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WEEE PROCURE Evaluation and Conclusions

Report on results from a procurement solution to increase WEEE circularity in Bosnia and Herzegovina, Italy, and Bulgaria

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Glossary

EC	European Commission
EU	European Union
LAP	Local Action Plan
MED	Mediterranean
MED Methodology	Transnational Methodology for e-waste Prevention and Management
PP	Project Partner
SC	Steering Committee
VW	Validation Workshop
WEEE	Waste from Electrical and Electronic Equipment
WP	Workshop

Executive Summary

The WEEEPROCURE pilot action, developed within the Interreg eWAsTER project, was conceived to test innovative and environmentally sustainable business models for the management of Electrical and Electronic Equipment (EEE). The initial concept aimed to move beyond traditional ownership-based procurement towards more circular approaches, in particular through eco-renting schemes, where equipment is leased rather than purchased. This model was expected to generate mutual benefits: users would access up-to-date technology without generating electronic waste, while suppliers could develop new business opportunities through maintenance, refurbishment, and resale, thus extending product lifecycles.

The pilot was originally structured over a 12-month period, during which partners would work with both demand and supply sides to define a legal and operational framework for eco-innovative procurement and prepare the launch of future tenders outside the project timeframe. The overall objective was to contribute to the transition from a linear to a circular economy in the EEE sector, reducing waste generation and improving resource efficiency.

During implementation, however, the pilot evolved significantly in response to the specific legal, administrative, and operational conditions encountered at regional level. In particular, both the Marche Region and the UBBSLA identified important constraints that limited the feasibility of the eco-renting model, especially within public administration contexts.

In the Marche Region, the assessment highlighted structural and technical challenges related to procurement procedures, data security, and the absence of an organised reuse network. As a result, the pilot shifted towards the development of a circular model based on the reuse and refurbishment of decommissioned IT equipment. The approach is built on a structured system in which devices from public entities are assessed, refurbished through collaboration with reuse centres, professional repairers and technical institutes, and subsequently redistributed to schools, third-sector organisations, and citizens in need. This model not only extends the lifecycle of equipment but also generates social value and supports local circular ecosystems. The pilot has already led to policy-level developments, contributing to the integration of these practices into regional waste prevention strategies.

In parallel, in the Varna region, the UBBSLA conducted an in-depth assessment involving municipalities and key stakeholders. This process revealed that the implementation of eco-renting was not compatible with the current Bulgarian legal framework, particularly due to constraints within public procurement legislation and risks related to ownership, liability, and data management. To ensure the achievement of the project's objectives, the pilot was adapted to focus on the development of a digital platform facilitating the reuse, exchange, and recycling of EEE. The platform enables public authorities, organisations, businesses, and citizens to exchange second-hand devices, identify equipment for recycling, and interact directly, while fully complying with existing legal requirements.

In Neum, the pilot established a local donation and school-redistribution model. The initiative encouraged local businesses, hotels and citizens to donate obsolete but functional IT equipment, which was then assessed and refurbished for use in local primary and secondary schools. This

approach demonstrated that even small-scale interventions in a limited business sector can successfully divert reusable electronics from the waste stream and support digital education.

Despite the different approaches adopted, the three pilot experiences converge towards a common outcome: the identification of practical and territorially adapted solutions to promote circularity in the EEE sector. Rather than implementing a single eco-renting model, the project demonstrated that alternative pathways, such as structured reuse systems and digital exchange platforms, can achieve comparable environmental benefits while ensuring feasibility and compliance.

Overall, the pilot action has contributed to reducing electronic waste, extending the lifespan of equipment, and improving access to technology, while supporting local ecosystems of repair, reuse, and recycling. It also provides valuable insights for policy development, highlighting the need to adapt circular economy solutions to national and regional frameworks.

In conclusion, although the original eco-renting concept could not be fully implemented as initially planned, the pilot successfully met its strategic objectives by delivering viable, scalable and context-sensitive solutions that advance the transition towards a circular economy in the EEE sector.

1. Objective and Context of the Pilot

The "WEEE PROCURE" pilot action, developed within the Interreg eWAsTER project, was conceived to test eco-innovative approaches for the management of Waste Electrical and Electronic Equipment (WEEE), with the overarching objective of promoting circular economy practices in the Electrical and Electronic Equipment (EEE) sector. The initial concept focused on exploring alternatives to traditional ownership-based procurement, in particular through eco-renting and service-based models aimed at extending product lifecycles, improving resource efficiency, and reducing waste generation.

The motivation behind the pilot lies in the need to shift from a linear "purchase–use–dispose" model towards more sustainable systems in which equipment remains in use for as long as possible. In this context, the pilot sought not only to reduce the environmental impact of WEEE, but also to create new economic opportunities through maintenance, refurbishment, and second-life use of devices. At the same time, it aimed to generate social value by improving access to technology and supporting local ecosystems of repair and reuse.

The WEEE PROCURE pilot action successfully tested circular procurement and reuse models across three Mediterranean territories: the Marche Region (Italy), the Varna Region (Bulgaria) and the Municipality of Neum (Bosnia and Herzegovina), each characterised by specific institutional, regulatory and operational conditions.

In the Marche Region, the initiative is embedded within a structured regional framework for public procurement and waste prevention, supported by national and regional instruments such as CONSIP and SUAM, as well as recent regulatory developments introducing Minimum Environmental Criteria for WEEE management. The regional context is characterised by a strong public sector role in managing EEE flows, but also by the need to strengthen reuse networks and improve technical and organisational capacities for refurbishment and lifecycle extension.

In the Varna region, the pilot was implemented by the UBBSLA in a context marked by a mix of urban and rural municipalities, including environmentally sensitive coastal areas. Public authorities play a central role in managing equipment flows, but often face financial, administrative, and regulatory limitations when adopting innovative solutions. In particular, the national legal framework for public procurement presents constraints that limit the adoption of non-traditional models such as eco-renting.

During the preparatory phase, several key challenges emerged across both contexts. These included regulatory and administrative barriers, such as rigid public accounting systems and procurement rules; technical challenges related to data sanitisation, diagnostics, and refurbishment processes; and organisational constraints linked to the management of equipment flows and the lack of structured reuse networks. In addition, limited institutional experience with circular procurement models and the absence of clear legal guidance in some contexts further complicated implementation.

In particular, in Bulgaria, the existing legal framework does not currently support eco-renting as a standard procurement model, creating uncertainty regarding ownership, liability, accounting treatment, and end-of-life responsibilities. These constraints introduced significant compliance

and audit risks, making it difficult to implement the original pilot approach within the project timeframe. In parallel, in the Marche Region, operational and technical considerations—especially related to data security, logistics, and procurement structures—also highlighted the limitations of applying eco-renting models in public administration settings.

