

Calling All Cell Phones: Collection, Reuse, and Recycling Programs in the US

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INFORM

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— Eric Most
INFORM, Inc.

Introduction

This new INFORM report is the second of two INFORM studies of cell phone waste. The first report, *Waste in the Wireless World: The Challenge of Cell Phones*, released in 2002, was a groundbreaking investigation of the rapidly growing, highly toxic waste stream generated by these products — over 1 billion of which are currently in use worldwide. It examined the efforts under way to address this waste challenge in the US and abroad and identified two arenas for action: (1) development of programs that keep used phones out of the waste stream by collecting them for reuse and recycling, and (2) redesign of cell phones and their accessories to facilitate reuse and recycling and eliminate or reduce the chemicals contained in these products.

While advances in sustainable cell phone design have been minimal since the release of *Waste in the Wireless World*, refurbishment and recycling programs have emerged as the main response to cell phone waste in the US.

Calling All Cell Phones: Collection, Reuse, and Recycling Programs in the US provides the first in-depth assessment of some of the key collection and reuse programs in this country. While these still new programs mark a step in the right direction, their impact on cell phone waste has so far been negligible. This report identifies the likely reasons for their minimal impact and makes specific recommendations to significantly improve their effectiveness. It also describes how manufacturers and government can help such programs tackle the cell phone waste challenge both at home and abroad.

Since the publication of *Waste in the Wireless World*, cell phone waste has become an issue of worldwide concern, and international efforts are being initiated to address it. Of particular significance was the launching in December 2002 by the international Basel Convention (which addresses the transboundary shipment of hazardous waste) of the Initiative for a Sustainable Partnership on Environmentally Sound Management of End-of-Life Mobile Phones, which aims to promote redesign of cell phones and to iden-

tify the best practices for their refurbishment, recycling, and safe disposal.

In the US, cell phone subscriptions have skyrocketed over the past 18 years, from 340,000 in 1985 to more than 140 million at the beginning of 2003 (see table). By 2005, INFORM's research indicates that US cell phone use will reach approximately 175 million. Meanwhile, the waste from these products is growing rapidly: by 2005, over 100 million cell phones will be retired annually in the US alone, over 25 times more than in 1990, when subscriptions in this country numbered 5.3 million.¹ Many of these phones will be stored away in closets and drawers before being thrown out in the trash, but eventually — if current trends continue — they will wind up in landfills and incinerators along with other municipal waste. According to INFORM's estimates, a total of about

US Cell Phone Subscribers, 1985-2002

Year	Number of Subscribers (millions)
1985	0.34
1990	5.3
1991	7.6
1992	11.0
1993	16.0
1994	24.1
1995	33.8
1996	44.0
1997	55.3
1998	69.2
1999	86.0
2000	109.5
2001	128.7
2002	140.8

Source: Cellular Telecommunications & Internet Association, "CTIA's Semi-Annual Wireless Industry Survey Results, June 1985-December 2002," 2003, http://www.wow-com.com/images/survey/2003/752x571/SEMI-Annual_Table_Part_2_Slide_2.gif.

500 million used cell phones weighing over 250,000 tons will be stockpiled and awaiting disposal by 2005.²

These waste amounts may seem large, but they are conservative estimates. The rate of increase in cell phone subscriptions has declined in recent years, but there is some indication that a trend in the opposite direction may be about to occur. According to data from the Cellular Telecommunications & Internet Association, growth in US cell phone subscriptions declined from approximately 27 percent in 2000 to 9.4 percent in 2002; the number of new subscriptions in the first six months of 2003, however, suggests that this rate of growth could rise to 10 percent for the year.³ Moreover, changing technology may cause the average cell phone's life span — now about 18 months⁴ — to shrink further. Phones with color displays are beginning to become available outside of Japan, and monochrome phones could be jettisoned in large numbers if a wholesale migration to color occurs in the US and Europe. Similarly, many consumers may choose to discard their older phones in favor of “smart” phones with Internet, e-mail, calendar, and other capabilities, to say nothing of phones with photo, video, and music functions.

Because they are so small and lightweight, cell phones generate only a negligible quantity of waste per unit. However, their small size — the average phone weighs less than a pound — also makes them more likely to be thrown out in the trash. Cell phones have become progressively smaller over the years, but this could change. As phones acquire more and more features, larger screens may be needed and overall size may increase — though not enough to deter users from discarding used phones with the rest of their household waste. Likewise, Internet access and other functions may make cell phones heavier, further increasing the total tonnage of waste generated by these products.

Toxicity of Cell Phone Waste

As described in detail in *Waste in the Wireless World*, cell phones (and other electronic devices) are an especially problematic component of the waste stream because they contain a large number of hazardous substances, which can pollute the air when burned in incinerators and leach into soil and drink-

ing water when buried in landfills. Many of these toxic substances — including antimony, arsenic, beryllium, cadmium, copper, lead, nickel, and zinc — belong to a class of chemicals known as persistent toxins, which linger in the environment for long periods without breaking down. Some of them — including the metals lead and cadmium — also tend to accumulate in the tissues of plants and animals, building up in the food chain to dangerous levels even when released in very small quantities. These persistent, bioaccumulative toxins, or PBTS, have been associated with cancer and a range of reproductive, neurological, and developmental disorders. They pose a particular threat to children, whose developing systems are especially vulnerable to toxic assault. Most of the persistent toxins and PBTs contained in cell phones are in the printed wiring board and liquid-crystal display.

The PBT of greatest concern in cell phones is lead, a heavy metal recognized as a problem material throughout the world. Lead is a suspected carcinogen, has adverse effects on the central nervous system, immune system, and kidneys, and has been linked to developmental abnormalities. Its main application in cell phones and other electronic products is in the solder used to attach components to each other and to the printed wiring board. Within the European Union (EU), the *Directive on the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Products* (RoHS Directive) mandates that, by July 1, 2006, no new electrical and electronic products put on the market in any of the EU's 15 member states may contain lead (among a handful of other particularly hazardous substances). Numerous efforts are under way to find alternatives to lead solder that do not compromise the performance of electronic products. (For more information on the RoHS Directive, see INFORM's fact sheet “The WEEE and RoHS Directives: Highlights and Analysis,” July 2003, http://www.informinc.org/fact_WEEE.pdf.)

Another hazardous constituent of cell phones is brominated flame retardants, which are added to plastics to reduce the risk of fire. They are used primarily in the phones' printed wiring boards, cables, and plastic housings. Research indicates that some brominated flame retardants can be persistent, bioaccumulative, and toxic, while the impacts of others are still being evaluated. Two categories of flame retardant —

polybrominated biphenyls (PBBs) and polybrominated diphenyl ethers (PBDEs) — have been associated with cancer and disruption of the immune and endocrine systems. In addition, some of these substances can form dioxins and furans, a group of highly toxic and persistent by-products of combustion, when products that contain them are incinerated or recycled. Like lead, the use of PBBs and PBDEs in electrical and electronic products sold in the EU is banned under the RoHS Directive beginning in July 2006.

The rechargeable batteries that power cell phones also contain a number of highly toxic substances. Through the mid-1990s, the most commonly used power source in cell phones was nickel-cadmium batteries (Ni-Cds). Cadmium is a PBT and probable human carcinogen that can cause lung, liver, and kidney damage and is toxic to wildlife. Because of its toxicity, cadmium is banned from electronic products under the EU's RoHS Directive. Lithium-ion and nickel-metal hydride batteries are increasingly replacing Ni-Cds in cell phones, but these contain cobalt, zinc, and copper — all heavy metals that can be toxic to plants, wildlife, and human beings. Although a system is in place — the Rechargeable Battery Recycling Corp. (RBRC) — to collect and recycle rechargeable batteries in the US, few consumers are aware of the program and most of these batteries wind up in the trash. (It is important to note that recycling is not a panacea and can have its own environmental impacts, including the release of toxic chemicals into air, surface water, and public sewage systems as a result of the recycling process.)

Cell Phone Collection and Reuse Programs: A Potential Solution?

Cell phone collection programs of various sizes and types have been springing up around the country over the last several years and continue to do so. Such programs recover used phones from consumers and either refurbish and resell or recycle them, depending on their condition. By refurbishing used phones, such programs extend the lifetime of these products and divert them — along with the many toxic substances they contain — from landfills and incinerators, at least temporarily. Similarly, recycling keeps discarded phones out of disposal facilities and reduces the

need for raw materials used to make new products.

Since collection programs are one of the main options for reducing cell phone waste, INFORM undertook an assessment of four cell phone collection programs now under way in the US:

1. The Donate a Phone family of programs, founded by the Wireless Foundation and comprising —
 - Call to Protect, run by Motorola and several other program partners
 - Sprint Project Connect, run by Sprint
 - The National Cell Phone Collection Program, run by The Body Shop
 - RadioShack's collection campaigns
2. The HopeLine Program, run by Verizon Wireless
3. CollectiveGood International
4. The Charitable Recycling Program.

This report describes and evaluates the methods these programs employ to recover used phones and explores the degree to which they ensure that refurbished phones are managed responsibly at *their* end of life and that recycled materials are processed and ultimately disposed of in ways that protect the environment and human health. It provides INFORM's conclusions and a summary of ways to improve program effectiveness.

Methodology

INFORM included the Wireless Foundation's Donate a Phone program and Verizon Wireless' HopeLine program in its research for this report because they are the largest programs currently under way in the US.* In addition to their reputation for recovering the largest numbers of used cell phones, these programs have received considerable attention from the media, as have CollectiveGood and Charitable Recycling, two smaller programs that we also studied. These programs, unlike Donate a Phone and HopeLine, are not affiliated with the wireless industry; they are also distinctive in several ways that make them trendsetters in the cell phone collection arena.

* AT&T Wireless expanded its cell phone recovery and reuse program in April 2003, after research for this report was complete. For more information, see the addendum at the end of this publication.

INFORM's research for this report consisted of preliminary and follow-up interviews with program representatives regarding the following topics:

- Quantity of cell phones collected
- Number of cell phones refurbished/resold versus the number recycled
- The methods used to collect used cell phones
- Program expenses
- Program revenues from the sale of refurbished phones and recycled materials
- Program promotion and advertising
- Incentives to encourage consumer participation in the program
- What determines whether phones are recycled or refurbished
- The refurbishment and recycling processes used
- The ultimate destination of refurbished phones.

In addition, INFORM conducted interviews with third parties affiliated with the collection programs, such as cell phone refurbishers, cell phone distributors, cell phone and battery recyclers, and charitable partners and beneficiaries. We also examined phone drop-off mechanisms at retail collection sites and questioned store employees regarding these programs. Finally, we assessed collection program websites and contacted the programs by phone to question representatives about their programs.

In preparing this report, INFORM evaluated how effectively the various programs are collecting used cell phones and addressing the toxic wireless waste stream. We believe that the findings of this new study will be of value to a wide variety of audiences. They will:

- Give the cell phone collection programs themselves an independent view of the limited overall role they are currently playing in addressing cell phone waste, and provide suggestions on how they can build on their important initiatives.
- Show large institutions, including major businesses, government agencies, and schools, how they can, with relative ease, contribute to reducing the cell phone waste stream by collecting used phones for reuse and recycling.
- Make environmental, health, and safety regulators and legislators aware of the marginal impact

of cell phone collection and reuse programs to date and the public policies and programs they can implement to improve rates of cell phone collection and reuse.

- Make consumers aware, no matter where they live in the US, that cell phone reuse and recycling programs, limited as they are, nonetheless provide an alternative to throwing their used phones out with the trash.
- Create an impetus for those at the source of the problem of cell phone waste — cell phone manufacturers — to move forward with programs to redesign cell phones and their accessories in ways that make them less toxic, more refurbishable, and more recyclable, and make them fully aware of international initiatives that may make redesign essential for competing successfully in the global marketplace.

Findings and Recommendations

Findings

Recovering used cell phones and either refurbishing them for reuse or recycling them are critically important because of the growing quantity of waste generated by these products and the many hazardous substances they contain (including a number of persistent, bioaccumulative toxins, or PBTS). While many retired cell phones get stored away in closets and drawers, virtually all of them — if present trends continue — will eventually wind up in disposal facilities, where their combustion in incinerators and burial in landfills pose risks to the environment and public health. The following are the main findings of this report.

1. The four cell phone collection programs examined by INFORM — which include the nation’s two largest programs, run by the wireless industry, and two smaller, independent programs — collected approximately 2.5 million phones from 1999 through early 2003.

- These programs refurbish and resell the vast majority of phones they collect, with a smaller number — about 40,000 between 1999 and 2003 — being donated to individuals (such as victims of domestic violence) or sold to recyclers. Every cell phone collected and either refurbished or recycled means fewer of these products flowing into landfills and incinerators in the US.
- The cell phone collection programs examined for this report recover used phones by four principal means. These include (1) permanent collections at retail stores; (2) short- or long-term drives held at retail stores or in partnership with government agencies, businesses, schools, and other organizations; (3) collections at football games and other sports events; and (4) direct shipment by donors to the program’s headquarters or refurbishing/recycling facility.

2. Collecting, refurbishing, and reselling used cell phones have generated millions of dollars in revenues from the sale of refurbished phones and recyclable materials. Most of this money — over \$6.5 million since 1999 — is being donated to charity.

- Donate a Phone, the largest cell phone collection program in the US, has raised about \$5 million in revenues for charitable purposes since 1999. This represents approximately two-thirds of the program’s total income.
- Verizon’s HopeLine program raised approximately \$1.4 million from the sale of used phones from October 2001 through the end of 2002. Approximately 75 percent of this amount was used for charitable purposes.
- CollectiveGood and Charitable Recycling — for-profit programs that have collected much smaller numbers of used phones — have also donated a “significant portion” of their proceeds from phone sales to charity. In the case of CollectiveGood, charitable donations were said to account for over one-half of the program’s income.*
- ReCellular, Inc., a leading refurbisher of used cell phones, generates \$25 to \$30 million in annual revenues from the sale of refurbished phones and recyclable materials from all sources. This for-profit business coordinates the refurbishment and recycling of used phones collected through the Wireless Foundation’s Donate a Phone family of programs and Verizon’s HopeLine program, but it obtains used phones from many other sources as well, including purchases from wireless carriers and retailers.

* Unlike CollectiveGood (and most other collection programs), Charitable Recycling does not make donations based on the resale value of the phones it collects, and it has not estimated its dollars donated as a percentage of phone sale revenues.

3. The 2.5 million cell phones so far recovered by the programs studied for this report account for less than 1 percent of the millions of phones retired and discarded each year, and have had only a negligible impact on this waste stream.

- Collecting, refurbishing, and recycling used cell phones have barely made a dent in the problem of cell phone waste. Although 2.5 million cell phones have been collected by the programs examined by INFORM since 1999, hundreds of millions of cell phones have been retired during this same period that have *not* been recovered by these or any other collection programs.
- The collection programs are not publicized sufficiently to achieve major national impact. INFORM's research indicates that most consumers are not aware of the existence of the collection programs currently available in the US. Promotion and advertising occur mostly at the local level, and the wireless industry (which runs the two largest programs) has not taken full advantage of the resources at its disposal to promote the programs and educate the public about the importance of cell phone recovery and reuse. Still, the Wireless Foundation's Donate a Phone program and Verizon's HopeLine program have reaped the benefits of comparatively greater exposure by recovering much larger numbers of phones than CollectiveGood or Charitable Recycling.
- Cell phone collection sites are not located to encourage wide-scale public participation. Although consumer convenience is essential to high rates of cell phone recovery, permanent collection sites at high-traffic locations within a community are not widely available. The most successful programs are those that collect used phones at drop-off sites in retail stores, especially those that sell wireless products. Verizon, for example, has been able to collect relatively large numbers of phones — approximately 500,000 in 2002 alone — because consumers can drop them off anytime at any of the company's 1200-plus retail stores. Phone drives at schools, shopping malls, and public events such as football games can bring in a lot of phones in a short period — Motorola collected 5000 units for Call to Protect (a Donate a Phone program) at a sin-

gle NFL game in Tennessee — but such collections are not available on an ongoing basis.

- The collection programs offer few financial incentives to motivate people who might not otherwise be inclined to donate their used phones. Rebates and discounts on new products in exchange for a used phone have proven effective but are offered rarely or not at all. The few times Verizon employed this strategy, distributing coupons that entitled cell phone donors to \$5 off the price of a new phone or accessory, the result was a 15 to 20 percent increase in the number of phones collected. Prepaid shipping labels can also help, but CollectiveGood is currently the only program that offers free shipping for all donations from individuals, including donations of only a single phone.

