EPS packaging challenges

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EUMEPS President
(European Manufacturers of Expanded Polystyrene)

Hello!

I am Paolo Garbagna

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Goals of this presentation

- Understand how the negative feeling against EPS packaging, sometimes causes us losing focus on food waste or logistics damages
- Analyze possible bio (and scrap) based alternatives, whether they are real and ready to use substitutes for EPS or still to be developed
- Verify that the key to a sustainable future in the short range is closer than it appears if disruptive innovation breaks in

We are living times
where growth of
ecological sensitivity
is higher than
the speed of change

We are all aware that ***the end of life of a material*** *is what at the moment legislators are rightly focusing on, as the horrible images we see constantly on the internet make us all aware that plastics, even if in small percentage in the product itself, should*

never

reach our woods, oceans, shores and rivers.

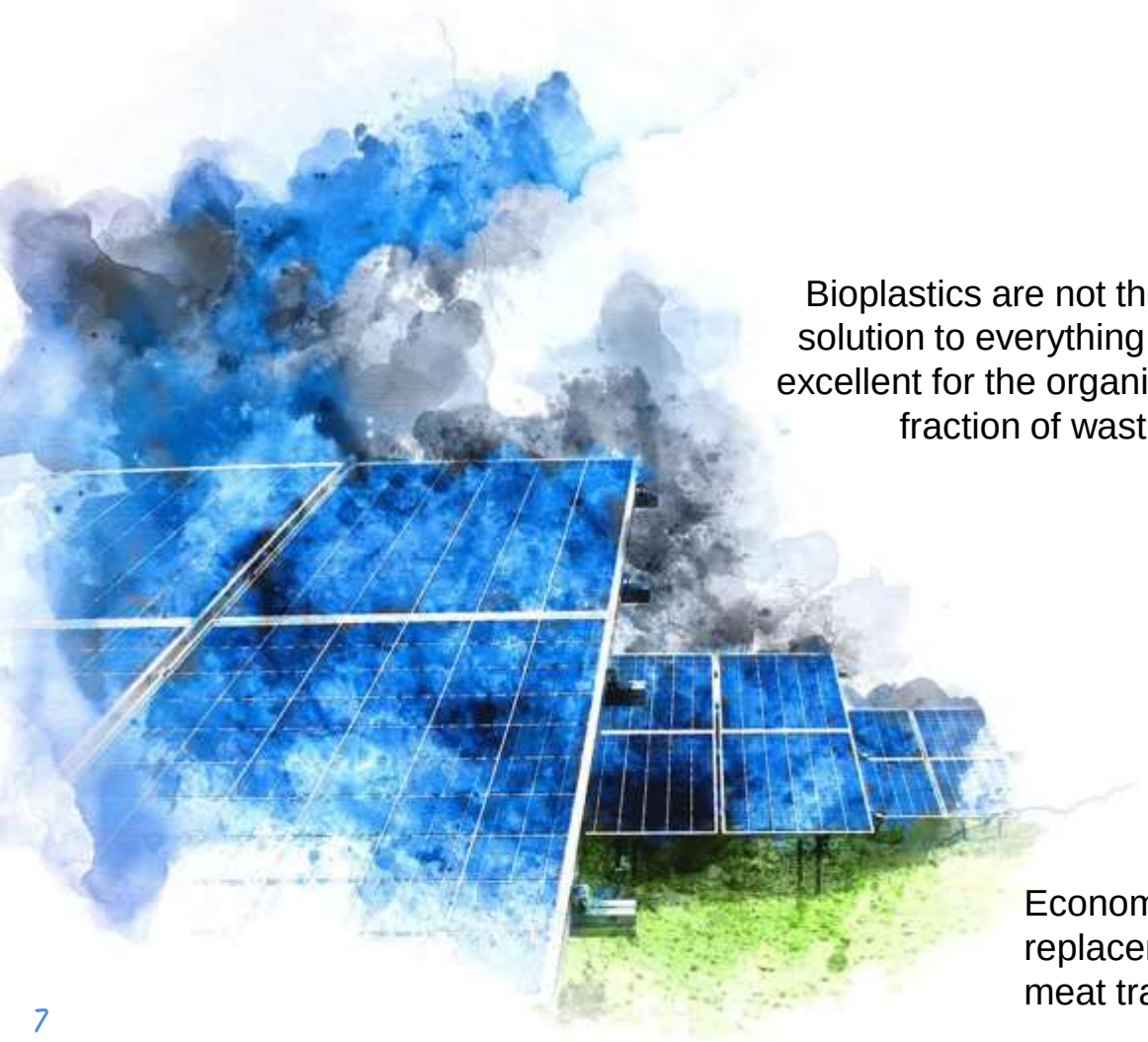
We want a change

We want it now

IMPERFECT LOGISTICS
CALL RATE
WASTE

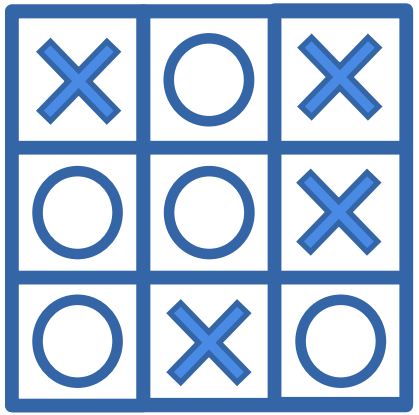
DISPOSAL IN
CITY DUMP

FOOD WASTE



