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THE EUROPEAN RECYCLING PLATFORM: PROMOTING COMPETITION IN E-WASTE RECYCLING

E-waste recycling is an opportunity, not a burden. Normal business principles, such as fair competition and efficiency, must be applied to recycling.

—Umberto Raiteri, Chief Executive Officer of the European Recycling Platform¹

In November 2007, the board of the European Recycling Platform (ERP) met near Paris to consider the future of the electronic waste recycling company. ERP's chief executive officer, Umberto Raiteri, had an important presentation for his eight-member board, complete with 70 PowerPoint slides highlighting the company's track record and prospects. After listening to the presentation, the group discussed whether the five-year-old organization should greatly expand its scope and strategy.

ERP had been formed in 2002 as the only pan-European recycling organization created in response to the European Union's groundbreaking directive to promote e-waste collection and recycling. ERP was a unique and ambitious venture based on the principle of producer responsibility, in which manufacturers are financially responsible for managing their end-of-life products. Braun, Electrolux, Hewlett-Packard and Sony had founded ERP as an alternative to the monopolistic e-waste takeback organizations then existing in several European countries. By late 2007, ERP operated in eight countries and had succeeded in stimulating competition and driving down e-waste recycling costs. It was handling a growing tonnage of e-waste and had achieved 10-35 percent market share in the countries where it operated. That was Act I.

Now the board was considering the best way to carry out Act II. Should ERP take on new product categories such as discarded batteries and packaging? Should it expand to additional countries? If so, which countries? If it expanded, could the "lean and mean" enterprise handle

¹ This case is based on interviews conducted by the authors from December 5, 2008 to July 10, 2009 and on information provided by ERP. All quotes and references are from these interviews and materials unless otherwise noted.

Maria Shao prepared this case under the supervision of Professor Hau Lee as the basis for class discussion rather than to illustrate either effective or ineffective handling of an administrative situation.

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the additional complexity while preserving its low-cost, outsourced business model? Should it take on more, even though it faced lingering problems due to the inconsistent and incomplete way in which the e-waste directive had been carried out across Europe?

BACKGROUND ON E-WASTE IN EUROPE

A Growing Crisis

Electronic waste was the fastest-growing form of waste in Europe and much of the Western world by the early twenty-first century.² From music and books to retail sales and business transactions, almost everything was going digital. Widespread Internet use and advances in technology led to a proliferation in computers, mobile phones, digital music players, and other electronic products. Tech gear was being replaced or upgraded at an increasing pace. The result: the world faced an emerging e-waste crisis. Some called it a “looming tsunami.”³

By the early 2000s, some 20 million to 50 million metric tons of e-waste was being created globally every year, comprising more than 5 percent of all municipal solid waste.⁴ Europe generated 6 million metric tons of e-waste in 1998, or 4 percent of the municipal waste stream. This volume was expected to increase by at least 3-5 percent a year.⁵ The 27 nations in the European Union (EU) generated 8.3 million to 9.1 million metric tons of e-waste in 2005, according to a 2007 report done for the European Commission. The study predicted that Europe’s e-waste “arising” would grow 2.5 percent to 2.7 percent a year, reaching about 12.3 million metric tons by 2020. But only about 25 percent of medium-sized appliances and roughly 40 percent of larger ones were being collected for treatment and recycling, leaving much room for improvement in collection rates.⁶

Electronic products were loaded with materials—such as lead, mercury, cadmium, brominated flame retardants, solvents, and plastics—that could be hazardous if not treated properly upon discard. A large portion of these products were dumped in landfills and incinerators, contaminating water, soil and air. A significant amount was exported, often illegally, to developing countries in Asia and Africa, where they were processed or salvaged for scrap, exposing workers and communities to highly toxic chemicals arising from improper treatment.

² Jessica McCallin, “The Recycling Revolution,” *Strategic Risk*, Newsquest Financial Media Ltd., October 1, 2003, <http://global.factiva.com/aa/default.aspx?pp=Print&hc=Publication> (September 18, 2008).

³ “E-Waste: The Exploding Global Electronic Waste Crisis,” issue briefing book, Electronics TakeBack Coalition, February 2009, <http://www.electronicstakeback.com/legislation/Ewaste%20Briefing%20Book.pdf> (July 16, 2009).

⁴ “Basel Conference Addresses Electronic Wastes Challenge,” press release, United Nations Environment Programme, November 27, 2006, <http://www.unep.org/Documents.Multilingual/Default.asp?DocumentID=485&ArticleID=5431&l=en> (April 3, 2009).

⁵ Elena Lymberidi, “Towards Waste-Free Electrical and Electronic Equipment,” European Environmental Bureau, March 2001 http://www.eeb.org/publications/2001/Towards_Waste-free.pdf (October 26, 2008).

⁶ Jaco Huisman et al., “2008 Review of Directive 2002/96 on Waste Electrical and Electronic Equipment (WEEE),” Final Report, United Nations University, August 5, 2007, available at http://ec.europa.eu/environment/waste/weee/pdf/summary_unu.pdf, p. iii-iv. (July 15, 2009).

Europe's Leadership

Europe was a leader on environmental issues, with trailblazing policies and practices on greenhouse gas emissions, alternative energy, waste management and chemicals use. In particular, Germany's environmental leadership was underscored in June 1991, when the government of a newly unified Germany passed the landmark Ordinance on Avoidance of Waste Packaging.

The goal of the ordinance was to eliminate or reduce the environmental impact of packaging waste. The ordinance marked the first time that the principle of "polluter pays" was applied to municipal solid waste.⁷ It created an obligation on industry to pay for the takeback of packaging—including glass, aluminum, plastic and paper—for reuse, recycling or safe disposal. It attempted to shift the burden of waste management from municipal authorities to manufacturers, distributors and retailers. By imposing a financial obligation on industry, the law created an incentive for business to reduce or optimize packaging at the design and manufacturing stages.

To implement the ordinance, German industry in 1990 created a private, nonprofit organization called Duales System Deutschland GmbH (DSD). DSD was funded by industry and contracted with municipal and private waste management firms to collect and sort discarded packaging.⁸ Manufacturers paid DSD a fee for the right to place DSD's Green Dot symbol on their packaging, signalling that takeback of packaging would be financed through the Green Dot system. Consumers could place their discarded containers and packaging in yellow bins and bags provided by DSD or bring them to designated collection points.⁹

In 1994, the EU passed the European Packaging Waste Directive (94/62/EC) that attempted to harmonize actions by member states to promote reuse and recycling of packaging waste. It established recycling targets for member states and required them to set up systems to collect and process discarded packaging.¹⁰ By 2008, packaging takeback programs using the Green Dot symbol had emerged in 22 EU member countries. They operated under the Packaging Recovery Organization Europe, or PRO-EUROPE, an umbrella organization founded in 1995 that licensed out the Green Dot symbol.¹¹

At the same time, industry-sponsored takeback programs spread to electronic waste. Between 1994 and 2001, five European countries—Switzerland, Netherlands, Norway, Belgium and Sweden—established e-waste takeback schemes. Switzerland's SWICO was founded in 1994;

⁷ Bette K. Fishbein, *Germany, Garbage and the Green Dot: Challenging the Throwaway Society* (New York: Inform Inc., U.S. Environmental Protection Agency, 1994), pp. 13-16.

⁸ Deanne Toto, "Green with Envy: Germany's Green Dot Program Continues Generating Good Collection Numbers," *Recycling Today*, October 2004.

⁹ FAQ, Der Grüne Punkt – Duales System Deutschland GmbH web site, <http://www.gruener-punkt.de/index.php?id=1401&L=1#c8624> (October 23, 2008).

¹⁰ "Treaties and Legislation: EU Packaging Directives," U.S. Environmental Protection Agency fact sheet, April 2007, <http://www.epa.gov/oswer/international/factsheets/200610-packaging-directives.htm> (October 23, 2008).

