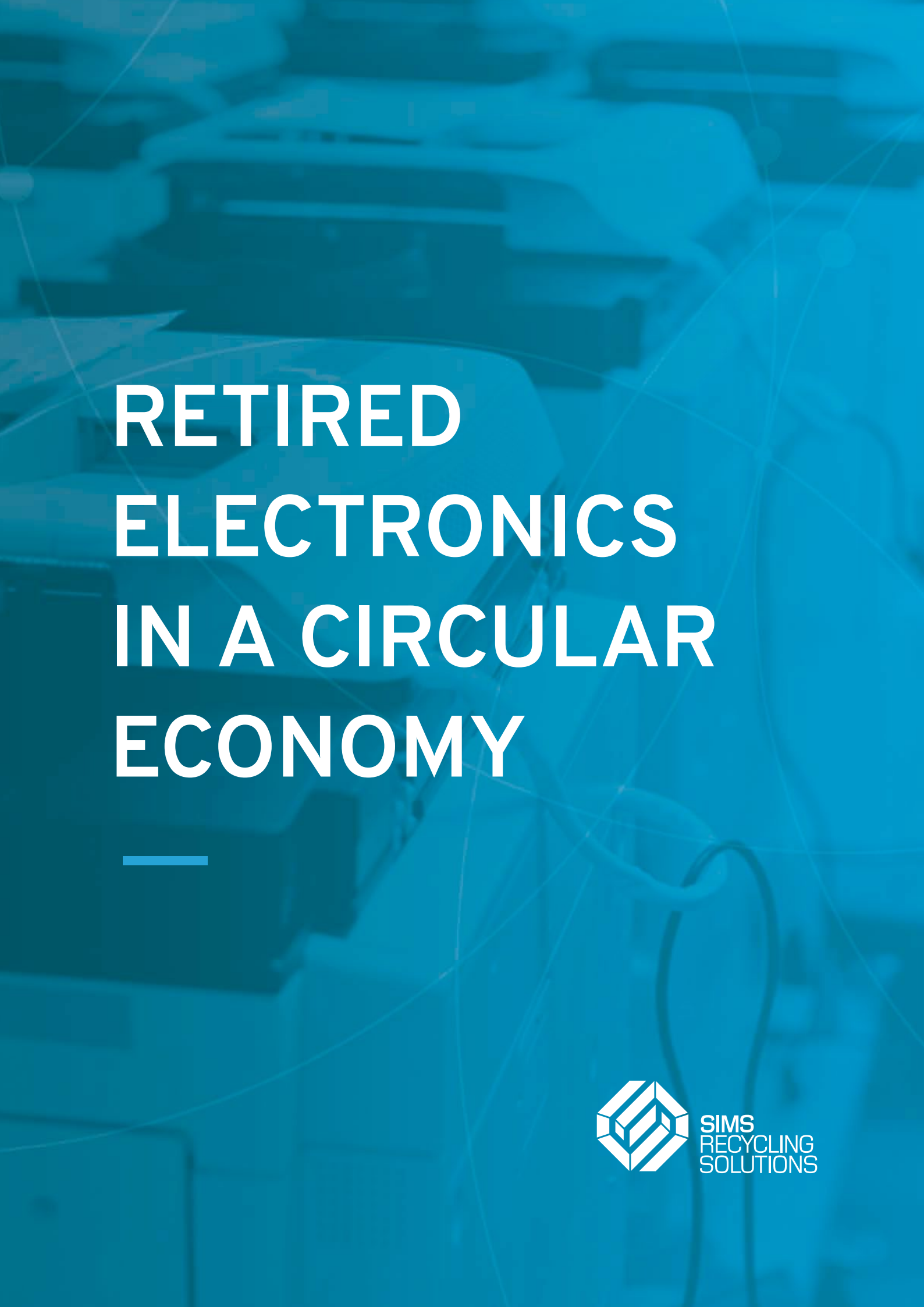


RETIRED ELECTRONICS IN A CIRCULAR ECONOMY

SIMS RECYCLING SOLUTIONS

From a linear economy to a circular economy: an introduction

In the traditional ‘linear’ economy, products are created using raw materials and then distributed and sold to end-users, which could be consumers and companies. After their lifecycle, products are disposed of as waste, either in a landfill or at an incineration site. Traditionally, this ‘waste’ also includes electronic and electrical office products such as computers, printers, laptops and phones, as well as household equipment such as vacuum cleaners and electrical toys. In this traditional ‘linear’ economy, all materials with potential value are permanently lost.

Thankfully, we are making a gradual shift towards a circular economy, in which materials such as metals, plastics, glass, and paper are reused. To ensure availability of sufficient raw materials to meet growing demand, prevent loss of materials, and avoid environmental hazards, our economy needs to become circular. In a circular economy, raw materials can be obtained by sustainable recycling, that doesn’t harm the environment and protects valuable resources. Production processes should shift towards ‘design for reuse’. Once this approach is adopted, the product lifecycle can be prolonged and more efficient recycling processes can be introduced. In this way, it becomes possible to recover even more resources from real end-of-life products (desktop PCs, laptops, printers, phones, complete data center inventories) and other appliances.

