





Circular Economy, recycling, refurbishment and remanufacturing: Towards Sustainable Business Models Luca Pucci

Legambiente



















EDUCA RAEE



















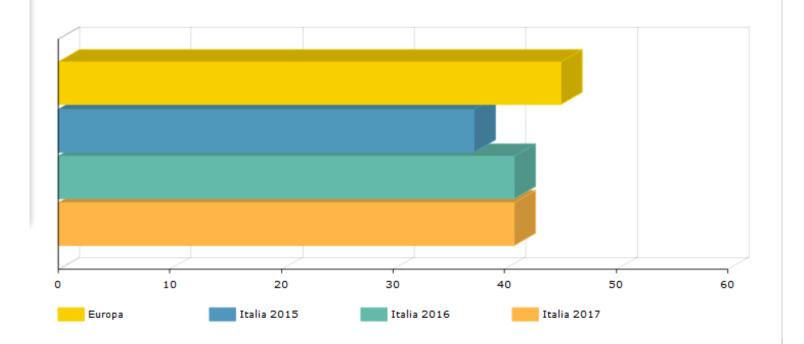






*Fonte: Dichiarazione annuale impianti

Anno rif.	Immesso Totale Ultimi 3 Anni	Valore Medio	Raccolta		Target	Tasso vs Target
2015	2.595.962 ton	865.017 ton	322.090 ton	37,23%	45%	-7,77%
2016	2.630.270 ton	876.757 ton	358.383 ton	40,87%	45%	-4,13%
2017	2.807.847 ton	935.949 ton	382.544 ton	40,89%	45%	-4,11%



Centro di coordinamento RAEE – www.cdcraee.it











































I pirati dei RAEE

Dall'analisi dei fenomeni d'illegalità nella raccolta, gestione e riciclo dei rifiuti da apparecchiature elettriche ed elettroniche, alle attività di prevenzione e di contrasto.

gennaio 2014





600.000 tonnellate/anno di RAEE non si sa che fine fanno!













Found in	CRM						
Connectors and springs but being phased out	Beryllium	B e	United States (90%) China (8%)	0%	Inhalation of dust in processing previously linked to cancer in US	Most of the world's beryllium comes from one mountain in Utah	None yet
Batteries	Cobalt	C o	Democratic Republic of Congo (64%) China (5%) Canada (5%)	35%	Cobalt in Li-ion batteries presents a risk of 'thermal runaway' – dangerous fires	In increasing demand for electric car batteries – as is lithium, which Europe deems to have less supply risk	Electric vehicles
Integrated circuits	Gallium	G a	China (85%) Germany (7%) Kazakhstan (5%)	0%	Gallium is a byproduct of highly energy-intensive aluminium production	Used in semiconductors, LEDs and photovoltaic cells	Solar
Batteries	Graphite	С	China (69%) India (12%) Brazil (8%)	3%	Inhalation of graphite dust can cause lung disease	Used on the negative electrode of a Li-ion battery	Electric vehicles
Touch screen	Indium	In	China (57%) South Korea (15%) Japan (10%)	0%	Can cause lung disease in workers involved in processing	There are no Indium mines, it is found as a byproduct of zinc and other metal refining	Solar
Metal alloy in casing	m	M g	China (87%) United States (5%)	13%	Casting operations require precautions because of reactivity of magnesium with sand and water	Magnesium production has moved swiftly between provinces within China	None yet

Found in	CRM		Main global producers (average 2010-2014)	End-of- life recyclin g rate	Hazards in production / disposal	Top fact	Demand for renewables ?
Microphone	Neodymi um	N d	China (95%)	3%	Can cause lung embolisms, especially during long-term exposure	Combined with iron and boron, Nd makes the strongest known permanent magnets	Wind
Camera	Rare earth elements (REE)	D y Pr	China (95%)	6%	Rare earth elements are often found in close proximity to radioactive deposits and mining poses extra risks	Known as a 'rare earth elements' these minerals are actually quite abundant but their production is the most concentrated in China	Wind Electric vehicles
Microchips	Silicon metal	Si	China (61%) Brazil (9%) Norway (7%) US (6%)	0%	The silicon metal itself is not toxic, but the process of layering it and making chips creates hazardous chemical byproducts	Silicon Valley is still the area in the US with the highest concentration of federally-supervised environmental remediation sites	Solar
Microcapacit ors	Tantalum	Та	Rwanda (31%) Democratic Republic of Congo (19%) Brazil (14%)	1%	Artisanal mining of tantalum is the most dangerous kind – and still does occur in DRC	Commonly known as a 'conflict' mineral due to origin in troubled area in central Africa	None yet
Vibration motor	Tungsten	W	China (84%) Russia (4%)	42%	Artisanal mining of tungsten is the most dangerous kind – and still does occur in DRC	Because it retains strength at high temperatures, used to be used in light bulb filaments	None yet

Impacts on people and planet

Critical raw materials are mined from other people's land, and the impacts of this mining are often invisible to us. Mining processes require a lot of environmental management and there is a high cost associated with this, so it makes more economic sense for this to occur in other regions of the world when possible. And if mining occurs in countries without rule of law, sound regulation and enforcement, risks arise. Use of acid and chemicals in mining processes can threaten health of nearby communities.

