

# THE STORY OF eReuse

ZERO WASTE CONSUMPTION & PRODUCTION

## # 3

Imagine expanding the life of electronic devices while incorporating blockchain traceability technology capable of creating 1 job for every 300 items reused. Now imagine ensuring a 95% recycling rate and transforming a cost for municipalities into revenue that stays in the community.

This is not imagination, this is eReuse: a perfect example of how symbiosis between the digital agenda and waste management can create value, sustainability and jobs.

Did you know that repairing and reusing generates 20 times more value than recycling?

The eReuse project creates value from refurbishing, upcycling, reusing and tracking electronic goods. It uses an innovative traceability system that prolongs computer life, creates local jobs, gives people and organisations access to high-functioning electronics at lower prices, and guarantees recycling.

#### HOW DID IT ALL START?

It all started with a question: "what if we opt for reuse rather than premature recycling?". In 2014 the Government of Catalonia planned to discard 30,000 computer devices each year until 2019. However, 92% of these devices were functional and 87% had the potential to be reused locally by social groups, schools and digitally excluded people. The government thus decided to involve

all of the active reuse centres in refurbishing, channeling and tracking these devices. This was their ask to a research group at the Universitat Politècnica de Catalunya, and - several months later - eReuse.org was launched. Today the programme is active in 10 cities, eight countries and growing, with 10,000 reused devices held until final recycling and 5,000 devices entering the networks each year.

#### WHAT IS EREUSE.ORG

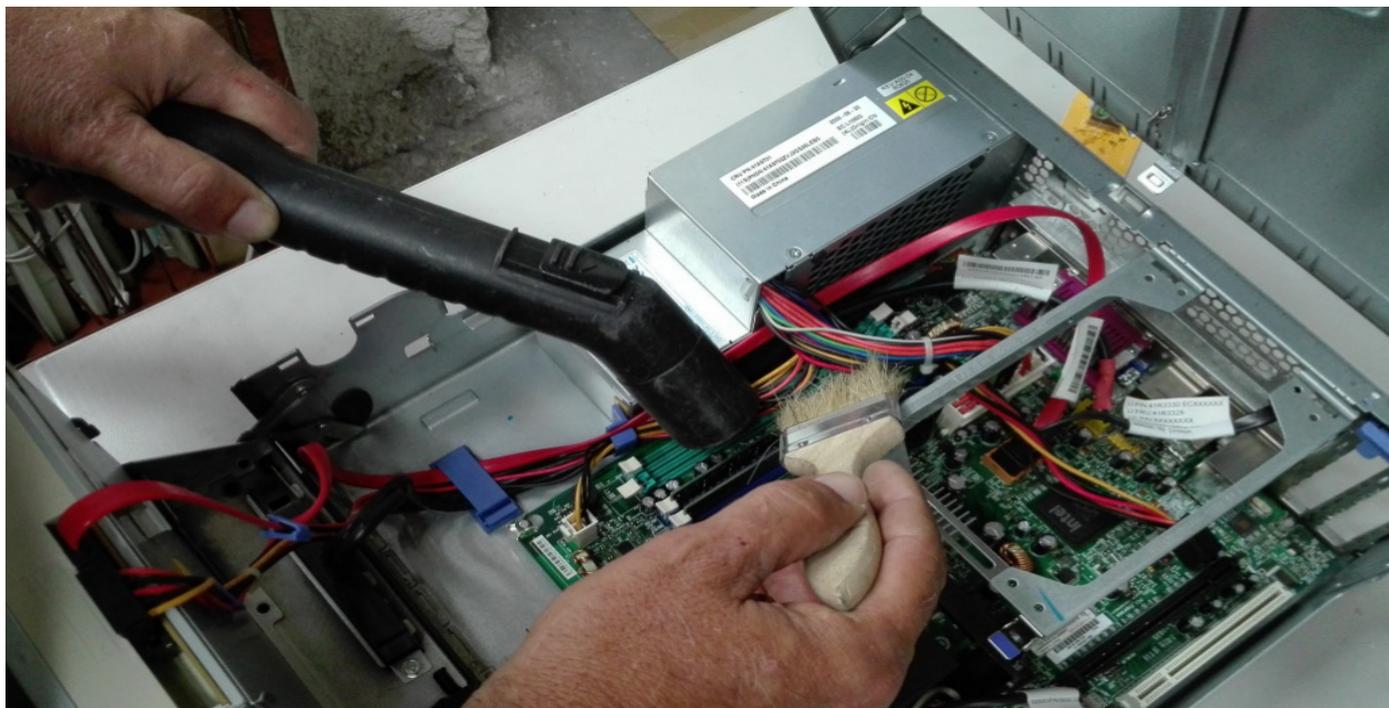
The mission of eReuse - Electronic Reuse - is to avoid the premature recycling of digital devices, practising reuse while ensuring a chain of custody and final recycling. The project is hosted under Pangea.org, a private, independent non-profit organisation founded in 1993 to promote the strategic use of ICT (Information and Communication Technologies). Its members are

