This report from the GSM Association is the latest in a series aimed at informing stakeholders of policy issues contributing to sustainable development, in particular bridging the digital divide. The Association is committed to influencing policy to help lower the environmental impact and the cost of access to mobile communications in an effort to bring voice, data and internet services to more people globally.

This report has been made possible thanks to the support and contributions of individuals and organisations whose insights into the lifecycle of a mobile phone have been invaluable.

In particular, the GSM Association would like to thank France Telecom/Orange and O2 for their active role in the preparation of the report. Thanks to their innovative programmes, these operators are helping to make a positive environmental difference.

The GSM Association also thanks those organisations that contributed data for this report: the Australian Mobile Telecommunications Association (AMTA) MobileMuster programme, Fonebak and ReCellular.

For more information please visit www.gsmworld.com or for more information on mobile phone recycling, please contact Dr. Jack Rowley at jrowley@gsm.org

About this report

This report is valuable to anyone interested in finding out more about what happens to used mobile phones when they are returned through the many recognised take-back schemes in operation worldwide.

This report aims to put into context some of the debates surrounding environmentally responsible approaches to used and end-of-life mobile phones. Wherever possible, examples of practical action and good practice are highlighted with references for those readers who require more information.

This analysis looks at how the mobile telecommunications industry is working to address its environmental responsibilities for both new and used phones and to accommodate the growing market for used phones. In this document, 'industry' refers to the views of mobile network operators unless otherwise indicated. Other industry stakeholders such as manufacturers, resellers, take-back scheme operators, refurbishers and recycling organisations are also important to the mobile phone lifecycle.

To tell the story of used mobile phones, we follow them from manufacture, to the original customer, through refurbishment and on to a new life in secondary markets, and finally recycling. We also pay attention to the broader social, economic and environmental benefits used phones can bring, and look at how the mobile industry is working to address its environmental responsibilities and accommodate this growing market.

In preparing this report, we found there were few existing sources of data about mobile phone recycling and reuse activities. We hope this document will provide a useful point of reference for governments, the media and others seeking information about this topic.

Visit www.gsmworld.com for an executive summary of this report, which is available in Arabic, English, French, Mandarin Chinese, Russian and Spanish.

Tell us what you think about the issues raised in this report, at environment@gsm.org

FACT

WORLD

In 2004, analysts estimated that used mobile phones accounted for 10-15% of all handsets sold in China. The same statistic was 10-25% for markets in Eastern Europe and the Middle East. In the United States, about 2% of new subscribers were thought to be using used phones.¹

Context

The GSM Association estimates that about 896 million mobile phones will be sold in 2006 and about 50% of these will be replacement phones. Therefore, there will be approximately 448 million new handsets sold for an estimated 489 million new mobile phone customers. The difference, 41 million people, or a little over 8% of new customers will rely on a used mobile phone.²

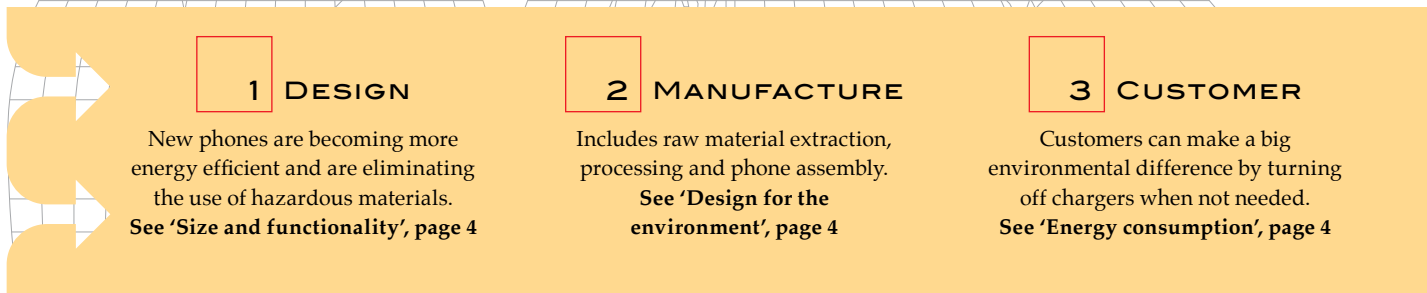
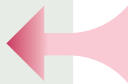
The mobile phone lifecycle

This diagram illustrates the lifecycle of a typical mobile phone from initial design, through use, take-back, reuse and finally to end-of-life processes, such as recycling.



USED ELECTRONIC PRODUCTS

International activities are underway on environmental management of used and end-of-life electronic products in countries that lack the specialist infrastructure. See 'The Basel MPPI', page 14



1 DESIGN

New phones are becoming more energy efficient and are eliminating the use of hazardous materials. See 'Size and functionality', page 4



2 MANUFACTURE

Includes raw material extraction, processing and phone assembly. See 'Design for the environment', page 4



3 CUSTOMER

Customers can make a big environmental difference by turning off chargers when not needed. See 'Energy consumption', page 4

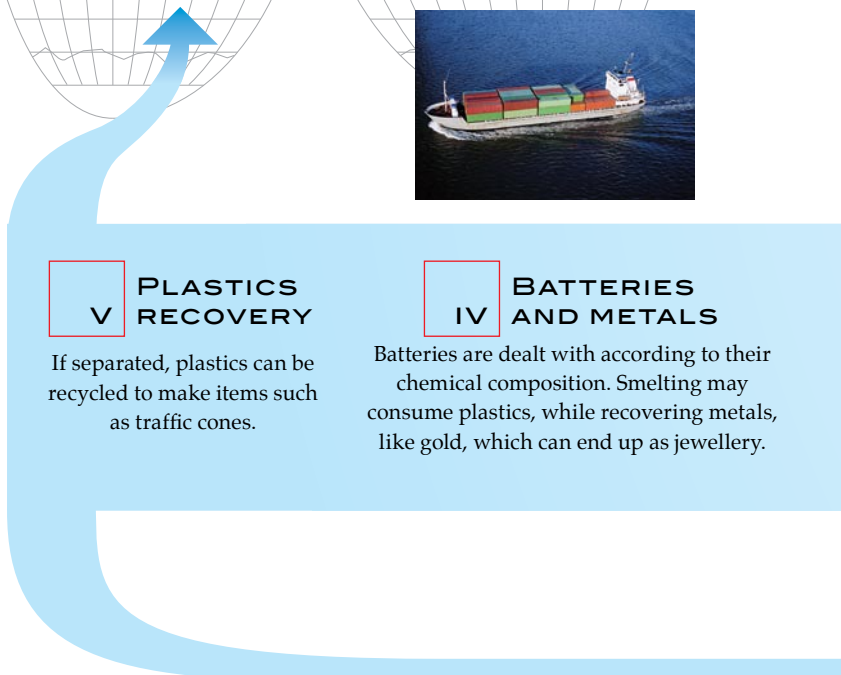


International movement

At various points in the mobile phone lifecycle, the new phone, used phone, components and accessories may cross international borders. These potential transboundary movements may include, for example, phones being returned via take-back schemes being transported for refurbishment or recycling.

