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Környezettechnika Zrt.

Challenges in Hungarian composting

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PROFIKOMP KÖRNYEZETTECHNIKA ZRT.

✓More than 25 years of experience

✓85 reference plants, outside Hungary in other european, asian and african countries;

✓Solid scientific background - education, R&D cooperation with universities and research institutes
(EU FP5, FP6, GINOP, KFI, GOP, MKI ...);

✓Initiator and founder of the Hungarian Society of Quality Compost (MMKT) (1999), or rather from ECN (European Compost Network) (2002, Budapest).

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Profikomp Innovation and Education Centre (PIKK - PIECE)

- ✓**offices, warehouses;**
- ✓**laboratories;**
- ✓**R + D facilities;**
- ✓**Phytotrone;**
- ✓**Odour laboratories;**
- ✓**…**

CHALLENGES I. - LEGAL BACKGROUND, INTERNATIONAL TRENDS

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Council Directive 1999/31/EC

There is no "bio-waste regulation" at EU level!

Art. 5: Member States should develop national strategies to reduce the final disposal of biodegradable waste in landfillings:

In relation to the quantity of 1995:

- 2006 (2010): to 75%
- 2009 (2013): to 50%
- 2016 (2020): to 35%

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Legislation

- **Waste Act ClXXXV of 2012**
- 23/2003. (29.12.) Decree of the Hungarian Ministry of Environment and Waters ("Biowaste Ordinance")
- 246/2014. (29.09.) Hungarian Government Decree (Waste Treatment Plants) - 22-24.§
- 36/2006. (18.05.) Decree of the Hungarian Ministry of Agriculture and Rural Development (marketing as a product - End of Waste - EoW)
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Waste Act CIXXXV of 2012

The recycling principle of biodegradable waste: the separate collection and utilisation of biodegradable waste must be encouraged so that materials of great purity can be returned after the recycling process into the natural cycle of organic substances.

By the first of July 2016, this quantity had to be reduced to 35%,
therefore less than 820,000 tons!

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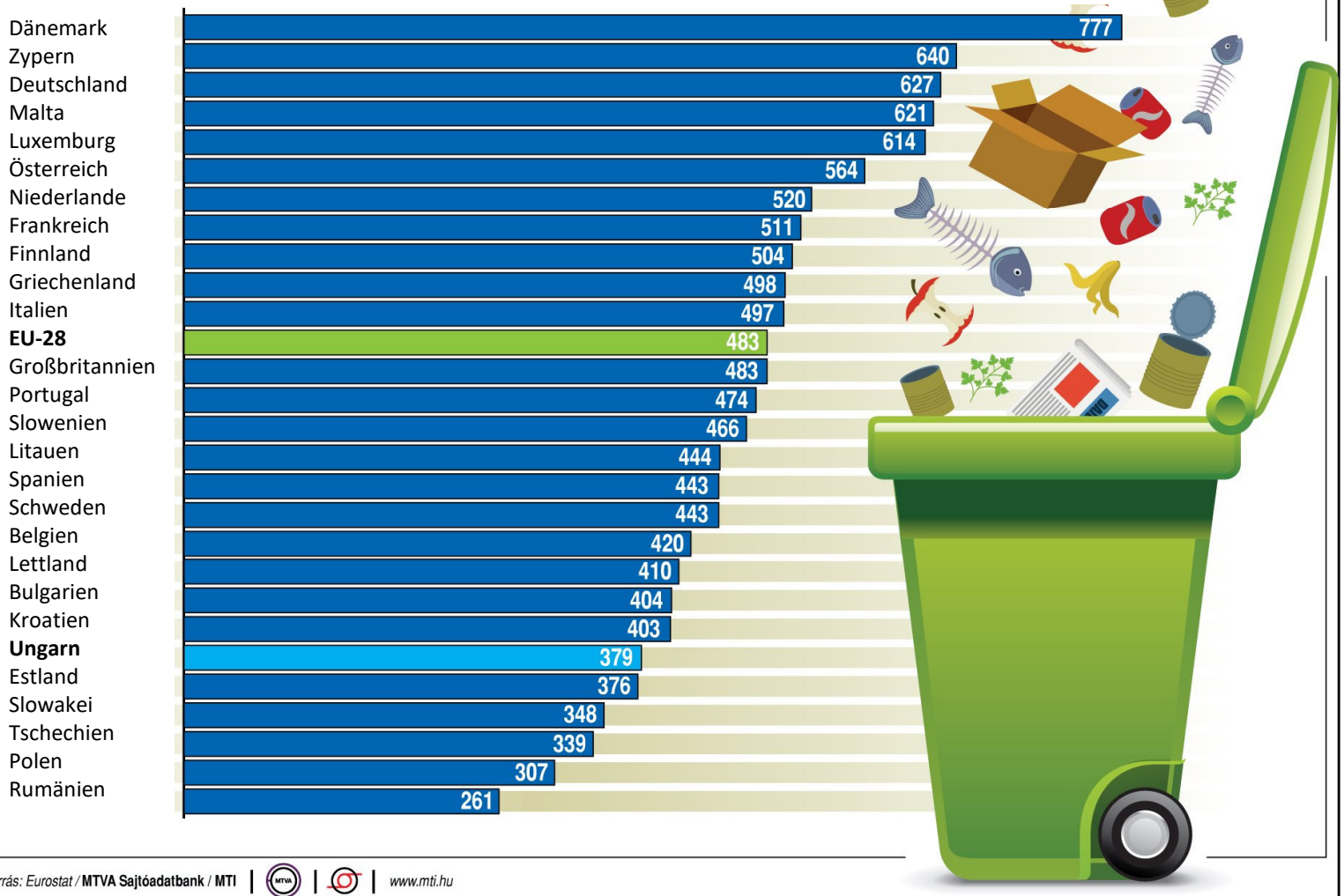
INTERNATIONAL ENVIRONMENT - Formation of solid municipal waste