4. Over two-thirds of refurbished cell phones wind up abroad — often in developing countries — where there is little or no infrastructure in place to manage these products responsibly after users discard them. Large numbers of cell phones are also being shipped overseas for recycling. However, none of the collection programs is taking responsibility for the reuse, recycling, and disposal of the phones they export.

- The largest market for refurbished phones is Latin America, although many are also sold in Africa, Asia, and Eastern Europe. These phones are generally older or outmoded models for which there is greater demand outside the US.
- Because they do not take responsibility for the phones they collect that are refurbished and sold for export, existing programs are providing only a temporary solution to the problem of cell phone waste by shifting the disposal problem abroad. Exported phones avoid being landfilled or incinerated in the US, but they will still end up joining the waste stream unless reuse and recycling systems are available in the countries where they are sold.
- According to one recent report, 50 to 80 percent of the electronic waste collected for recycling in the US is exported to Asia, where investigators at some disposal and recycling facilities found unrestricted dumping and workers exposed to high levels of toxic chemicals.¹

While there is no evidence that any existing collection program is working with recyclers that send used cell phones to such places, the ultimate destination of these materials cannot be determined, because shipments are not tracked along the often complicated course of their purchase and subsequent resale to processors and other buyers.

5. Cell phone refurbishers and recyclers would generate higher revenues, and would likely increase their recovery rates, if phones were cheaper and easier to refurbish and recycle. However, since cell phone manufacturers bear none of the costs of refurbishment and recycling, they have little incentive to come up with designs that facilitate these processes.

- Cell phone refurbishers and recyclers interviewed by INFORM cited a number of design-related impediments to refurbishment and recycling that compromise efficiency and increase program costs. Disassembly can be time-consuming, parts can be expensive and difficult to replace, accessories can be hard to find, and modifying the internal software can be complicated. Some of these problems are common to all cell phones while others are specific to certain makes and models. They all make refurbishment more difficult and costly.
- Most cell phone metals can be recovered and sold, but there is little market for the plastics, which are mostly burned off during smelting. The typical phone contains a variety of plastics, which cannot be separated cost-effectively. Recycling is also hindered by the presence of toxic contaminants such as brominated flame retardants and beryllium. Since plastics make up 40 percent of a cell phone's contents, the failure to reuse them represents a significant waste of materials.

Recommendations

To effectively address the problem of cell phone waste, the programs that collect, refurbish, and recycle used cell phones must be of a scale commensurate with the scope of the problem. Today's programs will not be able to prevent a massive legacy of persistent toxic waste and contamination from cell phones unless they are dramatically expanded and improved. The following recommendations aim to enable collection programs to fulfill their potential through both internal change and cooperative action by manufacturers and public policy makers.

1. New and existing collection programs must improve cell phone recovery rates by conducting more aggressive promotional and advertising efforts, providing widespread, conveniently located, and permanent phone drop-off sites, and offering financial incentives for consumers to donate their used phones.

- To increase participation, wireless providers and the cell phone collection programs themselves need to do more to spread the word about the importance of cell phone reuse and recycling. National and regional advertising campaigns and expanded media coverage would increase public awareness of the programs and highlight their value. Collections at retail outlets could be promoted more aggressively inside the store, wireless providers could publicize the programs in ads for their service plans, and collection information could be included with new phones and phone bills.
- Collection programs should make it more convenient for consumers to donate their used phones by establishing permanent drop-off sites at a variety of high-traffic locations within a community, such as shopping malls, supermarkets, banks, and post offices. Converting temporary drives to permanent collection systems would also help. This is especially true in the case of RadioShack (a Donate a Phone program partner), which has about 7100 stores nationwide and could recover much larger numbers of phones if its collection drives were ongoing.
- To motivate more people to donate their phones, program participants with retail outlets

should offer discounts and rebates on their products to customers bringing in phones. In the case of programs that recover significant numbers of phones through direct donations, participation could be increased by providing free shipping in all cases, regardless of quantity.

2. Collection programs should ensure that refurbished phones sold abroad are managed responsibly after users discard them, and that phones sent abroad for recycling are processed and ultimately disposed of in a manner that protects public health and the environment.

- Phones sent abroad should be returned to the US for reuse and recycling, or systems need to be established that enable these phones to be collected, reused, and recycled abroad. Both of these options present significant challenges requiring the cooperation of all interested parties, including the wireless industry, those involved in refurbishing, recycling, and reselling phones, and the collection programs themselves. Establishing an overseas recovery infrastructure would advance one of the goals of the 1989 Basel Convention, which is to prevent the dumping of hazardous materials in developing countries. Revenues generated from the sale of refurbished phones and recyclable materials could be used to cover the costs of this infrastructure.
- To ensure responsible recycling and disposal practices, phones sent abroad should be tracked at every point where they change hands. The collection programs can require verification of the ultimate destination of all product shipments, as well as certificates of destruction/consumption for all shipments processed.

3. Cell phone manufacturers can alleviate impediments to cost-effective refurbishment and recycling by making relatively simple changes in cell phone design and manufacturing, which would in turn increase the profitability of programs that collect, refurbish, and resell used phones.

- More durable designs that are easier to disassemble would reduce the time, labor, and costs involved in refurbishing used cell phones.

Phones with fewer breakable parts (such as flip panels and external antennae) or with parts that can be easily snapped on and off are easier and less costly to take apart and refurbish.

- Standardized components would allow for interchangeability among different makes and models of phone. When a phone can use many types of battery, adapter, or other accessory, finding a replacement can be done more quickly and easily.
- Simplified internal software would expedite refurbishing. Resetting a phone's internal software is one of the most time-consuming and difficult parts of the refurbishing process.
- Reducing the toxic constituents of cell phones would make them more recyclable. Cell phones manufactured with alternatives to brominated flame retardants and beryllium-copper would reduce contamination problems and improve worker safety.
- Standardizing and labeling plastics and batteries would facilitate both refurbishment and recycling. Since different brands of cell phone contain different plastics and battery types, this would make sorting and replacing them more cost-efficient.

4. Policy initiatives at both the federal and state levels can play a vital role in stimulating more efficient systems of cell phone recovery that substantially reduce the flow of this waste stream to landfills and incinerators.

- Deposit refunds on cell phones would increase the incentive for consumers to return their used phones for reuse and recycling. In the US, bottle and can recovery rates are more than two and a half times higher in states that require deposits on beverage containers than in states that do not.
- Landfill bans on cell phones would increase the number of phones flowing into collection programs. Legislation requiring municipalities to create systems for recovering, refurbishing, and recycling used phones would make such bans even more effective. Revenues generated from the sale of recovered phones could help fund these municipal programs.

- Targets for cell phone collection, reuse, and recycling would give the wireless industry an incentive to improve program efficiency. Similarly, targets for reducing these products' toxic constituents would give cell phone manufacturers an incentive to design for reuse and recycling. Such targets are a critical component of "extended producer responsibility" (EPR) policies in effect in Europe and elsewhere. The European Union's (EU's) recently adopted *Directive on Waste Electrical and Electronic Equipment* (WEEE Directive) establishes a cell phone recycling/reuse target of 65 percent by the end of 2006, and its *Directive on the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment* (RoHS Directive) requires the elimination of toxic substances (such as mercury, lead, and certain brominated flame retardants) from all electrical and electronic equipment, also by 2006. (For more information on these directives, see INFORM's fact sheets "European Union Electrical and Electronic Products Directives," http://www.informinc.org/fact_WEEEoverview.pdf, and "The WEEE and RoHS Directives: Highlights and Analysis," http://www.informinc.org/fact_WEEE.pdf.) All manufacturers wishing to sell their products in any of the EU's 15 member states must meet all the requirements of both directives by the dates specified. Worldwide action such as this may force change in the US, especially in light of the Basel Convention's Initiative for a Sustainable Partnership on Environmentally Sound Management of End-of-Life Mobile Phones, adopted in December 2002. This initiative, which aims to identify and establish best practices for the refurbishment, recycling, and disposal of used cell phones, may have an effect on the export of used cell phones by US collection programs.
- Mandated reporting on the collection and end use of refurbished phones and recyclable materials would provide valuable information on program efficiency and the destination of cell phones that wind up abroad. Full disclosure of this information would allow consumers and others to evaluate and compare the global effectiveness of individual programs.

5. By requiring manufacturers to bear the financial and/or physical responsibility for managing their products after consumers discard them, policy makers can provide a powerful driver for them to create designs that facilitate cell phone reuse and recycling.

- A system of extended producer responsibility would give manufacturers of cell phones that can be efficiently refurbished and recycled a competitive advantage. In the EU, the WEEE Directive encourages environmentally sustainable designs by holding manufacturers financially responsible for the take-back and management of their products at end of life. US producers that offer cell phones designed for reuse and recycling will be able to meet some of the criteria imposed by the directive on companies wishing to market their products in Europe.
- Since toxic contaminants hinder recycling, EPR could give manufacturers a stronger incentive to design their cell phones with fewer toxic components. The EU's RoHS Directive calls for the substitution of toxic substances with safer alternatives, which could increase the profitability of recycling electronic equipment such as cell phones.

1 Cell Phone Collection Programs in the US

By far the largest and most successful cell phone collection programs in the US are the two affiliated with the wireless industry: the Wireless Foundation's Donate a Phone program and Verizon's HopeLine program.* Together, these programs account for the majority of phones — nearly 2.5 million of them — collected from 1999 through early 2003. Both Donate a Phone and HopeLine rely on ReCellular, Inc., a for-profit buyer and seller of cell phones, to coordinate the refurbishment and recycling of phones collected through their programs. Two smaller programs, CollectiveGood and Charitable Recycling, are affiliated with neither the wireless industry nor ReCellular and have collected much smaller numbers of phones. All of these programs either refurbish and resell or recycle the phones they collect, depending on their condition. In all cases, most of the proceeds from the sale of refurbished phones are used for charitable purposes.

Wireless Foundation/ Donate a Phone

The Wireless Foundation (a not-for-profit philanthropic organization established in 1991 by the Cellular Telecommunications & Internet Association, an international trade organization representing the interests of the wireless industry) created the Donate a Phone family of programs in September 1999 for two reasons: to benefit charities by tapping into the potential value of discarded cell phones and to prevent these materials from entering the waste stream.¹ Donate a Phone accepts all types of cell phones (including batteries and accessories such as adapters, headsets, and phone

cases), regardless of carrier, make, model, and condition. ReCellular is responsible for the refurbishment, resale, and recycling of all cell phones collected through Donate a Phone.

Donate a Phone comprises three separate programs, summarized below.[†] The Wireless Foundation is responsible for recruiting participants into these programs and coordinating charitable functions such as the distribution of phones and revenues from their sale. Individual participants (Motorola, Sprint, The Body Shop, RadioShack, etc.) are responsible for running their own programs.

- **Call to Protect.** Created by the Wireless Foundation, Motorola, the National Coalition Against Domestic Violence, and several wireless carriers, the national Call to Protect program collects used cell phones for the benefit of domestic violence victims. Most phones are sent in to the program by individuals, but corporate participants such as Motorola and RadioShack also conduct collections at community events and retail outlets. After refurbishment by ReCellular, the phones are either resold and the proceeds used to benefit organizations that work to prevent domestic violence, or they are distributed free of charge (equipped with free airtime) to domestic violence victims and organizations.
- **Return Outreach Initiative (ROI).** Under this program, which began in 2002, the Wireless Foundation and ReCellular partner with wireless carriers and retailers to benefit specified charities from the sale of recovered phones. Phones are generally collected at retail outlets,

* Another major wireless provider, AT&T Wireless, expanded its own cell phone recovery and reuse program in April 2003, after research for this report was complete. For more information, see the addendum at the end of this publication.

[†]These classifications were originally used by the Wireless Foundation to distinguish its collection partners and programs

by type and purpose, but they are now used mainly for internal record-keeping purposes. In the future, the Wireless Foundation intends to classify program participants into those that donate phones and revenues from phone sales to domestic violence victims and prevention programs (i.e., Call to Protect) and those that donate revenues from phone sales to other causes and charities.

with community-based collection events complementing these permanent collection sites. Current collection partners include Sprint (whose program is described below), Nextel, and FranklinCovey.*

- **PhoneRaising.** Similar to ROI and launched the same year, this program helps for-profit and not-for-profit organizations collect used cell phones and raise funds for hospitals, civic groups, amateur sports groups, schools, parent-teacher associations, fraternities and sororities, Boy Scout troops, youth groups, and religious organizations. Participants collect phones at company locations or through community collection events; donors may also send in phones directly to participating companies. Currently, the largest PhoneRaising programs (described below) are run by RadioShack and The Body Shop. Many program beneficiaries, such as individual Goodwill Industries International operations, run collection drives for their own benefit.

Packing and sending collected phones to ReCellular are the responsibility of individual program participants, but the actual shipping costs are paid by ReCellular out of Donate a Phone program expenses. In most cases, individual donors may also send in phones at their own expense. Partners in the Donate a Phone program generally use their own funds for advertising, public relations, staff, and other expenses.

Each Donate a Phone program sends its collected cell phones to ReCellular's facility in Dexter, Michigan, where they are refurbished, sold "as is," or sold to recyclers, depending on their condition. Regardless of condition, ReCellular pays the Donate a Phone program for these phones based on its estimate of their value, which mainly depends on brand and model.

About one-third of Donate a Phone's proceeds from the sale of phones to ReCellular are returned to ReCellular to cover its costs, which include the shipping and processing of phones obtained through the program. The remaining two-thirds — about \$5 million since 1999² — go to the Wireless

* Nextel and FranklinCovey, with approximately 180 and 400 retail outlets, respectively, began their collection programs in early 2003.

Foundation to be used and distributed for charitable purposes. The Wireless Foundation also buys refurbished phones from ReCellular for donation to domestic violence victims, teachers, community watch groups, and others; some wireless carriers that support the Wireless Foundation's programs match these donations with free airtime.

From 1999 through 2002, the Donate a Phone program collected approximately 1.5 million used cell phones.³ Approximately 75 percent of these were refurbished by ReCellular and donated to individuals in need or were resold (either "as is" or after refurbishment). Approximately 25 percent (375,000) were recycled.⁴ Of the more than 1.1 million phones that were donated or resold, approximately 700,000 ended up outside of the US, mostly in Latin America but also in Africa and Asia.⁵ The remainder wound up within the US.

The principal Donate a Phone programs are described in the following sections.

Motorola/Call to Protect

This program was inaugurated in 1996, when Motorola and Rural Cellular Corp. (a national wireless carrier) donated 40 new cell phones with free airtime to victims of domestic violence.⁶ From 1996 through 1998, the program made donations of new phones only, but in 1999 Motorola joined with the Wireless Foundation, the National Coalition Against Domestic Violence, and the wireless carriers Alltel, Cingular, Nextel, Rural Cellular Corp., and Sprint in launching the present-day used cell phone collection and donation program. From 1999 through the end of 2002, Call to Protect collected over 1 million used cell phones.⁷

Refurbished phones collected through Call to Protect are equipped with free airtime (provided by Wireless Foundation supporters) and donated to victims of domestic violence, or the proceeds from their sale are donated to organizations that work to prevent domestic violence. In addition, Motorola sponsors an annual companywide phone donation event. In 2000, Motorola employees donated over 5000 used cell phones to Call to Protect. According to the Wireless Foundation, Call to Protect has raised "several million dollars" in charitable donations since 1999.⁸

The Collection Process

As a partner in the Call to Protect program, Motorola collects all types of used cell phones (including batteries and accessories such as adapters, headsets, and phone cases), regardless of carrier, make, model, and condition. Unlike wireless carriers such as Sprint (a partner in the Return Outreach Initiative) and retailers such as RadioShack (a one-time participant in Call to Protect and a current participant in PhoneRaising), Motorola does not have any retail locations and therefore relies on individual donations and large collection events to recover used phones. Call to Protect obtains the majority of its phones directly from individual donors, although phone drives conducted by other program participants, such as RadioShack, have recovered significant numbers of phones for the program.

Motorola is a National Football League (NFL) sponsor, and its collection events are generally held at NFL games. In 2001, events held at 27 NFL games resulted in the collection of 15,000 to 20,000 used phones; in 2002, events at 16 stadiums collected approximately 10,000 phones.⁹ Motorola also collects used phones through citywide collection campaigns conducted in partnership with local businesses. In Austin, Texas, a partnership with Cingular Wireless for several weeks in 2001 and 2002 resulted in the recovery of almost 15,000 phones.¹⁰

Packing and sending cell phones collected at NFL events are the responsibility of Motorola, but the actual shipping costs are currently paid by ReCellular out of Donate a Phone program expenses (in the past, shipping was provided by FedEx and Central Transport). Phones can also be sent directly (at the donor's expense) to Call to Protect c/o ReCellular, Inc., 2555 Bishop Circle West, Dexter, MI 48130-1563. Donations are tax deductible; tax receipts are provided to donors who drop off a phone in person or they can be downloaded from the program website at http://www.wirelessfoundation.org/CalltoProtect/CTP_DonationReceipt.PDF.

