

wasteinprogress

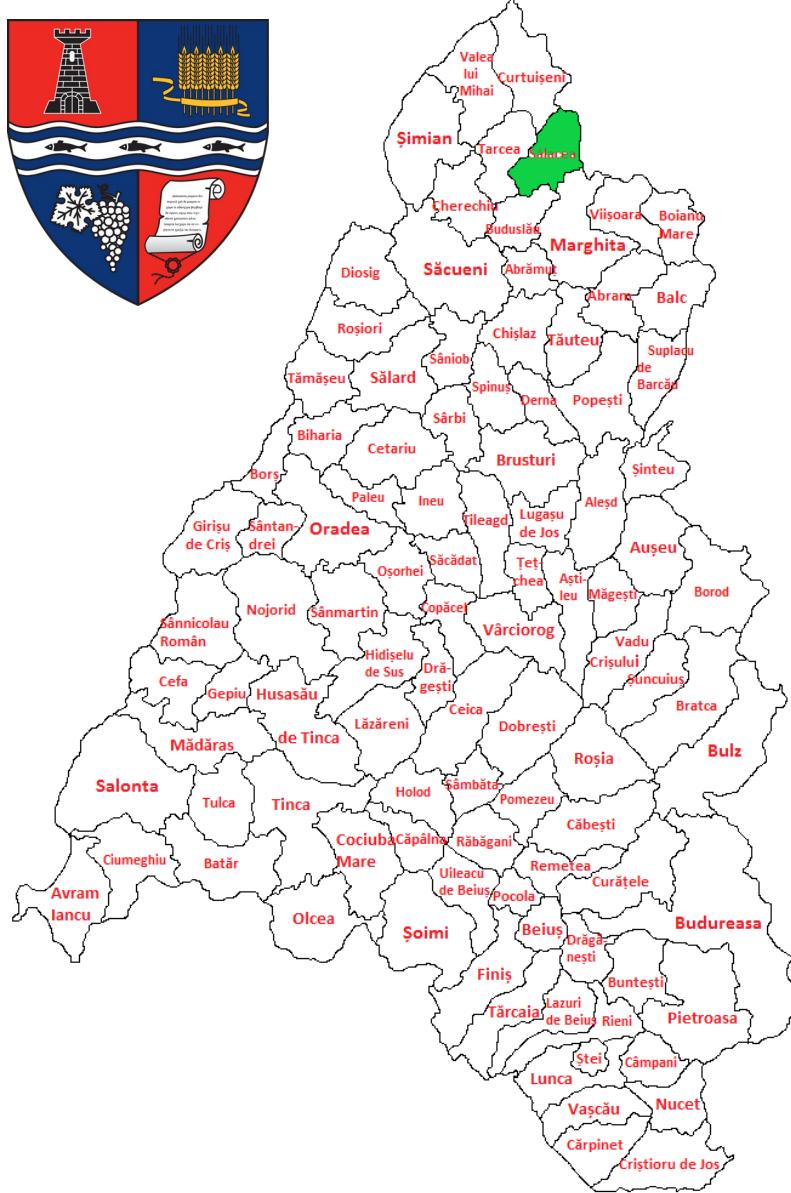
# Sălacea & Bihor County – Romania

## Are there social limits to the implementation of an identification system?

**PhD PÁSZTAI ZOLTÁN-ATTILA**  
CEO of ECO BIHOR Ltd.  
representative of AVE BIHOR Ltd.

**Mr. HORVÁTH BÉLA**  
Mayor of Salacea





## SĂLACEA AND BIHOR COUNTY

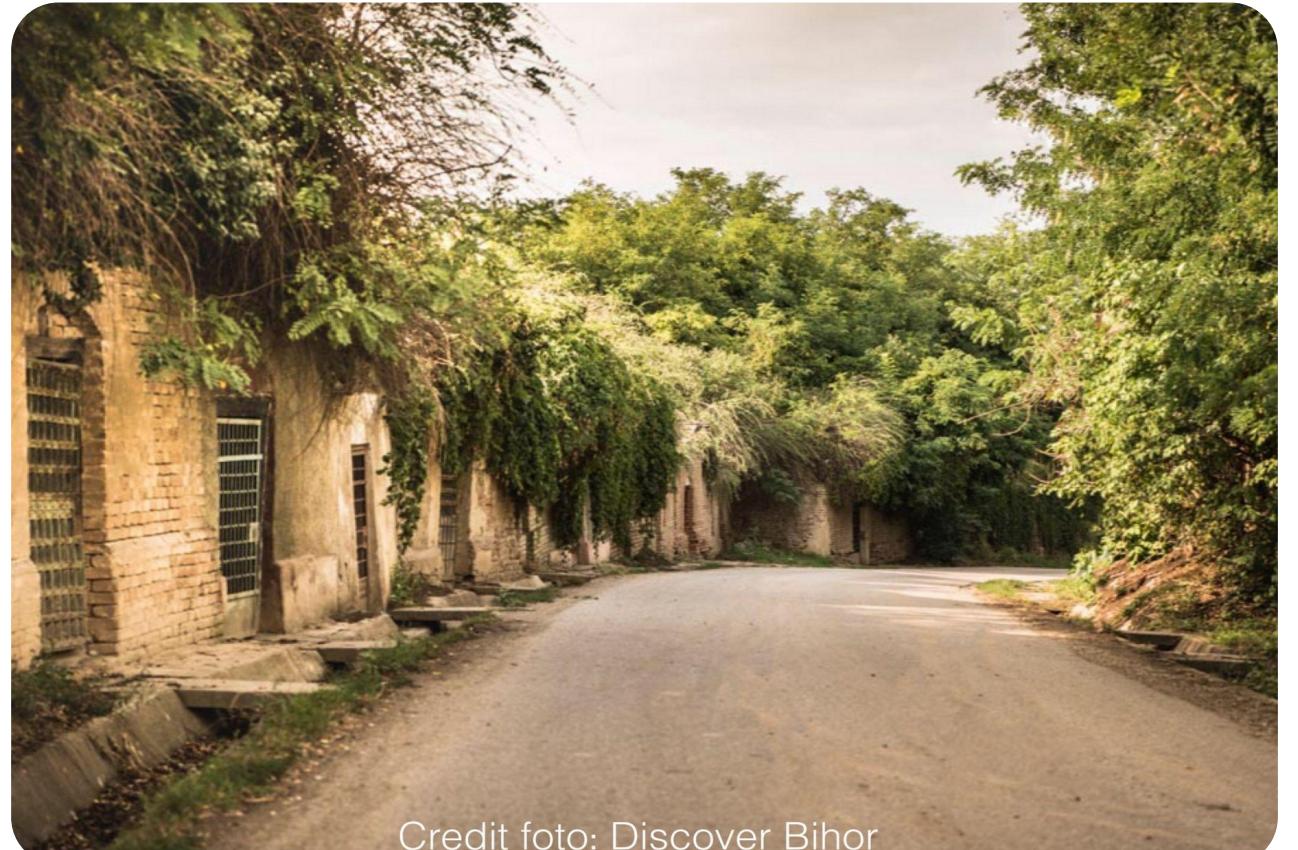
Sălacea is situated in Bihor county, which is located in the western part of Romania. They are known for their rich history, cultural heritage, and diverse population.

Here is an overview of the demographic characteristics of the Bihor county:

According to the 2020 census, Bihor has a population of 616.264 and a density of 79,56 people per square kilometer, below the national average density (93/km<sup>2</sup>)

## COLLECTION SYSTEM IN SĂLACEA

Sălacea is a small Romanian town with rural characteristics of life. Historically, residents separated waste into recyclable and mixed waste which were collected curbside. Residents paid a monthly fee of 5 lei (approximately USD \$1)



## COLLECTION SYSTEM IN SĂLACEA

Sălacea joined the international Zero Waste Cities Network in 2018 to aid their transition to a circular zero-waste economy.



## IMPLEMENTATION OF THE SYSTEM

Volunteers supported the system's implementation and were essential to building community trust. Volunteers distributed waste disposal kits (3 bins, two types of bags, and information) to residents for free to sort their waste, and answered questions about the new collection system. Residual waste bins contained chips to allow the collection authority to monitor the volume of residual waste disposed.



