Food Waste Collection and the unintended consequences of plastic contamination

Webinar

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What we will be talking about

1. The current food waste regime in the EU
2. The new food waste regime post 2023
3. The quality of collections and the current implications
4. A future projection and outcomes
5. What we need to do before this happens

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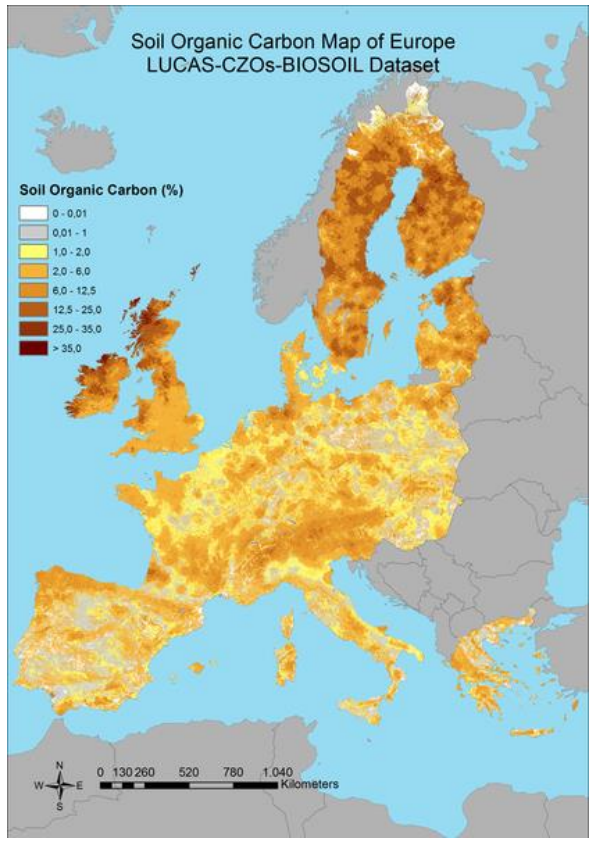
Why is this speaker concerned?

- Former MD of the Italian Biogas and Composting Association CIC (2003-2014)
- Former President of the International Solid Waste Association ISWA (2012-2016)
- President of the World Biogas Association since 2016
- Managing Director of the BBIA UK since 2015

so I know the waste industry very well and
I am concerned for my industry as well as the environment.

Challenges and opportunities

We need to collect, treat and manage food waste



The challenges

- We are losing circa 15m tonnes/year topsoil from crop harvesting
- EU sends 50m tonnes of food waste to incineration and landfill instead of into treatment. This contributes to climate change emissions.

The opportunities

- By treating food waste, we can generate biogas, biomethane, compost, digestate and extracted CO_2
- We can meet targets to reduce GHG emissions, produce renewable energy, return nutrients to soil, restore the soil to soil loop that urbanisation has broken.