Refurbishment, Recycling, and Resale

ReCellular, Inc. (see box, page 15), is responsible for the recycling, refurbishment, and resale of all cell phones collected through the Call to Protect program

(see Chapter 4 for more on the refurbishment and recycling processes). According to ReCellular, it refurbished approximately 75 percent (750,000) of the 1 million phones collected by Call to Protect from 1999 through the end of 2002 and recycled approximately 25 percent (250,000). Refurbished phones obtained through Call to Protect included 30,000 units that were donated to victims of domestic violence.¹¹ Donated phones are pre-programmed (either by ReCellular or a participating wireless carrier) to dial 911 and one or two other numbers (such as a domestic violence shelter); participating wireless carriers provide free airtime.

For More Information

Information about Call to Protect can be found on Motorola's website (<http://www.motorola.com/content/0,1037,128-293,00.html>) and the Wireless Foundation's website (<http://www.wirelessfoundation.org/CalltoProtect/index.cfm>). The Wireless Foundation's website also provides information about drop-off locations (<http://www.wirelessfoundation.org/CalltoProtect/HowToDonateCTP.cfm>). Individuals can call 888-901-SAFE (7233) for information on how to donate their used cell phones.

Sprint/Sprint Project Connect

As a partner in Donate a Phone's Return Outreach Initiative, Sprint PCS launched Sprint Project Connect in April 2002 to collect used cell phones and donate the proceeds from their sale to organizations that provide services to people with disabilities.¹² Like all phones collected through Donate a Phone, those obtained by Sprint Project Connect are sent to ReCellular to be either refurbished and sold or recycled, depending on their condition.

Funds raised from the sale of phones collected through Sprint Project Connect are donated to Easter Seals and the National Organization on Disability for services such as medical rehabilitation, job training and employment, child care, adult day services, and camping and recreational services. From April 2002 through February 2003, Sprint collected approximately 116,000 used cell phones and raised approximately \$348,000 from their sale.¹³

The Collection Process

Donors may drop off used phones of all makes, models, and condition (including batteries and accessories such as adapters, headsets, and phone cases) at any of Sprint's roughly 450 retail stores, or at any Sprint store that provides landline service (there are about 30 of these). While most phones collected by Sprint Project Connect are dropped off at retail outlets, donors may also bring their phones to any Easter Seals location, of which there are approximately 400 at clinics, rehabilitation centers, hospitals, and offices throughout the US.

In addition to these permanent cell phone collection sites, Sprint sponsors collection events at National Football League games and on college campuses. The company also promotes cell phone collections at grand openings of its retail stores, and Sprint employees can run collection events on their own. Sprint public relations managers work closely with their counterparts at the Easter Seals national office, apprising them of upcoming program events and providing promotional materials. The national office sends this information on to its affiliates, including news about collection events being organized near specific Easter Seals locations. Easter Seals also holds monthly conference calls with its affiliates to discuss Sprint Project Connect news and progress.

Packing and sending collected cell phones to ReCellular are the responsibility of Sprint, but the actual shipping costs are paid by ReCellular out of Donate a Phone program expenses. Phones can also be sent directly (at the donor's expense) to Sprint Project Connect c/o ReCellular, Inc., 2555 Bishop Circle West, Dexter, MI 48130. Donations are tax deductible; tax receipt forms are available at every Sprint cell phone collection box and on the Sprint Project Connect website (provided below).

Refurbishment, Recycling, and Resale

ReCellular (see box, page 15) is responsible for the recycling, refurbishment, and resale of all cell phones collected through Sprint Project Connect (see Chapter 4 for more on the refurbishment and recycling processes). Of the 116,000 phones collected through Sprint Project Connect between April 2002 and February 2003, approximately 75 percent (87,000) were refurbished and resold; approximately 25 percent (29,000) were recycled.

For More Information

Information about Sprint Project Connect can be found on Sprint's website (http://www.sprint.com/community/communities_across/spc.html), which includes a link for the locations of all Sprint retail stores and Easter Seals affiliates. Information can also be found on the Easter Seals website (http://www.easter-seals.org/site/PageServer?pagename=ntl_sprint) and the National Organization on Disability website (http://www.nod.org/cont/dsp_cont_item_view.cfm?viewType=itemView&contentId=889). General information can be found on the Wireless Foundation's website (<http://www.wirelessfoundation.org/DonateAPhone/index.cfm>) and on ReCellular's website (http://www.wirelessrecycling.com/home/sprint_project_connect.asp). Individuals can call 888-253-1315 for information on how to donate their used cell phones.

The Body Shop/National Cell Phone Collection Program

The Body Shop has a history of participation in environmental initiatives, from minimizing packaging to reusing and recycling product containers. Moreover, in the mid-1990s the company adopted the Stop Family Violence in the Home campaign as part of its commitment to "defend human rights and activate self-esteem." In support of both these environmental and human rights goals, the company became a partner in PhoneRaising and inaugurated the National Cell Phone Collection Program in September 2002 at all Body Shop stores.¹⁴

Proceeds from the sale of used phones, which are refurbished by ReCellular, are donated to the National Coalition Against Domestic Violence. The Body Shop's agreement with the Wireless Foundation also stipulates that 10 cell phones must be donated every year to each of The Body Shop's approximately 250 family violence shelter partners. (These cell phones may originate from other Wireless Foundation collection partners as well as from The Body Shop's own collections.) Through March 2003, the National Cell Phone Collection Program had collected approximately 25,000 used cell phones and raised approximately \$36,000 from their sale.¹⁵

The Collection Process

The Body Shop provides collection boxes for used cell phones of all makes, models, and condition (including batteries and accessories such as adapters, headsets, and phone cases) at each of its approximately 300 retail stores. Shop managers can publicize and promote the program in any manner they deem appropriate, including community collection events, and employees are periodically trained to answer basic questions about the program.

Packing and sending collected cell phones to ReCellular are the responsibility of The Body Shop, but the actual shipping costs are paid by ReCellular out of Donate a Phone program expenses. Donors receive a tax receipt when they drop off their used phones.

Refurbishment, Recycling, and Resale

ReCellular (see box) is responsible for the recycling, refurbishment, and resale of all cell phones collected through the National Cell Phone Collection Program (see Chapter 4 for more on the refurbishment and recycling processes). Of the 25,000 cell phones collected through the National Cell Phone Collection Program between September 2002 and March 2003, approximately 75 percent (18,750) were refurbished and 25 percent (6,250) were recycled.

For More Information

Information about the National Cell Phone Collection Program can be found on The Body Shop's website (http://www.usa.thebodyshop.com/web/tbsus/values_ase.jsp). For individual store locations, see <http://www.usa.thebodyshop.com/web/tbsus/locator.jsp>.

RadioShack

RadioShack has been involved in the Donate a Phone program since 2001 and has so far conducted three collection campaigns, each lasting approximately three months.¹⁶ For the first two campaigns, the company was a participant in Call to Protect, which it learned of through Motorola, a program co-founder whose wireless products are sold in RadioShack stores. In its most recent campaign, in the summer of 2002, RadioShack participated in PhoneRaising.

RadioShack's three campaigns have together collected approximately 200,000 used cell phones.¹⁷

As a participant in Call to Protect, RadioShack donated the proceeds from its first two collection campaigns to organizations that work to prevent domestic violence. Funds from the sale of refurbished phones collected in the latest campaign were donated to Students in Free Enterprise, a global educational outreach organization. Since 2001, RadioShack has raised approximately \$500,000 for charity through the sale of refurbished cell phones.¹⁸

The Collection Process

In its first two campaigns, RadioShack collected cell phones only at its retail stores, of which there are approximately 7100 throughout the US. In the most recent campaign, members of Students in Free Enterprise promoted cell phone collection in their communities, organizing collections on college campuses and at strip malls. Outside of these three campaigns, RadioShack has no ongoing cell phone collections at its stores. When a collection campaign is not under way, store employees are told to refer customers interested in donating their used cell phones to the Wireless Foundation.

Packing and sending collected cell phones to ReCellular are the responsibility of RadioShack, but the actual shipping costs are paid by ReCellular out of Donate a Phone program expenses. Tax receipts are available at drop-off locations during the collection campaigns.

Refurbishment, Recycling, and Resale

ReCellular (see box) is responsible for the recycling, refurbishment, and resale of all cell phones collected through RadioShack (see Chapter 4 for more on the refurbishment and recycling processes). According to ReCellular, of the approximately 200,000 cell phones collected by RadioShack between 2001 and 2002, 75 percent (150,000) were refurbished and 25 percent (50,000) were recycled.

For More Information

Information about RadioShack's collection campaigns, while they are in progress, can be found on the Wireless Foundation's website (<http://www.wirelessfoundation.org/DonateaPhone/index.cfm>).

Refurbishing and Reselling Used Cell Phones: ReCellular, Inc.¹⁹

Established in 1991, the for-profit company ReCellular is a “world leader” in buying, refurbishing, and selling used cell phones. In 1999, ReCellular became responsible for refurbishing and recycling cell phones collected through the Wireless Foundation’s Donate a Phone programs; in 2001, it partnered with Verizon and became responsible for cell phones collected through that company’s HopeLine program. (ReCellular also refurbishes a significant number of phones from other sources, including phones it buys from wireless carriers and retailers.) ReCellular receives used phones at its facilities in Dexter, Michigan (formerly in Ann Arbor), and Miami, Florida, where they are refurbished, sold “as is” to third parties, or sold to recyclers. Approximately two-thirds of the phones refurbished and sold by ReCellular (as well as by other refurbishers) wind up abroad, many in the developing world.

Through the end of 2002, ReCellular had received over 2.4 million cell phones collected through Donate a Phone and HopeLine. Of these, approximately 75 percent (1.8 million) were donated or resold, either “as is” or following refurbishment. Approximately 25 percent (600,000) were recycled by third parties. According to ReCellular, none of the cell phones or components it sends to third parties for recycling wind up in landfills.

Whether or not a used phone is refurbished largely depends on its condition and whether a market exists for the particular brand and model. Phones chosen for refurbishment are cleaned and any defective parts replaced.

ReCellular also removes any carrier tags or logos and deletes any internal messages or locks. Finally, batteries, chargers, and operating instructions are added, depending on whether the purchaser provides its own accessories or requests them from ReCellular (see Chapter 4 for more on the refurbishment process). Refurbished phones are sold to a variety of recipients, including wireless carriers, retailers, cell phone aggregators (companies that buy phones and then sell them in large blocks within the US and abroad), and other cell phone dealers.

ReCellular sells phones that cannot be economically refurbished to recycling companies. Through the end of 2002, ReCellular had sent approximately 600,000 used phones obtained through Donate a Phone and HopeLine to US recycling facilities. These facilities separate the cell phone components into different material streams, mainly metals and plastics. Metals are smelted and sold in the US and abroad for use in jewelry, piping, gold-flake paint, and other products. Plastics are mainly incinerated, though a small amount is recovered and sold in the US and abroad for use in such items as milk jugs, toys, and soda bottles. Approximately 10 to 20 percent of the batteries contained in the phones ReCellular receives are in sufficiently good condition to be reused; the rest are sent to a US battery recycler.

For more information, see ReCellular’s website (<http://www.recellular.net/brochure/donate.asp>), or call Jenifer Chambers, Director of Charitable Collections Programs, at 734-205-2250.

Verizon Wireless/ HopeLine Program

In 1995, Verizon Wireless (then Bell Atlantic Mobile) initiated the HopeLine program to provide women in domestic violence shelters with voice mailboxes for communicating with counselors, prospective

employers, and other supporters.²⁰ At the time, Bell Atlantic was providing work force training on domestic violence and funding prevention programs. Certain Bell Atlantic stores began collecting phones on a limited basis and the program went national in 2000. In October 2001, after the merger with Airtouch, Cellular GE Wireless, Primeco PCS, and Bell Atlantic, every Verizon retail store began to par-

ticipate in the HopeLine program. Like the Wireless Foundation's Donate a Phone program, Verizon's refurbishing and recycling partner in the HopeLine program is ReCellular.

From October 2001 through the end of 2002, Verizon collected approximately 900,000 used cell phones (approximately 500,000 phones were collected in 2002 alone).²¹ Verizon uses the CDMA and Analog (Tri-mode) cellular standard and distributes refurbished phones compatible with this standard (along with free airtime) directly to victims of domestic violence. Since October 2001, 10,000 of these donations have been made. The remaining phones are sold, with the proceeds — approximately \$1.4 million since October 2001 — donated to domestic violence shelters and prevention programs.²²

The Collection Process

HopeLine accepts every type of used cell phone (including batteries and accessories such as adapters, headsets, and phone cases), regardless of carrier, make, model, and condition. Donors can deposit their used phones in kiosks provided at all Verizon Wireless Communications stores, of which there are over 1200 throughout the US.

In addition to these ongoing in-store collections, Verizon sponsors collection events in partnership with government agencies, human services organizations, and local businesses. To date, collection partners have included the City of San Francisco, the New York City Mayor's Task Force on Domestic Violence, the North Carolina Coalition Against Domestic Violence, the Colorado Coalition Against Domestic Violence, Ernst & Young, KPMG Peat Marwick, and IKEA. The company also sponsors drives at football games, golf outings, and other public occasions, sometimes in cooperation with one of its collection partners. These events are promoted at Verizon's retail stores.

Packing and sending collected cell phones to ReCellular are the responsibility of Verizon Wireless. Funds raised from the sale of refurbished phones and recyclable materials are used to cover the shipping costs. Phones can also be sent directly (at the donor's expense) to HopeLine Program/Verizon Wireless c/o ReCellular, Inc., 2555 Bishop Circle West, Dexter, MI 48130-1563. Donations are tax deductible; tax receipts are provided to donors who drop off a phone in person

or they can be downloaded from the program website at http://www.verizonwireless.com/jsp/aboutus/wireless_issues/hopeline_recycling.jsp.

Refurbishment, Recycling, and Resale

ReCellular (see box, page 15) is responsible for the recycling and refurbishment of all cell phones collected through the HopeLine program (see Chapter 4 for more on the refurbishment and recycling processes). Of the 900,000 used cell phones collected by HopeLine since October 2001, approximately 75 percent (675,000) were refurbished and 25 percent (225,000) were recycled.²³ Depending on demand, ReCellular sends refurbished Tri-mode phones back to Verizon for donation to domestic violence victims; the remainder are sold.

For More Information

Information about the HopeLine program can be found on Verizon's website (http://www.verizonwireless.com/jsp/aboutus/wireless_issues/hopeline_recycling.jsp) and ReCellular's website (<http://www.wirelessrecycling.com/home/hopeline.asp>). Individuals interested in donating their used cell phones can call HopeLine at 800-426-2790.

CollectiveGood International

CollectiveGood, headquartered in Atlanta, Georgia, began its cell phone collection program in December 2000 to help charities and provide a "socially and environmentally responsible means" for consumers to dispose of their used phones.²⁴ Depending on their condition, collected phones are refurbished at this for-profit company's own facility and resold, sold "as is" to third parties (which perform refurbishing themselves or salvage usable parts), or they are recycled. Most are sold for reuse abroad, generally to countries in Latin America and Eastern Europe. Between December 2000 and January 2003, CollectiveGood had collected approximately 50,000 used cell phones.²⁵ Of these, 70 to 80 percent were refurbished and sold for reuse; the rest were recycled.

For every used cell phone received, CollectiveGood pays an amount ranging from \$1 to \$15 to the charity specified by the donor. The amount depends on the organization's estimate of the refurbished or recycled

unit's value, so CollectiveGood makes a profit on any resale revenues above that amount.²⁶ A total of about 50 charitable organizations are listed on CollectiveGood's website; charities listed on the donation form include the American Humane Association, CARE, the Sierra Club, Environmental Defense, Children's National Medical Center, and the Working Assets Wireless Charity Fund. CollectiveGood works closely with CARE, which is one of its collection partners. CARE promotes CollectiveGood on its website and provides information about the program in newsletters and e-mails to members. It also works with businesses and other organizations to establish cell phone drop-off sites. From the program's inception in 2000 through January 2003, CollectiveGood made approximately \$100,000 in charitable donations.²⁷

The Collection Process

CollectiveGood accepts all types of used cell phones (including batteries and accessories such as adapters, headsets, and phone cases) regardless of carrier, make, model, and condition. The organization uses its website to promote the program, but collection campaigns conducted by business and charitable partners are beginning to outstrip individual donations as a source of used phones. In 2003, the Staples office supply chain agreed to establish CollectiveGood cell phone drop-off sites at each of its approximately 1200 retail stores in the US. This ongoing collection, which will generate funds for the Sierra Club, will likely become the program's principal means of collection.

