ICT Electronic Devices Sustainability

ESA Webinar

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Welcome to the Webinar!

Before we start...

- Please keep your microphones muted during the webinar and make sure your webcam is switched off.

- You can use the conversation function anytime to submit your questions. They will be addressed during the Q&A at the end of the webinar

Agenda

ESA Welcome and Introduction

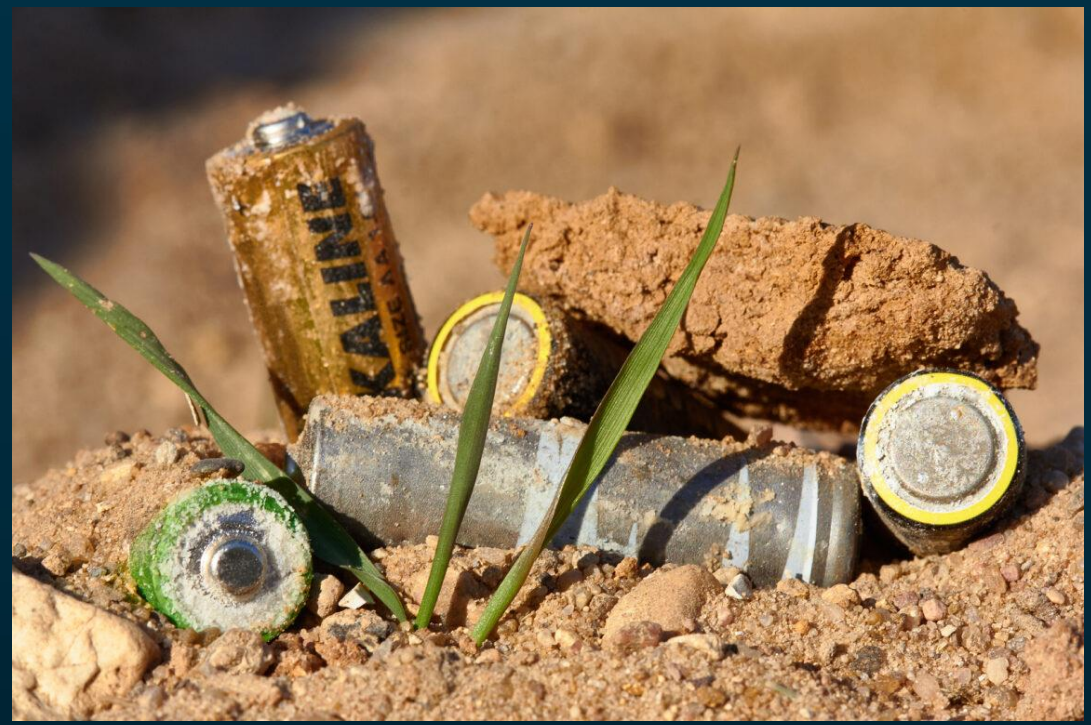
About ESA's ICT Electronics Sustainability Invitation to Tender