The industry view is that for the purpose of transboundary movement, used mobile phones that have been evaluated and are destined for reuse should be considered as products and not waste.

See the MPPI sidebar on page 14 for more details.



PLASTICS RECOVERY

If separated, plastics can be recycled to make items such as traffic cones.



BATTERIES AND METALS

Batteries are dealt with according to their chemical composition. Smelting may consume plastics, while recovering metals, like gold, which can end up as jewellery.



IV COLLECTION

Processes are needed for in-country take-back of all used electronic products.

III NEW OWNERS

Phones help people take control of their lives where telephony wasn't previously available.

See 'Life changing benefits', page 15

II NEW DESTINATIONS

Phones are resold, often in developing nations, through formal and informal channels. See 'Extended life for mobile phones', page 7

I REFURBISHMENT

Phones are wiped of data, physically repaired, repackaged with new instructions and sent to suppliers.

See 'The refurbishment process', page 7

Working together to increase collection rates. For example, see Egypt case study, page 6

4 TAKE-BACK

Unwanted mobile phones should be given to an official scheme not put in the trash or stored away.

See 'Take-back schemes', page 9

5 EVALUATION

Here it is decided whether the phone can be repaired and resold, or sent for recycling.

See 'Reusing mobile phones', page 5



III RECYCLING

Phones may be further dismantled and some parts shredded, or processed intact for material and energy recovery.

See 'The recycling process', page 8

II SORTING

The handsets, batteries and accessories may be separated according to their chemical and material composition.

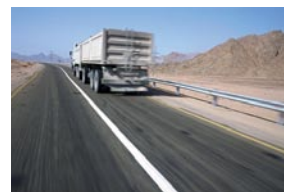
I MATERIALS RECOVERY

Phones deemed to be beyond repair – or simply too old – still have a residual value and their parts may be reused.

See 'Recycling end-of-life phones', page 8

VI MINIMAL DISPOSAL

Remaining materials are made insoluble in high temperature processing so that they will not leach substances of concern, and may be safely used as a construction aggregate. See 'Disposal', page 8



The mobile phone lifecycle

Design for the environment

The ideal, from an environmental perspective, is to design a mobile phone with reuse, recycling and minimal disposal in mind. This starts with reducing energy input to manufacture of components, substituting less hazardous substances (for example, the use of lead-free solder), and minimising mixing of materials, such as metals embedded in plastics, which could be difficult to separate during recycling.

Designing a phone for easy dismantling is also an important factor, as this would reduce the cost of refurbishment and recycling. One approach being developed uses heat to disassemble the hardware.³ Motorola is currently evaluating the use of biodegradable plastics in mobile phone covers, with a view to composting.

In order to further reduce environmental impacts, NTTDoCoMo has announced the use of recycled plastics in its new phone accessories,⁴ and Fujitsu is developing a plastic derived from corn starch.⁵

The mobile industry's pioneering switch to batteries with a higher energy density also produced environmental benefits. For example, power cells currently in use require fewer resources during manufacture, and avoid the use of toxic metals, such as lead and cadmium. This makes the batteries much safer during the recycling and disposal processes.⁶

Size and functionality

Consumer expectation drives the continuous redesign of mobile phones and prompts new telecommunications services.⁷ However, while the list of handset functions grows, the actual product size decreases. This produces environmental benefits through reductions in natural resources used during manufacture, and the substitution of one device for many.

Energy consumption

Though the average phone is getting smaller, its functions are growing; as a result energy consumption may also increase to support the additional features.⁸ In fact, it is the component manufacture and use phases of the phone's lifecycle which have the greatest environmental impact.⁹

However, in order to satisfy consumer expectations about talk and standby time, there have been significant improvements in the energy efficiency of mobile phones. Over the last 20 years, the standby operating time of a mobile phone after charging has increased from about 4 hours to 10 days or more. There has also been industry focus on reducing the phone's power consumption during the charging period.⁶ However, consumers can also make an important environmental difference, by simply switching off the phone and charger when it is not needed.

As a related point, when a mobile phone is discarded and replaced, the accompanying accessories are seldom compatible with the replacement phone. This issue of hardware incompatibility is particularly true in the case of phone chargers – some manufacturers are tackling this by making a standard charger to fit multiple models in their range.

Used mobile phones

When a consumer no longer intends to use their purchased mobile phone and passes it on to a friend or relative, or deposits it in a recognised take-back scheme, the mobile phone is referred to as a 'used phone'. This definition is important for issues raised later in this report.

The average useful life of a mobile handset is around seven years, but users in developed countries replace their phones about every 18 months.¹⁰ In the UK alone, the industry estimates that around 15 million handsets go out of use each year. This replacement cycle is driven by the evolution of technology and the tendency of consumers to want a device with more applications.

To help identify trends, work has been done to assess what consumers do with used mobile phones. The results of a recent Australian survey are shown in figure 1. In any discussions on used phones, the cultural preferences for keeping, passing on or returning used mobile phones have to be considered when trying to develop practical and feasible take-back schemes.

FACT

WORLD

Nokia estimates that if just 10% of the world's mobile phone users turned off their chargers after use, the energy saved in one year could power 60,000 European homes.¹¹

Figure 1: What happens to old mobile phones?

