



PlasticsEurope Operation Clean Sweep®

Report 2017

About PlasticsEurope

PlasticsEurope is the pan-European association of plastics manufacturers with centers in Brussels, Frankfurt, London, Madrid, Milan and Paris.

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1. Report Summary

Plastics have become indispensable to our lives and are too valuable to be lost in our environment and the oceans. They deliver significant societal benefits, including energy and resource savings, the protection and preservation of food and consumer products, and innovations that improve health care, reduce food spoilage and improve the quality of life.

However, plastic debris forms a major component of marine litter, negatively affecting aquatic life, leading to socio-economic costs and representing waste of valuable resources. Plastic products need to be responsibly managed throughout their life cycle, so that they are prevented from escaping into the environment by proper waste management, mindful product design and responsible behaviour.

The plastics industry is committed to contributing to solutions preventing marine litter. In 2011, leaders from plastics associations around the world signed the Declaration of the Global Plastics Associations for Solutions on Marine Litter. As of the publication of this report a total of 70 plastics associations, covering 35 countries have signed the Declaration. It sets out clear objectives for industry action and advocates close cooperation with a broad range of stakeholders to achieve substantial progress in reducing the impact of marine litter on the marine environment. The six focus areas of the Global Declaration are:

- 1 Education
- 2 Research
- 3 Public policy
- 4 Sharing best practice
- 5 Plastic recycling/recovery
- 6 Plastic pellet containment

Since 2011, over 260 projects have been completed, are under way or currently being planned. The most recent progress report provides an update on projects carried out under the Declaration and can be downloaded from www.marinelittersolutions.com.

Industrial plastic pellets are among the items recorded in marine litter monitoring reports, and are recognised by the sixth focus area of the Global Declaration. In general, pellet loss containment is part of a company's environmental management system and of Responsible Care[®].¹ However, in order to give additional focus and priority to this topic and engage with the value chain, PlasticsEurope rolled out Zero Pellet Loss (ZPL), a voluntary initiative aimed at improving awareness, promoting best practices and providing guidance and tools to support its members in the implementation of the necessary pellet loss prevention measures.

To align and concentrate all industry efforts globally under a common approach, in 2015 the ZPL initiative was integrated into the global Operation Clean Sweep[®] (OCS) programme, which had been developed in 1990 in the US by the Plastics Industry Association (formerly SPI).

Since then, PlasticsEurope has become one of the major promoters of the OCS programme and is actively encouraging its member companies as well as other associations to become signatories to the programme. As host, PlasticsEurope supports companies by providing a platform for the exchange of knowledge and experience.

At the time of publication of this report, around 50 percent of the PlasticsEurope members to whom OCS is applicable² have signed the OCS pledge,

¹ Responsible Care[®] is the global chemical industry's unique initiative to improve health, environmental performance, enhance security, and to communicate with stakeholders about products and processes. <http://www.cefic.org/Responsible-Care/>

² Operation Clean Sweep[®] is applicable to those members handling and/or producing solid plastics materials and members not engaged in a similar Zero Pellet Loss programme (see section 4.1, Table 2).



including the largest plastics producers and all steering board members. By volume, this covers the majority of the plastics production in Europe. PlasticsEurope has set itself the target of increasing this level of participation to 100 percent by the end of 2017.

The OCS signatories have either implemented or are in the progress of implementing a variety of measures addressing pellet loss step by step. An overview of their activities is provided in Chapter 6 of this report. The signatories are currently at various stages of implementing the OCS programme and there is no “one size fits all” solution. In order to be able to monitor the status and progress of implementation across all of the signatories, a reporting scheme is being developed during 2017 to gather relevant and comparable information from all of the members and establish smart targets.

As well as encouraging its member companies to undertake this programme, both PlasticsEurope and

its members are actively reaching out to other industry associations, policy-makers, environmental organisations and the general public to involve them in constructive dialogue, as we all share the same goal: zero pellet loss.

The aim of this report is to:

- provide information about the steps taken by PlasticsEurope and its members in rolling out and implementing OCS;
- give an overview of the variety of measures and practical solutions that companies have taken to prevent pellet loss into the environment; and
- encourage more companies and value chain partners to undertake this journey too.

This report has been developed by PlasticsEurope and those of its members which have signed the OCS pledge, and it will be updated on a yearly basis. For the most recent information, please visit www.opcleansweep.eu.

2. Plastic Pellets in the Marine Environment

While marine litter consists of all kinds of materials, plastics are by item count and material volume the major material fraction today found as litter in Europe (e.g. on beaches, the sea surface or the sea floor). Most data is available for beaches, as can be seen in the OSPAR intermediate assessment of 2017. This assessment describes the abundance and composition of beach litter in the OSPAR Maritime Area across 76 beaches in 2014 - 2015.