local groups, businesses and organisations with the common goal of extending products' lifetimes through repair, refurbish, and reuse.

eReuse's partners are international groups promoting social awareness about the social and environmental impacts of electronics, social labour, zero waste, circular economy, fair electronics, the right to repair, the reduction of the digital divide and social inclusion.

#### WHY IS THE REUSE OF ELECTRONICS IMPORTANT?

The increase in e-waste volumes (equivalent of 4,500 Eiffel towers in 2016 alone) will not be mitigated by recycling alone. The concept and drive to recycle comes from our current linear economy and, even if applied at 100%, would reduce the carbon footprint by only 1.6%. The amount of obsolete electronic equipment is further increased by



relatively short replacement cycles. Since technology changes quickly, many users regularly replace their mobile phones and tablets, for example, often before the devices break.

This, together with other factors, generated a volume of 44.7 million metric tonnes (Mt) of e-waste in 2016. Only 20% (8.9 Mt) of waste is documented as collected, meaning that the fate of 76% (34.1 Mt) of e-waste is unknown, likely dumped, traded, or recycled under unknown conditions.

Dumping into landfills leads to toxics leaking into the environment, and burning causes harmful emissions. These disposal scenarios exist in both developed and developing countries and they represent a loss of value, secondary raw materials and natural capital.

Today, most devices from businesses and public administrations are discarded once they are considered depreciated and, although they retain a value for use and are indeed perfectly suited to reuse, they are nevertheless scrapped (recycled) or illegally exported to other countries via

informal reuse circuits.

**Our challenge is the implementation of a circular economy: to extend the lifetimes of electronic/digital devices as far as possible by repairing, updating, and reusing them.**

Although public authorities and some private organisations are willing to promote reuse, they face two key challenges in that the devices lack proper traceability and customers may not want to buy reusable or reused products. This creates a situation where used electronic devices are illegally exported and potentially pollute the environment. This project aims to provide **the traceability and incentives necessary to ensure safe and guaranteed reuse.**

#### **HOW DOES REUSE FEED INTO A ZERO WASTE CIRCULAR ECONOMY?**

The benefits of reuse are recognised by the European waste hierarchy, which places reuse above recycling and the zero waste hierarchy. It contributes to developing a zero waste circular economy, creates local employment, keeps money in the community, prevents the

generation of waste and reduces the digital divide.

#### **WHY DOES REUSE OF ELECTRONIC GOODS STILL LAG BEHIND IN EUROPE?**

The reuse of electronic devices such as desktops, laptops or mobile phones is applied to devices that are no longer in use (disposal) and will be recycled if they are not prepared for reuse (repaired, upgraded) and redistributed to other users.

In general when companies, governments or individuals want to give a second life to their digital devices, they lack information on where to go. Online secondhand platforms typically do not provide any guarantee that what is traded or donated will end up being recycled at the end of its life.

A device or component is reusable for as long as it has use value for someone. If the device use value is high enough, it means that a potential user exists for that device as it is. Thus, only a basic refurbishing process, such as erasing data or restoring the operating system, is required (see citizen reuse loop in the figure below).