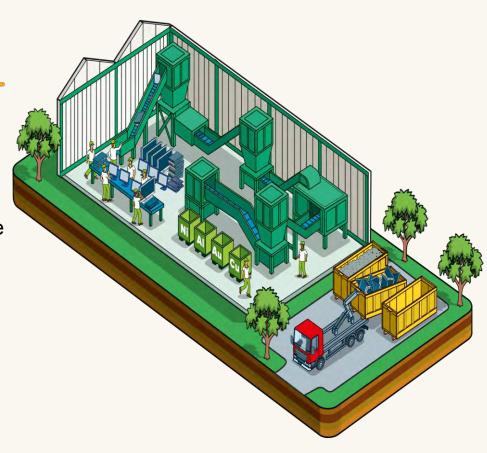




Recycling cannot keep up

The vast majority of these critical raw materials cannot be recycled effectively - many have nearly insignificant rates of recycling. Recyclers are constantly playing catch-up to an ever-faster cycle of new products, new materials and new technologies - having to invent new techniques and business models for processing dead devices.

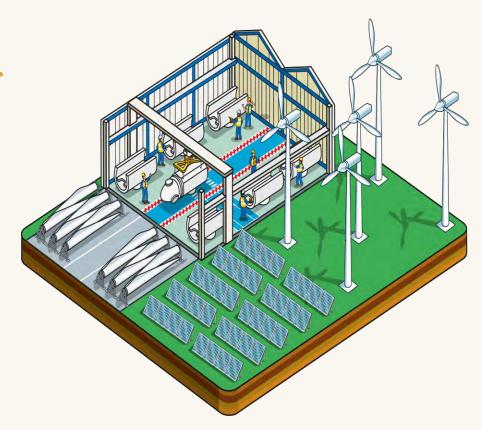
What this means in practice is that demand for virgin critical raw materials continues to increase with every new product we buy.



Needed for renewable energy

In an age when we are moving away from fossil fuels, towards renewable energy, we must recognise that the same materials in our personal electronics are needed to scale up wind and solar energy production.

Gallium (used in integrated circuits), indium (used in touchscreens), germanium (used in electrodes) are needed in photovoltaic cells and neodymium (used in microphones) is needed in wind turbines.





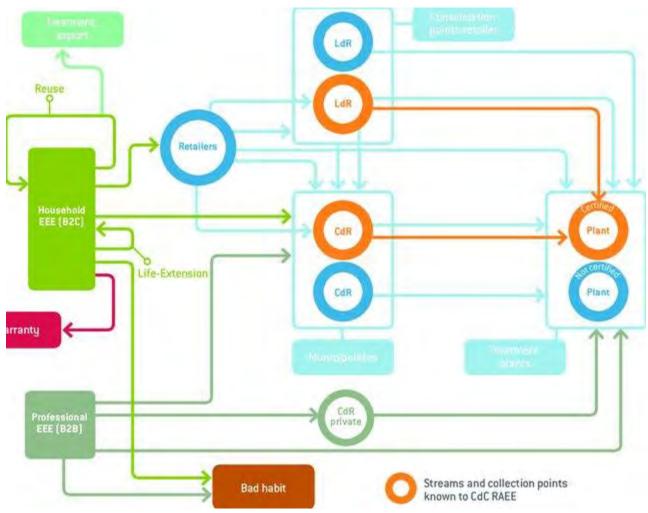
Using electronics for longer is the best way of easing demand for critical raw materials











Sistema RAEE in Italia: flussi domestici e professionali. (2012)











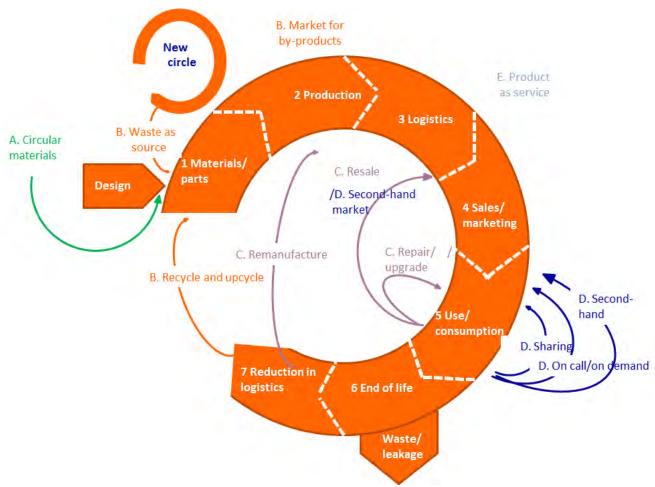








Towards new models of circular economy



The potential of circular economy. Rabobank (2015)