This approach is especially relevant to IT and electronics. More electronic devices are in use than ever, and generations of equipment rapidly follow each other. Worldwide, it is estimated some 50 million tons of electronic waste - or ‘E-Waste’ - were produced in 2018, but just 20% of this is formally recycled. The remainder is generally incinerated, dumped or ends up in a non-regulated informal circuit, with all associated health, safety and environmental hazards. However, almost all E-waste can be recycled or reused.

A joint report from the World Economic Forum, World Business Council for Sustainable Development, United Nations Environment Programme, International Telecommunication Union, International Labour Organization and other E-waste Coalition members urgently calls for a new circular vision for the sector.

A linear economy

What is the circular economy?

In a circular economy, the focus is on the use rather than possession of products. As a result, attention is paid to restoration, use of renewable energy, and elimination of toxic chemicals and waste. Circular models avoid depletion of finite raw material resources, of which electronic devices use a significant share.

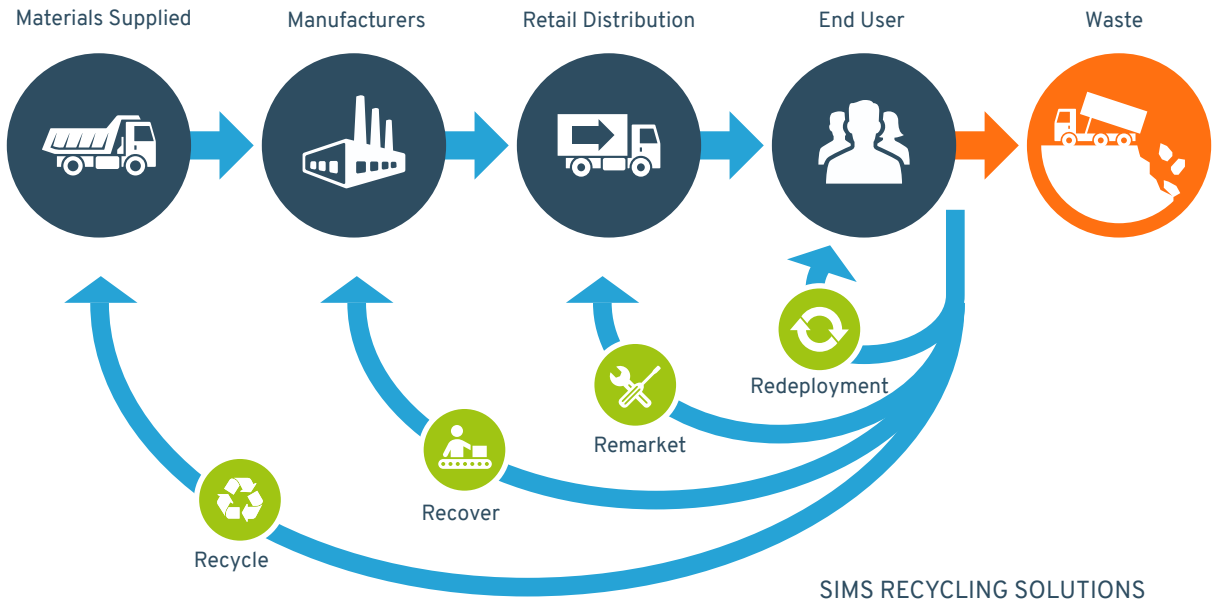
To make things clearer, we can divide the circular economy concept into several areas of interest:

- The business model: The ultimate circular business model targets 'Products as a Service'
- Product design: 'Products are designed and assembled for multiple lifecycles compared to products developed on the basis of a 'use and dispose' model.
- End–of–life: Products in a circular economy are created with a prolonged lifecycle in mind, and are to be reused as often as possible, before finally discarded and recycled. Ease of reuse and recycling is designed into the products.

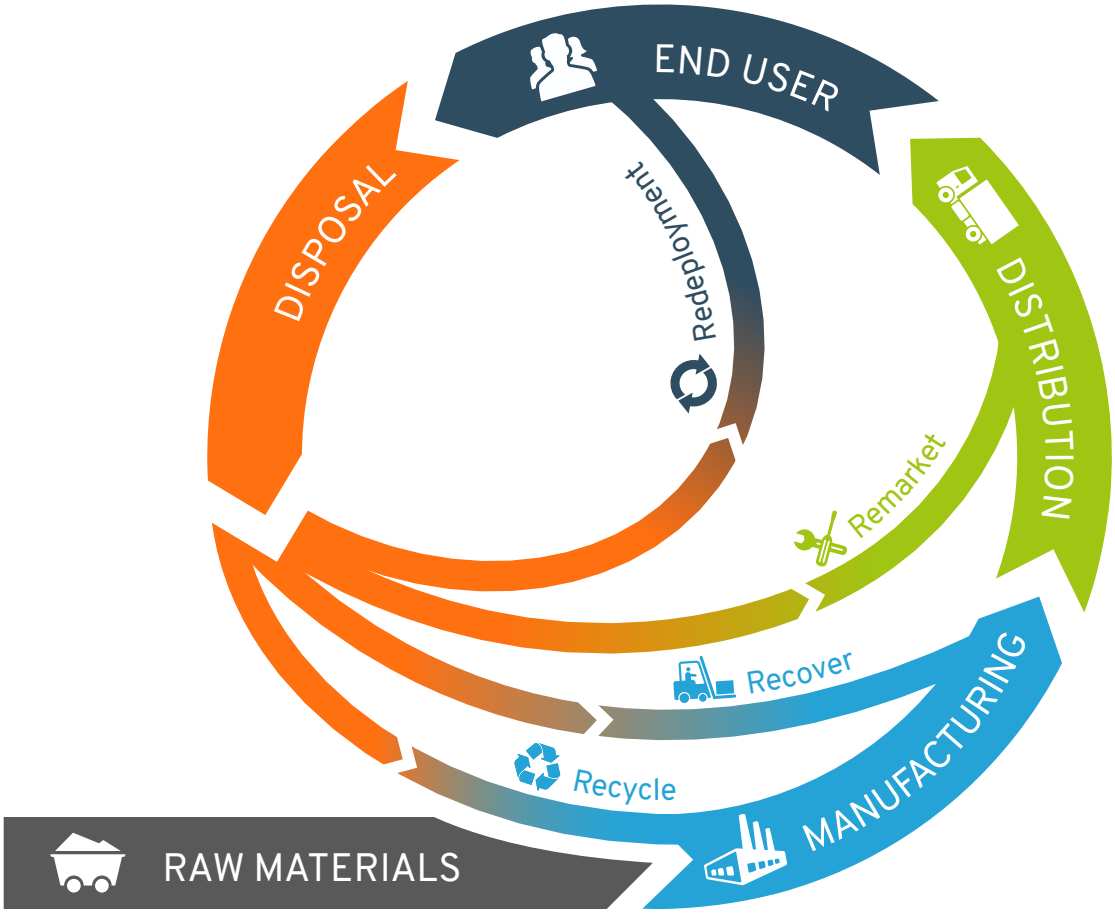
Although 'linear economy' products already on the market can no longer be altered to match these design criteria, there are possibilities for obtaining maximum value from these existing products by clever recovery and recycling.

