

Organic Recycling within the Circular Economy

The role of compostable plastics

The case study of Italy

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Current food waste collections in the EU

According to CIC in 2020 Italy treated **4.6 mn tons of wet food waste** (plus 1.8mn tons of green waste, 1.3mn tons of other wastes), about half of all the EU.

These were treated in plants which have both combined AD/composting technologies and also compost plants.

Italy has the largest food waste sector in the EU (and possibly the world) with the largest food waste treatment plants.

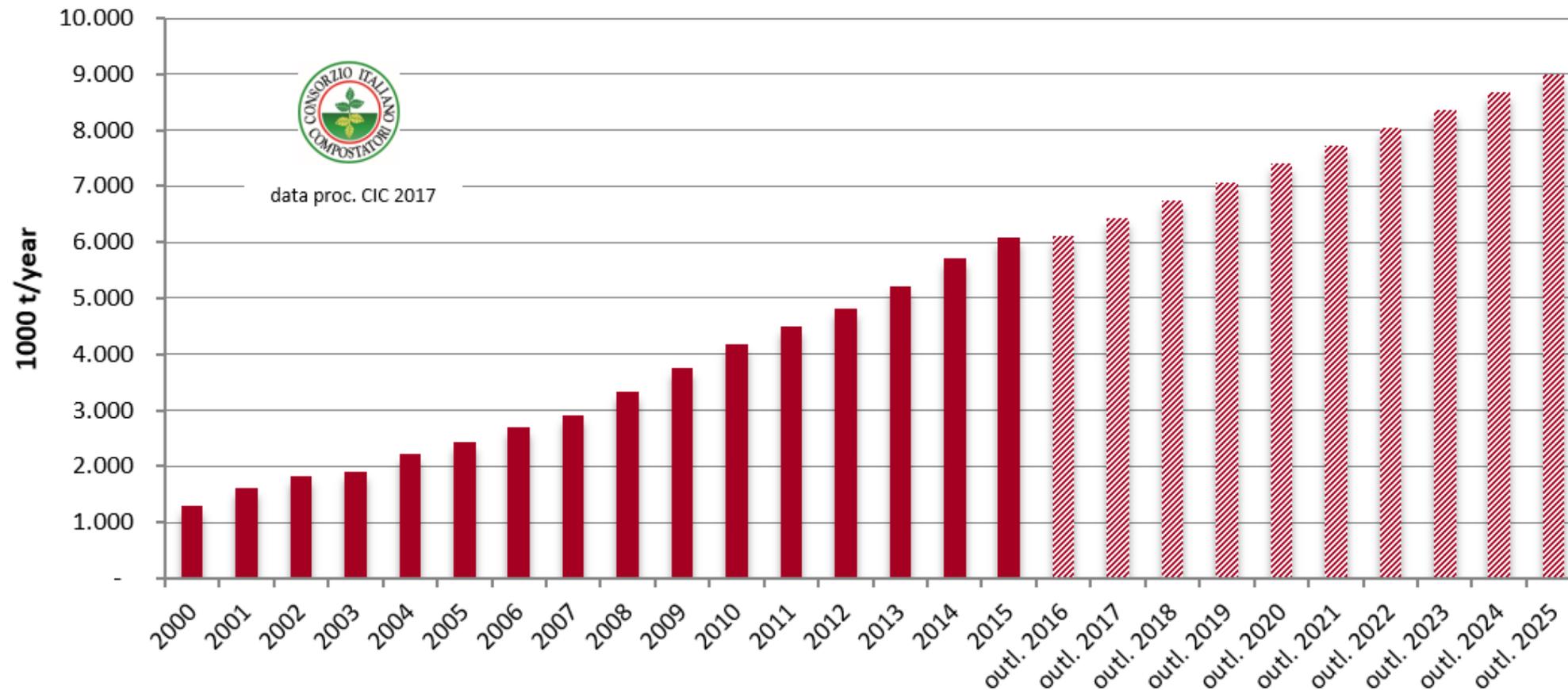
Italy has been separately collecting food waste since 1990s and has the longest experience in how to do this efficiently.