Plastics often still not easy replaceable in minimizing food waste (e.g. controlled atmosphere)

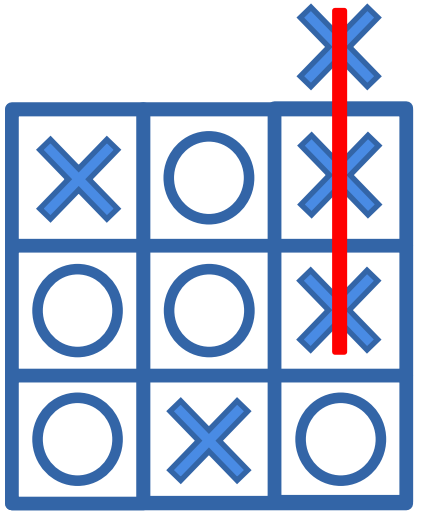
Bioplastics are not the solution to everything - excellent for the organic fraction of waste



Incineration (waste to energy) is no longer an acceptable solution (CO_2 release)

Economic barriers to replacement (e.g. meat trays)

We must think out of the box



Only innovation makes EPS packaging business sustainable. It is the only possible way to protect the planet, create and redistribute value by improving everyone's living conditions.

Innovation changes the ARCHITECTURE itself of the business, combining Green Chem with new Technology and new Business Model.

1 – ECO DESIGN

2 – PRODUCITON WITHOUT USELESS COSTS

SHOP IN SHOP CONCEPT

PolyStyreneLoop

4 – POLYMERIC DISSOLUTION RECYCLING

3 - BIO and MULTI MATERIAL PACKAGING

Bio Foam inside®

The Game Changers

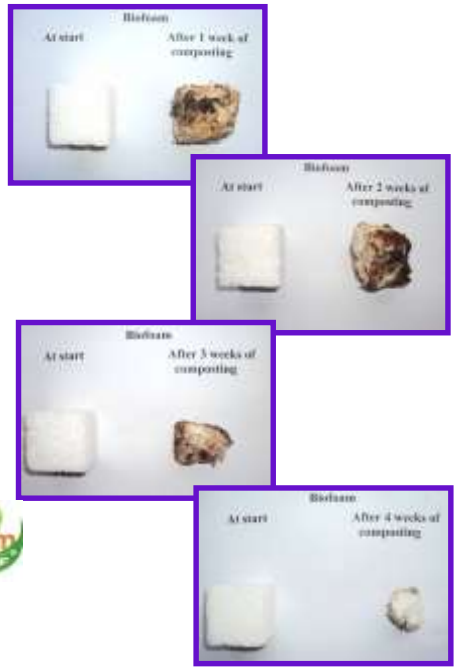
- Lower Environmental Impact Production Sites

LESS 280 tons CO^2 PER YEAR!!!

2.650 g di CO^2 per diesel lt
12 large lorries a day
220 gg working days
100km distance (200 round trip)
Usage 20lt/100km

- Multi material eco design (ready for separation)

- Compostable foam



Polystyvert Dissolution (Canada)

Up and Running (pilot plant)

IT IS NOT WATER !!