ICT & Electronics Sustainability and Space

→ Scott Butler - Material Focus: E-waste

How to Apply to the ITT

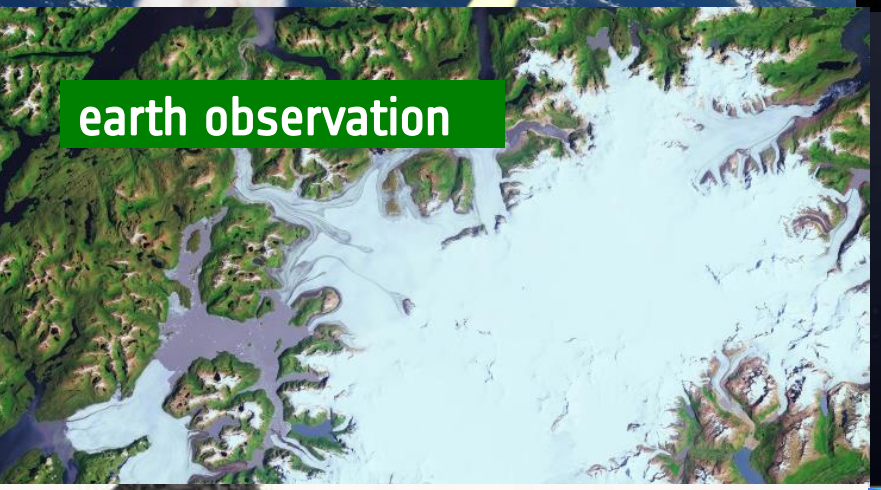
Q&A Session




space transportation


science


human spaceflight


earth observation


telecommunications
and applications


navigation


exploration

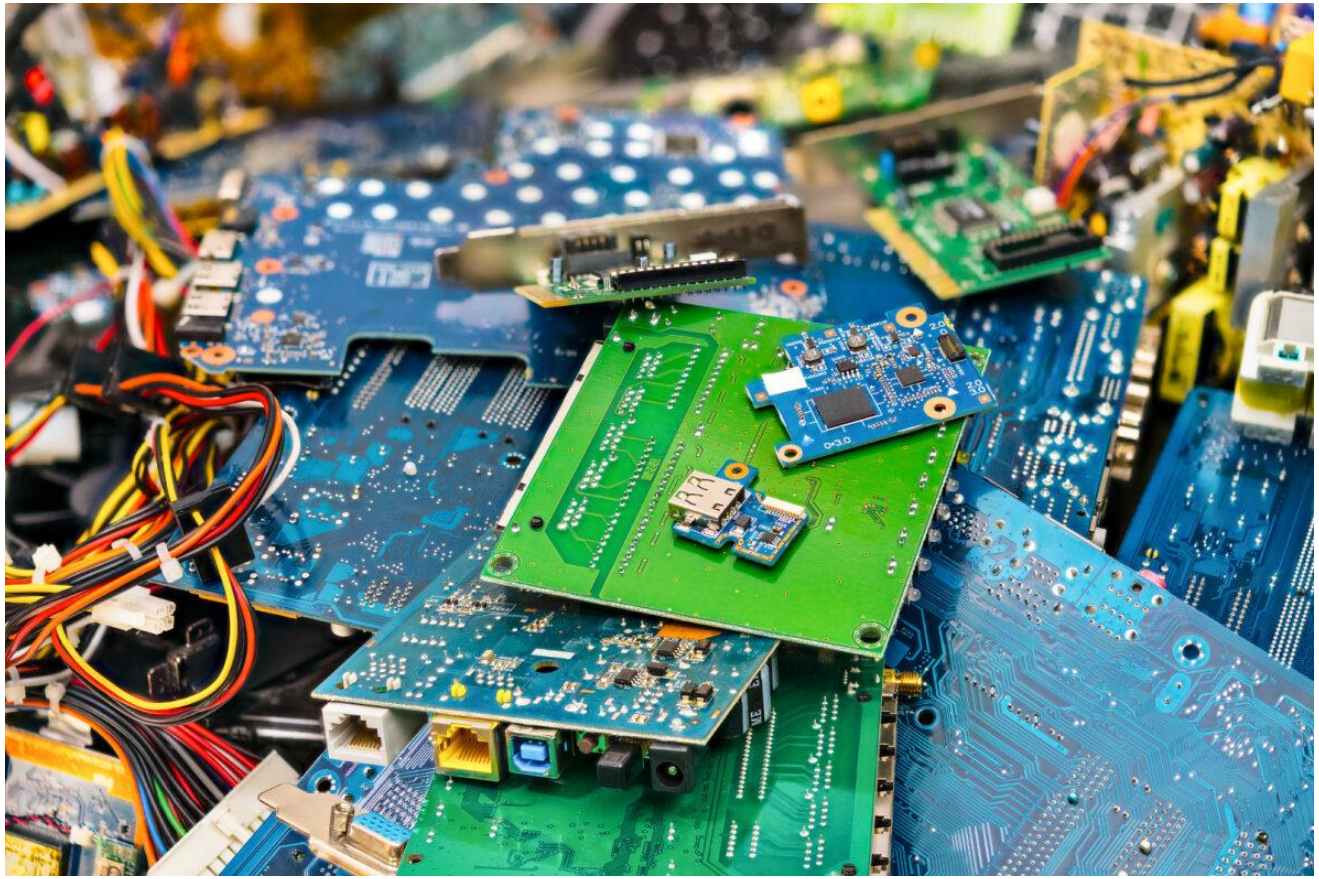

operations


technology

Business Applications: space-enabled services

BASS aims at reaching **commercial exploitation of space assets, data and capabilities** addressing **technical feasibility and business development**. This includes the development **of operational services for a wide range of users** through the combination of different systems, and **support in creating viable companies as well as to existing companies**

What can BASS offer to you?



Your Business Powered by Space:

- Zero-equity funding (from €50k to €2M+ per activity)
- A personalised ESA consultant
- Technical support and commercial guidance
- Tailored project management support
- Access to our international network of ESA and partners
- Access to our network of investors
- Credibility of the ESA brand

Sustainability elements of space applications

PEOPLE
Social value

PLANET
Green value

PROFIT
Commercial value

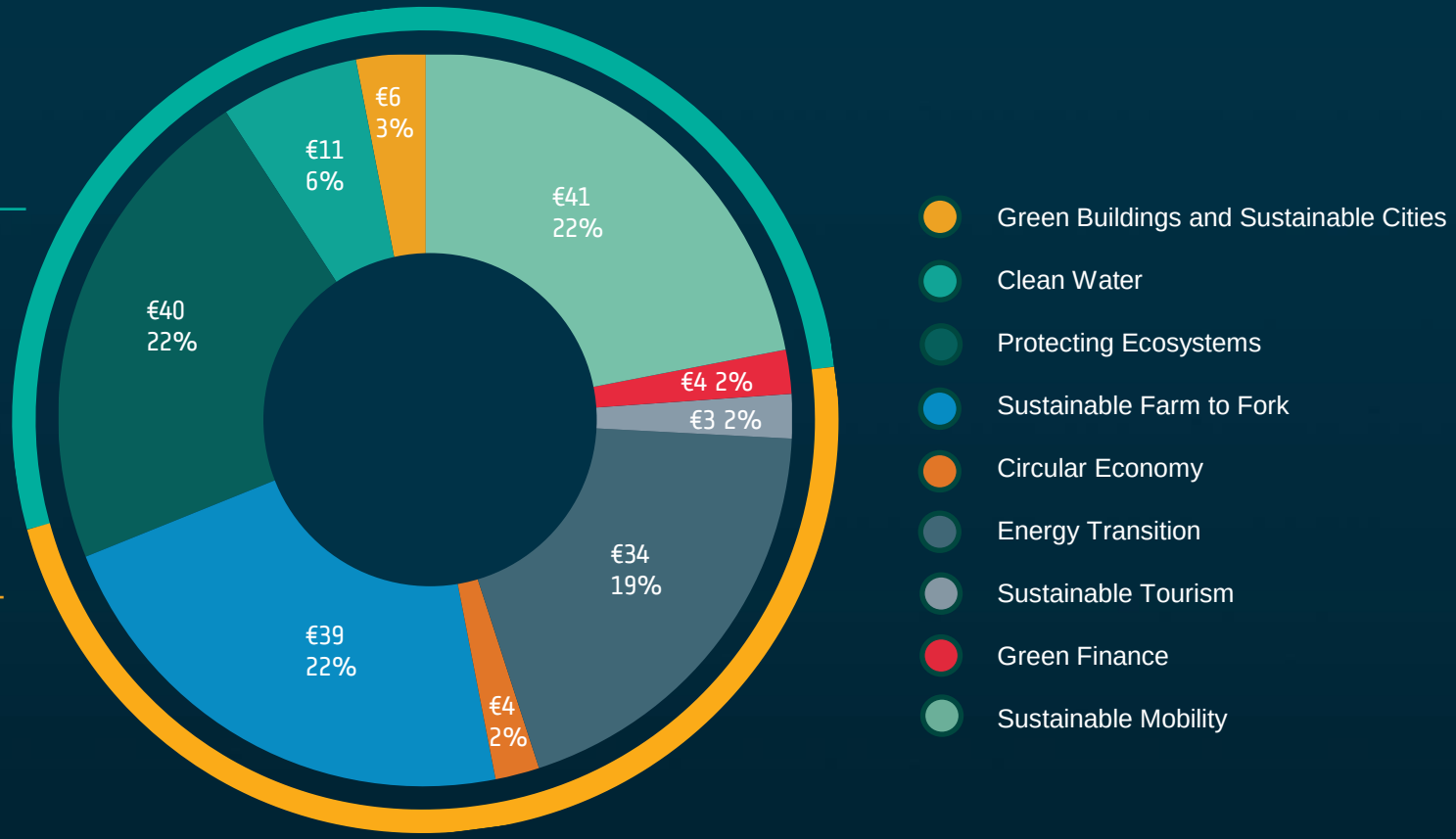
Sustainable applications with green impact