- Blue bags collected paper and cardboard.
- Yellow bags collected plastic
- Two brown bins (23L and 10L) collected organic waste.
- Green bins for glass waste.
- Black bins ( 40 L) for residual waste

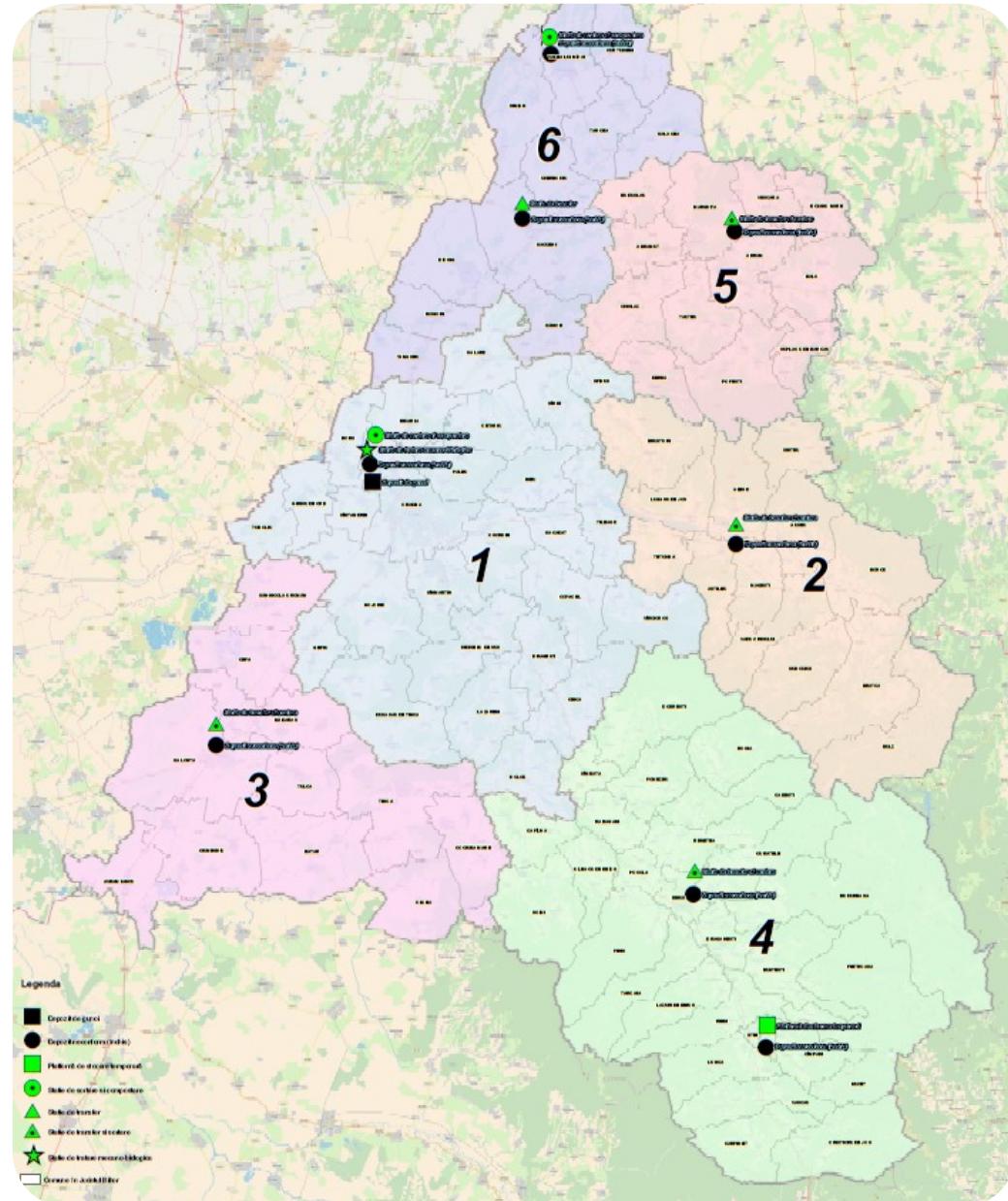
## BIHOR COUNTY

Sălacea has become a model city for its progress on waste management, the three-month pilot reduced waste generation by 55% and increased source segregation rates to 97%.

In 2022, 62,9% MSW (115,6 tons) was segregated at source, up from 15,1% (18,7 tons) pre-intervention.

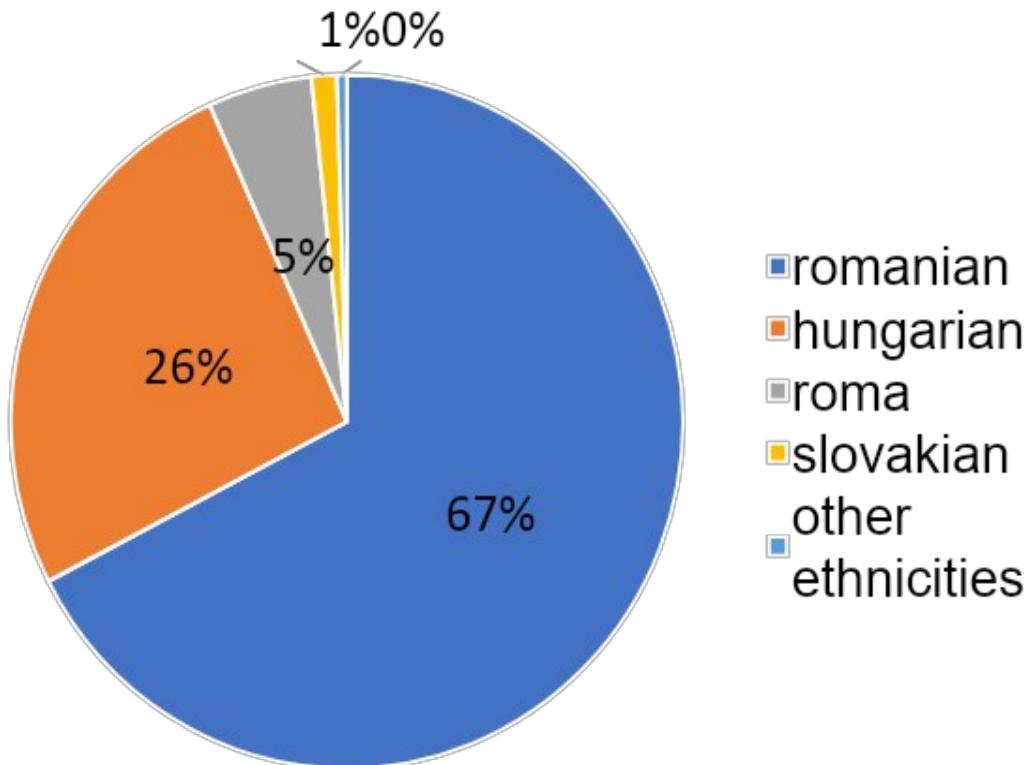
Following the initiative's successful implementation in Sălacea, **political decision has been taken** and the source separation system expanded to all of Bihor County by public tendering the waste management service (616.264 inhabitants).

There are three waste collectors companies in Bihor county: AVE BIHOR, RER VEST, SALUBRI

