

# Determining the Effectiveness of Cell Phone Reuse, Refurbishment, and Recycling

*The Environmental Protection Agency's Office of Solid Waste and Emergency Response initiated a series of innovative pilot projects to test ideas and strategies for improved environmental and public health results. This series of fact sheets highlights the innovative approaches, results, and environmental and economic benefits from the pilot projects that may be replicated across various sectors, industries, communities, and regions.*



## PROJECT DESCRIPTION/INNOVATION

EPA awarded an Innovation grant to INFORM, Inc., a national nonprofit environmental research organization, to complete the first in-depth assessment of the effectiveness of cell phone donation and take-back programs, determining how their value is recaptured and how collected phones are ultimately managed at end-of-life. Without research into the effectiveness of cell phone donation and take-back programs, it is unknown whether these programs are sustainable and how they impact the environment. This pilot was designed to be a first step towards forging the link between cell phone design and end-of-life management.

## BACKGROUND

In 2002, cell phone use in the United States surged to over 140 million subscribers. With an average cell phone life of 18 months, approximately 100 million cell phones (50,000 tons) are retired annually. Although the electronics segment of the waste stream accounts for less than five percent of municipal waste, it is growing much faster than the waste stream as a whole. Collection programs, which recover used phones from consumers to refurbish and resell or recycle, are one of the main options for reducing cell phone waste. But without aggressive collection, refurbishment and recycling programs, persistent, bioaccumulative toxins (e.g., arsenic, antimony, beryllium, cadmium, copper, lead, nickel, and zinc) and brominated flame retardants in cell phones enter the municipal waste stream and become a burden for local governments.

Retired cell phone components retain some value and while there are programs that promote refurbishment,

## Project Highlights

- Four take-back programs collected 2.5 million phones between 1999 and 2003.
- Sale of refurbished and recycled cell phones generated millions of dollars in revenues, most of which was donated to charity.
- Educated consumers by explaining how cell phone reuse and recycling programs provide an alternative to throwing out used cell phones.
- Created an impetus for cell phone manufacturers to redesign cell phones to make them less toxic, more easily refurbished, and more recyclable.

reuse and recycling, it was hoped that the increasing visibility of this issue will inspire more effective, national-level take-back and reuse programs.

## PROJECT SUMMARY

INFORM, Inc. in partnership with EPA Region 2, conducted the first in-depth assessment of some of the key cell phone collection and reuse programs in the country in 2002. These programs included: Wireless Foundation's Donate-a-Phone programs (includes programs by Motorola, Sprint, The Body Shop and Radio Shack), Verizon Wireless' HopeLine program, CollectiveGood, and The Charitable Recycling Program. INFORM examined whether these programs were sustainable and assessed the environmental benefits of cell phone donation and take-back programs.

INFORM interviewed program representatives to gather information such as the quantity of cell phones collected and refurbished or resold, collection methods, program

expenses and revenues, promotion methods, participation incentives, refurbishment and recycling processes, and the ultimate destination of refurbished phones.

## RESULTS

The pilot study found that the four cell phone collection programs recovered used phones by four principle means: 1) permanent collections at retail stores; 2) short- or long-term drives at retail stores; 3) collections at sporting events; and 4) direct shipment to the program headquarters or refurbishing/recycling facility.

From 1999 to early 2003, approximately 2.5 million cell phones were collected through these four combined programs—which still accounted for less than one percent of all retired cell phones. The majority of these phones were refurbished and resold, while about 40,000 were donated to individuals or sold to recyclers.

The programs generated significant revenues through the sale of refurbished phones and recyclable materials. ReCellular, Inc., a leading refurbisher of used cell phones, generated \$25 to \$30 million in annual revenues from the sale of refurbished phones and recyclable materials from all sources. Additionally, between 1999 and 2003, the programs interviewed had donated over \$6.5 million to charities from the sale of refurbished phones and recyclable materials.

The study determined that uncollected, used cell phones represent lost potential revenue for both collection programs and the many charities that receive donations from them. Increasing the percentage of collected phones by only a few points would mean an exponential increase in revenue; collecting even one-third of all retired cell phones could create a billion-dollar refurbishing and recycling industry.

The project further demonstrated that to effectively address cell phone waste, programs that collect, refurbish and recycle used cell phones would need to be dramatically improved and expanded to effectively address the scale of the problem—and keep pace with the rate of cell phone use and disposal. The study recommended the following actions to enable collection programs to fulfill their growth potential:

- Collection programs need to offer convenient, permanent drop-off sites in high-traffic locations and

## Innovation Pilot Partners

**Lead:** INFORM, Inc.

**Sponsor:** U.S. EPA Region 2

**Other Partners:**

- CollectiveGood International
- The Charitable Recycling Program
- Verizon Wireless Hopeline Program
- Wireless Foundation Donate a Phone programs

## Additional Information

**OSWER Innovation Projects:**

[www.epa.gov/oswer/iwg/pilots](http://www.epa.gov/oswer/iwg/pilots)

**EPA Plug-in to eCycling:**

[www.epa.gov/epawaste/partnerships/plugin](http://www.epa.gov/epawaste/partnerships/plugin)

**Federal Electronics Challenge:**

[www.federalelectronicschallenge.net](http://www.federalelectronicschallenge.net)

**INFORM Inc.:**

[www.informinc.org](http://www.informinc.org)

be broadly publicized by wireless providers and cell phone collection programs.

- Policy makers should consider offering financial incentives to enlist large-scale participation; rules for extended producer responsibility (EPR), which gives manufacturers physical and/or financial responsibility for managing their products after consumers discard them; federal and state initiatives to stimulate more efficient cell phone recovery systems; and landfill bans on cell phones to increase the number of phones flowing into collection programs.
- Manufacturers need to design cell phones for refurbishment and recycling with standardized components, simplification of internal software, and reduction of toxic cell phone components.

## 2010 UPDATE

Shaped by pilot's findings, EPA has teamed up with leading cell phone makers, service providers, and retailers to launch the "Recycle Your Cell Phone. It's An Easy Call" national campaign, which aims to increase the public's awareness of cell phone recycling and donation opportunities, with the ultimate goal of increasing the nation's cell phone recycling rate.