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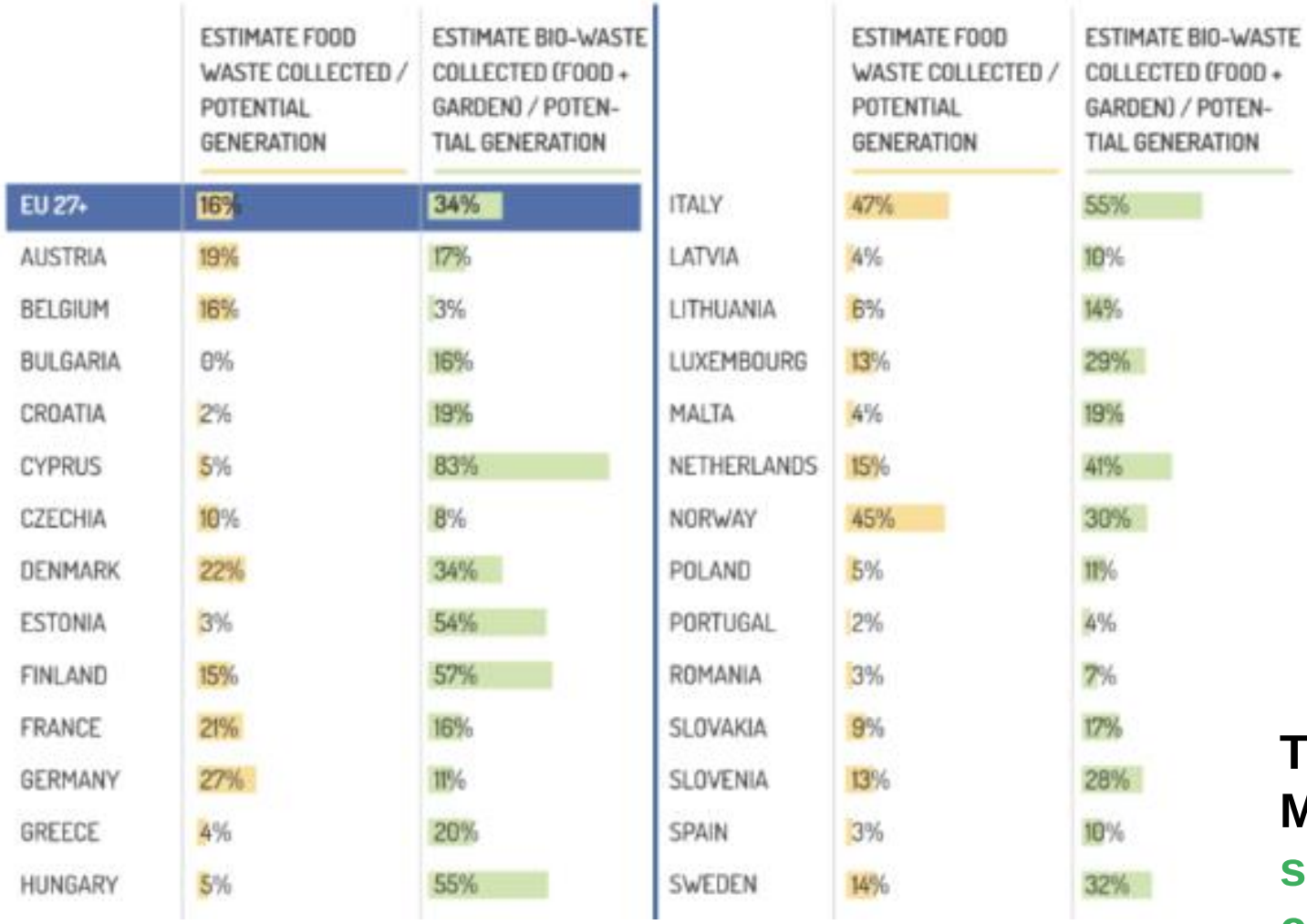
However, to ensure soil quality we need clean feedstocks

Zero Waste Europe and BIC report



	ESTIMATE FOOD WASTE COLLECTED / POTENTIAL GENERATION	ESTIMATE BIO-WASTE COLLECTED (FOOD + GARDEN) / POTENTIAL GENERATION
EU 27+	16%	34%
AUSTRIA	19%	17%
BELGIUM	16%	3%
BULGARIA	0%	16%
CROATIA	2%	19%
CYPRUS	5%	83%
CZECHIA	10%	8%
DENMARK	22%	34%
ESTONIA	3%	54%
FINLAND	15%	57%
FRANCE	21%	16%
GERMANY	27%	11%
GREECE	4%	20%
HUNGARY	5%	55%
ITALY	47%	55%
LATVIA	4%	10%
LITHUANIA	6%	14%
LUXEMBOURG	13%	29%
MALTA	4%	19%
NETHERLANDS	15%	41%
NORWAY	45%	30%
POLAND	5%	11%
PORTUGAL	2%	4%
ROMANIA	3%	7%
SLOVAKIA	9%	17%
SLOVENIA	13%	28%
SPAIN	3%	10%
SWEDEN	14%	32%

