



Circular Economy Workshop – Czech Republic

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EPS Raw Material Suppliers - EUMEPS responsibilities / activities



- **EU**ropean **M**anufacturers of **E**xpanded **P**oly**S**tyrene
- 23 National Association full voting members
- Associate Members covering raw materials, machinery and recycling
- Representing an industry of over 1000 SMEs, employing ca. 60,000 people, with a turnover of 5-6 billion Euros in Europe.
- ca. 1.8 million MT annual sales. 80% into construction and 20% into packaging applications.
- Expanded Polystyrene insulation is commonly found in most homes in Europe and in a broad range of packaging and protection applications.

Circular Economy - Where have we come from?

- EPS is an easily recyclable plastic
- In 1992, the Asian, European and North American EPS industries formed INEPSA, to enhance global EPS recycling and environmental stewardship
- Almost 60% of all EPS packaging waste in Europe is recovered, of which ca. 21% is recycled in a profitable way
- The key challenge lies with collation and sorting waste streams
- The ability and level of recycling is application and country dependent.
- Two very different streams: Construction and Packaging

EPS Recycling has been a reality for years

EPS Waste is an important and precious resource for whole PS/EPS Industry.

- Within last 30 years various recycling technics were developed and being used by RMS and its customers.
- EPS Raw Material Suppliers do their best to eliminate any polymer release to the environment,
- With growing EPS extrusion technology demand of EPS waste is constantly rising.



EPS Industry key objectives 2018

1. By end 2018, 75% of NAs are involved in recycling schemes using best practices identified by EUMEPS
2. By end 2018, all NAs have a Circular Economy project in place aligned with EUMEPS
3. An agreed industry pledge is submitted to the EU by end June as requested in Annex 3 of the Plastics Strategy
4. No legislation evolving from the EU Plastics Strategy unfairly targets EPS
5. Achieve a fruitful dialogue with EMAF

Best Practices:

PolyStyreneLoop – Managing legacy additives

- Major industry investment in innovative and entrepreneurial technology to recycle insulation foam waste and generate recycled raw material
- Supported by the EU Life program in partnership with the entire styrene value chain
- Recognised as a best practice in the EU Plastics Strategy and in the Basel Convention
- Plant due to start operation in 2019



PolyStyreneLoop coöperatie



60 entities from 14 countries

Know how providers - FR producers - EPS bead & XPS producers - EPS converters - Industry sectors & associations - System applicators - Styrene recyclers - Waste collectors - Machinery suppliers

The PolyStyreneLoop project

► Offers a solution...

- with an innovative process to turn PS foam waste into new high quality material, based on the CreaSolv®* Technology

► Supported by authorities

- included in the UNEP Basel Convention as best available technology to handle HBCD containing waste
- considered as an iconic project within the LIFE programme (the EU's funding instrument for the environment and climate action)

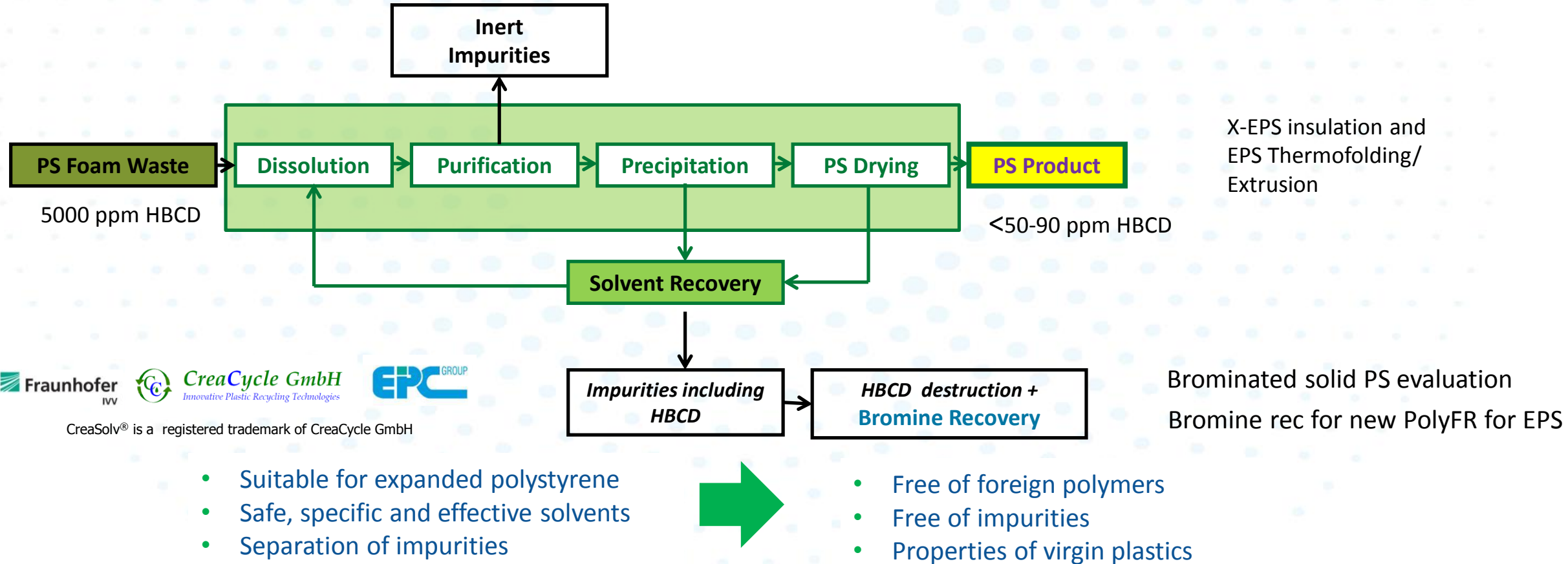
*CreaSolv® is a registered trademark of CreaCycle GmbH