¹¹ "About PRO-EUROPE, Introduction," PRO-EUROPE web site, <http://www.pro-e.org/Introduction.html> (October 23, 2008).

the Netherlands' ICT Milieu and NVMP in 1999; Norway's El-retur in 1999; Belgium's Recupel in 2001 and Sweden's El Kretsen in 2001. Typically, they were not-for-profit companies set up and owned by electronic industry trade associations. They tended to be dominant or monopolistic national systems responsible for collecting, recycling and financing all or most of the electronic waste within their countries. Proponents of such national, collective systems viewed this model as the simplest and most effective way to collect and recycle e-waste.¹²

CREATING PRODUCER RESPONSIBILITY FOR E-WASTE

The WEEE Directive

In the early 2000s, the EU made a major leap forward in dealing with e-waste by enacting groundbreaking legislation—the Directive on Waste Electrical and Electronic Equipment, or WEEE Directive. The European Commission put forward proposals on e-waste in June 2000, which were passed by the European Parliament in December 2002 and issued as European Council Directive 2002/96/EC in January 2003.¹³ At the same time, the EU passed companion legislation, Directive 2002/95/EC, on the “Restriction of the Use of certain Hazardous Substances in Electrical and Electronic Equipment.” The RoHS Directive limited the use of six chemicals, including lead, mercury and cadmium, commonly found in electronic products.¹⁴

The WEEE Directive's goal was to prevent the creation of e-waste and to promote the reuse, recovery and recycling of discarded electronic products and components. The legislation required member states to ensure the setting up of collection and recycling systems that would let consumers return their discarded equipment for free. It called for collection of electronic waste separate from unsorted municipal waste and it set quantitative targets for collection, recovery and recycling of e-waste in member states.¹⁵

Significantly, the directive was set up under the principle of “producer responsibility.” The legislation placed a responsibility on producers to organize and contribute to the recovery and recycling of waste electronic goods they marketed in the EU. By requiring industry to take financial and organizational responsibility for dealing with end-of-life products, the directive created an important, up-front incentive for companies—to improve product design and manufacturing in order to minimize recycling costs and environmental impacts.

¹² Matthew Savage, Steve Oglivie, Jozsef Slezak, Eniko Artim, Josefina Lindblom (ed.), Luis Delgado (ed.), “Implementation of the Waste Electric and Electronic Equipment Directive in the EU,” executive summary, European Commission Joint Research Centre's Institute for Prospective Technological Studies, April 2006, <http://ftp.jrc.es/EURdoc/22231-ExeSumm.pdf> (October 23, 2008).

¹³ “ERP Press Kit,” European Recycling Platform, June 2008, http://www.erp-recycling.org/fileadmin/erp-PR-files/Press_Kit/090608/ERP_press_kit_PUBLIC.pdf (October 24, 2008).

¹⁴ “Directive 2002/95/EC of the European Parliament and of the Council of 27 January 2003,” Official Journal of the European Union, February 13, 2003, <http://www.rohs.eu/english/legislation/docs/launchers/launch-2002-95-EC.html> (April 2, 2009).

¹⁵ “Directive 2002/96/EC of the European Parliament and of the Council of 27 January 2003,” Official Journal of the European Union, February 13, 2003, <http://www.epeat.net/Docs/EU%20WEEE%20Directive.pdf> (April 2, 2009).

The directive established common goals across Europe, but left it to individual member states to pass national implementing legislation. Member states were given until August 13, 2004 to transpose the directive into national law.¹⁶ Some countries were late in transposing it, and many inconsistencies emerged in the way the directive was carried out among the EU's member nations.

The directive covered 10 major categories of goods, including large household appliances such as washers and refrigerators, small consumer devices such as TVs and video recorders, and tech equipment such as printers, PCs and phones. Products placed on the market after August 13, 2005 were required to carry labels with a crossed-out garbage bin on wheels, signifying the separate collection of e-waste.¹⁷ (see **Exhibit 1**).

A producer was defined as the first entity in a country to place a product on the national market.¹⁸ A producer, therefore, could be a manufacturer, distributor, importer or retailer. A producer would be responsible for the recycling and associated costs of e-waste from its own products sold after August 13, 2005. This was known as “future waste.” For e-waste from products sold before that date, known as “historical waste,” a producer's obligation would be based on its actual market share for each type of equipment.¹⁹

Producers did not have to handle the e-waste themselves, but could create or use collection and recycling organizations (CROs). These compliance schemes would ensure collection, treatment and recycling.

Implementation of the directive depended on the establishment of national registries to identify producers and determine the volumes of new products they put on the market. This in turn would determine a producer's share of financial responsibility in a compliance scheme.

The legislation required that European countries achieve an e-waste collection rate of 4 kilograms per capita by the end of 2006. It also set numerical targets for the recovery of different types of goods and for the reuse and recycling of electronic components and materials inside the products.²⁰ In addition, the directive called for communities to set up facilities to collect discarded electronics free of charge and for distributors and retailers to take back obsolete products for free from customers purchasing similar new items.

Extended Producer Responsibility

The WEEE Directive was the broadest and most visible attempt to implement producer responsibility, a principle increasingly embraced by environmentalists and businesses. Under the concept of “extended producer responsibility,” (EPR) manufacturers assumed the obligation for the environmentally safe management of their discarded products. “Extended Producer

¹⁶ “Frequently Asked Questions” on Directive 2002/95/EC and Directive 2002/96/EC, European Commission web site, May 2005, http://ec.europa.eu/environment/waste/weee/pdf/faq_weee.pdf (April 2, 2009).

¹⁷ Directive 2002/96/EC, op. cit.

¹⁸ ERP Press Kit, op. cit.

¹⁹ Ibid.

²⁰ Directive 2002/96/EC, op. cit.

Responsibility (EPR) is a policy principle to promote total life-cycle environmental improvements of product systems by extending responsibilities of the manufacturer of the product to various parts of the product's life cycle, and especially to the take-back, recovery and final disposal of the product," according to Thomas Lindhqvist, a Swedish clean production expert credited with coining the term.²¹

Proponents argued that EPR encouraged manufacturers to consider the end-of-life management of their products, providing a competitive advantage to companies that designed products that were easier and cheaper to recycle. Producer responsibility could spur innovation and competition among companies over how to manage the end-of-life phase of their products.²²

Producer responsibility could motivate manufacturers to invest in "eco-design" or environmentally sound product design. If companies were responsible for their discarded products, they would be motivated to keep waste costs down. So they would design products that lasted longer and were more easily and cheaply recycled. They would use environmentally safer, and fewer, materials during production.²³ For instance, the manufacturer of an electronics product might use fewer components, smaller amounts of potentially toxic metals, more recycled plastics and more parts that were easier to disassemble. In effect, producer responsibility created an important link between product design and product recycling, closing the loop from the beginning to the end of a product's life.

Individual Producer Responsibility

In the early 2000s, a refinement of the EPR concept emerged: Individual Producer Responsibility (IPR). Purists argued that takeback and recycling schemes had to be carefully constructed to ensure IPR rather than collective responsibility. Under an IPR recycling system, each producer would be financially responsible for the e-waste from only its own products. Under a collective-responsibility system, all producers would be responsible for e-waste from all manufacturers' products.²⁴ A collective obligation would mean that a producer had less incentive to improve its product design since higher recycling costs due to poor design would hit all manufacturers equally. By contrast, IPR would provide the strongest incentive—and reward—for eco-design and recycling efficiency, according to IPR proponents.

The WEEE Directive, in Article 8.2, required member states to ensure IPR for products marketed after August 13, 2005, known as future waste. For older or historical e-waste, the directive called for collective responsibility "in proportion" to a producer's market share for that type of equipment.

²¹ "What Is Extended Producer Responsibility?" Clean Production Action, 2009, <http://www.cleanproduction.org/Producer.Introduction.php> (April 10, 2009).

²² "The WEEE Directive: Building a Framework for Individual Producer Responsibility," presentation by Mark Dempsey, European Waste Policy Advisor, Hewlett-Packard Development Company, 2006 (April 3, 2009).

²³ "Extended Producer Responsibility," Electronics TakeBack Coalition, http://www.electronicstakeback.com/legislation/about_epr.htm (July 16, 2009).

²⁴ "Developing Practical Approaches to Individual Producer Responsibility," IPR Works, October 2007, <http://www.iprworks.org/practice/Developing%20Practical%20Approaches%20to%20Individual%20Producer%20Responsibility%20October%202007.pdf> (April 10, 2009).