Phones can be sent directly to CollectiveGood International, 4508 Bibb Blvd., Suite B-10, Tucker, GA 30084. Prepaid US Postal Service labels are downloadable from the organization's website (http://www.collectivegood.com/donate_phone.htm); donation acknowledgment letters are sent by the individual charities. Shipping is free, except for bag phones and mounted car phones.* (CollectiveGood will pay to ship bag

* Bag phones, also known as transportable phones, operate by equipment stored in a small carrying case, from which the phone's antenna usually extends. Bag phones have little economic value, but they are sometimes sold for reuse, generally in foreign countries. They also contain a 2-pound lead-acid battery that CollectiveGood removes and sends to recyclers. Some bag phones (especially those made by Motorola) are sometimes sold, either directly or through third parties, to companies that manufacture vehicle security systems used to track stolen cars.

and mounted car phones when they are included in donations of 20 or more phones.)

Refurbishment, Recycling, and Resale

Participants in CollectiveGood send their used cell phones to the organization's facility in Tucker, Georgia, where those that can be refurbished are separated from those that will be recycled. Refurbishment generally takes place at this facility, although a small number of phones are refurbished by third-party organizations. Recycling is done by Global Investment Recovery Inc. (Tampa, FL), a function performed until recently by Waste Management's Asset Recovery Group. Batteries are sent to INMETCO, a recycler affiliated with the Rechargeable Battery Recycling Corp. The vast majority of phones refurbished by CollectiveGood are sold to users in Latin America and Eastern Europe, mainly by cell phone aggregators that buy up phones for block sales.²⁸

For More Information

Information about CollectiveGood can be found on the organization's website (<http://www.collectivegood.com>), or by calling Seth Heine, President, at 770-856-9021.

Charitable Recycling Program

The Charitable Recycling Program, based in Bloomfield Hills, Michigan, is run by Oakland County (MI) and REAP2 (Recycling Electronics and Pollution Prevention), an environmental initiative sponsored by a group of 480 high-tech companies in southeast Michigan.²⁹ The program is supported by the Wireless Source, a for-profit distributor of new, used, and remanufactured cell phones.

Charitable Recycling began in May 2002 as a pilot project to determine how consumers and corporations could be motivated to donate their used phones. The Wireless Source became involved because its main business is buying used cell phones from manufacturers and other companies and reselling them to aggregators. (For example, it bought used phones from Staples after the company switched wireless provider and had to buy phones of a different brand.)

The Wireless Source donates a percentage of the revenues generated from its business to fund the Charitable Recycling Program.

Depending on their condition, collected phones are refurbished at the Wireless Source's own facility and resold, or they are recycled. From the program's inception through February 2003, Charitable Recycling had collected over 40,000 cell phones.³⁰ Approximately 62 percent (24,800) of these were refurbished and 38 percent (15,200) were recycled.³¹ Almost all of the refurbished phones were resold.

For each cell phone received, Charitable Recycling makes a \$1 to \$5 donation to a charity of the donor's choice (the larger the charity, the larger the donation). Organizations listed on the program's website include the Rainbow Connection (a charity for children with life-threatening illnesses), the Women's Survival Center of Oakland County [MI], the Detroit Public Library, EcologyFund, and the Rainforest Site. If a donor fails to choose a charity, the default organization is the Rainbow Connection. Although Charitable Recycling will donate phones to those in need, it received only about five requests for free phones between May and November 2002.³² From May 2002 through February 2003, Charitable Recycling donated approximately \$60,000 to its charitable partners.³³

The Collection Process

The Charitable Recycling Program collects every type of cell phone (including batteries and accessories such as adapters, headsets, and phone cases), regardless of carrier, make, model, and condition. The organization's website originally served as the main means of participation in the program, but partnerships with businesses and community organizations now generate the majority of donations. Charitable Recycling provides collection bins to groups holding collections and is currently working with local government offices in Michigan to promote phone collection in that state. It is also beginning to work with other businesses and charities to promote collection events throughout the US.

Phones can be sent directly to the Charitable Recycling Program, 794-A Industrial Court, Bloomfield Hills, MI 48302. Tax receipt forms and address labels can be downloaded from the organiza-

tion's website (<http://www.charitablerecycling.com>). Shipping is free for the organization's charitable partners. Charitable Recycling will provide prepaid shipping labels to individuals upon request, but individual contributions are generally shipped at the donor's expense.

Refurbishment, Recycling, and Resale

Participants in the Charitable Recycling Program send their used cell phones to the Wireless Source, where refurbishment takes place at the company's own facility. Depending on their condition, phones that cannot be refurbished are sold to wholesalers for parts or sent to third-party companies for recycling. Maxim Industries USA (Ft. Lauderdale, FL) and Great Lakes International Recycling (Roseville, MI) are currently the principal recyclers used, but the Wireless Source, Oakland County, and REAP2 are in the process of developing an independent recycling center to ensure that no by-products of the recycling process wind up in landfills. Batteries are sent to Battery Solutions, Inc. (Wayne, MI), for recycling.

Of the phones it collects through Charitable Recycling and subsequently refurbishes (along with most of the 400,000-plus phones it purchases each year), the Wireless Source sells approximately 70 percent to overseas wireless providers and cell phone aggregators. These phones are then resold for reuse, mainly in Mexico and Venezuela but also in India and Eastern Europe.³⁴ The remaining 30 percent are sold directly to US retailers, including local wireless stores and gas stations.

For More Information

Information about the Charitable Recycling Program can be found on the program's website (<http://www.charitablerecycling.com>), or by calling 800-300-1052 ext 301.

2 Collection Methods and Program Promotion

Assuming a life span of 1.5 years per phone, INFORM estimates that by 2005, over 100 million cell phones weighing about 50,000 tons will be retired each year in the US. An additional 500 million phones will be stockpiled — stored away in closets and drawers, and ultimately destined for disposal. Meanwhile, the principal cell phone collection programs have diverted a total of only about 2.5 million phones from the waste stream since 1999, a period in which hundreds of millions of phones have been retired, buried in landfills, and burned in incinerators.

The collection programs now under way have been in existence for too short a time to determine their long-term effectiveness as a means of recovering large numbers of phones. However, INFORM's research suggests that the success of these programs depends on four main factors: (1) the collection method used, (2) its convenience to potential donors, (3) public awareness of the program generated through promotion and advertising, and (4) customer incentives provided to encourage donation.

The collection programs that are recovering phones in the largest numbers are the ones that make it easiest for consumers to donate their used phones. Verizon, for example, has many more stores throughout the US than Sprint or The Body Shop, and has therefore been able to collect many more phones for its HopeLine program than either Sprint Project Connect or the National Cell Phone Collection Program. As to public awareness, Donate a Phone and HopeLine have reaped the benefits of greater exposure by recovering larger numbers of phones than CollectiveGood or Charitable Recycling. Even these programs, however, are finding ways to counter the disadvantages of small size and limited resources by offering greater convenience. CollectiveGood, for example, provides free shipping for all donations from individuals.

Collection Methods

The cell phone collection programs that INFORM examined use a variety of collection methods, pro-

mote them in different ways, and publicize them to different degrees. Collection methods include (1) permanent collections at retail stores; (2) short- or long-term phone drives, held at retail stores or in partnership with government agencies, businesses, schools, and other organizations; (3) collections at football games and other sports events; and (4) direct shipment by donors to the program's headquarters or refurbishing/recycling facility. Most of the programs studied rely primarily on a single one of these methods, although they may use a combination of two or more.

Permanent Collections at Retail Stores

Programs that use ongoing collections at retail outlets are all very similar. Collection bins are set up at the stores and donors can drop off their used cell phones and accessories at any time. Sprint, The Body Shop, and Verizon Wireless use these collections as their principal means of obtaining used phones.*

- Of the approximately 116,000 phones collected through Sprint Project Connect between April 2002 and February 2003, the vast majority came from Sprint's retail stores (smaller amounts came from its Easter Seals affiliates).¹
- The Body Shop — a relative newcomer in the cell phone collection arena — collected 23,000 phones between September 2002 and March 2003 at its retail stores, as well as at corporate offices and the company's home shopping events (The Body Shop at Home parties).²
- Verizon's HopeLine program has had considerably more success, collecting approximately 500,000 phones in 2002 alone, mainly from its retail stores.³

One reason for the relative effectiveness of Verizon's program may be the fact that HopeLine has been running at all Verizon retail locations for a longer period —

* CollectiveGood is currently in the process of establishing permanent collection sites at Staples' 1400 retail outlets throughout the US. Thus, ongoing collections at retail outlets are likely to become the principal means of obtaining used cell phones for this program as well.

since October 2001 — so public awareness of the program is probably greater. Another factor may be the larger number of collection sites. While Verizon has over 1200 retail locations where phones can be dropped off, Sprint has only about 450 wireless retail stores and 30 landline stores. With more customers entering its stores and more sites for drop-off, Verizon has been able to collect considerably more cell phones than Sprint.

The Body Shop's ongoing collection program began only recently, but so far it does not seem able to reach the collection levels of either Verizon or Sprint. One reason may be that customers entering its stores — unlike those who visit Sprint or Verizon stores — do not have the purchase or drop-off of cell phones in mind. Moreover, The Body Shop has only about 300 retail locations where cell phones can be donated — fewer than either Verizon or Sprint.

Short- and Long-Term Phone Drives

Phone drives can last from several days to several months. When held at retail stores, they can bring in large numbers of phones, especially when the store sells wireless products.

- RadioShack's first two nationwide collection campaigns, which lasted for several months during 2001 and 2002 at all of its retail stores, resulted in the collection of over 150,000 phones.⁴ (In another campaign in 2002, discussed below, collections on college campuses and other locations complemented the drive at RadioShack stores.)

With over 7100 retail outlets throughout the US, RadioShack has a distinct advantage over the other national collection programs, including those of Verizon and Sprint. Were RadioShack to establish permanent collection sites at all of its stores, it would likely recover larger numbers of cell phones than any other program, especially since customers come to these stores to buy cell phones.

Short- and long-term phone drives can also be held in partnership with a government agency, local business, school, or other organization. Generally, the collection partner's reason for sponsoring the drive is to support a local charity, further a local environmental initiative, or otherwise serve the community for public relations reasons. While temporary drives do not yield the large numbers of used phones that retail stores with perma-

nent collections can generate, they can be a useful complement to these ongoing drives, obtaining substantial amounts in a relatively short period. They are also advantageous in that the collection partner takes on most of the responsibility for running the drive and delivering phones to the program's refurbishing partner.

Partnerships with government agencies. Verizon has had considerable success supplementing its ongoing in-store collections with temporary drives held in partnership with government agencies. These campaigns, which are generally developed by the partner and Verizon headquarters, last from a few weeks to several months. The company has recovered tens of thousands of phones through these partnerships since October 2001.⁵

- In 2000, Verizon (then Bell Atlantic) sponsored the New York City P.H.O.N.E.S. (People Helping Others Needing Emergency Services) initiative with the New York City mayor's office. This three-month drive collected over 22,000 phones at 300 sites for distribution to people in need of emergency services.⁶ A similar campaign, also in New York City, yielded approximately 1800 phones during a one-month collection in 2002.⁷
- In San Francisco and Colorado, Verizon has participated in domestic violence prevention partnerships that included used cell phone collections.⁸ In San Francisco in 2001, city agencies succeeded in collecting a total of 3000 phones.⁹ In Colorado, 1200 to 1500 cell phones were collected at Verizon retail stores over a six-month period in 2002.¹⁰

Phone drives with government agencies can also take place at the federal level.

- In April 2003, Sprint partnered with the US Dept. of the Interior, the US General Services Administration, the US Office of Personnel Management, and the Office of the Federal Environmental Executive for a one-day cell phone drive in Washington, DC, on Earth Day. On that one day alone, Sprint and its partners collected several hundred phones from both government employees and local residents.¹¹

Partnerships with businesses. Private companies, especially large ones, can be ideal partners for a cell phone drive because their employees provide a guaranteed source of donations. Such drives are usually conducted on behalf of selected charities, with the

company managing the collection either on-site or elsewhere in the community. Again, these arrangements are valuable because the collection partner bears most of the responsibility for running the drive and subsequently shipping the phones.

The Call to Protect program has used short-term business partnerships to supplement the large collection events and shipments from individual donors that supply most of the phones it recovers.

- For several weeks in 2001 and 2002, Motorola partnered with Cingular Wireless to collect used phones at various locations in Austin, Texas, including the state comptroller's office and Cingular retail stores. Motorola collected approximately 10,000 phones during the 2001 collection and 4000 phones in 2002.¹²
- A similar partnership in Arkansas in the spring of 2002 resulted in the collection of about 2000 phones.¹³

Verizon and Sprint have also explored relationships with business partners.

- Since the inception of the HopeLine program in October 2001, Verizon has conducted phone drives with Ernst & Young, KPMG Peat Marwick, and IKEA, each several weeks in duration, which recovered several thousand phones overall.¹⁴
- Sprint recently partnered with the Century 21 real estate company (which works closely with Easter Seals, one of Sprint's charitable partners in the Return Outreach Initiative), establishing long-term drop-off sites at 20 company offices in eastern Pennsylvania. From mid-April through mid-May 2003, this drive collected approximately 500 phones.¹⁵

Charitable Recycling and CollectiveGood are much smaller programs, with more limited resources, than either Verizon's HopeLine or any of the Donate a Phone programs, but they too have been able to bring in significant numbers of phones through partnerships with local and national businesses. Charitable Recycling now obtains 70 to 80 percent of its phones through such collections.

- In September 2002, Charitable Recycling established a phone drop-off site at Lifetime Fitness, a health club in Troy, Michigan. The club is open 24 hours a day and accepts phones from members and

nonmembers. This arrangement has resulted in the recovery of approximately 300 phones per month, and the added traffic has brought the club new members.¹⁶

- Charitable Recycling is also partnering with Half Price Books, a new and used bookstore chain, which has collection bins and posters advertising the program in all of its 75 stores throughout the West and Midwest. This phone drive, which began in April 2003, collected approximately 3000 phones in its first month and is still under way.¹⁷
- About half of the 27,000 phones recovered by CollectiveGood in 2002 came from businesses and charitable partners that undertook their own short-term drives and sent the phones on to the organization's refurbishment facility.¹⁸

Partnerships with high schools and colleges.

College students are an especially good source of donations, since they often replace their phones several times before graduation. Like collections conducted with government and business partners, phone drives at schools — high schools as well as colleges and universities — can be an effective supplement to ongoing collection programs. Again, these campaigns can save on program expenses because students perform the bulk of the work.

- In RadioShack's second campaign of 2002, Students in Free Enterprise (which is active on over 1300 college and university campuses worldwide) complemented drop-off bins at RadioShack retail stores by collecting phones on college campuses and at strip malls around the country. This drive, which lasted for several months, collected 20,000 to 30,000 phones.¹⁹
- Sprint has conducted phone collections with fraternities/sororities and individual students. In the fall of 2002, one- to two-week drives at the University of Colorado, the University of Mississippi, the University of Missouri, the University of Nebraska, Indiana University, Iowa State University, Kansas State University, and Tufts University yielded a total of approximately 1500 phones.²⁰ According to Sprint, students donated roughly equivalent numbers at all schools, regardless of size.
- In Toledo, Ohio, Sprint and the Lucas County Educational Service Center (the county's board of education) have begun organizing one-week collections at different times during the school year,

with high schools donating their employees' used phones whenever new ones are issued. The first campaign, in February 2003, resulted in the recovery of 50 phones.²¹

- High school phone drives organized by The Body Shop — both company headquarters and individual stores — have brought in up to 350 phones in a single week.²²

Partnerships with other organizations. Verizon and Charitable Recycling have run phone collections with domestic violence shelters, National Organization on Disability members, fraternal organizations, and other community groups. Because these partners get involved in the drives to raise money for their organizations, they have a strong incentive to collect as many phones as they can.

- Over the course of several months in 2001, Verizon worked with the New York City Mayor's Task Force on Domestic Violence to collect phones at city fire stations and at retail stores other than Verizon outlets. This effort resulted in the recovery of between 1000 and 2000 used phones.
- A collection partnership between Charitable Recycling and a Women of the Moose chapter in Poughkeepsie, New York, has been recovering approximately 400 phones per month since early 2003.