Conversely, a low use value can be increased through several actions, called 'preparation for reuse' (see professional reuse loop in the figure below) :

- 1) Repair a component.
- 2) Replace a damaged component that cannot be repaired, i.e. change the battery.
- 3) Upgrade it with a new or used component with higher performance (i.e. replace a disk drive with SSD storage).

**In a circular economy, reuse is the result of performing all viable reuse processes (citizen and professional loops) until the device's use value is exhausted.**

At the end of the cycle the device is recycled to recover raw materials and manufacture new components.

It should be ensured that after multiple reuse cycles the device ends up being recycled (**traceability**)

and that at the time of recycling all of the components have low use value (**auditing**). The traceability of the reuse process ensures that the device will be recycled when no further reuse is possible. It therefore acts as an audit to ensure that there is no premature recycling, that society doesn't waste value from the computational resources in circulation (already manufactured) and that resources are used efficiently (minerals, work, pollution capacity, etc).

**WHAT IS AN EREUSE PLATFORM?**

An eReuse platform is a set of open-source web tools to support efficient reuse, certify the stakeholders involved and the circularity of the process, and share chain of custody information. In practice, an eReuse platform provides donors with a guarantee that their devices will be reused and finally recycled, avoiding illegal trade and reducing environmental impact.

**HOW DO EREUSE STAKEHOLDERS COLLABORATE?**

The collaborative platform emerges when the local reuse centres cooperate and complement one another (cost-oriented, not profit-oriented). There are two platform levels. The first involves only reuse centers, each of which has its own platform. The second level (collaborative) is where an entity focused on zero waste or/and the digital divide creates a collective platform. In Barcelona, for example, there are three circuits where 20+ reuse centres collaborate.



There are four main stakeholders:

- i) Public administrations interested in donating to the circuit.
- ii) Reuse centres and professionals interested in added value services to distribute, refurbish, repair, retail, enhance or recycle secondhand devices.
- iii) Customers (i.e. end users) interested in using environmentally friendly or more cost-effective reused devices.
- iv) Zero waste entities and organisations focusing on the current digital divide in society. They manage the circuits and assign devices to reuse centres and retailers.

#### HOW DOES IT WORK?

The devices typically enter a circuit through one of three channels:

- 1) Collective procurement of new or used products.

2) Charitable donation from public administrations and companies, e.g. a city council seeking to feed the local social economy and reuse surpluses for target groups in vulnerable situations.

3) Exchange with other members of the circuit with stocks that cannot be processed internally.

#### EREUSE BENEFITS FOR CITY COUNCILS

**Public administrations and local circular economy entities have formal, scalable and sustainable reuse circuits offering traceability and guaranteeing proper recycling.** City councils donate depreciated devices to citizens and organisations, thereby creating local jobs, improving efficiency and enlarging trade volumes in the markets of secondhand computers and mobiles. This has the added benefit of all of the

