

Only high tech can generate raw materials.  
New prospects for old equipment.

> Electric and electronic equipment recycling

>





We are on the road for you day and night! All across Europe.

## Unlimited opportunities – Europe-wide take-back systems.

REMONDIS Electrorecycling: highly efficient, environmentally sound resource conservation processes, maximum security, best possible service.

The number of used electrical and electronic appliances discarded every year is enormous: In Germany alone their total weight comes to more than a million tonnes, while the total for all the relevant EU member states comes to around 5 million tonnes – including no less than 20 million refrigerators. There are very few large infrastructure service providers capable of recycling large volumes of waste electrical and electronic appliances and guaranteeing this service throughout Europe. REMONDIS is one such company.

# Perfect service, market-driven conditions. Make use of our advantages.

We provide you with individual and cost-effective services – adapted ideally to suit your needs as well as all legal and environmental requirements. Our processes are being assessed and optimized all the time. But read about it yourself. And if you feel something is missing, then ring us up!

REMONDIS Electrorecycling has been planning, building and operating WEEE processing plants since 1992.



We are a European company with cross-border solutions and services.

## **1** Europe-wide network

REMONDIS has a close network of branches and transfer points as well as logistics and dismantling centres. In those places where we do not have our own branches, we have capable cooperative partners who have been assessed by us. Your advantage: lower costs due to shorter transport routes and central contact people.

## **2** Logistic expertise

REMONDIS has an excellent knowledge of regional and long-haul logistics. Due to our close network of branches, we are able to make sure that the material flow is transported to the dismantling centres in the most effective way. We therefore also make use of the knowledge and competence of our sister company Rhenus Logistics.

## **3** Technical Expertise

As we have our own planning department, we are in a position to be able to offer you extensive specialist know-how in all areas of environmental services and so for dismantling centres, too. Our engineers are continuously optimizing our

plants, as the steady improvement to state-of-the-art technology is an important factor for long-term profitability.

## **4** Clean solutions

In the recycling of electrical and electronic equipment, waste materials that require special monitoring are a critical factor. Thanks to our long experience in the disposal of special waste (gained over several decades) you can rest assured of our expertise when it comes to handling problematical substances.

## **5** Thorough monitoring procedures

By using the information drawn up and documented by us, it is possible to follow every single stage of the recycling process without exception – such IT solutions have been used by REMONDIS for many years. Furthermore, we have the experience and IT expertise necessary to set up interfaces – for example to our customers', to the operators of take-back systems as well as to coordination and clearing offices, as like to the German 'Elektro-Altgeräte-Register'.

A point to remember: when you choose us, you are choosing the market leader – and so you are choosing a good name which suits you well.

## 6 Safe disposal and legal security

REMONDIS Electrorecycling stands for safety and security during all the collection, processing and recycling or disposal stages. These are the most important components of our safety system:

- Certification as a waste disposal contractor in accordance with § 52 KrW-/AbfG (German Recycling & Waste Management Law) and the waste disposal contractor regulations EfbV)
- Quality management in accordance with DIN EN ISO 9001
- Licensing of plants in accordance with the BImSchG (Federal Air Pollution Control Law) – Fourth regulation for implementing the BImSchG (4th BImSchV – regulation for plants requiring a licence)
- Satisfying the air purity criteria in accordance with the amended German Clean Air Regulation (TA-Luft)
- Documentation of all process steps
- Ongoing internal monitoring procedures by external assessors

## 7 Continuously looking forward

Even if we are only working together directly with the central European countries today, you can be sure that we will be able to provide you with solutions which suit you perfectly in the other countries in the future, too.

## 8 Continuously optimizing procedures

We attach great importance to cooperating as a partnership – also as this means we can constantly optimize our handling procedures. An advantage which we would like to pass on to you – as it is part of our joint competitive advantage!

### Last but not least: Expert advice!

Our engineers, technicians, sales managers and legal advisers have many years of experience as a result of implementing many pilot projects and take-back systems and developing plants. We would be very happy to use our knowledge to your advantage. Why not give us a challenge! Just one telephone call and then our experts will be there to help you!

## > The WEEE Directive

The stipulations of the EU Directive 2002/96/EG, better known as the WEEE Directive (Waste Electrical and Electronic Equipment), aim to achieve a more systematic collection and an environmentally sound recycling and recovery. From December 2006 onwards, a minimum of 4 kg WEEE must be collected and recycled per inhabitant per year. WEEE stands for Waste Electrical and Electronic Equipment.