Collections at Football Games and Other Sports Events

Sprint, Verizon, and especially Motorola have conducted successful used cell phone collection drives at sports events such as football games. These collections are heavily promoted before the event to ensure that large numbers of donors arrive with their cell phones in hand.

As described in Chapter 1, Motorola has used its position as a National Football League (NFL) sponsor to conduct Call to Protect cell phone drives at many NFL games, with the home team helping to promote collection. To participate, donors bring their phones to the game and deposit them in collection bins set up at the four highest-traffic gates in the stadium. According to Motorola, cell phone drives hosted by 27 NFL teams in 2001 resulted in the collection of 15,000 to 20,000 used phones. In 2002, 16 events yielded approximately 10,000 phones.²³ Occasionally, Motorola holds these events

in partnership with Verizon (in which case recovered phones are divided equally between the two sponsors), or in partnership with Sprint or a local wireless carrier (in which case the phones go to Call to Protect).

Sprint and Verizon have also collected cell phones at football games on their own, entering into sponsorship agreements with specific franchises. However, these companies have not been as successful with these events as Motorola, whose efforts have probably benefited from the company's relationship with the NFL and the league's cooperation in promoting Motorola's phone drives. For example, while Motorola collected 5000 phones at a single NFL game in Tennessee,²⁴ Sprint was able to collect only 1800, 450, and 400 phones, respectively, at games in Nashville, Kansas City, and Detroit.²⁵ Similarly, Verizon collected only 1500, 500, and 300 phones, respectively, at games in Tampa Bay (FL), Buffalo (NY), and Green Bay (WI).²⁶

Direct Shipment by Donors

Most of the cell phone collection programs surveyed for this report accept cell phones shipped directly by individual donors, either to program headquarters or to a program partner such as ReCellular. Call to Protect, CollectiveGood, and the Charitable Recycling Program are the only programs that rely on this method for a significant percentage of the phones they collect.

- Call to Protect has obtained the majority of the 1 million used cell phones collected since 1999 through direct donations.²⁷
- CollectiveGood obtained about half of the 27,000 phones it collected in 2002 through direct shipments from donors.²⁸
- Charitable Recycling originally received most of its phones from direct donations, which now account for about 20 to 30 percent of the phones it recovers.²⁹

Collection Incentives

By motivating people who might not otherwise be inclined to drop off their used phones or mail them in for donation, incentives can be an important factor in a collection program's effectiveness.

Tax Receipts

The most common incentive, used by all the programs surveyed for this report, is a tax receipt that allows donors to take a charitable deduction (based on their estimate of the value of the donated unit) on their federal income tax return. The necessary forms are provided when donors drop off their phones or they can be downloaded from the program website (in some cases they can also be obtained from participating charities or collection partners).

Philanthropic Opportunities

All the collection programs investigated by INFORM appeal to people's philanthropic impulse by giving refurbished phones to those in need or donating the proceeds from their sale to charities. To promote the philanthropic side of its collection program, Verizon tries to tie the donation of used phones to the specific social benefit of domestic violence prevention. For example, during Domestic Violence Awareness and Prevention Month in October 2000, the company handed out domestic violence awareness ribbons to cell phone donors at all its stores in the Northeast.

Some collection programs try to appeal to a range of interests by giving donors a number of charitable choices. CollectiveGood, for example, works with close to 200 organizations — youth groups, women's groups, and environmental organizations, among many others — that participants can specify for donation. About 50 of these groups are listed on CollectiveGood's website, generally the larger organizations with the greatest international, national, or regional interest.

Financial Incentives

The offer of discounts or rebates on new products in exchange for a used phone can be an effective tool in promoting cell phone donation. However, few of the programs investigated for this report make use of such incentives, and those that do have done so in only a limited way.

Verizon's experiences with financial incentives have been quite successful. During a number of several-week periods since HopeLine's inception in 2001, the company has distributed coupons entitling cell phone donors to \$5 off the price of a new cell phone or accessory when presented at a Verizon store in

designated locations. These promotions, which have been held throughout the US, are usually tied to the opening of a new Verizon retail store. According to Verizon, they have resulted in a 15 to 20 percent increase in the number of cell phones collected.³⁰

Sprint, according to a company spokesperson, also hopes to offer some type of financial incentive to cell phone donors starting in the summer of 2003.³¹ At The Body Shop, cell phone collection at individual outlets can be promoted at the initiative of store managers, but no discounts on the company's products are offered. Motorola has tried offering donors discounts on new cell phones through its website; at several NFL collection events, the company gave donors coupons that could be used toward the purchase of a new Motorola phone. However, these promotions have been discontinued because of the logistical problems involved in redeeming the coupons (Motorola has no retail stores of its own).³²

Promotion of Collection Programs

Public awareness is a primary factor in a cell phone collection program's effectiveness, and awareness depends in large part on how well a program, as well as specific collection events and campaigns, are promoted. INFORM's research indicates that publicizing and promoting specific collection events can help to increase the number of phones collected. However, INFORM's research also suggests that most consumers are still not aware of the collection programs that currently exist.

Efforts by cell phone collection programs to promote donation generally involve ongoing campaigns on program websites. (In fact, while INFORM was not able to determine specific program budgets for promotion and advertising, spokespersons for Verizon and Sprint said that a large portion of these funds are used to develop their websites.) For collection events or phone drives, newspaper ads, radio commercials, and flyers distributed in the community may also be used. Drives undertaken in partnership with government agencies, local businesses, high schools, colleges, and fraternal and charitable organizations are often promoted through posters, leaflets, and other materials distributed at stores and other locations by

the partner business or organization. Programs that collect phones at retail outlets often use highly visible collection receptacles inside the store to encourage participation.

Internet Promotion

All of the programs surveyed for this report use their own websites and those of their affiliates to promote the collection of used cell phones. Generally, these sites contain basic information on the value of donating phones, the charities the program works with, the mechanics of phone donation, and downloadable postage labels and tax receipt forms. In the case of the Donate a Phone family of programs, information on the Wireless Foundation's website complements individual program sites. ReCellular's website also contains information about the collection programs with which it is affiliated.

Advertising Campaigns

At one time or another, most of the collection programs investigated by INFORM have used advertising to promote collection events, phone drives, and the program itself. None, however, has made much use of advertising on the national level. Instead, the programs mainly rely on in-store promotions, local advertising in connection with specific collection events, and program websites.

Although nationwide advertising in print and other media is rare, national publicity campaigns can make a big contribution to the public's awareness of a collection program.

- Donate a Phone's collection numbers increased significantly following an appearance by spokespeople from the Wireless Foundation and the National Coalition Against Domestic Violence on ABC's "Good Morning America" show in 2000.
- Sprint inaugurated Sprint Project Connect in 2002 with two quarter-page ads in *USA Today*. The actress Marlee Matlin was the program's spokesperson, and she and former senator Bob Dole were present at the program launch. According to Sprint, this national promotional effort resulted in the recovery of large numbers of phones at the program's outset.

Verizon likewise enjoyed the benefits of national exposure when stories about the HopeLine program

began to appear in *USA Today* and other national newspapers after the program's inception in 2001. Since then, however, the company has not devoted any resources to national advertising. Similarly, since the successful national launch of Sprint Project Connect, Sprint has mainly relied on local promotions of specific collection events rather than national advertising. The Wireless Foundation claims to be planning to secure national TV exposure in the future, but the organization does not devote significant resources to promoting individual Donate a Phone programs, which are responsible for their own advertising and publicity.³³ CollectiveGood and Charitable Recycling have not tried to develop national promotional or advertising campaigns, largely, according to spokespeople for these programs, because they do not have the resources to do so. Instead, both rely on their websites, word of mouth, and promotions of local collection events to publicize their programs.

In-Store Promotion

Collections at retail outlets can encourage the public to participate by drawing attention to the program inside the store, providing comprehensive information on the benefits of cell phone donation, and ensuring that company employees are knowledgeable about the program.

According to HopeLine's executive director, Verizon spent approximately \$500,000 on cell phone receptacles designed to attract customers' attention and educate them about cell phone recycling and refurbishment.³⁴ INFORM visited several Verizon stores in New York City and found highly visible donation kiosks that provided tax receipt forms as well as some basic information about the program. At Sprint stores, in contrast, the cardboard boxes that serve as cell phone receptacles wear out easily and are easy to overlook; INFORM visited one Sprint store where the box had been removed and not replaced, and no information on cell phone donation was posted anywhere in the store. In addition, both Sprint and Verizon fail to publicize their collection programs with signs posted inside the store on in store windows.

Verizon and The Body Shop provide some information about HopeLine and the National Cell Phone Collection Program at the collection kiosks in their

stores, but nothing about why donating cell phones is important. At Sprint stores, pamphlets attached to donation receptacles do say something about program benefits and the purpose of cell phone collection, but the information is again very basic, omitting any discussion of the problem of electronic waste and the importance of cell phone reuse and recycling. Moreover, employees at Sprint and Verizon retail outlets are not instructed to tell customers who purchase new phones about the collection program under way at the store.

An informal telephone survey conducted by INFORM indicated that customer service representatives at Verizon, Sprint, and The Body Shop were knowledgeable about their companies' collection programs. They were able to direct callers to the nearest collection sites and were familiar with program details such as whether donated cell phones are refurbished or recycled. At the stores themselves, however, employee knowledge seems to vary considerably, with some employees able to provide comprehensive information and others confused about some program details. According to RadioShack, its customer service representatives are told about any collection campaign that is under way.

Promoting Collection Events

Motorola relies on collection events for most of the phones it collects, and according to a company spokesperson, their success is directly tied to the promotion that takes place beforehand. When the company gets out the message that used cell phones have value, that donation is important, and that a collection event will take place soon, the public is much more likely to drop off large numbers of phones.³⁵ (Motorola has also found that holding its collection drives a few times a year accustoms people to the events and results in larger donation numbers.) The company generates publicity for its collections through large press events, but ads in the local media and one-of-a-kind publicity events can also help increase collection numbers.

Motorola's press events often feature local politicians and sports figures who encourage the public to participate in the upcoming collection. At the Tennessee Titans game where Motorola collected 5000 phones, several football players helped publicize the drive by making public service announcements and participat-

ing in other promotions. (Sprint, too, has used entertainers — including, in addition to Marlee Matlin, members of the band 'N Sync, television actress Star Jones, and NASCAR racer Kyle Pettery — to promote collection events.) Motorola also publicizes its collections through NFL websites, e-mails sent to fan clubs and season-ticket holders, promotions and ads at the stadium, and ads in programs sold at the game. When a collection is sponsored by Motorola in partnership with another wireless carrier, the latter sometimes posts ads at its retail outlets or distributes circulars promoting the event.

Television, radio, and newspaper ads can also help, though they are no guarantee of a phone drive's success. Motorola used TV commercials to publicize several cell phone collection events at NFL games in Denver and Tennessee, and donations increased markedly. On other occasions, however, TV ads seemed to make little difference. For its part, Sprint promoted a phone collection in Kansas City, Missouri, with dozens of 30-second public service announcements and commercial spots that ran for a month on a local TV station. The company also ran ads in a local newspaper, promoted the event on college campuses, and had 100,000 fliers inserted into a newspaper given to fans who parked at the stadium during the week before the collection day. Although collection numbers were not as high as Sprint had hoped (it was a rainy day), the company believes that these multiple promotional efforts did raise public awareness of the importance of donating cell phones.³⁶

Sprint has taken a more unusual approach to promoting cell phone reuse. In 2002, the company's Ugliest Phone Contest encouraged New York and New Jersey residents to donate their old phones to Sprint Project Connect. Customers dropped off their phones at two Sprint outlets in New York City and Totowa, New Jersey, where their "ugliness" was judged by an East Village fashion designer. Sprint publicized the drive with local radio spots and newspaper and magazine ads that featured "cell phone fashion do's and don'ts." The event, which lasted for a week in both locations, collected about 200 phones overall.³⁷ While this is not a huge number of phones, such innovative approaches can be helpful in generating public awareness of the existence and benefits of cell phone collection programs.

Direct Mail Solicitation

CollectiveGood receives the vast majority of its used cell phones from individuals who send them in directly. Many of these people learn about the program from informational e-mails sent by CollectiveGood's collection partners or by CollectiveGood itself, which maintains a database of participants and buys lists of potential donors. CollectiveGood sends periodic follow-up e-mails encouraging donors to inform their friends and colleagues about the program and send in additional phones themselves. According to Collective Good, these electronic solicitations, along with the free shipping labels the program provides, have proven extremely effective as a means of obtaining used phones.³⁸

3 Program Revenues, Expenses, and Charitable Donations

All of the programs surveyed for this report are making money — in some cases, significant amounts — from the sale of refurbished phones. Although a large portion of these revenues, approximately one-third in most cases, is used to cover the costs of shipping, refurbishing, and recycling used phones, the sizable income generated distinguishes these programs from other take-back efforts in the US (such as various computer recycling programs run by manufacturers), which typically claim that collecting products for reuse and recycling is not a profitable venture.

The existing cell phone collection programs are also unique in using most of their revenues for charitable purposes. Among not-for-profit programs, the percentage donated ranges from two-thirds in the case of Donate a Phone to approximately 75 percent in the case of Verizon's HopeLine program. Similarly, the for-profit programs CollectiveGood and Charitable Recycling donate a significant percentage of their proceeds from phone sales to charity — over one-half in the case of CollectiveGood (Charitable Recycling has not estimated its donations as a percentage of its revenues). And while neither Verizon, the Wireless Foundation, nor any Donate a Phone program participant (e.g., Sprint, The Body Shop, or RadioShack) makes any profit itself, the for-profit company ReCellular generates \$25 to \$30 million in annual revenues from sales of refurbished phones and recyclable materials from all sources (ReCellular would not disclose the revenues generated specifically by phones collected through Donate a Phone and HopeLine).

Why do these programs donate so much of their income to charity? Part of the reason may simply be that the Wireless Foundation established Donate a Phone on the philanthropic model and subsequent programs followed suit. INFORM's research also suggests that the charitable component, by providing an incentive for partners and consumers to get involved, is regarded by the programs as essential to recovering used phones. This is a crucial factor, but as the programs amass millions of dollars from the sale of refurbished phones, it is worth considering

whether more of their income should be used for purposes directly related to managing cell phone waste. As we saw in Chapter 2, the programs as they currently exist are recovering only a tiny fraction of the millions of cell phones discarded each year, and collection rates would undoubtedly rise if more resources were devoted to advertising and other means of promotion. Finally, the ultimate fate of the vast majority of refurbished phones that are sold abroad is an issue that no current program has so far addressed. Ensuring that these phones are recovered, recycled, and disposed of responsibly at *their* end of life will require ingenuity and significant resources, but a global and permanent solution to the problem of cell phone waste requires that this challenge be met.

Revenues from the Sale of Refurbished Phones and Recyclable Materials

The average price of a refurbished phone is \$14 to \$16 per unit.* Phones sold for the recyclable materials they contain command far lower prices. Generally, third-party recyclers pay by the pound, based on the estimated value of the metal components; phone accessories command lower prices than the phones themselves. Revenues from phones sold to recyclers fluctuate slightly as the demand for specific materials rises and falls. Thus, if a larger market existed for a material such as lead, which currently is not in great demand, the collection programs would be able to increase their revenues from cell phones sold for recycling.

As mentioned in Chapter 1, the for-profit company ReCellular is responsible for refurbishing and

* When program revenues are adjusted to reflect expenses, the average revenues each program generates per phone are much lower. ReCellular and Charitable Recycling did not provide exact figures, but CollectiveGood disclosed that it makes an average of \$3 to \$5 per cell phone once expenses are subtracted. In the case of phones that have no economic value, the program takes a loss of about \$1 per phone. Personal communication, Seth Heine, President, CollectiveGood International, September 19, 2002.

reselling, or selling to recyclers, all cell phones collected by the Wireless Foundation's Donate a Phone family of programs and Verizon's HopeLine program. CollectiveGood and Charitable Recycling, which have collected far fewer phones than either of these larger programs, have generated much smaller revenues from the sale of refurbished units.