320 plants serving 32 million people. Biowaste recycling in Italy is 42% of all material recycling.

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

Growth of biowaste treatment in Italy 2000-2025



The biowaste industry's plastic contamination challenge:

As food waste collections grew, so did plastic contamination.

- Today, 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 according to CIC, to extract plastics is around **€90-120m/year**

this is the **economic cost**



How Italy handled the challenge of plastic

The level of contamination and the cost would be much more but ...

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.

Then in order to reduce pollution further

- Italy banned single use plastic carrier bags in 2011, allowing only compostable
- Italy banned single use fruit and vegetable bags in 2019, allowing only compostable
- These bags can be reused as food waste binliners encouraging citizens to recycle food waste.

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



So Italy has very pure collections and low contamination levels...



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 4.6m tonnes of food waste equals a cost of c.€20/ton.
- Multiply this by approx. 50m tonnes, **the cost will be c.€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.
- Whilst the SUP attempts to reduce plastic waste, it ignores the largest single, unnoticed disposal of plastic waste in the EU- into biowaste treatment.

Economically:

a **DISASTER** for the anaerobic digestion and composting industries,
YET, a BEST CASE scenario based on Italy's low contamination levels

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.***

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.



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”.



The environmental problem (continued)

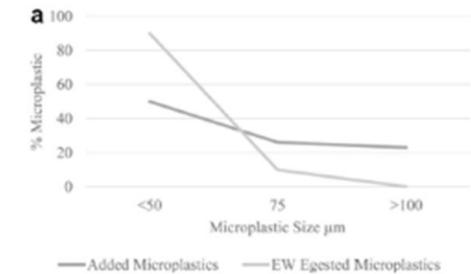


Micro-plastics in sludge and soil

- 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

What can we do to avert this?

We must intervene **before** 2023 food waste collections are mandated to stop plastics going to soil and destroying food waste treatment plants.

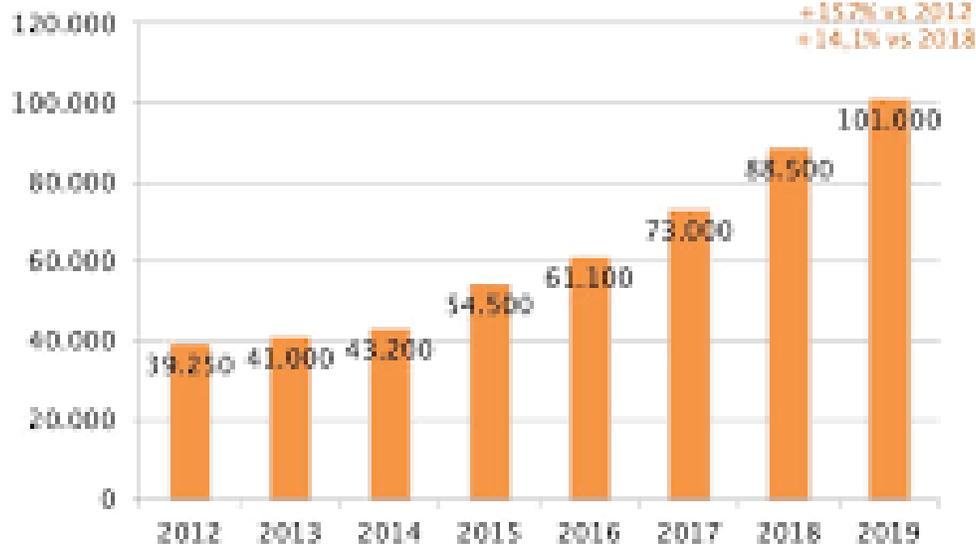
- Mandate a **similar law to Italy's** across the EU 27 to ensure purity of food waste collections is maximised. This should be a Regulation, i.e. legally binding on all nations e.g. the SUP. Ban plastics from biowaste collections, mandate use of compostable bags for collections, period.
- Ban lightweight plastic bags allowing compostable bags so citizens can re-use them for food waste collections.
- Ban non compostable plastics in products carrying food waste to treatment, eg tea bags, coffee pods



The use of compostable plastics needs to be seen as an instrument for the collection of organic wastes. In Italy the two are completely correlated.