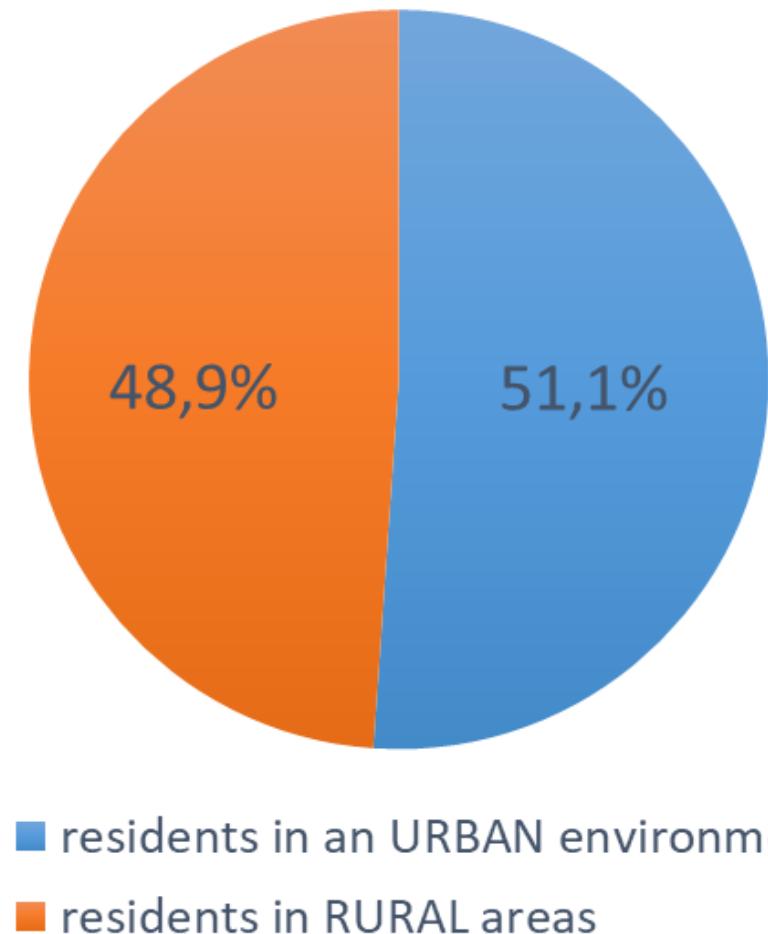


## STATISTICAL DATA OF THE BIHOR COUNTY

ETNIC STRUCTURE OF BIHOR  
COUNTY 2022



DISTRIBUTION BY LIVING  
ENVIRONMENT



## IMPLEMENTATION OF THE SYSTEM IN BIHOR COUNTY



In implementing the revised system, residual waste disposal behaviors were particularly difficult to change. Despite the cities attempt to mitigate residual waste by using smaller bins, residents' established habits were difficult to change. 15 percent of residents improperly used the largest (120 L) bins for residual waste. Following the pilot's completion, this issue triggered a change in the SWM program's design; the 120L bin has now been removed from the disposal kit entirely.





## IMPLEMENTATION OF THE SYSTEM IN BIHOR COUNTY

The different colored and sized bins and bags provided physical cues to guide waste disposal behavior and prioritize recycling and segregation over residual waste disposal.

To establish buy-in, community leaders engaged in a four-week education initiative prior to the system's launch. The city's mayor, priest, school director, and private operators met with community members at highly trafficked locations (e.g., church, schools, pubs, cultural center). They discussed the new system and provided demonstrations on proper waste sorting using the new waste bins.

The labels on the bins are written in five languages depending on the language spoken by the majority in the region.

## COLLECTION CALENDAR AND FREQUENCY FOR EACH WASTE TYPE

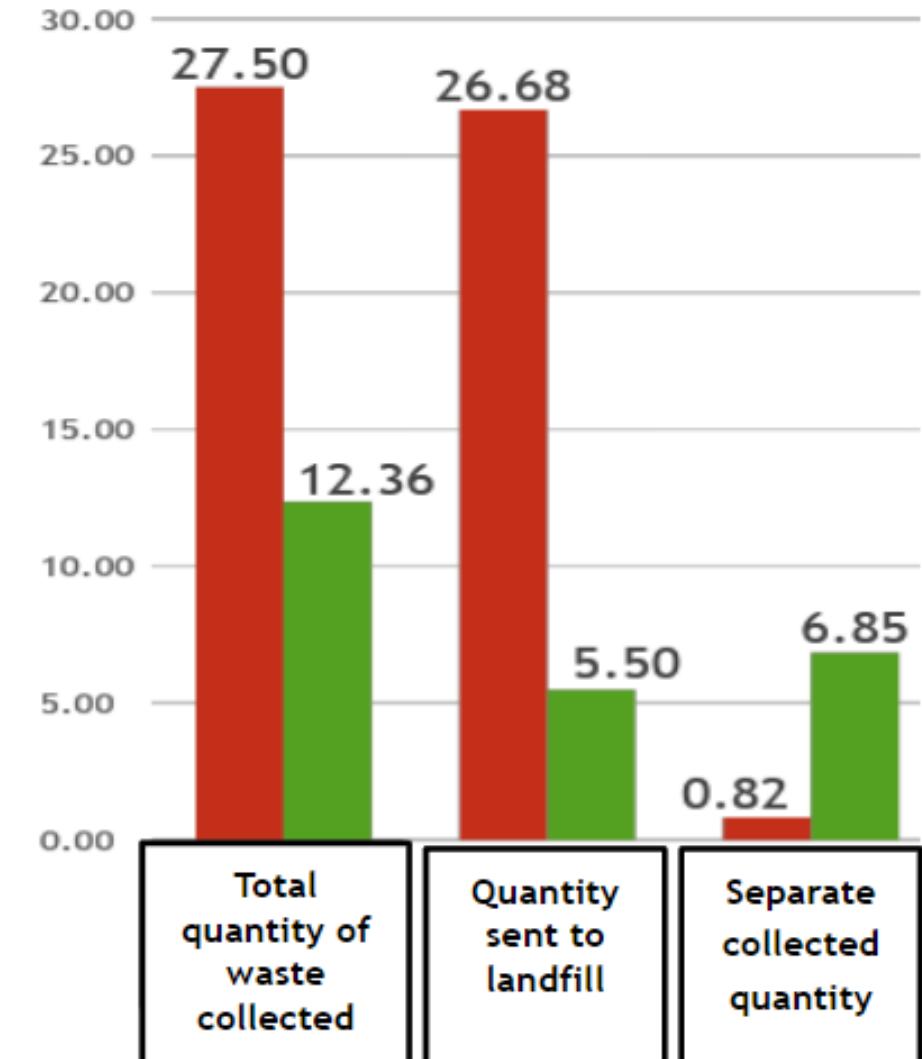
- Blue bags/blue bins collected paper and cardboard - once a month
- Yellow bags /blue bins collected plastic - twice a month
- Two brown bins (23L and 10L) collected organic waste - in cities once every week
- Green bins for glass waste - once a month
- Black bins ( 40 L) for residual waste - once every week