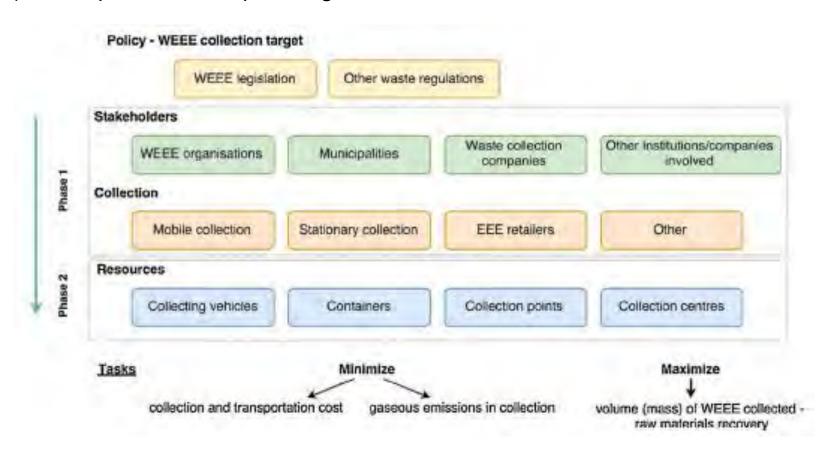








1) Municipal collection planning













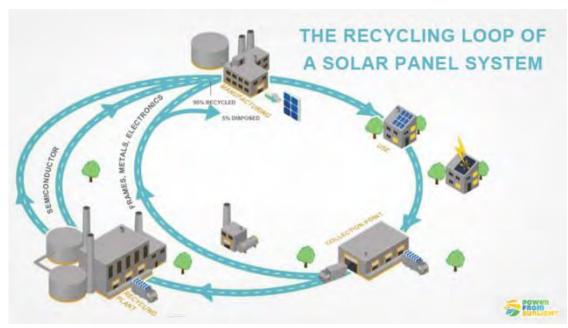


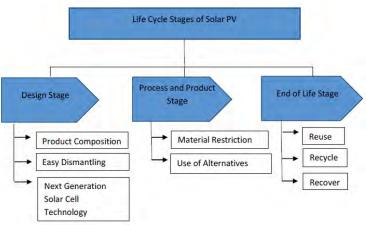






2) Professional WEE collection and recycling





Greening the solar PV value chain. (2018)











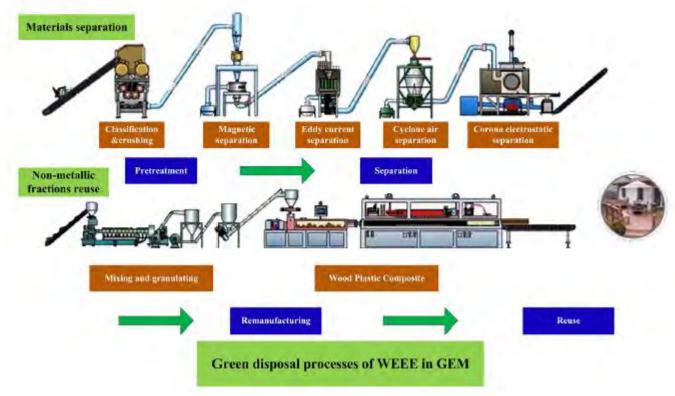








3) Ecoinnovazione nel trattamento RAEE Nuove tecnologie e idee per il riciclaggio, recupero materie prime, metallurgia



Flowchart of WEEE green disposal processes at GEM. (From: (GEM, 2015)



























Riplastic – Balvano (PZ)



















Virtual Winter School on Consiglio Nazionale delle Ricerche Waste Electrical and Electronic Equipment





Riplastic – Balvano (PZ)



























Riplastic – Balvano (PZ)



