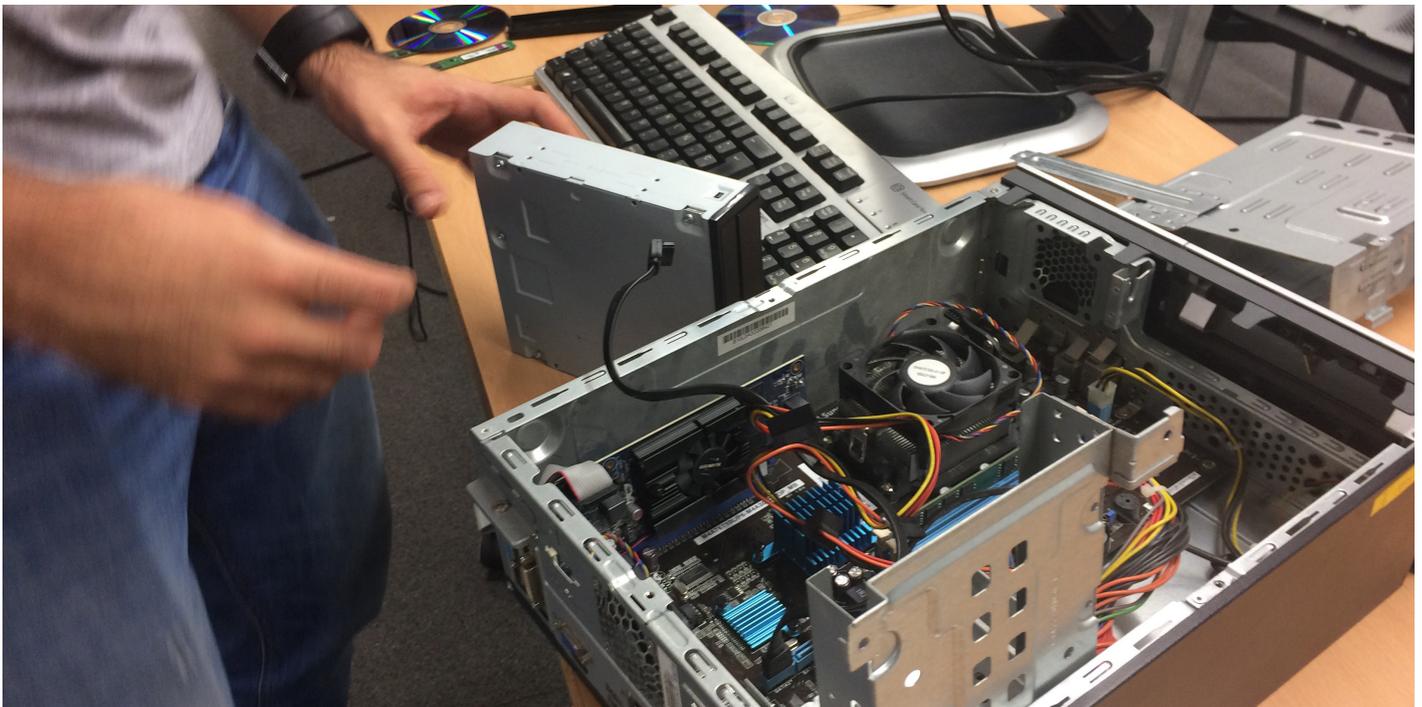
positive externalities in terms of job creation and the economy in the refurbishment, support and recycling sectors.

These services were initially supplied by volunteers but became stable local jobs once the circuits grew and income began to be generated from sale of the devices.

**Approximately one new job is created for every 300 reused items sold.**

#### EREUSE BENEFITS FOR CUSTOMERS

The customers of eReuse circuits are citizens that choose secondhand devices for environmental or economic reasons, and organisations such as schools, social enterprises, environment or budget-conscious public or private entities.



Citizens can access devices at a lower economic and environmental cost and they also benefit from the creation of local jobs. Electronic devices registered in a local circuit are traceable through blockchain\* technology. This preserves users' privacy while also ensure proper recycling ultimately. Citizens can purchase secondhand devices (in person or via e-commerce) with reliable origins, with a wide range of service providers to assist in maintenance, repair, improvement, repurchase (buy-back) or take-back services.

In every city in which eReuse operates, the system is run by local organisations (social enterprises) and city authorities, which are now considering (or trying) the use of IoT (Internet of Things) eReuse tools and services. The circuit coordinators are: Itopie in Carouge, Reciclanet in Bilbao, NodoTau in Rosario, Revertia in Vigo, Lakalle in Madrid, Pangea in Barcelona, ComputerAid in Manchester and Nairobi, etc.

#### THE EXAMPLE OF EREUSE IN BARCELONA

Previously, no entity in Barcelona could process more than 500 computers each month. Large

donations presented problems for storage, processing effort and finding a market. Combining their activities and resources and specialising in different tasks in the reuse chain allows reuse centres and retailers to scale-up their operations and together process up to 3,000 devices per month without discarding any donation.

Barcelona city council sought a system that would work for all reuse centres in the city. It thus opted for a coordinating entity, Pangea.org, a zero waste not-for-profit private entity that coordinates the circuit and manages agreements with the city council and other donors. Pangea coordinates the distribution of devices to reuse centres while maintaining traceability and accountability.