It is estimated that abandoning the current high-carbon pathway in favour of a low-carbon future will bring €26 trillion in economic benefit.

Investment in BASS Green Activities since 2010

Market demand for green solutions, new ESA BASS funding opportunities, and collaborations with industry partners will support future growth in sustainable development investment

With **€183M** invested into **300 ideas** the green transition now drives **48%** of all new ESA Space Solutions.



ICT Electronic Devices Sustainability

Main topics/ opportunities

Structural integrity, disposal & recycling of batteries

Increased battery-powered electronic devices & li-ion batteries:

- *Environmentally hazardous*
- *Cannot be recycled economically in large numbers*
- *Fire hazard: impacting health, safety & releases pollutants*

Export and Management of electronic waste (e-waste)

- *Only 17.4 % of the globe's annual e-waste is collected under documented circumstances*
- *8% is mixed with general household waste*
- *20% shipped to developing countries*
- *Significant amount of e-waste ends in unregulated sector performing activities such as cable burning by unlicensed companies or individuals*
- *Raw material value of e-waste estimated at $57 billion*

Environmental effects of data centres & blockchain-powered solutions

- *Continuous rise of data centres*
- *Generating large quantity of heat that must be eliminated to prevent equipment damage*
- *Increasing generation of emissions, 2% of world's CO2 emissions*
- *Blockchain applications especially those utilizing proof-of-work (PoW) consume significant amounts of electricity . Ex. Cryptocurrency Bitcoin consumes 80 TWh of electricity annually = 0.3% of worldwide consumption*
- *Blockchain hardware has huge e-waste problem, becoming obsolete after on average 1.5 years*

Main topics/ opportunities

Structural integrity, disposal & recycling of batteries

- ***Earth Observation:*** *Location optimization and monitoring of processing facilities*
- ***Satellite Navigation****: Tracking battery pack, tracking the entire recycling process chain*
- ***Satellite Communication****: Instantaneous alerts to emergency services in case of detected leaks of toxic materials or above-tolerance internal temperatures, To law enforcement agencies in case of unauthorized attempted disassembly, Transmit battery anomaly or failure reports to manufacturer*

Export and Management of electronic waste (e-waste)

- ***Earth Observation****: Detecting illegal & environmentally hazardous e-waste processing facilities, Identify contents of landfills & heaps of waste or the presence of toxic metals*
- ***Satellite Communications & Positioning****: Enabling or assisting localized, in-situ search for non-visible, hidden smuggling operations, For in-situ recovery operations*

Environmental effects of data centres & blockchain-powered solutions

- ***Earth Observation****: Detecting heat signatures and possible local emissions, Reviewing whether data centre operators and AI researches abide to promises of continuously reduced carbon emissions*
- ***Satellite Communications****: key enabler for satellite-based edge computing solutions, those spacecrafts process data from space function as data centres and offer to be energy efficient and environmentally sustainable alternatives*

The goal

Our goal is to deliver space-based services that help to tackle sustainability challenges relating to batteries, electrical products, electronic waste, and the ICT sector.

Solutions can target any part of the product lifecycle, whether it's improving sourcing of materials for the micro-mobility industry or helping to recover useful components from landfill sites.

Speaker: Scott Butler

Material Focus

ICT and Electronic Devices Sustainability Call

February 2024

What do Material Focus do?

Insights
Identify, produce and share insightful, timely and impactful research to help build a better UK e-waste/WEEE system.

Investments
Identify and fund projects which help make it easier for people to reuse and recycle electricals.

Inspiration
Create and deliver communications which help make it feel easier for people to reuse and recycle electricals through our **Recycle Your Electricals** campaign.

Our impacts since 2020

22,100+ reuse and recycling points

We're making recycling information easy to find in our online locator. And we're adding more recycling locations all the time.

12 million more people

From the Orkneys to the Isles of Scilly, we've funded 60 projects to make it easier for over 12 million more people to recycle their electricals closer to home

702,500 recycling searches

More and more people are finding their nearest reuse and recycling points on our Recycling Locator

48% more people

Nearly half the people who see our campaign say they plan to recycle their electricals in future. We're making electrical recycling the easy and obvious choice for millions of people.

The issue

What is e-waste and what is the issue?

e-waste (WEEE) is old and unwanted electrical and electronic equipment.

Discarded electricals are one of the fastest-growing sources of waste in the world – and the UK.

And that poses a major threat to the environment and human health, and produces losses to society and the economy.

But anything with a plug, battery and cable can and should be recycled.

Legislation requiring producers and retailers to finance collection and recycling of products at end-of-life has been in place for more than 15 years but.....

