

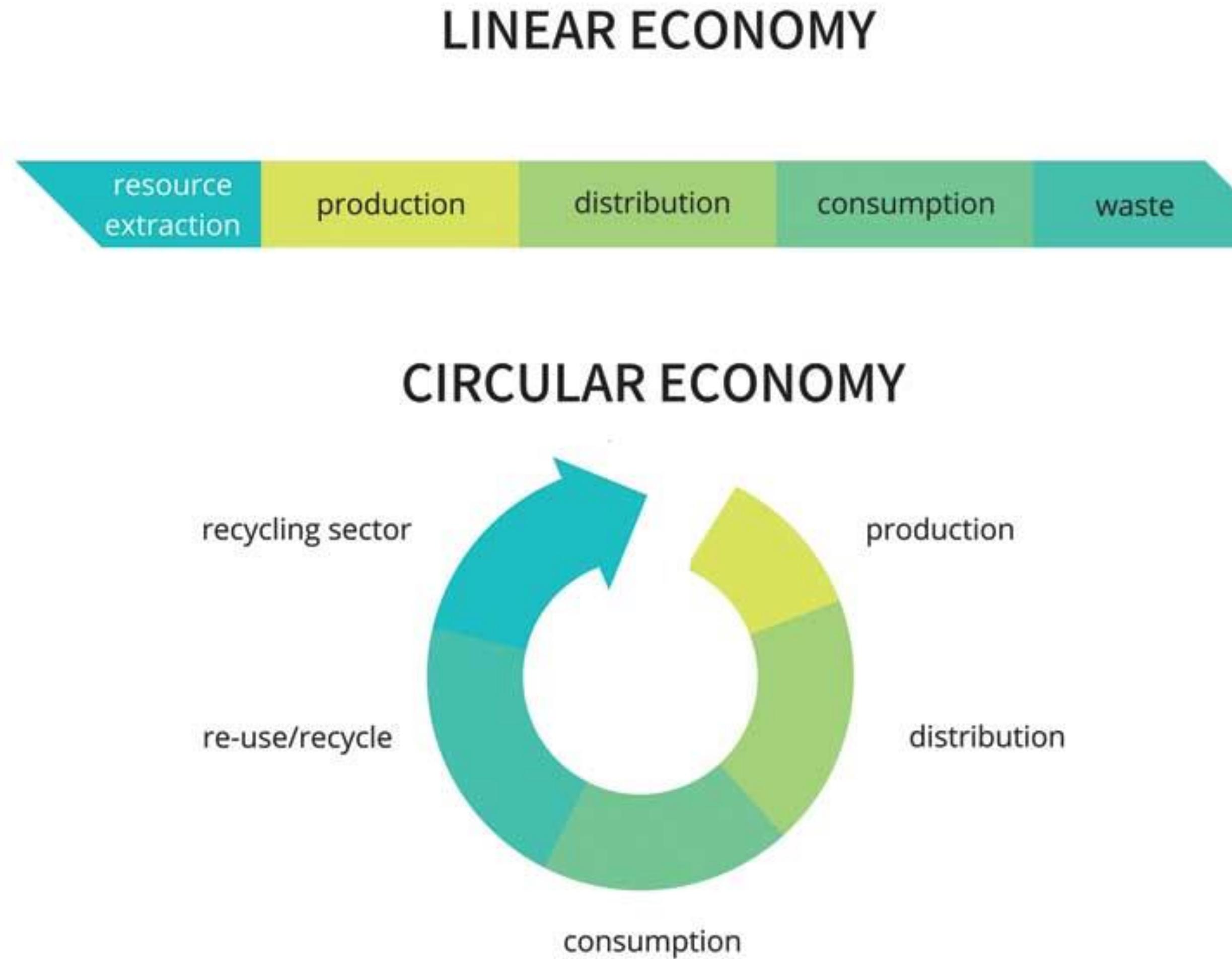
# Initiatives on biowaste in Hungary

Laszlo ALEKSZA PhD.  
associate professor



- **MATE (Hungarian University of Agriculture and Life Sciences):** one of the largest agricultural-focused, multidisciplinary higher education institutions in Europe;
- Established on **1 February 2021** (Szent István University and integration of Kaposvár University, Eszterházy University's Károly Róbert Campus (Gyöngyös) and Pannon University's Georgikon Faculty in Keszthely);
- **Campuses:** Buda, Gödöllő, Gyöngyös, Kaposvár and Keszthely;
- MATE has an Institute structure;
- **Institute of Environmental Sciences.**