Amount of municipal waste in EU Member States (2016)
Per capita quantity, in kg



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INTERNATIONAL ENVIRONMENT - EU CIRCULAR ECONOMY RECYCLING ECONOMY

Amending Directive of the Waste Regulations: 2 July 2014 entry into force: 1 May 2018

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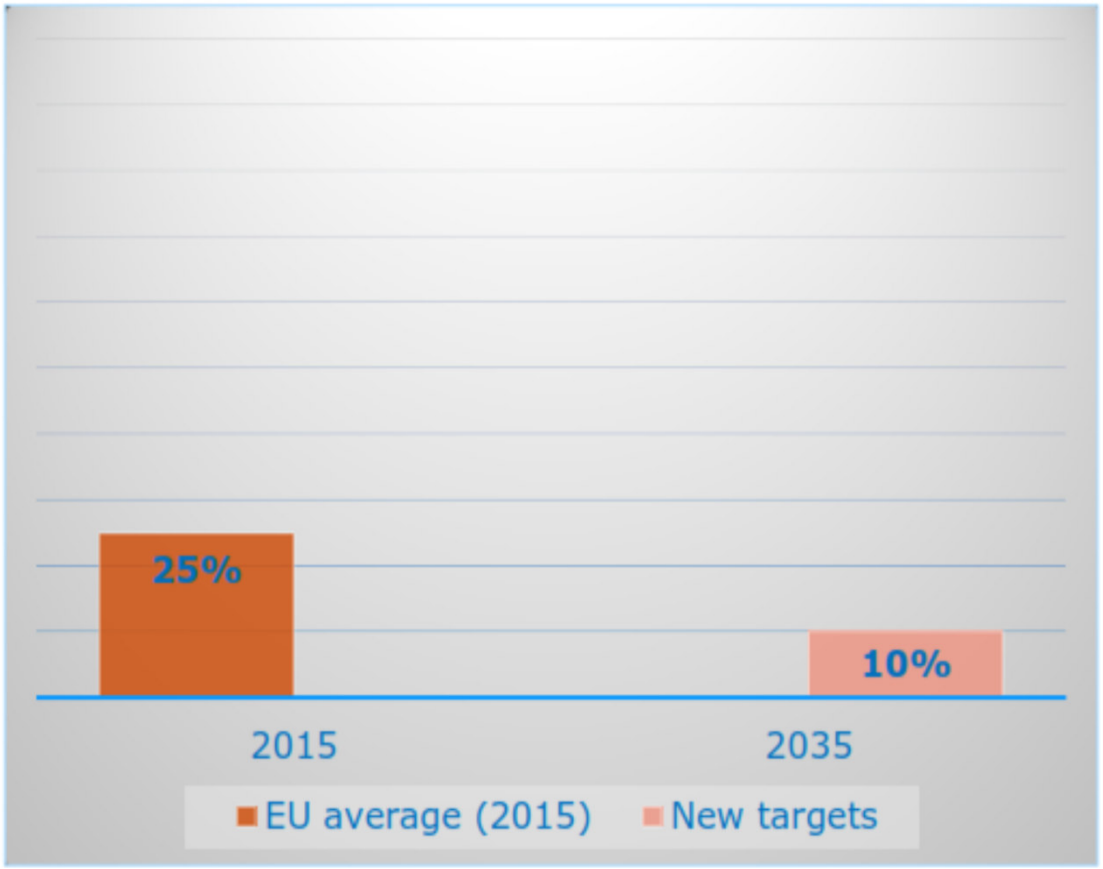
Amended versions of directives:

- ✓Waste Directive 2008/98/EC,
- ✓Directive 94/62/EC on packaging and packaging waste,
- ✓Directive 1999/31/EC on landfills,
- ✓Directive 2000/53/EC on end-of-life vehicles,
- ✓Directive 2006/66/EC on batteries and accumulators and waste batteries and waste accumulators,
- ✓Directive 2012/19/EU on WASTE electrical and electronic equipment

Landfill: max. 10% (until 2035)

- 5-year extension for countries with high landfill rates
  - 10 MS: EL, HR, CY, LV, LT, HU, MT, RO, SK, BG
  - Implementation plan + interim targets
- Calculation rules for landfilling
- Landfill restrictions for separately collected waste



INTERNATIONAL ENVIRONMENT - Treatment of solid municipal waste

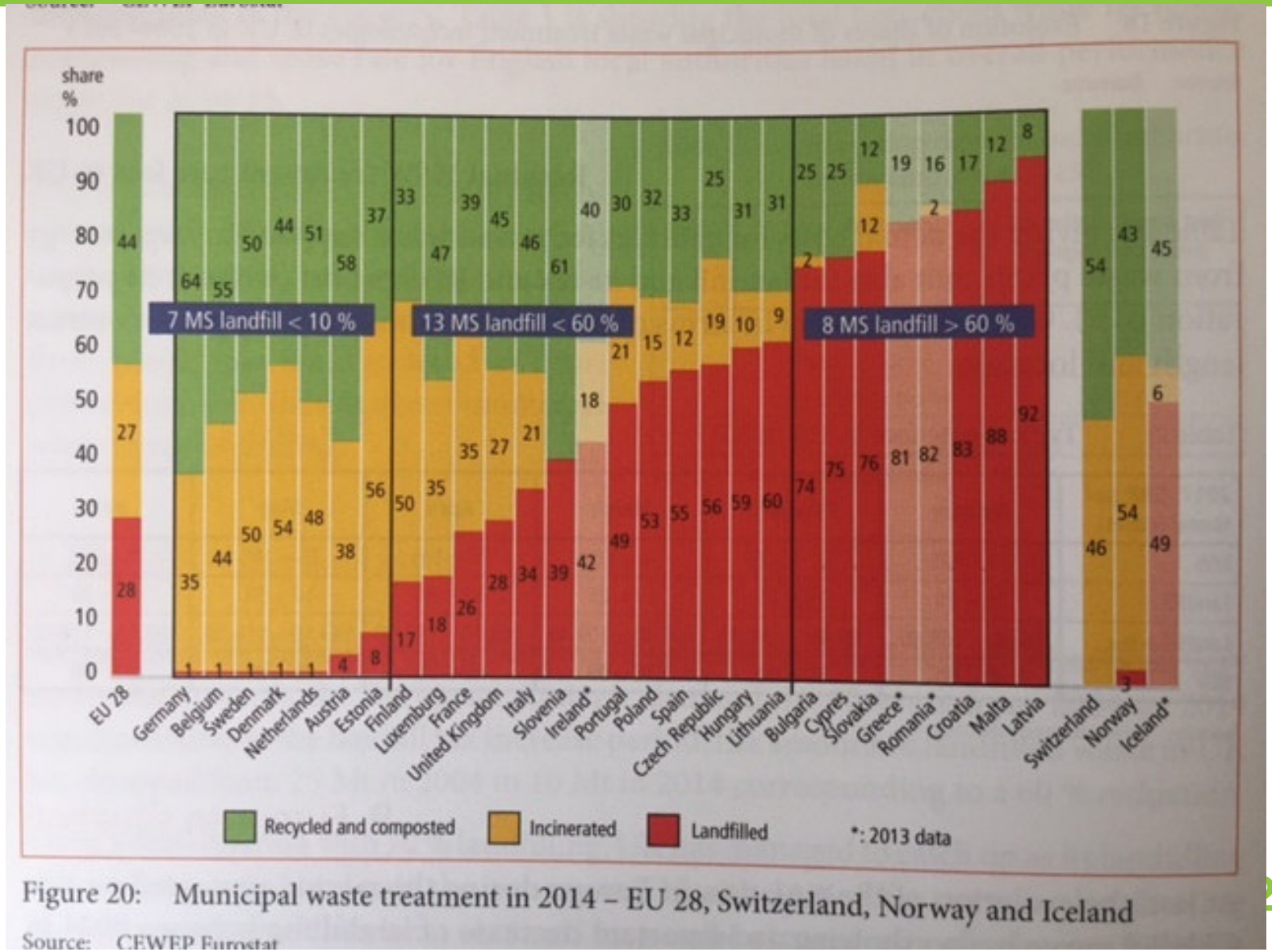


Figure 20: Municipal waste treatment in 2014 – EU 28, Switzerland, Norway and Iceland

Source: CEWEP Eurostat

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Treatment of municipal waste in Hungary 2017 (Presentation of NHKV ZRt.)

Mio. t/a

3,8	**Amount of municipal waste in Hungary**
2,3	**comes into the landfills**
0,4	**is used in the incinerator of Rákospalota (HUHA)**
1,1	**is recycled**

The landfilled but usable waste represents a significant loss of value. The resulting added value is, depending on different estimates, 20-50 billion HUF.

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COMPLEX WASTE TREATMENT PLANTS

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Biological treatment:

- ✓ from the 31st of December 2023: separate collection of bio-waste or on-site recycling (e.g. in domestic gardens) is obligatory
- ✓ from the first January 2027: the operation of MBA plants is not no longer supported!

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Challenges II - SEPARATE COLLECTION OF BIOWASTE

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SEPARATE COLLECTION OF BIOABFALL

It has already been proven that the separate collection of biowaste is possible everywhere!

