



Regional E-waste Monitor for the Western Balkans

*South-East Europe Pollution Platform:
Western Balkans Regional Waste conference*

*Session 3 – Pollution challenges from hazardous waste in
selected high impact sectors*

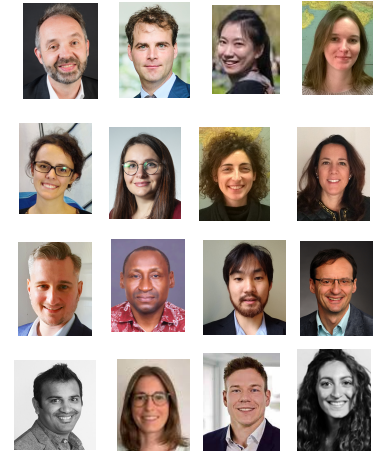
UNITAR – SCYCLE Programme

March 27th, 2024



SCYCLE Programme

- United Nations Institute for Training and Research
- Established 60 years ago
- SCYCLE team is located in the Bonn office opened in 2021
- Prior to that, SCYCLE was hosted by the United Nations University



SCYCLE Work

Quantification



- [Global and Regional E-waste Monitors](#)
- [National country studies](#)
- [E-waste statistics Guidelines](#)
- [First Dutch Battery Flows Monitor](#)
- [ProSUM](#)
- [FutuRaM](#)

Capacity building and trainings

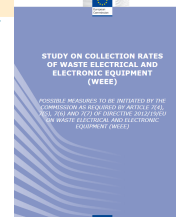


- [E-waste Academies EWAM & EWAS](#)
- [Dotcom-Waste and Person in Port](#) (counter illegal management of e-waste)
- [Workshops on E-waste statistics](#)
 - Western Balkans
 - CIS + Georgia
 - [Namibia/Botswana/Malawi](#)

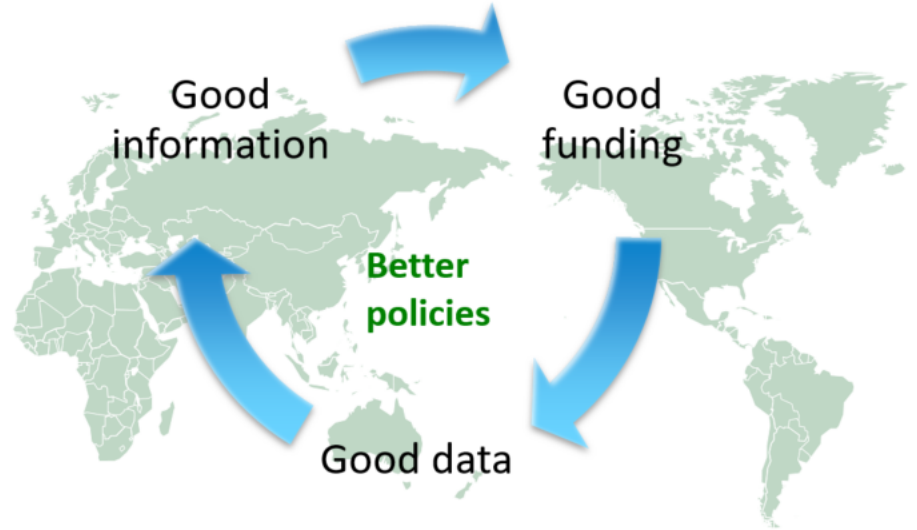
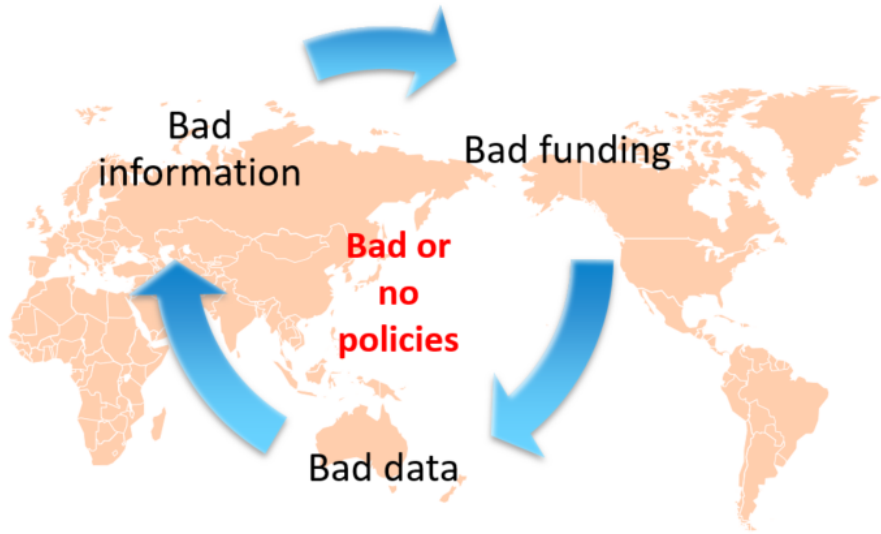
Policy advice & Partnerships