The abundance of marine litter in the OSPAR Maritime Area provides information on the magnitude of litter pollution in adjacent waters and coastal areas, indicating spatial differences in litter pollution. The litter on a given beach may be generated locally at sea or on land, or may arrive from distant sources, transported by rivers or ocean currents.

Beach litter composition gives an indication of the scale and magnitude of the problem, as well as the level of threat to the environment.³

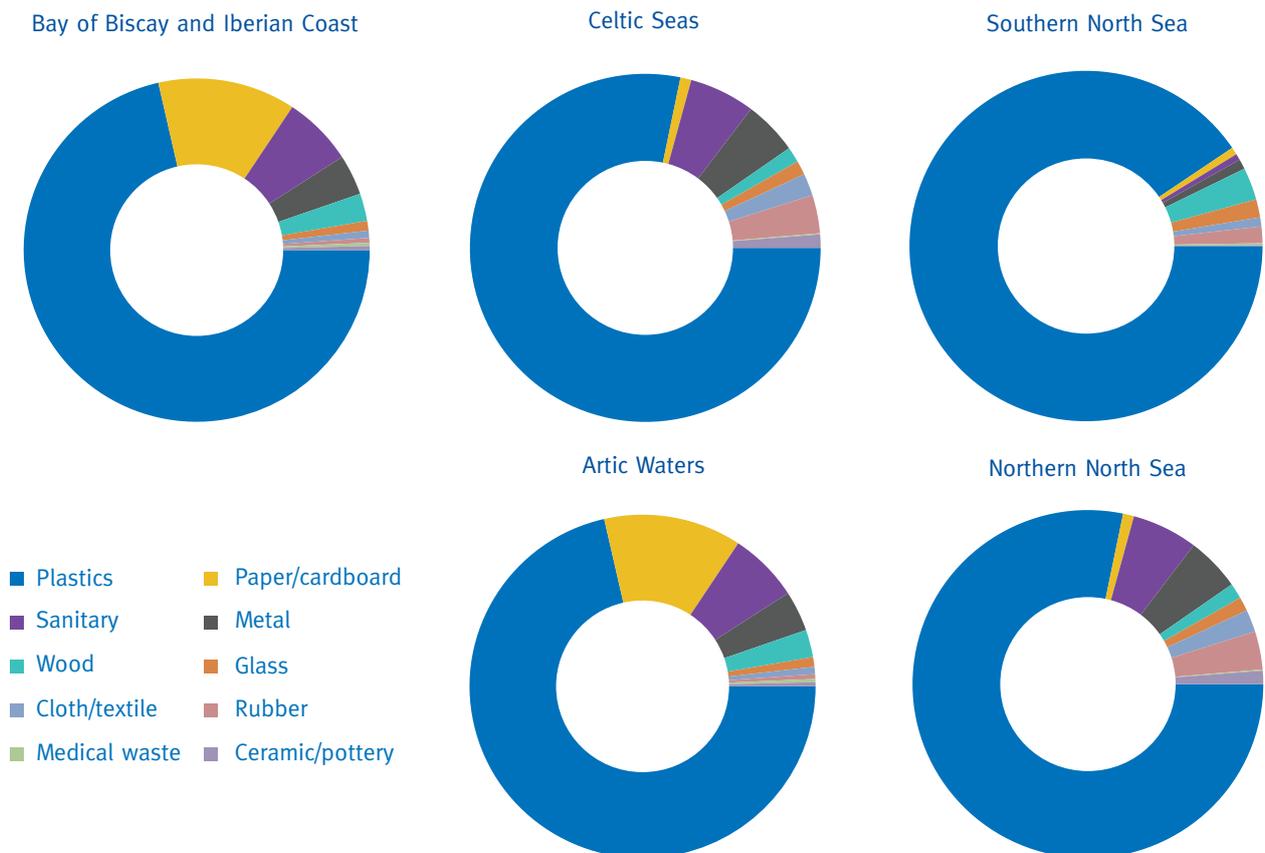


Figure 1. Composition of marine litter according to material / use categories for the period 2014-2015 in the OSPAR Maritime Area

³ Text and graph taken from publication: <https://oap.ospar.org/en/ospar-assessments/intermediate-assessment-2017/pressures-human-activities-v2/marine-litter/beach-litter/>: Abundance, Composition and Trends D10 - Marine Litter

The study “Plastic waste inputs from land into the ocean” by Jambeck et al. (2015)⁴ estimated that the amount of plastic waste entering the ocean from land each year was between 54,000 and 145,000 metric tonnes from the EU member countries⁵ and 4.8 and 12.7 million metric tonnes globally in 2010.

Scientists have been reporting the loss of pellets in the marine environment since the 1970s, including industrial plastic pellets. This is of concern as the pellets are valuable materials intended for the manufacture of plastic parts for end products, and should not be ending up in the environment.