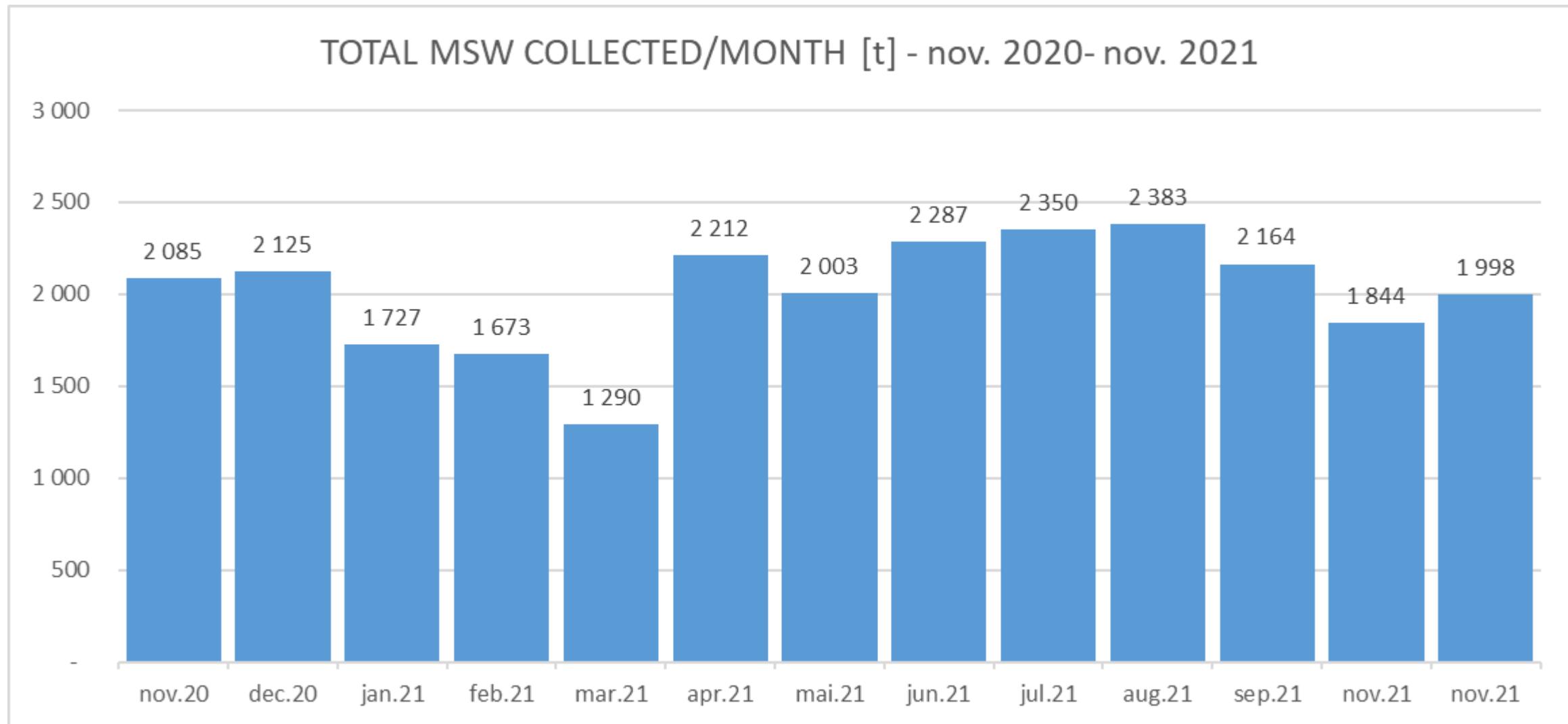
# THE IMPACT OF 5 STREAM SEPARATE COLLECTION IN SALACEA IN 2018

Comparing 3 months before and after changing from dual to 5 stream collection

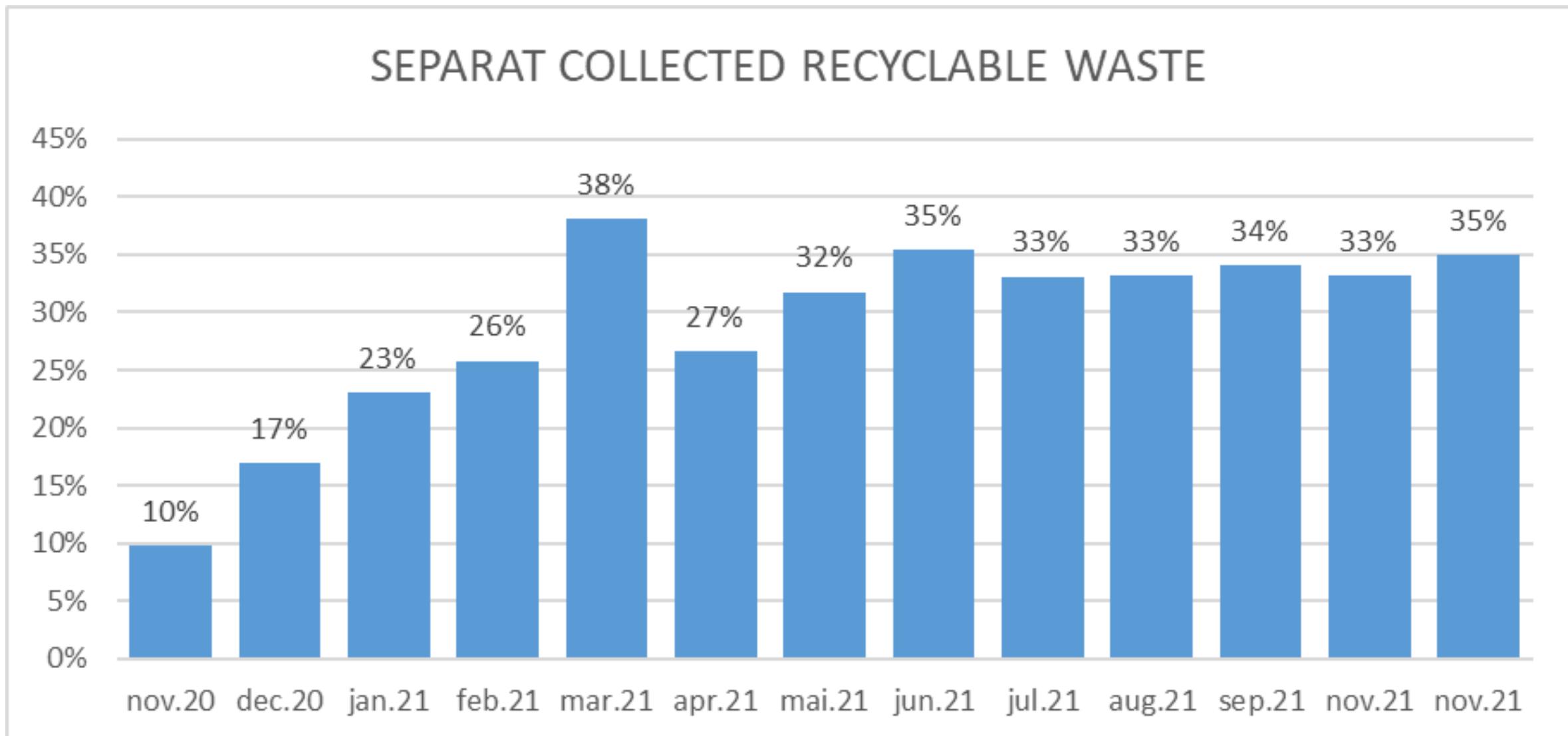
tonne / month	Before	%	After	%
<b>Total quantity of waste collected</b>	<b>27,50</b>	<b>100%</b>	<b>12,36</b>	<b>100%</b>
Quantity sent to landfill	26,68	97%	5,50	39%
Separate collected quantity	0,82	3%	6,85	61%