Findings

- biowaste management remains an **untapped potential** for the European Union to further transition to a Circular Economy
- Only **16%** of the potential is currently captured
- through proper initiatives, this number could be **multiplied x5 to reach 85%.**

This shows the need for the EU and Members States to maintain and strengthen their effort in biowaste collection and treatment as key steps towards soil regeneration, circularity and climate neutrality

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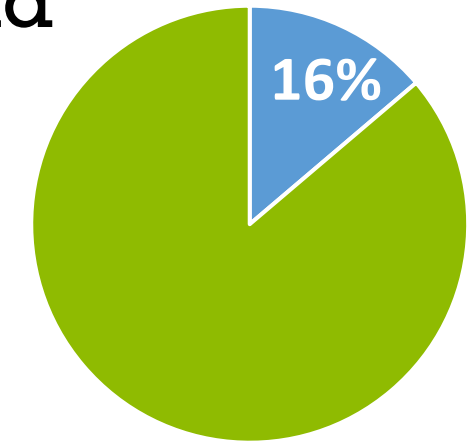
Current food waste collections in the EU

According to the June 2020 Zero Waste Europe and BIC report



"In the EU27+, the current capture of food waste is

9,520,091 tonnes per year,

just 16% of the theoretical potential, estimated at 59,938,718 tonnes."

Most of this 9.5 mn tonnes is captured in **Italy.**

Italy captures circa **6.3 million tonnes** of food waste.

Italy is a good example for the rest of Europe as other European countries will face the same challenges Italy has faced since 2000.

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Italy's main challenge:

The plastic contamination of food waste

- Italian food waste treatment plants, AD and composting, are contaminated with circa 100,000 tonnes of plastic - of which 55,000 tonnes is plastic packaging.
- You cannot compost plastics. You cannot make biogas from plastics. You have to extract them, and send the plastics to landfill or incineration.
- When extracting plastics, you also extract 5-10% food waste
- The cost to Italian plants to extract plastics is around €90-120m/year

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this is the economic cost

Italy's main challenge (continued)

The level of contamination would be much more …

hadn't Italy introduced **a law** in 2010 for food waste to be collected either

- with reusable containers or
- with food waste collection bags certified to the EN13432 standard on compostability

As a result, Italy has just **1,5% contamination from plastics overall.**

So Italy has very pure collections and low contamination levels…

But this is still a big problem

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What does this mean for the EU?

Let's do the maths…

- 100,000 tonnes of plastic contamination cost for Italian plants = circa €100m annually on 6.3m tonnes of food waste.
- Multiply this by approx. 50m tonnes, **the cost will be €800 million - €1 billion annually across the EU 27.**
- This is the potential cost to extract unwanted plastics from biowaste, based on the high purity levels achieved in Italy. This calculation assumes contamination of 1.5%.
- This will mean higher costs for EU citizens + sending approx. 750,000 tonnes of plastics to landfill and incineration, along with the food waste attached.

Economically:

a DISASTER for the anaerobic digestion and composting industries,

YET, a BEST CASE scenario based on Italy's low contamination levels

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EU current plastic contamination rates

Countries/regions	% of plastic impurities
Italy	1.5%
Belgium, France, Germany, Netherlands, UK	5%
Catalonia, Spain	Up to 15%

5% impurities level applied to 50 million tonnes equates to:

2.5 million tonnes of plastic to extract/dispose of annually

The cost is circa €2 to 2.5 billion a year extra to be paid by citizens and the biowaste system to incinerate or landfill plastic contamination. ***The plastic industry is transferring its waste to the biowaste industry free of charge***.

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This is the potential economic cost with 5% impurities

The environmental problem

AD and compost plants already extract **99.5%** of plastics from contaminated food waste. They do a fantastic job but they should not have to. They are biowaste plants, not plastic waste plants.