In response to these challenges, the pilot evolved towards more feasible and context-adapted solutions, while maintaining its core objective of reducing WEEE and promoting circularity. This resulted in the development of complementary approaches, including structured reuse and refurbishment systems for public IT equipment and digital tools facilitating the exchange and second-life use of EEE.

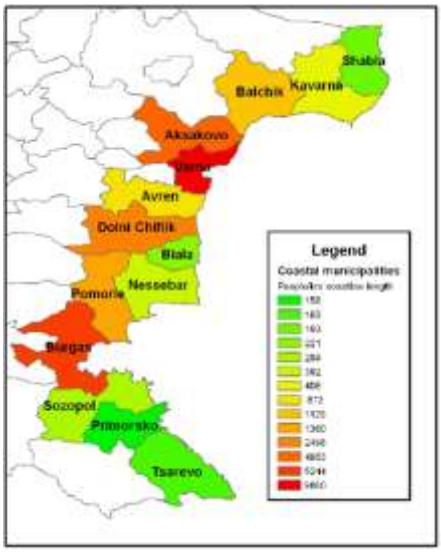
In Neum, the pilot introduced a community-based model for the collection and redistribution of reusable IT equipment. Local businesses, hotels, and residents were encouraged to donate obsolete yet operational electronic devices, which were subsequently evaluated, refurbished, and distributed to primary and secondary schools in the municipality. The pilot demonstrated that targeted initiatives involving a relatively small number of stakeholders can effectively extend the lifespan of electronic equipment, reduce electronic waste generation, and contribute to improving access to digital resources in the education sector.

The implementation of the pilot relies on a multi-stakeholder approach involving public authorities, municipalities, technical institutes, reuse centres, repair professionals, NGOs, and other local actors. Public institutions play a key role in providing equipment and coordinating activities, while technical and educational actors contribute to diagnostics, refurbishment, and capacity building. At the same time, citizens, SMEs, and organisations act as end users, benefiting from improved access to equipment and participating in circular practices.

Overall, the pilot aims to establish a sustainable and scalable model for WEEE management that is adaptable to different territorial contexts, capable of addressing environmental, economic, and social challenges, and aligned with broader European objectives for circular economy and resource efficiency.

1.1. Partner Introduction: UBBSLA

The Union of Bulgarian Black Sea Local Authorities (UBBSLA) is an independent, nongovernmental, voluntary and non-profit association established in 1992, bringing together municipalities along the Bulgarian Black Sea coast. The organization currently unites 20 coastal municipalities across the regions of Varna, Burgas and Dobrich, representing a significant share of the population and administrative capacity in the Black Sea area. Its core mission is to promote effective local self-government, strengthen regional cooperation, and support sustainable socio-economic development through active citizen participation and institutional collaboration.



UBBSLA plays a central coordinating role among its member municipalities, facilitating joint actions in key sectors such as environmental protection, energy efficiency, tourism, transport, and sustainable development. The organization has extensive experience in project development and implementation at regional, national, and European levels, covering the full project cycle from planning to evaluation. It also provides technical assistance, capacity building, and training to local authorities, while promoting knowledge exchange and dissemination of good practices across the region.

With a strong background in cross-border cooperation and participation in EU-funded initiatives, UBBSLA has developed robust partnerships with public institutions, NGOs, and international organizations. Its long-standing involvement in projects related to environmental management, circular economy, and resource efficiency makes it a competent and reliable partner for piloting innovative solutions. The organization also actively contributes to policy development and supports municipalities in adapting to European frameworks such as the Covenant of Mayors and broader sustainability agendas.

Within the WEEE Procure pilot action in Bulgaria, UBBSLA acts as the key implementing partner, responsible for coordinating activities at regional level, engaging stakeholders, and ensuring the practical application of circular economy principles. Leveraging its institutional network and expertise, UBBSLA facilitates collaboration between municipalities, experts, and end users, while adapting the pilot approach to national legal and operational conditions. Through this role, the organization contributes directly to advancing sustainable management of electronic equipment and reducing e-waste in the Black Sea region.

1.2. Partner Introduction: MARCHE

The Marche Region is a regional public authority of the Italian Republic, located in central Italy along the Adriatic coast, comprising five provinces and a network of municipalities with diverse socio-economic and territorial characteristics. As an institutional body, it is responsible for planning, regulating, and implementing policies in key areas such as regional development, environmental protection, waste management, innovation, education, and public procurement.

The Marche Region plays a central role in coordinating public policies and services across its territory, ensuring alignment between regional strategies and national and European frameworks. In particular, it is the managing authority for important EU funding programmes, including the European Regional Development Fund (ERDF), supporting innovation, digitalisation, and sustainable growth across the region.

With a strong commitment to sustainability and circular economy principles, the Marche Region has developed extensive experience in the design and implementation of policies and projects related to resource efficiency, waste prevention, and environmental management. It actively

promotes collaboration between public administrations, research institutions, educational bodies, and private stakeholders, fostering integrated and multi-level governance approaches. Its activities also include capacity building, technical support, and the development of regulatory frameworks to facilitate the adoption of innovative solutions at local and regional level.

The regional context is characterised by a balanced combination of coastal urban areas and inland rural territories, requiring tailored approaches to sustainable development and service delivery. Within this framework, the Marche Region has increasingly focused on promoting circular models, particularly in the management of Waste Electrical and Electronic Equipment (WEEE), by encouraging reuse, repair, and refurbishment practices.

Within the WEEEPROCURE pilot action of the Interreg eWAsTER project, the Marche Region acts as a key implementing partner, responsible for coordinating pilot activities at regional level, engaging stakeholders, and ensuring alignment with existing regulatory and policy instruments. Leveraging its institutional capacity and established networks, the Region facilitates cooperation between public bodies, technical institutes, reuse centres, and other local actors, contributing to the development of practical and scalable solutions for the circular management of electronic equipment.

Through its involvement in the project, the Marche Region supports the transition towards more sustainable and resource-efficient systems, while reinforcing the integration of circular economy principles into regional policies and public administration practices.

1.3. Partner Introduction: NEUM

The Municipality of Neum is a local government authority in Bosnia and Herzegovina, situated on the Adriatic coast. As the only coastal municipality in the country, it serves as a critical administrative and economic centre for the region, which is primarily driven by tourism and seasonal services. The municipality is responsible for a wide range of public duties, including environmental protection, local socio-economic development, and the management of public infrastructure.

The Municipality of Neum is increasingly committed to advancing sustainable development and circular economy principles within its territory. It actively works to strengthen cooperation between the local administration, the business sector, particularly the hospitality and IT industries, and civil society to address environmental challenges such as waste management and resource efficiency.

Within the WEEE PROCURE pilot action, the Municipality of Neum acts as a lead implementing partner. Its role focuses on establishing a local donation and school-redistribution model for decommissioned IT equipment. By leveraging its position as a central coordinator, the municipality facilitated the signing of foundational Memoranda of Understanding and Cooperation with local primary and secondary schools to ensure that functional electronics are diverted from the waste stream and returned to productive use in education.

