

Circular Economy Transition Stories from N. Macedonia

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About us

- Founded in **November 2010**
- **Not for profit** organization, equal treatment of all clients/member companies (> 760), collection of their packaging waste placed on the market by selling their products
- On national level more than 5000 companies are obliged industry
- PAKOMAK founders are **11 biggest producers** from brewing & wine industry, water fillers, eatable oil and processed food industry



Ladna

ПЕЛИСТЕРКА

кристал

Waste facts

EU facts for average European (2021)

- **5 tones of waste** are generated by production and consuming of all product that he need per year including household and packaging waste
- **480 kg household waste** is generated per year from which average **188.7 kg is packaging waste (73.8 Croatia up to 246 kg Ireland).**

Facts for North Macedonia

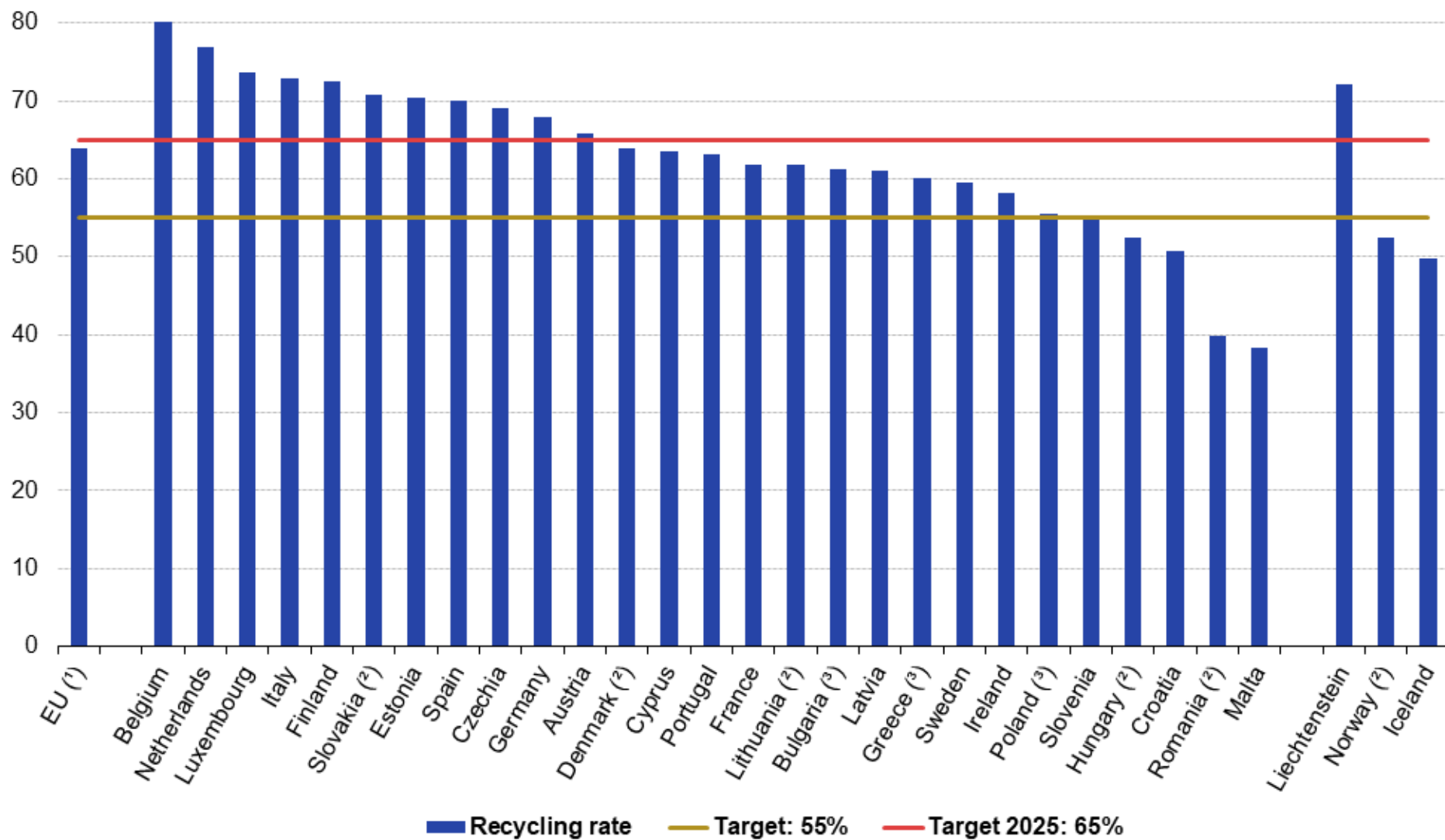
- per inhabitant **470 kg household waste** is generated per year from which **est. 62-80 kg is packaging waste**
- in total cc. **900.000 tones household waste** is generated per year from which more than **112.000 tones is packaging waste (est. 2024)**