Donate a Phone. A proprietary agreement with the Wireless Foundation stipulates the price that ReCellular pays Donate a Phone for used cell phones of specific makes and models (this amount is based on ReCellular's estimate of a phone's resale value). About one-third of Donate a Phone's income from these sales is returned to ReCellular to cover its costs, which include the shipping and processing of phones obtained through the program. The remaining two-thirds go to the Wireless Foundation. The Wireless Foundation uses about half of these revenues to cover its own expenses, including the administrative costs of running the program, and for distribution to its recipient charities. The remaining half is distributed to individual Donate a Phone programs (such as those run by Motorola, RadioShack, and The Body Shop) for disbursement to the charities of their choice (some of these charities receive funds directly from the Wireless Foundation). Since 1999, the Donate a Phone program has generated about \$5 million in revenues used and distributed by the Wireless Foundation for charitable purposes.¹

HopeLine. Verizon donates approximately 70 percent of the revenues from the sale of recovered phones to domestic violence shelters and prevention programs and uses approximately 5 percent to run the HopeLine program. Approximately 25 percent is used by ReCellular to cover its own costs. From October 2001 through the end of 2002, HopeLine raised approximately \$1.4 million from the sale of used phones.²

CollectiveGood. CollectiveGood resells the phones it refurbishes for an average of \$8 to \$10 per phone, although on occasion it is able to charge as much as \$75. According to CollectiveGood, the "slight profit" it makes (above and beyond the \$1 to \$15 per phone that it donates to charity) is enough to sustain it, but much of its revenues go to cover the costs of the program. While most of the collection programs reviewed for this study would not disclose the amounts they receive from third-party recyclers, the president of CollectiveGood said his organization receives \$.07 to \$.45 per pound for recyclables, mainly from Global Investment Recovery Inc. (Tampa, FL).³

Charitable Recycling. This program sells its refurbished phones for an average of \$20 per unit, with the price ranging from \$6 to \$150. Charitable Recycling has collected fewer phones than any of the other programs discussed in this report — about 40,000 from the program's inception in May 2002 through early

ReCellular's Revenues from Selling Refurbished Phones and Recyclable Materials⁴

ReCellular pays Donate a Phone based on its estimate of the resale value of cell phones obtained through the program. It keeps as profit any revenues it receives above and beyond that amount from the sale of the phones to third parties. In the case of phones obtained through HopeLine, ReCellular keeps approximately 25 percent of the revenues it generates.

Altogether, ReCellular generates \$25 to \$30 million in annual revenues from the sale of refurbished cell phones and recyclable materials from all sources. ReCellular sells its

phones — both those it refurbishes and those it sells "as is" — for an average price of \$14 to \$16 per unit. Refurbished phones cost an average of \$45 to \$50. Generally, the company does not receive more than \$100 per phone. ReCellular also sells used cell phones to recyclers, with the amount received depending on the current value of the constituent metals (the company would not disclose any exact amounts to INFORM). ReCellular bears the costs of shipping 80 to 90 percent of the batteries contained in the phones it receives to INMETCO, a battery recycler affiliated with the Rechargeable Battery Recycling Corp.

February 2003. If Charitable Recycling succeeds in increasing its collection numbers, the average price per phone is likely to decline. This program is unique in that its funding comes from a for-profit business — the Wireless Source — which buys, refurbishes, and resells used phones or sells them to recyclers. Because the Wireless Source covers the program costs, Charitable Recycling does not have to pay the costs of collection with revenues generated from phone sales.⁵

Collection Program Expenses

Revenues that the collection programs receive from third parties — such as retailers, recyclers, and cell phone aggregators — for refurbished phones and recyclable materials are used to offset program expenses. (As noted above, in the case of Donate a Phone and HopeLine, these revenues are based on the anticipated value of these materials.) The largest expenses are generally collection and shipping (where shipping is not paid by donors and third parties), and spokespeople for every program surveyed for this report emphasized that bringing these costs down would significantly increase the revenues available for charitable purposes. Other collection program expenses are associated with administration, processing, and advertising and promotion.

Donate a Phone. As described in Chapter 1, the individual Donate a Phone programs bear the responsibility — and the costs — of collecting used cell phones and packaging them for shipment to ReCellular. In the case of phones collected by Motorola, Sprint, The Body Shop, and RadioShack, the actual shipping costs are paid by ReCellular out of Donate a Phone program revenues. According to the Wireless Foundation’s executive director, approximately one-third of the value of phones collected through Donate a Phone is spent on ReCellular’s shipping and processing costs.⁶

HopeLine. Similarly, approximately 25 percent of the value of every phone collected through Verizon’s HopeLine program is used to cover shipping and processing costs. These programs claim to be looking for ways to decrease these costs in order to become more cost-effective.

CollectiveGood/Charitable Recycling. For these two programs as well, collection and shipping account for the bulk of their costs. Because Collective Good provides free shipping in almost all cases (including donations from individuals), its shipping costs are generally higher than those of other programs. Approximately 35 percent of its revenues are used to collect cell phones and ship them to the program’s refurbishing facility. Another 10 percent of revenues cover administrative costs.⁷ (Both Collective Good and Charitable Recycling also pay to ship cell phone batteries to recyclers.) The Charitable Recycling Program offers prepaid shipping to some of its partner organizations and to other organizations upon request, but it does not offer free shipping to individuals who send in phones on their own. (The Wireless Foundation offers free shipping to individuals only for donations of over 100 phones, claiming that the costs are prohibitive — \$3 to \$4 per phone. Verizon provides no free shipping to individual donors.)

Charitable Donations

Since 1999, the Wireless Foundation, Verizon, CollectiveGood, and Charitable Recycling have contributed over \$6.5 million to charities from the revenues generated through their programs.

Donate a Phone. According to the Wireless Foundation, the total funding generated for charitable programs from September 1999 through the end of 2002 was about \$5.03 million — the largest amount of any collection program.⁸ Beneficiaries include partner charities in the Call to Protect, Return Outreach Initiative (ROI), and PhoneRaising collection campaigns, in addition to the Wireless Foundation itself and its recipient charities. As noted previously, the Wireless Foundation uses approximately two-thirds of the revenues received from Donate a Phone for charitable purposes. A small portion of this income — approximately 5 percent — goes to cover the Wireless Foundation’s own expenses.

From September 1999 through the end of 2002, the Wireless Foundation also donated 20,000 new phones and 30,000 refurbished phones collected through Donate a Phone to individuals in need.⁹ Of these, approximately 30,000 new and refurbished phones went to victims of domestic violence. Most of the remaining phones went to ClassLink, a Wireless

Foundation program that provides cell phones to teachers for use in the classroom or on class trips. Some also went to the Communities on Phone Patrol program, a national neighborhood watch organization. The Wireless Foundation matches these cell phone donations with free airtime secured from some of Donate a Phone's participating wireless carriers. According to the Wireless Foundation, the value of these airtime gifts is at least \$6 million annually. (Donations of airtime are made to the phone recipients themselves, rather than to the Wireless Foundation.)

As described in Chapter 1, the programs run by individual Donate a Phone participants currently benefit these charitable organizations:

- Sprint uses the proceeds from the sale of refurbished phones to benefit Easter Seals and the National Organization on Disability. From April 2002 through February 2003, Sprint collected approximately 116,000 used cell phones and raised approximately \$348,000 from their sale.¹⁰
- Phones collected through Call to Protect, and/or the funds raised through their sale, are donated to domestic violence victims and organizations that work to prevent domestic violence. According to the Wireless Foundation, Call to Protect has raised "several million dollars" in charitable donations since 1999, which have been placed in the foundation's Call to Protect Endowment.¹¹
- The Body Shop donates phones and phone proceeds to domestic violence shelters and the National Coalition Against Domestic Violence. Through March 2003, the National Cell Phone Collection Program had collected approximately \$36,000 from refurbished phone sales.¹²
- RadioShack's collection campaigns have benefited domestic violence prevention organizations and Students in Free Enterprise. Since 2001, this retail chain has raised approximately \$500,000 for charity through the sale of refurbished cell phones.¹³

HopeLine. Of all the cell phone collection programs surveyed for this report, Verizon contributes the largest percentage of the revenues its raises from the sale of refurbished phones to charity — approximately 75 percent (about 5 percent of which covers program expenses). This may be because Verizon deals with its charitable partners directly rather than through a third party such as the Wireless Foundation. From October 2001 through the end of 2002, Verizon contributed

approximately \$1.4 million to domestic violence shelters and prevention programs through the HopeLine program.¹⁴ This amount includes the value of approximately 10,000 cell phones equipped with free airtime that Verizon donated to domestic violence victims.

CollectiveGood. CollectiveGood donates approximately 55 percent of the revenues raised from the sale of refurbished phones to charity — approximately \$100,000 since the program's inception in late 2000 through January 2003. In the last several months of 2002, the organization was distributing approximately \$12,000 in charitable contributions each month. In 2003, it expects to donate from \$250,000 to \$500,000.¹⁵

Depending on the type and value of the collected cell phone and whether it includes a charger and batteries, CollectiveGood returns from \$1 to \$15 per unit to a charity of the donor's choice.¹⁶ As noted in Chapter 1, about 50 charities are listed on the organization's website, including CARE, Environmental Defense, and the Working Assets Wireless Charity Fund. In addition, revenues from the sale of phones recovered at drop-off sites now being established at Staples stores nationwide will be donated to the Sierra Club. Because collection, shipping, and most refurbishing are done by CollectiveGood rather than by third parties, CollectiveGood's president is confident that revenues from cell phone sales will grow.

Charitable Recycling. Charitable Recycling's donations to charity do not depend on the value of the phones it collects. Instead, it donates \$1 to \$5 per phone depending on the size of the recipient charity, regardless of the phone's condition or model and whether it is ultimately refurbished and resold or recycled. From May 2002 through February 2003, Charitable Recycling donated approximately \$60,000 to its charitable partners.¹⁷ As mentioned in Chapter 1, these include the Ecology Fund and the Rainforest Site. Since the Wireless Source covers the program's expenses, the amount donated is roughly equivalent to the amount raised through cell phone sales. Charitable Recycling also has an unusual arrangement with the Seekonk, Massachusetts, police department, which serves as a drop-off site for used phones. Upon request, the Wireless Source will refurbish (and pre-program to dial 911) a specified number of phones and return them at no cost to a shelter run by the New Hope Battered Women Program.¹⁸

4 Refurbishment and Recycling of Used Cell Phones

Whether a used cell phone gets refurbished or recycled depends first of all on its condition: Is it damaged? Can it make and receive calls? Can it perform other basic functions according to manufacturer specifications? When a shipment of phones arrives at ReCellular or some other refurbishing facility, those that do not work or are too damaged to be economically refurbished are separated out and sent for recycling. The rest are assessed as to the costs of refurbishment: Are replacement parts available and at what cost? How long will it take to disassemble the phone, replace faulty parts, and reassemble the phone? Finally, these costs are examined in light of the phone's technology (e.g., analog or digital), the availability of technical support from the original manufacturer, and the phone's saleability given the demand for specific makes and models.

The market demand for a specific cell phone depends on its technology, appearance, functions, size, weight, and other factors. While the popularity of particular brands and models changes frequently, all the collection programs reviewed for this report agreed that, as of the end of 2002, Nokia 5100- and 6100-series phones were in especially high demand. According to ReCellular, its top five phones in order of popularity are the Motorola c60, Nokia 5125, Nokia 5190, Nokia 8260, and Samsung 6100.¹ The Charitable Recycling Program's list of high-demand phones includes the Nokia 8260 and also its 8160 and 5165 models, as well as the Motorola 720.² CollectiveGood lists Nokia's 5120, 5160, 6120, 6160, and 8260 phones and Motorola StarTAC phones as among the most popular.³

Often, it is not economical to refurbish phones with outmoded technology. For example, because analog phones are no longer in high demand in the US, the collection programs generally sell them either to recyclers or to a third party for refurbishing and subsequent sale abroad. Similarly, bag phones and

mounted car phones are usually recycled.* Charitable Recycling acknowledges that it sells analog and other outdated models to refurbishers in countries such as Mexico and China, where labor costs are low.⁴

Refurbishing Cell Phones

The process used by ReCellular, which refurbishes most of the cell phones collected by the programs surveyed for this report, is typical. The company markets three categories of used phone: refurbished, graded, and raw. Phones in the refurbished category are refurbished by ReCellular and sold. Graded phones are tested to confirm that they are fully functioning and are sold at lower cost than refurbished phones. Phones in the raw category are sold to distributors and wholesalers, which buy phones "as is" in large quantities and may refurbish them themselves. Some raw phones may also end up being sold to recyclers.

Phones selected for refurbishment are tested to determine whether they perform various functions correctly, such as turning on and off, ringing and vibrating, displaying prompts, recharging, etc. Once parts have been repaired and replaced as needed, ReCellular resets the phone's user locks, clears all phone books, timers, voice messages, text messages, and call lists, and erases all wireless provider logos and internal messages. The phone is then programmed in English, unless otherwise specified, and buffed and cleaned to look like new.

The Charitable Recycling Program and CollectiveGood conduct similar tests and perform similar repair and replacement procedures. Charitable Recycling conducts between 20 and 40 tests against original equipment manufacturer specifications to certify that a refurbished unit performs as well as a new phone.⁵ CollectiveGood performs similar quality assurance tests, generally programming refurbished phones to be compatible with a variety of

* As noted in Chapter 1, bag phones operate by equipment stored in a small carrying case from which the phone's antenna usually extends.

carriers. According to CollectiveGood, the more information it has on a phone's destination the easier it is to refurbish, since the software programming can be tailored to the particular carrier.⁶

On average, it takes between 15 and 30 minutes to refurbish a cell phone, depending on the phone model and condition. Once refurbishment is complete, the handset is generally packaged in a new box with charger, batteries (usually new ones), and programming instructions.

Basic Components of a Cell Phone

- The handset, including —
 - The printed wiring board
 - The liquid-crystal display panel (LCD)
 - The keypad, antenna, speaker, and microphone
 - The carrying case
- The power source/batteries
- An adapter to charge the batteries

Impediments to Refurbishment and How They Can Be Overcome

A number of problems associated with refurbishment are common to all cell phones, while some are specific to certain makes and models. These problems make the refurbishment process more difficult and costly. In many cases, however, alleviating them could be accomplished through relatively simple changes in cell phone design and manufacture.

Durability of Components

Perhaps the most significant impediment to refurbishment is the need to replace worn components, which adds time and costs to the process. In particular, cell phones undergoing refurbishment often must have their external parts replaced because the plastic

scratches and breaks easily. According to CollectiveGood and ReCellular, a cell phone's plastic parts tend to be the most damaged, with Charitable Recycling adding that the "back plastics" on many phones can be expensive and difficult to replace.⁷ If cell phones were made of more durable plastics, they would be significantly cheaper and easier to refurbish.

Cell Phone Design

A cell phone's design can also create obstacles in the refurbishment process, with some models presenting particular problems. For example, Motorola StarTAC phones have flip panels and other movable parts that often must be replaced. (According to ReCellular, the culprit is frequently a defective hinge.⁸) As a result, refurbishing these phones can be expensive, difficult, and time consuming. External antennae are another problem. Certain Motorola phones have an antenna designed to slide in and out, which tends to break more often than internal antennae. Similarly, certain Nokia 5100 and 6100 models have stationary antenna ports that break easily when the phone is dropped. Phones designed without external parts are much easier and less costly to refurbish.

Another issue is the cell phone's finish. Some phones, such as the Audiovox 135 and the Qualcomm 860, have soft or glossy finishes that scratch easily and cannot be restored by buffing. In these cases the entire housing must be replaced, which makes refurbishment more expensive. Matte finishes, in contrast, are much easier to refurbish. Also, many handsets have the carrier logo silk-screened into the cell phone housing. This must be erased or replaced during refurbishment. In contrast, certain Nokia 5100- and 6100-series phones have these logos printed on a label that can be easily removed.

Ease of Disassembly

Some phones contain as many as eight screws and disassembling them is not cost-effective, because it takes too much time. Instead, these units are generally recycled. In contrast, the Kyocera 2035, Nokia 5120, and other Nokia models have interchangeable faceplates that can be snapped on and off, without tools or screws, reducing the overall costs of refurbishment. In general, phones designed to be easily disas-

sembled are cheaper and easier to refurbish because less time is needed to take them apart and put them back together.

Standardized Accessories

Refurbishment is also hindered when many models of a single cell phone brand each requires the use of a different type of battery and/or adapter. For example, while a phone from Nokia will run on one of three types of battery used in that manufacturer's cell phones, a Motorola phone requires one of approximately 10 different battery types. Thus, finding the right battery for a refurbished Nokia phone is comparatively easy compared to matching the battery for a phone from Motorola. Similarly for adapters, since each Nokia cell phone model uses one of only a few types of adapter, finding a replacement is relatively quick and easy. Samsung, Ericsson, and Audiovox, however, use 7 to 10 different adapter types in their phones. Standardizing cell phone design elements would allow adapters, batteries, and other accessories to be used with many different brands and models of phone.

Software

Often the biggest challenge in refurbishing cell phones is modifying the internal software. For example, deleting welcome messages and wireless provider messages and resetting internal phone locks are time-consuming and difficult tasks. Less complicated software and locks would minimize this problem considerably.