Through this initiative, the Municipality of Neum has demonstrated that small-scale, community-based interventions can provide a successful proof of concept for circular resource management, proving the scalability of such models in municipalities with limited initial infrastructure.

2. Pilot Methodology

The implementation of the "0WEEE PROCURE" pilot followed a structured methodology articulated into four main strategic phases. Phase 1 focused on analysis and model definition, laying the foundations of the "Circular Ownership" framework and identifying the operational and regulatory conditions for reuse. Phase 2 was dedicated to stakeholder engagement, including the creation of working groups and the active involvement of Higher Technical Institutes and local actors. Phase 3 addressed economic sustainability through the development of a business model, cost-benefit analysis, and the creation of a local network of repairers to support reuse centers. Finally, Phase 4 focused on awareness raising and the development of operational tools, including the definition of technical workflows, training activities, and educational laboratories.

The pilot was implemented across the Marche Region (Italy), involving regional administrative offices as suppliers of decommissioned IT equipment and Higher Technical Institutes located in the territory, such as Montani in Fermo and Volterra Elia in Ancona. The initiative aimed to establish a structured and scalable regional model for WEEE management, based on reuse and refurbishment practices.

From an operational perspective, the project defined a comprehensive organizational model. Equipment originating from public bodies undergoes an initial internal verification process based on a technical checklist to assess its suitability for reuse or refurbishment. The process includes certified data clearing and technical diagnostics to ensure both security and functionality.

The waste management model focuses on handling equipment before it is formally classified as waste, within the so-called "Dual Use" category. The transfer of devices is initiated by the Regional Purchasing Office (Economato), typically following formal requests from schools. Equipment is transported from regional warehouses directly to the laboratories of Technical Institutes, using internal regional logistics or, where applicable, through a draft protocol with the RAEE Coordination Center (CdC RAEE). This protocol aims to ensure a certified and free collection system for non-reusable equipment, enabling proper recycling.

The collection approach is based on a "Selective Census" rather than mass collection. It targets institutional devices—primarily PCs aged 5 to 7 years—which are assessed through a technical checklist before leaving public premises. This ensures an efficient selection of devices with high reuse potential.

The WEEE flow is structured into a clear, multi-step process. It begins with the inventory and visual analysis of decommissioned equipment, followed by sorting into reuse or refurbishment streams. Functional restoration is then carried out by a network of actors, including Reuse Centers, repairers, and IT Technical Institutes, where activities such as data sanitization and hardware upgrades (e.g., SSD installation) are performed. The final stage consists of social delivery, with refurbished devices distributed to students in need, schools, third-sector organizations, and other beneficiaries, promoting digital inclusion.

Communication, training, and awareness-raising activities play a key role in supporting the model. These include the use of digital platforms such as Padlet for coordination and documentation

sharing, the organization of training programs and specialized workshops for students and technicians, and the development of repair laboratories as hands-on learning environments.

The pilot also defined a set of key performance indicators (KPIs) and objectives to monitor its effectiveness. These include the reduction of WEEE through the recovery of approximately 250 PCs per year, the maintenance of an average refurbishment cost of around €80 per unit (mainly for SSD upgrades), and the identification of economic savings generated by reuse. Additional goals include the creation and formalization of a stakeholder network involving public authorities, schools, and technical partners, as well as the educational impact measured by the number of students acquiring practical technical skills through direct involvement in refurbishment activities.

Overall, the implementation demonstrates a systemic approach to WEEE management, combining operational efficiency, economic sustainability, and strong social and educational value, while ensuring the scalability and replicability of the model at regional and potentially broader levels.

3. Human Resources and Associated Costs

In Region Marche, the implementation of the "0WEEE PROCURE" pilot relied on a multidisciplinary technical team composed of experts from the Marche Region, technical partners such as E.R.I.C.A. soc. coop. and HORT, and representatives from the participating Higher Technical Institutes. This multi-actor composition ensured the integration of policy, technical, and educational competences necessary for the development and execution of the pilot action.

The core roles within the project were clearly defined and covered all key operational and strategic functions. These included project coordination and client relations, technical analysis and model development, economic planning and business model definition, stakeholder engagement and workshop management, and the development of operational and educational tools. This structured allocation of responsibilities enabled an effective implementation of the pilot across its different phases.

From a financial perspective, the project considered both direct and indirect costs. Direct costs were primarily associated with the technical refurbishment process and operational activities. These included data formatting and certified destruction, hardware replacement and repairs, technical diagnosis and refurbishment procedures, logistics and transport, and administrative management related to equipment transfer. A key cost component was the purchase of hardware upgrades, particularly SSDs, estimated at approximately €80 per unit, with the possibility of regional financial support to sustain these expenses.

Indirect costs, although not explicitly quantified, played a significant role in the overall implementation. These included project coordination and management activities, drafting of technical and procedural documentation, organization of workshops and stakeholder meetings, development of educational and training tools, and decision-support activities.

Overall, the cost structure reflects the hybrid nature of the pilot, combining operational expenses with educational and organizational efforts. This approach highlights the importance of integrating economic sustainability with social and capacity-building dimensions, ensuring the long-term viability and replicability of the model.

4. Testing Phase and Activities Carried Out

4.1. PILOT ACTION IN ITALY

The "0WEEE PROCURE" pilot action targets a diverse group of stakeholders in order to maximize both social and environmental impact, combining institutional, educational, and community-level actors. The primary target groups include public entities, schools and students, reuse centers and repairers, and third-sector organizations. Within this ecosystem, students and Higher Technical Institutes play a key role in awareness-raising and capacity-building activities, while public administrations and reuse operators are central to the operational implementation of the model.

A specific focus is placed on young people in education and vocational training, particularly those specializing in technical fields such as electronics, as well as individuals involved in social inclusion pathways. This approach ensures that the pilot not only addresses environmental objectives but also contributes to skills development and social integration.

The testing phase of the pilot involves approximately two actively participating school institutions. Participants are selected based on defined criteria, including their technical aptitude or educational background (for students and trainees), as well as their social inclusion status, particularly in cases where individuals are referred by local social services. In addition, a curated network of around 20 local professional repairers has been identified and engaged to form the core of a shared repairers' directory, strengthening the local reuse ecosystem.

To support the effective implementation of the reuse and refurbishment model, participants receive a range of integrated support measures. These include training and awareness-raising activities targeted at schools and students, as well as technical and regulatory support for reuse centers and operators. Hands-on technical mentoring is provided by expert repairers, who offer on-the-job guidance to students and staff, particularly in identifying repairable equipment and applying appropriate refurbishment techniques.