The Technology

The CreaSolv® Process

Solvent-based Recycling ... when other technologies fail



Conclusions / key features

- ▶ a tangible way to demonstrate an effective contribution to a Circular Economy
- ▶ a unique way of organising the value chain out of many small fish becoming one big fish
- ▶ demonstrates the PS value chain as a leading initiative that is positively uncommon in the polymer industry
- ▶ a long term commitment and runs for 100 years
- ▶ roll out is foreseen to locations all over Europe once more PS foam waste becomes available starting with Poland/Germany



The circular economy in action

Website: www.polystyreneloop.eu

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Best Practices: Marine Litter and Operation Clean Sweep

- Operation Clean Sweep® (OCS) is an international programme designed to prevent the loss of plastic granules (pellets) during handling by the various entities in the plastics industry and their release into the aquatic environment
- By signing the OCS pledge, each Company recognizes the importance of preventing pellet loss into the environment and commits to OCS by implementing the following actions:
 - Improve its worksite set-up to prevent and address spills;
 - Create and publish internal procedures to achieve zero pellet loss goals;
 - Provide employee training and accountability for spill prevention, containment, clean up and disposal;
 - Audit its performance regularly;
 - Comply with all applicable state and local regulations governing pellet containment;
 - Encourage its partners (subcontractors, carriers, etc ...) to pursue the same goals.
- Prevention is possible by applying best practices.
- **Plastic Raw Material Producers** (BASF, BEWI, Borealis, Braskem, ChevronPhilips Chemicals, Covestro, DOW Europe, Dupont, Evonik, ExxonMobil, Ineos-Styrolution, Inovyn, Lanxess, LyondellBasell, SABIC Europe, Solvay, Synthos, Total, Trinseo, Versalis, Vestolit, Vinnolit, Vynova, etc.), **National Converters Associations , National Chemical Industry Associations , Plastics and Rubber Processing Machinery and Moulds Manufacturers Association**



Best Practices

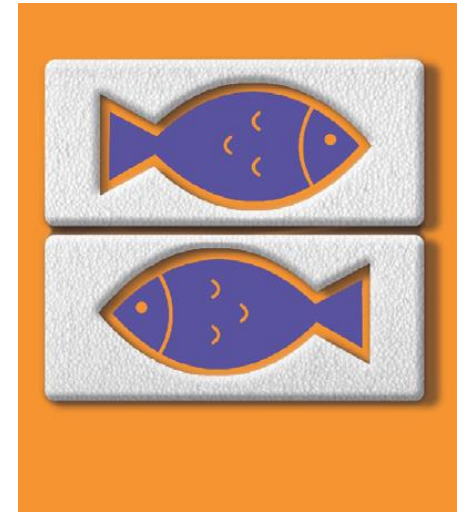
Innovative collection in Belgium

- Recycling rates in Belgium are above the European average but the industry is always looking for ways to improve on this.
- To reduce logistics costs for collection, the industry is putting a new collection opportunity on trial which could potentially be implemented at 20,000 businesses
- Tests with woven collection bags and a communication package for businesses have proved successful so that a pilot with 70 companies has been launched.



Best Practices: Recycling food grade EPS in Spain

- Fish boxes represent 50% of EPS packaging in Spain, which is similar to other European countries with a large fishing industry.
- There are opportunities to improve collection, pre-treatment and recycling of EPS fish boxes to produce a high value, food grade end product.
- A cross-industry pilot project, with investment of 1.3 million €, with EU LIFE funding, is running from 2017-2019 to develop a solution to close the loop



Best Practices: EPR scheme in Norway

- Norway has a voluntary EPS collection and recycling scheme in place since 1995 as part of the Grønt Punk Norge (GPN) system.
- Both industry and municipalities participate in this collection system.
- GPN facilitates collaboration with several regional entrepreneurs with compression systems, and municipalities with collection at manned recycling stations
- Financially self-supporting



Barriers



How to increase collection and recycling quota. Barriers.