These figures look alarming considering our resources are limited, but there might be a solution.

Many products and materials can be reused or repaired, thus reducing waste.

Recycling rate of packaging waste, 2021

(%)



■ Recycling rate
 — Target: 55%
 — Target 2025: 65%

⁽¹⁾ Eurostat estimate.

⁽²⁾ 2020.

⁽³⁾ 2019.

Source: Eurostat (online data code: env_waspacr)

Waste facts

	Current targets (%)	By 2025 (%)	By 2030 (%)
All packaging	55	65	70
Plastic	25	50	55
Wood	15	25	30
Ferrous metals	50	70	80
Aluminium	-	50	60
Glass	60	70	75
Paper and cardboard	60	75	85

https://environment.ec.europa.eu/topics/waste-and-recycling/packaging-waste_en

Waste facts

CO2 emissions per capita, regional ranking, 2021

Rank	Country/Region	tCO2 / Capita
	Europe	5.37
1	Gibraltar	19.57
2	Luxembourg	12.26
3	Czechia	8.62
4	Poland	7.84
5	The Netherlands	7.66
6	Germany	7.50
7	Belgium	7.45
8	Cyprus	6.86
9	Austria	6.75
10	Ireland	6.75

Why Circular Economy is good for Europe?

Circular economy is a necessity:

- in 1920, world population was **2 billion**, generated 30 kg/waste/year
- By 2050, world population expected to be at **9 billion (now more than 8 billion)**
- Europe loses **95%** of material and energy value
- 8.3 billion** tons of plastic waste created since 1950, mostly landfilled or leaked

Circular economy can be a game changer for jobs and savings:

- Create **180,000 jobs** by 2030 and **2 million** in the longer term
- Save **EUR 72 billion** per year in waste management costs
- 10,000 tons of waste create **1 job** if burned/landfilled, **40 to 100 jobs** if recycled

CIRCULAR economy- Business Models



Hierarchy of waste management

At this moment, **Resources recovery** seems the fastest and most applicable circular business model!

Increase of RECYCLING and increase use of GREEN-ENERGY are on short run, the fastest and the most applicable approaches to the existing economic models, until companies transform into “**not-only profit-driven**” businesses!

Circular Economy will **push OUT OF THE COMFORT ZONE** businesses and consumers! Transition could be with decades, but it must start now!
Changing behaviour takes times, usually years and decades!



Fee from the industry

EPR organization



“Primary” Separate collection by citizens and companies



Separate Collection and Transport by Public or Private Waste Management company



“Secondary” Collection and or Sorting by Public or Private Waste Management Company

“Transport to the Recycling Plant



Waste movement



Revenues



Activities

SMART system – project for packaging waste management with 25% financial contribution by SDC



Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Swiss Agency for Development
and Cooperation SDC

Green points – subsidy fee for using RVM per bottle/can thru RVM mobile app.