What is e-waste and what is the issue?

.....a lot more needs to be done.

Material Focus research has identified that in the UK we are throwing away or hoarding 490,000 tonnes of domestic and commercial waste, and this is set to grow.

UK households are throwing away 103,000 tonnes of domestic electrical waste every year.

We are hoarding over 800 million small old electricals - 30 items per household.

145,000 tonnes of business electricals are also being thrown away.

What is e-waste and what is the issue?

Resources

If old electricals go to landfill, or are flytipped instead of being recycled, valuable resources are lost forever. That's a big problem.

Economy

Discarded or hoarded household electricals cost the UK economy £370 million per year of lost valuable raw materials such as gold, copper, aluminium and steel.

Financial value

The average UK household is hiding away 20 unwanted electricals. If we passed these on to charities they could make a big difference to people's lives.

Climate change

Producing electricals creates carbon emissions. Recycling our old electricals would cut as much CO2 as taking 1.3 million cars off the road.

Fastest growing source of waste

Precious resources lost forever

Environmental Damage

Financial Loss

Benefits of reuse and recycling e-waste

More sustainable

Recycling equals a cleaner environment. If we recycled all our old electricals we would cut as much CO2 as taking 1.3 million cars off the road.

More from less

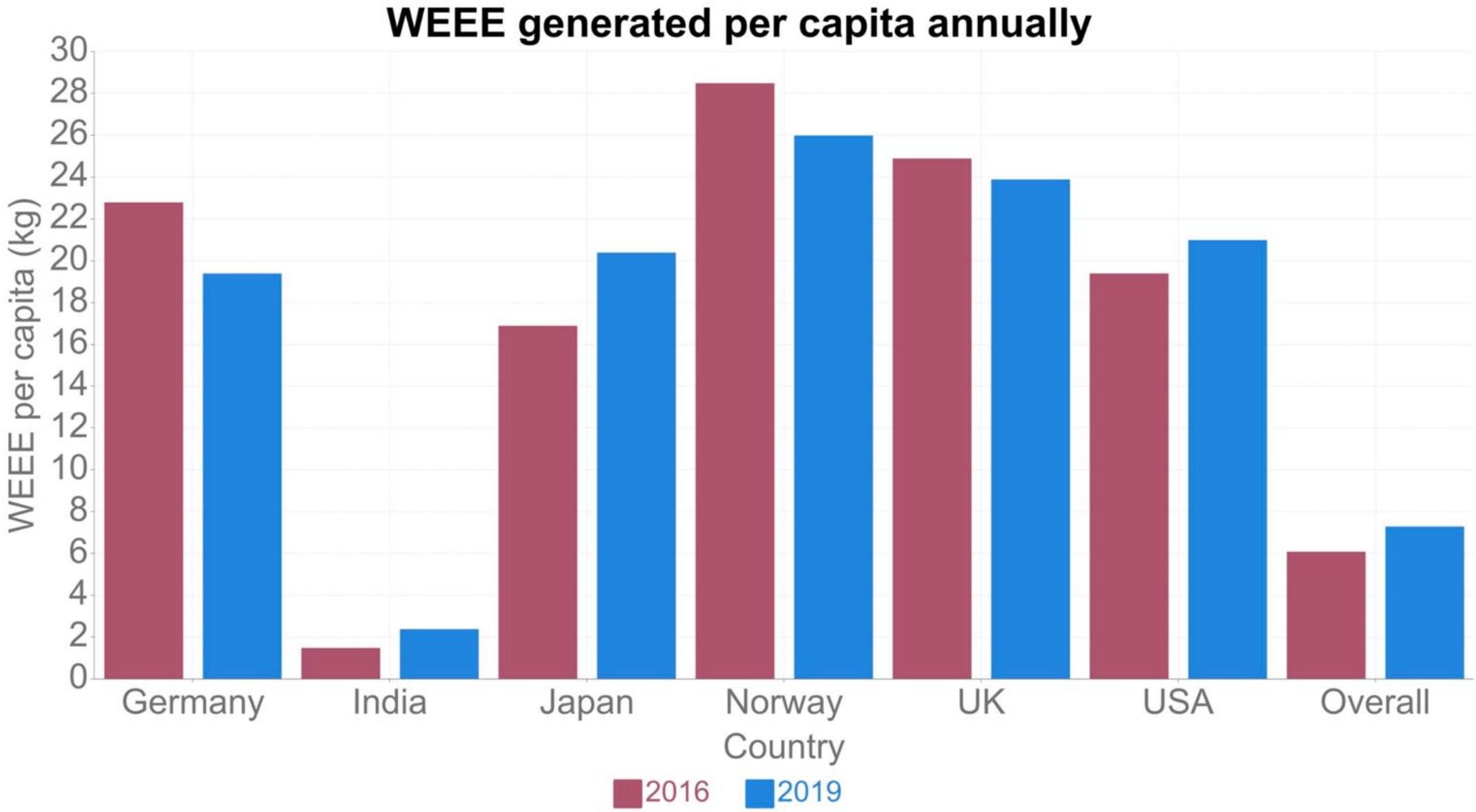
Each year, more than £850 mil of precious metals could be salvaged from our old electricals – including enough gold to make more than 850,000 rings.

