



managing director

265 member organisation
env. SME advocacy



2020-2022





vice-president of the National
Membership (HU)
Task Force for Plastic Treaty
Regional Chapter for SE Europe



11-year cleanup and lobby experience 367.000 kg removed 60% recycled



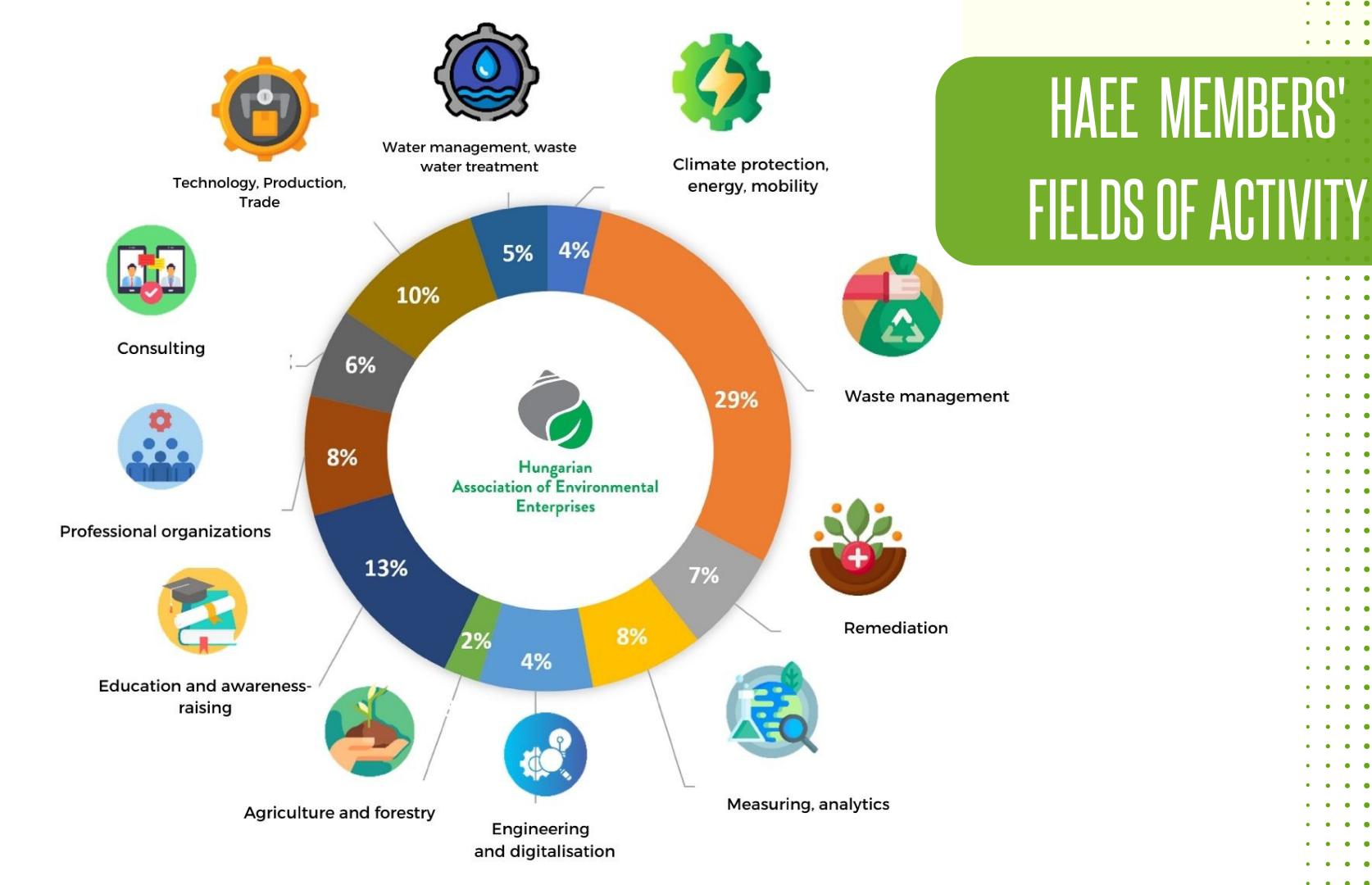




associated partner co-author of Policy Guidance

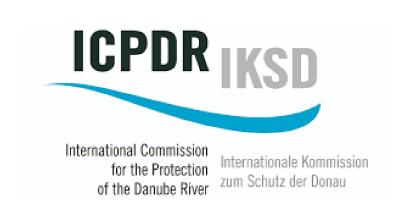
2024-2026

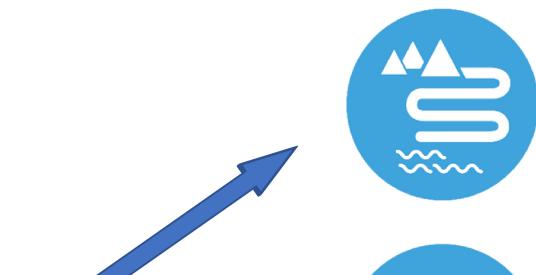




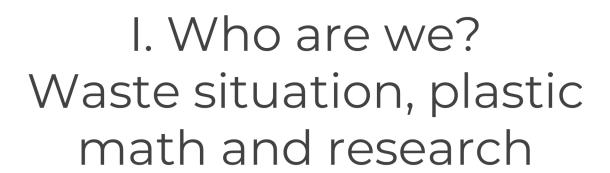
















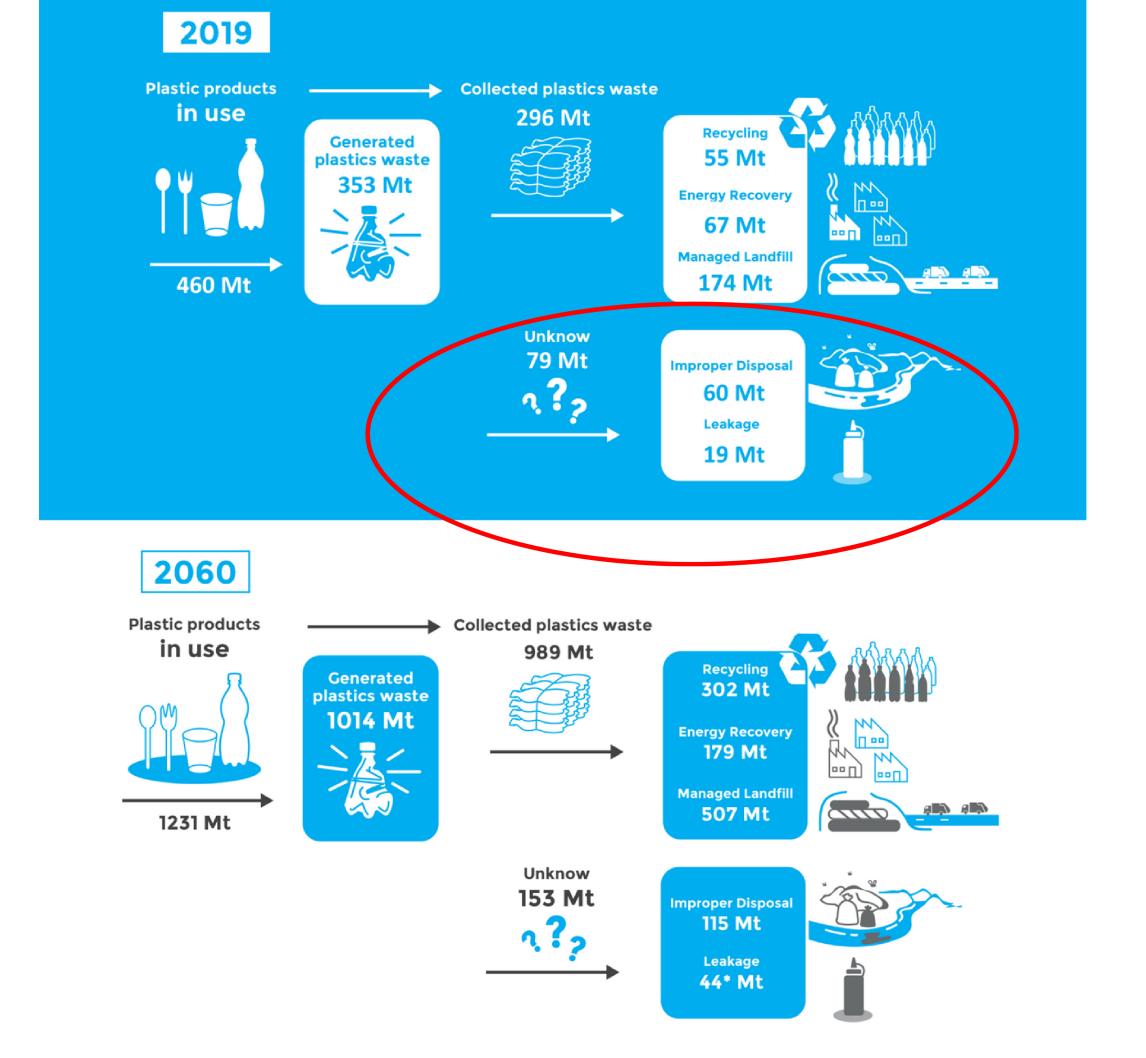
III. Best practice in Transcarpathia

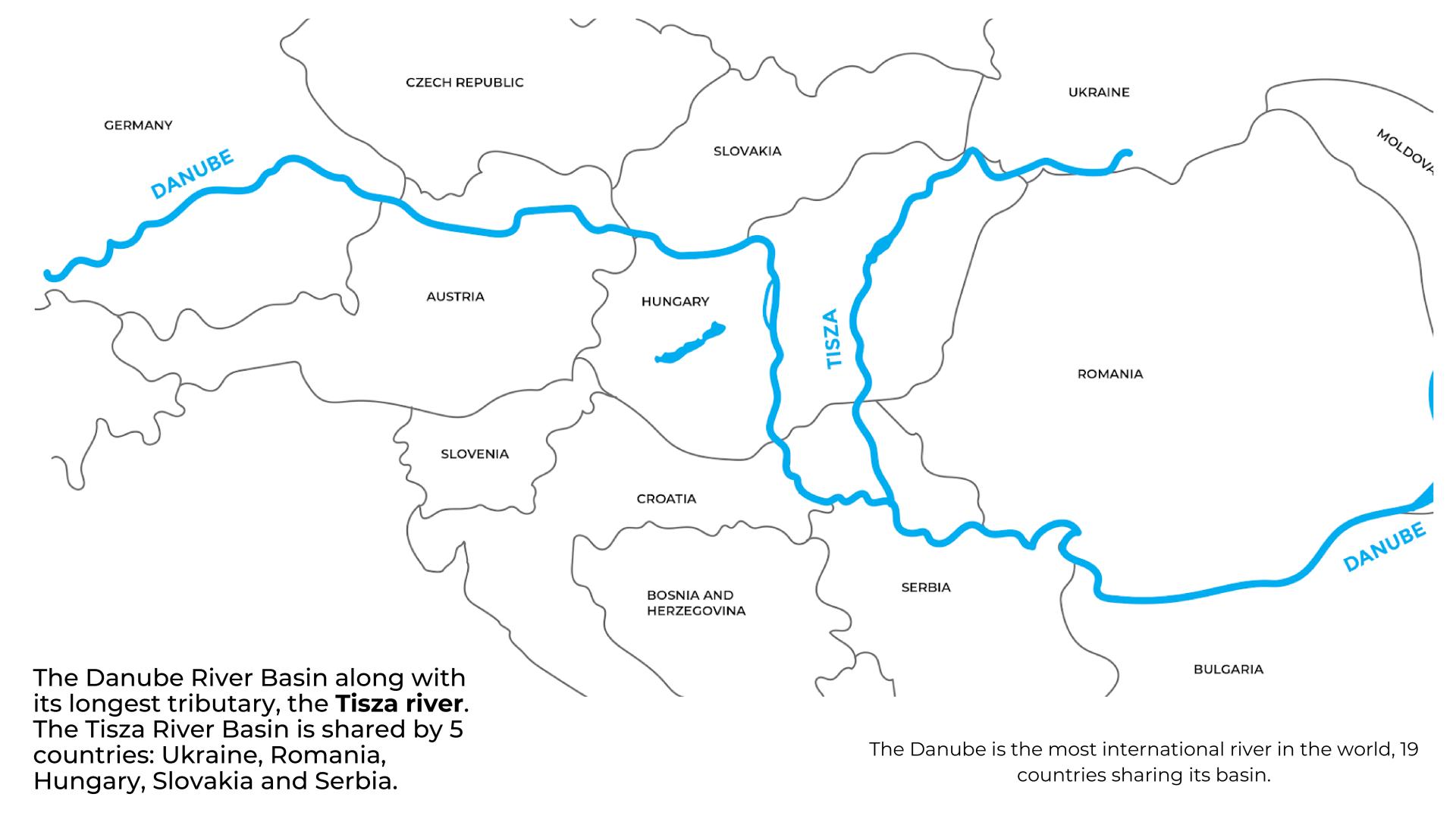


IV. Regional project proposal



I. Who are we?
Waste situation, plastic
math and research











#### **PLASTIC MATH**

- The Danube transports about **1500 tons** of plastic per year into the Black Sea
- Tisza is responsible for **250 tons**/year (16%) **200** settlements have no access to sanitary services in Trc.
- Estimated amount of riverine litter in coastal acc. in Tisza basin: **1665 tons**
- Estimated unmanaged waste in Transcarpathia region: cca. **10.000 tons**/year
- Plastic Cup handles (PRC+CRC) around 70-100
  tons/year + prevent cca. 700 tons/year with
  supporting MWM procedures (selective, reuse,
  education) in regions where waste collection is
  unresolved
- Diverting waste from nature to a circular economy is a



### Pollution at source



Standing on Latorica river (UA) - 2022

@photo: Papilio

## Pollution on "road"

The 2017 plastic flood, combined with an unusually severe ice flood imported an unprecedented amount of riverine litter into the EU by the natural waterways of the Tisza River Basin.