But critics argued that the IPR mandate for future e-waste was lost in the transposition of the directive into national laws. By 2007, a coalition of major corporations and environmental groups declared their concerns over the incomplete and inconsistent transposition of the IPR requirement across the EU. The group said 13 member states had transposed Article 8.2 into law, while another 10 had omitted the requirement, making producers “jointly responsible” instead for e-waste recycling. The coalition, which included Braun, Electrolux, HP and Sony, as well as Greenpeace International, added, “This jeopardises the attainment of the Directive’s objectives, which means that companies will not be financially rewarded for making products easier to recycle.”²⁵

Setting up an IPR system in which a producer’s financial obligation was limited to just its own products was tricky. Discarded equipment needed to be sorted or identified by brand to accurately determine a producer’s share of financial responsibility. Yet, sorting the municipal waste stream posed big practical and technical challenges.

Producer Responsibility in Practice

As the twenty-first century progressed, the producer responsibility model in e-waste gained steam well beyond Europe. The concept was supported by a growing number of corporations, governments and environmental organizations, such as Greenpeace International. In the U.S., by mid-2009, 18 states, including Connecticut, Illinois, Maryland, Minnesota, New Jersey and Texas, plus New York City, had passed producer responsibility laws on e-waste.²⁶ Some states, such as Maine and Washington, had even enacted laws to put IPR into practice, while Japan had an IPR system in which consumers could return branded personal computers through the postal system to the manufacturers’ own recycling plants.²⁷

Among U.S. states, only California eschewed producer responsibility. Starting in 2005, it enacted an “Advanced Recovery Fee” (ARF), an up-front flat fee that consumers paid to retailers when they purchased a television, monitor or laptop (not computer) with a screen of more than 4 inches. The fees covered recycling of any brand of product and were put into a state recycling fund to reimburse recyclers. From 2005 through 2008, the fees ranged from \$6 to \$10, depending on screen size. They were raised to \$8 to \$25 in 2009.^{28, 29} Advocates of producer responsibility criticized the ARF model because it passed the financial burden for recycling directly to consumers, rather than giving industry incentives to work toward eco-design and competition and efficiency in recycling.³⁰

²⁵ “Joint Statement by a Group of Industry and NGOs on Producer Responsibility for Waste Electrical and Electronic Equipment,” September 2007, at http://www.iprworks.org/statements/IPR_Statement_EN.pdf (April 3, 2009).

²⁶ “State Legislation,” Electronics TakeBack Coalition, http://www.electronicstakeback.com/legislation/state_legislation.htm (April 14, 2009).

²⁷ “Developing Practical Approaches to Individual Producer Responsibility,” op. cit. (April 14, 2009).

²⁸ “Electronic Waste Recycling (eWaste) Fee—FAQ,” California State Board of Equalization website, <http://www.boe.ca.gov/sptaxprog/ewfaqsgen.htm> (August 11, 2009).

²⁹ “Brief Comparison of State Laws on Electronics Recycling,” Electronics TakeBack Coalition, June 16, 2009, http://www.electronicstakeback.com/legislation/Compare_state_laws_chart.pdf (July 16, 2009).

³⁰ “Producer Responsibility: Why It’s a Better Solution than ARF,” Electronics TakeBack Coalition, May 29, 2007, http://www.e-takeback.org/docs%20open/Toolkit_Legislators/tools/Why%20EPR.pdf (April 14, 2009).

LAYING THE GROUNDWORK FOR ERP

Growing Corporate Attention

By the early 2000s, e-waste was a growing concern for companies in the technology, consumer electronics and appliance industries. Increasingly, they were being scrutinized for the ecological soundness of their products as well as their recycling and takeback policies. In addition, the WEEE Directive drew global attention to the e-waste issue.

Among the companies closely monitoring and participating in the European policy debate were: HP, the American computer and printer maker; Braun, the German consumer appliance company (a unit of Gillette, which was acquired in 2005 by Procter & Gamble); Sony, the Japanese consumer electronics giant; and Electrolux, the Swedish household appliance maker.

HP was an early leader among tech companies in recycling. The company started recycling computer products internally in 1987. In Europe, HP began voluntarily taking back all brands of computing products from business customers in 1989. It established its “Planet Partner” recycling program for laser jet print cartridges in 1991 and for inkjet print cartridges in 1997. The company opened its first recycling facility in Roseville, California in 1997, becoming the only major computer maker to run its own recycling facility.³¹

Braun/Gillette, as a manufacturer of electric shavers, hair dryers, toothbrushes, coffee makers, and other small household appliances, had a longstanding interest in recycling of electronic and electrical products. As the owner of the Duracell battery business, Gillette also had a strong interest in recycling of batteries.

Electrolux was one of the world’s largest manufacturers of large household appliances, such as refrigerators and washing machines. Recycling had long been a major issue for these “white goods” companies, since their products contained large amounts of metal that could be recovered and re-sold. Electrolux prided itself on being one of the first companies in its industry to “identify the business case for recycling and lobby actively for individual (producer) responsibility.”³²

Sony understood the importance of recovering and reusing the materials inside the TVs, PCs and other consumer products it made. It was active early on with e-waste issues, since many of its products contained cathode ray tubes, a major part of the world’s e-waste problems. In its home country of Japan, after the Home Appliance Recycling Law went into effect in 2001, Sony established a national network of TV recycling plants with five other manufacturers.³³

³¹ “HP and the Environment,” environment timeline, Hewlett-Packard Co. web site, http://www.hp.com/hpinfo/newsroom/press_kits/environment/timeline.html (July 13, 2009).

³² “Recycling,” Electrolux web site, <http://www.electrolux.com/node195.aspx> (September 25, 2008).

³³ “Recycling Activities in Japan,” Sony Corp. web site, <http://www.sony.net/SonyInfo/Environment/activities/recycle/japan/index.html> (July 13, 2009).

The Transformers

Hans Korfmacher and Klaus Hieronymi, environmental managers of Gillette and HP respectively, would lead the charge in developing a radically new approach to e-waste recycling in Europe. After working 10 years for 3M Co. in Germany and elsewhere in Europe in environment-related jobs, Korfmacher had joined Duracell/Gillette in 2000 to establish battery takeback programs in Europe and later developed appliance takeback programs for Braun/Gillette. Hieronymi had joined HP in Germany in 1984, working in services marketing and environmental management positions. In 1989, he had developed the first formal e-waste takeback program for HP Germany. Hieronymi, who restored old motorcycles and cars on the weekends, had always been fascinated by the challenge of creating value from end-of-life products. He liked to point out, “Something is a scrap or waste (only) if you don’t know what you can do with it. The moment you know what you can do with it or use it for, it’s not scrap or waste.”

During the 1990s, both men had seen first-hand the shortcomings of the national consortia then existing in Europe to handle packaging and e-waste takeback. The Green Dot system, financed by producers, was the nationwide collection and recycling organization for packaging waste within Germany. Belgium, Netherlands, Norway, Sweden, and Switzerland each had industry-backed dominant organizations to handle e-waste recycling. Typically, these national CROs had been created under government direction and were strongly influenced or controlled by industry trade associations and local politicians. Korfmacher and Hieronymi believed the existing systems were monopolistic and inefficient. Within a country, producers had only one choice of CRO, leaving them exposed to high costs and sometimes arbitrary price increases. The early CROs tended to charge producers fees per unit or kilogram of product sold, which were not reflective of the actual costs of takeback and recycling. Together, the CROs and the industry associations that founded or backed them were a strong lobbying force with their governments. This three-way alliance created an “old boy’s club,” as Hieronymi put it, that wanted to preserve the status quo in e-waste recycling.

Korfmacher recalled, “The existing programs and organizations worked only on a national level, did not enable basic business principles and were far too expensive for producers, customers and consumers.... (W)e believed that a competitive approach with market forces would deliver better results.”

The Old Model

Some of the shortcomings of the national consortium model were apparent in the Green Dot system for waste packaging in Germany. Under the system, which was set up under approval from the German government, manufacturers paid DSD license fees to use the green dot recycling symbol on their packaging. The fees were based on the type of material and weight of the package. As of 1993, plastics had the highest fee per kilogram, while paper, natural materials and glass had much lower fees. To determine how much it would pay in fees, a company needed to estimate and report the number of packaging units it expected to sell in Germany in the following year.³⁴

³⁴ Fishbein, op. cit., pp. 62, 66.