More cash

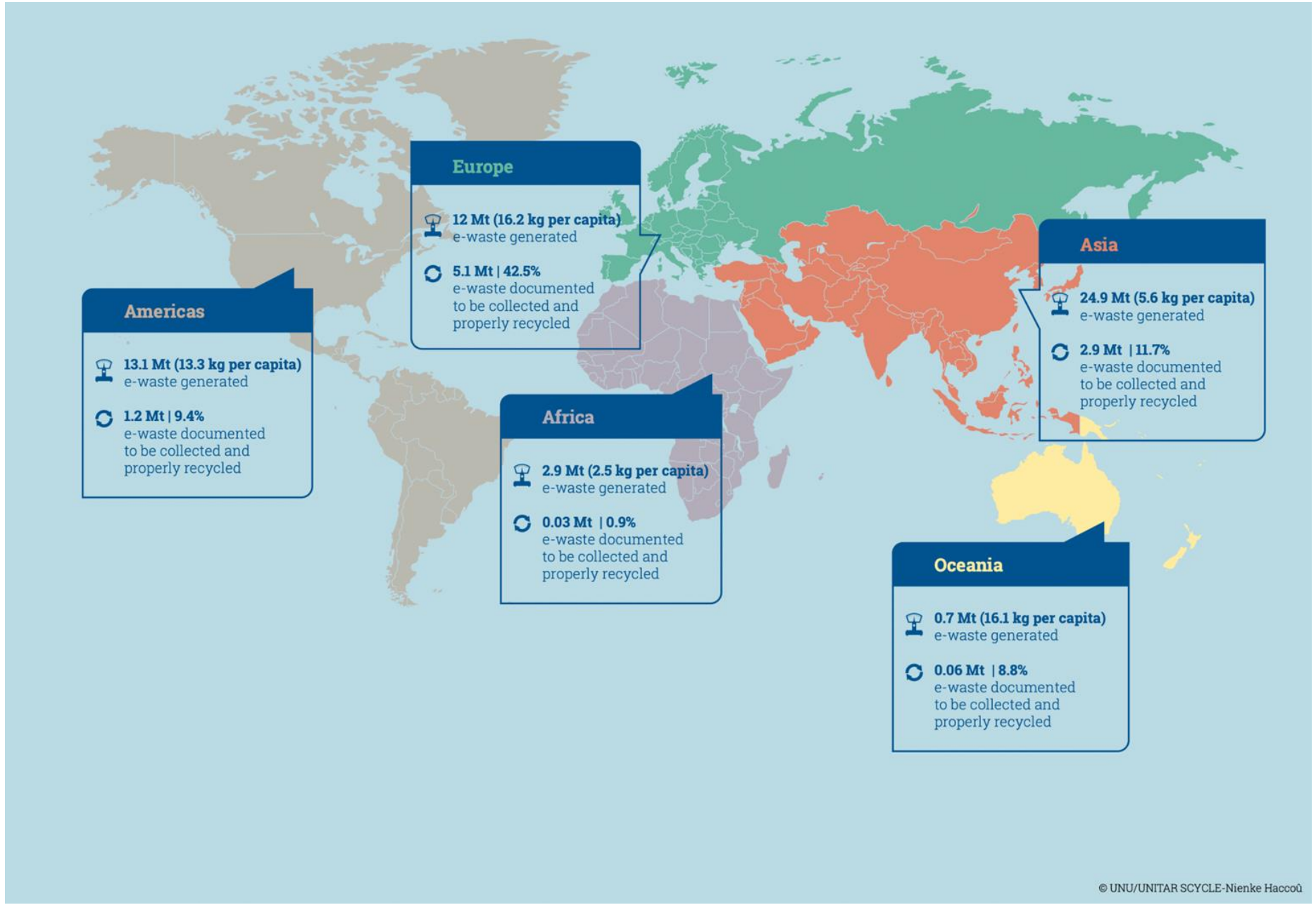
The average UK household could make £620 from selling their unwanted electricals – imagine all that extra cash and shelf space!