# Transition from linear to circular economy

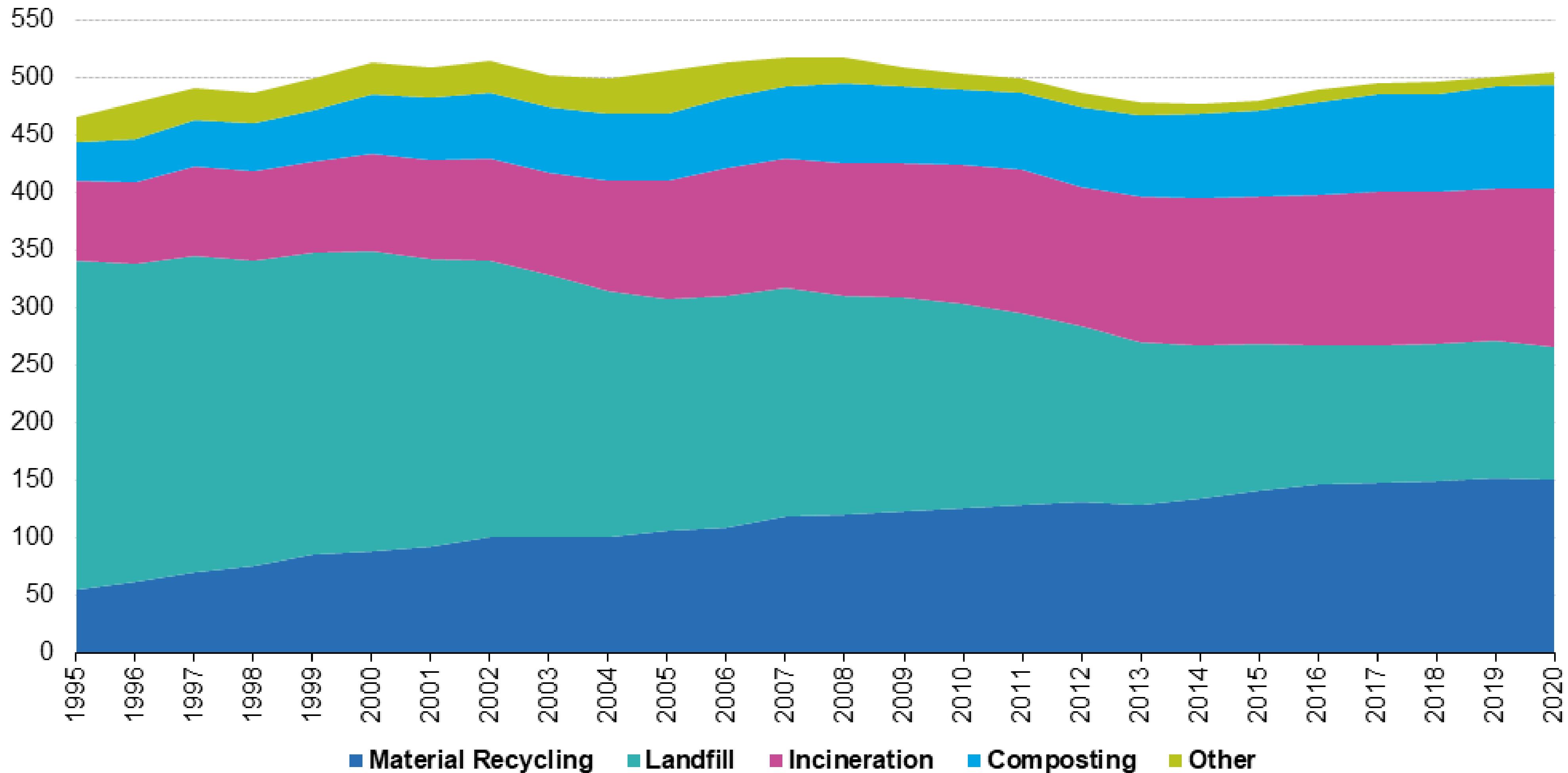


- Hungary:**
- ✓ 50% of MSW to landfill;
  - ✓ 1,5 million tons biowaste potential;
  - ✓ ~30 billion EUR: value as secondary raw material;