But as more plastics enter the system, the more difficult it will be to extract them.

Plastics are going to soil.

Studies from the UK Environment Agency, EEA, Bayreuth University Germany, already show worrying levels of plastic contaminating farmlands, more than to the oceans.

Some of this derives from compost and digestate.

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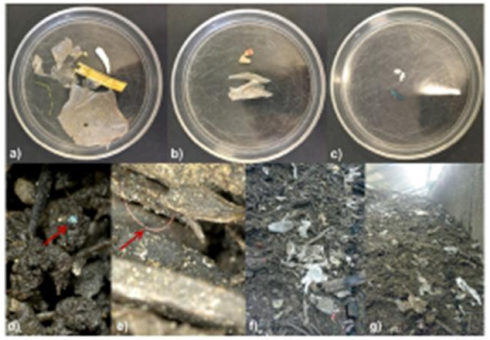
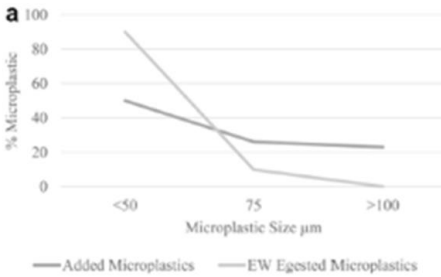
The environmental problem (continued)

Micro-plastics in sludge and soil

- 10Mt/yr of organic wastes (incl. biosolids and composts) applied to farmland
- Estimated to include >100 kt of microplastics



Plastics in compost (from Bläsing and Amelung 2018)



Earthworms concentrate finer microplastic particles in their casts (from Lwanga et al. 2016)

If the above is the quality of food waste collection (as currently in the UK and many other countries)

Then the inevitable consequence across the whole EU is massive plastic contamination to soils

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Photos from the England Environment Agency

Food waste collections in Catalonia (Spain has low food waste collections overall)
According to ZWE report from 2019, overall contamination levels in Catalonia from “domestic collection, in which the unsuitable content amounts to 22%, one of the highest in the study. This is largely due to people using ordinary non-compostable plastic bags”.

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What can we do to avert this?

We must intervene **before** 2023 food waste collections are mandated to stop plastics going to soil !

- Mandate a **similar law to Italy's** across the EU 27 to ensure purity of food waste collections is maximised. This should be a Regulation, i.e. legally binding on all nations

- Revise the **Fertiliser Directive** to reduce input contamination permitted for the production of organic fertilisers. Currently no inputs limits of contaminants are foreseen, a major fault. EA England will stipulate maximum 0.5% plastic input contamination by 2025.
- Review the **Fertiliser Directive pre 2023** on outputs to soil (currently 0,3% plastics are permitted falling to 0,25%). Scotland mandates much lower, 0.06% from 2019.

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Principle Sources

Soil loss

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6500783/

https://ec.europa.eu/jrc/en/publication/soil-erosion-europe-current-status-challenges-and-future-developments

EU food waste collection data

https://biconsortium.eu/biowaste

Italian data

www.compost.it

Italian law on food waste collections

Decreto Legislativo 205, 3 dicembre 2010, article 182/ter (see https://www.camera.it/parlam/leggi/deleghe/testi/10205dl.htm)

Plastics contamination of compost and soils

https://www.uni-bayreuth.de/en/university/press/press-releases/2018/047-Organic-Waste/index.html

EEA Report No 04/2020 Bio-waste in Europe — turning challenges into opportunities

Catalonia: https://zerowasteeurope.eu/wp-content/uploads/2019/11/zero_waste_europe_report_separate_collection_the_path_to_composting_en.pd

UK Data on plastics in food waste collections

https://www.letsrecycle.com/news/latest-news/more-awareness-needed-over-plastics-in-compost/

https://www.sepa.org.uk/media/219843/wst-g-050-regulation-of-outputs-from-composting-processes.pdf

Thank you

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