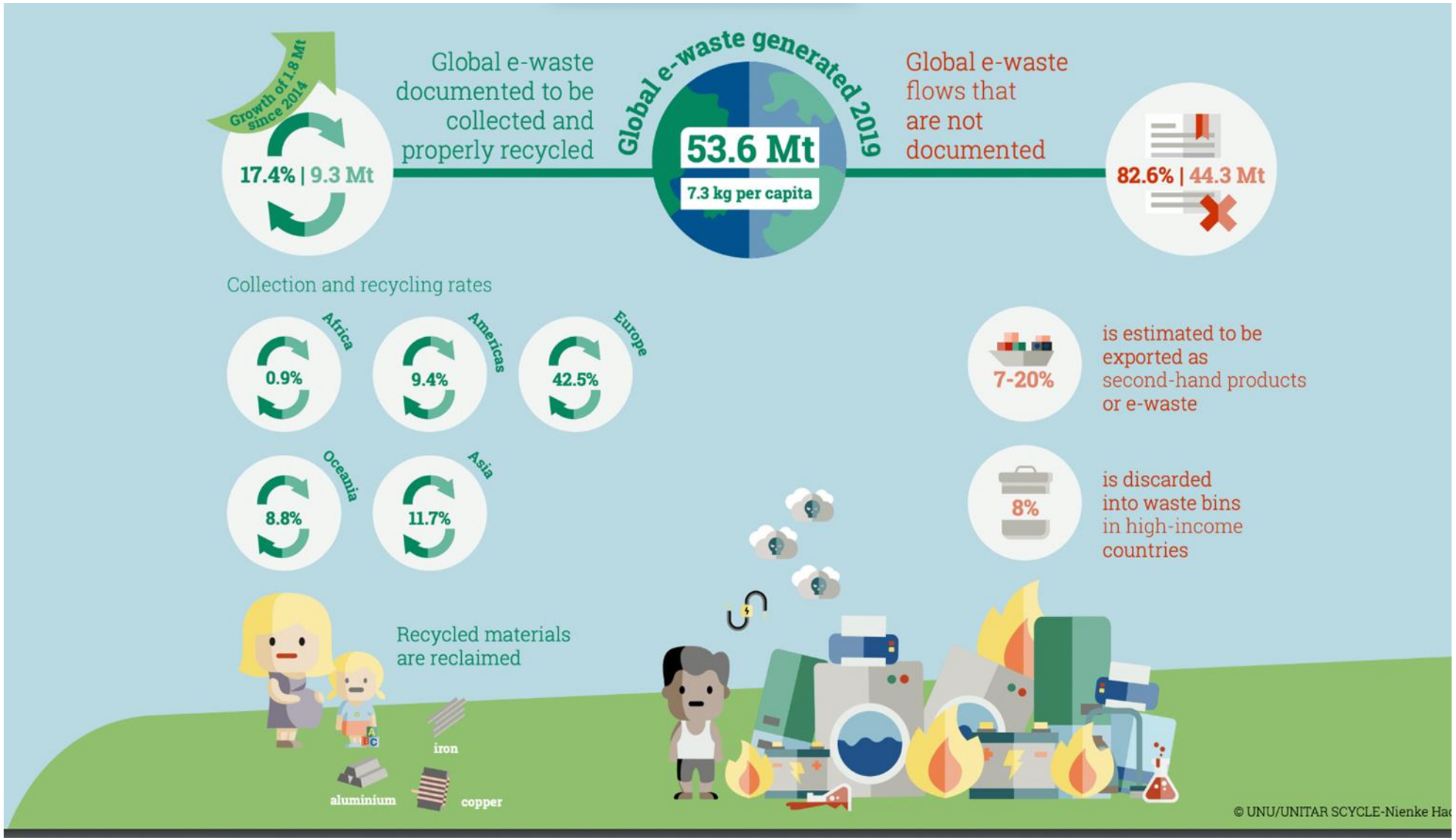
More jobs

Recycling our old electricals would create hundreds of new jobs in electrical reuse and recycling – and save valuable raw materials like gold, copper and steel.


WEEE generated per capita annually
WEEE per capita (kg)
30
28
26
24
22
20
18
16
14
12
10
8
6
4
2
0
Germany
India
Japan
Norway
UK
USA
Overall
Country
2016
2019


Global E-waste Generated
44.4 Mt
6.4 kg per capita
Growth of 9.2 Mt since 2014
Global e-waste generated
53.6 Mt
7.3 kg per capita
Global e-waste generated
74.7 Mt
9 kg per capita
2014
2019
2030
17.0% | 7.5 Mt
Global e-waste documented to be collected and properly recycled(1)
Growth of 1.8 Mt since 2014
17.4% | 9.3 Mt
Global e-waste flows that are not documented
82.6% | 44.3 Mt
43.7 Mt
of e-waste is unknown; this e-waste is likely dumped, traded, or recycled in a non-environmentally sound way
0.6 Mt
is estimated to end up in waste bins in EU countries
© UNU/UNITAR SCYCLE-Nienke Haccoû


Europe
12 Mt (16.2 kg per capita)
e-waste generated
5.1 Mt | 42.5%
e-waste documented to be collected and properly recycled
Americas
13.1 Mt (13.3 kg per capita)
e-waste generated
1.2 Mt | 9.4%
e-waste documented to be collected and properly recycled
Africa
2.9 Mt (2.5 kg per capita)
e-waste generated
0.03 Mt | 0.9%
e-waste documented to be collected and properly recycled
Asia
24.9 Mt (5.6 kg per capita)
e-waste generated
2.9 Mt | 11.7%
e-waste documented to be collected and properly recycled
Oceania
0.7 Mt (16.1 kg per capita)
e-waste generated
0.06 Mt | 8.8%
e-waste documented to be collected and properly recycled
© UNU/UNITAR SCYCLE-Nienke Haccoû


Growth of 1.8 Mt since 2014
17.4% | 9.3 Mt
Global e-waste documented to be collected and properly recycled
Global e-waste generated 2019
53.6 Mt
7.3 kg per capita
Global e-waste flows that are not documented
82.6% | 44.3 Mt
Collection and recycling rates
Africa
0.9%
Americas
9.4%
Europe
42.5%
Oceania
8.8%
Asia
11.7%
7-20%
is estimated to be exported as second-hand products or e-waste
8%
is discarded into waste bins in high-income countries
Recycled materials are reclaimed
iron
aluminium
copper
© UNU/UNITAR SCYCLE-Nienke Ha

The future

Future trends

Is green purchasing becoming more mainstream?

Better recovery of critical raw materials from smart tech and batteries that we need for future green tech.

Increasing focus on digital poverty and digital inclusion - devices, data and skills.

Valuing social impacts - benefits from increased reuse providing affordable tech and appliances to those in need.

Increased fire risk from portable tech powered by lithium-ion batteries going to the wrong places.

The rise of FastTech.

New circular business models

Hire and leasing of products.

Service approaches based on delivering specific performance rather than exchanging ownership of a product.

Incentivised return systems for used products.

Active asset management tracking how clients use products and managing the re-use, repair or redeployment of these assets.

Collaborative consumption with products and services being rented or shared.

Products being designed for long life, supported by guarantees and trusted or self repair.

More information

All of our research is available on the link below:

https://www.materialfocus.org.uk/material-focus-publications-and-research/

700 TONNES OF COPPER hidden in unwanted cables in UK homes

recycle your electricals

Unwanted cables stashed away in UK homes could circle the Earth **MORE THAN 5 TIMES**

recycle your electricals

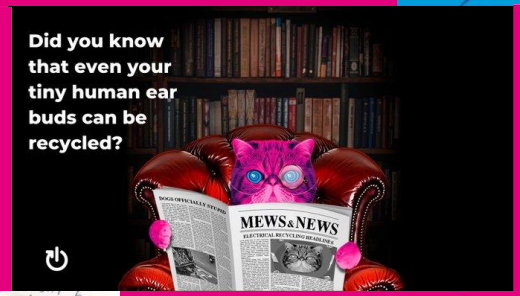
Erin wants to know what to do with her bag of old electricals?