# Waste treatment in EU (1995-2020)

## Municipal waste treatment, EU, 1995-2020

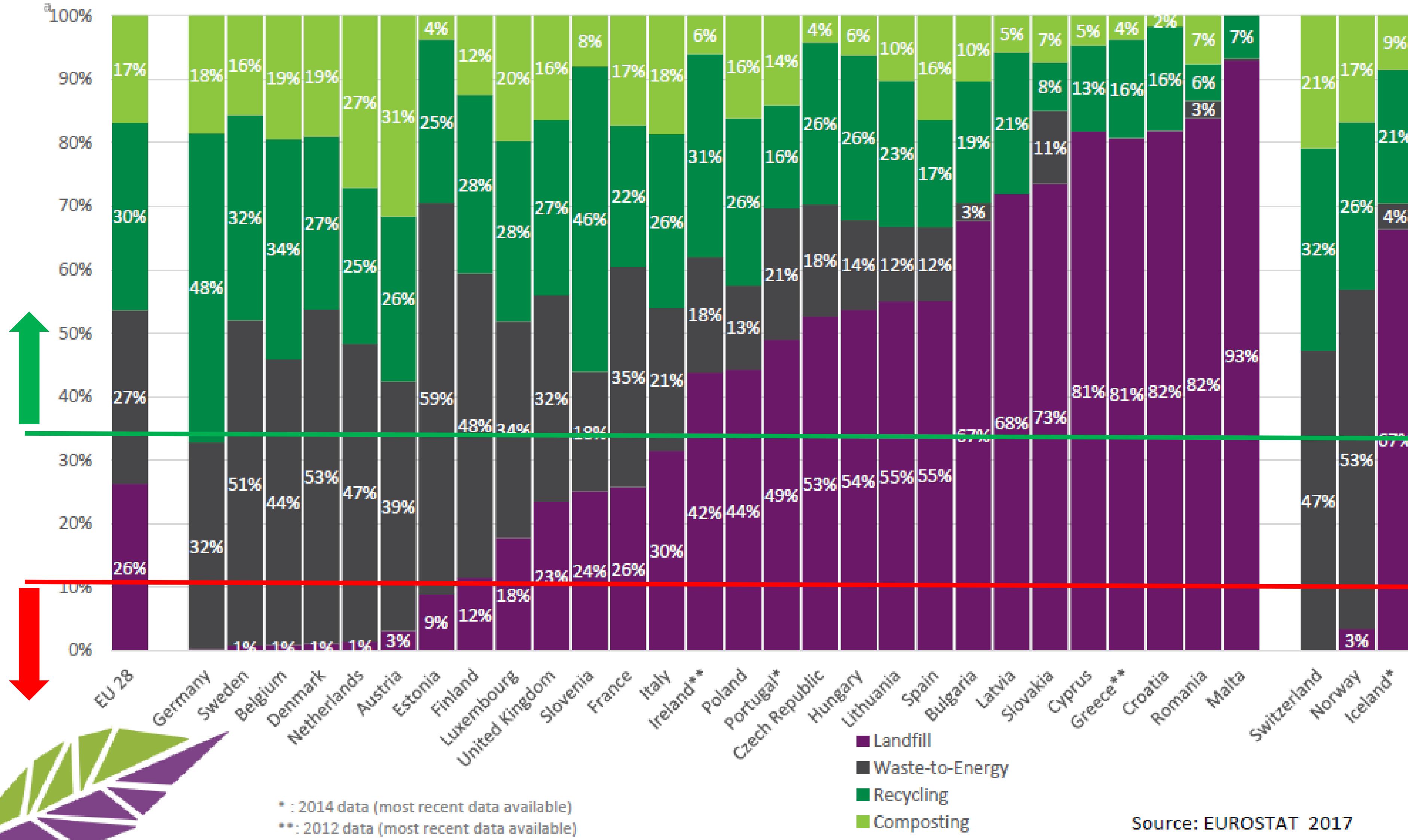
(kg per capita)