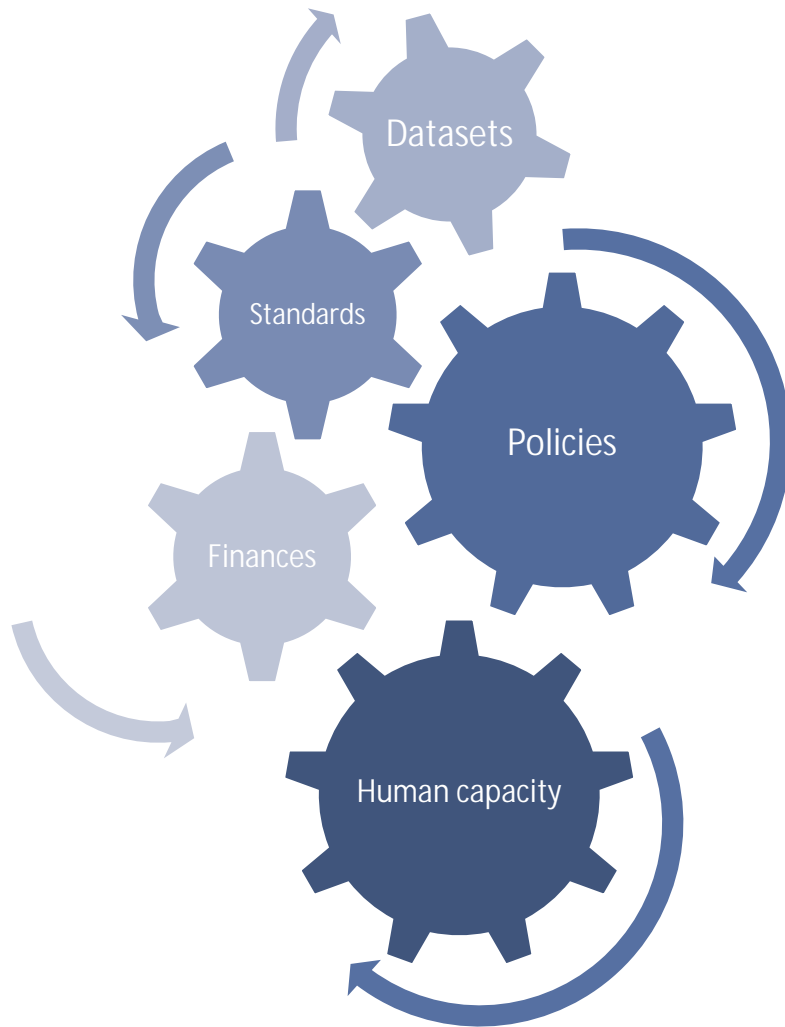
- Studies on Article 7 & 11 and review of the WEEE Directive
- UN E-waste Coalition
- [Global E-waste Statistics Partnership](#)
- [WEEE Calculation Tools for the European Commission](#)



E-waste is a growing mountain: why data is important



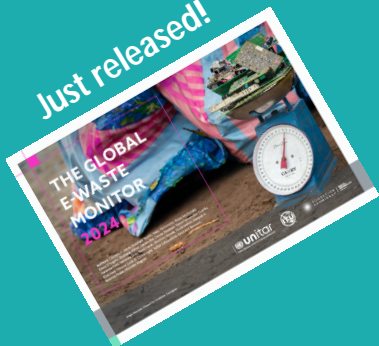
Five gears towards effective and safe management of e-waste



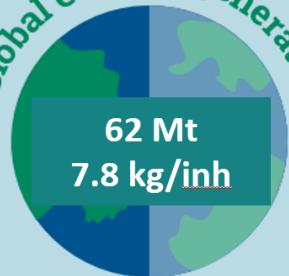
Besides data...

Global E-waste Monitor 2024: e-waste quantities

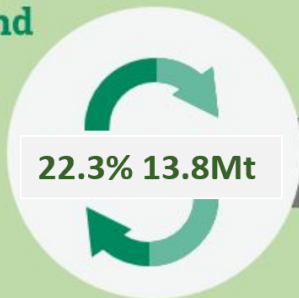
Just released!