Collection and sorting costs were enormous, since the law required the system to be nationwide and included highly aggressive recycling quotas set by government. In fact, at two different times during 1993, DSD faced public budget crises, in part because of high operating costs.³⁵ The system cost Germany about 3 billion Deutsche Mark (DM) a year in 1993 and 1994 and about 4 billion DM a year for 1995 to 1998. Given that packaging waste accounted for only about 24 percent of all household waste, which in turn represented only about 13 percent of all waste in Germany, about 4 billion DM was being spent on handling a mere 3 percent of overall waste, one skeptic pointed out.³⁶ Given DSD costs of about 4 billion DM (\$2.4 billion) a year and a German population of about 80 million, the Green Dot fees averaged 50 DM (\$30) per person per year.³⁷

Critics contended that the national, single-provider system reduced competition in recycling. One 1999 research paper pointed out that the Green Dot system evolved into a series of regional monopolies in which large waste management companies—dealing with local governments—secured “the lion’s share” of waste management contracts authorized by DSD. The contracts ran for as long as 10 years.³⁸ DSD also signed contracts with local waste management authorities throughout Germany.³⁹ Germany’s Federal Cartel Office in the early 1990s opened an antitrust investigation into the DSD and its expansion plans. Small recycling companies had complained to the office that they were being squeezed out of the market by DSD’s network of contractors across the country. Criticism mounted that the DSD system was fostering greater concentration in the waste industry.⁴⁰

In addition, some producers complained that the relatively high fees charged by some national takeback consortia resulted in large accumulated financial reserves that discouraged efficiency and competition. For instance, DSD in 1998 reportedly amassed a reserve of €200 million (Euros) for takeback of packaging in Germany.⁴¹

Lobbying and Persuasion

By the late 1990s, the EU had started drafting legislation that would become the WEEE Directive. Korfmacher and Hieronymi began leading a group of like-minded companies to lobby for the directive to be based on competition and IPR. Gillette, Electrolux, HP, Sony and other companies in the group believed that it was important to get out ahead of the directive, to help

³⁵ Ibid., pp. 59-60.

³⁶ Eric Neumayer, “German Packaging Waste Management: A Successful Voluntary Agreement with Less Successful Environmental Effects,” *European Environment: The Journal of European Environmental Policy*, John Wiley & Sons, Inc., 2000: 10, p.155.

³⁷ Fishbein, op. cit., p.70.

³⁸ Erich Staudt and Markus Schroll, “The Germany Packaging Ordinance: the Questionable Effects of a Fragmentary Solid Waste Management Approach,” *Journal of Materials Cycles and Waste Management*, April 1999: Volume 1, Number 1, p. 20.

³⁹ Fishbein, op. cit., p. 68.

⁴⁰ “Falling Victim to Its Own Success,” *The Financial Times*, January 27, 1993.

⁴¹ C. Kieren Mayers, “Strategic, Financial, and Design Implications of Extended Producer Responsibility in Europe: A Producer Case Study,” *Journal of Industrial Ecology*, 2007: Vol. 11, No. 3, p.117.

shape it rather than to fight it. The companies wanted to see competition among CROs and they shared a belief that the directive presented “an opportunity rather than a threat,” according to Korfmacher.

As they lobbied on the directive, the companies coalesced around the idea of creating a pan-European recycling organization that would spark competition and drive down costs. The group studied existing CROs in packaging, electronics and batteries, concluding that they were plagued by high costs and inefficiencies. The group believed that e-waste takeback costs could be reduced as much as 50 percent with a competitive business model, recalled Korfmacher.

In February 2002, Korfmacher and Hieronymi, meeting at the Schloss Schönburg castle hotel on the Rhine River in Oberwesel, Germany, arrived at a basic framework for the pan-European recycling organization. They convinced Electrolux and Sony to join Braun/Gillette and HP. In November 2002, at a ceremony at the Sony Center in Berlin, executives from the four companies signed a joint cooperation agreement.

Four global corporations from four separate sectors—small appliances, large appliances, information technology and consumer electronics—had crossed industry boundaries to create a joint solution for addressing e-waste.

THE ERP SOLUTION

The Business Model

On December 16, 2002, the ERP was launched as the first pan-European e-waste takeback scheme created in response to the WEEE Directive. The goal of the four founding companies was to create a manufacturer-run vehicle for purchasing recycling services and managing e-waste. The ERP’s guiding principles were: competition and efficiency in recycling, cost-effective implementation of the directive, and support for IPR.

“By introducing the first ever pan-European procurement platform, we seek to establish pan-European services and cross-border competition in the European waste management service market,” said Korfmacher, who would serve as president of ERP from 2002 until 2006.⁴² He added, “By pooling volumes and procuring recycling services on a European level, we have realized that we have the opportunity to reduce our annual recycling costs by millions of euros.”⁴³ In addition, by creating competition to other CROs, the founders of ERP hoped to reduce the cost to society from e-waste, Korfmacher later recalled.

Companies would join ERP, a not-for-profit corporation, to buy takeback and recycling services that would enable them to meet their producer obligations under the directive. For companies,

⁴² “Braun, Electrolux, HP and Sony Launch the First Pan-European Recycling Platform,” ERP press release, December 16, 2002, http://www.erp-recycling.org/fileadmin/www_erp-files/pdfs/pr_december2002.pdf (July 14, 2009).

⁴³ “Braun, Electrolux, HP and Sony Move Towards a Pan-European WEEE Recycling Scheme,” ERP press release, November 26, 2003, http://www.erp-recycling.org/fileadmin/www_erp-files/pdfs/pr_compliance_scheme.pdf (July 9, 2009).

ERP membership provided a single contact to deal with in complying with the varying producer responsibility requirements in different countries under the directive. Multinationals, in particular, were looking for a single interface throughout Europe. Companies could join ERP in a single country as well as on a Europe-wide level. Most of ERP's revenue came from the takeback costs it charged. Membership fees, ranging from €1,000 to €5,000 per country, were a relatively small factor.

By operating throughout Europe, ERP could pool the volume of e-waste collected, creating economies of scale that drove down takeback costs. To keep its overhead costs low, ERP outsourced most operations—including collection, treatment and recycling—to two general contractors. Having just two general contractors that each operated in multiple countries gave ERP scale that was lacking at other compliance schemes that might have many contractors within a single country (see **Exhibit 2**).

In addition, ERP did not keep large financial reserves, as traditional takeback schemes in some countries did. These factors, according to Raiteri, combined to help it offer e-waste takeback prices that were among the lowest, if not the lowest, wherever it operated.

Raiteri said, “Our purchasing power is much bigger than local schemes. Therefore, we are able to offer a lower cost to our members.... They use the two advantages of our business model and our international sourcing.”

ERP's prices to customers closely reflected the actual cost of e-waste takeback. To mirror the real costs, ERP, wherever permitted by local authorities, charged customers by the tonnage of e-waste recycled on their behalf. (The producer's obligation under the directive, in turn, was determined by its market share of sales in a specific country. In addition, the prices ERP charged customers took into account the value that could be obtained by recyclers selling the recovered metals for scrap. If scrap prices rose, ERP lowered the prices it charged customers. If scrap prices dropped, the company raised prices to customers.)

Overall, ERP's “collected-treated” method contrasted with the traditional pricing method used by some other compliance schemes that charged fees per unit or kilograms of products sold. The traditional method, which had been developed by the early CROs, was inherently more arbitrary and less reflective of the actual cost of takeback and recycling.

Raiteri explained, “The costs paid by our companies are as low as possible. Our business model is to charge our members only the actual costs—the takeback costs plus our overhead.... Therefore, at the end of the year, we're basically breaking even. Our target is not to make a profit unless required by local legislation.”

Breaking the Mold

Most important, ERP helped change the paradigm in European e-waste recycling. ERP helped break the monopolistic mentality fostered by the national consortia. ERP sparked competition among CROs and gave manufacturers and other users more freedom of choice.

HP's Hieronymi recalled, "We developed a system which was completely against the mainstream. The mainstream was every country has just one system—the monopolist system."