Consiglio Nazionale delle Ricerche

Virtual Winter School on Waste Electrical and Electronic Equipment





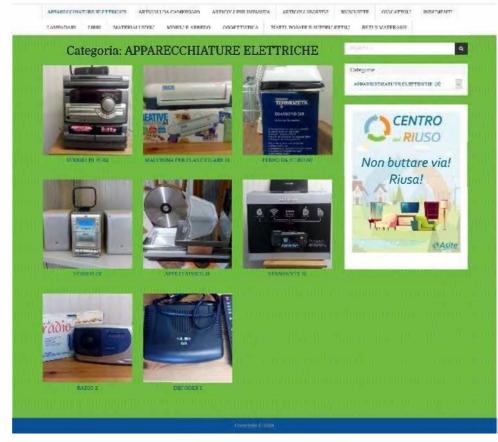












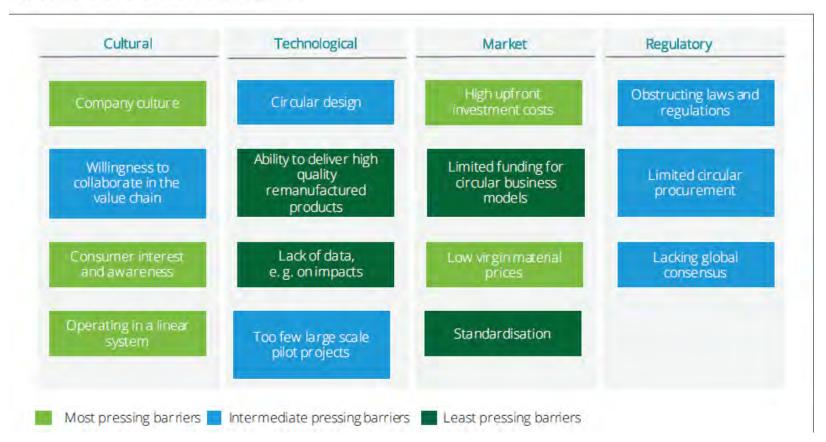








Figure 3. Heatmap of Circular Economy Barriers



Breaking the barriers to circular economy. Deloitte, Utrecht University (2017)



























RIFIUTI ZERO IMPIANTI MILLE

ROMA 26-27 GIUGNO 2019

NAZIONALE SPAZIO EVENTI • VIA PALERMO 10

WWW.ECO-FORUM.IT









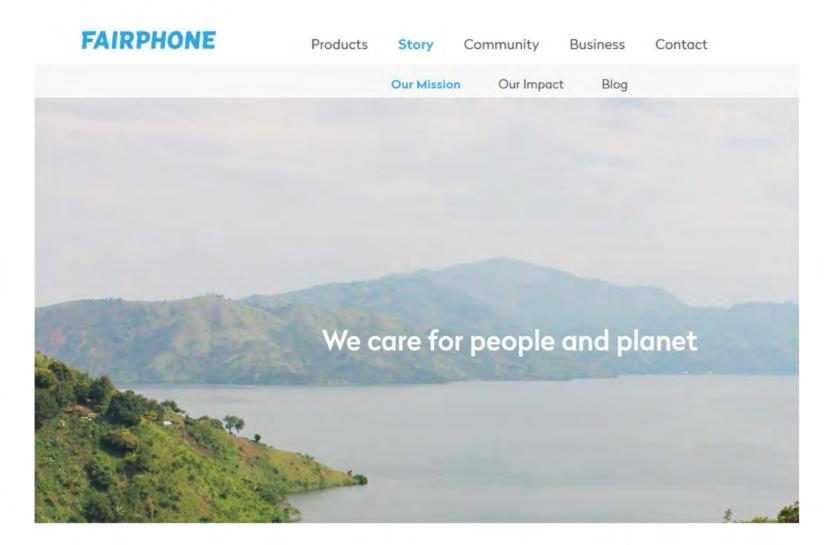






























From the earth to your pocket, a smartphone's journey is filled with unfair practices. We believe a fairer electronics industry is possible. By making change from the inside, we're giving a voice to people who care.



How we build a fairer world

Fairphone builds a deeper understanding between people and their products, driving conversations about what "fair" really means.

By creating a more sustainable smartphone, we're demonstrating the endless possibilities for a fairer future – for everyone.





















A fairer phone

With every phone we make, we're getting closer to a fairer and more sustainable electronics industry.

From responsible material sourcing to advocating for workers' welfare, we share all our results freely and set new standards for the entire industry.





A fairer future

It's no secret: we're out to change the world. Fairphone puts people and the planet first.

We care about human rights and worker well-being.

We care about the climate and our planet's delicate ecosystem.

We care about designing longer-lasting products that are easier to repair.

We care about reducing waste and making the most of what we already have.

See how we're making an impact >





















Best in the industry for greener electronics

B-Corporation certified



An important part of our social enterprise identity is the open collaboration with independent certification organizations. We're proud to be B-Corp certified, joining a community of over 1000 companies, using business to address social and environmental issues.

EcoVadis gold medal



The Fairphone philosophy is embedded in the way we run our company. This commitment to fairness has been made measurable by the globally-recognized EcoVadis sustainability rating. We're the only smartphone manufacturer with a gold medal, putting us in the top 1% of our industry.

iFixit 10/10 score



Our core value of longevity is designed directly into our smartphones. We created the Fairphone 3 to last – both in its original design and in making the repair as easy as possible. This made it the only smartphone in the world to be awarded a perfect iFixit score for repairability.

Fairtrade gold integrated



The materials that go into your phone have an impact on people and the planet. We want to go straight to the source to make sure we're creating positive change. Using responsibly sourced materials, we are the first and only smartphone company to be Fairtrade gold certified.























Our Impact

Changing the electronics industry from the inside.

We believe that care for the environment and people should be a natural part of doing business throughout our industry. With suppliers, local communities and the wider industry, we work for fairer materials and more responsible practices – one step at a time.

Together we're disrupting a short-term way of thinking that the world can no longer afford.