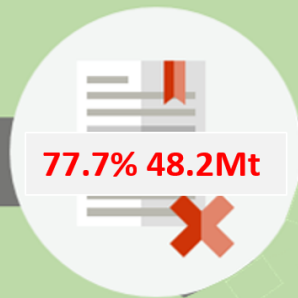
Global e-waste generated



Global e-waste documented to be collected and properly recycled⁽¹⁾



Global e-waste flows that are not documented



E-waste environmental issues

Community exposure

- Exposure through food, water, air
- Home based workshops

Environmental contamination

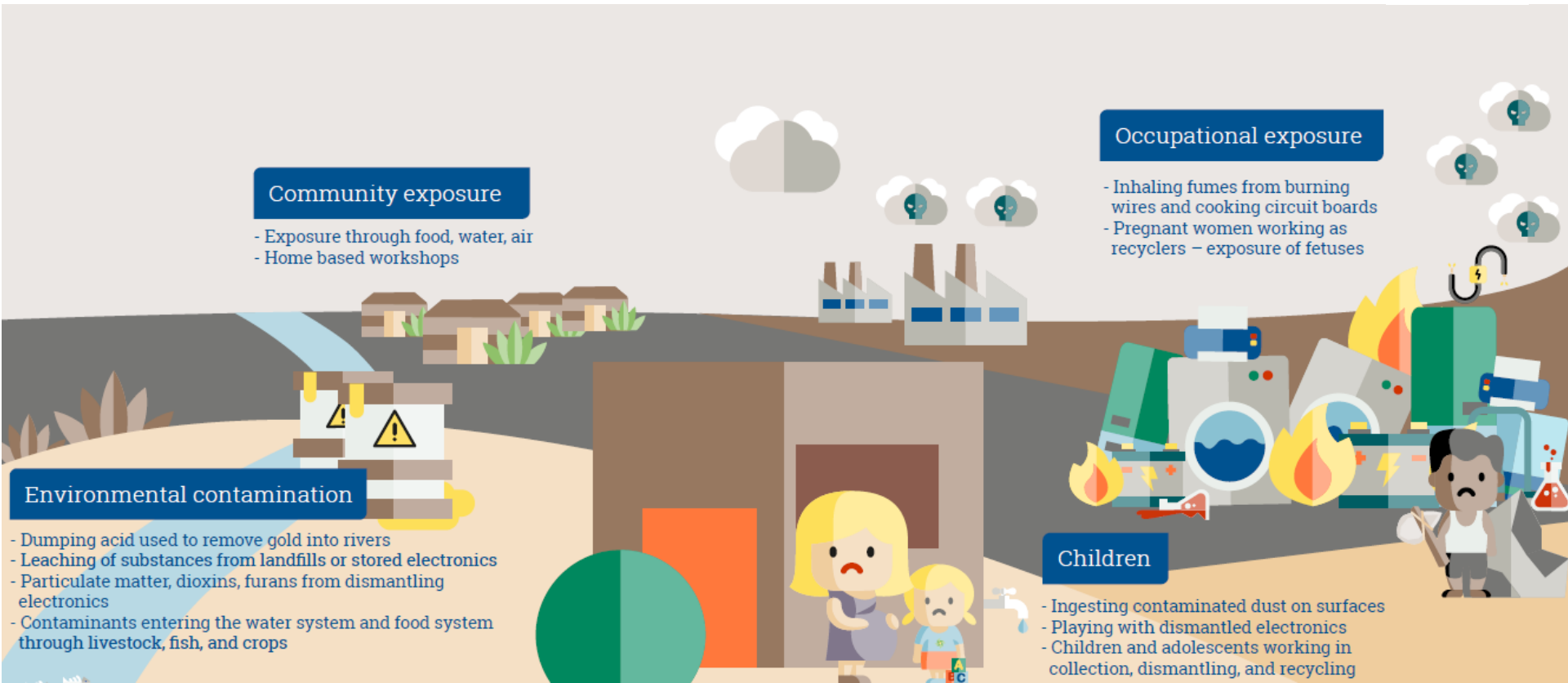
- Dumping acid used to remove gold into rivers
- Leaching of substances from landfills or stored electronics
- Particulate matter, dioxins, furans from dismantling electronics
- Contaminants entering the water system and food system through livestock, fish, and crops

Occupational exposure

- Inhaling fumes from burning wires and cooking circuit boards
- Pregnant women working as recyclers – exposure of fetuses

Children

- Ingesting contaminated dust on surfaces
- Playing with dismantled electronics
- Children and adolescents working in collection, dismantling, and recycling



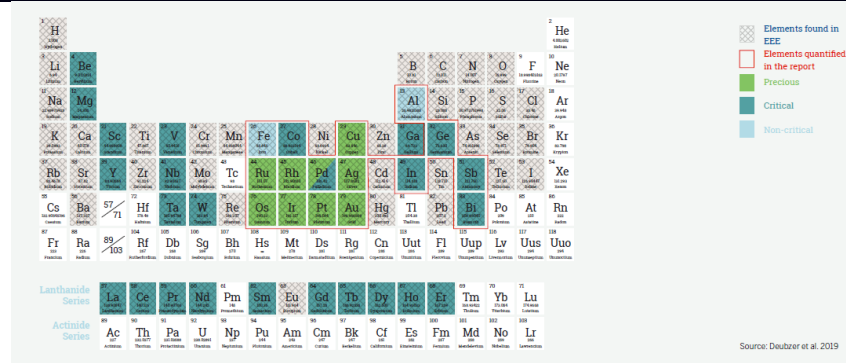
E-waste opportunities

Content of valuable material

- n Precious metals including gold, silver, copper, platinum and palladium
- n Valuable bulky materials such as iron and aluminum, and plastics





**\$91 billion
USD (2022)**



... Regional E-waste Monitor for the Western Balkans



Project background

- Internationally comparable e-waste statistics and information on e-waste management in the Western Balkans is limited 
- Provide technical assistance to 5 Western Balkan countries to assess e-waste statistics 
- Implementation by ITU Europe Office, UNEP Europe Office & Vienna Office and UNITAR-SCYCLE, as well as respective administrations and statistical offices of the beneficiary countries.