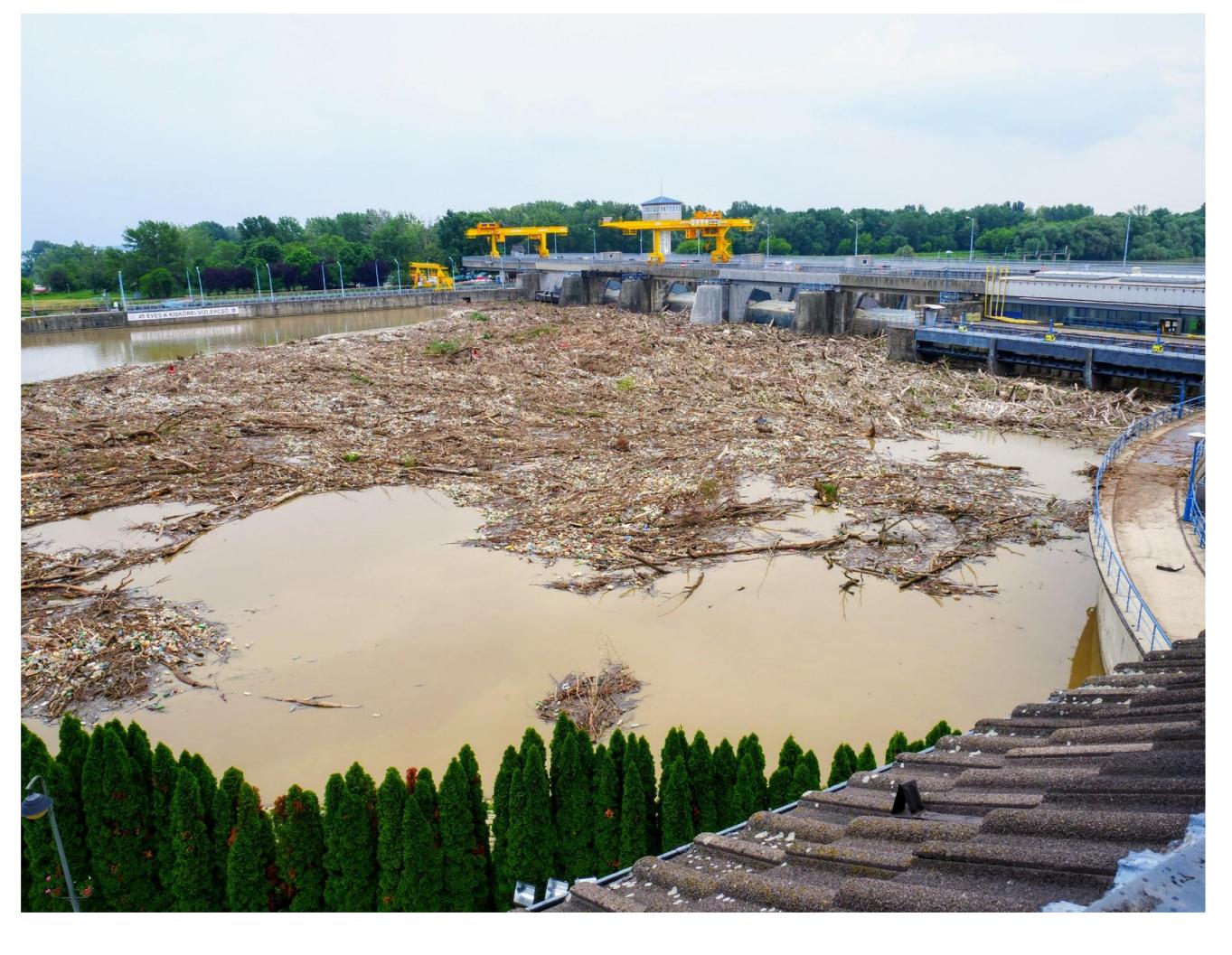
@photo: Sándor Szabó



# Pollution after 500 rkm

The moment of truth: The HPP of Kisköre. Thanks to the waste retention capacity of the HPP effective remediation and selection is feasible.

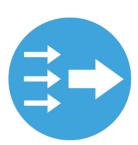
@photo: Plastic Cup



### Beyond plastic...







Lowland countries like Hungary face **international river pollution** events on a regular basis. The Tisza cyanide disaster in 2000 from Romania (left, photo by Zsolt Czeglédi, MTI) and the Slana river pollution wave in 2022 from Slovakia (photo by Marton Mohos) were significant. Other transnational **legacy pollution** cases affected rivers like Torna, Marcal, Rába, Danube (red mud alumina plact accident), the Somes and the Tisza river (cyanide catastrophe).

In the beginning, Plastic Cup was mostly known for its spectacular summer **plastic bottle boats**. The funny watercrafts are constructed from recycled waste and are an effective tool during **community river cleanups**. After Tisza, new boat races started on Bodrog, Mures, Danube and other rivers. @photos: Plastic Cup