FAIRPHONE



















Making a positive impact

Creating products that last

We design for longevity, easy repair, and modular upgrades. Our goal is to make your phone's hardware last as long as possible, and to provide the support to keep its software up to date. The longer you can keep your phone, the smaller its environmental footprint.

Our approach to long-lasting design >

Our impact with the Fairphone 2 >

Extending your phone's lifespan >



Reducing e-waste

We want to make the most of the materials used in consumer electronics. We're moving one step closer to a circular economy by encouraging the reuse and repair of our phones, researching electronics recycling options and reducing electronic waste worldwide.

Our programs and progress >

Our takeback initiative?

Rethinking plastic waste >



Choosing fairer materials

We go straight to the source to make sure we're creating positive change. One material at a time, we're working to incorporate fairer, recycled, and responsibly mined materials in our phones – to increase industry and consumer awareness.

Our focus on fair materials explained?

Responsible sourcing from conflict areas 3

Partnership for responsible gold sourcing >



Putting people first

We're innovating ways to improve job satisfaction for workers in the industry. Together with our suppliers, we're listening to workers and creating better working conditions with employee representation, income and growth opportunities for all.

Learn about our initiatives

Our partnership with Arima >

Paying living wages in the electronics supply chain 3























Meet the suppliers

Baolong Electronics Group Co. Ltd. produces the vibration motor of the Fairphone 3. We partnered to integrate responsible tungsten into our motors and implemented an extensive worker satisfaction survey. Based on employee feedback, we co-invested in a multi-year improvement program covering communication between workers and management, providing training, and improving canteen and living facilities.



Vibration Motor Producer



Mapping your phone's journey

To improve how our phone is made, we need to know where it comes from. By mapping our supply chain from start to finish, we're setting new standards for responsible material sourcing.

Explore the Fairphone supply chain >

Telling the whole story

By opening up our phone's supply chain, we want to start a discussion about where our products come from and how they're made. As we dig deeper, we'll include our community each step of the way.

Dive in and join the movement >





















Fairphone list of suppliers

To gain a deeper understanding of the complex, often opaque consumer electronics supply chain, we're mapping all the different materials, suppliers and manufacturing locations involved in creating our phone. In addition to our first-tier assembly manufacturer, we have now mapped all second-tier component suppliers, and are progressively researching third and fourth-tier suppliers. Besides increasing transparency, we're using this information to engage with individual suppliers, establish relationships and pioneer innovative solutions in our impact areas...

View the Foirphone 2 list of suppliers >

View the Fairphone 3 list of suppliers >

Explore the Fairphone 3 supply chain with our interactive map

The map below is a visual representation of the path that the components in the Fairphone 3 take – from the mines and the factories all the way to you. It includes all the suppliers that we know of to date, as well as some of the mines sites and smelters we work closely with through specific sourcing programs.

We created this interactive map using an open supply chain mapping program called Sourcemap. Zoom in, click on specific point and learn more about our suppliers. You can also type "gold", "copper", "tin" or "tungsten" into the search box to reveal the supply chain of individual minerals. (For a full-screen view, you can also access our map on the Open Sourcemap website.)

















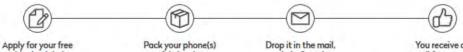






Consiglio Nazionale delle Ricarcha

How does it work?



shipping label

safely in a box

wait 6 - 8 weeks

You receive an email from us and that's it!

Own a Fairphone 1 or 2?

Get cash back when you order the Fairphone 3 or Fairphone 3+ from our online shop



€ 20 for a Fairphone 1 UK customers get £18



€ 40 for a Fairphone 2

UK customers get £36





55% get a new life

Phones that are still usable first get their data scrubbed. Then they're refurbished and sold through a trusted partner so that someone else can enjoy them.

45% are safely recycled

Phones that are no longer functional go to a European recycling facility where they're processed to recover the valuable resources inside.

14,268 Help us reach our goal! О We've got ambitious plans for reducing e-waste. Help us 20,000 reach our target of collecting 20,000 phones in 2020.





















Consiglio Nazionale delle Ricerche

Virtual Winter School on Waste Electrical and Electronic Equipment

FAIRPHONE



iFixit Guest Blog: What comes after a 10/10 score?

All 17 October 2020

Editor's Note: This is a guest feature from Dorothea Kessler, Communications Manager of Fait Europe. Fait is a global online repair community renowned for open source repair manuals and product teardowns. They awarded Fairphone 3 a perfect 10 out of 10 repairability score. By now you know the consumer cycle: another_

Read more >



What does it take to launch a fairer phone?



All 30 September 2020

One month aga, we hit a new milestone on our journey towards fairer electronics: the Fairphone 3+. The real stars of the show, though, are the upgraded Fairphone 3 modules that made the "+" possible. They are real, tangible proof that a better, fairer way is possible for this industry. ...