Korfmacher added:

The more generic success of ERP is that we established competition in most countries between collection and recycling organizations. Many countries ... have learned or are learning the fact that running collection and recycling organizations on good business principles is beneficial for consumers, retailers, producers and the overall economy and society.

The Journey

Environmental managers from the four founding companies developed the business on a part-time, rotating basis in the first few years as they prepared for the directive's implementation to start in August 2005. In November 2004, the four companies established a joint venture company called ERP SAS, registered in Paris, with Korfmacher as president.⁴⁴ In August 2006, Raiteri, who had served as general manager of ERP in Ireland, was appointed as ERP's CEO and first employee. He had spent 20 years in management positions at Electrolux, the most recent as the appliance maker's country manager in Ireland. Over the next several years, Raiteri would serve as ERP's road warrior CEO, traveling around Europe typically four days a week and working out of his home office in a northeastern Italian town one day a week.

The rollout of operations across Europe proceeded. Operations in Austria, Ireland and Spain were launched in 2005. That was followed by France, Germany, Poland and Portugal in 2006. The United Kingdom launched in 2007. Italy started up in January 2008, increasing ERP's portfolio to nine countries covering more than 70 percent of Europe's population. In each place, ERP hired a country manager to run the compliance scheme. By 2009, with the addition of Denmark and Finland, ERP operated in 11 countries (see **Exhibit 3**).

Despite its growing footprint, ERP continued to stress the importance of being lean, outsourced and cost-effective. As of early 2009, Raiteri pointed out, the company employed only 25 people, (including just five at its headquarters or "coordination office" in Paris) to manage the business across Europe. Some e-waste compliance schemes covering a single country employed 25 or more people, he noted.

Measures of Success

ERP's business grew markedly as Europe's e-waste market expanded under the WEEE Directive. As the only e-waste compliance scheme to operate across national borders, ERP was at the leading edge of this growing market.

⁴⁴ "European Recycling Platform (ERP) Established First Pan-European WEEE Compliance Scheme," ERP press release, November 11, 2004, http://www.erp-recycling.org/fileadmin/www_erp-files/pdfs/pr_european_compliance.pdf (July 10, 2009).

By the end of 2007, after more than two years in operation, ERP had collected about 250,000 metric tons of e-waste and had more than 1,100 members in eight countries. Revenue in 2007 was €43 million.

By the end of 2008, the company had collected more than 500,000 metric tons and had about 1,300 members in nine countries, including 1,270 local members and 30 Europe-wide members. Revenue in 2008 was €64 million (see **Exhibit 4**).

By mid-2009, ERP had collected more than 700,000 metric tons and membership had climbed to more than 1,300 customers in 11 nations, including 34 Europe-wide members. Sales were expected to be at least €72 million for 2009. The four founding companies, which were equal shareholders of ERP, accounted for about 70 percent of its recycling volume. Other members included Apple Computer, Dell, Microsoft, Nike and Nokia.

ERP estimated in 2009 that its market share ranged from 10 percent to 35 percent in each country where it directly operated. Often, ERP's e-waste tonnage made it only the second- or third-largest compliance scheme in a country, while the largest was the CRO that specialized in handling large domestic appliances known as "white goods." Overall, ERP represented about 15-20 percent of the e-waste market among CROs in Europe, the company estimated in 2009.⁴⁵

THE EXPERIENCE AND IMPACT

Driving down recycling costs

From its earliest days, ERP's emergence pointed out the monopolistic pricing that existed in countries that had just one major e-waste compliance scheme. Before the directive took effect, five countries—Belgium, Netherlands, Norway, Sweden and Switzerland—already had national consortia for e-waste takeback. In June 2006, 10 months after implementation of the directive, HP published information showing that recycling costs were higher in the monopolistic countries (where ERP did not operate) than in competitive countries such as Austria, Germany and Spain (where ERP did operate). Based on the recycling costs it faced with its own product lines, HP estimated that recycling a digital camera, for instance, cost just 1 or 2 euro cents in Austria, Germany and Spain, compared with 7 euro cents to as high as €1.24 in the five monopolistic countries. For a laptop computer, it cost 7 to 39 euro cents in the three competitive countries, compared with 88 euro cents to as high as €6 in the monopolistic nations. "Costs are higher in countries where there is no competition and only one recycling provider for industry to work with," HP said.⁴⁶

Sometimes ERP, by merely publishing its own prices in countries where it operated, would knock down prices charged by other compliance schemes in neighboring non-ERP countries. Steve Rockhold, global program manager for product recycling at HP, recalled, "Within a year,

⁴⁵ "A Better WEEE Directive to Support a Sustainable European Resource Management," ERP web site, July 2009, p.2, <http://www.erp-recycling.org/fileadmin/erp-files/pdfs/ERP-BROCH.LR.29.06.pdf> (July 10, 2009).

⁴⁶ "Real Consumer Costs for Electronic Equipment Recycling as Low as 1 Euro Cent," Hewlett-Packard Co. press release, June 2, 2006, http://www.hp.com/hpinfo/globalcitizenship/environment/pdf/nr_costofrecycling.pdf (July 10, 2009).

some of them cut their prices by as much as 70 percent.... Norway dropped the fee they were collecting from manufacturers by 70 percent because they felt the heat of us and others pointing out the inefficiencies that existed outside of the ERP countries.”

ERP often cited the example of Austria, which saw competition increase sharply following the WEEE Directive. In the second quarter of 2005, before implementation of the directive, there was one CRO charging 70 euro cents per kilogram of e-waste from small household appliances. ERP launched in the third quarter of 2005, charging dramatically less—about 25 euro cents. The first scheme lowered its price in anticipation of ERP’s launch. Two other schemes sprang up in 2005. All four chased each other in further cutting prices. The result: By the first quarter of 2007, the lowest price on the market was 7.5 euro cents per kilogram, offered by ERP. In effect, the cost of recycling had dropped in less than two years to just one-tenth of the former level (see **Exhibit 5**).

By 2008-2009, recycling costs were dramatically lower throughout Europe. This was apparent from the so-called “visible fees” that manufacturers in some countries were required to disclose, showing consumers how much recycling costs contributed to the retail price of a new product. In Ireland, the visible fee on a washing machine was €20 in 2005-2006, plunging to €5 in 2009. In Italy, the visible fee in 2007-2008 for a refrigerator was €16, dropping to €10 in 2009. Even in Belgium, which continued to have a single dominant CRO, recycling charges plunged. The visible fee in Belgium on a refrigerator dropped from €20 in 2006 to €10 three years later; on washing machines from €10 to €1; and on televisions from €11 to €1.

Raiteri declared, “The good old days with no competition and no public pressure are gone. The market is moving.”

ERP was both a catalyst and a beneficiary of increased competition in e-waste recycling. The prices it paid to buy e-waste takeback services on behalf of its customers plunged. Between 2006 and 2008, ERP’s costs per ton for takeback services on four major waste streams fell dramatically. For large domestic appliances, ERP’s costs per metric ton were just 31 percent of the 2006 level, 60 percent for refrigerators, 70 percent for computer and television screens, and 52 percent for small household appliances.

Experience of the Users

Companies that used ERP realized significant savings from its competitive new model and were able to sharply boost their recycling volumes. They also had a single entity that could take care of the many administrative and paperwork tasks involved in complying with the directive across multiple countries.

Gillette at one point achieved as much as 90 percent savings in recycling costs by using ERP, according to Korfmacher. In 2001, the company estimated its e-waste takeback expenses in Europe would be €17 million. In 2005, the year ERP started operating, e-waste recycling costs were an estimated €12 million, based on prices offered by national compliance schemes. But in 2007, the company’s actual e-waste takeback costs were just €1.3 million—despite much higher volumes of e-waste recycled than in the earlier years. That represented a 90 percent drop in

recycling costs from 2005. Korfmacher said, “This is the real impact of ERP to the Gillette business and European consumers.”

What’s more, Gillette experienced first-hand the dramatic difference in recycling costs between ERP countries and non-ERP countries. Out of the €1.3 million spent in 2007, only 20 percent was spent in the nine countries where ERP directly operated and which represented the vast majority of the company’s business in Europe. The other 80 percent was spent in the non-ERP countries with monopolistic compliance schemes. In the monopolistic countries, costs dropped 25 percent between 2005 and 2007 (€1.2 million to €0.9 million), while in the nine ERP countries with competition, costs dropped 96 percent (€10.8 million to €0.4 million), Korfmacher pointed out.