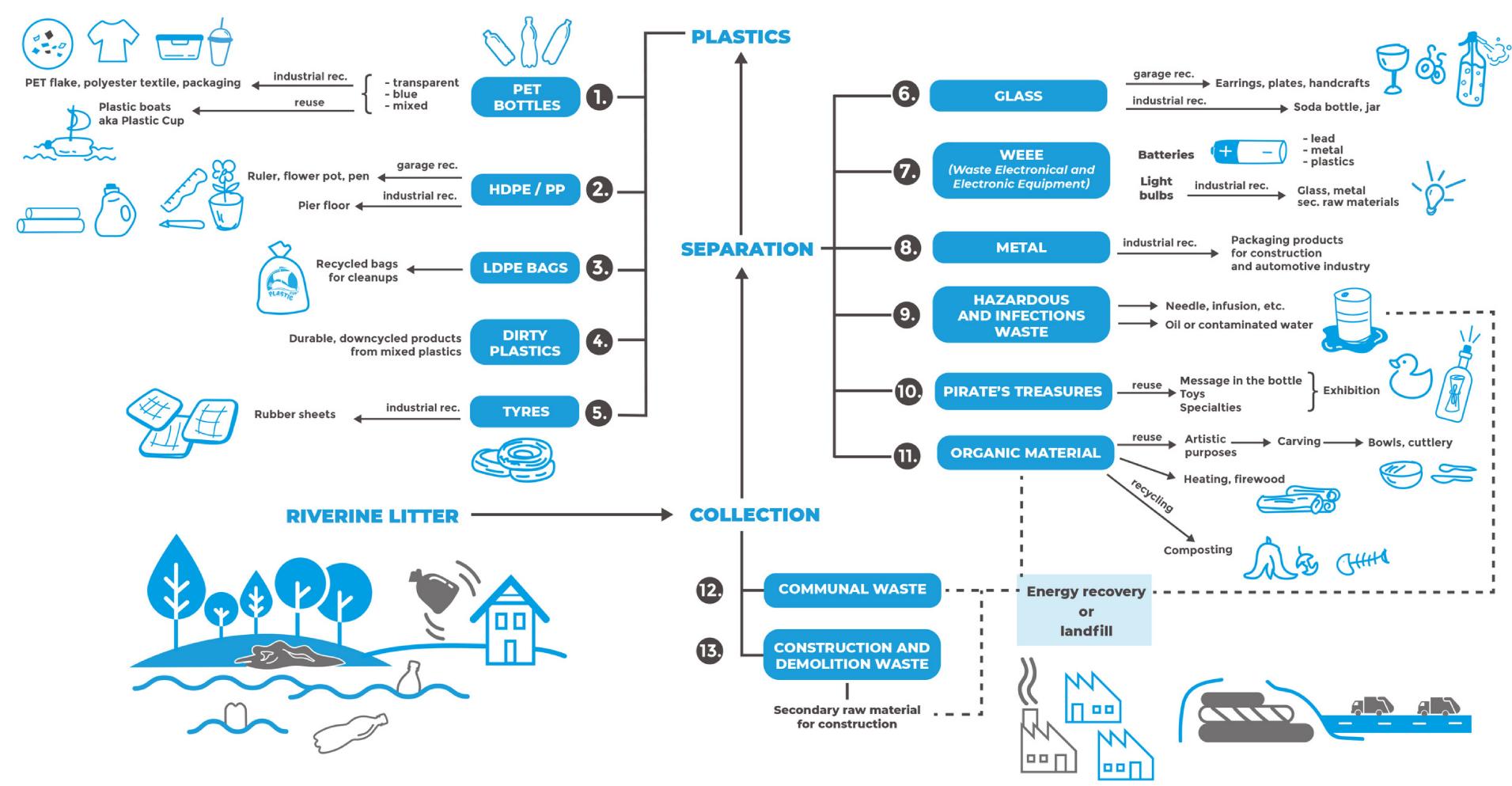








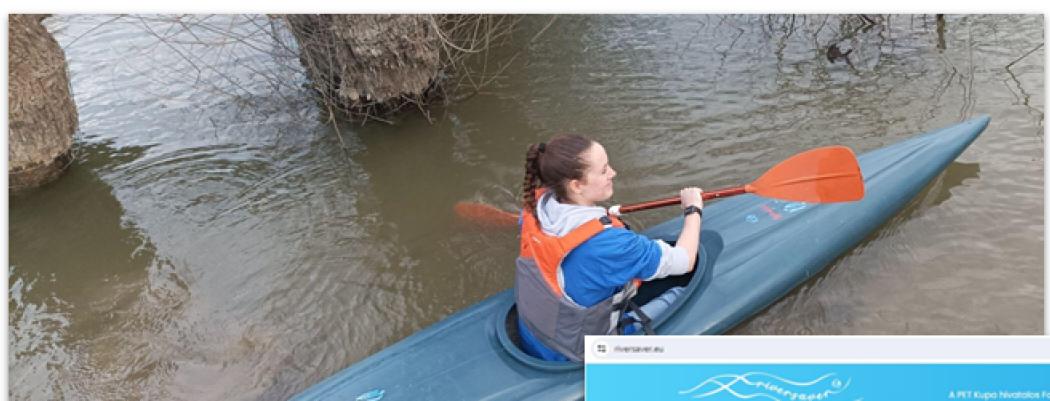
@photo: Plastic Cup



@source: Molnar et al.: Aquatic Plastic

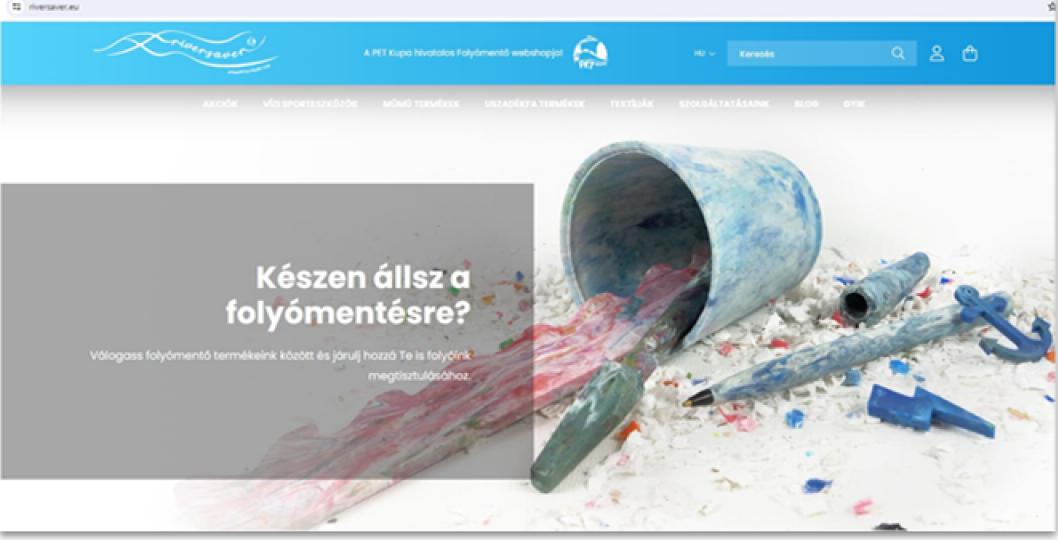






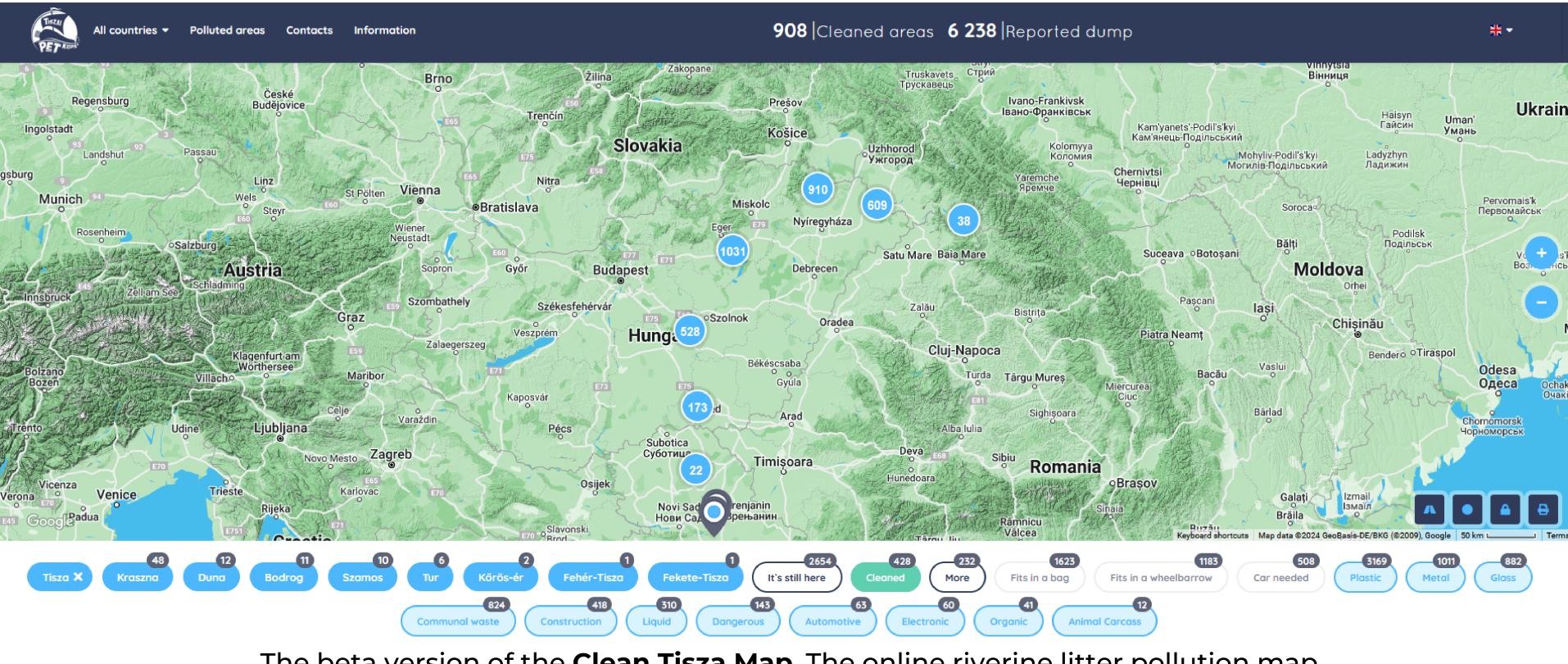


### www.riversaver.eu



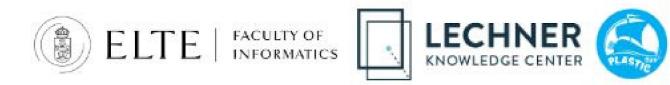


#### Research





The beta version of the **Clean Tisza Map**. The online riverine litter pollution map covers the entire Tisza river in all 5 countries as well as several of the major Tisza tributaries like Somes or Bodrog rivers. The beta version is available at <a href="https://www.tisztatiszaterkep.hu">www.tisztatiszaterkep.hu</a>



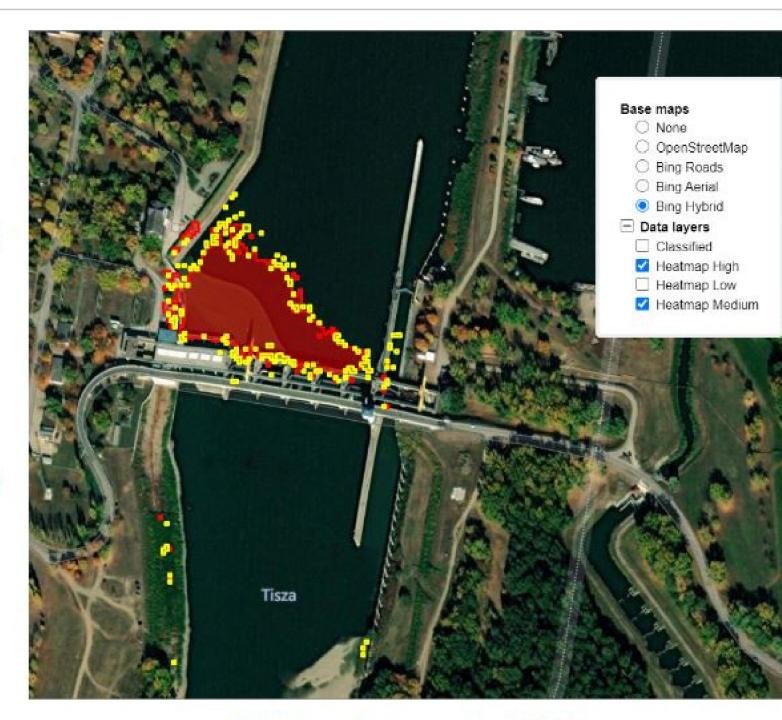
#### **DEMO** - Web Application

#### Description

The goal of our research is to develop an accurate classification method for plastic waste detection to provide a viable platform for repeatable, cost-effective and large-scale monitoring. Such a robust waste monitoring solution would speed up the detection of illegal waste hot-spots close to water flows and floating waste islands on rivers, as well as support waste collection actions with an automatic monitoring system. This application automatically searches for newly recorded satellite images and downloads them on a daily basis. After this a *Random Forest* model classifies the pictures and displays the results in the web view. You can check out the extension of polluted areas on the set locations in the previous five days when the cloud cover over them was 0%.

#### **Features**

- Location: You can choose from four previosly set locations: Kisköre, Lake Călinești,
   Pusztazámor and Paxie
- Date: It can be changed using the swipe. You can select from the last five most recent
  days when the cloud cover over the areas was 0%.
- Colors:
  - o Classified: Orange. All pixels that were classified as plastic waste.
  - Heatmap High: Red. Pixels that were classified as plastic waste with a confidence of 90% or higher.
  - Heatmap Medium: Vellow. Pixels that were classified as plastic waste with a confidence between 80% and 90%.
  - Heatmap Low: Green. Pixels that were classified as plastic waste with a confidence below 80%.