Read more >



Meet the changemakers: Fairphone Ambassador Heidi Andersson

Community

16 October 2020

We're on a journey to change the electronics industry - and we're not alone. While the Fairphone is a physical expression of the possibility of change, it also happens to be a great storytelling device that connects us with inspiring changemakers from all over. In this series, we want

Read more >



Research spotlight: Studying the A golden opportunity: The risks end of the tin life cycle



26 September 2020

Long before we made a single phone, Fairphone was working to better understand and improve mineral supply chains. Many years and three phones later, we're still focusing on our mission of driving important materials projects and pioneering research that has a positive impact on how materials are sourced, used and reused improving ...



Podcast: Making a business case for African battery recycling

Reuse and Recycling Of October 2020

Read more about the business case for African battery recycling in Closing the Loop's whitepaper based on our learnings from the project. It's no secret - We're out to change the electronics industry. Together with an amazing network of changemakers, we're disrupting a short-term way of thinking that the world _

Read more >



and rewards of gold recycling

Foir Moterials 25 September 2020

Why would anyone put gold in a phone? Silver and copper are better conductors, and much cheaper. The answer lies in one word: tarnishing. Silver and copper react with axygen. Pure gold doesn't, making it ideal for tiny circuits and connectors. What's not ideal are the deeply ingrained issues __

Read more >

















Consiglio Nazionale delle Ricorche

Virtual Winter School on Waste Electrical and Electronic Equipment



UE HOLD THESE TRUTHS TO BE SELF-EVIDENT

IF YOU CAN'T FIX IT, YOU DON'T OWN IT.

REPAIR IS BETTER THAN RECYCLING

Making our things last longer is both more efficient and more cost-effective than mining them for raw materials,

REPAIR SAVES YOU MONEY

Fixing things is often free, and usually cheaper than replacing them. Doing the repair yourself saves you money.

REPAIR TEACHES ENGINEERING

The best way to find out how something works is to take it apart,

REPAIR SAVES THE PLANET

Earth has limited resources, Eventually we will run out, The best way to be efficient is to reuse what we already have.





TO DEVICES THAT CAN BE OPENED

= CONSUMABLES OURSELVES | FLOWCHARTS

IN THE PRIVACY OF DUR OWN HOMES | WIRING DIAGRAMS TO AVAILABLE, REASONABLY-PRICED SERVICE PARTS



SAVES MONEY & RESOURCES | CREATIVITY | CONTRIB









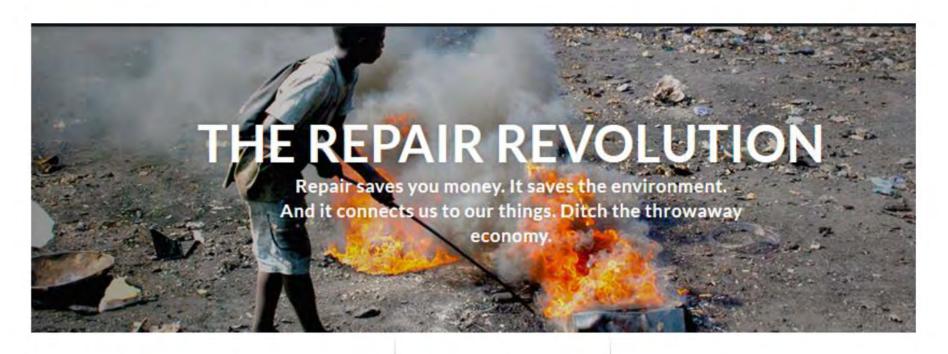












Repair is Freedom Repair creates Jobs Repair is Sustainable























You bought it, you should own it. Period. We're working on right to repair laws. Let's take back our right to use, modify, and repair however we want.

Defend your right to fix.

We deserve the right to repair.



Catch up with the latest news.

























Products that can be repaired, should be repaired. Refurbished cell phones can be sold to someone new. Repaired computers bridge the digital divide. Even better, repair jobs are local. They won't ever be shipped overseas.

It's time for a repair jobs revolution.



Repairable products make good sense.

























Our stuff used to be made to last. Now it's made to last only a couple of years. Repair is green. It keeps the stuff you love in service, and out of a landfill.

What's the problem with e-waste?



Recycling is destruction.



Manufacturing and mining are toxic.























Great products build brand loyalty.

Repair isn't just good for consumers—it offers great benefits to businesses, too. Many companies embrace DIY repair.

They know that people who fix their stuff are dedicated customers.

Giving people the information and tools they need to fix products cuts down on support costs. Customers love it when they can get their stuff fixed quickly—whether by themselves or at a local repair shop.



These companies make their repair manuals available online:

patagonia + DELL + lenovo + FAIRPHONE





























95% care

iFixit community members overwhelmingly say a successful repair makes them more likely to buy from that company.



The battery in your cellphone only lasts for a year or two. Phones with easy-to-replace batteries last longer.

500 million lbs

Computers can have a second life. Through its partnership with Dell, Goodwill has collected 500 million pounds of used electronics to refurbish and resell in its stores.