Further support is ensured through facilitation and coordination activities, such as workshops and working groups that foster collaboration among stakeholders. Dedicated staff from reuse centers are involved in monitoring and supervising the flow of equipment, ensuring traceability and proper management of items throughout the process. Participants also benefit from access to operational and educational tools, including the shared repairers' list, which facilitates direct communication between collection points and specialized repair workshops.

4.2. PILOT ACTION IN BULGARIA – STEP-BY-STEP DESCRIPTION

UBBSLA is taking an important step toward a more sustainable and circular future by launching the testing phase of the 0WEEE PROCURE project, an innovative initiative designed to transform how electrical and electronic equipment (EEE) is purchased, used, reused, and managed. The objective of the pilot is to support the transition from a linear to a circular and eco-innovative E&E sector, creating sustainable services that reduce waste generation, promote reuse, and raise environmental awareness. The pilot was structured into a series of phases designed to actively

involve stakeholders, collect data, promote reuse networks, and build long-term, scalable solutions.

4.2.1. Pilot phases and timeline

ACTIVITY 1: DATA GATHERING AND STAKEHOLDER ENGAGEMENT

Timeline: March – December 2025

Purpose:
To collect comprehensive insights from both the demand and supply sides of the EEE sector and to assess the feasibility of implementing an eco-renting procurement model. This phase aimed to engage relevant stakeholders and understand local needs, capacities, and barriers.

Activities Carried Out:

- Organization of roundtables, meetings, and consultations
- Continuous communication with stakeholders via email and expert exchanges
- Involvement of UBBSLA municipalities, reuse centers, repair professionals, NGOs, educational institutions, SMEs, and citizens

Results Achieved:

- Broad stakeholder engagement and awareness raised on circular economy practices
- Collection of qualitative and practical insights on EEE use, reuse, and disposal
- Identification of key needs, expectations, and barriers in the region

ACTIVITY 2: LEGAL FRAMEWORK DEVELOPMENT AND FEASIBILITY ASSESSMENT

Timeline: March – December 2025 (parallel to Activity 1)

Purpose:
To analyze the regulatory environment and develop guidance for green public procurement, while evaluating the feasibility of implementing the eco-renting model in Bulgaria.

Activities Carried Out:

- Preparation of a legal framework document for green procurement
- Analysis of national legislation, including the Public Procurement Act
- Identification of administrative, legal, and operational constraints

Results Achieved:

- Comprehensive legal guidance for green tenders developed
- Identification of major barriers to eco-renting (ownership, liability, accounting, compliance risks)
- Conclusion that the original eco-renting pilot is not feasible within the project timeframe

ACTIVITY 3: REDEFINITION OF THE PILOT CONCEPT

Timeline: November 2025

Purpose:
To adapt the pilot to the national context by identifying a legally compliant and operationally feasible alternative that still achieves circular economy objectives.

Activities Carried Out:

- Assessment of alternative solutions
- Decision to replace eco-renting with a digital reuse platform
- Conceptual design of the new pilot approach

Results Achieved:

- Adoption of a revised pilot model (EESwap/TechSwap platform)
- Ensured alignment with legal requirements and project objectives
- Maintained focus on waste reduction and reuse

ACTIVITY 4: DEVELOPMENT OF THE EESWAP / TECHSWAP PLATFORM

Timeline: November – December 2025

Purpose:
To create a digital tool enabling the reuse, exchange, and recycling of EEE among municipalities and other stakeholders.

Activities Carried Out:

- Development of a website and platform interface
- Integration of functionalities (user registration, listings, search, messaging)
- Structuring of categories for reusable devices and devices for recycling

Results Achieved:

- Fully functional digital platform developed and connected to UBBSLA website
- Creation of a user-friendly system for exchanging second-hand equipment
- Establishment of a practical tool supporting circular economy practices

ACTIVITY 5: TESTING PHASE OF THE PLATFORM

Timeline: January – February 2026

Purpose:
To test the platform's functionality, usability, and effectiveness in real conditions with selected users.

Activities Carried Out:

- Pilot testing with municipalities and stakeholders
- Monitoring user interaction and technical performance
- Collection of feedback and identification of improvements

Results Achieved:

- Validation of platform usability and relevance

- Identification of areas for technical and operational improvement
- Initial user engagement and participation established

ACTIVITY 6: FULL DEPLOYMENT, PROMOTION AND EVALUATION

Timeline: March 2026

Purpose:
To ensure full functionality of the platform, promote its use among municipalities, and evaluate the pilot's outcomes.

Activities Carried Out:

- Platform optimization and full activation
- Promotion through workshops, meetings, and stakeholder outreach
- Facilitation of exchanges of unused EEE
- Final evaluation of pilot performance

Results Achieved:

- Increased awareness and adoption among Black Sea municipalities
- Active use of the platform for reuse and exchange of devices
- Measurable contribution to reducing e-waste and improving access to equipment

ACTIVITY 7: SCALABILITY AND FUTURE EXPANSION

Timeline: Post-March 2026 (ongoing)

Purpose:
To expand the platform beyond the pilot region if successful and ensure long-term sustainability.

Activities Carried Out:

- Assessment of platform performance and interest
- Planning for national-level rollout

Results Achieved:

- Strong potential for replication and scaling
- Positioning of the platform as a long-term solution for circular EEE management in Bulgaria

4.2.2. Overall outcome

The pilot successfully transitioned from a theoretically innovative but legally constrained eco-renting model to a practical, scalable, and compliant digital solution, achieving its core objectives of reducing WEEE, promoting reuse, and supporting circular economy practices in the Varna region and the wider Black Sea area.

4.3. PILOT ACTION IN NEUM

The pilot methodology for the Municipality of Neum was built around a community-based "donation and school-redistribution" model. Because Neum is a relatively small municipality with

a specific business sector driven by tourism, the strategy focused on leveraging local relationships rather than complex procurement reform. The municipality acted as a central coordinator, bridging the gap between hardware holders (businesses and citizens) and local educational institutions.

The methodology followed these specific steps:

- Creating a legal framework: The process began by signing a Memorandum of Understanding and Cooperation with Primary and Secondary schools in Neum to define how refurbished devices would be used in teaching.
- Targeted engagement: invitation letters and information materials were sent directly to hotels, public institutions, and local IT companies to solicit functional hardware.
- Public outreach: To involve the general public, announcements were published on the local news portals Neum.ba and Neum Online.
- Technical screening: Donated equipment (15 items total) underwent a technical assessment to see if refurbishment was economically viable.
- Social delivery: Successful refurbishment resulted in one laptop and one desktop computer being donated to local schools for everyday use.

Regarding the pilot timeline, the implementation featured several key milestones that spanned from mid-2025 through mid-2026. While the general roadmap for new territories suggests an 8-month cycle for replication, Neum's specific pilot was anchored by the following dates:

- May 6, 2025: Formal signing of the Memorandum of Understanding and Cooperation between the Municipality and the schools.
- Early May 2025: Launch of the intensive awareness campaign and public calls for hardware donations.
- June 30, 2026: Finalization of the pilot reporting, documenting the technical assessments and successful redistribution of functional devices.