Click here for interactive DEMO

deposits, and floating waste accumulations (jams) on Sentinel-2 and PLANETSCOPE satellite images. The initial results indicate that by analysing satellite images captured in the spring and summer months using four distinct wavelengths, it is possible to reliably detect floating plastic

accumulations.

Remote sensing

hotspots,

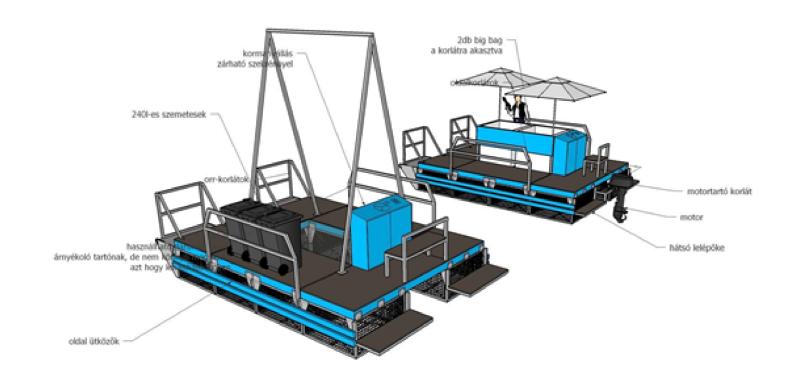
macroplastic

#### **Publications**

Waste Detection and Change Analysis based on Multispectral Satellite Imagery
Dávid Magyar, Máté Cserép, Zoltán Vincellér, Attila D. Molnár

#### Developing a fast-responde unit

Winter river cleanup action on the Bodrog with PETii.

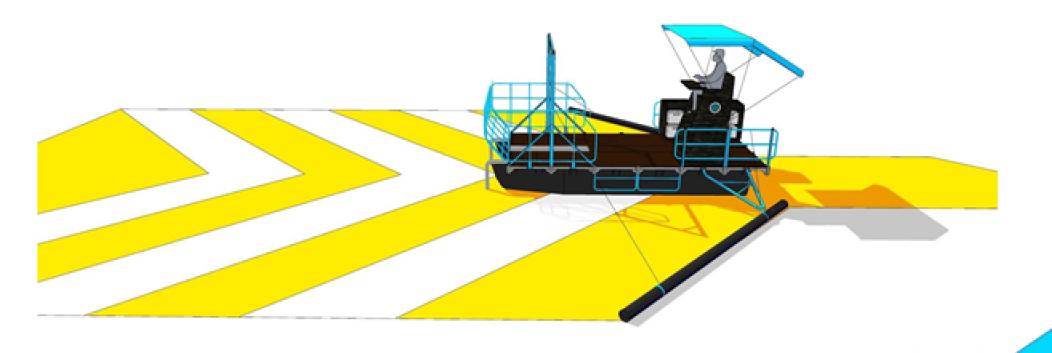






Plastic Cup initiative workboat, the PETII with the River Litter Skimmers attached to her sides.











# II. Key findings and policy recommendations

#### **Objectives of the Survey**

- better understanding of the complexity of the pollution problem in the DRB
- foster changes in legislation to improve river water quality
- helpful input for ICPDR and the next update of the Danube River Basin MP

**INSPECT**: PP country's legislative background on environmental regulations

MAP: organisational structure of water & waste management organisations

**HIGHLIGHT**: possible inefficient regulatory practices

**EXPLORE:** competent organisations' decision mechanisms, existing "chains of command", network and cooperation

ASSESS: existing/missing industrial and communal waste collection systems **RESEARCH:** legislative regulations reflecting the criminalisation level of public and industrial littering

**COLLECT:** best practices listed for possible adoption and recommendations formulated for improvement





















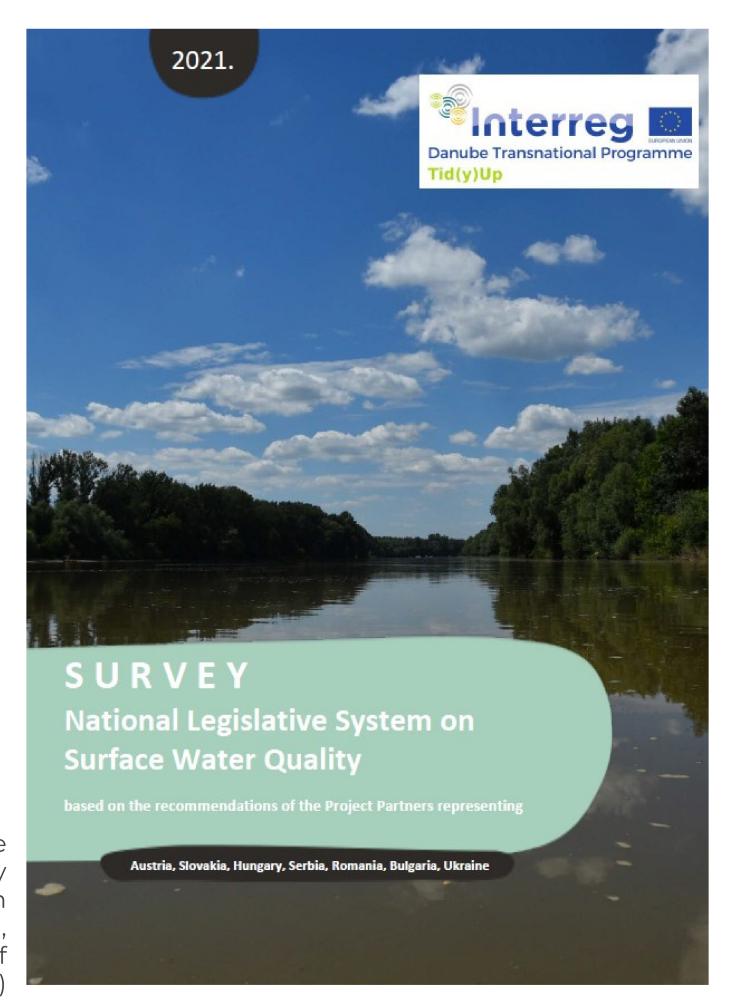








Copyright - an open-source publication edited and published by the Institute of Oceanology, Bulgarian Academy of Sciences (IO-BAS), Hungarian Association of Environmental Enterprises (HAEE)