It is para-cymene, it is an aromatic compound related to mono terpenes present in many essential oils, in particular in those of cumin and thyme

PolyStyrene LOOP
PS-foam and Bromine recycling

2. Compaction

3. PS-foam is being treated in the PolyStyreneLoop demonstration plant in Terneuzen, Netherlands

4. HBCD-sludge is being treated in the Bromine Recovery Unit, safely destructing HBCD

35
Br
Bromine
79.904

4.1 Bromine is recovered and can be used in new flameretardants (Poly-FR)

(H)CFC release and capture

Pilot plant in 2021

5. From PS-foam new PS is made

5.1 PS can be used for new XPS or X-EPS

1. Demolition

FROM DEMOLITION SITE TO RECOVERING BROMINE AND POLYSTYRENE

Eps is 98% (engineered) Air

Logistics Managers

of many OMS & FOOD COMPANIES

(Pharma & Food)

are NOT happy about this

MOUNTING HOSTILITY

EPS efficiently protects where the goods are most vulnerable. At the same time it minimizes the pack size and the weight of shipped goods.

Overall, the use of EPS has a positive effect on CO2 emission reduction during transport whilst reducing scrap and waste.

EPS: an unbeatable packaging

A comparison of airpop packaging with other cushioning materials

	Density/Weight	Cushioning factor C*	Specific potential energy e* (cN Cm/cm2)
airpop Mould	30 kg/m3	22	22
Coconut fibre rubberised	80 kg/m3	38	70
Corrugated cardboard single corrugation	0.8 kg/m2	24	530
Corrugated board twin corrugation	1.2 kg/m2	26	80

Assuming the ideal cushion is completely compressed, that impact force and deceleration remain constant during deformation and, after deformation the pack is at rest, then under ideal condition G=h/d. The theoretical term G then describes the quality of the material, and is related to the actual quality per unit volume of a real material by factor C=Gact/G = Gact/h/d

The potential energy of a dynamic load (e) that must be applied to a cushioning material to obtain agiven volume of C is given by e=mgd/ad where A is length x width of the pack. (Source: BPF Buyer's Guide)

1,600,000

EPS TONS INSTALLED CAPACITY IN EUROPE

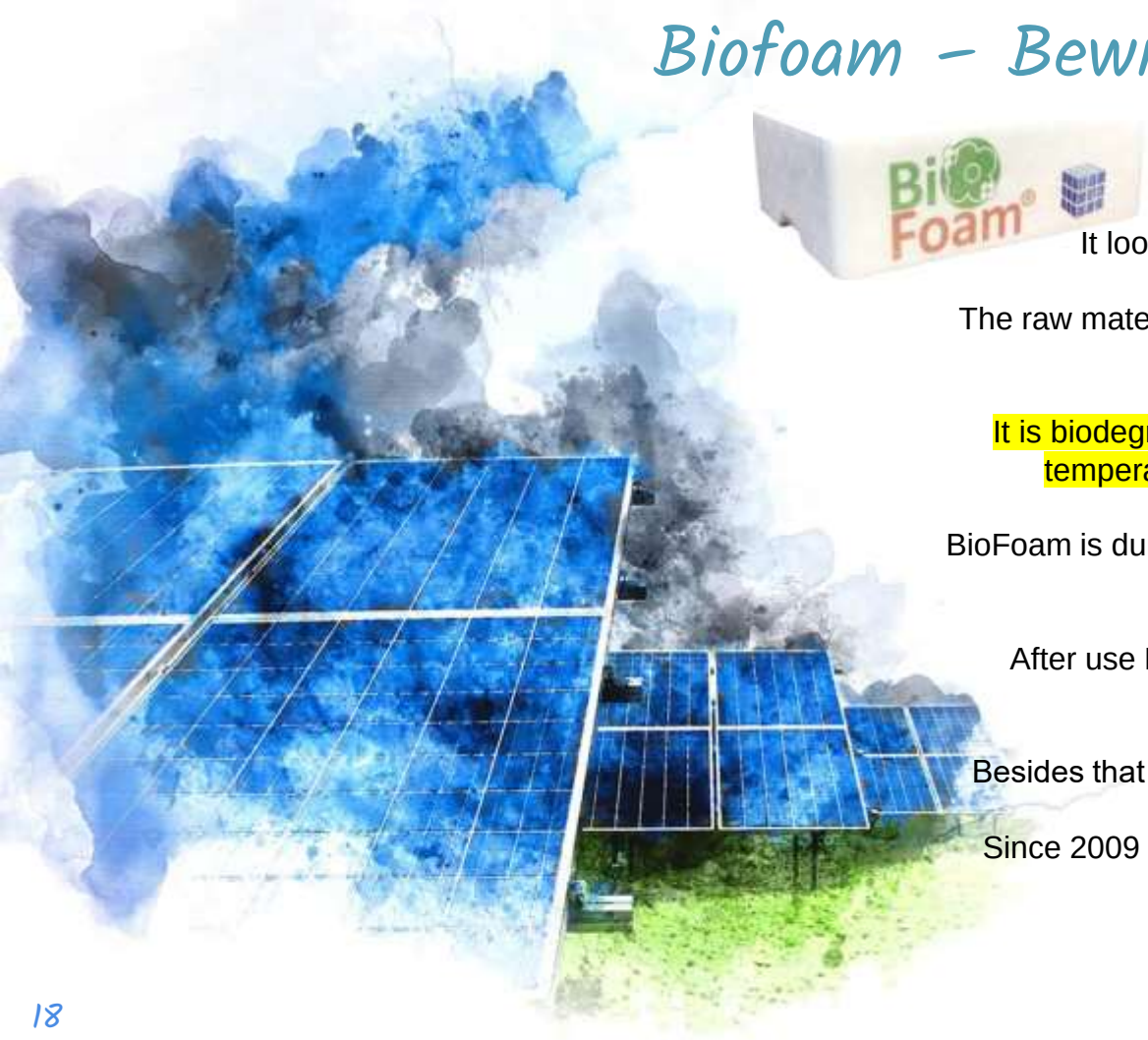
But Today Emotion Driven Decisions often prevail