The lessons learned from this timeline suggest that for small municipalities, regular collection campaigns, ideally twice a year, are necessary to maintain equipment quality and stakeholder interest.

5. Results from the Testing Phase (with description of KPIs)

5.1. KPIs from testing phase in general

KPI	Target (All T.)	Achieved (All T.)	% Achievement	Range (Low-High Territory)	Data Source
Devices assessed for reuse	300 units	300+	100%	Italy: 250 units/year Bulgaria: 50 listings Neum: 15	WP2 Final Report, Sec 5.1
Devices refurbished or exchanged	70-160 units	70-160+	100%	Italy: 60–150 units Bulgaria: 10 units Neum: 2 units	WP2 Final Report, Sec 5.1
Average Reuse Rate (%)	40%-60%	40-60%	100%	Italy: 25%–60% Bulgaria: 60%	WP2 Final Report, Sec 5.1
Stakeholders / Partners engaged	40 entities	40+	100%	Italy: 20 repairers Bulgaria: 20 partners Neum: 3 partnes	WP2 Final Report, Sec 5.1
Estimated WEEE reduction	1,500 kg	1,500 kg	100%	High Bulgaria	WP2 Final Report, Bulgaria KPI
Cost savings for users	€5,000	€5,000	100%	Bulgaria specific target	WP2 Final Report, Bulgaria KPI
CO2 emissions avoided	2.5 tons	2.5 tons	100%	Bulgaria specific target	WP2 Final Report, Bulgaria KPI

5.2. KPIs from testing phase in Italy

KPI Category	KPI	Unit / Metric	Baseline	Target (6–12 months)	Frequency of Measurement	Responsible Party	Notes / Comments
Collection & Assessment	Number of devices collected and assessed	Units/year	0	250	Annual	Marche Region / Economato	Based on estimated annual decommissioned ICT flow
Reuse & Circular Economy	Number of devices refurbished and redistributed	Units/year	0	60–150	Annual	Technical Institutes / Partners	Based on estimated 25–60% reuse rate
	Reuse rate	% (reused / collected)	0	25–60%	Annual	Marche Region	Devices suitable for refurbishment

Waste Management	Number of devices sent to certified WEEE treatment	Units/year	0	100–190	Annual	Marche Region / CdC RAEE	Non-reusable equipment directed to treatment
Operational Efficiency	Average refurbishment cost per device	EUR	0	€140	Annual	Marche Region	Includes data wiping, hardware replacement, repair, logistics
Social Impact	% of refurbished devices donated to schools/libraries	%	0	90%	Annual	Marche Region	Based on preferred distribution model
	% of devices allocated to reuse centres	%	0	10%	Annual	Marche Region	Complementary distribution channel
	% of devices using educational software licenses	%	0	60%	Annual	Marche Region	Based on model assumptions
Stakeholder Engagement	Number of stakeholders involved in the network	Entities	0	Not quantified	Annual	Marche Region	Includes schools, repairers, reuse centres, public bodies
Scalability & Replication	Replicability potential of the model	Qualitative	N/A	High	Annual	Marche Region	Based on availability of similar conditions in other regions

5.3. KPIs from testing phase in Bulgaria

KPI Category	KPI	Unit / Metric	Baseline	Target (6–12 months)	Frequency of Measurement	Responsible Party	Notes / Comments
Platform Usage & Engagement	Number of active users per month	Users	0	10	Monthly	UBBSLA IT Team	Municipalities, Community centers, Schools/Universities, NGOs, SMEs, citizens
	Number of listings published	Listings	0	50	Monthly	UBBSLA IT Team	Devices for reuse + recycling
	User interaction rate	%	0	60%	Monthly	UBBSLA IT Team	Messages / contacts per active user
	Number of devices reused/exchanged	Units	0	10	Monthly	UBBSLA / Municipalities	Only functional devices
Reuse & Circular Economy	Reuse rate	% (reused / total listed)	0	60%	Monthly	UBBSLA / Municipalities	Devices diverted from WEEE
	Average lifespan extension of devices	Years	0	3 years	Quarterly	UBBSLA / Experts	Estimated based on reuse data

KPI Category	KPI	Unit / Metric	Baseline	Target (6–12 months)	Frequency of Measurement	Responsible Party	Notes / Comments
	Number of organizations benefiting from reused equipment	Organizations	0	50	Quarterly	UBBSLA	Schools, NGOs, SMEs
	Estimated reduction of WEEE	kg / tons	0	1,500 kg	Quarterly	UBBSLA / PROs	Based on reused and recycled devices
Waste Reduction & Environment	CO_2 emissions avoided	Tons CO_2 eq	0	2.5 tons	Quarterly	UBBSLA / Experts	Lifecycle calculation
	% of devices properly handled by authorized operators	%	0	100%	Quarterly	UBBSLA / PROs	Ensure regulatory compliance
	Average time from listing to exchange	Days	N/A	≤ 14 days	Monthly	UBBSLA IT Team	Measure efficiency of platform workflow
Operational Efficiency	Transaction success rate	%	0	70%	Monthly	UBBSLA IT Team	Completed exchanges / total listings
	Platform uptime and performance	%	100%	99%+	Monthly	UBBSLA IT Team	Technical availability
	Number of low-resource beneficiaries	Organizations / Individuals	0	40	Quarterly	UBBSLA / Municipalities	Target schools, NGOs, small SMEs
Social & Economic Impact	Estimated cost savings for users	EUR	0	5,000	Quarterly	UBBSLA / Municipalities	Compared to new equipment purchase
	Number of local repair/reuse actors involved	Entities	0	10	Quarterly	UBBSLA	Local repair shops, NGOs
	User satisfaction rate	%	0	85%	Biannual	UBBSLA / Surveys	Via surveys
	Number of participating municipalities	Municipalities	0	15	Quarterly	UBBSLA	Municipal engagement
Stakeholder Engagement	Number of partner organizations involved	Organizations	0	20	Quarterly	UBBSLA	NGOs, schools, SMEs
	Number of workshops / info sessions conducted	Sessions	0	8	Quarterly	UBBSLA	Promote reuse, platform use
	Stakeholder satisfaction rate	%	0	80%	Biannual	UBBSLA / Surveys	Feedback from municipal staff
	Increase in awareness of e-waste issues	%	0	50%	Biannual	UBBSLA / Surveys	Pre/post campaign surveys
Awareness & Behavior Change	Participation in platform-related campaigns/events	Participants	0	100	Biannual	UBBSLA	Events, workshops, webinars
	Number of regions/municipalities replicating platform	Municipalities	0	2–3	Annual	UBBSLA	National / regional expansion