Our unwanted electricals have a **£160 MILLION DONATION VALUE** that could help those in need

recycle your electricals campaign

We purchase a massive **53.5 MILLION ELECTRICAL ITEMS** between Black Friday and Christmas

recycle your electricals campaign



Every year, the magnetic materials recycled from our old tech could help build **2,661 WIND TURBINES**

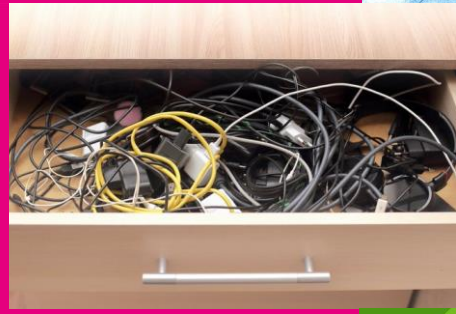
recycle your electricals

A massive **8 in 10** of us have been **DECLUTTERING** in lockdown this year!

recycle your electricals

This New Year we'll throw away or hoard **OVER 5 MILLION UNWANTED ELECTRICALS** as a result of Christmas spending

recycle your electricals campaign



Recycling all **31 million old laptops** hidden in UK homes could provide enough aluminium to make **159,000 bikes**

There are nearly **12 MILLION UNWANTED KETTLES** going spare in UK households

recycle your electricals campaign

There are over **200 MILLION UNWANTED CABLES, LAPTOPS & SPEAKERS** stashed away across the UK

recycle your electricals campaign

There are over **8 MILLION UNWANTED HAIR DRYERS** in UK households, waiting to blow away the cobwebs

recycle your electricals campaign

Nearly 1 in 3 of us have **SECRETLY DITCHED** a partner's old kitchen gadgets

recycle your electricals

44% of us **ADMIT TO CHUCKING** obsolete music equipment

recycle your electricals

Contact

Recycle Your Electricals is brought to you by Material Focus.

Material Focus is a not-for-profit organisation - our vision is of a world where materials are never wasted.

Please follow us and share our content on social media

facebook.com/recycleyourelectricals

www.recycleyourelectricals.org.uk

@recycleelectric

hello@materialfocus.org.uk

@recycleyourelectricals_

linkedin.com/company/materialfocus

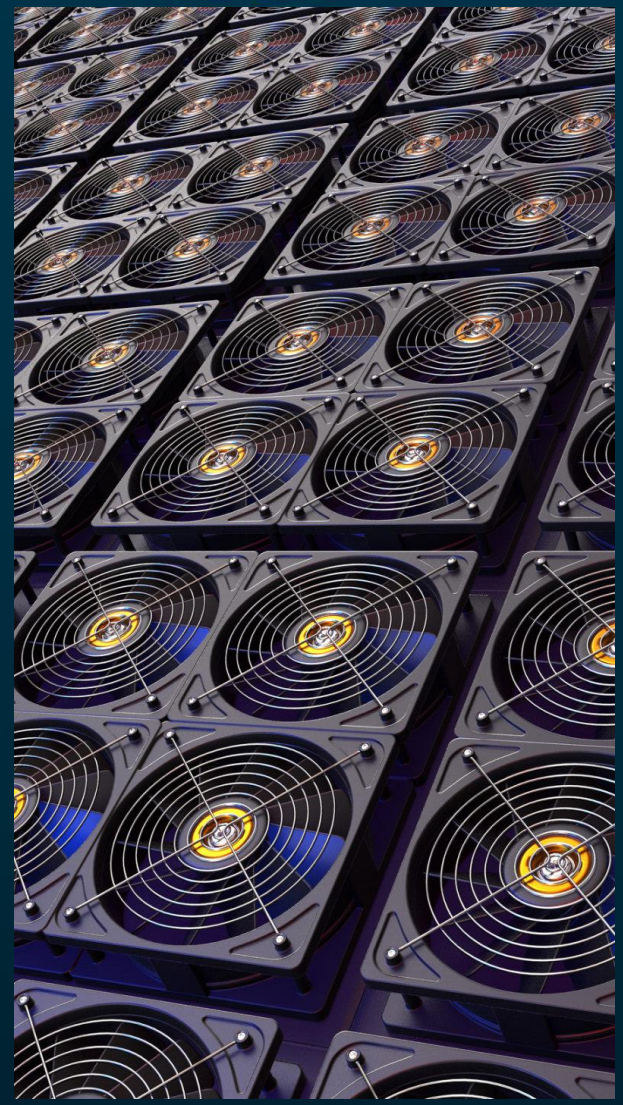
How to Apply

Who can apply?

To be eligible for funding, your team must be based in one of the following countries:

Austria, Belgium, Czech Republic, Denmark, Estonia, Finland, France, Germany, Hungary, Ireland, Italy, Lithuania, Luxembourg, Norway, Poland, Portugal, Romania, Slovenia, Sweden, Switzerland and United Kingdom.

If you are considering applying, you must inform your National Delegation to obtain a letter of authorisation allowing the funding of the proposed activity. Contact details of each National Delegate can be found here: https://business.esa.int/national-delegations-0



How to apply?

1. Register your team on esa-star Registration today!
   https://esastar-emr.sso.esa.int

2. On 22nd February 2024 visit esa-star Publication and search for this opportunity to download the official competition documents.
   https://esastar-publication.sso.esa.int

3. Use the official documents to prepare your proposal

4. Contact details of each National Delegate can be found here: https://business.esa.int/national-delegations-0

5. Submit your proposal via esa-star Tendering by 18th April 2024.
   https://esastar.sso.esa.int

6. Your proposal needs to include a Letter of Support from the user/customer representative

Opening dates: 22nd February - 18th April 2024

*** Opening and closing dates shown are tentative and still subject to change ***

ICT Electronic Devices Sustainability: About the Feasibility Study

Winners of the competition will run a 9-month study to investigate the technical feasibility and commercial viability of their idea.

ESA will provide funding up to 80% for a maximum of €200K to each winning team.

After the study there is the opportunity for further funding and support from ESA.

Visit: ICT Electronic Devices Sustainability (esa.int)

How to Apply

Register

- Register your company on **esa-star Registration**.