Project aims and objectives

Project **aims** to collect statistics, map the situation of e-waste management and legislation in the beneficiary countries as well as build subregional capacities in the field of e-waste monitoring and reporting.

The project has the following **objectives**:

- **Train NSOs** to produce e-waste data for **monitoring of SDG 12.5.1**.
- Contribute to the development of **internationally comparable e-waste statistics**.
- **Inform** policy makers, industries, and business about regional e-waste data.
- Support the development of national and regional counter-measures through policies, regulations, awareness raising and industrial response.



Scope and outline

Statistics

Legislation

Management infrastructure



Monitor Features



1. What is E-waste?

Definition, product categories, disposal routes, key issues



2. Methodology

Statistics, Management Assessment, Sources



3. Regional Overview Legislation and Systems

Status, International Agreements, Stakeholders, Projects



4. Statistics

EEE POM and E-waste Generated, Categories, ESM



5. Transboundary Movement

Policies, Quantities, Issues and Impacts



6. Management Assessment

Comparative Performance Review



7. Common Issues

Five Driving Reasons



8. Recommendations



9. Country Profiles

Country focus



- National legislation
 - E-waste legislation
 - EPR
 - E-waste standards
 - MEAs



- Key national e-waste statistics
 - EEE POM
 - E-waste generated
 - E-waste collection rate
 - E-waste import/export



- E-waste management system
 - PROs
 - Collection network
 - Recycling facilities



- Stakeholders mapping



Albania

Country Profile
 UN Population: 2,900,000 (2021)
 GDP: 17.5 billion USD (2021)
 Average Yearly Rainfall: 1,200 mm (2021)

Waste Management
 National Legislation: Law No. 100/2017
 National Strategy: Strategy for the Implementation of the Waste Management Law No. 100/2017
 Product Coverage: All types of waste, except hazardous waste

Waste Generation
 Total Waste: 1,100,000 tons/year
 Municipal Waste: 800,000 tons/year
 Industrial Waste: 300,000 tons/year
 Agricultural Waste: 100,000 tons/year

Waste Treatment
 Landfill: 100,000 tons/year
 Incineration: 50,000 tons/year
 Recycling: 100,000 tons/year
 Other: 850,000 tons/year

Waste Management System
 PROs: 10
 Collection Network: 100
 Recycling Facilities: 10



Bosnia and Herzegovina

Country Profile
 UN Population: 3,500,000 (2021)
 GDP: 25 billion USD (2021)
 Average Yearly Rainfall: 1,800 mm (2021)

Waste Management
 National Legislation: Law No. 100/2017
 National Strategy: Strategy for the Implementation of the Waste Management Law No. 100/2017
 Product Coverage: All types of waste, except hazardous waste

Waste Generation
 Total Waste: 1,500,000 tons/year
 Municipal Waste: 1,000,000 tons/year
 Industrial Waste: 500,000 tons/year
 Agricultural Waste: 100,000 tons/year

Waste Treatment
 Landfill: 100,000 tons/year
 Incineration: 50,000 tons/year
 Recycling: 100,000 tons/year
 Other: 850,000 tons/year

Waste Management System
 PROs: 10
 Collection Network: 100
 Recycling Facilities: 10



Montenegro

Country Profile
 UN Population: 600,000 (2021)
 GDP: 5 billion USD (2021)
 Average Yearly Rainfall: 1,800 mm (2021)

Waste Management
 National Legislation: Law No. 100/2017
 National Strategy: Strategy for the Implementation of the Waste Management Law No. 100/2017
 Product Coverage: All types of waste, except hazardous waste

Waste Generation
 Total Waste: 200,000 tons/year
 Municipal Waste: 150,000 tons/year
 Industrial Waste: 50,000 tons/year
 Agricultural Waste: 10,000 tons/year

Waste Treatment
 Landfill: 100,000 tons/year
 Incineration: 50,000 tons/year
 Recycling: 100,000 tons/year
 Other: 850,000 tons/year

Waste Management System
 PROs: 10
 Collection Network: 100
 Recycling Facilities: 10



North Macedonia

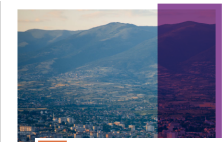
Country Profile
 UN Population: 2,100,000 (2021)
 GDP: 10 billion USD (2021)
 Average Yearly Rainfall: 1,200 mm (2021)

Waste Management
 National Legislation: Law No. 100/2017
 National Strategy: Strategy for the Implementation of the Waste Management Law No. 100/2017
 Product Coverage: All types of waste, except hazardous waste

Waste Generation
 Total Waste: 1,000,000 tons/year
 Municipal Waste: 700,000 tons/year
 Industrial Waste: 300,000 tons/year
 Agricultural Waste: 100,000 tons/year