HP also achieved significant cost savings by using ERP. In 2009, reflecting on HP’s experience using ERP, Hieronymi said, “My gut feel is that HP saved, in the last four years, roughly about \$100 million. And it’s going to save even more in the future.”

Overall, the WEEE Directive and ERP helped drive a major increase in HP’s recycling activities. The volume of computer hardware and supplies recycled by HP nearly doubled, from 64,000 metric tons worldwide in 2005 to 120,000 metric tons in 2008.⁴⁷ ERP recycled 29,000 metric tons of equipment on behalf of HP in 2008.⁴⁸ Europe led the way in the recycling surge at HP. The volume of recycled products from Europe, the Middle East and Africa more than doubled between 2005 and 2008, to 77,000 metric tons, accounting for nearly two-thirds of the amount HP recycled worldwide in 2008.⁴⁹

Stimulating Recycling

By 2009, the WEEE Directive had sparked a significant increase in e-waste recycling throughout Europe. After the directive’s implementation in August 2005, CROs sprang up across the continent. One 2007 report counted at least 129 producer takeback organizations for e-waste⁵⁰, while a 2008 report put the number at more than 150.⁵¹ By mid-2009, only a few countries were left with just a single compliance scheme. The volume of e-waste that was being recycled grew markedly.

In one sign of the increased activity, the recycling return rates on items made by ERP’s producer members rose significantly. In 2007, the tonnage of e-waste handled by ERP represented 17 percent of the weight of new products put on the market by its members. That recycling return rate shot up to 29 percent just one year later. Monitors and screens had the highest return rate,

⁴⁷ “Product reuse and recycling performance,” HP Global Citizenship Report 2008, Hewlett-Packard Co. web site, <http://www.hp.com/hpinfo/globalcitizenship/gcreport/productreuse/performance.html> (July 15, 2009).

⁴⁸ “Product reuse and recycling programs,” HP Global Citizenship Report 2008, Hewlett-Packard Co. web site, <http://www.hp.com/hpinfo/globalcitizenship/gcreport/productreuse/programs.html> (July 15, 2009).

⁴⁹ “Data and goals summary,” HP Global Citizenship Report 2008, Hewlett-Packard Co. web site, <http://www.hp.com/hpinfo/globalcitizenship/gcreport/ataglance/data.html> (July 15, 2009).

⁵⁰ Mayers, op. cit., p.115.

⁵¹ Jaco Huisman, Federico Magalini, Ruediger Kuehr, “Where Should WEEE Change?”, *E-Scrap News*, July 2008, p.1.

followed by refrigerators, large domestic appliances, and other products, including small domestic appliances.

The increased activity and competition led to widespread drops in costs for e-waste takeback services. ERP liked to point out that increased competition and lower costs helped Europe's economy and consumers. ERP estimated that increased competition resulted in takeback cost savings in Europe of more than €200 million a year compared with 2005. "This cost avoidance has left more money in the consumer's pocket. As a result, environmental quality and economic performance are hand in hand and deliver sustainable services to European society," the company said in a 2009 report.⁵²

However, much of Europe's e-waste flow was not being well monitored. A large portion of e-waste was not being collected and handled by compliance organizations operating under the directive. ERP estimated that only 30 percent of the region's e-waste, often the part with no commercial value, flowed through CROs that were registered and recognized under the directive. The remaining 70 percent, which contained materials with value that could be recovered, was being sold by municipalities and retailers to recycling companies, scrap dealers and brokers who were not covered by WEEE Directive regulations and not recorded in the national e-waste registries.⁵³ This unmonitored e-waste potentially was going to landfills, being treated in an environmentally unsafe way, or was being illegally exported to developing countries.

FACING THE CHALLENGES

Fragmented Market

Despite its success in expanding across Europe, ERP still faced numerous hurdles several years after it began operations. The biggest challenge, perhaps, was that regulatory and business conditions varied greatly from country to country. So even though ERP was offering a pan-European service, a one-size-fits-all solution was impossible.

There were barriers to operating an e-waste business regionally. For example, several countries prohibited the transport of e-waste across national borders, preventing ERP from benefiting from Europe-wide efficiencies and competition. A truly open market would have allowed e-waste to be recycled in the most convenient and cost-effective location with the least environmental impact. That's why ERP advocated the creation of a single European certification for recycling companies, which would allow e-waste to be shipped to any certified recycler in Europe that would treat the waste in a legal and environmentally sound manner.

The rules for running a compliance scheme varied greatly across the continent, adding costs and inefficiencies. In every country where it operated, ERP faced different sets of regulations and requirements for permitting, financial obligations, pricing and other issues. In Spain alone, ERP needed 19 different permits to run a nationwide compliance scheme.

⁵² "A Better WEEE Directive to Support a Sustainable European Resource Management," op.cit., p.2 (July 15, 2009).

⁵³ "Ibid., p.5 (July 15, 2009).

In what Raiteri called a “nightmare,” each of the national e-waste registries had its own rules, definitions and reporting requirements for recording producers’ sales and e-waste collection figures. Belgium at one point had 106 categories for electronic and electrical products, while Germany had 29, Austria six, and the United Kingdom 13. This created enormous inefficiencies and administrative burdens on e-waste operators. ERP was a strong advocate of “harmonization” of WEEE registries so that they were linked to each other and used a single set of reporting requirements for European producers.

Overall, there were 27 different versions of the WEEE Directive in the 27 countries that made up the EU. The uneven implementation of the directive created major operational challenges for the ERP and other waste operators.

Raiteri believed that Europe had not yet developed a truly competitive and seamless e-waste market. He declared, “There is no real European waste market yet. We are definitely not reaping the whole benefit of being a European compliance scheme.”

IPR’s Elusiveness

Most important, ERP’s goal of achieving IPR across Europe remained more a vision than a reality. Only 13 countries had transposed the directive’s IPR requirement into national law by 2007. Even in countries where the IPR requirement for future waste was incorporated into law, ERP and other CROs were not actually practicing IPR since they were still largely dealing with historical waste (from products put on the market before August 13, 2005). The directive required only collective financial responsibility for historical waste.

Under a collective responsibility system, e-waste from all producers was collected and recycled, in effect, on one bill. This meant all producers were responsible for all brands. The costs would then typically be allocated to each producer according to its current market share of new product sales.⁵⁴ (Even ERP operated under this model, since it was handling historical waste in the absence of true national IPR systems.)

Under IPR, each producer would be financially responsible for e-waste only from its own brand. This would give the company a stronger incentive and reward for designing products that were more durable and used environmentally safer materials, according to IPR proponents.⁵⁵ In addition, IPR advocates such as ERP believed that a producer’s obligation should be determined by its share of actual e-waste returned, rather than its market share of sales. They believed that IPR based on return share was more fair, and more accurately reflected—and differentiated—the real costs of recycling a manufacturer’s products.

But there was a huge practical challenge to putting IPR in place—municipal waste would need to be identified by brand. To help develop such processes, ERP funded waste sampling studies in

⁵⁴ “Individual Producer Responsibility Q&A,” Greenpeace International, <http://www.greenpeace.org/international/campaigns/toxics/electronics/philips/individual-producer-responsibi> (July 29, 2009).

⁵⁵ Ibid.

Ireland, Portugal and several other European countries. It also monitored developments with waste-tracking technologies, such as Radio Frequency Identification (RFID). ERP's founding companies also established IPR Works, a group that lobbied for IPR. (As a pan-European organization, ERP had broad clout in lobbying for European and national legislation that would ensure IPR.)

Raiteri noted, "The discussion on IPR is actually a long way (from) being completed. Even in the countries where the IPR concept has been taken into account ... the way to do it and to practically make it happen is far from being identified." IPR, added Hieronymi, remained an "aspirational principle."

NEXT STEPS

In November 2007, ERP's board gathered at Electrolux offices in Senlis, north of Paris, for a day-long meeting to assess and decide whether ERP should enter new countries and get into new product categories. Customers were constantly requesting that ERP expand into batteries and packaging, so that they could have a single provider take care of a broad range of their recycling needs. In addition, ERP was eager to increase the volume of waste it handled so that its fixed costs could be spread over a larger base.