## EVOLUTION OF COLLECTED QUANTITY IN BIHOR COUNTY

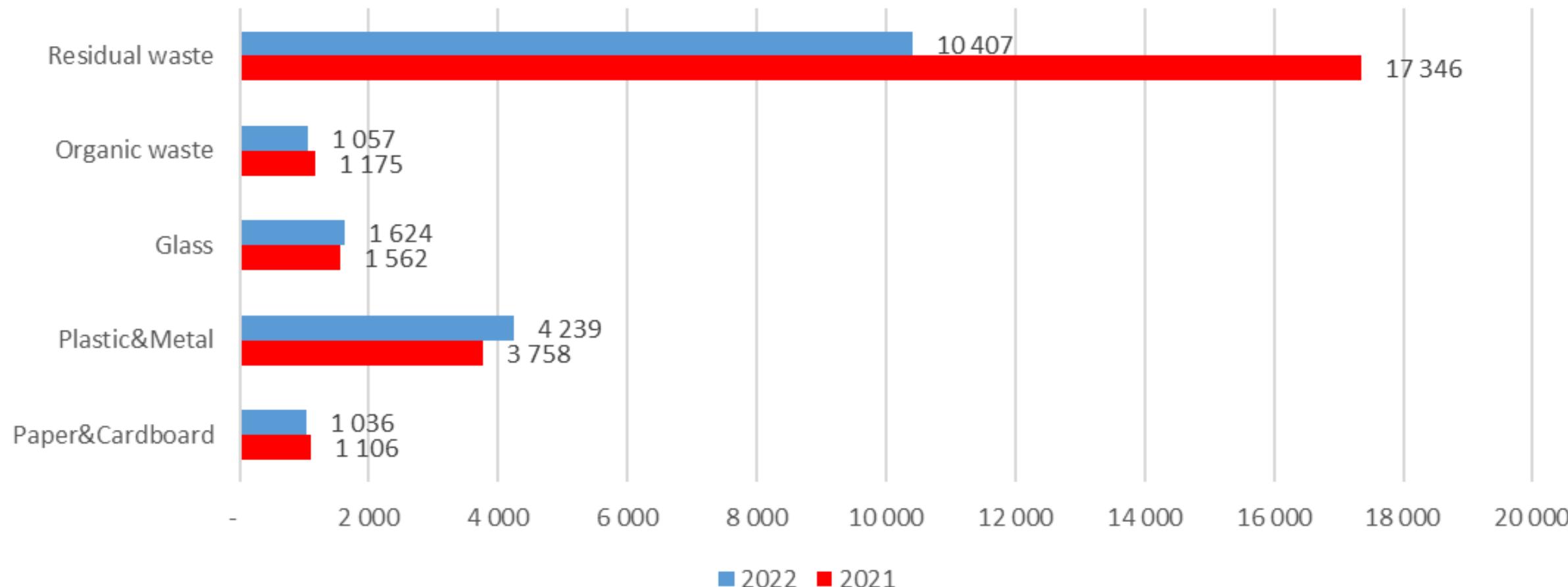


## EVOLUTION OF SEPARATE COLLECTION IN BIHOR COUNTY



## EVOLUTION OF COLLECTED QUANTITY IN BIHOR COUNTY

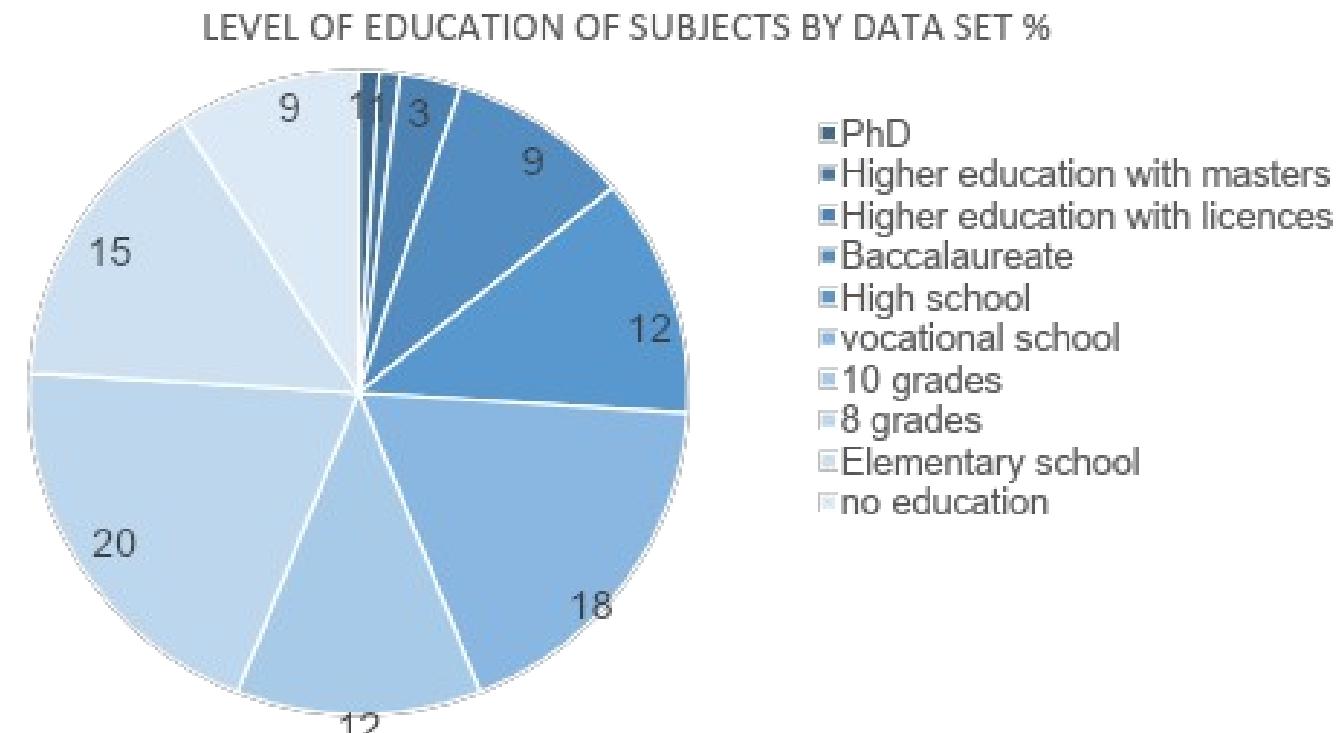
TOTAL WASTE COLLECTED/STREAM IN 2021 AND 2022 (tons)



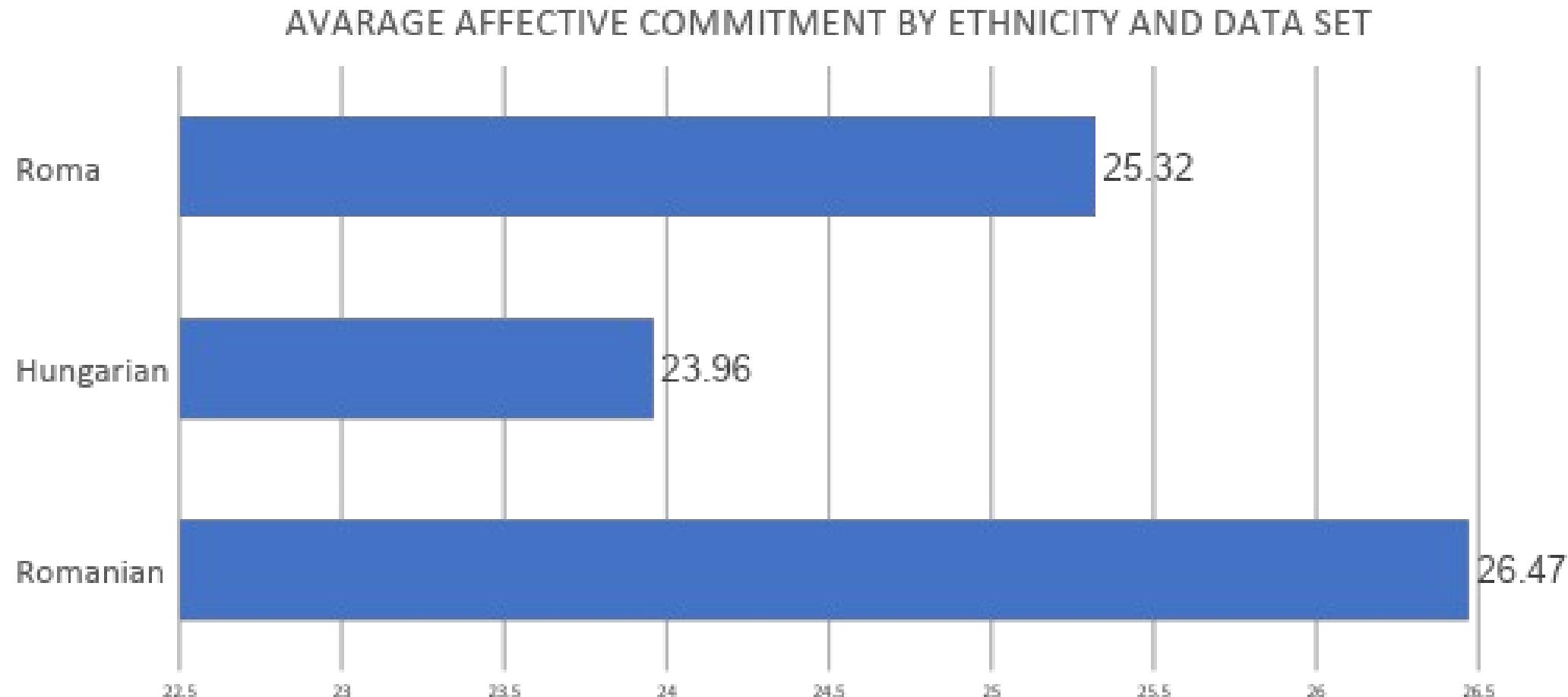


## HEKS/EPER ROMANIA ACTIVITIES IN COLLABORATION WITH PARTNER COMPANIES FROM BIHOR COUNTY

- Following the collaboration agreements between the months of November 2019 - January 2020, data were collected through questionnaires
- The data were processed by a team of sociologists and are synthesized in a report



## AFFECTIVE COMMITMENT BY ETHNICITY



## AFFECTIVE COMMITMENT BY ETHNICITY



## BEHAVIOURAL TOOLS

### Mixed Mechanisms

This initiative uses mixed mechanisms to promote source separation behaviors.



#### Financial Mechanisms:

Appealing to loss aversion: Research suggests that individuals are particularly motivated to avoid potential losses. In this case study, citizens were given the choice to opt-in to a tax to support the revised MSW collection service. If citizens opted into the new system, they were charged a lower monthly fee than those who did not participate in waste segregation. This encouraged residents to practice source separation to avoid incurring additional monetary losses.



#### System Design Mechanisms:

Simplifying behaviors & decisions: The design of waste management programs can influence their uptake. The municipality provided households with designated waste bins, eliminating the need for residents to procure their own. In tandem, waste bins were identified with stickers in Romanian, Hungarian, and Roma language to accommodate the cities multilingualism.