In early 2006, an independent survey of 650 people for the Australian Mobile Telecommunications Association revealed that:

- 52% of Australians keep their old mobile phones (whether working or not)
- 23% give away their old mobile phones, either to family or friends, employer or retailer
- 5% throw them away
- 4% of people have lost or had their mobile phone stolen
- 4% still using them
- 4% recycle them
- 4% traded them in for a replacement handset
- 1% sold them
- 1% donated to charity
- 2% don't know

Reusing mobile phones

If a mobile phone is returned by a consumer and sent to a company where it may be refurbished, then it may be sold for reuse. This is generally the preferred option in the environmental management hierarchy as it extends the life of the same product. However, this may not be the case if the mobile phone is not properly recycled when it reaches end-of-life. Phones have a greater chance of being reused if they are donated quickly rather than being stored. However, a recent UK report found that people kept mobile phones on average for 2.37 years before disposal.¹²

Experience from network operators shows that one of the most important steps in establishing a successful take-back scheme is the incentives provided to customers. These vary depending on customers and cultural preferences but generally involve donations to charity, extra call minutes for the customer or a discount on a different phone.

Other important factors include consumer education, scheme awareness and convenience. The European Commission is supporting work, facilitated by France Telecom/Orange, to look at how take-back services and incentives can be made more visible to customers to promote take-back and potentially reduce storage time.

In Australia, the MobileMuster programme is partnering successfully with companies to run phone collection sessions. For example, a month long initiative in August 2006 with a major bank was expected to collect approximately 2,000 mobile phones, recycling the equivalent of gold extracted from 5.8 tonnes of gold ore.¹³ Encouraging people to donate their phone has led to some novel approaches as the example in the adjacent case study from the North West of England shows.

Case study: Used phones making a difference in the community

For several years now, O2 has been running an annual fundraising activity with Fonebak and Radio Merseyside in the North West of England. The scheme encourages local schoolchildren to round up their families' spare mobile phones for reuse in developing nations.

Several organisations in Gambia have benefited from the campaign, where the handsets bring real benefits to businesses such as women farmers associations, wildlife reserve projects and sustainable fisheries.

This project allows people to gain control of their personal communication for the first time. It also benefits the children at the school, who learn about the possible impacts on the environment and about reuse and recycling.



All of the funds raised by the project are used to support charities in the North West of England, so everyone involved can see tangible benefits in their own communities.



The mobile phone lifecycle

Reused phones in developing countries

Whilst reusing mobile phones seems to be the most environmentally friendly way to lengthen their lifecycle, there is a concern over the disposal of mobile phones in developing countries. One issue is the risk of phones being discarded in countries that lack the necessary recycling infrastructure for end-of-life electronic equipment. Determining what people actually do with their mobile phones needs to be considered, in light of these concerns.

A study in Romania involving 262 people showed that most would give away or sell their old handset, or keep it as a spare. Importantly, very few people said they would just throw the old phone away. The research also found that used mobile phones were particularly important to people who were new to mobile telephony, those on low incomes, those under the age of 18, manual workers and non-workers. These users of used mobile phones were generally as happy with their device as users of new phones.¹⁴

FACT

WORLD

In many developed countries, less than 4% of used phones are collected for reuse or recycling.

In developing countries without a strong tradition of recycling, unless there is substantial investment in education, awareness raising and infrastructure, the number of phones returned is likely to be small (see Egyptian case study right).

Case study: Battery take-back in Egypt

Mobinil, one of the largest mobile phone operators in Egypt, has over seven million customers and has both Orascom Telecom and France Telecom/ Orange as shareholders.

In October 2005, Mobinil and Fonebak agreed to work jointly to establish the first Egyptian take-back programme for mobile phone batteries.

The project was implemented under the umbrella of the Egyptian Ministry of Environment.

The batteries, once collected, are shipped to the UK for inclusion in Fonebak's normal shipments to its battery processor in France.

However, shipping waste batteries from Egypt was a completely new experience for both organisations and required an understanding of the legislation and administration procedures in all the countries concerned.

Even with organisational commitment, working across different languages and administrative cultures meant that the project took significant time and energy.

Whilst it seems a long road, the first 1500kg of batteries have been diverted from landfill in Egypt and are en route to the recyclers.

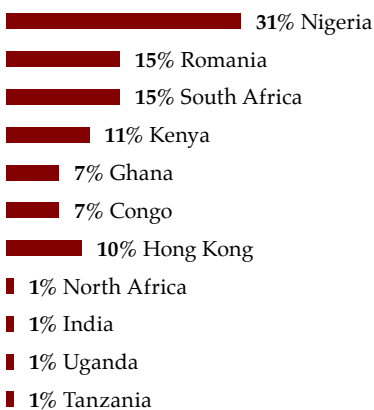


Extended life for mobile phones

On average, more than 70% of collected handsets from developed markets can be refurbished. However, only about 25% of phones collected in developing countries are suitable.¹⁵ Collected phones may be used as loans during customer repairs, or exported to the developing world. Virtually all Fonebak's refurbished phones¹⁴ and 55-60% of ReCellular's¹⁶ are exported. The markets for these phones include Latin America, Eastern Europe, China, India and Africa.¹⁷

Refurbished phones that aren't exported are used in a variety of ways. For example, in North America some refurbished phones are donated directly to local charities through US Wireless Foundation programmes.¹⁸

Figure 2: Destination country data supplied by Fonebak for some phones collected via France Telecom/Orange and O2.