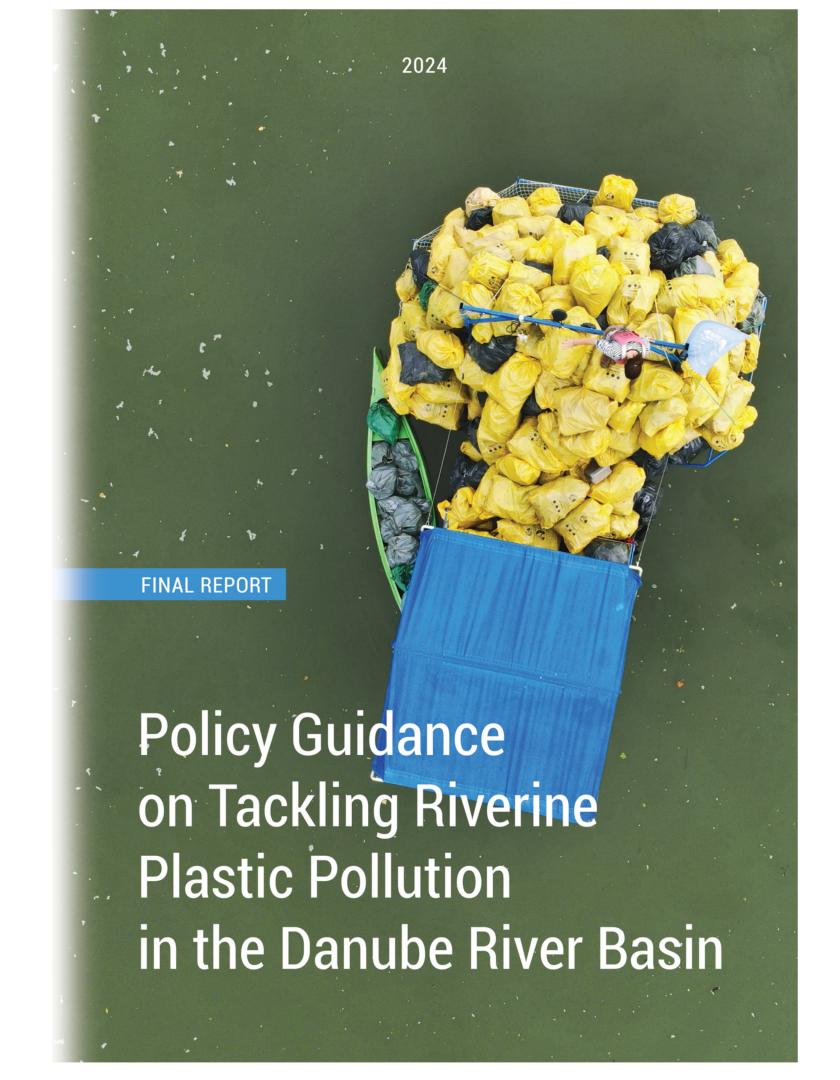






#### This document is primarily intended to:

- **provide** strategic and legislative recommendations to all levels of legislation
- offer guidance on reducing plastic pollution
- raise awareness among stakeholders
- **facilitate** harmonised actions of water management authorities/directorates, and encourage communities and decision-makers to organise transnational actions
- assist non-EU members with knowledge and technology transfer
- **serve** UNEP CC, ICPDR and ISWA a comprehensive recommendation in the plastic treaty process



### COMPLEX

# Problem<br/>Solution

- harmonised actions
- transboundary cooperations
- standard measurements
- prevention is a priority
- sound waste management
- strictly enforced regulation
- awareness-raising



#### Policy tools and recommendations

Part B: Strategy

- enhancing transboundary negotiations, cross-border collaborations and intergovernmental treaties
- development of the enforcement infrastructure (licences, permits, standards, certifications)
- ecodesign: determines a product's lifecycle environmental impact (80%)
- regular review of legal regime to adapt (SUP)

#### **Financial tools**

- environmental liability insurance for industrial activities
- dedicated state support and tenders: e.g. SUPERFUND (US)
- positive and negative incentives: taxes, fees, credits, refunds, bonds, like:
   Contribution based on the amount of non-recycled plastic packaging waste
- EU Taxonomy, ESG Directive: future support

Part A: Context

**Part B: Strategy** 

Part C: Implementation

#### Service and infrastructure

- sound waste management is a critical prerequisite
- expansion of collection infrastructure
- optimisation of Extended Producer Responsibility (EPR) and DRS
- monitoring facility performances: Makkosjánosi (out of order since 2018)







#### **Capacity building**

- necessary skills, knowledge and resources (mentoring experts, NGOs, ...)
- collaborations and partnerships among different sectors: symbiosis = shared capacities and services
- NGOs: weak but filling capacity gaps
- Tisza Roundtable: discussion and Co-Creation for Policy processes (CfPs)
  - periodic meetings became an international best practice
  - democratic advocacy
  - world café and opera method; trained facilitators
  - policy and strategy co-creation with multiple stakeholders
- encourage and support eco-innovation start-ups (pool of knowledge, labour market supply green jobs, blue jobs)

Part A: Context

**Part B: Strategy** 

Part C: Implementation

#### **Water-management**

- water and waste-water networks are in poor conditions
- missing wastewater treatment
- issue of plastic/municipal waste is not considered water pollution, as it does not affect the chemical status of water bodies (solved)
- artificial overhead cuts (HU): the cuts have made the development and maintenance of water infrastructure impossible
- existing water management infrastructure: the opportunity to interact (HPPs)

#### National waste management practices

- Serbia: higher littering rates than recycling; lack of wastewater treatment
- Slovakia: illegal landfills → comprehensive legislation, enforcement; EPR
- Romania: industrial river pollutions; progress in control through local government
- Ukraine: missing infrastructure, no law enforcement; appropriate legal framework
- Hungary: Reorganisation, 35-year concession with a licensor: EPR, DRS is ongoing



#### Organisational structure

- too complex institutional structures: uncertainty about involvement and responsibilities
- no dedicated ministry for the environment (HU)
- weak NGOs: no capacity for advocacy or participating in European campaigns (EWWR, Zero Waste Day, no media access)

#### **Monitoring Microplastics & Macroplastics**

- we can give valuable data, info and field experience for the ICPDR and the next DRBMP
- pollution map
- tagging and tracking
- retention potential (HPP)
- remote sensing
- pilot actions for identification and monitoring of high-risk leakage points
- intervention methodology to prevent infiltration
- standardised MP sampling and analysis: cost-effective microplastic assessment methods, open access database and methodology to measure microplastic pollution in fluvial systems

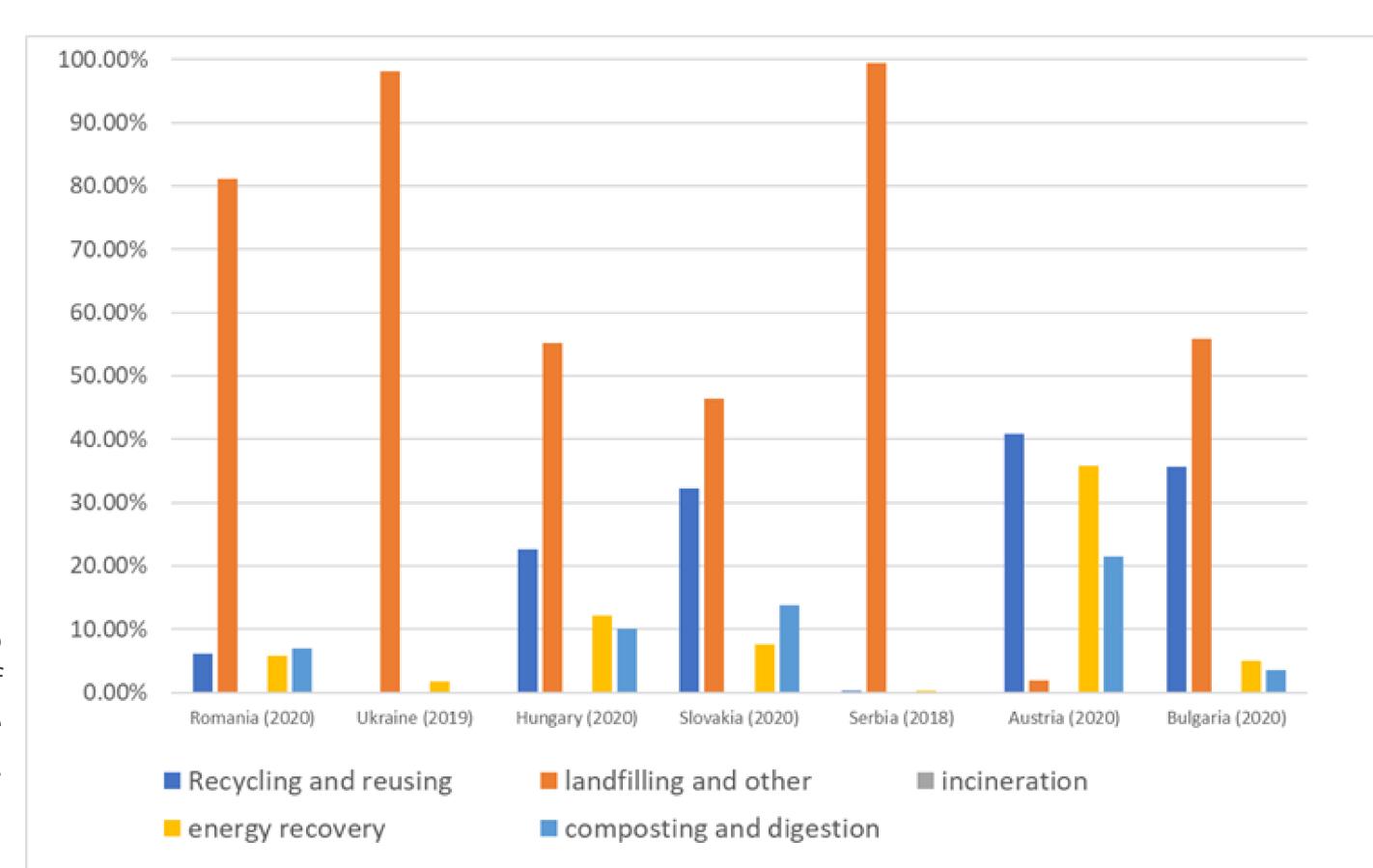
#### Improper waste disposal

insufficient data due to a lack of monitoring and control mechanisms

"Some countries have no official waste data whatsoever, or this data may be incomplete or inaccurate."