#### Timely messages:

Visual prompts can serve as a timely reminder to engage in waste-related behaviors. Included stickers on waste bins with examples of waste that each bin could accommodate. These stickers reduced the uncertainty surrounding which items went in which bin.

## BEHAVIOURAL TOOLS

- The bins are equipped with RFID identification chips
- With the RFID system every bin emptying is recorded and added to the customer's invoice
- Client platform integrated to the waste collection & monitoring system



**VARGA AUGUSTIN**

Persoană fizică

**INFO**

Bogei, Principala 155 B

**PCT. COLECTARE**

Bogei, Principala 155 B

Pubelă verde 30L  
A0030S043302

Pubelă neagră 40L  
A0040R008765

**Facturile mele**

Nr. Factura	Data Factura	Scadenta	Val. Factura	Val. Neachitata
L5TAU10045	31.10.2021	15.11.2021	14,52	0
L5TAU10613	31.10.2021	31.10.2021	3,7	0

**LOGOUT**

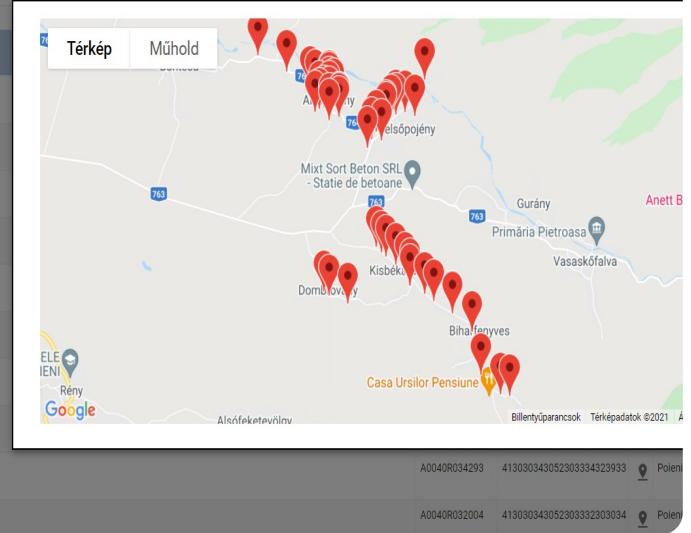
The collection trucks are tracked in real time

**RAPORT RIDICĂRI**

De la 30.11.2021 | Fizor - Select - | Terminal 370 ORADEA BIROU | DOWNLOAD

Terminal	Data cîștiri	Fizor
370	30.11.2021 09:25:36	TODEA EMILIA
370	30.11.2021 11:17:57	MIHUTA DOREL
370	30.11.2021 10:44:14	BODENCIU AUREL
370	30.11.2021 11:23:51	GAVRA MIRCEA BUJOR
370	30.11.2021 10:07:45	TIRLA CORNEL
370	30.11.2021 11:40:37	PIRTEA IOAN COSTEL
370	30.11.2021 11:35:03	COSTE DORU
370	30.11.2021 11:58:04	VARGA NICOLETA ANDREEA
370	30.11.2021 09:40:45	STEF TRAIAN
370	30.11.2021 11:19:21	GRUIE AUGUSTIN
370	30.11.2021 10:42:38	BLAGA FLORIN

**Térkép** | Műhold



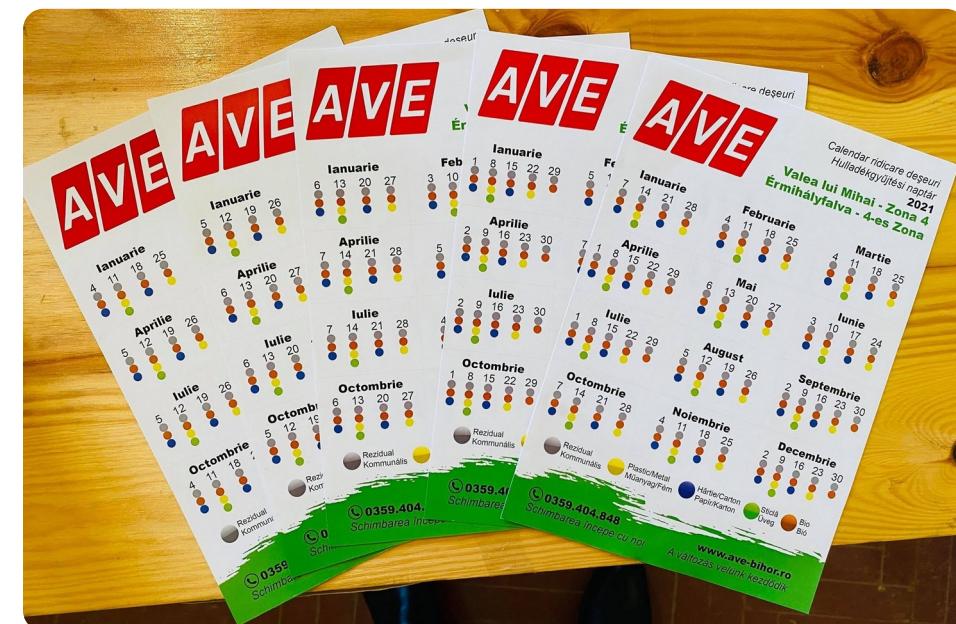
Billentyűpáncsok | Térképadatok ©2021 | Alkalmakép | A0040R034293 | 413030340523033323034 | Polen

## COMUNICATION TOOLS



The type of waste collected is indicated on the waste collection truck, so residents realize that each type of waste is collected separately

The collection calendar is distributed to the residents



## COMMUNICATION TOOLS



On all the collector trucks users can find the central phone number of the operator for suggestions and reclamation.

Also an identification number (47) for easy recognition even from the lateral view.

# COMMUNICATION TOOLS



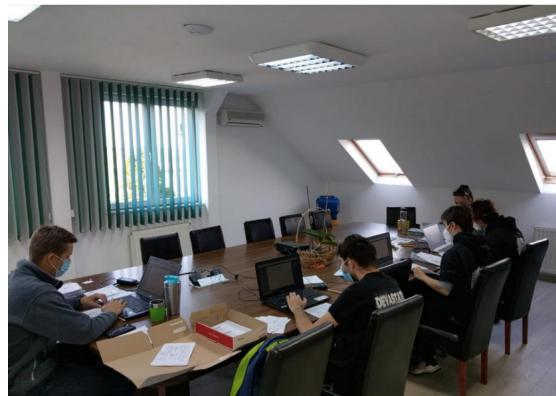
ave bihor

**Tot Postări Persoane Grupuri Fotografii**

**AVE BIHOR**  
13 nov. 2020 ·

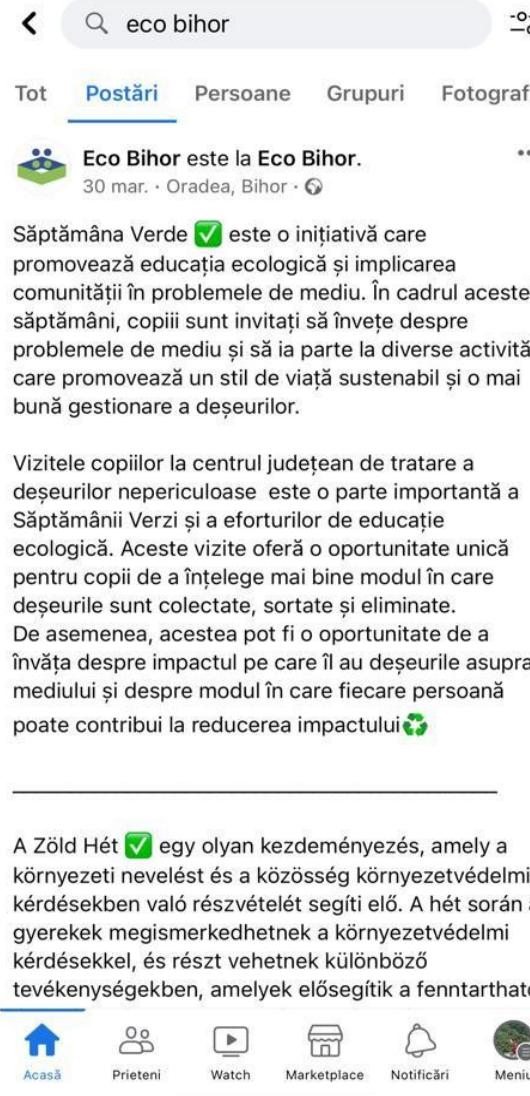
Colegiul nostru, proaspăt absolvenți de facultate, sunt bine veniți în rândul echipei noastre și ei acum lucrează cu spor pentru introducerea datelor contractuale în sistem.