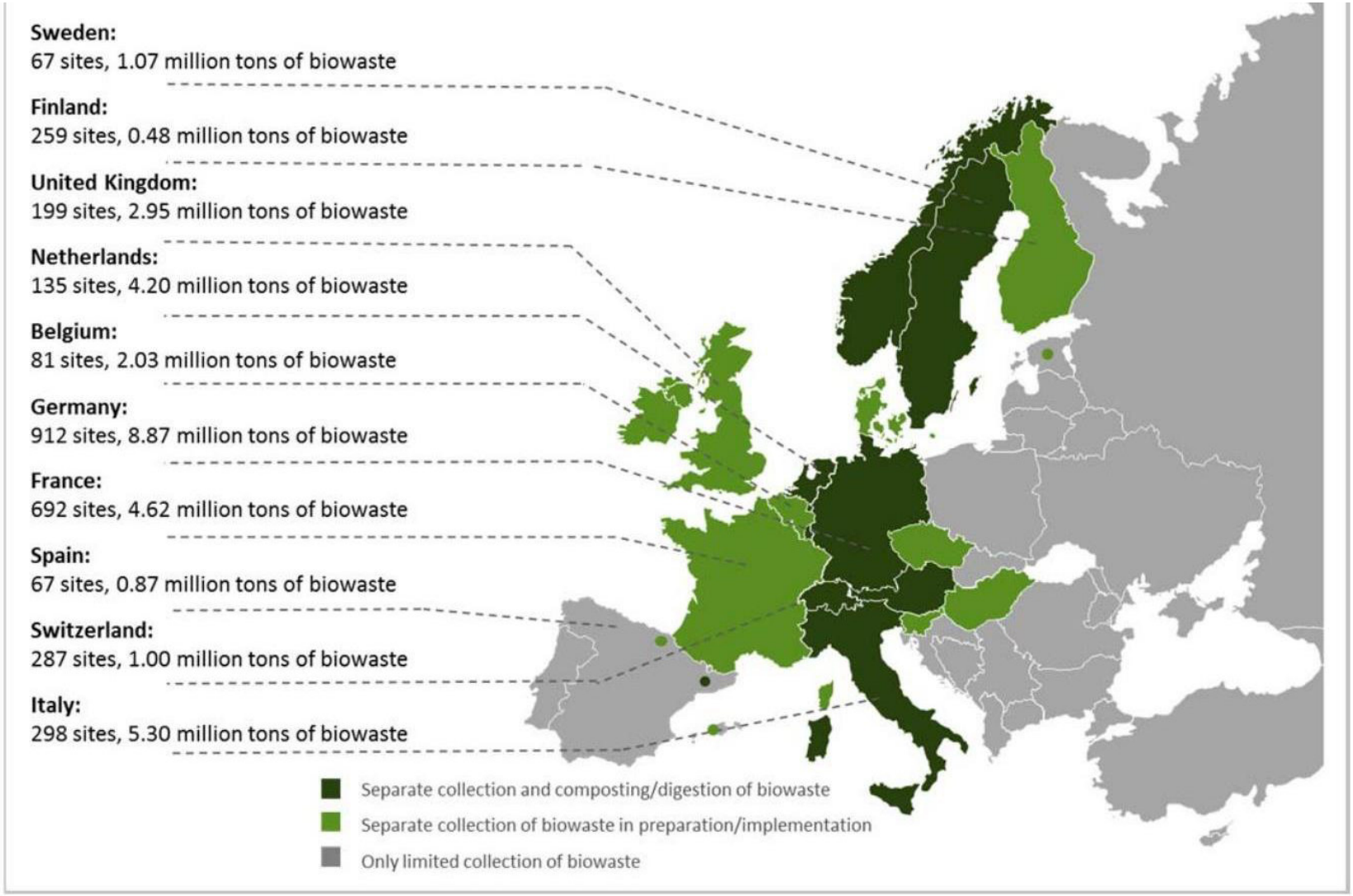
Paris

Milan

Barcelona

New York

Biowaste recycling - EU27



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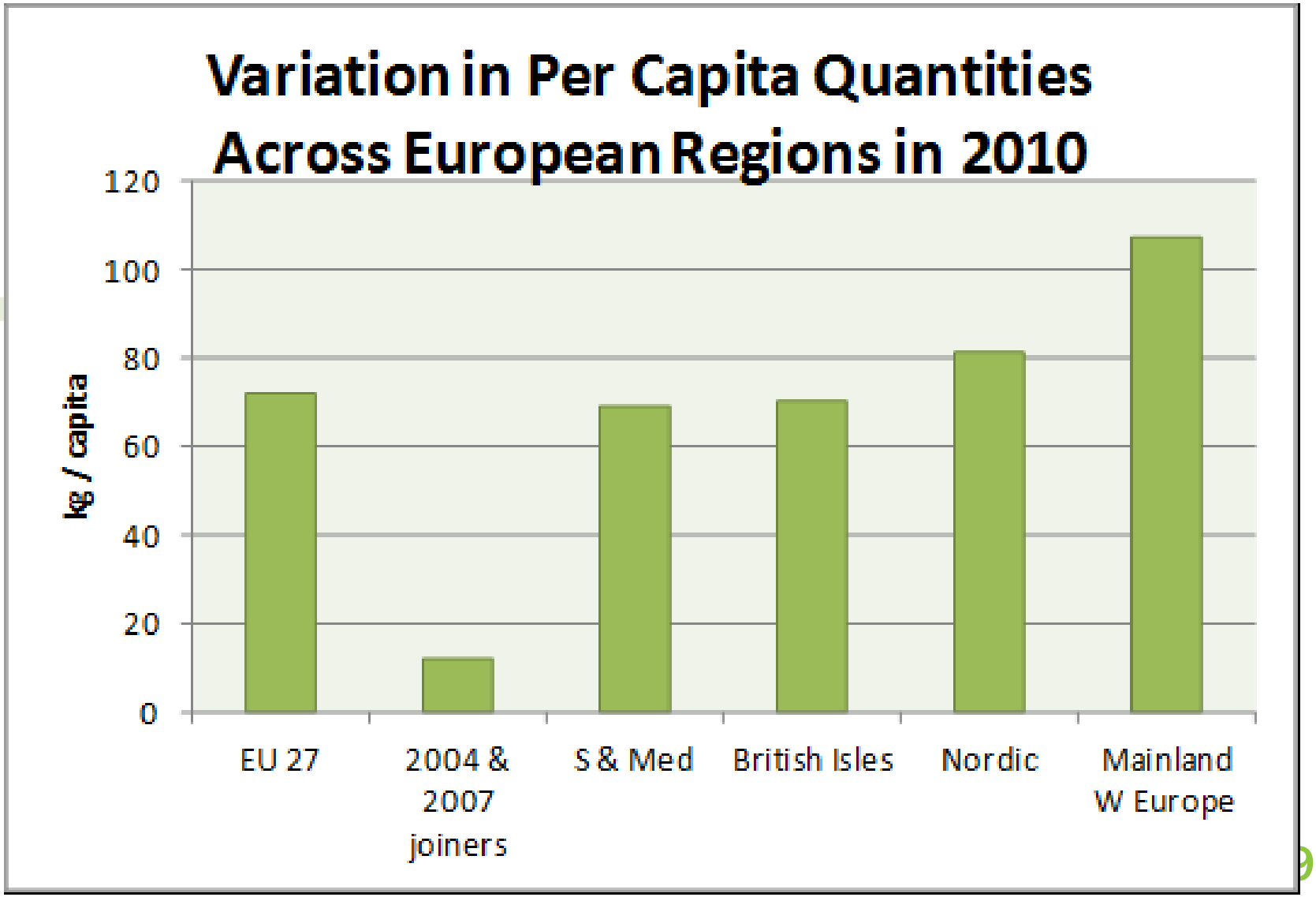
~4500 plants, 44 million t/a capacity

Biowaste recycling - EU27



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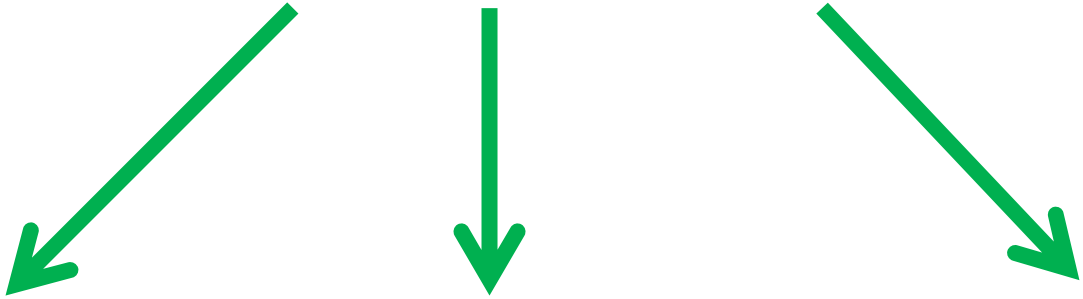
The Hungarian situation