70% Less

DIY repair saves money: iFixit members spend nearly 70% less on repairs than the average American homeowner.











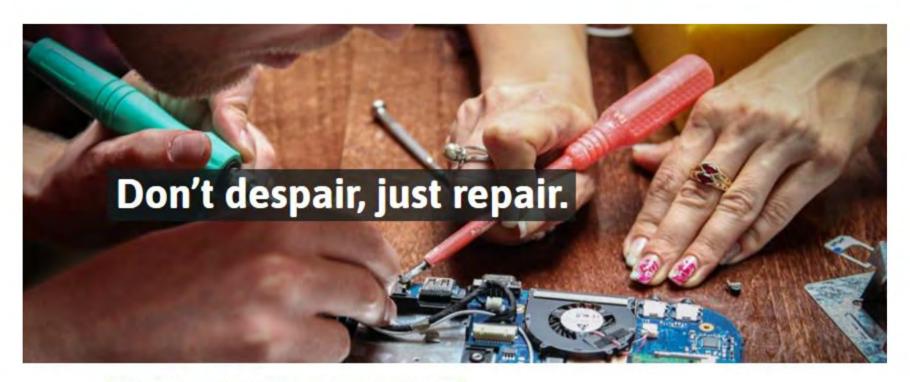












The Restart Project helps people learn how to repair their broken electronics, and rethink how they consume them in the first place.





















delle Ricerche

Virtual Winter School on Waste Electrical and Electronic Equipment



You're invited to a Restart Party!

Participate in a free community repair event, where volunteer fixers will help you learn how to repair your broken or slow devices - and tackle the growing mountain of e-waste.

Find events nearby

Host one

IMPORTANT CORONAVIRUS NOTICE

All physical repair events across our network are currently cancelled. However, the community is still running repair events online.

15

ONLINE (via United Kingdom)

Reading International Solidarity Centre (RISC)

Latest News Read more news



Keep up to date with our latest news from community repair and the right to repair.





19 October 2020

Repair is essential! Here is how we celebrated International Repair Day

"Repair is Essential" - this is the theme we chose for this year's International Repair Day. In London, an online team of volunteers mapped 45+ repair businesses in London to be considered for inclusion. Small groups met repair businesses in Crystal Palace, Shepherd's Bush and Tooting.



20 August 2020

Donated laptops help keep everyone connected

The need for electronic devices is high. We look at how Hackney Fixers, a community repair project in London, is reusing donated laptops to support students.





















Repair Data

Together with our growing network, we collect and share data on the things we repair, and use it to help us demand better, more sustainable products.



8,812 devices fixed



38,859 hours volunteered



23,564

kg waste prevented



357,563

kg CO₂ prevented

Fixometer

Our web app allows members of the repair community to log their fixes and to learn about the social and environmental impact of their work.

How we're using the Fixometer

Our insights

We collect data on repair from our community events and we use the data to provide insights into the devices we see.

Read our latest insights





















Repair Data

We collect data on every repair that we attempt at our events using our Fixometer app. We then use that data to provide insights into the devices and problems we see to those who design, manufacture and regulate products in the first place. We want to identify the barriers to repair that people come up against, whether it's lack of spare parts, poor documentation, or simply bad design.

We're also a founding member of the <u>Open Repair Alliance</u>, which shares information and insights with repair organisations around the world. And we're exploring the availability of reliable commercial repairers, with our Repair Directory.



Share your data skills

We need help analysing and making good use of the data we're collecting. You can help by volunteering your data or design skills.

Join our community

The Fixometer

Our web app allows members of the repair community to log their fixes and to learn about the social and environmental impact of their work.

How we're using the Fixometer

Repair Directory

In London, we're exploring the availability of trusted commercial repairers, and learning about the behaviours of the people who like get involved in Restart Parties.

Find business nearby

















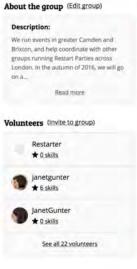


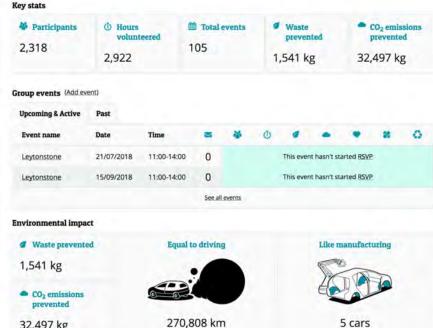




FIXOMETER > GROUPS + RESTART HQ

Group actions *



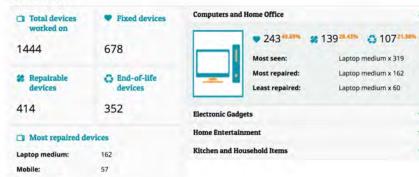




PC Accessory:

47

32,497 kg



270,808 km







































ABOUT RREUSE

RREUSE is an international non-profit network representing social enterprises active in the field of re-use, repair and recycling. In 2019, RREUSE federated 27 members across 25 European countries and the USA.