Recycling Cell Phones

The collection programs discussed in this report send phones that cannot be refurbished — as well as batteries and accessories such as adapters, headsets, and phone cases — to recyclers that either process the phones on their own or separate the components and resell them to other companies. Maxim Industries USA, Inc. (which does recycling for the Charitable Recycling Program), Global Investment Recovery Inc. (which recycles phones for CollectiveGood), and Great Lakes International Recycling (another company used by Charitable Recycling) all pay the collection programs for the

phones they receive.* Maxim Industries (Ft. Lauderdale, FL) also pays the shipping costs on deliveries of 3000 phones or more, and Global Investment Recovery (Tampa, FL) pays for shipping regardless of quantity.

When a shipment of phones arrives at a recycling facility, the components are divided into different material streams, mostly metals and plastics. (Cell phones consist of approximately 50 percent copper, aluminum, and other metals; 40 percent plastic shell; and 10 percent industrial rubber.⁹) Metal components undergo smelting to recover the individual metals, which are then sold. Plastics are mainly incinerated, although a small amount is recycled into such products as milk jugs and soda bottles. (See Chapter 5 for information on the ultimate destination of recycled cell phones.)

ReCellular. All of the handsets, batteries, and accessories from phones sent to ReCellular are recycled by third parties in the US. Smelting for metals recovery occurs at these facilities. Most of the plastics are burned off during this process, along with the rubber from cell phone keypads. A small amount of the fabric collected from phone cases (including imitation leather) is sold to textile manufacturers for reuse.

According to ReCellular, smelting is monitored and performed in accordance with all applicable environmental laws. All of ReCellular's recyclers provide copies of state certifications and licenses, as well as certificates of destruction/consumption for each shipment processed. ReCellular claims that no materials are landfilled.¹⁰

CollectiveGood. CollectiveGood sends cell phones and accessories (batteries excepted) to Global Investment Recovery, which shreds the handsets and separates the components into metals, plastics, and other materials such as rubber. These are then sent to Europe for smelting and incineration for energy recovery.¹¹ Dust from the shredding process is collected and refined overseas. Global Investment provides its customers with copies of state certifications and licenses, as well as certificates of destruction/consumption for

*ReCellular generally pays third parties to recycle accessories such as adapters and headsets. The company would not disclose to INFORM the identities of the recyclers it uses.

each shipment processed. Like ReCellular, the company claims that no cell phone materials are landfilled.¹²

Charitable Recycling. Maxim Industries USA and Great Lakes International (Roseville, MI) recycle phones collected by Charitable Recycling. Maxim claims that its processes are environmentally safe and that no materials are disposed of in landfills.¹³ Great Lakes does not perform recycling on its own, but sorts the components and sells them to other companies. Different materials are sold to different buyers, but most are sent to smelters for metals recovery, both in the US and abroad. How the materials that Great Lakes sends abroad are processed and what ultimately becomes of them are not known.

The Market for Recycled Materials

Depending on market demand, many components of cell phones can be resold after recycling, especially the metals. The most valuable metals in cell phones are silver, gold, and copper. While a material such as gold is generally in high demand, the market for copper is much smaller. Gold recovered from phones is used in the manufacture of jewelry and gold-flake paint. Recycled copper is commonly used to make copper pipes.

Most of the plastics contained in cell phones are burned off during metals recovery. Of the remainder, very little is recovered. Separating plastics is difficult and labor intensive, and since virgin materials are much cheaper, it does not pay to recover them. Similarly, the market for mixed plastics is very small. According to ReCellular, a small amount of plastics recovered from the phones it sends for recycling is shredded and sold, mostly to injection-molding companies to be made into milk jugs, soda bottles, and children's toys.

Reusing and Recycling Batteries

The batteries contained in the typical cell phone account for about one half of its weight. Thus, of the

50,000 tons of cell phones expected to be retired per year in the US by 2005, approximately 25,000 tons will be batteries, nearly all of them rechargeables. Rechargeable batteries generate less waste than single-use batteries because they can be recharged hundreds of times, but they also contain many hazardous materials, such as cadmium, nickel, zinc, and copper, which pose serious environmental risks when buried in municipal landfills or burned in incinerators. The vast majority of newer cell phones are powered by nickel-metal hydride or lithium-ion batteries, which are increasingly replacing nickel-cadmiums as the power source for these devices.

Alone among the cell phone refurbishers discussed in this report, ReCellular reuses 10 to 20 percent of the batteries contained in the phones it receives in the phones it refurbishes.¹⁴ The number reused depends on functionality. ReCellular sends the remaining batteries for recycling, although many of them could probably be reclaimed for reuse. CollectiveGood and Charitable Recycling recycle almost 100 percent of the batteries they collect.¹⁵

The International Metal Reclamation Co., Inc. (Ellwood City, PA), known as INMETCO, is the sole recycler of batteries recovered through the collection programs surveyed for this report. INMETCO is under contract with the Rechargeable Battery Recycling Corp. (RBRC), an industry organization that operates a nationwide program to take back and recycle rechargeable batteries. Cell phone batteries destined for recycling are either removed by the refurbisher and sent to INMETCO or the entire phone is sent to a general recycling company, which sends the batteries on to INMETCO.

When a shipment arrives at INMETCO, the batteries are sorted according to chemistry (nickel-cadmium, lithium-ion, etc.) and then processed to remove most of the plastic. The remaining plastic is burned for energy recovery during the smelting process, which recovers most of a battery's constituent metals. Cadmium (a persistent, bioaccumulative, and highly toxic chemical) is handled by a separate processing facility, and is sold primarily to battery manufacturers for reuse in new batteries. Smaller amounts of cadmium are sold to third parties, such as glass and pigment manufacturers. The remaining metals, mostly nickel, iron, manganese, and copper, are melted

down and sold to the stainless steel industry, which uses them in a variety of products such as automobiles, corrosion-resistant materials, and kitchen sinks. According to INMETCO, none of the battery materials it manages are landfilled.¹⁶

Impediments to Recycling and How They Can Be Overcome

While most of the metals contained in a cell phone can be recovered and sold, there is little market for recycled plastics and most are burned off in the smelting process. Since plastics make up about 40 percent of a cell phone's contents, this represents a significant waste of materials — especially considering the effort that goes into collecting these phones for reuse and recycling.

Mixed Plastics

One of the most significant impediments to recycling cell phone plastics is the variety of plastics contained in the typical unit. Separating these materials is not economically feasible, and mixed plastics are not very marketable. Plastics are also liable to become contaminated with metals during recycling, which renders them even less desirable. A further hindrance is that different brands of phone contain different plastics. Standardizing and labeling the plastics used would make recycling easier and more cost-efficient, just as standardizing cell phone components would facilitate refurbishment.

Toxic Contaminants

The toxic materials contained in cell phones also hinder recycling. Of particular concern are brominated flame retardants, which are added to plastic components to reduce the risk of fire (plastics are highly flammable). Flame retardants can contaminate recycled materials and make it very difficult to recycle plastics. Beryllium-copper, used in springs and contacts, creates another impediment to recycling, because of the dangers it poses to workers at recycling facilities. Beryllium dust can spread through the air when cell phone components are shredded or heated, putting workers at risk of chronic beryllium disease, which can cause irreversible and sometimes

fatal scarring of the lungs.¹⁷ Cell phones manufactured with less toxic flame retardants and with copper instead of beryllium-copper would be easier and safer to recycle.

Cell Phone Design

How a cell phone is assembled affects recycling efficiency in the same way that it affects refurbishment. Those that are easier to take apart — such as Nokia phones with removable faceplates and fewer screws — significantly reduce the time, and therefore the costs, involved in separating components and recycling materials.

Batteries

The batteries contained in cell phones have to be sorted before recycling can begin. This is a time-consuming process that could be streamlined, for example, by color-coding batteries according to their chemistry (i.e., lithium-ion, nickel-metal hydride, etc.). Standardizing batteries so the same type is used in cell phones of every brand would make recycling even more efficient.

5 Destination of Refurbished Cell Phones and Recyclable Materials

By refurbishing used cell phones, the collection programs surveyed for this report extend the lifetime of these products and divert them from landfills and incinerators. Similarly, recycling phones that cannot be refurbished keeps them out of disposal facilities and reduces the need for raw materials used to make new products. These are important environmental benefits, but it is equally important that refurbished phones and recycled materials be treated responsibly further down the line. Thus, a truly effective collection program will ensure that refurbished phones and phones sold for recycling are processed and ultimately disposed of in ways that protect the environment and human health. In particular, it is crucial that developing countries, where stringent environmental and health and safety laws are often lacking, do not become dumping grounds for these products and the many toxic substances they contain.

Refurbishers such as ReCellular, CollectiveGood, and Charitable Recycling sell most of the phones they refurbish to wireless carriers, retailers, aggregators, and other cell phone dealers. Approximately two-thirds of these refurbished phones ultimately wind up abroad (see box, page 37). Since 1999, approximately 65 percent of the phones ReCellular collected through Donate a Phone and HopeLine and subsequently refurbished (or 49 percent of the more than 2.4 million phones it obtained through these programs overall) ended up abroad, many in developing countries. ReCellular's phone sales break down is as follows:

- Approximately 44 percent of the phones it receives from Donate a Phone and HopeLine and then donates or resells are sold within the US, to buyers that include retail stores and wireless carriers.
- Approximately 56 percent of the phones it receives from Donate a Phone and HopeLine and then donates or resells are sold overseas.
- Of the phones ReCellular sells in the US, approximately 20 percent are eventually resold in foreign countries.

Refurbished Cell Phones Sold Abroad

Latin America is the largest market for refurbished phones, especially Mexico, Argentina, Brazil, Colombia, and Venezuela. Large numbers of refurbished phones are also sold in Eastern Europe, China, India, and Africa.

Refurbished phones are sold abroad principally for economic reasons: the phones are generally older or outmoded models for which there is greater demand outside of the US.* In the developing world, where new cell phones are not as affordable and widely available as they are in the US (and in Europe, Japan, and Australia), refurbished phones provide an inexpensive alternative for people who might not otherwise be able to afford them.

Several cell phone collection programs are also explicitly committed to making cell phones more readily available in the developing world. For example, one of CollectiveGood's stated goals is to "bridge the digital divide by hooking people up with the first cell phone they will ever own."¹ Similarly, Charitable Recycling has made a commitment to "bringing communication to an emerging country, perhaps for the first time."²

Donate a Phone/HopeLine. Almost half the cell phones obtained through the Wireless Foundation and Verizon programs are sold abroad. ReCellular, which refurbishes phones for both Donate a Phone and HopeLine, sells most of its refurbished phones in Latin America, as well as in China and Hong Kong. (ReCellular sells approximately 65 percent

*For similar economic reasons, collected phones with outmoded technology are sometimes sold abroad for refurbishing. The Charitable Recycling Program, for example, sends analog and other phones with little market value to refurbishers in Mexico and China, where labor costs are much lower than in the US. Robert Sullivan, President and Chief Executive Officer, The Wireless Source, November 20, 2002.

How Refurbished Cell Phones Wind Up Abroad

ReCellular, CollectiveGood, and the Charitable Recycling Program sell refurbished phones to cell phone aggregators, wireless providers, and other companies. The aggregators are generally US-based companies that purchase cell phones and sell them in large blocks within the US and abroad. Neither ReCellular nor either of the two independent collection programs would disclose much information about their relationship with aggregators, but spokespeople for ReCellular said their company works with Brightstar Corp., a distributor of wireless products and accessories abroad and in the US, among other companies. (Brightstar is a distributor of Motorola products in Latin America.)

CollectiveGood and Charitable Recycling chose to keep the names of their aggregators confidential.

The Charitable Recycling Program sells refurbished phones to wireless providers in addition to aggregators. These are typically offshore providers in Latin America, Eastern Europe, India, and Africa.³ ReCellular, CollectiveGood, and Charitable Recycling also sell phones to US companies that distribute them mainly within the US but also abroad. According to ReCellular, approximately 20 percent of the phones it sells in the US are eventually sold abroad by these US distributors.⁴

of its refurbished phones and those sold “as is” to overseas customers.)⁵

CollectiveGood. According to the organization’s president, CollectiveGood sells the majority of the phones it collects and refurbishes abroad, primarily in Latin America and Eastern Europe. Very few phones are sold in the US. Most of the phones sold in Latin America go to Mexico, as well as to Argentina, Brazil, Colombia, Venezuela, and countries in the Caribbean. Some phones are also sold directly to buyers in Panama, French Guinea, and Kenya.⁶ CollectiveGood collects large numbers of analog phones that it sends to Mexico, where the technology is still widespread.⁷

Charitable Recycling. About 43 percent of the phones collected by Charitable Recycling are sold abroad. This program recycles about 38 percent of the phones it collects — somewhat more than ReCellular. Of the remaining 62 percent that are refurbished, approximately 70 percent are sold abroad — slightly more than the proportion sold abroad by ReCellular.

What Happens to Refurbished Cell Phones That Are Sold Abroad?

Refurbished cell phones that are sold for export avoid being landfilled and incinerated in the US, but they will still end up joining the waste stream unless reuse and recycling systems are available in the countries where they are sold. Unfortunately, no infrastructure exists in the developing world to manage these products responsibly at end of life. And neither ReCellular nor any of the collection programs or cell phone aggregators is promoting the development of reuse/refurbishment systems overseas, or is working to establish systems to collect used phones and send them back to the US for refurbishing or recycling. Thus, the collection programs as they currently exist are providing just a temporary solution to the problem of cell phone waste in the US by shifting the problem abroad.

Although spokespeople for several collection programs said that efforts might be made in the future to

recover the cell phones they sell overseas, none could provide any concrete plans. The main reasons cited for their reluctance were logistical and economic: limited access to foreign countries, prohibitive costs (especially shipping), and the lack of collection partners abroad.

Refurbished Cell Phones Donated Within the US

Most of the cell phone collection programs surveyed for this report donate some of the phones they collect and refurbish to people in need within the US. The majority go to victims of domestic violence, but the Wireless Foundation also gives phones to teachers, livery cab drivers, neighborhood watch programs, and the elderly. Distributing refurbished cell phones free of charge to people who need them is unquestionably worthwhile, but it would also be helpful if recipients were encouraged to donate these phones in their turn. However, there is no evidence that any of the collection programs are currently providing information along with the phones they donate on the value of reuse and recycling and the location of cell phone drop-off sites.

Cell Phones Sold for Recycling: The Potential for Overseas Dumping

According to the recent report *Exporting Harm: The High-Tech Trashing of Asia*, 50 to 80 percent of the electronic waste collected for recycling in the US — mostly TVs and computers, but also cell phones, stereos, and large household appliances — is exported to Asia, where labor is cheap and where environmental and health and safety laws are lax or not well enforced. At recycling and disposal facilities in China, India, and Pakistan, investigators found open burning of hazardous wastes, workers handling toxic materials without protection, and unrestricted dumping of toxic chemicals in waterways and elsewhere.⁸ At Guiyu, a village in China, they found soil contaminated with lead and water that was undrinkable because of pollution from electronic waste; workers,

many of them children, were seen stripping wires and burning them in open pits to recover the copper.⁹ Although the US has signed the international Basel Convention, which aims to reduce transboundary shipments of hazardous waste, it has not ratified the treaty; thus, the export of electronic waste is not controlled in any way by the US.

As previously noted, the collection programs discussed in this report sell phones to recyclers that process the phones on their own or separate the components by material and resell them for further processing. The programs claim to “attempt” to use recyclers whose operations are in compliance with federal, state, and local environmental regulations, and to ensure that their phones are not shipped to places like Guiyu. However, the number of players involved in the buying and selling of cell phones makes it difficult to track recyclables from individual programs to their ultimate destination. There is no question, however, that large numbers of phones are being shipped overseas for recycling. In fact, cell phones have been found in the piles of electronic waste discovered by investigators in China and elsewhere.

Charitable Recycling. This refurbisher sends phones for recycling to Maxim Industries USA, which claims that it processes all materials at its own or partner facilities “in an environmentally safe manner” and that none are sent overseas for processing or disposed of in landfills.¹⁰ Charitable Recycling also uses Great Lakes International Recycling. This company sorts the cell phone components and sells the various materials to other companies for processing. Great Lakes ships 50 to 60 percent of the materials it receives abroad; it was the only recycler investigated for this report that acknowledged sending some cell phone materials to China.¹¹ Great Lakes told INFORM that the company is looking into what happens to the materials it sends overseas and how they are disposed of.

CollectiveGood. Until recently, CollectiveGood relied mainly on Waste Management’s Asset Recovery Group for recycling, but it now uses Global Investment Recovery Inc. This company sends the metals and plastics in cell phones to Europe, to be smelted for metals recovery and incinerated for energy recovery. It claims that none of these materials are disposed of in landfills.