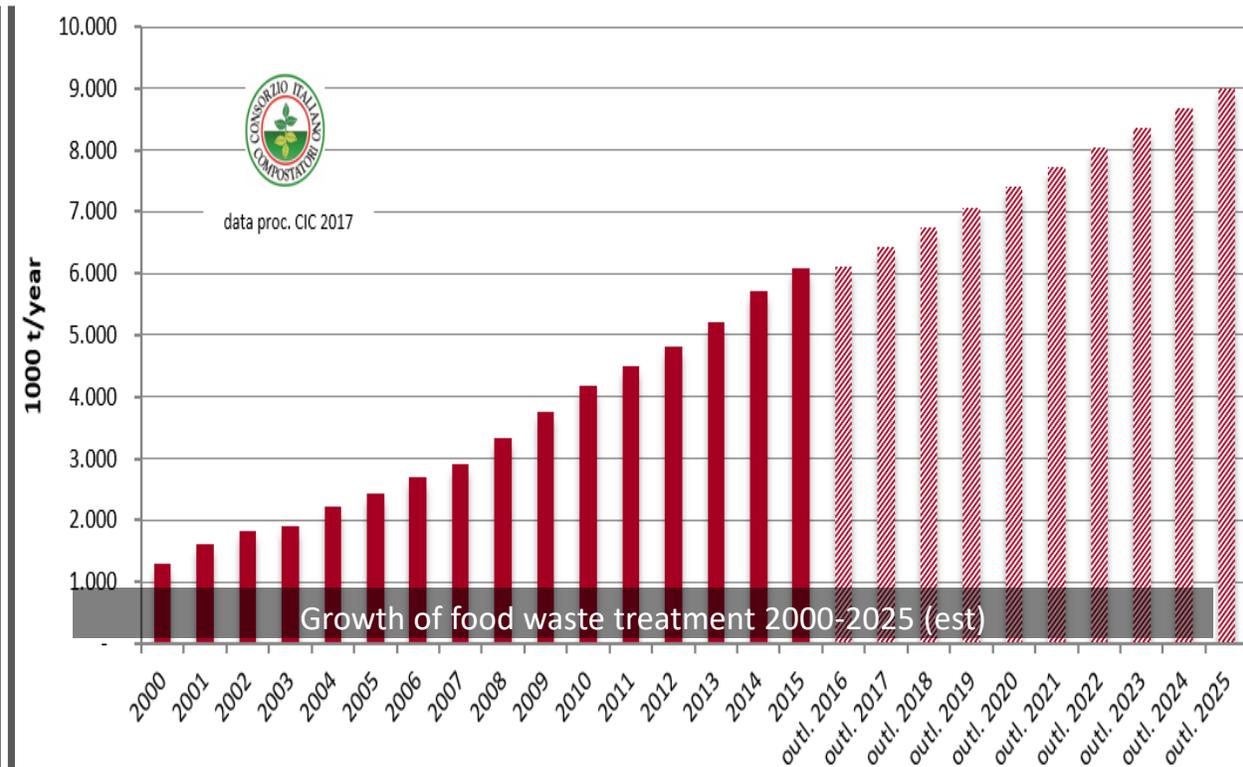
CIC estimate that c.80% of compostable plastic on the Italian market is recycled in composting and AD

LA FILIERA DEI POLIMERI COMPOSTABILI - DATA 2019
Evoluzione della produzione nazionale
 Totale, tonnellate, 2012-2019



Growth of bioplastics market 2012-2019

Fonte: Plastic Consult per Assobioplastiche



Thank you

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