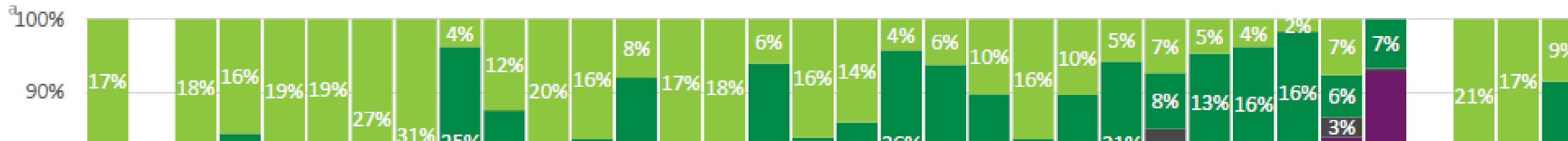


Note: estimated by Eurostat.

Source: Eurostat (online data code: env\_wasmun)

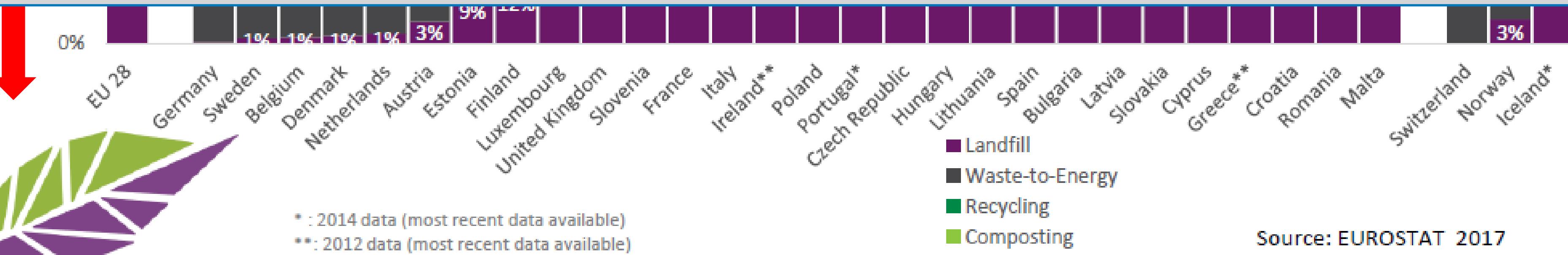
# WASTE TREATMENT IN EU





## Hungarian Waste Law: 2012. CLXXXV. - modified 25.02.2021

- min. 65% of MSW must be recycled (75% of packaging materials);
- max. 10% of MSW to landfill;
- mandatory separate collection of biowaste (31.12.2023), hazardous waste (01.01.2025), textile waste (01.01.2025)
- 50% food waste reduction by 2030;
- ...