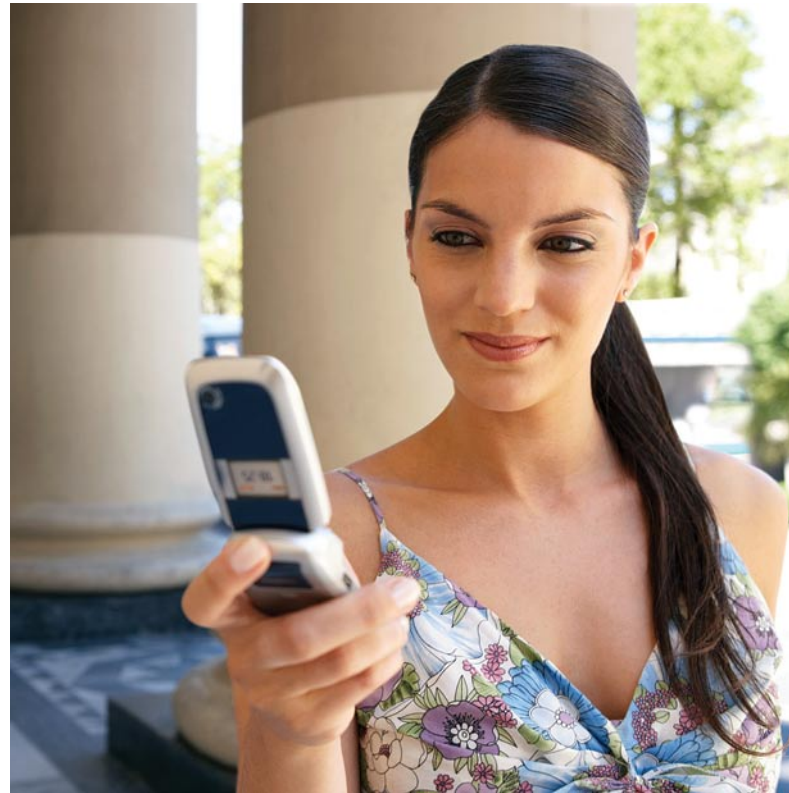


The refurbishment process

Refurbished phones can be of varying quality. Some refurbishing companies have sought environmental accreditation to demonstrate that the entire process is properly managed. For a mobile network operator choosing a recycling partner, assurances that a partner operates good practices and transparency in the way they work are important.¹⁹ For responsible partnering companies, environmental management systems are often used to provide assurance about the proper treatment of collected phones.

Collected phones must first be evaluated to determine those most likely to be suitable for reuse. These phones will then be subject to a series of tests to determine suitability for reuse with or without further repair. The testing equipment and procedures are similar to those in manufacturer repair centres.

Faulty parts will be replaced, batteries evaluated or exchanged and the phone's appearance reconditioned. Particular care is needed to ensure that replacement batteries have proper internal safety circuits. All original customer information is



securely erased and the refurbished phone must meet all regulatory requirements. These steps are labour intensive and in some cases the work is done in lower cost economies using internationally accepted health and environmental controls. Finally the refurbished phone will be packaged for resale along with a battery, charger, and instructions. Any residual materials arising during the refurbishment process are disposed of in an environmentally sound manner.

The price of a refurbished phone will vary significantly, depending upon the model type, its age and appearance. The extent of any guarantee offered by the refurbisher is another key factor. Indicative prices for one scheme are in the range of US\$30-40.

New ultra-low cost mobile phones

In parallel with the growing demand for refurbished mobile phones in the developing world, the GSM Association has launched the Emerging Markets Handset (EMH) programme to promote the development of new ultra-low cost mobile phones. The competitive tender process resulted in one handset manufacturer launching a handset for under US\$30. By February 2006, the manufacturer had received orders for more than 12 million from network operators in developing countries,²⁰ and Strategy Analytics estimates that there could be 48 million handsets in this price category by the end of 2007.²¹ It is not yet certain what effect this will have on the used mobile phone market but anecdotal observations suggest that people in developing countries will still be interested in higher end refurbished phones.

The mobile phone lifecycle

230 GRAMS

One tonne of recycled cell phones can generate up to 230 grams of gold.²²

MORE THAN 70%

of a mobile phone can be recycled.²³

0.001-0.003%

Current mass of phones being recycled is only about 0.001-0.003% of the total weight of waste electronic equipment each year.

Recycling end-of-life phones

We estimated earlier that there would be about 448 million new replacement phones sold in 2006. Up to 69% of the phones they replace will either be stored or given away to someone to use and only about 5% will be collected for reuse or recycling (see figure 1, page 5). Of the collected phones, 15-20%²⁴, or up to about 4.5 million phones globally, will be beyond economic repair and need to be recycled. However, even in the case of these phones, some components may be reused to refurbish other phones. Using the MPPI (see page 14) estimate of 130 grams as the average phone weight (inclusive of battery), the current total mass of phones to be recycled is about 582 tonnes. This is only about 0.001-0.003% of the estimated 20-50 million tonnes of waste electronic equipment each year.²⁵ While it is important for the mobile phone industry to play its part, even if 100% of used phones were collected for recycling this would still be much less than 1% of annual waste electronic equipment collection. Therefore, practical and environmentally responsible methods for the recycling of end-of-life phones have to be developed in conjunction with those for other electronic equipment.

The recycling process

Often the batteries are first separated from the mobile phone and sorted into their various types before reprocessing by specialist recyclers. Nickel cadmium, nickel metal hydride and lithium ion/polymer batteries have their metals recovered and reused in products such as power tools, saucepans and new batteries.

The rest of the handset may be dismantled by manual and/or mechanical separation of components (the LCD display, for example) or directly placed into high-temperature integrated metal smelters with efficient controls for the separation of metals and removal of waste gas.

The metals extracted during this process – including gold, platinum, palladium and silver – are put back into productive use. About 16% (by weight) of a typical mobile phone is considered 'high value' materials. However, the quantities of some of these materials – gold for example – has reduced over time due to advances in manufacturing techniques.²⁶ However, AMTA (see page 12) estimates that 1 tonne of circuit boards yields the same amount of gold as 110 tonnes of gold ore. The recovered metals are used again as good quality raw materials. A further 22% of the handset is recovered as lower grade material that can be used in a variety of ways, for example as aggregate for road surfacing.¹⁴

Chargers, accessories and even packaging should be recycled. It is generally not economic to reuse the plastic components due to mixed grades, the presence of dyes and other contaminants, so energy is recovered through the incineration process. In one case, energy produced from the incineration of waste materials is used to heat a village local to the recycling plant. In another, plastics are shredded and used locally in the manufacture of fence posts and pallets.

Efficient and environmentally sound treatment of mobile phones requires sophisticated facilities that cannot be duplicated in every country. Therefore, end-of-life phones will need to be exported, under appropriate authorisations, to the few suitable plants. The GSM Association welcomes efforts by authorities to tackle illegal export of end-of-life electronic equipment to countries that lack the necessary infrastructure. However, the introduction of unnecessary barriers for companies demonstrating good practices are not supported.

Disposal

If a mobile phone cannot be refurbished or if the components cannot be reused or recycled, the remaining materials are sent for environmentally sound disposal. In an efficient take-back programme, only a tiny proportion of the materials that make up mobile phones should go for disposal (less than 10%). Consumers should not throw away their mobile phones with household rubbish, as the phones may end up in a landfill site. Instead they should be deposited in a take-back scheme for refurbishment or recycling.