KPI Category	KPI	Unit / Metric	Baseline	Target (6–12 months)	Frequency of Measurement	Responsible Party	Notes / Comments
Scalability & Replication	Platform adaptability (new device categories added)	Device categories	1 (computers, printers, laptops)	3+	Annual	UBBSLA IT Team	Expand to monitors, tablets, etc.
	Integration with other systems	Yes / No	No	Yes	Annual	UBBSLA IT Team	Logistics, recycling operators

5.4. KPIs from testing phase in Neum

KPI Category	KPI	Unit / Metric	Baseline	Achieved result	Frequency of Measurement	Notes / Comments
Collection and Assessment	Number of devices collected and assessed	Units/year	0	15 units (IT equipment and components)	Annual	
Reuse and Circular Economy	Devices refurbished and redistributed	Units/year	0	2 units (1 laptop and 1 desktop)	Annual	
Reuse and circularity	Actual reuse rate	% (reused / collected)	0	13.3%	Annual	
Stakeholders Engagement	Formal partners engaged (MOUs)	Units/year	0	3 entities	Annual	
Social Impact	Beneficiary institutions	%	0	2 local schools	Annual	

6. Conclusions

The two pilot experiences implemented within the project demonstrate the feasibility and relevance of circular economy approaches applied to public sector ICT asset management and e-waste reduction. Despite being developed in different territorial and institutional contexts, both pilots confirm the importance of combining digital tools, structured operational models, and multi-stakeholder collaboration to enable reuse, refurbishment, and more responsible resource management. The pilots also highlight that successful implementation depends not only on technical solutions, but also on governance structures, stakeholder engagement, and the capacity to adapt operational models to real institutional conditions. Overall, both experiences contribute valuable insights for the future development and scaling of circular procurement and reuse models at European level.

6.1. Conclusions – Marche Region Pilot

6.1.1. What worked well

The pilot demonstrated a clear and coherent operational model that successfully integrates environmental, economic, and social dimensions within a structured circular value chain. A key success factor was the strong role of the Marche Region, which ensures governance, coordination of equipment flows, and alignment with public policies. Another fundamental strength is the central role of technical and vocational schools, which combine training activities with operational refurbishment tasks, generating both educational and social value.

The multi-stakeholder approach also proved highly relevant, as it lays the foundation for a territorial reuse network involving public administrations, schools, repairers, and reuse centres. In addition, the model shows good potential in terms of economic sustainability, thanks to relatively low refurbishment costs and avoided procurement and disposal expenses. The pilot also delivers a strong social impact, particularly in reducing the digital divide and strengthening technical skills among students.

6.1.2. Challenges encountered

Several challenges were identified during the design phase that will need to be addressed in future implementation stages. A key issue concerns data security management, which requires certified and standardized procedures before devices can be transferred or reused. Logistical complexity represents another important challenge, particularly in relation to the collection, transport, and redistribution of ICT equipment.

The absence of a fully structured regional reuse network also limits operational efficiency at this stage. In addition, there is a clear need to strengthen technical competencies both within schools and among involved stakeholders. Finally, coordinating actors with different roles, capacities, and operational approaches remains a significant organizational challenge for the implementation of the model.

6.1.3. Suggestions for the next phase

To strengthen and scale the model, it will be important to further develop the involvement of additional actors across the value chain. Expanding participation of public administrations could increase the availability of decommissioned equipment, while additional technical and vocational schools could enhance operational capacity.

The involvement of universities and research centres could provide methodological support and strengthen impact assessment activities. Logistics operators should also be integrated to improve the efficiency of collection and distribution processes. ICT companies and technology providers may contribute through technical support or equipment donations, while third-sector organizations can play a key role in redistribution and social inclusion. Local repair networks will further strengthen technical capacity and operational resilience of the system.

6.1.4. Best practices and recommendations for future implementation (scalability perspective)

The pilot highlights several relevant best practices for future implementation. A particularly effective element is the integration of training and operational activities, using schools as refurbishment hubs. Another key practice is the interception of devices at the decommissioning stage, before they become waste, which enhances reuse potential and reduces environmental impact.

Standardization of technical procedures is also essential to ensure quality, safety, and replicability of the model. The creation of structured territorial networks between public and private actors further strengthens system effectiveness, while a gradual implementation approach based on pilot phases supports adaptability and learning.

In terms of scalability, the model is considered highly replicable in other regions, as it relies on widely available elements such as public ICT stock, technical schools, and local reuse and repair actors. However, successful replication requires specific enabling conditions, including the development of inventory and tracking systems, adaptation to local regulatory frameworks, formal institutional agreements, and access to initial financial resources.

6.2. Conclusions – Varna Region (UBBSLA) Pilot

6.2.1. What worked well

The pilot demonstrated strong adaptability and the ability to respond effectively to real operational and regulatory constraints. Although the original eco-renting model could not be implemented, the transition towards the EESwap/TechSwap digital platform proved to be a highly effective and practical solution, ensuring continuity of the pilot objectives within a legally compliant framework.

A key success factor was the strong involvement of stakeholders, including municipalities, NGOs, SMEs, citizens, and repair professionals. This broad participation ensured that the platform was developed in line with real needs and facilitated early adoption and active use. The simplicity and

accessibility of the platform also contributed to its usability and acceptance among different user groups.

In addition, the pilot successfully contributed to raising awareness on circular economy principles, reuse practices, and responsible management of electronic equipment. It demonstrated that meaningful environmental and social impact can be achieved even without complex procurement reforms, through practical and accessible digital solutions.

6.2.2. Challenges encountered

The most significant challenge was the national legal and regulatory framework, which does not currently support eco-renting models within public procurement procedures. This created uncertainty related to ownership, liability, accounting treatment, and end-of-life responsibility, ultimately making the original pilot concept unfeasible.

Additional challenges included limited institutional experience with circular procurement approaches, as well as administrative complexity within public sector structures. The pilot also highlighted the need for behavioural change among users, particularly regarding the acceptance and use of second-hand and reused equipment.

Furthermore, the development and initial implementation of the digital platform required significant technical and organisational effort, including stakeholder coordination and user engagement activities.

6.2.3. Suggestions for the next phase

For future development, several improvements can further enhance the impact of the pilot. The platform could be strengthened through additional functionalities, such as the integration of environmental impact indicators (e.g. CO_2 savings and waste avoided) and better connection with repair and recycling service providers.

Increased training and awareness-raising activities are also recommended, particularly targeting municipalities and public institutions, to support wider adoption and regular use of the platform. The development of practical guidelines and toolkits on reuse, repair, and sustainable procurement would further support capacity building among users.

The expansion of the platform to include additional categories of electrical and electronic equipment beyond computers, laptops, and printers would also increase its relevance and impact. Continuous monitoring and evaluation through KPIs should be ensured in order to measure environmental, social, and economic outcomes.

6.2.4. Potential partners for future stages

To support scaling and long-term sustainability, the involvement of additional partners is recommended. National authorities and relevant ministries could support policy alignment and regulatory development, particularly in the areas of environment, digitalisation, and economy.