Kollégáink, frissen végzett egyetemisták is szeretettel vannak a csapatunkba befogadva és épp most, szorgosan dolgoznak hogy felvezessék a rendszerbe az új szerződéseket.



35 5 comentarii 2 distribuiri

 Acasă  Prieteni  Watch  Marketplace  Notificări  Meniu



eco bihor

**Tot Postări Persoane Grupuri Fotografii**

**Eco Bihor este la Eco Bihor.**  
30 mar. · Oradea, Bihor ·

Săptămâna Verde este o inițiativă care promovează educația ecologică și implicarea comunității în problemele de mediu. În cadrul acestei săptămâni, copiii sunt invitați să învețe despre problemele de mediu și să ia parte la diverse activități care promovează un stil de viață sustenabil și o mai bună gestionare a deșeurilor.

Vizitele copiilor la centrul județean de tratare a deșeurilor nepericuloase este o parte importantă a Săptămânii Verzi și a eforturilor de educație ecologică. Aceste vizite oferă o oportunitate unică pentru copii de a înțelege mai bine modul în care deșeurile sunt colectate, sortate și eliminate. De asemenea, acestea pot fi o oportunitate de a învăța despre impactul pe care îl au deșeurile asupra mediului și despre modul în care fiecare persoană poate contribui la reducerea impactului

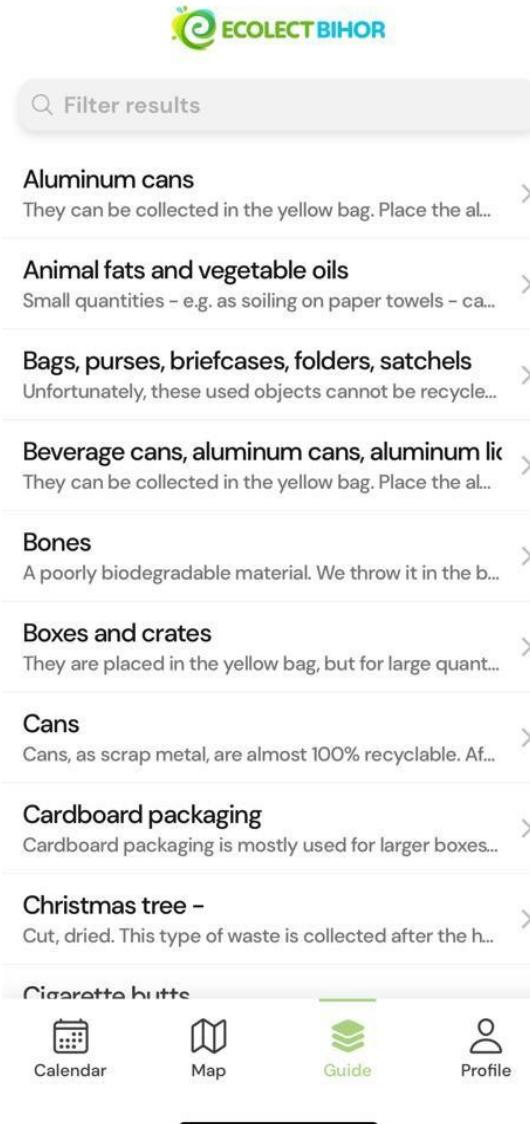
A Zöld Hét egy olyan kezdeményezés, amely a környezeti nevelést és a közösség környezetvédelmi kérdésekben való részvételét segíti elő. A hét során a gyerekek megismerkedhetnek a környezetvédelmi kérdésekkel, és részt vehetnek különböző tevékenységekben, amelyek elősegítik a fenntartható

 Acasă  Prieteni  Watch  Marketplace  Notificări  Meniu

All the operators (collectors, treatment center) are actively present in social media.

The social media posts are bilingual, they appear both in romanian and hungarian language.

## COMMUNICATION TOOLS



ECOLECT BIHOR

Filter results

- Aluminum cans
 

They can be collected in the yellow bag. Place the al...
- Animal fats and vegetable oils
 

Small quantities - e.g. as soiling on paper towels - ca...
- Bags, purses, briefcases, folders, satchels
 

Unfortunately, these used objects cannot be recycle...
- Beverage cans, aluminum cans, aluminum li
 

They can be collected in the yellow bag. Place the al...
- Bones
 

A poorly biodegradable material. We throw it in the b...
- Boxes and crates
 

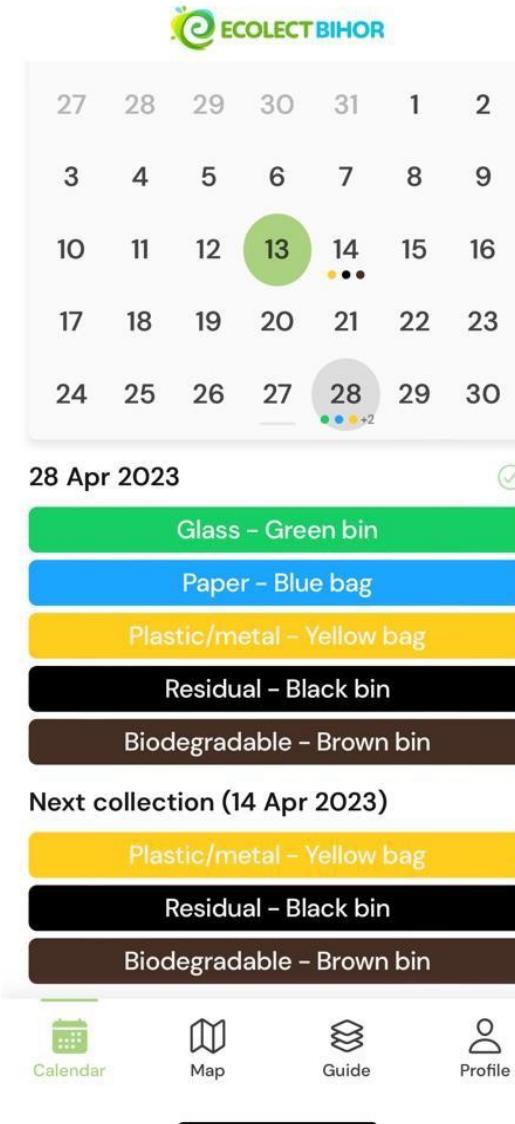
They are placed in the yellow bag, but for large quant...
- Cans
 

Cans, as scrap metal, are almost 100% recyclable. Af...
- Cardboard packaging
 

Cardboard packaging is mostly used for larger boxes...
- Christmas tree -
 

Cut, dried. This type of waste is collected after the h...
- Cigarette butts

Calendar Map Guide Profile



ECOLECT BIHOR

27	28	29	30	31	1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30

28 Apr 2023

- Glass - Green bin
- Paper - Blue bag
- Plastic/metal - Yellow bag
- Residual - Black bin
- Biodegradable - Brown bin

Next collection (14 Apr 2023)