So more expensive and less performing (and actually less sustainable in LCA) materials are preferred to EPS

EPS bio alternatives (with similar features)

End of Life / Source	Standard EPS	Compostable	Biologic ?
Renewable (biopolymers)	Biomass Balance	BIOFOAM ECOVIO	E-PHBH
Totally or Partially from Recycled (post consumer waste)	Revive Muster Ex EcoPlastic		
FOSSILE/OIL	STANDARD EPS		

Biofoam – Bewi Synbra Technology



It is comparable to EPS-expanded polystyrene.

It looks similar in structure and has the same properties.

The raw material for BioFoam consists of biopolymers, which are made of vegetable materials (an infinite resource).

It is biodegradable and it can be industrially composted at high temperatures under the influence of moisture and bacteria.

BioFoam is durable and is suitable for long-term use in virtually all technical and packaging applications.

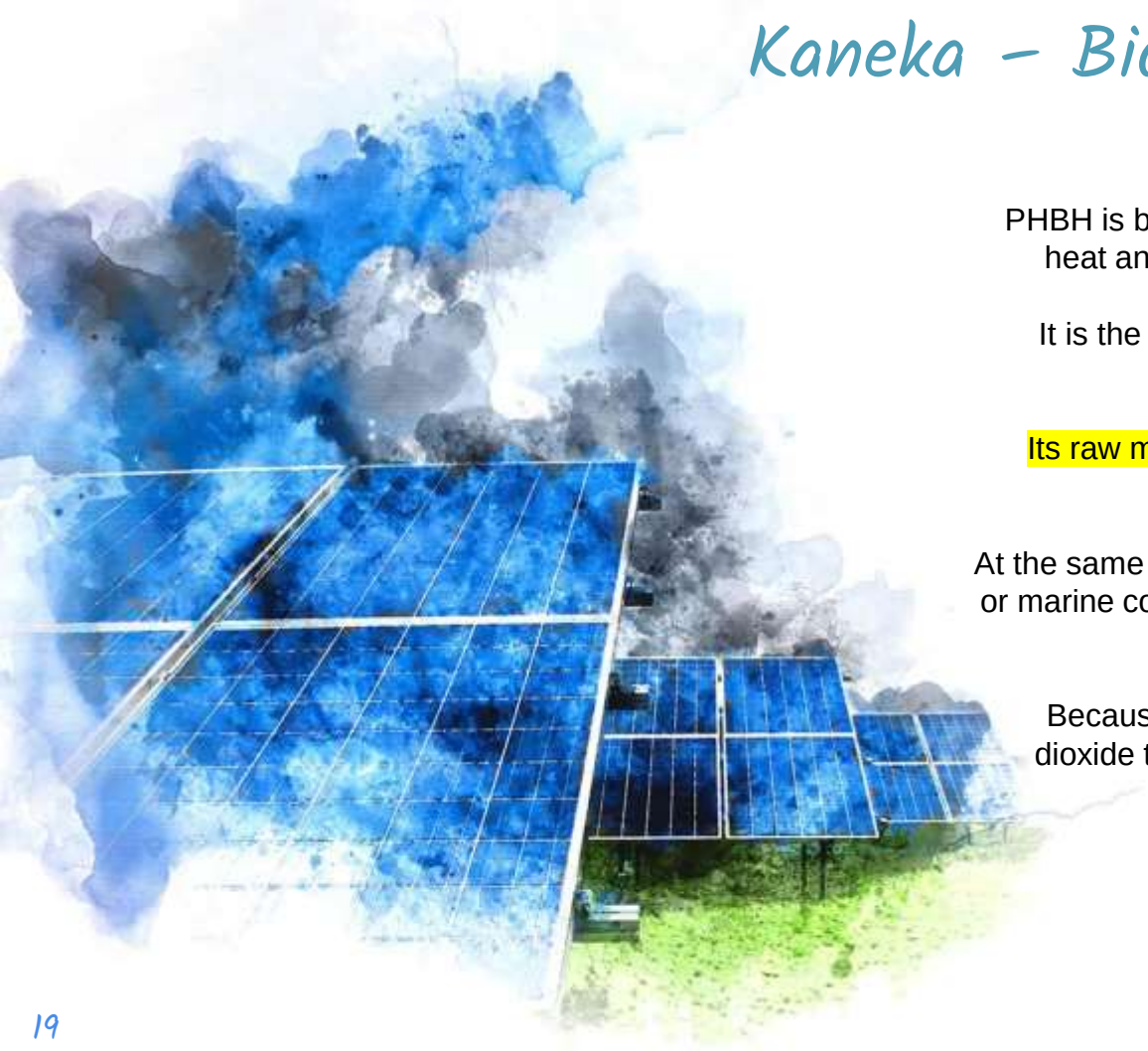
After use BioFoam® can be either re-formed into a new foam product or recycled into solid PLA.

Besides that it's got the unique possibility to be fully composted.

Since 2009 BioFoam® is a C2CCM (Silver) certified foam – the first foam to obtain this certification.

BEWi Synbra

Kaneka – Biodegradable PHBH™



PHBH is bio-based and biodegradable yet strongly resistant to heat and hydrolysis and can act as a barrier to water vapor.

It is the first ever 100% plant-based biopolymer to offer both flexibility and heat resistance.

Its raw materials are biomasses such as plant oils, which are renewable resources.

At the same time, it is biodegradable in either anaerobic, aerobic or marine conditions in the natural environment, ultimately being converted into carbon dioxide and water.

Because it is completely bio-based, it produces less carbon dioxide than fossil-based polymers and can contribute to the prevention of global warming.

kaneka
BIOPOLYMERS

BASF – Ecovio L Foam

Ecovio® is a high-quality and versatile bioplastic from BASF.
It is certified compostable and biobased.