This white paper focuses on currently available end-of-life possibilities, and aims to retain the greatest possible value of products, parts and materials. Extending the life of todays electronic products, and reusing components, already makes a positive contribution towards a circular economy.

Towards a circular concept



Retired Electronics Value Recovery steps



When a new device model or technology standard is introduced, or when a business scales down or refocuses its activities, large volumes of IT-products might be replaced or become obsolete. Often, there are opportunities for prolonging product or component lifecycles of retired ICT equipment, as well as reuse of recovered raw materials resources. This is where Circular Economy thinking comes in: extending the product lifecycle and professional resource recovery of products means less environmental impact from mining, production and transportation.

Please note: it is important all the options and services described below are carried out in accordance with the strictest security, safety and environmental certification in order to ensure compliance with local legislation and regulations.

Basically, four options exist along the value chain: Redeployment, Remarketing, Recover and Recycle. Each step has it own specific characteristics and contributes to the circular economy and value chain in its own way.

REDEPLOYMENT

Redeployment of previously retired products in your own organization is the most cost-effective way of reusing ICT equipment. Electronics which are (temporarily) not serving their intended purpose are collected, data-wiped, cleaned, have their software updated, and are tested, so they can be redeployed in a more suitable capacity in your organization. No new equipment is required, saving on investments and environmental impact.

REMARKETING

If IT products can't be reused in-house, they can be matched to an external party's requirements. Products are cleaned, refurbished, repaired or modified if necessary, worn or defective parts may be replaced and software updated and prepared for reuse, possibly in a different market or region. For example, computers, laptops and phones are generally replaced every three years, but can be reused in their entirety in other settings or regions. For the original owner, the economic value is largely retained. This benefits the environment: the usage of raw materials and energy for production of new products declines as the lifecycle of existing products is prolonged. Fully refurbishing and reusing IT equipment is a way to reduce environmental impact, and retain value.

RECOVER

If a product is not reusable in its entirety, parts and components may be reused or redistributed for a second or even third lifecycle. Key components such as casings or racks can be updated with modern electronics, making them available for a new lifecycle without any loss of functionality. Hard disks (HDD / SSD), CPUs, graphics cards and many other types of component can be removed, data erased, tested, and provided a second lifecycle after being sent back into the distribution stage. Certified software rewrites hard disks until data is irretrievable. If equipment is returned in Point of Sale packaging, items that can be reused unmodified, such as connection cables and power leads, can directly be returned into the market.

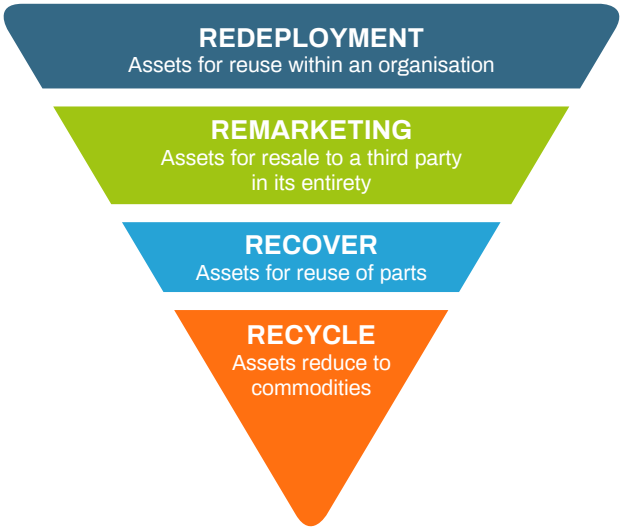
This retains a large part of the value of a product for the original owner and also has a positive impact on the environment as the lifecycle of components is prolonged and thus production of these declines. Similar to Redeployment and Remarketing environmental impact is minimized, as is the demand for new devices, new devices put pressure on the environment, related to materials, energy consumption during manufacturing and CO2 emissions.