# BIOWASTE TREATMENT IN EU

**Sweden:**  
67 sites, 1.07 million tons of biowaste

**Finland:**  
259 sites, 0.48 million tons of biowaste

**United Kingdom:**  
199 sites, 2.95 million tons of biowaste

**Netherlands:**  
135 sites, 4.20 million tons of biowaste

**Belgium:**  
81 sites, 2.03 million tons of biowaste

**Germany:**  
912 sites, 8.87 million tons of biowaste

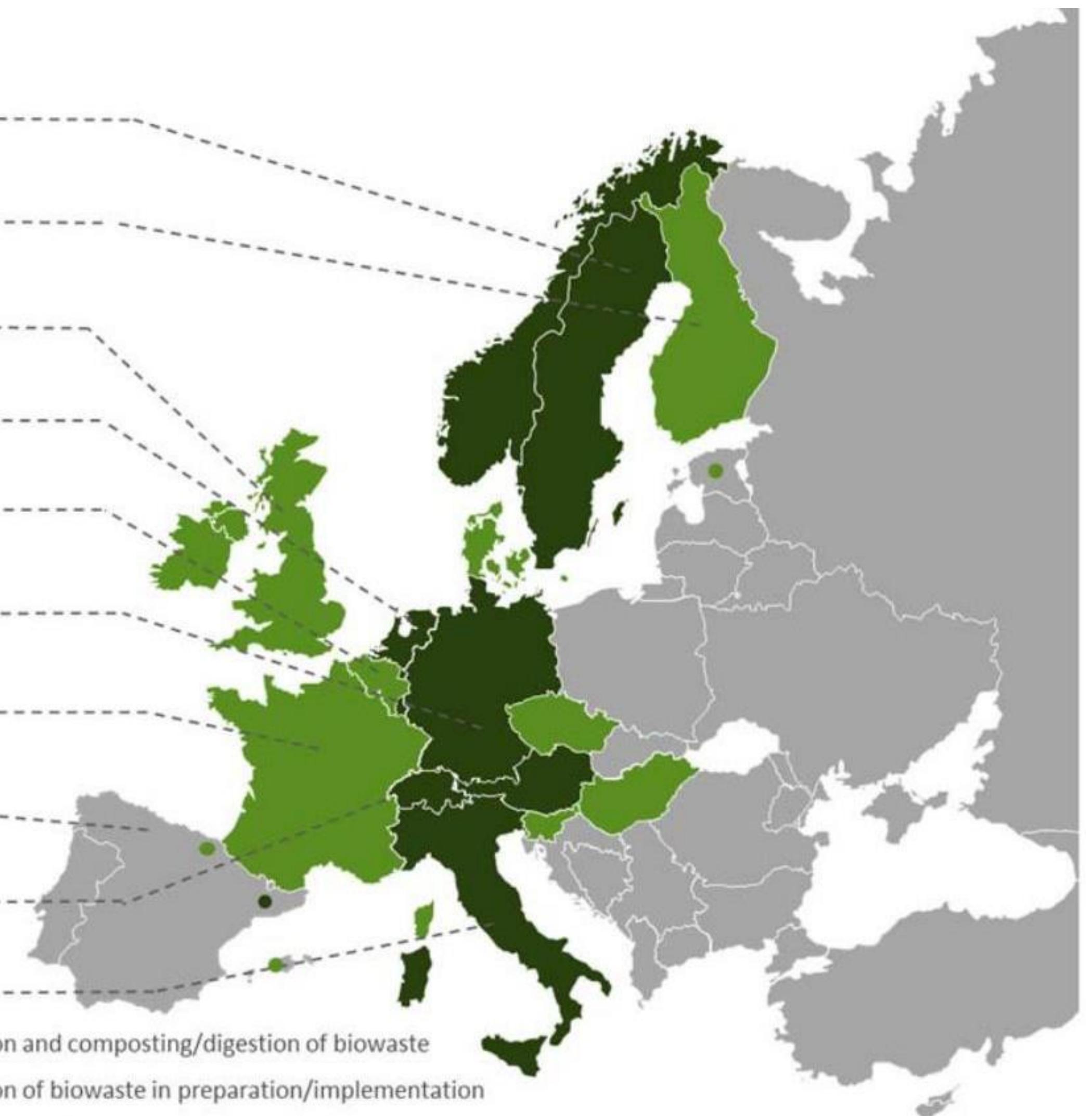
**France:**  
692 sites, 4.62 million tons of biowaste

**Spain:**  
67 sites, 0.87 million tons of biowaste

**Switzerland:**  
287 sites, 1.00 million tons of biowaste

**Italy:**  
298 sites, 5.30 million tons of biowaste

- Separate collection and composting/digestion of biowaste
- Separate collection of biowaste in preparation/implementation
- Only limited collection of biowaste



- ✓ **123 million tons/year: EU biowaste production;**
- ✓ **4200 biowaste treatment plants;**
- ✓ **47,5 million tons/year biwaste recycled;**
- ✓ **117 kg/person/year;**
- ✓ **25 kg/person/year (2004/2007 joiners)**
- ✓ **28 kg/person/year in Hungary**