#### PRACTICAL EXAMPLE

When a donor, i.e. Barcelona city council, has devices to donate, it contacts Pangea, which is then responsible for referring the donation to a circuit member. Each circuit agrees its own rules for donation referrals to individual members.

The reuse centre then collects the

devices from the donor's facility and repairs, registers and tags them. The EU's Tagltsmart.eu project means that quick scan can be used as well as blockchain technology to ensure that there are no duplicated tags. A smartphone app allows quick access to all of the information about each device's internal components and lifecycle, creating an inventory of all of the information on each device and its components. This inventory is shared with retailers, such as the work cooperative Abacus.coop (which has more than 800,000 members), or donalo.org (which distributes devices to NGOs). The reuse centre can check the location of any device at any time, as well as monitoring the point at which it is recycled.

#### RESULTS AND IMPACT OF EREUSE IN BARCELONA

The eReuse platform in Barcelona manages the donation of computer equipment (computers, mobile phones, printers).

Currently, it works with 400 entities and provides the following benefits:

- 20 consolidated workplaces in 18 social reuse centres.
- €500,000 per year of social economy created.

#### eReuse figures and impact

- eReuse in 10+ cities and 8+ countries.
- 10,000 reused devices tracked and traced through to final recycling.
- 5,000+ devices entering the reuse circuits every year.

#### Reuse of digital devices, figures and impact

- 1 job created for every 300+ devices.
- Avoids 90% of premature recycling.
- Job creation from product-as-a-service (maintenance, repair, servicing).
- Increase turnover three or four-fold compared to original purchase.
- More affordable, high-quality secondhand devices.
- Responsible public and private procurement of devices: purchase of long-lasting devices that can be reused (avoiding planned obsolescence).
- Increase Material Circularity Indicator by extending product lifespan by four years or more when sharing usage (reuse).
- Decrease environmental impact of e-waste and CO2 emissions by reducing recycling and manufacturing

- €350,000 per year in cost savings on subsidies from city governments to address the digital divide.
- 92% of the donated devices are effectively reused, saving 43 tons of electronic waste.
- 864 tons of greenhouse gas emissions saved, by using secondhand devices.
- 95% recycling rate guaranteed at the end of life (compared to the 2017 European rate of 35%).
- Development of local economy and more digital inclusion.

#### LOOKING TO THE FUTURE - WHAT'S NEXT FOR EREUSE?

The eReuse community continues to train reuse centres, transfer its know-how and open-source platform to others. It is working to improve the processes to enable device traceability and guarantee that reused devices are finally recycled, as well as auditing the

performance of end-of-cycle recycling. Finally, it continues to monitor the impact of reuse on labour and digital inclusion.

The aim is to recycle only those devices with low use value and no demand for reuse. eReuse communities empower local reuse centres and groups to create private and collaborative platforms to promote reuse and ensure proper traceable recycling. eReuse is already operational in 10 cities, with a total volume of 10,000 devices in use. The movement's growth is based on the replication of the model in different cities and areas, and therefore depends on the initial training of the seed organisation and on the remote use of tools, such as: downloadable support materials; remote assistance to circuits; periodic visits, combined with local community events for follow-up (face-to-face support and training);

collection of activity metrics, etc. All of this allows for a small core coordination team to steadily grow, given that local circuits are quite autonomous.