RECYCLE

If used and new products, components, parts or complete systems can't be reused or are no longer allowed on a certain market, recovering and then recycling the materials they are made from is the next step. Products and appliances are shredded and materials are separated, such as different types of plastics (ABS, PE, PP, etc...), batteries, and metals (such as steel, aluminum, copper, gold, silver, palladium) are recovered. These materials are placed back in the raw materials production chain and reworked into new materials that the OEM industry can use to produce new products – a form of Urban Mining. Returning recycled metals to the ore stream to create new metals is a far more energy efficient process than using virgin mined ores and limits the mining and preparing of new ore. Recycling aluminum, for example, means 90% lower CO2 emissions than creating aluminum from ores.

An interesting fact concerning plastics: these can be returned to an OEM plastics compounder who can, in return, deliver separated granulates back to the electronics manufacture for reuse in new products and in this way a closed loop is created! The equipment owner can rest assured their obsolete electronics are disposed of in an environmentally sound manner, compliant with all relevant legislation, guidelines and Corporate Social Responsibility (CSR) goals. Advanced processing techniques and expertise means materials can be recovered to an extremely high degree with minimal environmental impact, limiting the need for new materials and mining activities.

The 'waste hierarchy' described in the steps above is a key component of EU waste strategy. The higher the level achieved within this waste hierarchy, the greater the contribution to sustainable waste management, retrieved value and a circular economy.



Did you know?

Did you know one ton of Printed Circuit Boards contains 40x more gold - which can be reused infinitely - than one ton of ore?

Recycling Electronics

Reuse reduces environmental impact by extending product lifetimes, which slows down the growth of Waste Electrical and Electronic Equipment (WEEE). However, sometimes reuse is not an option.

Electronics Recycling extracts value from obsolete products and E-waste by recovering resources and using this as a source of materials for creating new products. This means less virgin mined raw material is needed which benefits our environment and battles climate change.

Consumers can often dispose their obsolete electronics at the outlet where they shop for new products.

Most businesses are not aware exactly what happens to their retired and obsolete IT and communication equipment.

Ask yourself these three questions:

- Have I checked the different reuse opportunities?
- Is any remaining data erased correctly?
- Does my current e-waste solution guarantee my retired office equipment is recycled responsibly and doesn't end up on a landfill?

Responsable reuse and recycling make sure you retain as much value as possible.

As a business owner and OEM, corporate responsibility is becoming increasingly important to your brand equity, as consumers and end-users are looking into your performance in these areas when purchasing new products. Sustainable Electronics Recycling can be part of your sustainability program. It is important to rely on a certified reuse and recycling company - to retrieve as much value as possible from retired and obsolete electronics, and to help you doing the "responsible" thing.

This means value for business, your brand and for the environment.

In conclusion...

In a Circular Economy, reuse and recycling of retired electronics is important. Systems, products and components continue to offer value, either through (partial) reuse, or as a source of raw materials. Furthermore, this approach minimizes environmental impact and reduces depletion of raw materials.

Market research shows that many companies are not aware of these benefits, and are also often insufficiently informed of the risks of not correctly recycling and reusing retired electronics. Data could end up in the wrong hands, for example, if devices are not processed by a certified supplier. What's more, there is a real risk of damage to your brand and image, for example if illegally processed devices are found, or processing is done in a way that damages the environment.