REMONDIS collects WEEE in many European countries – in, amongst others, Belgium, Denmark, Germany, France, Greece, Great Britain, Ireland, Italy, The Netherlands, Austria, Poland, Portugal, Sweden, Spain, Czech Republic and Hungary.

### Economic services and systems

REMONDIS' comprehensive services and systems cover every aspect required to ensure that you are provided with a professional solution which is conform with all legal stipulations:

- Collection procedures and safe transport
- Documentation of take-over and weighing procedures
- Careful sorting of WEEE according to collection or recycling category
- Environmentally sound removal of hazardous substances and dismantling
- Automatic high-tech mechanical process state-of-the-art
- Professional material-flow and downstream management
- Thorough monitoring and reporting procedures

When drawing up our integral solutions, we give priority to achieving maximum economic efficiency for our customers combined with an easy-to-use service. We guarantee that central contact partners handle the work and that the separate, modular services are adapted to your individual requirements in the best possible way.



### All-round services

REMONDIS collects and recycles equipment from each of the product categories listed in the WEEE Directive:

1. Large household appliances –  
e.g. refrigerators, washing machines, oil radiators
2. Small household appliances –  
e.g. toasters, vacuum cleaners
3. IT and telecommunications equipment –  
e.g. computers, telephones
4. Consumer equipment – e.g. TVs, hi-fi systems

### > Services, Water, Raw Materials and Energy for Millions. The REMONDIS Group

Since its foundation in 1934, REMONDIS has developed into a leading international water and environmental service company – built on the solid foundations of a family-run business full of tradition. Today, REMONDIS is a global service partner and provides a wide range of service systems, high-quality raw materials, innovative products, alternative fuels and regenerative forms of energy all around the world. The Group employs approx. 18,500 people at about 480 locations in 19 European countries as well as in China, Japan, Taiwan and Australia.

5. Lighting equipment –  
e.g. fluorescent lamps, gas discharge lamps
6. Electric and electronic tools –  
e.g. drills, circular saws, rechargeable screwdrivers
7. Toys, leisure and sports equipment –  
e.g. electric trains, remote-controlled cars
8. Medical devices – e.g. dialysis equipment
9. Monitoring and control instruments – e.g. thermostats
10. Automatic dispensers, special equipment and disassembly objects – e.g. automatic ticket dispensers, switchboards from production plants

### Working flexibly with our clients

We are willing to accept your suggestions and wishes and realize different kinds of take-back systems depending on the legal requirements and tasks involved:

- Systems to collect waste from households or directly from industrial/commercial final consumers
- Systems to collect WEEE handed back to retail stores, municipalities and consolidation centres
- All kinds of take-back systems for individual manufacturers
- Collective take-back systems for several manufacturers
- Management of equipment taken back by producers themselves
- Automatic IT interfaces to customers' systems

No matter which country, no matter which kind of transport system – we have a suitable solution for you. REMONDIS has a strong performance network across Europe both in the field of B2C and B2B.

After removing the hazardous substances in an environmentally sound way, electrical and electronic equipment is a modern source of raw materials from which we gain high-quality materials which can then be used again in the production process without any problems.



## Material flow management that guarantees economic efficiency.

In Europe many companies are involved in the process of the implementation of the WEEE directive which makes a professional management of material flow essential. In addition to the possibility of supplying the material directly to the dismantling centres, REMONDIS has for example set up consolidation centres throughout Germany. So REMONDIS is also able to manage the way of material flow of remoted collection points for waste electric and electronic equipment most effectively.

### **Europe: WEEE recycling requires extensive network logistics. We are everywhere**

REMONDIS and its logistics partners take over the waste electrical and electronic equipment at the municipal collection points and consolidation centres and transport it to the dismantling centres. The equipment is collected within the contractual deadlines – a reliable and punctual service.

### **Germany: The EAR system expects the highest standards. We fulfil them**

As soon as a municipality reports that a container is full, it must be collected within 48 hours. REMONDIS has more than 6,000 company-owned trucks to carry out the work and also coordinates a wide network of independent haulage businesses.



REMONDIS has consolidation centres throughout Germany. These consolidation centres are a main part of our transport logistics and are used to secure continuous material flow into our dismantling centres. And only in our dismantling centres an environmentally suitable and legal recycling is guaranteed.