Waste Treatment
 Landfill: 100,000 tons/year
 Incineration: 50,000 tons/year
 Recycling: 100,000 tons/year
 Other: 850,000 tons/year

Waste Management System
 PROs: 10
 Collection Network: 100
 Recycling Facilities: 10



Serbia

Country Profile
 UN Population: 7,000,000 (2021)
 GDP: 50 billion USD (2021)
 Average Yearly Rainfall: 1,200 mm (2021)

Waste Management
 National Legislation: Law No. 100/2017
 National Strategy: Strategy for the Implementation of the Waste Management Law No. 100/2017
 Product Coverage: All types of waste, except hazardous waste

Waste Generation
 Total Waste: 2,000,000 tons/year
 Municipal Waste: 1,500,000 tons/year
 Industrial Waste: 500,000 tons/year
 Agricultural Waste: 100,000 tons/year

Waste Treatment
 Landfill: 100,000 tons/year
 Incineration: 50,000 tons/year
 Recycling: 100,000 tons/year
 Other: 850,000 tons/year

Waste Management System
 PROs: 10
 Collection Network: 100
 Recycling Facilities: 10

UN Environment Unitar
REGIONAL E-WASTE MONITOR
 for the Western Balkans
 — 2023



Overview on the legislative framework

Country	Legislation/ regulation specific on e-waste*	Extended Producer Responsibility (EPR) legislation relating to e-waste	E-waste environmental health and safety (EHS) standards	Collection target
Albania	✓	✗	✓	⌚
Bosnia Herzegovina	✓	✓	✓	✓
Montenegro	✓	✗	✓	⌚
North Macedonia	✓	✓	✓	✓
Serbia	✓	⚙️	✓	✓

✓ present ✗ EPR legislated but not yet implemented ⚙️ EPR legislated with implementation in progress ⌚ expired target

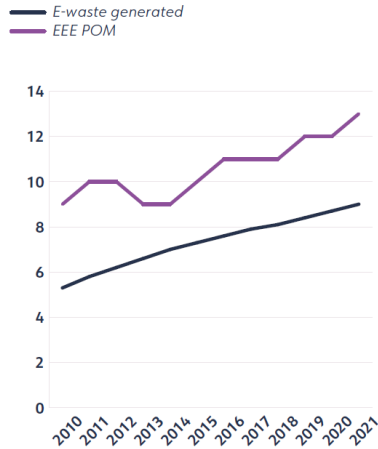
INTERNATIONAL AGREEMENT	ALBANIA	BOSNIA AND HERZEGOVINA	MONTENEGRO	NORTH MACEDONIA	SERBIA
Basel Convention	✓	✓	✓	✓	✓
Rotterdam Convention	✓	✓	✓	✓	✓
Stockholm Convention	✓	✓	✓	✓	✓
Minamata Convention	✓	✗	✓	✓	⚙️
Sofia Declaration on the Green Agenda	✓	✓	✓	✓	✓

✓ ratified ⚙️ signed ✗ not ratified; not signed

- All the countries have **specific e-waste legislation in place**, but only **two have EPR related to e-waste** functioning, while others are working towards EPR implementation.
- All the countries have **e-waste management standards legislated**, but information is not available on the actual implementation.
- E-waste **collection targets** are provided for in all countries, though in Albania and Montenegro they have now expired.
- All countries have ratified the Basel, Rotterdam, and Stockholm Conventions, but not the Minamata Convention on Mercury, which Bosnia and Herzegovina is yet to sign.

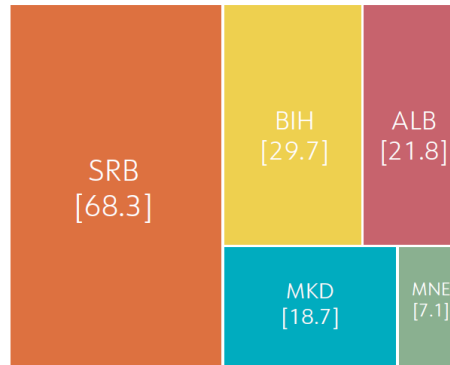
Overview on e-waste statistics

Regional EEE POM vs E-waste generated (kg/inh)



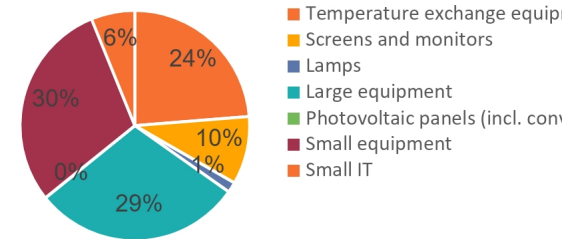
- From 2010 to 2021, the amount of **EEE POM** in the region increased from **9 kg/inh to 13 kg/inh**, while **e-waste generated** increased from **5 kg/inh to 9 kg/inh**.

E-waste generated per country in the region (kt)



- In absolute terms, Serbia is the **largest generator** of e-waste in the region (68 kt), but looking at the amount per capita then Montenegro is generating more (11 kg/inh).