The rapid growth of the number of ICT products in use today and fast technological developments mean that electrical and electronic equipment (EEE) is one of the fastest growing waste streams. Retired electronics should be processed by an expert partner, using best-in-class techniques and technologies that ensure compliance with local and international legislation. It is also essential that recognized certification is supplied following the reuse of recycling processes.

The Sims Recycling Solutions approach to retired electronics

Sims Recycling Solutions (SRS) is committed to circular economy initiatives. We help extract maximum value from electronics and IT assets, ensuring they can be used effectively for as long as possible, and recover and regenerate products and materials at the end of their useful life.

SRS is one of the world's largest suppliers of reuse and e-recycling services for electrical and electronic end-of life products. We offer a complete, fully certified solution at local, national and global scale. Our service portfolio focuses on creating the greatest possible value through the 'reverse supply chain', thereby maximizing the level of service. Our integrated approach to e-waste recycling and IT Asset Disposition (ITAD) programs supports corporate compliance programs, data security mandates, financial return on assets and environmental best practices. A worldwide network of certified processing facilities reinforces our sustainable business model, and closed loop approach.

Clients working with SRS can entrust all aspects of the process to a single party. We have knowledge of materials, collection, transport, dismantling sorting and recycling as well as redeployment with a dedicated focus on ICT equipment. We can collect and securely transport complete racks and equipment from data centers and provide secure, sealed and certified transport. Packaging materials are processed separately and recycled wherever possible. Anything that can't be reused is disposed of responsibly. We can capture and report back on serial numbers and asset tracking, and provide detailed reporting on everything from volumes, material mass balance, and CO2 reduction levels.

Our solutions are truly global. We are established in countries around the world, and always have knowledge of local legislation as well as R2 or Weeelabex/Cenelec certification. Where necessary, we work with local partners to ensure we are always compliant. Through our Global Customer Internet Portals we can coordinate projects and reporting across regions and time zones. We keep recycling inside each country to the greatest possible extent. Key sites are ideally positioned in strategic countries and wherever we do not have our own site we partner with fully vetted and audited subcontractors. Our internal auditors are closely involved in subcontractor selection and we also work with external auditors.

SIMS can offer a complete, integrated range of services, for reuse of systems, products and components, but also for materials recovery and recycling. We also ensure obsolete products and E-Waste is disposed of in a proper, safe, secure and environmentally sound manner. Your data and products will not end up in the wrong hands We help you to sustainably recycle and reuse electronics as part of your sustainability program.

SRS: one single dedicated supplier for your electronics reuse, asset recovery and recycling efforts

- One coordinated Global Delivery Structure
- Standardized processes (SOW)
- Simplified account management and financial management
- Defined service capabilities
- Centralized vendor management and auditing
- Financial capabilities and stability
- Dedicated Health and Safety teams
- Worldwide vetted sub-contractor network covering all continents
- Local in-country teams dedicated to in-country services.
- Helps ensure CSR compliance
- Less energy consumed than single use and landfill
- Less CO2 output than single use and landfill
- Less raw material usage than single use and landfill
- Less impact on the environment
- More value

Qualitiy & Environment

ISO 9001 ISO 14001

Recycling & Processes

weeelabex R2 2013

Security & Data destruction

ISO 27001 HMG IA NO.5

Other certificates

Microsoft REGISTERED Refurbisher TAIA CHWMEG

Health & Safety

OHSAS 18001

Reuse

AS/NZS 4801

In 2018, Sims also joined the World Business Council for Sustainable Development.

Sims Recycling Services: making sustainable electronics recycling easy

Would you like to find out more about how our solutions can support your specific situation, or discuss your challenges or requirements? Get in touch today!

SIMS RECYCLING SOLUTIONS

www.SimsRecycling.com

All information in this document is based on SIMS own knowledge and a selection of third party studies and industry reports.