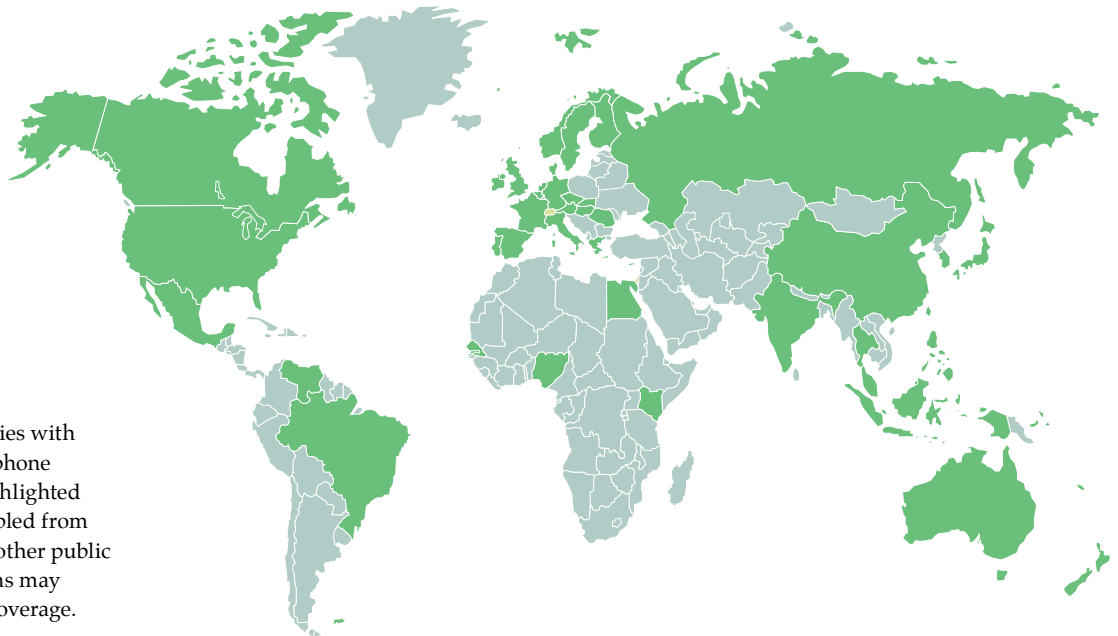
Take-back of used mobile phones

Since the 1990s, the mobile communications industry has been working in cross-sector partnerships to deliver sustainable initiatives, including used mobile phone take-back schemes that often predate national and international legislation.

Take-back schemes

The industry supports handset, battery and accessory take-back in more than 40 countries.²⁷ In addition, several mobile phone manufacturers have processes in place to deal with phones returned through the repair or retail outlets.²⁸ In most cases take-back schemes were established as voluntary initiatives, with self-sustaining financial structures. With some, a proportion of the revenues earned by take-back schemes are reinvested in environmental²⁹ and charitable³⁰ initiatives, depending on the customer culture in the individual countries. The typical price range for unsorted, used phones is in the range US\$1-10.

The earliest and now some of the largest schemes are in Europe, North America and Australia.³¹



The map shows countries with active or pilot mobile phone collection systems, highlighted in green. It was assembled from MPPI documents and other public sources. Not all systems may provide full national coverage.

Case study: Launching Venezuela's first-ever mobile phone recycling programme³²

In June 2006, in partnership with Venezuelan charity AVEC (Asociación Venezolana de Educación Católica) and wireless operator Movilnet, ReCellular launched the country's first-ever mobile phone recycling program, REICL@CEL, with more than 1,300 collection points throughout the country.

Antonio Maria Marquiegui Candina, President of AVEC, is delighted: "This initiative gives mobile subscribers the opportunity to protect the environment and support a noble cause which benefits thousands of young people that are aided by our housing network."

AVEC has 90 centres throughout the country, able to provide shelter and education for those people affected by the country's social problems, such as unemployment and drug abuse.

Take-back of used mobile phones



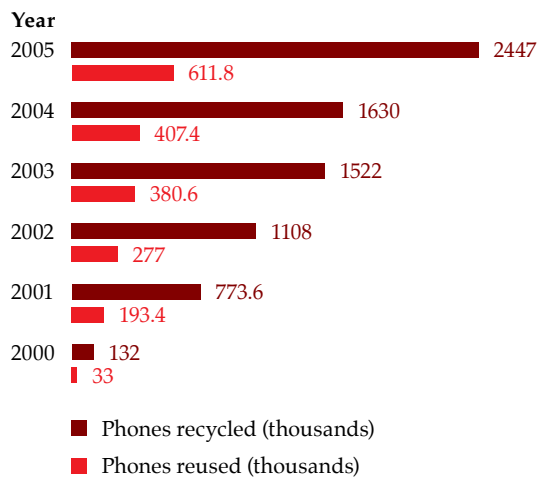
Europe – Fonebak

Fonebak is Europe’s leading provider of mobile phone reuse and recycling solutions, with over 1000 clients from every UK network operator and many major mobile networks, retailers, manufacturers and charities across the continent. It currently has collection sites in over 10,000 retail outlets, and also accepts phones sent in Freepost envelopes. About 70% of phones currently come from UK collections, but that proportion is reducing.

Based on the statistics shown in figure 3,³³ the number of phones collected has grown 18-fold since 2000, to just over 3 million handsets in the year to June 2006. Originally many of the refurbished phones went to Eastern Europe – indeed Fonebak has a refurbishment facility in Romania – but now more are destined for Asia and Africa. Fonebak has agreements with all of their distributors in developing nations to accept any unwanted handsets from customers for recycling.



Figure 3: Fonebak mobile phone collection



FACT

Between 2000 and 2005 Fonebak refurbished more than 1.9 million phones.

North America – ReCellular

ReCellular was founded in 1991, when there were still only 16 million mobile subscribers worldwide. ReCellular’s business has since grown from processing 300-400 used phones to processing nearly 300,000 a month, and has collected more than 15 million phones since it launched.¹⁶ Since 2004 ReCellular has been working with the Latin American trade association AHCIET to expand mobile phone recycling to customers throughout South America, Central America, and the Caribbean.³⁴

Collection data for ReCellular is shown in table 1. More than 60% of the collected phones are suitable for reuse; others are used for parts or recycled at facilities in the USA and Canada. Refurbishment is undertaken at plants in the USA, China, Argentina, Brazil, Chile, Colombia, and Mexico. In 2003, the top two markets for ReCellular refurbished phones were the USA and South America. Today, the main markets are the USA, Dominican Republic and Hong Kong, with about 55-60% of the refurbished phones being sold outside the USA. ReCellular has provisions for return of end-of-life phones with all its customers.