UNEP: Global Waste Management Outlook 2024

Percentage distribution of waste processing methods in relation to the total amount of treated waste in the Tisza Countries (+AU, +BG)



#### **TOP 10 Recommendations**

FOSTER LEGISLATION

COMPLIANCE

Part A: Context

**Part B: Strategy** 

Part C: Implementation

PREVENTION

PRODUCT PACKAGE
LABELLING REFERRING
TO RECYCLABILITY

#1

FACILITATE RECYCLING ESTABLISH LEGAL SANCTIONS
TO PREVENT ILLEGAL
DUMPING

RESTRICT MICROPLASTICS
AND EXPLORE BIODEGRABLE
PLASTICS

#### REMOVAL OF POLLUTION AND RESTORATION

#3
PROFESSIONAL RIVER
CLEANUP
INTERVENTIONS

COMMUNITY RIVER CLEANUP ACTIONS

#4

#5
ESTABLISH HARMONISED
PLASTIC POLLUTION
MONITORING SYSTEM

#6
IMPROVED
WASTEWATER
MANAGEMENT
PROTOCOLS

#### JUDICIAL INTERVENTION

ESTABLISH AND ENFORCEMENT PLAN INSTALL A CROSS

BORDER

MONITORING SYSTEM

#8
BETTER REPRESENTATION
OF WATER BODIES AND
THEIR VALUES

#9
CREATE CLEAN
DEFINITION OF
RESPONSIBILITIES

#2

#### AWARENESS AND DISSEMINATION

INVOLVE
STAKEHOLDERS IN THE
DISSEMINATION
PROCESS

#10

EDUCATION, COMMUNICATION CAMPAIGNS

Part A: Context

Part B: Strategy

Part C: Implementation

#### Recommendations proposed regarding prevention

#### 1. Foster compliance with existing legislation

- preventing the release of macro- and microplastics into the environment (regarding (EU) 2019/904 + (EU) 2020/2184): develop plastic/other waste collection
- standardisation of packaging should be a priority
- PPWR is bringing new but ambitious challenges
- setting additional requirements for product design (eco-design, reuse, right to repair)
- stricter penalties AND ENFORCEMENT for improper disposal/littering (e.g. make police responsible for interacting)
- updating and improving sectoral policies to ban single-use plastics
- implementing and introducing a deposit scheme for PET bottles (EPR-systems also) to meet the EU's 90% collection target by 2029 (without derogation)
- mandatory labelling of product packaging designating the type of plastic to promote selective collection and recycling

## Recommendations for Proper Treatment of Plastic Waste

## 2. Enhancing a legal framework for environmental violations

- mechanisms and instruments to identify, sanction and prevent illegal landfills
- restricting the release of microplastics and exploring the use of biodegradable plastics in product segments where releases to the environment cannot be avoided.

## 3. Professional river cleanup interventions (PRC)

- source: fundamental waste management problems
- allocated budgets for interventions
- mobile, versatile and temporary litter traps: considerate the environmental impact of the construction of permanent, large concrete structures. -it is recommended to carry out cost-benefit and environmental impact assessment before implementing physical barriers
- using existing water engineering structures (HPP)
- green jobs

@photo: Plastic Cup





Diversion and extraction of riverine waste by the water authority's waste chain on the Upper Tisza

@photo: FETIVIZIG

## 4. Community River Cleanup actions (CRC)

- reach a broad range of stakeholders and involve them in CRC
- highlighting the importance of CRC: it's not a one-day-show... (read: Aquatic Plastic Handguide)
- 908 coastal riverine litter accumulations cleaned, managing 367 tonnes, 60% recycled
- volunteering, mentoring, greenjobs

## 5. Establish a harmonised monitoring system for macro- and micro-pollution

- standardisation of definitions and sampling, testing and assessment procedures
- monitoring system for emitters
- shared and comparable data
- Clean Tisza Map: www.tisztatiszaterkep.hu

## 6. Improved wastewater management protocols

- wastewater treatment plants: ensure reliable, safe disposal and proper treatment of wastewater
- using innovations, new technologies to remove and treat micro and macro-pollutants
- financial tools to implement plants in the Balkans

## Recommendation regarding legal consequences

## 7. Cross-border monitoring and alert system

- enforcement plan and cross-border monitoring system (early warning system) for river water pollution (plastic, municipal, hazardous, etc.).
- existing: Ukrainian-Hungarian system, Missing: Romanian-Hungarian system

## 8. Legal representation of natural entities

- to ensure adequate legal protection, water bodies (rivers, large lakes) and their natural values need better representation: "Rights of the rivers"
- by granting legal status to water bodies, these natural values and resources could be represented before public authorities and their legal status could help to enforce environmental protection better: e.g. Whanganui River in New Zealand, Mar Menor Lagoon in Spain.

## 9. Defining the problem

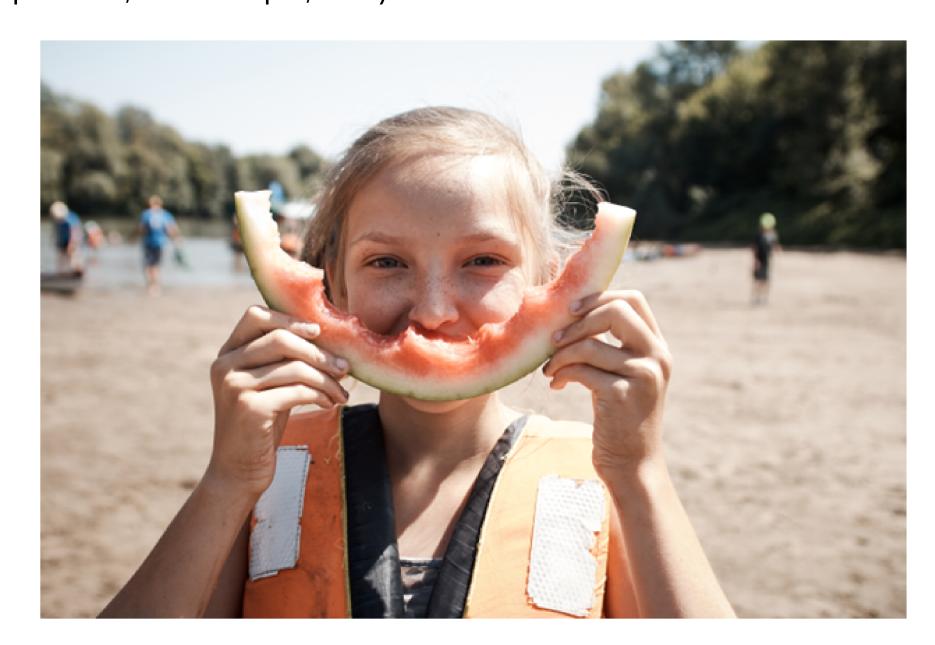
- a more precise definition of responsibilities for eliminating water pollution and managing collected waste is essential. Who is responsible for collection, recycling or disposal? And who bears the costs?
- budgets and resources must be allocated to clean up pollution and manage waste.

# Awareness-raising and dissemination

## 10. Environmental education programmes

Enhanced awareness-raising, education and communication campaigns involving stakeholders (decision makers, manufacturers, the general public, NGOs, etc.) and dissemination of methods, results and existing infrastructure (community compost points, reuse centers, repair network, recycling points, cleanups, etc).

@photo: Plastic Cup





The Waste Reduction Toolkit and the recommendations to plastic-free riversides is ready to use in 5 languagues

FOR A CLEANER ENVIRONMENT!

With the help of the **"9R"** we can think over what we can do ourselves, what

we need to look out for in order to reduce the contents of our bins and thus

REPLACE!

RONMENTALLY FRIENDLY, LOW-IMPACT SOLUTION!















nered annuals, ings, fallen fruits



(e.g.: cutlery)

toothbrushes, cassettes,



Danube Transnational Programme



our ecological footprint.

erreg

SOLUTION TO A PROBLEM.





WITH A LITTLE COOPERATION, INTEREST AND FREE TIME, LOTS OF THINGS COULD BE FIXED.