Download

- Download the official tender documentation (Invitation to Tender) via **ESA star Publication** ‘11581‘ from the opening date.

Prepare

- Prepare your proposal using the **official tender documents**. Reach out to your national Delegation to obtain a **Letter of Authorisation**.

Submit

- Submit your proposal by the deadline.

Please remember:

Estimated activity duration:	9 months
Estimated ESA co-funding:	max. €200K per activity (zero-equity funding) max. 80% of total cost per activity
Eligibility for funding	Companies must be based in a Member State subscribing to ESA BASS *

Opening date: 22 February 2024

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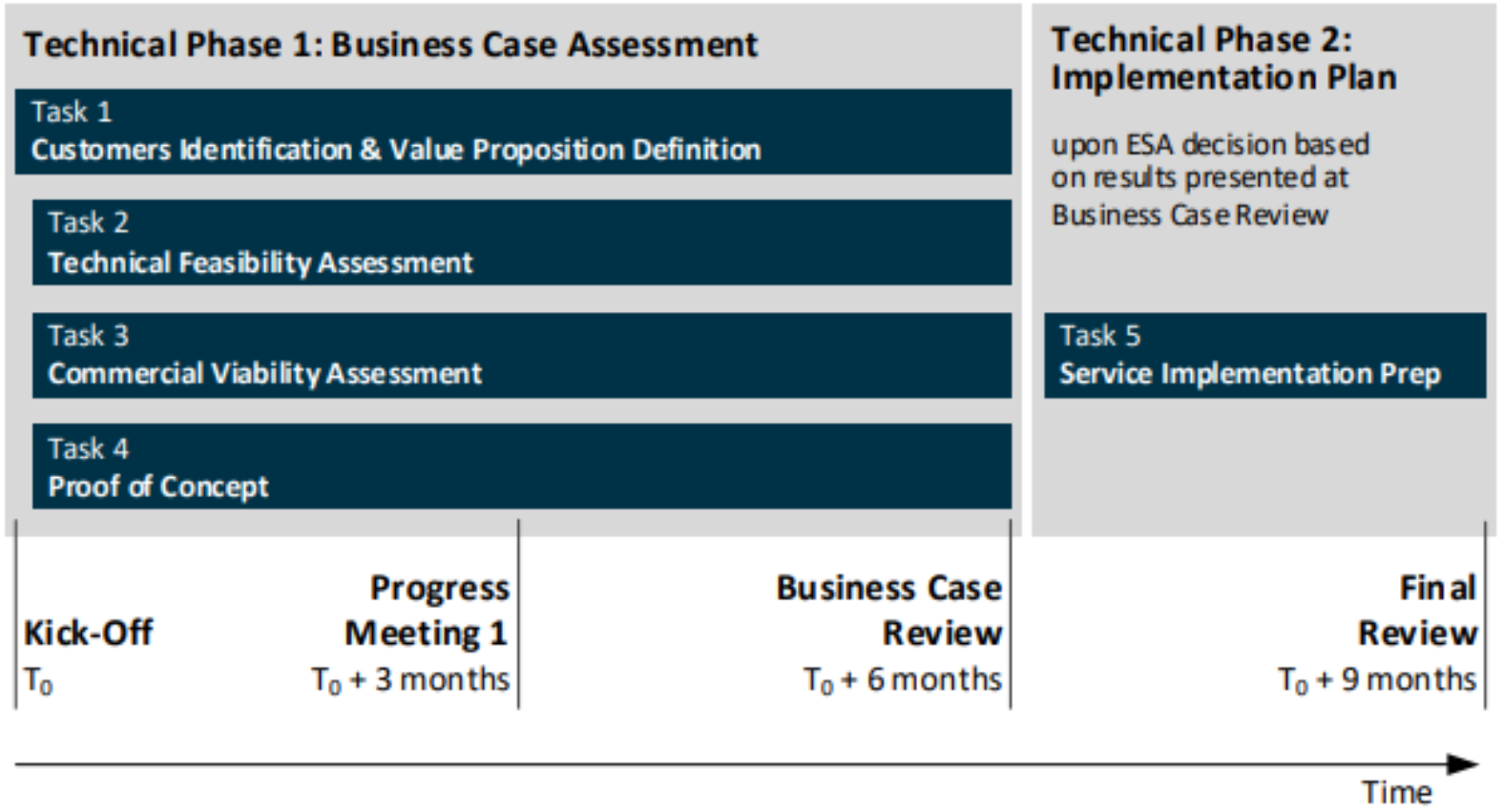
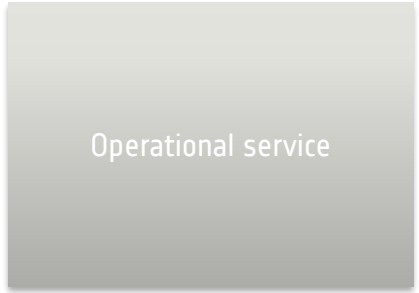
Work Logic


Technical Phase 1: Business Case Assessment
Task 1
Customers Identification & Value Proposition Definition
Task 2
Technical Feasibility Assessment
Task 3
Commercial Viability Assessment
Task 4
Proof of Concept
Technical Phase 2: Implementation Plan
upon ESA decision based on results presented at Business Case Review
Task 5
Service Implementation Prep
Kick-Off
T0
Progress Meeting 1
T0 + 3 months
Business Case Review
T0 + 6 months
Final Review
T0 + 9 months
Time

Overall Aim of the Feasibility Study

Explore the technical feasibility and commercial viability of a service

Develop the application and pilot the service with end users on board.



Ultimate aim is to have an economically sustainable service

Q&A

Opening Date: 22nd of February 2024

Closing Date: 18th of April 2024

*** Opening and closing dates shown are tentative and still subject to change ***

Click here and visit

ICT Electronic Devices Sustainability | ESA Business Applications