Economical barriers / Logistical barriers.

- Trained people are required
- Separation and washing of EPS waste is expensive (especially from household waste)
- Transport costs: Collection points are often widely spread
- Landfill prices are low (cost of selection vs incineration or landfilling)
- Due to small quantities the separation of PS/EPS is not interesting for municipalities
- In some countries EPS from household waste is considered as „others“; thus considered as „non-recyclable“ landing in incineration
- In countries where landfill still is an issue it is the cheapest option for EPS waste disposal
- In fish markets the boxes can only be returned the same day
- B2B waste is becoming B2C waste:
 - How to get hold of waste from e-commerce?
 - Or white goods purchased from large retailer store?

How to increase collection and recycling quota. Barriers.

General

- Unclear definitions for recycling and many different approaches to quantify volumes
- No standards for recycling and waste treatment

The human factor / Education needed

- Correct sorting needs training which is often not provided
- Post-consumer waste from household is often dirty and wet
- Lack of communication and understanding for the necessity to properly sort and collect

Technology limitations

- EPS waste needs to be dry and clean, to be suitable for machines
- No standards for waste treatment and recycling facilities

Future



Pledge campaign 2018

1. The European Commission calls on all stakeholders to come forward with voluntary pledges to boost the uptake of recycled plastics. The object is to ensure that by 2025 ten million tonnes of recycled plastics find their way into new products on the EU market
2. The Commission's intention is to get definite indications by industry for recycling volumes of plastics.

EPS Waste Streams 2018

Data from Consultic 2009 (approximated)

Sector	Applications	Origin	Collection	Separation	Fate
7kt					
Construction 1000kt	ETICS	New Build 30kt	Pure stream		Recycled
	Civ. Eng.	Renovation	Offcuts		9kt
	Flooring				
	Flat roof	Legacy: 110kt	Mixed Waste	Separation (HBCD > 100ppm)	Landfill 55kt (no HBCD)
EPS Industry 1400kt	Doublage	Demolition/Deconstruction			Incineration
	Loose fill + others				Incineration with energy recovery 70kt
					60kt
					Recycled 100kt
EU Packaging 400kt	Protective	Industrial + Commercial	Pure stream		Landfill 220kt (no HBCD)
	White goods				Incineration
	Appliances				Incineration with energy recovery 180kt
	TVs + others	e-commerce	Pure stream (HBCD > 100ppm)		
Imported 100kt	Insulation				
	Fish boxes				
	Seed trays				
	+ others				
Cups		Consumer	Mixed waste	Separated	
	Trays				
	+ others				
	Flotation				
Exported 7kt	+ others				Marine Litter 7kt

EPS Waste Streams 2030

Sector	Applications	Origin	Collection	Separation	Fate
Construction 1000kt	ETICS	New Build	Pure stream		Recycled
	Civ. Eng.	Renovation	Offcuts		Mechanical
	Flooring				
	Flat roof	Legacy: 300kt	Mixed Waste	Separation	Recycled
EPS Industry 1400kt	Doublage	Demolition/Deconstruction			PSLoop
	Loose fill				
Packaging 400kt	Protective	Industrial + Commercial	Pure stream		
	White goods				
	Appliances				
	TVs	e-commerce			Recycled
Insulation					
	Fish boxes				
	Seed trays				
	Cups	Consumer	Mixed waste	Separated	
Trays					

Notes:

- Landfill will not be allowed
- Unless we can demonstrate the ability to fully collect, separate and recycle an application, the application will not exist.
- Some incineration with energy recovery may be tolerated for legacy construction waste as long as we can show that current building design allows for future separation of EPS insulation with recycling.
- Some recycle to XPS and PS from PSLoop and/or chemical recycling may be allowed, but target is to recycle to EPS.

Next steps

- Continue the dialogue with the EU Commission about the pledge
- Support Conversio in collating EPS waste stream data
- Continue looking for synergies and benefits of working with the larger styrene chain
- Position activities with PolyStyreneLoop and other recycling best practices.
- Initiate/strengthen discussion amongst EU Member States concerning to need and urgency to find solutions to barriers for increasing recycling rates of EPS.
- Understand the pros/cons of EPR schemes (all materials) and the potential to establish customized schemes uniquely for EPS waste streams.
- Develop a project plan for Circular Economy with objectives, KPIs and activities to align with European EPS industry.
- Develop a mentality of "if we can't justify that the application waste stream is environmentally sustainable, then we should find ways to change that or stop supplying to that application.

If we can't recycle it, we will stop selling it.

...but we need support

- Recognition that different plastics have different functions
- Alternatives to plastics are not necessarily better for environment
- Environmental impact assessment should drive the agenda
- Level playing field for all materials
- Humans, not plastics, are key problem,

SYNTHESIS.ORTHOS