At the meeting, Raiteri presented a three-year plan for the business. This included the possibility of expanding operations into new countries. ERP considered three main criteria for entering a new country: whether it generated substantial volumes of e-waste, had high takeback prices, and political barriers to entry that were surmountable. Among the countries being considered: Denmark, Finland, Norway, Sweden, Holland, Greece, Switzerland, Romania and the Czech Republic.

The discussion turned to batteries. In some ways, battery recycling would be a natural extension of ERP's business, since batteries were often found in electronic and electrical products and since one of ERP's major shareholders was Gillette, owner of Duracell. In addition, the EU in 2006 had approved a new directive on batteries that would come into effect in August 2008, restricting certain chemicals and metals from batteries and requiring proper treatment and recycling.⁵⁶ Yet battery collection, often done in public venues such as supermarkets and post offices, was much more decentralized than collection of used equipment. In addition, battery recycling was done by a different set of recyclers than for devices and appliances.

The board considered packaging, which was in an entirely different realm from e-waste and batteries. With packaging, ERP would have to handle a wide range of materials, including glass, paper, wood and polystyrene. It also would have to deal with a different group of recyclers than for e-waste. What's more, in many European countries, packaging takeback was controlled by national, monopolistic organizations.

There was a strong argument for going ahead with these expansions. But Raiteri worried that getting into new product categories and new countries would require the company to become a

⁵⁶ "Questions and Answers on the Batteries Directive, 2006/66/EC," European Commission web site, April 2008, http://ec.europa.eu/environment/waste/batteries/pdf/questions_answers_directive.pdf (July 15, 2009).

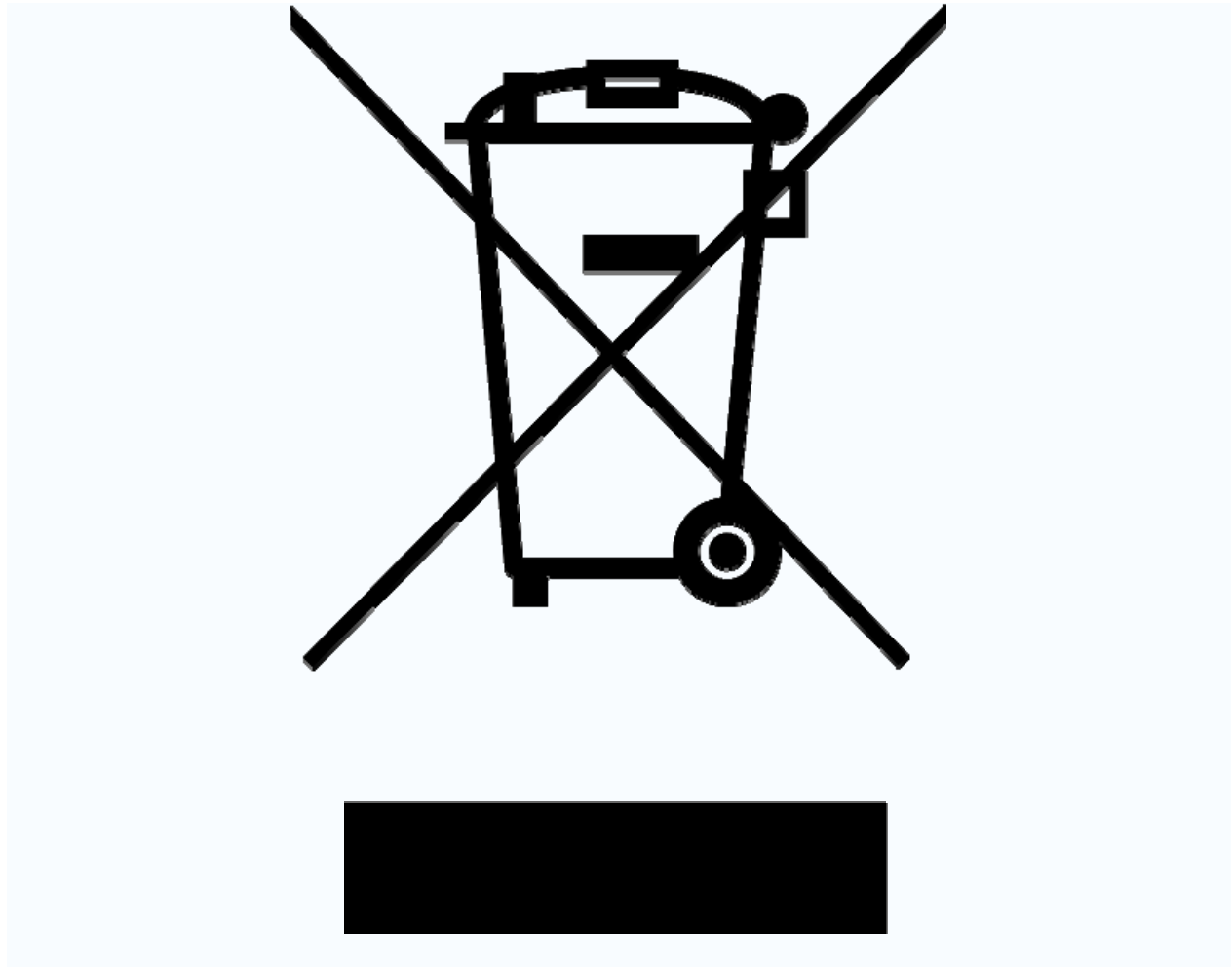
bigger, more complex organization. This might undermine ERP's longstanding focus on being a lean and low-cost provider. He later said, "The beauty of lean and quick could be lost if we expand too much."

In Act I of its existence, ERP had come far. It had been a pioneer in implementing the concept of producer responsibility for electronic waste. It had created a maverick business model that stimulated competition and helped change the monopolistic paradigm in European e-waste recycling. As the only e-waste compliance scheme to operate across national borders, it had become a major player in Europe's e-waste business. The question was: What would Act II be?

STUDY QUESTIONS:

1. What were the deficiencies of the national consortium model for recycling, such as the Green Dot system?
2. What were the driving values of the ERP model? In what ways did they address the deficiencies of the national consortium/Green Dot model?
3. Should ERP expand its scope?