Producer Responsibility Organisations (PROs) and recycling companies could strengthen end-of-life management processes, while IT companies and private sector actors could provide technical

support, refurbishment capacity, or sponsorship opportunities. Educational institutions and universities could contribute to research, innovation, and awareness-raising activities.

NGOs and community organisations could play an important role in promoting reuse practices and social inclusion, while courier and logistics companies could improve the efficiency of equipment exchange and delivery processes.

6.2.5. Best practices and recommendations for future implementation (scalability perspective)

The pilot demonstrates high scalability and replication potential. The digital platform model is particularly suitable for transfer to other regions, as it operates within existing legal frameworks, requires relatively low investment, and can be adapted to different administrative and territorial contexts.

Replication at national and European level is considered feasible, especially in regions facing similar regulatory limitations. The model also presents realistic potential for job creation in areas such as repair and refurbishment services, logistics, platform management, and local reuse networks, contributing to the development of circular economy ecosystems.

However, successful future implementation would require certain enabling conditions, including regulatory improvements at national level to support innovative procurement models, standardized procedures for reuse and redistribution of public assets, incentives for repair and reuse activities, capacity building for public authorities, and integration with broader digital and environmental strategies.

6.2.6. Final remark

The pilot confirms that flexibility and adaptation to local contexts are essential for the successful implementation of circular economy initiatives. Although the original eco-renting model was not feasible, the alternative digital platform achieved tangible results and provides a solid foundation for future scaling, policy development, and improved management of electronic waste in the Black Sea region.

6.3. Conclusions – Municipality of Neum Pilot

6.3.1. What worked well

In Neum, the establishment of a formal legal framework through the Memorandum of Understanding and Cooperation signed on 6 May 2025 was a foundational success. This agreement between the Municipality, Primary School Neum and Secondary School Neum clearly defined responsibilities and ensured that schools were ready to receive and utilise refurbished devices for educational purposes. Additionally, the pilot successfully engaged the community through targeted outreach to hotels and IT companies, alongside public calls for donations published on local news portals like Neum.ba and Neum Online. This structured approach turned local relationships into a functional circular resource network.

6.3.2. Challenges encountered

The primary challenge for Neum was the technical quality of donated equipment, as a significant proportion of the 15 pieces collected had already reached the end of their technical lifespan and could not be economically repaired. Furthermore, because Neum is a small municipality with a limited business sector and population, the volume of functional hardware available for collection was lower than initially anticipated. These logistical and technical limitations highlighted the difficulty of sourcing high-quality reusable devices within a small-scale community setting.

6.3.3. Suggestions for the next phase

To enhance future outcomes, the pilot suggests moving from ad-hoc collection to regularly scheduled campaigns, ideally organised twice a year. This frequency is expected to increase public participation and improve the overall quantity and quality of the hardware collected. Future phases should also focus on maintaining continuous communication with local stakeholders to better educate donors on the types of equipment that are suitable for refurbishment, thereby reducing the intake of obsolete items that are beyond repair.

6.3.4. Best practices and recommendations for future implementation (scalability perspective)

A core best practice identified is the centralised coordination role played by the municipality, which bridges the gap between hardware holders and educational institutions. This community-based donation model is highly replicable for other small territories because it requires minimal initial infrastructure and relies on existing local partnerships. Formalising cooperation early in the process through MOUs ensures long-term sustainability and demonstrates how small-scale interventions can provide a successful proof of concept for circular resource management.

6.3.5. Final remark

The pilot successfully demonstrated that even the refurbishment and redistribution of a small number of devices, specifically one laptop and one desktop computer, represents a meaningful result for a small municipality. This experience confirms that electronic equipment can be effectively diverted from the waste stream and returned to productive use in education, creating both environmental and social benefits. Ultimately, Neum's pilot serves as a practical model for local circular procurement that can be transferred to other small communities.

7. Annexes

7.1. Annex 1 – Technical specification of the platform

TechSwap

Platform for exchanging second-hand computers, laptops and printers

1. Visitor Experience (Public Facing Features)

The public face of the website is designed to be welcoming, intuitive, and highly functional.

1.1 Homepage & Product Catalog

- Welcome Experience: Visitors arrive at a modern landing page featuring a promotional banner and an engaging hero section.
- Browsing: The catalog displays a clean, responsive grid of all available products, ensuring easy navigation.
- Language Selection: All content is seamlessly bilingual. Visitors can toggle the website's language between English and Bulgarian at any point.

1.2 Viewing Product Details

- Detailed Information: Clicking on an item opens a dedicated product page outlining critical details: Title, Price, Category, Condition, and a comprehensive Description.
- Image Gallery: Visitors can interact with a high-quality image gallery to inspect the item from multiple angles.
- Contacting the Seller: Prominent contact points (phone number, email, or direct link) are available at the bottom of the page, making it practically effortless for a buyer to express interest.

2. Admin Workflows (Team Facing Features)

The administrative functions empower your team to govern the digital storefront without requiring any specialized technical expertise.

2.1 Accessing the System

How to Access: A team member navigates to the website.

URL of Security: Access is safeguarded by a simple password prompt, ensuring only authorized personnel enter the dashboard.

2.2 Adding a New Product

- Data Entry: Clicking "Add New" presents a straightforward digital form. The team member fills out necessary fields such as Title, Price, Category (e.g., Laptops, Phones), Condition (e.g., Like New, Good), and Description.
- Uploading Photos: Multiple images can be uploaded directly from a computer or mobile device.
- Publishing Options: Items can be saved as a "Draft" (hidden from the public while finalizing details) or set as "Published" (instantly visible on the live catalog).

2.3 Managing Existing Inventory

- Editing Details: If an item's price drops or a description needs adjustment, team members can quickly open the existing listing, modify the text or images, and save the changes.
- Removing Items: When an item is sold or becomes unavailable, it can be deleted or reverted to an unpublished state, immediately removing it from the public-facing store.