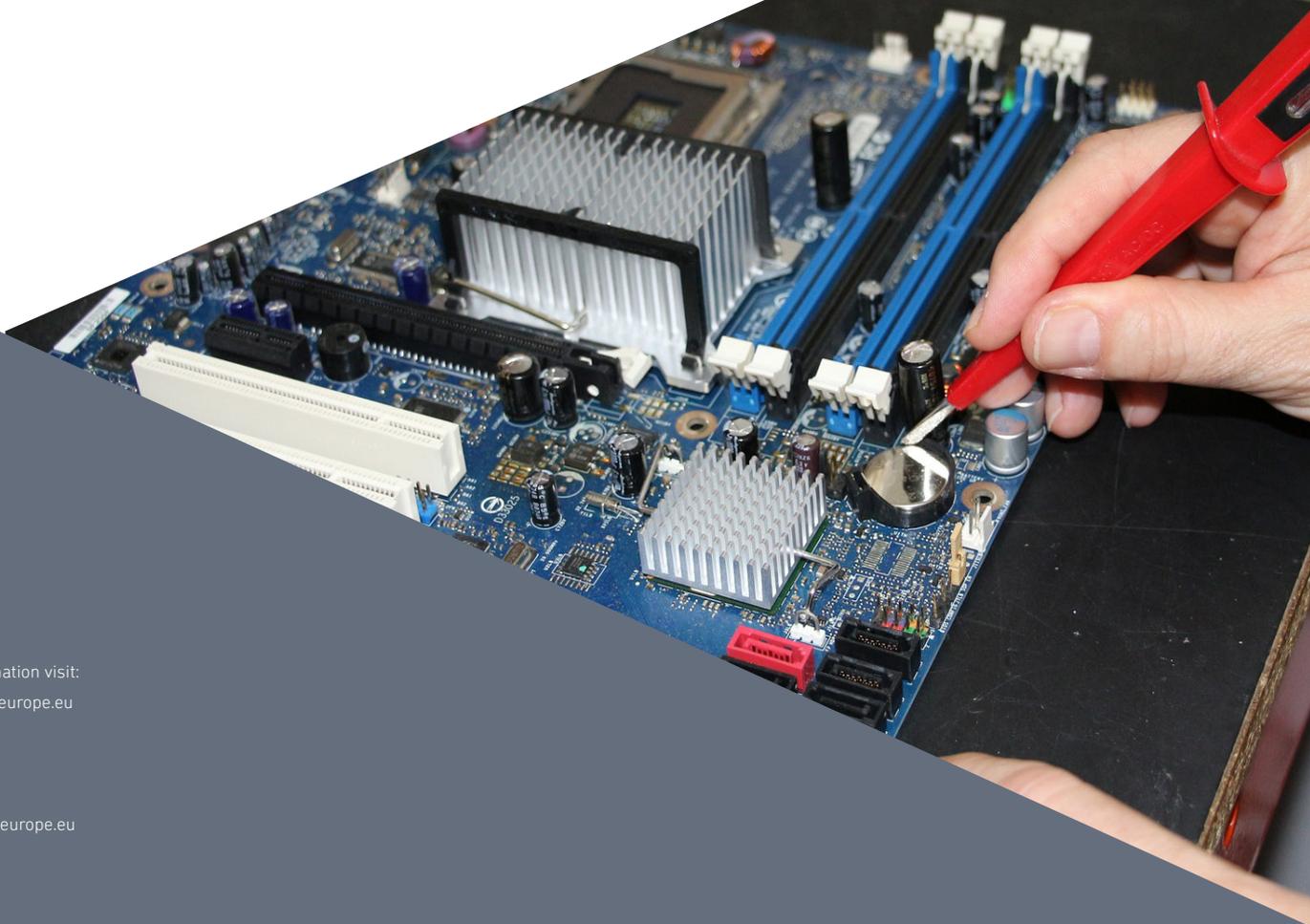
#### HOW TO IMPLEMENT A EREUSE PROGRAMME IN YOUR CITY

The eReuse project is open-source, completely replicable and ready to be deployed in any city around the world. If you are interested please contact: [hello@ereuse.org](mailto:hello@ereuse.org)

Note:

\* Blockchain is a decentralised, distributed and public digital ledger used to record transactions across many computers so that any record included cannot be retroactively altered without the alteration of all subsequent blocks.

Source: Wikipedia



For more information visit:  
[www.zerowasteurope.eu](http://www.zerowasteurope.eu)

Or contact:  
[info@zerowasteurope.eu](mailto:info@zerowasteurope.eu)

Sources  
[ereuse.org](http://ereuse.org)



Zero Waste Europe is the European network of communities, local leaders, businesses, experts, and change agents working towards the elimination of waste in our society.

We empower communities to redesign their relationship with resources, and to adopt smarter lifestyles and sustainable consumption patterns in line with a circular economy.

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