Table 1: ReCellular mobile phone take-back and recycling data for the USA and Canada					
Year	Total phones collected	Recycled	Good phones	Recycled %	Collection points
2004	2,455,475	430,064	2,025,411	17.51%	5,000
2005	2,336,884	729,195	1,607,689	31.20%	23,000
2006 (as of August)	2,138,772	722,223	1,416,549	33.77%	47,000

FACT

RECELLULAR

ReCellular has created partnerships with over 2,000 organisations around the world, enabling charities to earn more than US\$15 million since 1999.



Take-back of used mobile phones

Australia – AMTA's MobileMuster

The Australian Mobile Telecommunications Association (AMTA) is the national trade association of the mobile telecommunications industry and MobileMuster is its official national recycling programme. The programme originated from a successful trial in one state in 1998 and now collects mobile phone handsets, batteries and accessories from a network of over 1,400 retailers, local councils, government agencies and businesses drop off points.³⁵

The MobileMuster campaign was launched in 2005 following results from market research, carried out that same year, which showed that 46% of the population were aware they could recycle their mobile phones, batteries and accessories. 9% had thrown out their mobile phones and only 4% had ever returned phones to vendors.³⁶ More importantly perhaps, the research also found that raising public awareness of a recycling scheme could actually drive behaviour.

By March 2006 awareness had increased to 54% and phone disposal had dropped to 5%. As table 2 shows, by the end of June 2006 more than 590,000 handsets and over 1.5 million batteries had been collected, amounting to over 367 tonnes of material – the equivalent of a 16% increase in take-back over the previous 12 months.



FACT

MOBILEMUSTER

By 2008 the MobileMuster goal is to treble the annual collection to 150 tonnes per annum and halve the number of handsets going to landfill.

Table 2: Number of batteries and handsets collected by the MobileMuster campaign, November 1998 to June 2006³⁷

Year	Battery numbers	Handset numbers	Total numbers	Total weight (kg)
1998/00	244,433	13,043	257,478	27,928
2000/01	139,357	65,556	204,912	36,671
2001/02	185,695	182,144	367,839	77,697
2002/03	203,025	100,003	303,058	55,471
2003/04	172,795	92,944	265,739	57,809
2004/05	266,630	68,978	335,608	62,048
2005/06	321,593	69,481	391,074	50,261
Total	1,533,528	592,180	2,125,708	367,885

Regulatory and legislative developments

Action on many fronts by the mobile telecommunications industry predates legislative requirements, and the industry has a lot of good practice to share:

- Designing phones to minimise resource consumption, increase efficiency and make recycling easier
- Environmentally and socially sound management of used phones
- Development of low cost handsets for developing countries
- Funding for environmental and charitable organisations
- Taking action on stolen mobile phones.

In many parts of the world environmentally sound management of used and end-of-life electronic products has become a high profile environmental issue. Used mobile phones are part of this issue, though, as we've seen, in reality a small part – only 0.001-0.003% by weight, of waste electronic products.

Governments around the world, including China, Latin America and several US states, are considering legislation regarding the recycling of electronic wastes.³⁸ While the mobile industry broadly welcomes government initiatives on the environment – such as the new WEEE and RoHS directives in the European Union³⁹ – there are practical concerns over the implementation of such legislation, especially the absence of consistent, timely guidance (to minimise international interpretation issues) on a global subject.

“...there is a general consensus that sustainable development cannot be achieved through a regulatory approach alone. Voluntary initiatives and other tools (e.g. economic incentives, information campaigns, etc) are needed to help meet the complex and urgent challenges of sustainable development...”⁴⁰

The mobile industry is also working with the relevant authorities to ensure that exports of end-of-life mobile phone equipment comply with existing regulations. The GSM Association encourages authorities to tackle illegal export of waste electronics via the enforcement of existing domestic and international regulations.

The industry is actively engaged in the Mobile Phone Partnership Initiative (see the following page). Industry participation is aimed at sharing experience and the development of practical guidelines that can benefit governments, consumers, refurbishing organisations and other industry participants.

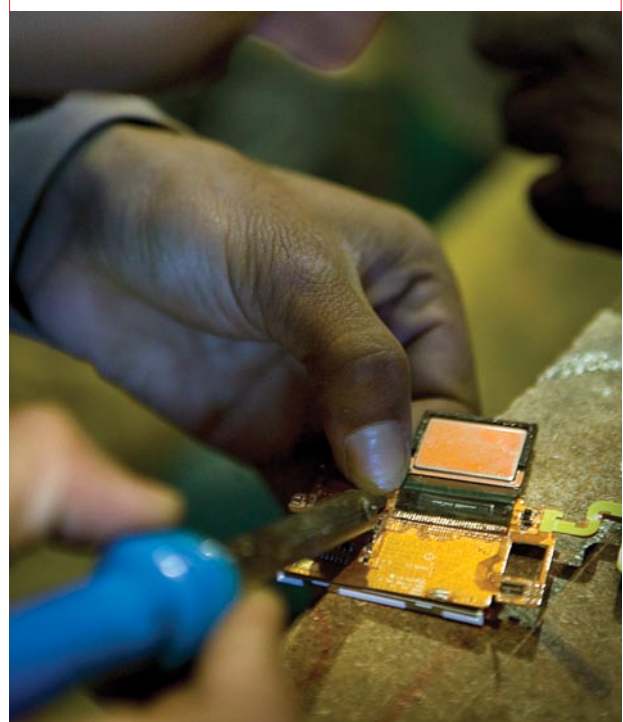
Case study: Working in partnership in Senegal

The demand for mobile phones in Senegal has resulted in an influx of handsets into the country, which in turn bring the potential environmental impacts associated with end-of-life disposal. The Mobile Back Senegal (MBS) project - a partnership between France Telecom, Fonebak, Sonatel (one of Senegal's mobile service providers) and international NGO, Enda (Environmental Development Action in the Third World) - was established to address this issue, by building a self-sustaining refurbishment and recycling infrastructure within the country.