Regional E-waste generated per six category in 2021 (%)

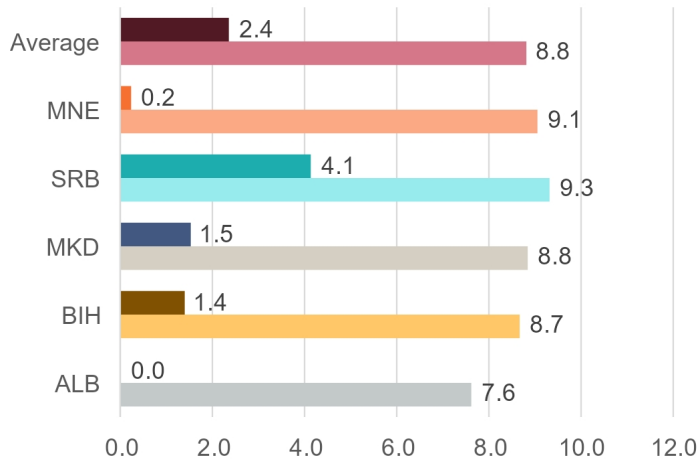


- Large equipment** (Cat. IVa) and **small equipment** (Cat. V) are the greatest categories of e-waste generated at **59% in total** (Cat. IVa 29%, Cat. V 30%).

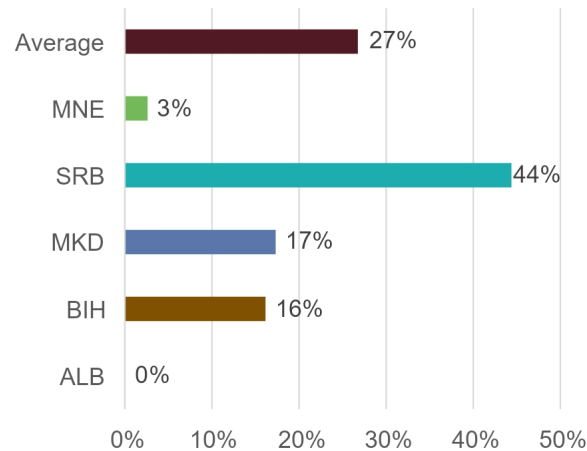
Overview on e-waste statistics

- The Western Balkans have **collected and managed 38.4 kt (2.4 kg/inh) of e-waste in 2021**, which gives a **total collection rate of 27%**.
- E-waste collection mainly occurs in Serbia, North Macedonia and Bosnia and Herzegovina.

E-waste generated and e-waste collected (kg/inh)



E-waste collection rate (%)



145 kt

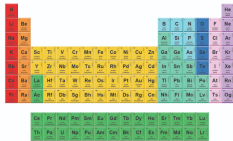


38 kt

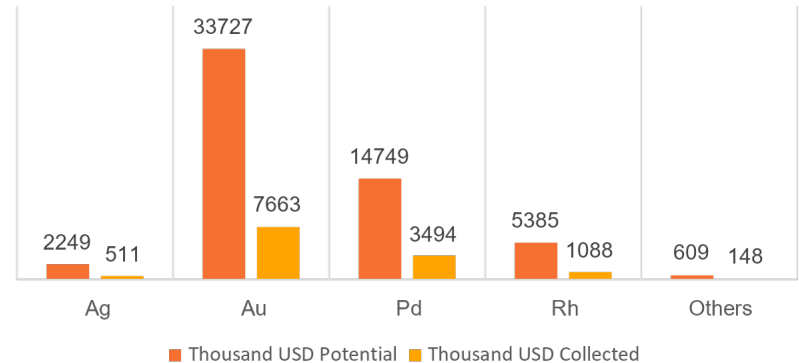
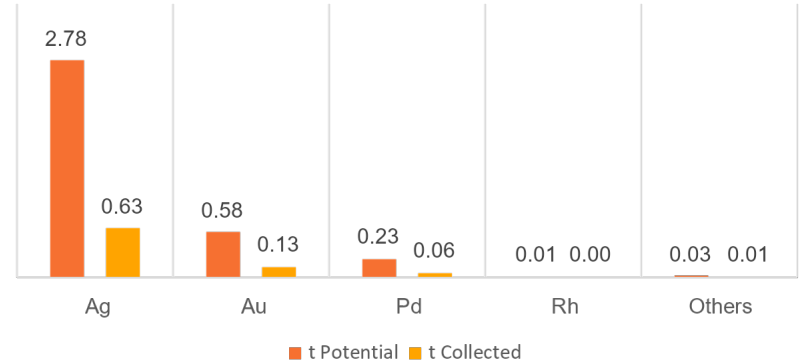
27% average
e-waste
collection rate
in the region

E-waste economic value

- Regionally, in 2021, **\$144 million USD (18 kt)** of secondary raw materials embedded in the e-waste were potentially available, out of which **\$34 million USD (4.2 kt)** was collected and recovered.



- Precious metals collected in 2021 versus their collection potential in tonnes (above), and their monetary value (below) in thousands of USD. Ir, Os, Pt and Ru are clustered as others.