## Hungary potential:

- ✓ 30 million tons agricultural by-products;
- ✓ 1,5 million tons biowaste (kitchen and green waste);
- ✓ 1,8 million tons food-waste (0,75 mio tpy households, 0,7 mio tpy processing, 0,25 mio tpy catering, 0,1 mio tpy trading);
- ✓ 1,2 million tons dewatered sewage sludge (biosolids);

## MATE Circular Economy – R+D priorities:

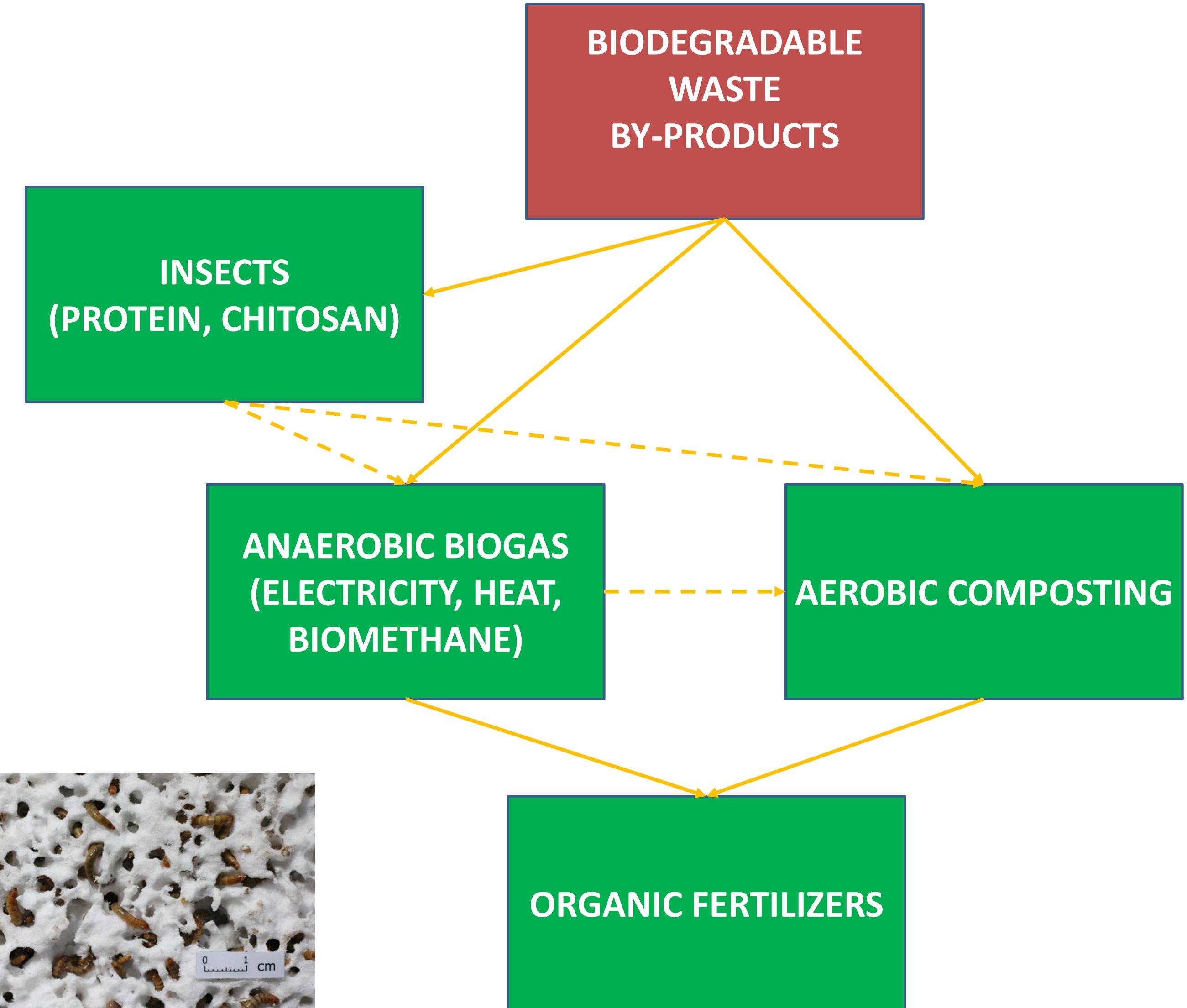
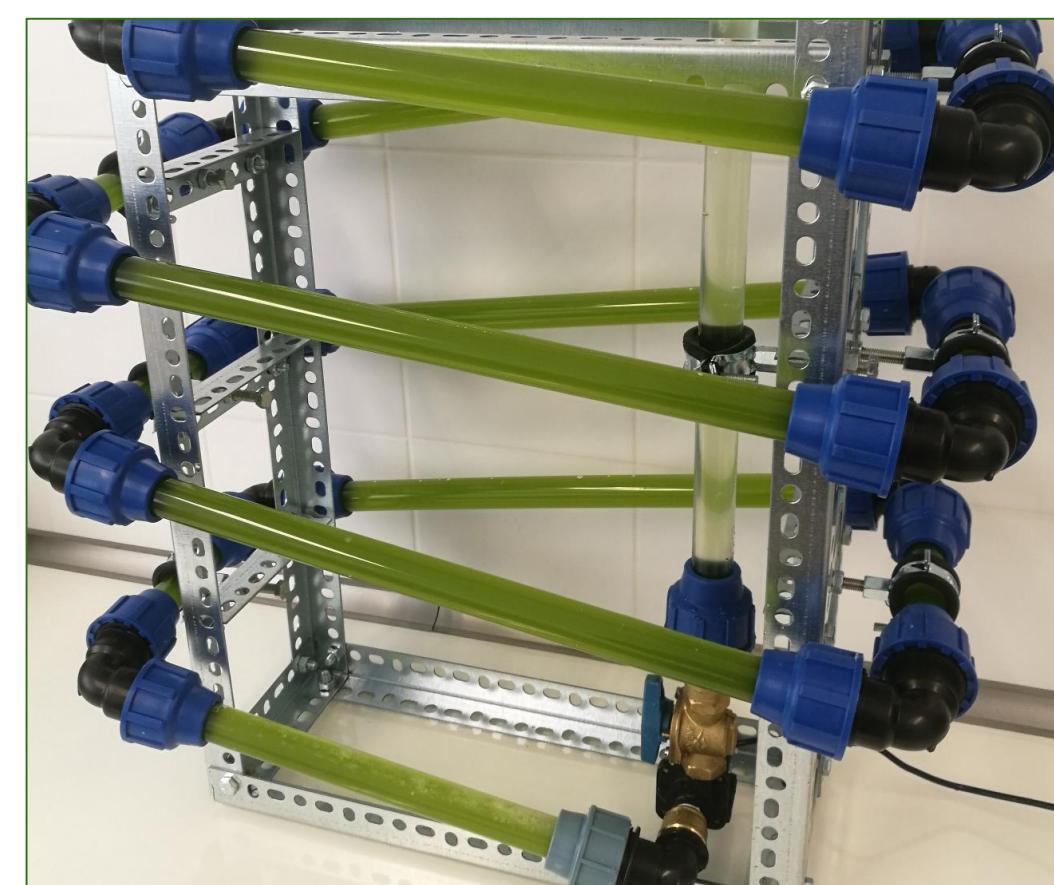
- ✓ Aerobic treatment – Hungary: 150 000 hectares/year organic fertilizer with biowaste compost (without manure);
- ✓ Anaerobic treatment - biomethane: min. 500 million m<sup>3</sup> (5% of Hungarian natural gas consumption);
- ✓ Phosphorus recovery - 15 000 tons/year P recovery (without manure);
- ✓ Second generation biofuels (using by-products and biowaste)
- ✓ Biodegradable polymers;
- ✓ Thermochemical treatment (pyrolysis, HTC...);
- ✓ Animal feed production (directly or insects protein);
- ✓ ...