SEPARATELY AND RECYCLE IT!



JUIDE FOR WASTE AND COLOGICAL FOOTPRINT **EDUCTION** 

Hungarian Association of Environmental Enterprises





nds (ERDF, IPA, ENI) in frame of the Danube national Programme with the financial



FLEX on the road. The mobile and modular exhibition visited Bulgaria, Slovakia, Serbia, Romania and doing so reached thousands of kids teaching them to the basics of River Lit(t)eracy.

@photo: Plastic Cup









# III. Best practice in Transcarpathia

- 2022: The first year when prevention surpassed cleanups and end-of-pipe solutions
- tech-support is a gamechanger
- recovery fund, tax income
- population growth by 10-15%
- 400 companies settled



Win election with selection Turia Bystra (Turjasebes)









https://youtu.be/Tx1kSjq4OIQ

https://youtu.be/TRzCWhHTICc?si=F8AJjLZITc0dkl6j

The **Call-Action** project, funded by Diageo company in 2022, aims to support separate waste collection and improve waste management in Transcarpathia, Ukraine. The 2year initiative seeks to improve the living conditions of at least 120,000 people living along the Tisza by bringing tonnes of valuable separate waste back into the recycle loop and creating employment opportunities in the region. The project has collected and managed 1182 tonnes of waste. The initiative has increased waste collection capacity in Uzhhorod and Beregovo. Furthermore, more waste collection points will be installed in schools and community institutions, involving over 21 municipalities, 29 schools, and 61,800 residents and students: <a href="https://callaction.com.ua/en">https://callaction.com.ua/en</a> In 2019, Coca-Cola Foundation began supporting the cleaning of the Tisza River, as they view reducing, collecting, and recycling packaging materials as a matter of great concern. The Zero Waste Tisza Project allowed them to expand their participation and spread their activities to other areas. Their financial support provides an opportunity for Plastic CUP and water authority experts to organise more frequent and diverse actions. Due to the project's remarkable success, the third phase of the Zero Waste Tisza Project will be launched at the beginning of 2023.



# IV. Regional project proposal

## Follow-up activities

• The Aquatic Plastic is approved and starts 1 January 2024 (30 months).

11 countries, 32 partners: Initiating bottom-up management solutions to reduce plastic waste in the Danube Basin

Cost-effective quantification of microplastic contamination and macroplastic accumulations at H Targeting and managing temporarily halted riverine litter accumulations

Empowering human resources to fight against water pollution in the Danube River Basin



- The **Styx Initiative** was a promising project application in the Horizon Europe programme. Its main strategic objectives were to prevent the formation of riverine litter accumulations through effective monitoring of macroplastics and microplastics in European rivers.
- The **DALIA (Danube Region Water Lighthouse Action)** project is a collaboration of 22 expert organisations. The project aims to bring an integrated DALIA tool to the DRB, which will be integrated into the Danube Mission Hub for better decision-making and to improve the restoration of fresh and transitional water ecosystems.
- **Plastic CUP** is a grassroots social innovation led by Plastic Cup Society, which organises annual international river cleanup events, team-building activities, and awareness-raising initiatives. The active involvement of volunteers has been instrumental in the success of the Plastic CUP initiative and the sustained motivation of regional communities.
- **River Lit(t)eracy** is a continuation of the 5 countries 1 river Erasmus+ project that was implemented in the Tisza River Basin. The project's goal is to adopt best practices from around the world, such as the Ocean Literacy principles, to educate and raise awareness among the public about river and plastic pollution.



TO END PLASTIC WASTE







for the Protection of the Danube River

...and more!!!

## 1. Use the existing network and infrastructure:

- Plastic Treaty process
- CRC actions, selection, recycling
- Riversaver training starts soon!
- ISWA Regional Chapter for SE Europe
- ICPDR expert groups

## 2. Give a strong boost to the processes that have been set in motion:

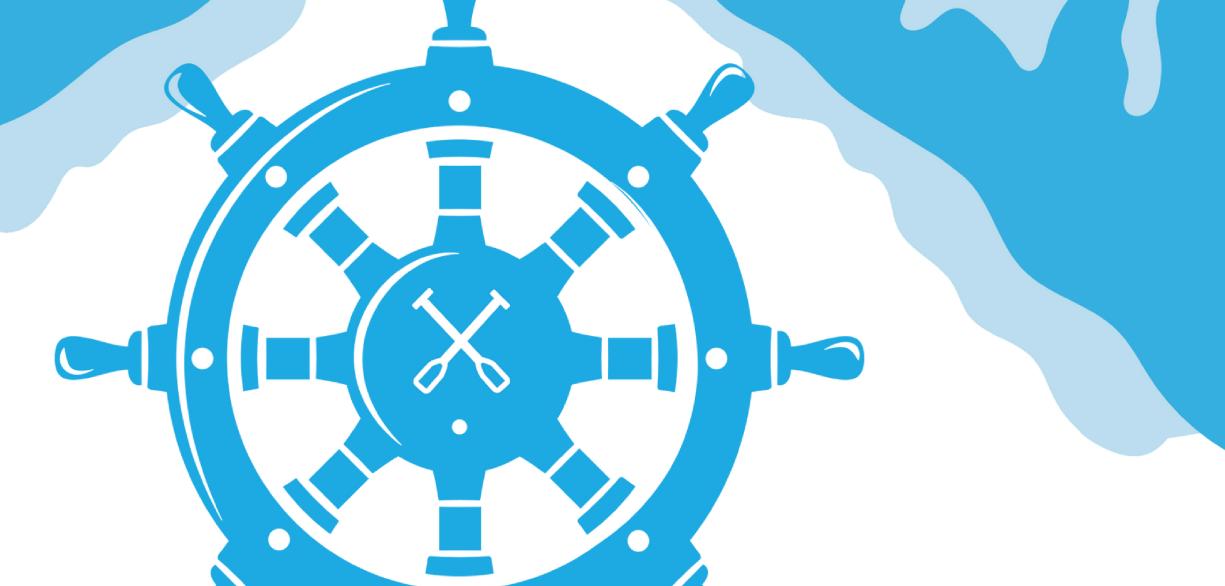
- Transboundary negotiations, Roundtable co-creation
- Financing PRC actions to prevent further pollution
- Budget for fast-response unit, pilot action at Drina
- Research: remote-sensing, high-risk leakage zones, providing reliable data

## 3. Support new dimensions:

- Technology transfer for UA and West Balkan countries
- 9R in West Balkan countries
- Country reports, EU-compatible landfills, reuse and recycling centers
- closing and remediating dumpsites
- flagship actions to reach critical mass



international attention
human resource/budget for salary
support for RDI
regional coordinators in West Balkan
budget for fast-response unit



JOIN OCTOBER.



1-3 October 2024





A new trade fair for the environmental sector will be organised in Budapest in October powered by HAAE's ÖKOINDUSTRIA trade fair (since 2009) concept.

ENVIRONTEC powered by Ökoindustria covers the trade fair topics of water technology, wastewater treatment, waste management, recycling and infrastructure, with a particular focus on municipal and urban issues, energy efficiency, renweable energy. Other neighboring markets can also be easily accessed from Hungary. ENVIRONTEC will be organised during the **EU presidency held by Hungary** attracting visitors from Europe's leading economic, scientific and political organisations.

ENVIRONTEC powered by Ökoindustria brings together exhibitors with high-caliber industry representatives from business, politics and science, from private companies to small municipalities, local authorities and large cities. A new platform is being created in Budapest that will enable export-oriented companies to make numerous business contacts with Hungary and neighboring countries over the three days of the trade fair.

Exhibitor application is open! www.environtec.hu/en

## ENVIRONTEC will be organised during the EU presidency held by Hungary.

- 1 October: What lies ahead? Climate change, adaptation/mitigation, air quality
- 2 October: RE-BROWN Remediation and brownfield management
- 3 October: Circular economy, waste management Prevention, reuse, recovery







## Thank you for your attention!



## **Gary Hanko**

project manager, Plastic Cup

Managing Director, Hungarian Association of

Environmental Enterprises

Vice-president of the National Member (Hungary) of ISWA

00 36 20 383 6242

hanko.gergely@kszgysz.hu

www.interreg-danube.eu/tid-y-up

https://kszgysz.hu/en/

https://petkupa.hu/eng/