RREUSE's mission is to ensure that policies, innovative partnerships and exchange of best practices promote and develop the role of social enterprise in the circular economy.

RREUSE members' activities include:

- Advocacy at local, regional and national levels and sharing of best circular practices
- Awareness raising campaigns, local and international projects and business support
- Collection, sorting and redistribution of used textiles and clothing
- Collection, repair and re-use of electronics, furniture and bulky items
- Re-use of other household items such as bric-a-brac, books, toys and paint
- Operating second-hand retail outlets
- Collection and recycling of paper, cardboard, wood, plastics and metals
- Home, community and cooperative composting
- · Food distribution services and management of food banks























RREUSE NETWORK IMPACT 2018

RREUSE IS AN INDEPENDENT NON-PROFIT ORGANISATION REPRESENTING SOCIAL ENTERPRISES ACTIVE IN THE FIELD OF RE-USE, REPAIR AND RECYCLING

1000 000 TONNES

[THIS IS EQUIVALENT TO THE WEIGHT OF 137 EIFFEL TOWERS]

OF MATERIAL DIVERTED FROM LANDFILL THROUGH RE-USE, REPAIR AND RECYCLING, WHICH INCLUDED:

FURNITURE 200 000 TONNES collected	TEXTILES 260 000 TONNES collected	ELECTRICALS 290 000 TONNES collected	BOOKS & RECORDS 16 000 TONNES collected	BRIC-A-BRAC 30 000 TONNES collected
OUT OF WHICH →	OUT OF WHICH -+	OUT OF WHICH	OUT OF WHICH -	OUT OF WHICH →
80 000 TONNES	95 000 TONNES	20 000 TONNES	5 500 TONNES	14 000 TONNES



850 SOCIAL ENTERPRISES
ARE PART OF RREUSE'S WIDER NETWORK
95 000 EMPLOYEES,
VOLUNTEERS AND TRAINEES
ENGAGED IN THE ACTIVITIES OF

2 000 SHOPS WELCOMED
39 000 000 CUSTOMERS
[THIS IS EQUIVALENT TO SERVING THE
WHOLE POPULATION OF POLAND]
CONTRIBUTING TO AN OVERALL
RREUSE MEMBER ACTIVITY
TURNOVER OF € 1 200 000 000

RREUSE'S MEMBERS





















Speaking engagements

Involvements in European and Platforms

Thematic webinars, Commission Expert Groups | working groups and internal meetings

International events organised

Original news items shared

Media outlets mentioning RREUSE

Engagements in EU policy files

Position papers, reports and reactions to Commission consultations

SOCIAL MEDIA FOLLOWERS







rreuse















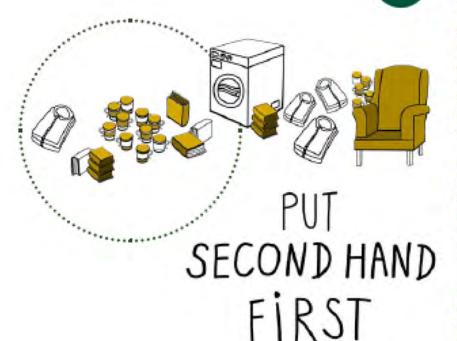














In 2019, a new European Parliament was elected and a new European Commission was formed, headed by President Ursula Von der Leyen. The Commission published its initial roadmap of the key policies and measures to be elaborated in the European Green Deal, including the development of a new Circular Economy Action Plan by March 2020. In addition, the Commission appointed a new College of Commissioners, including Nicolas Schmit as EU Commissioner for Jobs and Social Rights. Amongst other priorities, Schmit is entrusted to develop a Social Economy Action Plan by mid 2021.

In light of these political changes containing green and social initiatives at heart, RREUSE and its members kept the momentum going by pushing EU institutions to adopt a circular and social policy framework in order to:

- · Support the role of social enterprises in the circular economy
- · Boost the re-use of unwanted goods
- Ensure repair is made easier and cheaper

RREUSE engaged in the following policy files and European Commission policy initiatives aiming to create a stronger supporting legal framework for circular activities fostering social value:



























Green Deal



Waste Framework Directive



Ecodesign Directive and Regulations



Waste Electrical and Electronic Equipment Directive (WEEE)

Economic Policies



VAT Directive



Public Procurement Directive



Multi-Annual Financial Framework,notably ESF+ and Cohesion Funds

RREUSE is a member of:

- European Commission's Expert Group on Social Economy and Social Enterprises
- European Commission's Ecodesign and Energy labelling Consultation
 Forum
- European Innovation Partnership on Raw Materials High-Level Steering Group
- European Circular Economy
 Stakeholder Platform Coordination
 Group
- European Commission's Expert Group on Textile Names and Labelling

Social Policies



Social Economy Action Plan



EU Pillar of Social Rights



European Semester







Cooperation!