- Plastic/metal - Yellow bag
- Residual - Black bin
- Biodegradable - Brown bin

Calendar Map Guide Profile

## WasteBook

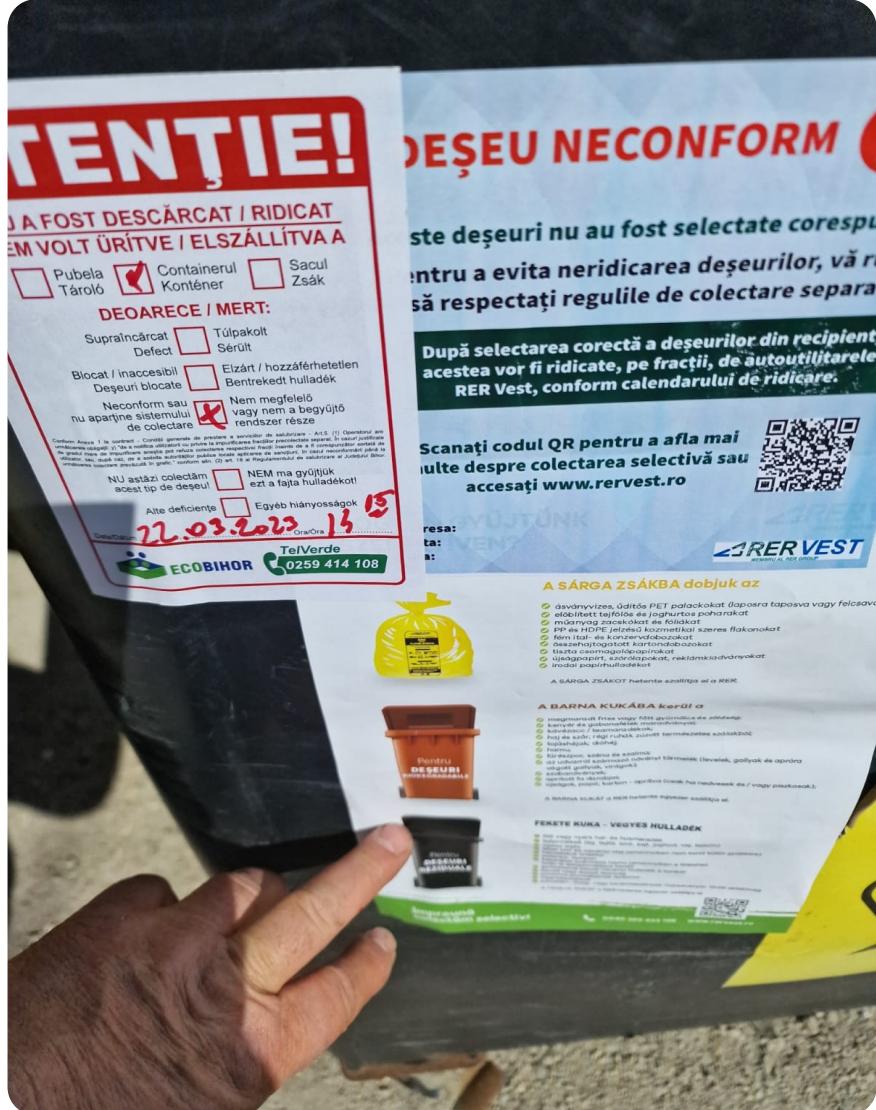
Bihor Curat (Cleen Bihor County)  
phone application (Android and IOS)

"Bihor Curat - WasteBook" will provide useful data such as:

- waste sorting guide
- collection calendar (specific for the user's area)
- collection centers and points (timetables, prices, delivery method, what waste is accepted).

The application also gives citizens the opportunity to *report* abandoned waste in public places, to request individual waste transport from the operator in the area and to file notifications or complaints regarding the sanitation service.

## MONITORING AND CONTROL TOOLS TO IMPROVE CITIZENS BEHAVIOUR



- The waste collection trucks are *randomly* accompanied by control team.
- Bins with inappropriate content are not emptied
- The reason for the non-conformity is communicated each time by stickers
- After the correct separation of waste by the customer, the bins will be emptied according to the collection schedule
- The non-conformities are communicated to the users by using the bilingual labels put on the bins by the control team, or the collection workers

## MONITORING AND CONTROL TOOLS TO IMPROVE CITIZENS BEHAVIOUR



Users who do not comply are warned the first time, and if the controllers continue to find non-compliance during the next control, users are fined by the local police.



## AWARENESS CAMPAIGNS REGARDING THE IMPORTANCE OF SEPARATE COLLECTION



Educational facilities are also a major role model for children around the county and play a pivotal role in shaping waste habits for our younger generations.

With the amount of solid waste increasing in schools year on year, it's becoming even more difficult to manage, however there are major benefits that the schools could see from an improved system!

## AWARENESS CAMPAIGNS REGARDING THE IMPORTANCE OF SEPARATE COLLECTION



The sanitation companies (collection/treatment companies) are also present at cultural activities and meet face-to-face with the users of the system.

## AWARENESS CAMPAIGNS REGARDING THE IMPORTANCE OF SEPARATE COLLECTION



The communication specialists of waste collection companies are present at festivals and other cultural activities

## AWARENESS CAMPAIGNS REGARDING THE IMPORTANCE OF SEPARATE COLLECTION



STEFAN ZWEIG 19 A  
CALEA SANTANDREI 16B

INFORMAȚII LA  
0748.228.822

Săptămâna care a trecut a fost una plină de activități cu copii la sediile ECO și Bihor. În timp ce ECO Bihor gestionează toate deșeurile generate la nivel județ în cadrul depozitului ecologic amenajat pe strada Matei Corvin, AVE Bihor compania de salubritate se ocupă cu colectarea de la populație, companii instituții publice a deșeurilor generate în patru zone ale județului. Astfel că e care ne-au vizitat zilele acestea au putut vedea îndeaproape cum funcționează acest sistem de colectare separată și cât este el de important pentru protecția mediului.



STEFAN ZWEIG 19 A  
CALEA SANTANDREI 16B



★ PĂREREA NOASTRĂ



eBihoreanul \ AVE Bihor 03 Aprilie 2023, 09:40

Şcoala AVE Bihor - Educația, primul pas în protecția mediului



2 Imagini 0 clipuri 0 audio 0 fisiere 0 comentarii



STEFAN ZWEIG 19 A  
CALEA SANTANDREI 16B



AVE Bihor își ia în serios misiunea de educator al tinerelor generații. În acest sens, am demarat ample acțiuni în unitățile de învățământ din Bihor, pentru a le explica celor mici importanța colectării separate a deșeurilor și impactul pozitiv al acestui demers asupra mediului. Săptămâna trecută am ajuns și la grădinița cu program prelungit "Toldi" din Salonta, care a organizat "Săptămâna Verde", dedicată educației și conștientizării cu privire la importanța protecției mediului înconjurător și a naturii.



eBihoreanul \ AVE Bihor 06 Martie 2023, 10:21

AVE Bihor: Lecție de salubritate cu elevii liceului Petőfi Sándor din Săcueni (FOTO)



4 Imagini 0 clipuri 0 audio 0 fisiere 0 comentarii

AVE Bihor este operatorul de salubritate care colectează deșurile din patru zone ale județului Bihor. Pe lângă această activitate, însă, facem mereu diferite acțiuni de conștientizare și educare continuă a noilor generații, în colaborare cu școlile și grădinițele care se află în zonele noastre de operare.

Săptămâna trecută, elevii Liceului Petőfi Sándor din Săcueni au vizitat

Articles appears in the local press every week that deals with issues related to waste collection for educational and awareness purposes.

The cost of control and monitoring actions is 300,000 euros/year for Bihor County.

## AWARENESS CAMPAIGNS REGARDING THE IMPORTANCE OF SEPARATE COLLECTION

**PLANTROPOLIS** project intended for schools - With local ONG's promoting circular economy concept by introduction compost in local kindergarten and elementary schools.

The project is destined for educational scoop regarding bio waste separate collection and organic gardening with vegetable and fruit cultivation

link: <https://www.youtube.com/watch?v=P0yvtRGDXpc>





## AWARENESS CAMPAIGNS REGARDING THE IMPORTANCE OF SEPARATE COLLECTION

**PLANTROPOLIS - GROWING TOGETHER WITH NATURE**



## AWARENESS CAMPAIGNS REGARDING THE IMPORTANCE OF SEPARATE COLLECTION



## REFLECTIONS AND CONCLUSIONS

**NO, there are no social limits to implementation of an identification system**

- Against the efforts submitted, only 10% of the population did not comply
- It was found that the acceptance of a new implemented system cannot be correlated with ethnicity, as long as the appropriate communication paths are found for each group
- Monitoring and control is indispensable for the operation of the system
- Monitoring and control actions without imposing fines are not enough to achieve results
- The EPER-HEKS association helped in identifying the motivation of each monitored group by education level

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**THANK YOU FOR YOUR  
ATTENTION!**

**PhD PÁSZTAI ZOLTÁN-ATTILA**

CEO of ECO BIHOR Ltd.

representative of AVE BIHOR Ltd.



**Mr. HORVÁTH BÉLA**

Mayor of Salacea