# EXAMPLE I. – AGRÁR-BÉTA LTD.

- ✓ Biogas production – anaerobic treatment (1,5 MWhe)
- ✓ Bioethanol production (15 000 tons/year)
- ✓ Energetic plantation (100 hectares)



# EXAMPLE II. – PROFIKOMP INC.



# EXAMPLE III. KNOWLEDGE CENTER OF CIRCULAR ECONOMY AT MATE (KEHOP 3.2.1.)

- ✓ 2013 – Founding of Waste Management Department
- ✓ 2014 – Starting of separate collection of waste



# EXAMPLE III. KNOWLEDGE CENTER OF CIRCULAR ECONOMY AT MATE (KEHOP 3.2.1.)

**Budget:** 1 billion HUF

**Deadline:** 31.12.2023

## Activities:

- ✓ Waste analysis;
- ✓ R+D activities;
- ✓ Introduction of separated biowaste collection on campus;
- ✓ Infrastructure for onsite and industrial composting;
- ✓ Utilization of all biodegradable waste and by-products on campus;
- ✓ ...



# MATE CIRCULAR ECONOMY PROJECT – INTERNATIONAL COMPARISON

# COMPOST

▼

All Food Scraps



▼ Used Compostable Containers & Utensils



▼ Tea Bags & Coffee Grounds



▼ Napkins, Paper Towels & Wooden Stirrers



VISIT: [green.harvard.edu/waste](http://green.harvard.edu/waste)



HARVARD  
UNIVERSITY | Sustainability

## U-M Compost Program Growth

### EARLY DAYS

Dining hall food prep waste began 1997.  
Student Sustainability Initiative (now Coalition) launched small-scale zero waste support for student events.  
Dana Building and a few others piloted composting.



### FORMAL PROGRAMS LAUNCH 2016

Zero Waste Events Program and Compost Expansion Initiative:  
Provided logistical support and supplies to compost at events.  
Purchased compost truck and hired staff member to collect waste from expanded programs.  
Began adding buildings to compost route.



### DRAMATIC EXPANSION 2017–2021

Expanded compost service to ~25 buildings/year based on potential for compost diversion (e.g. food service, regular zero waste events) and departmental commitment.  
Two bin options:  
Countertop bins for coffee grounds and food scraps.  
Full size compost bins for units stocking only compostable ware and holding regular zero waste events.  
Originally unit staff responsible for taking contents to the loading dock.  
Custodial Services began emptying full-size compost bins, purchased standard compost bins for staff kitchens, and program took off!  
By end of 2021, most buildings and most staff kitchens had compost service.



### FUTURE 2022+

Improve accessibility to students.  
Encourage better and more consistent use of compost infrastructure.



**MISSION COMPOSTABLE**

**FIND OUR BINS**

**FOOD WASTE & COMPOSTABLE PACKAGING**

CLOSING THE LOOP in Cambridgeshire

COUNTRYstyle RECYCLING enVar cambridgebid CAMBRIDGE CITY COUNCIL

# MATE CIRCULAR ECONOMY PROJECT

## - INTERNATIONAL COMPARISON

	<b>University</b>	<b>Zero waste program</b>	<b>Separated collection</b>	<b>Separate biowaste collection</b>	<b>Community composting</b>	<b>Comprehensive on-site biowaste treatment</b>
1.	Harvard University	YES	YES	YES	YES	NO
2.	University of Cambridge	YES	YES	YES	NO	NO
3.	Wageningen WUR	YES	YES	YES	NO	NO
4.	Edinburgh University	YES	YES	YES	NO	NO
5.	Michigan State University	YES	YES	YES	YES	NO
6.	Massachusetts Ins. of Technology	YES	YES	YES	YES	NO
7.	Berkley University of California	YES	YES	YES	NO	NO
8.	University of Oregon	YES	YES	YES	NO	NO
9.	Warsaw Univ. of Life Sciences	NO	YES	NO	NO	NO
10.	Kozminski University (Lengyelo.)	YES	NO	NO	NO	NO
11.	Universität für Bodenkultur Wien	NO	YES	YES	NO	NO
	<b>MATE</b> MAGYAR AGRÁR- ÉS ÉLETTUDOMÁNYI EGYETEM	YES	YES	YES	YES	YES

**THANK YOU VERY MUCH FOR YOUR KIND  
ATTENTION!**

**[aleksza.laszlo@uni-mate.hu](mailto:aleksza.laszlo@uni-mate.hu)**