Transboundary movement

- Western Balkan countries are all party to the **Basel Convention**, but **national reporting** on transboundary movement of e-waste is still **limited**
- Most of the countries have implemented specific **e-waste import bans**, while e-waste export and transit are allowed



This likely does not provide a complete picture of TBM of e-waste in the region



Limited data of TBM of e-waste through the Basel Convention poses the basis for illegal movements.



Common challenges

Non-
implemented
EPR and poor
system
monitoring/
supervision

Lack of reliable
data

Shortage of
collection
infrastructure
and non-
separation
collection of e-
waste

Insufficient
network of
treatment
facilities

Dominance of
informal sector

Environmental
and health
concern from
informal
activities

Inflows of used
EEE into the
region and non-
documentation
of TBM of e-
waste

Poor consumer
awareness &
knowledge of
waste codes
among
operators

Recommendations

Prevent e-waste, decoupling growth and e-waste generation, favoring reuse and repair over recycling

Increase awareness on the e-waste challenge

Increase the number of accessible e-waste collection points and define targets and indicators

Enforce and monitor e-waste management standards in all countries

Integrate the informal sector actors through collection incentives

Provide tailored and targeted training for different stakeholder groups

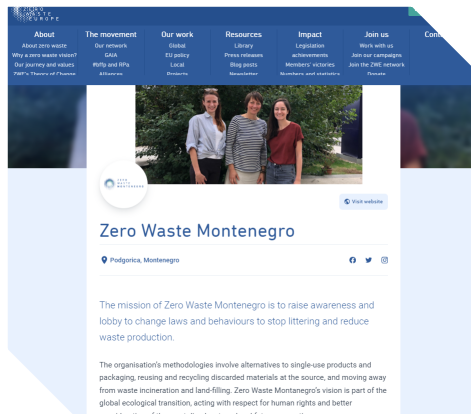
Projects, campaigns and initiatives



Education at the Children's Cultural Center

17 Nov. 2020

How natural resources are important and how we can preserve them by recycling, is necessary to learn from an early age. In this regard, on the occasion of the competition "Strong Green" published by BOS - Belgrade Open School and MIS - Young Researchers of Serbia, in cooperation with the Most Grad Children's Cultural Center, a theatrical workshop was held for preschool children. And what



Zero Waste Montenegro

Podgorica, Montenegro

The mission of Zero Waste Montenegro is to raise awareness and lobby to change laws and behaviours to stop littering and reduce waste production.

The organisation's methodologies involve alternatives to single-use products and packaging, reusing and recycling discarded materials at the source, and moving away from waste incineration and land-filling. Zero Waste Montenegro's vision is part of the global ecological transition, acting with respect for human rights and better

Akcija "Keš za treš" prikupila oko 600.000 ZA ANIKU

24.10.2020.

BRUŠTVO



foto: grvinfo.rs



Video 10 on TV24 for a one-hour discussion on the topic "Safe practices in e-waste



Social networks

Search

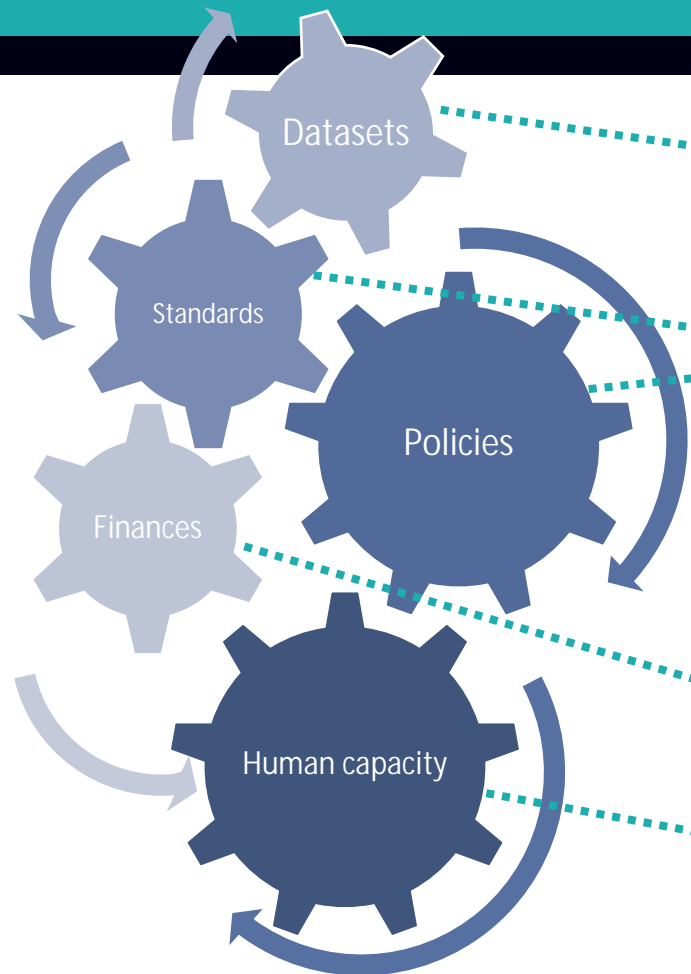


Mission and vision Our Team Existing problem Our strate,



REDI Recycling is a Start-up social enterprise which aims to organize and employ individual Roma collectors, while establishing a system for primary waste separation in households and companies

Five gears for sustainable e-waste management



145 kt of e-waste is generated each year
Grows rapidly with 6 kt per year
27% is environmentally managed

All countries have environmental health and safety standards and regulations on e-waste
73% of e-waste is not managed under those standards, leading to 14 kt of secondary raw materials lost (Fe, Al, Cu, Au, Pd, etc.), and more than 484 kt CO₂-eq emissions due to unmanaged refrigerants (e.g. CFCs, HCFCs, HFCs, etc.)