6 Increasing Cell Phone Recovery and Improving the Programs

US consumers retire over 100 million cell phones every year. Yet the programs examined for this report have together collected fewer than 2.5 million used phones since 1999. Clearly, these programs are addressing only a tiny portion of existing cell phone waste. Rather than being recovered for reuse or recycling, most used phones are being stored away in closets and drawers or disposed of in landfills and incinerators. Meanwhile, cell phone use continues to grow.

Although the success of existing cell phone collection programs has so far been limited, such programs do have potential as a means of addressing this enormous and growing waste stream. To make a real difference, however, these programs must recover much larger quantities of used phones and ensure that phones sent abroad are handled responsibly at end of life. Current programs can move closer to these goals in three ways:

- Improving public awareness of and participation in the programs
- Working with cell phone manufacturers to redesign cell phones with reuse and recycling in mind
- Taking the initiative to ensure that phones sent abroad, especially to countries in the developing world, are either recovered for reuse and recycling or are ultimately managed in ways that keep toxic constituents out of landfills and incinerators.

Both industry and government have a role to play in reducing cell phone waste. Wireless providers and the collection programs themselves could do much more to promote and facilitate cell phone collection and spread the word about the importance of reuse and recycling. They could also find ways to reduce program expenses, which would make more revenues available for promotion, advertising, and recovery of phones sold abroad. Finally, innovative policy initiatives would be helpful in preventing these products from entering landfills and incinerators.

Increasing Collection Program Participation

INFORM's research suggests that most US consumers are unaware of the cell phone collection programs that are available, but once they learn of their existence many are eager to participate. Increased promotion and advertising, more convenient donation systems, and improved customer incentives would all help to improve participation in new and existing programs.

Promotion and Advertising

- **Launch national advertising campaigns and expand media exposure.** So far, collection program advertising has mainly been at the local level. While local campaigns may be appropriate for specific events and short-term collections, they are inadequate for promoting phone drives at nationwide retail outlets and other ongoing collections. National television, radio, and print campaigns would increase public awareness of the programs available and highlight their value. The Call to Protect program enjoyed its greatest success in 2000, after the program was mentioned in several nationally syndicated columns, including Dear Abby, Ann Landers, and Hints from Heloise.
- **Promote collection aggressively inside the store.** Programs that collect cell phones at retail outlets could do much more to attract customers' attention and encourage participation. In general, signs advertising the program should be posted throughout the store and in store windows, collection receptacles should be larger, permanent, and more prominent, and employees should be able to answer customer questions about the program with detailed information. Employees should also encourage every purchaser of a new phone (and of accessories such as headsets and batteries) to return their phones for reuse and recycling rather than throw them away.
- **Highlight the environmental and social benefits of cell phone donation.** While most program websites provide basic information on the

goals and benefits of cell phone collection, advertisements and other promotional materials (such as information provided at participating retail stores) tend to say very little about the problem of cell phone waste, the environmental benefits of reusing phones, and the money that can be raised for charitable causes through refurbished phone sales. Clear and widespread messages about the crucial need for cell phone reuse and recycling would raise the public's awareness of the importance of participating in these programs.

- **Include information on collection programs in advertisements for service plans.** Wireless providers such as Sprint and Verizon, and retail companies like RadioShack, advertise their plans and products on television and radio and in national newspapers and magazines. A reference to each company's collection program would contribute to increased participation.
- **Enclose collection information with new phones and phone bills.** A label affixed to new phones (or painted or etched onto them) would provide a constant reminder to customers to return their used phones for refurbishment or recycling.* The label could contain a toll-free telephone number or web address where customers can locate the drop-off site nearest them. Such a service could be maintained by the wireless industry or by individual collection programs, which would place their own contact information on phones sold by affiliated retailers. For collection programs run by wireless providers such as Verizon and Sprint, program information could be included with monthly billing statements.
- **Publicize local events more intensively.** Programs that run short-term collection drives (such as at football games) generally use fliers and ads in local newspapers to promote their events. INFORM's research suggests that tele-

vision and radio advertising, promotion by celebrities, and cooperation from the local community can increase participation in these events considerably.

Convenience and Incentives

- **Set up permanent collection receptacles at shopping malls, supermarkets, banks, and post offices.** After public awareness, convenience is probably the main prerequisite to a collection program's success. Verizon has been able to collect relatively large numbers of cell phones because users can drop them off at any of the company's 1200-plus retail stores. Still, people do not visit phone stores on a regular basis, and more phones would be donated if receptacles were consistently available at a variety of high-traffic locations within a community.
- **Offer discounts and rebates on new phones (and other products) to customers returning used phones.** Verizon's experiences with such promotions resulted in a 15 to 20 percent increase in the number of phones collected. These offers increase not only cell phone donations but store traffic as well. They should be offered on a permanent basis.
- **Convert short- and long-term drives at retail stores to permanent collections.** Verizon and Sprint have had considerable success because their collections are ongoing. With approximately 7100 store locations nationwide, RadioShack could recover much larger numbers of phones than it has so far by providing drop-off sites on a permanent basis.
- **Hold more regular collection events.** When cell phone drives are held at the same time each year — during ball games or local events such as a street fair — people are more likely to get accustomed to donating phones as a matter of course.
- **Provide free shipping for individual donations.** CollectiveGood is currently the only program that offers free shipping for all donations from individuals, including donations of a single phone. If the other programs likewise offered prepaid shipping labels downloadable from their websites, they would likely succeed in collecting much larger numbers of phones.

*This approach is used on batteries manufactured by participants in the take-back program run by the Rechargeable Battery Recycling Corp. (RBRC). The RBRC's battery recycling seal, printed on batteries and often on product packaging and instructions, includes the word "recycle" and a toll-free help line. The RBRC attributes many of the more than 250,000 inquiries it receives each year to this product label. Ralph Millard, Executive Vice President, RBRC, May 29, 2003.

Reducing Program Expenses

The collection programs surveyed for this report are all generating revenues from the sale of refurbished phones and recyclables, but more than a third of this income generally goes to cover administrative costs and the costs of shipping and processing used phones. However, some of these expenses, especially those associated with running collections and shipping the phones, could be reduced through arrangements with third parties.

- **Increase the use of partnerships that make third parties responsible for running phone drives.** Short- and long-term phone collections

Europe's WEEE and RoHS Directives

Compared to the US, the European Union (EU) is much further along in managing the problems associated with electronic waste. The *Directive on Waste Electrical and Electronic Equipment (WEEE Directive)* holds producers responsible for managing their products after consumers discard them and sets collection and reuse/recycling targets for all types of electrical and electronic equipment. The reuse/recycling target for cell phones is 65 percent of all separately collected units by the end of 2006. The *Directive on the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment (RoHS Directive)* requires the elimination, by 2006, of toxic substances such as mercury, lead, cadmium, hexavalent chromium, and certain brominated flame retardants from electrical and electronic equipment. Cell phones contain many of these toxic chemicals, and manufacturers will have to eliminate them from all phones sold and distributed in Europe. (For more information on these directives, see INFORM's fact sheets "European Union Electrical and Electronic Products Directives," http://www.informinc.org/fact_WEEEoverview.pdf, and "The WEEE and RoHS Directives: Highlights and Analysis," http://www.informinc.org/fact_WEEE.pdf.)

conducted with businesses, educational institutions, fraternal organizations, and other community groups can reduce expenses because the partner bears most of the responsibility for running the drive and delivering phones to the program's refurbisher. They can also recover large numbers of phones in a relatively short period (Charitable Recycling now obtains up to 80 percent of its phones through such arrangements). Partnerships with large businesses and colleges and universities offer the added benefit of providing a guaranteed source of used phones.

- **Enter into cost-sharing arrangements with third parties.** In an effort to reduce its program costs, Call to Protect explored an arrangement whereby the US Postal Service would provide free shipping of phones collected through Call to Protect in exchange for advertising or other benefits. This idea was never implemented, but such relationships — which can provide the further advantage of increased convenience for donors — are worth pursuing.

Policy Options

About 52 active or pending pieces of legislation in 25 states concern electronic waste, mostly computers. US legislators have started addressing this issue in part because of policy changes in Europe that mandate the reuse and recycling of electronic products and the elimination of many highly toxic chemicals from electronic products distributed in Europe (see box). These policies will have a large impact on US manufacturers, and for this reason are starting to affect the policies and practices of both government and business in this country. For example, the European policies regarding electronic waste were undoubtedly a factor in the US electronic industry's decision to join the National Electronics Product Stewardship Initiative (NEPSI), an ongoing dialogue among industry, government, and nongovernmental organizations whose goal is to reach agreement on how electronic equipment should be managed at end of life.

Although most state laws addressing the management of electronic waste focus on computers rather than wireless products, some state legislation — in Maine, New York, and Washington — addresses the

take-back of cell phones. In addition, at least one US senator (Rhode Island Democrat Jack Reed) is considering federal legislation that specifically deals with discarded cell phones. Awareness of the problem of wireless waste is growing (especially since the release in 2002 of INFORM's report *Waste in the Wireless World*), and it is perhaps only a matter of time before this large and toxic waste stream receives the attention it deserves.

A number of policy initiatives at both the federal and state levels could encourage more efficient cell phone collection programs.

- **Impose deposits on cell phones.** Deposit refunds, of perhaps \$1 or more, would increase the incentive for consumers to return their used phones for reuse and recycling. In the US, deposits on beverage containers have been effective in encouraging their return by consumers. Overall, bottle and can recovery rates in states requiring deposits are more than two and a half times higher than in states that do not.¹ In Michigan, a high deposit fee of \$.10 per bottle has virtually eliminated beverage container waste.²
- **Institute landfill bans on cell phones.** While difficult to enforce because of the small size of cell phones, state and local landfill bans could increase the number of phones flowing into collection programs. Legislation requiring municipalities to create systems for recovering, refurbishing, and recycling used phones would make such bans more effective. Revenues generated from the sale of recovered phones could help fund these municipal programs.
- **Require producer responsibility for discarded cell phones.** Legislation requiring manufacturers to create systems for recovering, refurbishing, and recycling used phones would shift the responsibility for managing these products at end of life from government to the private sector, creating incentives for producers to design phones that can be refurbished and recycled more easily and economically. At present, no manufacturer is directly involved in cell phone refurbishment and recycling. Motorola participates in the Call to Protect collection program, but the phones it recovers are sent to a third

party for processing. For this reason, the company has little incentive to come up with sustainable cell phone designs.

- **Impose reporting requirements and targets for cell phone collection and reuse/recycling.** Mandated reporting on the collection and end use of refurbished phones and recyclable materials would provide valuable information on program efficiency and the destination of cell phones that wind up abroad. Target numbers for collection, refurbishing, and recycling would give the wireless industry an incentive to improve program efficiency.

Product Redesign: Removing Impediments to Refurbishment and Recycling

Impediments to refurbishment and recycling compromise efficiency and increase costs. Removing these problems would make these processes more cost-effective, thereby giving the collection programs an incentive to collect more phones. The following strategies, discussed in greater detail in Chapter 4, deserve the attention of cell phone manufacturers:

- **Increase durability.** More durable components — especially plastic components — would reduce the number of parts that need to be replaced during refurbishment.
- **Facilitate disassembly.** Cell phones that come apart easily can be refurbished and recycled more quickly and inexpensively.
- **Standardize design elements.** Interchangeable adapters, batteries, and other accessories allow the same components to be used in different cell phone makes and models. Similarly, standardizing plastics and labeling them by type would make recycling easier and more cost-efficient.
- **Reduce toxic contaminants.** Cell phones manufactured without toxic chemicals would facilitate recycling.
- **Simplify software.** Cell phones with less complicated internal software would allow refurbishers to reprogram the settings more easily.

- **Identify battery types.** Color-coding rechargeable batteries according to their chemistry would expedite recycling.

Creating a Recovery and Disposal Infrastructure Abroad

The majority of refurbished cell phones are sold overseas, many in developing countries where no infrastructure is in place to deal with these products after users discard them. And none of the existing collection programs is taking responsibility for the reuse, recycling, and disposal of phones that wind up abroad. As a result, the small fraction of discarded phones that these programs recover are merely being shifted from the US to countries even less equipped to handle them responsibly at end of life. The prob-

The Basel Convention

One of the major goals of the 1989 Basel Convention is preventing the dumping of hazardous materials in developing countries. In December 2002, the parties to the convention adopted the Initiative for a Sustainable Partnership on Environmentally Sound Management of End-of-Life Mobile Phones. Among the goals of the initiative are improving product stewardship and identifying and promoting the best practices for refurbishing, recycling, and disposing of cell phones. The Basel Secretariat, cell phone manufacturers, and the parties to the convention are working together to develop a management system for cell phones that can be replicated for other products. This initiative is expected to be the first in a series of agreements between various industry sectors and the Basel Convention. Although the US has not ratified the Basel Convention (it has signed it, however), its participation in the cell phone initiative could have an effect on US policy and practices.

lem of cell phones sent (or “dumped,” in the view of many advocates for change) to the developing world is addressed by an initiative recently adopted by the Basel Convention, which concerns the transboundary shipment of hazardous wastes (see box).

Recovery of refurbished phones. There are two ways that new and existing collection programs could take responsibility for refurbished cell phones sold abroad:

- Ensure that systems are established that enable the phones to be collected, reused, and recycled abroad.
- Ensure that systems are established that return the phones to the US for refurbishment and recycling.

Both options will require cooperation between the collection programs and the wireless industry, especially major phone manufacturers and service providers that provide goods and services abroad. As in the US, phone retailers and overseas providers could provide collection information with new cell phones and act as collection points for used phones. Cell phone aggregators and distributors may also have a role to play, providing collection information along with refurbished units.

Revenues from the sale of refurbished cell phones could be used to fund either of these systems. The existing collection programs are already generating significant revenues from the relatively small number of phones now being recovered. In fact, the Wireless Foundation is investigating other options for using these funds besides donations to charitable groups, such as increasing its marketing and promotional efforts or paying the service provider costs for donated phones. If these programs ultimately succeed in collecting larger numbers of phones than they have so far, the extra revenues raised from sales could be used to cover the costs of a recovery system for cell phones sold abroad.

Recycling and waste disposal. There is no evidence that any of the recyclers used by the programs surveyed for this report is shipping collected phones to places like Guiyu, in China, where unsafe handling practices and unrestricted dumping are putting human beings and the environment at risk. Nonetheless, it is crucial that existing and future collection programs go out of their way to ensure that all phones sent over-

seas are processed and disposed of responsibly. The first step is to sell phones to reputable recyclers only. In addition, collection programs can:

- Require certificates of destruction/consumption for all shipments processed.
- Require verification of the ultimate destination of all product shipments.

- Provide full public disclosure of the ultimate destination of all recycled materials.

Finally, overseas dumping by cell phone recyclers can be avoided altogether if collection programs develop their own recycling systems, as Charitable Recycling is attempting to do.

Addendum: AT&T Wireless Reuse & Recycle

In April 2002, AT&T Wireless began a cell phone recycling program that was available to employees, customers, and the general public. In April 2003, the company expanded this program, renaming it AT&T Wireless Reuse & Recycle and providing for the drop-off of cell phones, batteries, and accessories — regardless of brand, type, and condition — at all AT&T Wireless retail stores. AT&T Wireless employees can drop off their used phones at designated workplace collection sites. Phones are refurbished or recycled by Hobi International, Inc. (Batavia, IL, and Dallas, TX).

AT&T Wireless donates a portion of the phones it refurbishes to groups that respond to emergency situations, such as the American Red Cross and the Federal Emergency Management Agency (FEMA). Funds from the sale of refurbished phones and recycled materials are donated to Keep America Beautiful, a national nonprofit organization that focuses on community improvement and beautification. AT&T Wireless claims that it makes no profit from these sales.

From April 2002 through early 2003, AT&T Wireless had collected approximately 200,000 pounds of used cell phones, batteries, and accessories.¹ In August 2002, the company donated 75 phones (equipped with wireless service) to each of 25 Red Cross chapters across the US for use in disaster relief, for a total of 1875 phones.²

Hobi International claims that it sends less than 3 percent of the materials collected through AT&T Wireless Reuse & Recycle to municipal landfills. The company sends phone batteries to INMETCO, a recycler affiliated with the Rechargeable Battery Recycling Corp.

Information about AT&T Wireless Reuse & Recycle can be found on the AT&T Wireless website (http://www.attws.com/our_company/cares/recycle_program.jhtml).

Notes

INTRODUCTION

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- ⁵ *Ibid.*
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- ²² *Ibid.*, May 16, 2003. This figure includes the value of the free airtime provided with the 10,000 donated phones.

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