Platform User Guide: A short and clear guide for non-technical people: can be downloaded from here

7.2. Annex 2 – Evidence documents

- Legal framework for green procurement and support for new enterprises: the document is uploaded here
- Promotion of the platform, links:

https://www.ubbsla.org/weee-procure-pilot-test/

https://www.ubbsla.org/ewaster-techswap-platform/

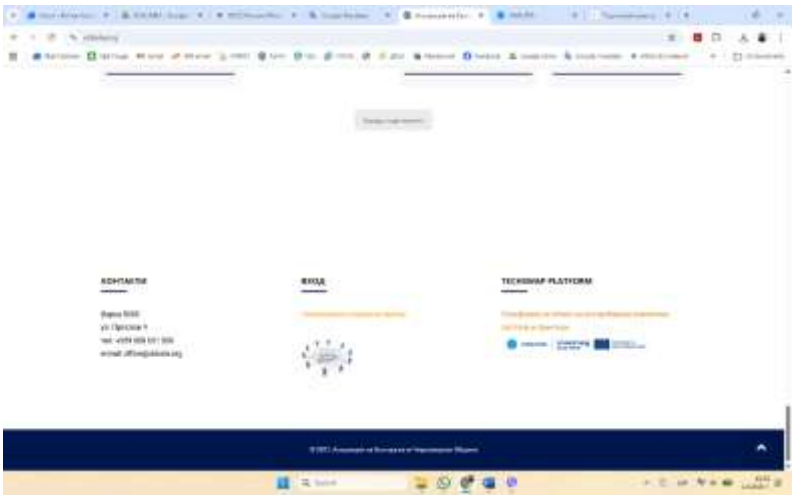
- Stakeholders' meetings:



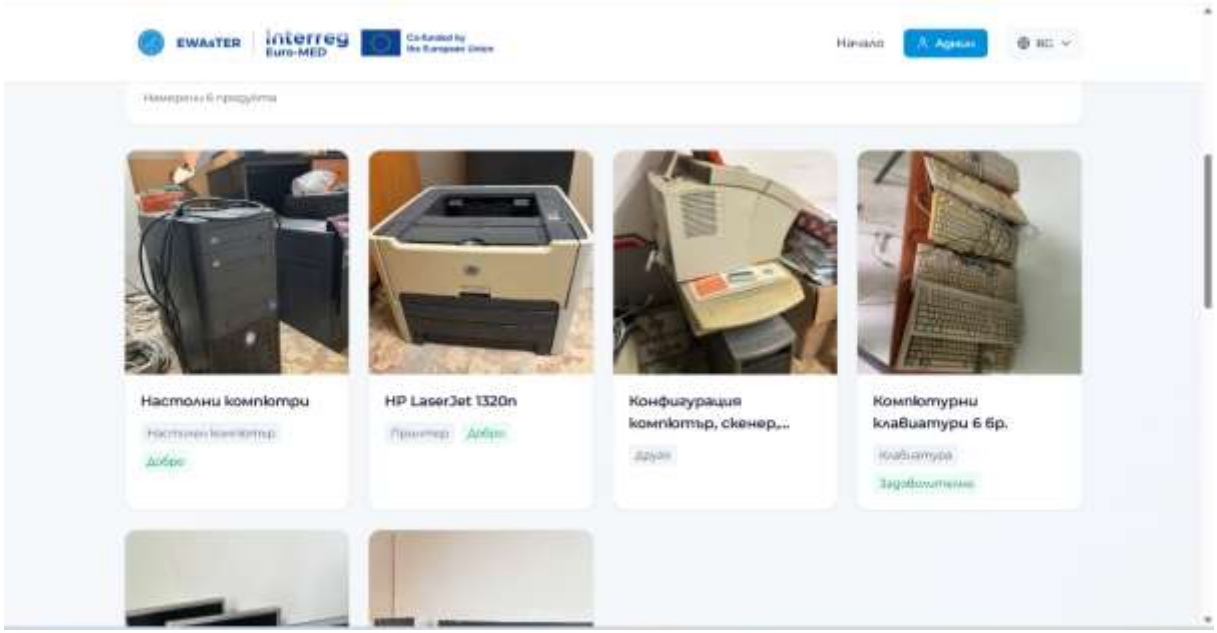


- TechSwap Platform for exchanging second-hand computers, laptops and printers

The platform is available https://ewaster.ubbsla.org/en, connected to UBBSLA website




EWAsTER
Предотвратяване на замърсяването на водите
от е-отпадъци чрез използването им като ресурс
Начало
Филтри
Всички категории
Най-нови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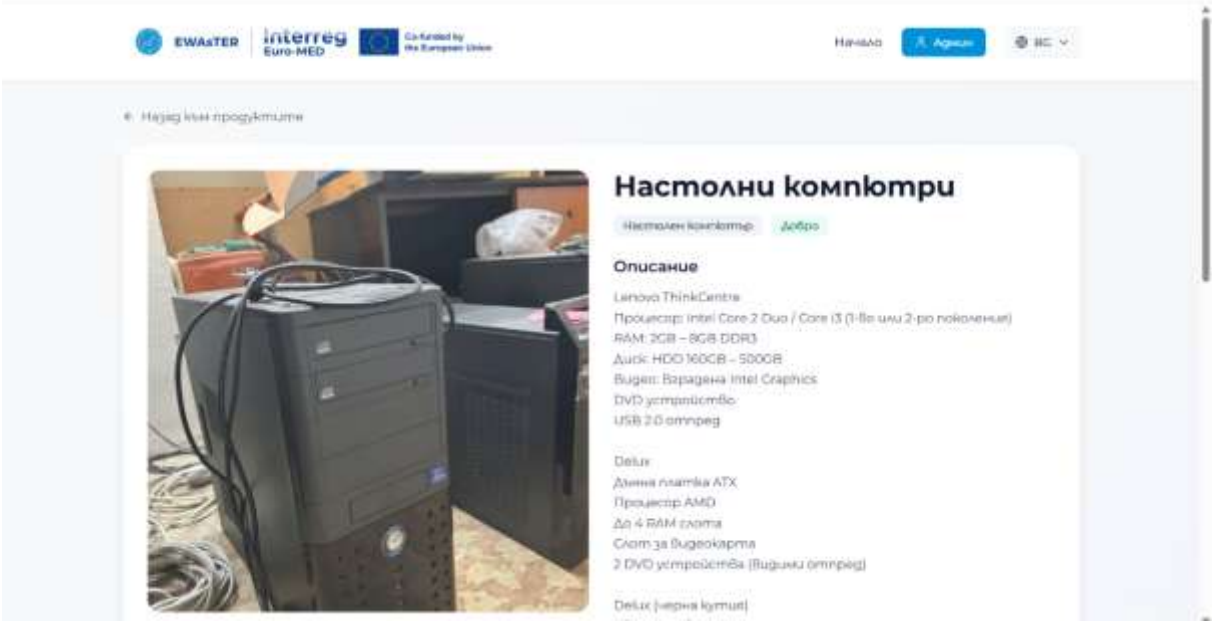
Настолни компютри
HP LaserJet 1320n
Конфигурация компютър, скенер,...
Компютърни клавиатури 6 бр.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Начало
Настолни компютри
Добро
Описание
Lenovo ThinkCentre
Процесор: Intel Core 2 Duo / Core i3 (1-во или 2-ро поколение)
RAM: 2GB – 8GB DDR3
Диск: HDD 160GB – 500GB
Видео: Вградена Intel Graphics
DVD устройство
USB 2.0 отпред
Delux
Дънна платка ATX
Процесор AMD
До 4 RAM слота
Слот за видеокарта
2 DVD устройства (Видими отпред)
Delux (черна кутия)

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