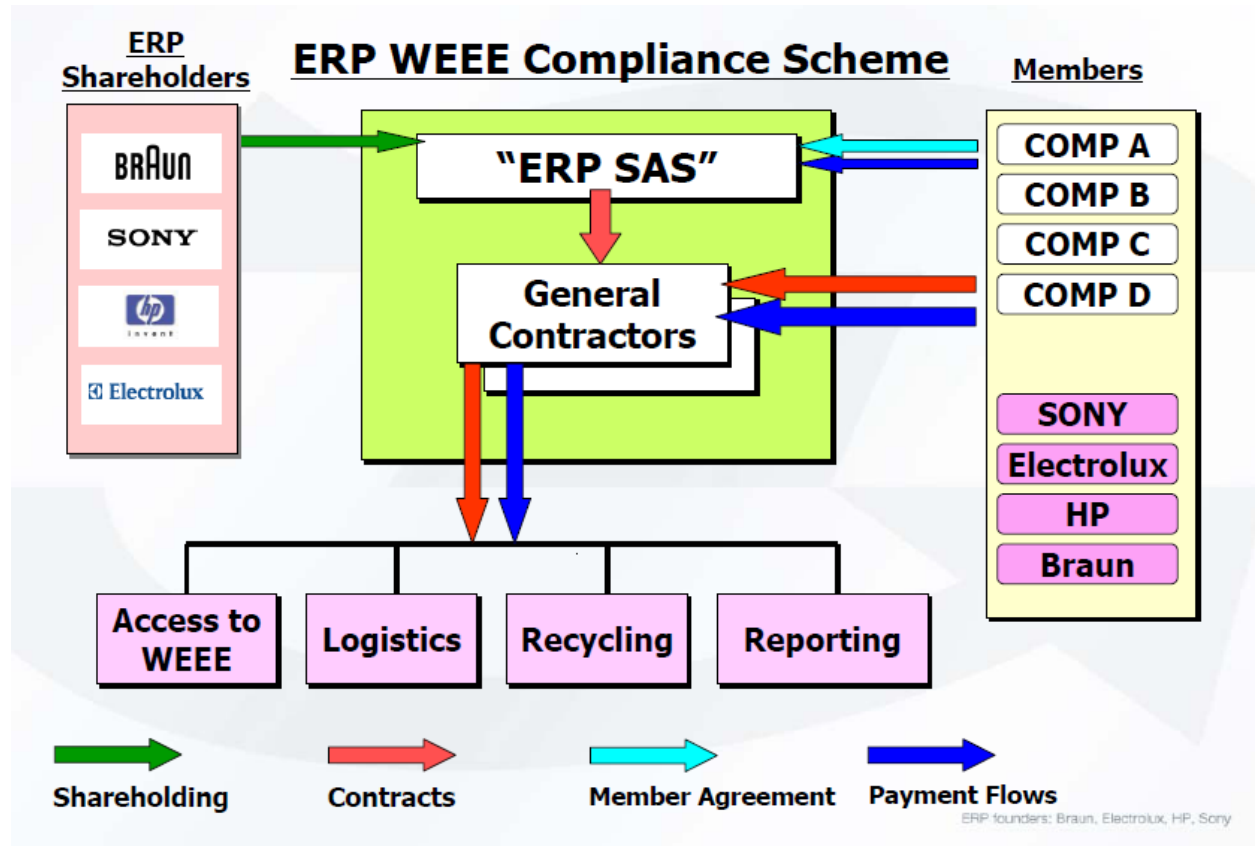
Exhibit 1
WEEE Directive Logo



Under the WEEE Directive, electronic and electrical products placed on the market after August 13, 2005 must carry the symbol of the crossed-out garbage can, or “wheelie bin,” signifying their separate collection as e-waste.

Source: Wikipedia.org

Exhibit 2 ERP Business Model



Source: Reprinted with permission of ERP.

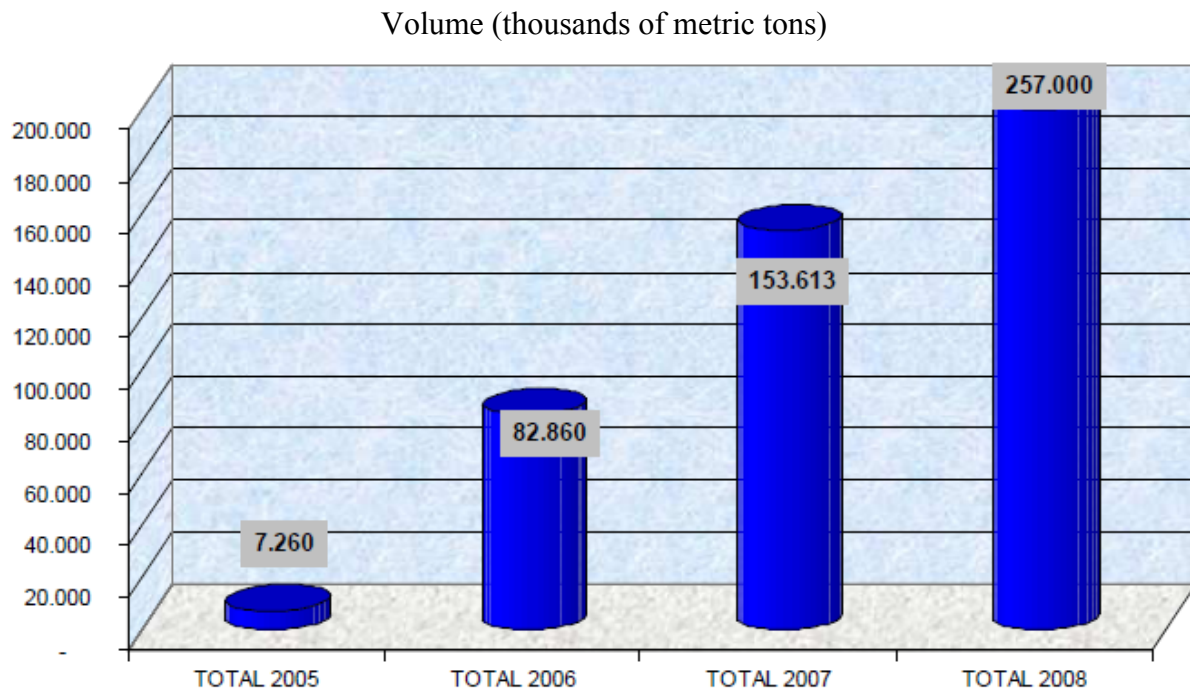
Exhibit 3 ERP Countries



ERP operated directly in 11 European countries (in gray) as of 2009.

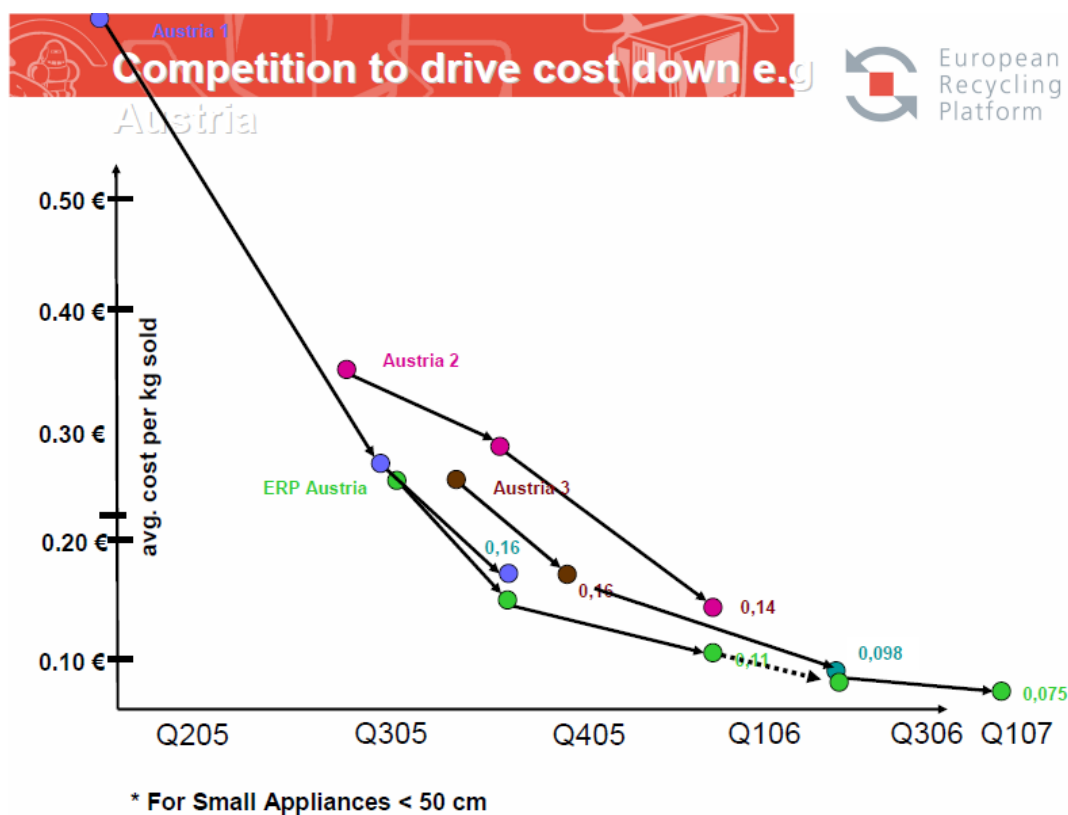
Source: Reprinted with permission of ERP.

Exhibit 4 ERP E-Waste Tonnage Collected



Source: Reprinted with permission of ERP.

Exhibit 5 Falling Recycling Prices



E-waste recycling prices fell sharply as competition increased under the WEEE Directive. In the second quarter of 2005, there was only one e-waste collection and recycling organization. After ERP and two other CROs started operating later that year, all four groups engaged in several rounds of price cutting. As a result, the cost to recycle e-waste from small appliances dropped by 90 percent, from about 70 euro cents per kilogram in the second quarter of 2005 to 7.5 euro cents in the first quarter of 2007.

Source: Reprinted with permission of ERP.