144 million USD of potential value of secondary materials
34 million USD are collected and recycled
Every year 110 million USD of losses of resources, and even larger hidden costs for the environment, which can be prevented with EPR schemes

Large informal sector
Low consumer awareness
Inadequate e-waste collection and recycling systems

Overview for the Western Balkans from the Regional E-waste Monitor



REGIONAL E-WASTE MONITOR
for the Western Balkans
— 2023



Whole package for the region

Facilitate policy decisions and improving legislation



- Extending statistical timeseries to 2050 under various scenarios + option for e-waste management
- Stakeholder consultations improving and harmonizing legislation

Regional waste transboundary flows monitoring



- Analysis and mapping on controlled and uncontrolled transboundary movements of e-waste and waste batteries in the region
- Recommendations on better data reporting and monitoring



Businesses case development for e-waste recycling, creating level playing field on e-waste standards

- Assessment on recovery + recyclability of e-waste into secondary raw materials to find business opportunities
- Overall environmental and economic assessment of e-waste recycling



Capacity building

- E-waste Academy for Managers and students (EWAM and EWAS)
- Business Bootcamps
- Further trainings on waste statistics

Potential achievements

Some examples

- ✓ Introduce more regulatory tools (e.g. E-waste collection categories, targets, etc.)
- ✓ Improve the reporting under the Basel Convention
- ✓ Create a national baseline for monitoring e-waste over time
- ✓ Comply with the requirements of the EU Directive 2012/19/EU
- ✓ Progressing towards the SDGs indicators



Regional E-waste Monitor for the Western Balkans - online



REGIONAL E-WASTE MONITOR

for the Western Balkans

— 2023



ITU,
UNEP
and
UNITAR
network



<https://ewastemonitor.info/regional-e-waste-monitor-for-the-western-balkans-2023/>



<https://www.scycle.info/regional-e-waste-monitor-for-the-western-balkans-2/>



<https://wedocs.unep.org/20.500.11822/44316>



<https://www.itu.int/hub/publication/d-hdb-e-waste-2023-wb/>

G. Iattoni, I.C. Nnorom, D. Toppenberg, R. Kuehr, C.P. Baldé. Regional E-waste Monitor for the Western Balkans – 2023. International Telecommunication Union (ITU), United Nations Environment Programme (UNEP) and United Nations Institute for Training and Research (UNITAR) – SCYCLE Programme.

Other related projects

The Global E-waste Monitor 2024

Cornelis P. Baldé, Ruediger Kuehr, Tales Yamamoto, Rosie McDonald, Elena D'Angelo, Shahana Althaf, Garam Bel, Otmar Deubzer, Elena Fernandez-Cubillo, Vanessa Forti, Vanessa Gray, Sunil Herat, Shunichi Honda, Giulia Iattoni, Deepali S. Khatriwal, Vittoria Luda di Cortemiglia, Yuliya Lobuntsova, Innocent Nnorom, Noémie Pralat, Michelle Wagner (2024). International Telecommunication Union (ITU) and United Nations Institute for Training and Research (UNITAR). 2024. Global E-waste Monitor 2024. Geneva/Bonn.

[Link](#)

National E-waste Monitor and roadmap for Kazakhstan

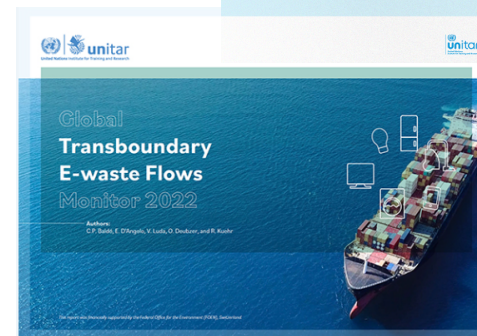
United Nations Institute for Training and Research / Ministry of Ecology and Natural Resources of the Republic of Kazakhstan / Center Cooperation for Sustainable Development. National E-waste Monitor 2023 - Kazakhstan, 2023, Bonn/Astana/Almaty

[Link](#)

The Global Transboundary E-waste Flows Monitor 2022

C.P. Baldé, E. D'Angelo, V. Luda O. Deubzer, and R. Kuehr (2022), Global Transboundary E-waste Flows Monitor - 2022, United Nations Institute for Training and Research (UNITAR), Bonn, Germany.

[Link](#)



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Thank you for your
interest and
attention!