The project would employ and train local electricians and craftsmen to sort, dismantle, repair and recycle collected end-of-life phones, with Fonebak providing secure processing facilities for any hazardous materials.

The launch of the two year pilot scheme was contingent on securing 30% of the total budget from the French authorities, who are keen on developing environmentally sustainable solutions in Senegal. However, this critical element of the project's budget was withdrawn in July 2006, when the French authorities cited what they believed to be more pressing environmental protection projects for the African state.

The MBS partnership is keen to address the problem posed by end-of-life mobile phones in Senegal, and is exploring the best way to move this groundbreaking project forward.



Take-back of used mobile phones

The Basel MPPI

The 1989 Basel Convention regulates the transboundary movements of hazardous and other wastes and obliges its Parties to ensure that such wastes are managed and disposed of in an environmentally sound manner.

Created in 2002 within the framework of the Basel Convention is the Mobile Phone Partnership Initiative (MPPI). The MPPI aims to address the issue of environmentally sound management of end-of-life mobile phones. Four project groups were set up under the MPPI, namely mobile phone refurbishment; collection and transboundary movement rules; material recovery and recycling; and design considerations.

The Initiative's participants include many nations, their environment agencies, individual network operators, phone manufacturers, material recyclers, NGOs, international trade organisations (such as GSMA) and collection companies.

A particular area of debate is on the applicability of the Basel Convention to electronic products that have been evaluated as suitable for reuse in the destination country. This has been a distraction from dealing with the critical issue of how to address end-of-life electronic devices in developing countries. The GSMA would welcome renewed focus on the end-of-life issue which was one of the key intentions of the MPPI.

The MPPI's working groups are set to be finalised in late 2006. For more information on the MPPI, see www.basel.int/industry/mppi.html

Voluntary Notification Procedure

An interim voluntary notification procedure has been proposed by the mobile industry to promote transparency and environmentally sound management of used mobile phones. In essence, it is based on a commitment to the MPPI guidelines and improved communications.

The procedure works through the use of a *Statement* setting out key information, such as details of the consignment; information on evaluations used to determine that the collected mobile phones are suitable for reuse, possibly after repair, refurbishment or upgrading; period covered; and the issue of environmentally sound management in the destination country.

By prior agreement, the *Statement* may cover single or multiple shipments.

Governmental authorities are tasked to consider the *Statement* and provide a decision within an agreed period on whether the shipment can proceed, with or without conditions. This procedure will be reviewed periodically to reflect practical knowledge and experience gained.

Where good practice exists, the GSMA encourages both governments and the refurbishment industry to use this or similar procedures.

The GSM Association is concerned by suggestions to extend hazardous waste controls to include used phones destined for reuse, possibly after repair and refurbishment, in a developing country. These could undermine the business case for refurbishment and mean that phones are directed immediately to recycling facilities. This may not be as good for the environment and potentially eliminates employment opportunities in developing countries. Shipments could also incur additional costs, through security bonds or additional permits, for example.

The bureaucratic approaches under discussion by the MPPI do not make a clear distinction between end-of-life phones, which may need to be managed as waste, and used phones which are products that their owners do not want to use any longer, but could be suitable for reuse.

As an alternative to regulation, the industry's preferred approach to dealing with the transboundary movement of used mobile phones is to follow the MPPI's Voluntary Notification Procedure where good practice is known to be in operation. This applies to those used mobile phones destined for reuse possibly after repair, refurbishment or upgrading which are not considered hazardous waste under the Basel Convention, and is used on an interim basis to ensure transparency and promote environmentally sound management.⁴¹

Self-regulatory approaches involving declarations of compliance with follow-up audit procedures are common in telecommunications policy and standards issues. It will require work on the part of the mobile industry to show environmental regulators that they can also apply these to mobile phones destined for reuse.

Social and economic impacts and benefits

In addressing the topic of mobile phone lifecycles and associated environmental issues, it is important to ensure that broader social and economic impacts and benefits are considered when evaluating the contribution to sustainable development. There are strong social and economic factors to promote and facilitate the reuse of mobile phones.

FACT

WORLD

In 2002, the total number of mobile phones in use worldwide exceeded the number of land-lines.⁴²

FACT

WORLD

3.6 million jobs in India are dependent on the mobile services industry.⁴³

FACT

WORLD

More than 20% of global mobile phone users live in the developing world.⁴⁴

Reduced barriers to entry

The importance of information technology has been recognised in the UN's Millennium Development Goals⁴⁵ and one of the key enablers is the mobile phone. Refurbished phones are often significantly cheaper than new handsets and are therefore more accessible, especially to those in developing nations.

The increased reach and reduced cost of mobile networks compared to fixed is also a huge driving force in the uptake of telecommunications in these regions. In fact, the GSM Association predicts that by 2010, around half of the world's population (approximately 3 billion people) will have access to mobile communications, and 90% will be within coverage of a mobile network.⁴⁶

Increasing demands in developing countries

Figure 4, on the following page, shows the regional distribution of mobile phone subscribers at the end of September 2006, when there were about 2.5 billion customers globally. As can be seen, the fastest growing region is Africa, followed by similar growth rates in the Middle East, Eastern Europe and the Americas.

This growing demand is best illustrated by the phenomenal increase in users in sub-Saharan Africa. Mobile phones now account for 75 per cent of all phone connections in 19 of the least developed African countries;⁴⁴ due to phone sharing the number of actual users is estimated to be even greater.