BIODEGRADABLE WASTE



Sewage sludge
20 kg
Dry matter/person/year

(250,000 dry matter/year (1 m t/year))

Food industry
Agriculture
✓animal
✓herbal

(Hungary: 0.5 m t/year)

Biowaste:
✓**Green waste**
20-70 kg/person/year
✓**Kitchen waste**
70-110 kg/person/year

(Hungary: 1.3 m t/year)

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The Hungarian situation

BIOWASTE

Kitchen waste

EWC 20 01 08

✓20-40% from solid municipal waste

✓Volumetric mass: 0.6-0.8 kg/l

✓High moisture content

QUANTITY: 70-130 kg/inhabitant

Green waste

EWC 20 02 01

✓2-4 kg/m2/year

✓Volumetric mass: 0.15-0.35 kg/l

✓Mean-low moisture content

QUANTITY: 20-70 kg/inhabitant

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Biowaste recovery - Hungary 2017

Population: 9,797,561
Annual amount of solid municipal waste: 3,752,000 t (KSH 2017)
Annual amount of biowaste: 1,013,000 t (27% from solid municipal waste)
Separately collected biowaste: 236 000 t/year (KSH 2017) (24 kg/person/year)
Self-composting: 135 000 t/year (nhKV estimate) ???
Number of composting plants: 81
Average capacity of composting plants: 3000 t/year

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CHALLENGES III - SELECTION OF TECHNOLOGY - ECONOMY

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Legislation

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80s and 90s - DEVELOPMENT OF COMPOSTING TECHNOLOGIES - OPEN SYSTEMS

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2000s - DEVELOPMENT OF COMPOSTATION TECHNOLOGIES - ENCAPSULATED SYSTEMS

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The best available techniques
Best Available Techniques (BAT)

Industrial Emissions Directive (IED) (2010/75/EU):

- ✓**Anaerobic treatment > 100 t/day**
- ✓**Mechanical-biological treatment > 75 t/day**
- ✓**Composting > 75 t/day**

The best available technology

Best available techniques (BAT) reference documents (BREF's)

Interpretation of BAT/BREF:

- ✓ **efficient and modern technologies;**
- ✓ **with a low emission value;**
- ✓ **with little energy consumption;**
- ✓ **with an economic operation;**
- ✓ **with references.**

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Economy

✓**PET bottle (from waste):** 70-80 EUR/t

✓**Electronic waste (E-waste):** 300 gr gold/t (+ silver, rare earth metals, etc.)

✓**Extended Manufacturer Responsibility (EPR):** does not exist for biowaste!

✓**Plant contribution:** < 20 EUR

Biowaste - Composting:

✓Operating costs: 20-70 EUR/t

✓Price of compost: 0-25 EUR/t

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CHALLENGES IV - COMPOST QUALITY, MARKETING

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Legislation

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Compost quality

Compost quality

Value-added characteristics:
Content of organic substances (stable humus forms)

- ✓ Nutrient content (NPK)
- ✓ Mezo and microelement content
- ✓ Microorganisms

Risks:
- ✓ Inorganic contaminants (heavy metals)
- ✓ Organic contaminants
- ✓ Human pathogens
- ✓ EDS (for sewage sludge composts)
- ✓ Foreign substance content