Ecovio® L Foam:
Third offspring in the family

BASF

New BASF biobased* plastic

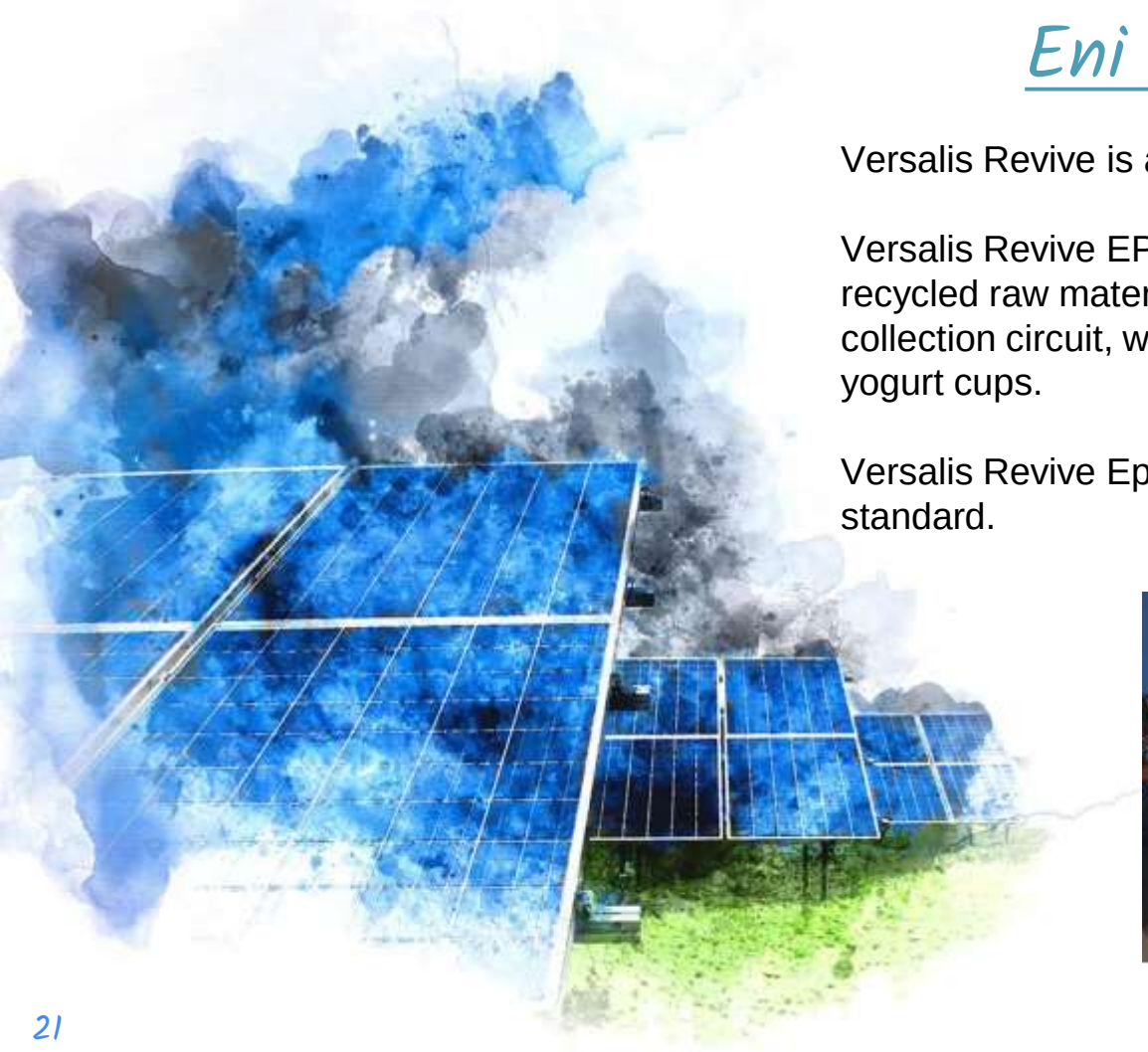
First biodegradable plastic on the basis of renewable raw materials for foam production

Name:	→ Ecovio® L Foam
Chemical composition:	→ Ecoflex® and polylactic acid (PLA), refinement of Ecovio®
Percentage of renewable raw material (PLA):	→ > 75% (ASTM 6866)
First laboratory samples:	→ K 2007, Düsseldorf, Germany
Planned market introduction:	→ Mid-2008 or end of 2008

*biobased: on the basis of renewable raw materials

Biodegradable and certified compostable biopolymer thanks to eco VIO® by BASF

Eni Versalis – Revive



Versalis Revive is a line of recycled plastic products.

Versalis Revive EPS is an expandable polystyrene containing recycled raw material from the Italian domestic separate waste collection circuit, which includes polystyrene glasses, trays and yogurt cups.

Versalis Revive Eps is already 20% PREMIXED with the standard.

Conclusions

SHORT TERM SOLUTION

EPS packaging in an excellent performant material that is worth using, developing, collecting and recycling

MIDDLE TERM INVESTMENT

Industry to invest in innovative physical separation by polymer dissolution

LONG TERM EFFECT

Create a real circularity in our businesses to avoid EPS to be deselected in favour of other, more expensive and less performing (and actually less sustainable in LCA) materials

Thanks!

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