Recycling plant, local or in surrounding countries



24/7 available
transparent
info for
citizens for all
waste streams



Back-end
Virtual
Server

Waste
Management
Application

Industry



Consumers
generating waste



Weight & final
destination info of
the transported
waste

Transport
to the
recycling
plant



Weight & final
destination
info of the
transported
waste



GPS location for
full container

SMART sensor info
about fullness

Packaging waste in
Igloo containers



Packaging waste in
Reverse Vending
Machines



Sorting of the waste to be
prepared for recycling
financed by Pakomak



GPS

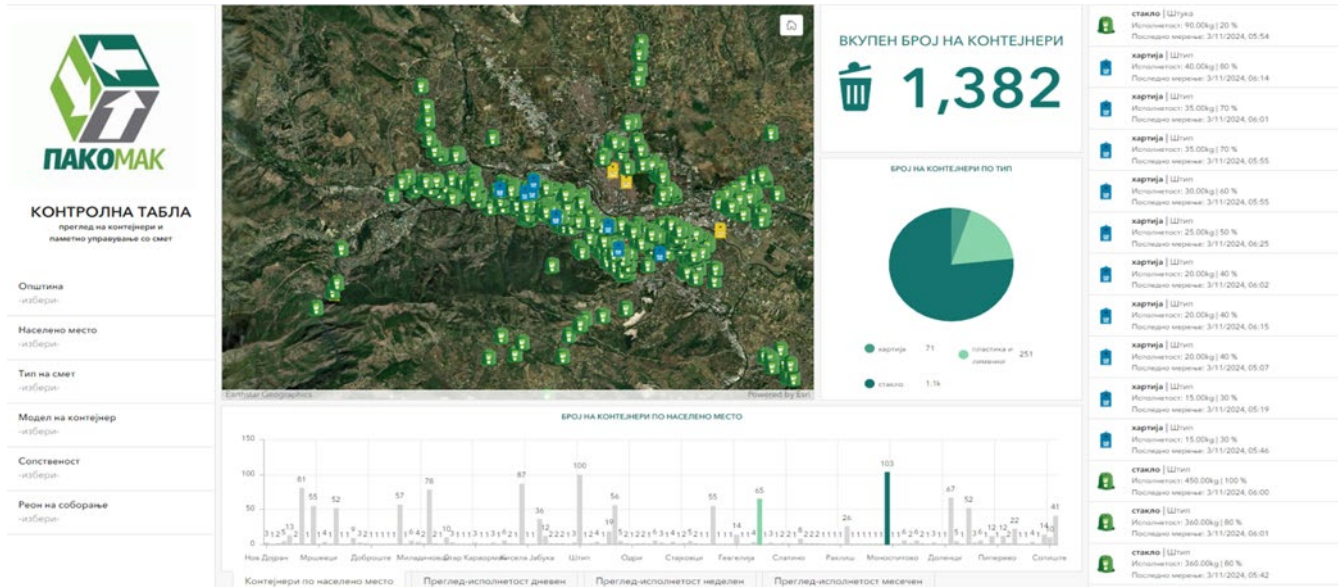
Collection and transport of the waste to the sorting plants by separate trucks financed by Pakomak.

Note: Waste collected from RVM's while transport & sorting should not be mixed with waste from Igloo containers.

SMART sensors for Waste Management

Installation

By April 2024 on all **1700** Igloo containers for: glass, plastic, aluminum and paper.