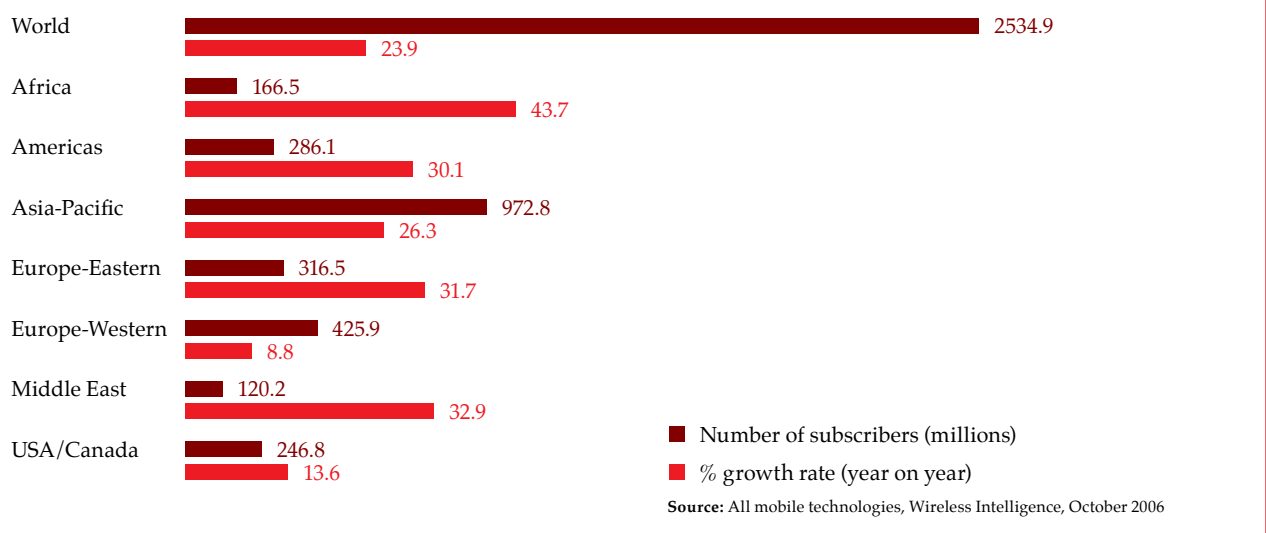
Life changing benefits

Mobile technology can sidestep problems linked to poor infrastructure, such as badly maintained roads and public transport. As a consequence, families who are, for example, spread across great distances, can stay in touch without having to spend days travelling between remote villages. In addition, due to poor fixed network coverage in some developing countries, ownership of a mobile phone can be hugely beneficial to businesses.

Mobile service providers are also using revenue from the used mobile phone market to fund schemes that bring direct benefits to many local communities. O2, for example, are helping to improve the quality of life for people in regions like Latin America (see the case study on the following page).

Social and economic impacts and benefits

Figure 4: The regional distribution of mobile phone subscribers at the end of September 2006



Case study: Helping communities in Ecuador

Rainforest Concern, an international charity fighting to conserve the world's rainforests, received a US\$171,000 grant from O2 to expand their project to develop a network of forest watershed reserves in the buffer zone of the Chocó-Andean rainforest corridor of north-west Ecuador.

Some of this money helped to create a total of 18 watershed reserves, double the average size of each watershed reserve from 40 to 80 acres and replant more than 20,000 native species of tree.

The charity is also involved in the protection of community watersheds, areas of land where fresh water congregates. These represent the only clean water source available to local people, and play a vital role in supporting the area's wildlife.

The funding from O2 helped local communities acquire land where the water gathers and to date, 15 communities comprising about 920 families have benefited from their ownership of watershed reserves and secure, clean water supplies.

ICT focus on sustainability

The wider mobile industry is also actively engaged in cross-sector global programmes such as the Global e-Sustainability Initiative (GeSI). These initiatives allow the sharing of good practice between member organisations and provide a forum for stakeholder engagement.⁴⁸

GeSI aims to achieve a better understanding of the role of information and communications technologies (ICT) in delivering a more sustainable society. Its members are drawn from ICT service providers and suppliers, and supported by the United Nations Environment Programme and the International Telecommunication Union.

FACT

WORLD Between 1996 and 2003 a developing country with 10 more mobile phones per 100 people could expect to experience annual GDP growth that was 0.59% higher than an otherwise identical country.⁴⁷

To ensure the environmental, social and economic benefits from mobile phones can be delivered to society, it is important that everyone works together and plays their part in developing international and country take-back systems for used mobile phones.

Industry action

The mobile communications industry can bring practical experience of more than 10 years of operating take-back schemes to establish practical collection channels and promote return of used mobile phones.

Mobile network operators partner with companies that are committed to the responsible take-back, reuse and recycling of mobile phones. This means that they recognise the need for collection channels to be present in all markets where mobile phones are used and reused. In addition to the collection channels, countries need the infrastructure to evaluate, test, refurbish and recycle used electronic devices, such as mobile phones. In countries where this infrastructure is not yet developed, it is important that alternative recycling solutions, including appropriate export provisions are available.

Recycling companies can continue to improve their processes to achieve greater resource recovery rates while meeting or improving on environmental, health and safety standards.

Regulatory contribution

As the used mobile phones market continues to mature, it is essential that government and industry work together to provide comprehensive solutions. Government recycling targets and mandated elimination of potentially toxic materials both add emphasis to existing industry initiatives to collect, refurbish and recycle mobile phones, but need to have practical application.

A proportionate approach should be taken which recognises existing good practice rather than reinventing the same activity under a different name. Regulation can be used to establish a level playing field, which works well if countries operate similar frameworks. However, when working internationally and between countries, legislation becomes less useful due to differing approaches and enforcement issues. In these situations practical action may be more valuable but this may require a more flexible approach from governments.

The mobile industry is constantly producing new and innovative products to better serve customers, so regulations should be sufficient to accommodate innovation and evolution in telecommunications services. This also means that any regulations addressing end-of-life issues for used mobile phones have to be consistent with other electronic equipment regulations, especially given the small quantities involved.

It is essential that government and industry work together to provide comprehensive solutions. Industry also asks governments to take note that increasing the regulatory burden could undermine the business case for reuse and focus attention on the less environmentally desirable outcome of recycling.

Action by Non-Governmental Organisations (NGOs)

The mobile phone industry is working successfully with environmental and developmental NGOs. NGOs can be very successful at motivating changes in consumer behaviour and challenging stakeholders to go further in their commitments. The GSM Association welcomes further opportunities to work collaboratively to raise consumer, government and industry awareness of the issues touched upon in this report.

Individual action

Each of us individually has the power to make a difference. First, by simply switching off the phone and charger when it is not needed. Secondly, by giving our old mobile phones to friends or returning them to take-back schemes, rather than throwing away or storing the phones, we are helping to maximise the useful life of the phone as well as optimise the recovery of valuable raw materials to make new products. This benefits the environment and improves economic and social well-being of other nations, through improved access to communications.

Mobile phones are one of the greatest success stories of the modern connected age, and a key enabling technology for people, communities and nations across the globe. By continuing to work together, industry and other stakeholders can ensure this success is able to continue sustainably.

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