Order No.	Location	Status
100001	REMONDIS - Köln	Completed
100002	REMONDIS - Köln	In Progress
100003	REMONDIS - Köln	Completed
100004	REMONDIS - Köln	In Progress
100005	REMONDIS - Köln	Completed
100006	REMONDIS - Köln	In Progress
100007	REMONDIS - Köln	Completed
100008	REMONDIS - Köln	In Progress
100009	REMONDIS - Köln	Completed
100010	REMONDIS - Köln	In Progress
100011	REMONDIS - Köln	Completed
100012	REMONDIS - Köln	In Progress
100013	REMONDIS - Köln	Completed
100014	REMONDIS - Köln	In Progress
100015	REMONDIS - Köln	Completed
100016	REMONDIS - Köln	In Progress
100017	REMONDIS - Köln	Completed
100018	REMONDIS - Köln	In Progress
100019	REMONDIS - Köln	Completed
100020	REMONDIS - Köln	In Progress

The REMONDIS IT interface guarantees that all EAR orders are carried out quickly and efficiently.

**Well thought-out IT solutions make things a lot easier. We have them**

Our IT experts have developed an internal company interface programme which automatically passes on each EAR message to the transport business responsible for the area in question. This is either the REMONDIS branch closest to the container or a forwarding business with whom we work together. The main advantages of our system are:

- Efficiency: it takes only a few seconds for the EAR message to be received, fully automatically, by the transport business in charge – incl. the intermediate registration in IT-system
- Reliability: human error can be ruled out as there are no manual processing stages

## Dismantling centres setting technological standards.

Only groups with the necessary funds to finance the required technology and quality of service are able to guarantee that the waste materials are disposed of safely in accordance with legal regulations. REMONDIS has the necessary capital to be able to continually invest in modern technology. And so we are in a position to be able to operate logistics and dismantling centres where they are needed. Now and in the future – throughout Europe.

The WEEE Directive sets high standards for the processing and recycling technology. REMONDIS is well prepared: our technology easily fulfils the stipulated recycling rates – even when it comes to small appliances, we are well above the set targets.

### Modern plant technology

REMONDIS currently operates five dismantling centres in Germany with a wide range of processing facilities for different kinds of WEEE:

#### 1 Dismantling televisions and monitors with automatic CRT separation facilities

REMONDIS operates disassembly lines which completely dismantle televisions and monitors. Following this, the end panel glass and the funnel glass is separated from one another in an automatic separating machine.

Output: cleaned panel glass, funnel glass, various metals, plastics, timber, circuit boards, fluores-cent coating.

#### 2 High performance facilities to process fridges and freezers

The first step in processing cooling and freezing appliances is to extract the mixture of oil and refrigerant gases (CFCs, HCFCs, HFCs, ammonia, HCs). The equipment is then dismantled:

- Removal of compressors and cooling circuits
- Mechanical processing of the cabinets
- Separation of the materials and components

Output: various metals (FE, NE, etc.), plastics (PS, etc.), oil, refrigerants, hg-switches, PUR foam (expanding agents removed), refrigerants and expanding agents (all separated according to type!).

#### 3 Automatic processing facilities for small household appliances, IT and telecommunications equipment, consumer electronics

Once the hazardous substances have been removed in an environmentally sound manner and the initial disassembly stage has been completed, the small household appliances are then placed on a sorting belt. There the remaining harmful substances are removed by hand as well as certain recyclable materials. Following this, the appliances are shredded further and undergo various separation and sorting stages, one of which includes the automatic recognition and separation of circuit boards. The processing methods we use are particularly environmentally friendly as the technology used is purely mechanical – the materials undergo no chemical changes, auxiliary materials are not used, wastewater is not produced and neither combustion or residual materials are generated! Output: various metals (FE, CU, etc. ), capacitors, batteries, plastics (ABS, PS, PP, etc.), printed circuit boards, fine residual materials.



CRT separation unit



Cooling and freezing appliances treatment plant



Up to 100,000 tonnes of WEEE can be processed each year at the dismantling centre in Lünen – the largest and most modern of its kind in Europe. REMONDIS has invested 17 million euros in this plant alone and created 110 new jobs. The large indoor area (5,500m<sup>2</sup>) and the facilities can be extended at any time.

**4** Processing facilities for gas discharge lamps

Once the lamps have been sorted according to length and special shapes, the caps are removed. The glass is then shredded and the mercury separated. All fractions are separated strictly according to the type and almost 100% can be fed back into the economic cycle.

Output: metal, glass, mercury.

**Removing hazardous substances in an environmentally sound manner in accordance with legal regulations**

The central aim of all the different kinds of processing technology is to first remove any hazardous substances in a safe manner and then to recover high-quality raw materials, as required by law and because we owe this to our future generation.

**Full recycling:**

Our full-service solutions ensure that all WEEE materials are recycled without exception.



Processing small household appliances



Processing gas discharge lamps

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