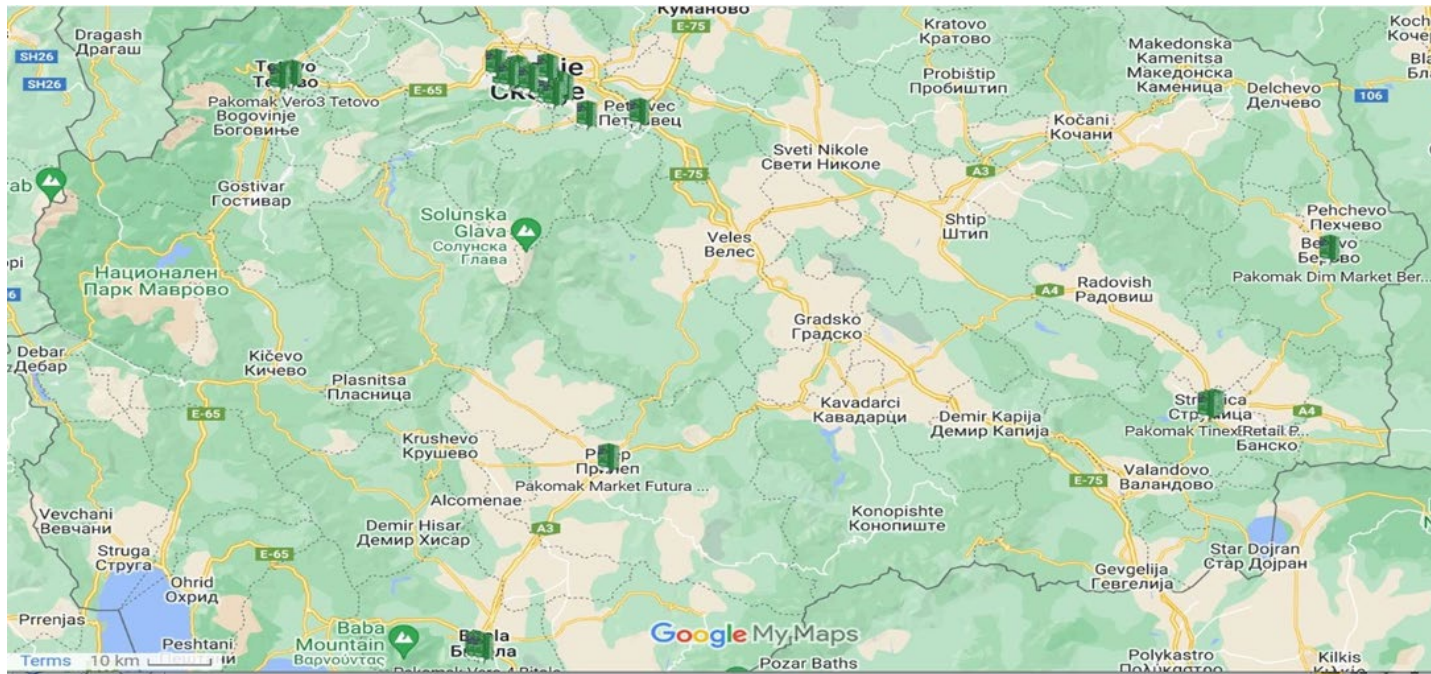
Benefits

- Enter circular economy & saving natural resources
- Optimizing collection routes
- Operational costs decrease by 30%
- **Environmental protection** by decrease of CO2 emissions

RVM – Reverse Vending Machines

Installation:

- First installation December 2022.
- Installed 70 RVM's by the end of 2024 in: Skopje, Berovo, Kriva Palanka, Kocani, Stip, Prilep, Bitola, Strumica, Kumanovo, Makedonska Kamenica and Tetovo
- RVM's are **ready for deposit system**



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RVM – Reverse Vending Machines

Ecosystem development

- **Circular economy** via collection of PET for RPET & aluminium cans
- Cc. **1.5 million pcs.** (over 40 tons) of PET bottles and AL cans per month collected

Engagement

- **Municipality** engagement by subsidizing of the incentives (Green points) from their local budgets (Green points) for the citizens for using RVM's: Berovo, Stip, Strumica, Kocani, Struga, Ohrid, Kriva Palanka, Kumanovo, Prilep and Bitola
- **Private sector** engagement: Two private companies, one retailer and Rotary club have bought RVM's which are installed in their municipality.
- **36000 users** of RVM's for one year. The number is constantly increasing for 300-400 new users per week

Obstacles for project growth

- **Lack of RVM's** to be installed in engaged municipalities. At the moment 5 municipalities from listed above are waiting for 14 RVM's.
- **Insufficient funds** for public awareness raising

Main Challenges for Circular Waste Treatment

- **LAWS PROPER IMPLEMENTATION**
Synchronized activities among the institutions responsible for the implementation of the National Waste Management Plan
- **PROFESSIONALS IN WASTE MANAGEMENT**
Minimize political influence on environmental decisions
- **SYSTEMIC & INTEGRAL APPROACH NATIONWIDE**
Create a system that will push all obliged companies with waste management laws to finance proper waste management
- **BUSINESS WILL NOT VOLUNTARY LEAVE LINEAR ECONOMY**
Financial stimulation for business to switch to circular

Final conclusions

- Transition from Linear to Circular Economy will take decades
- Going out from Comfort Zone is a MUST
- Consumerism as a vehicle for economy growth has to be replaced
- Institutions have to create positive reinforcement (bonuses/ incentives) for transition and penalties/malus for not-being “green”
- Greenwashing to be penalized

**Make Waste Selection and Recycling
a Habit in Our Lives!**

Thank You!