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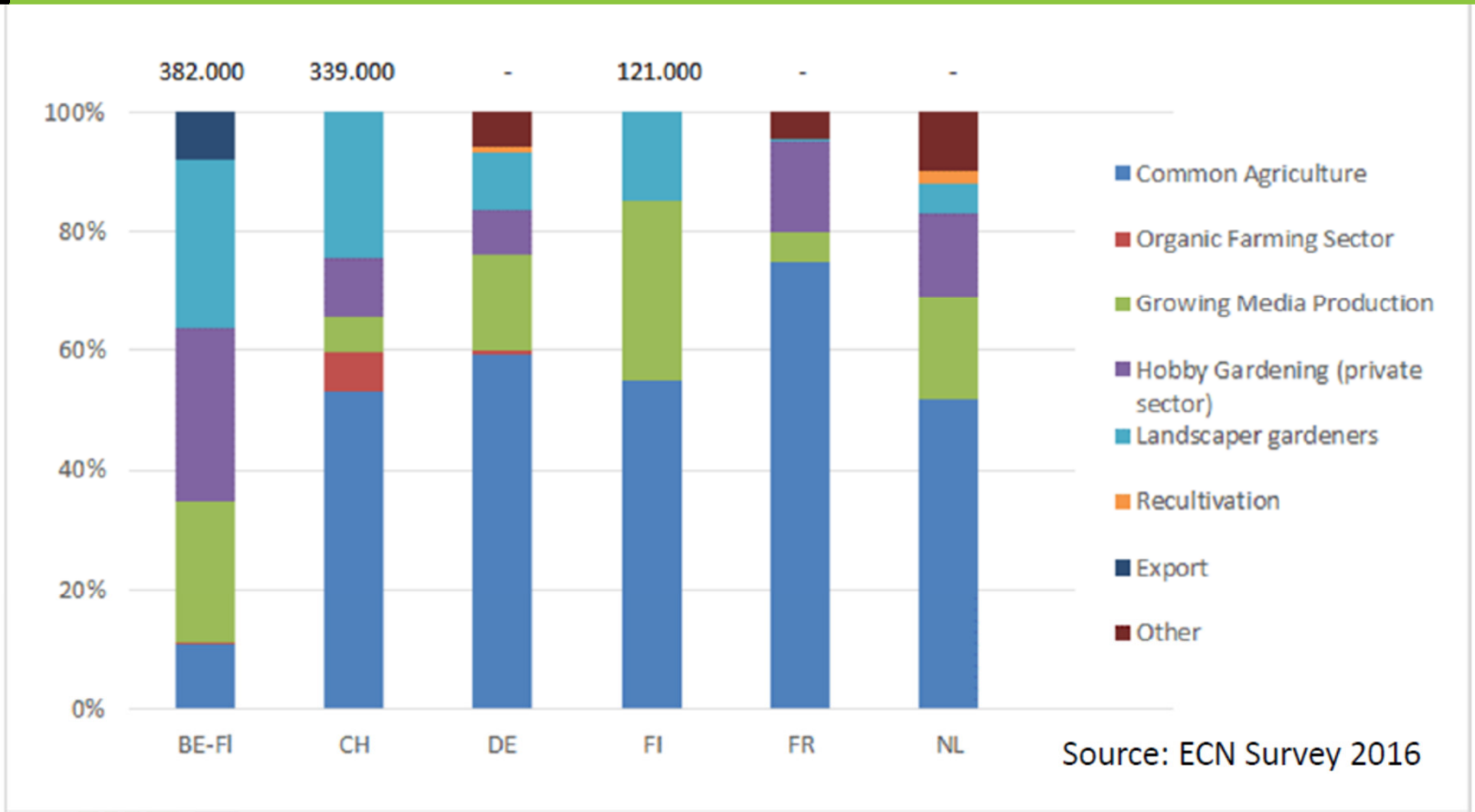
Compost recycling - EU



- ✓ **50% AGRICULTURAL UTILISATION**
- ✓ **RECULTIVATION UNSIGNIFICANT**

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Biowaste - "value" of compost in Hungary

	Amount (t)	Compost (t)	NPK-Value (Mio. HUF)
Biowaste potential	1.300.000	650.000	13.000
Biowaste 2017	240.000	120.000	2400

+ C-sink: 78 000 t/year

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Summary

- ✓ **The transition to a recycling economy can only be solved by separate collection and utilisation of bio-waste;**
- ✓ **In Hungary, there is a lack of capacity in collection and composting, and there is a need for serious development of infrastructure;**
- ✓ **Self-composting is very important, but it does not solve the problem of bio-waste recycling;**
- ✓ **The agricultural use of compost must be encouraged, with the improvement of compost quality being mainly relevant;**

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Thank you for your attention!

www.profikomp.hu

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