When mixed with other marine litter, the pellets may be eaten by certain marine animals such as sea birds, for example the northern fulmar. If the pellets do not pass through or get rejected by the digestive system, they, like other litter items, may accumulate and potentially cause malnutrition and starvation.

Dutch scientist Jan van Franeker has been monitoring plastic particles in the gut contents of northern fulmars found along the Dutch coastline

since the 1980s. A joint publication by Van Franeker and Law reported that pellet concentrations in the North Atlantic Ocean Gyre and in the guts of the northern fulmar have decreased by about 75 percent since the 1980s (see Figure 2). Plastics production volume more than doubled from around 25 to 58 million tonnes in Europe during the same period.⁶

The downward trends in the quantity of plastics found in the gyre and in the gut contents of northern fulmars are most likely the result of a combination of increased consumer awareness, actions by industry and policy initiatives. However, industrial plastics are still found in rivers, on beaches, in the sea and in the bodies of animals around the world, and continued effort is needed in order to achieve “zero pellet loss”.



Northern fulmar

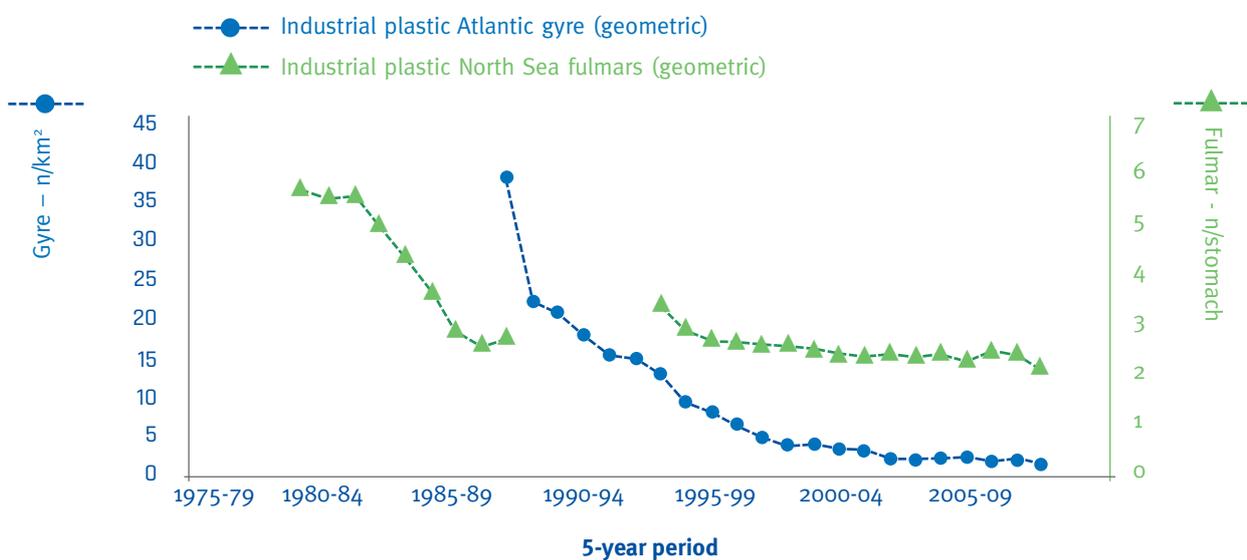


Figure 2: Comparative trends in numerical abundance of industrial plastics in stomachs of North Sea fulmars and surface densities in the North Atlantic subtropical gyre. Source: Franeker & Law, 2015⁷

⁴ Jambeck, J. R., Geyer, R., Wilcox, C., Siegler, T. R., Perryman, M., Andrady, A., Law, K. L. (2015) Plastic waste inputs from land into the ocean. *Science*, 347(6223), 768-771. DOI: 10.1126/science.1260352.

⁵ The paper assessed the 23 coastal EU countries.

⁶ EU28 & NO & CH; includes plastic materials (thermoplastics and polyurethanes) and other plastics (thermosets, adhesives, coatings and sealants). Does not include the following fibres: PET, PA, PP and polyacryl fibres. Source: PlasticsEurope (PEMRG) / Consultic.

⁷ Franeker, J. A. van, Law, K. L. (2015) Seabirds, gyres and global trends in plastic pollution. *Environmental Pollution* 203, 89-96. <http://dx.doi.org/10.1016/j.envpol.2015.02.034>.

3. Sources of Pellet Spills

In Europe, approximately 80 percent of plastic raw materials produced are in the form of round to oval granules of approximately 2-5 mm in diameter, called pellets. The leakage of pellets into the environment may occur at different handling steps

along the value chain, for example during production, loading & unloading and transportation, as well as during the production of the final product and during recycling.

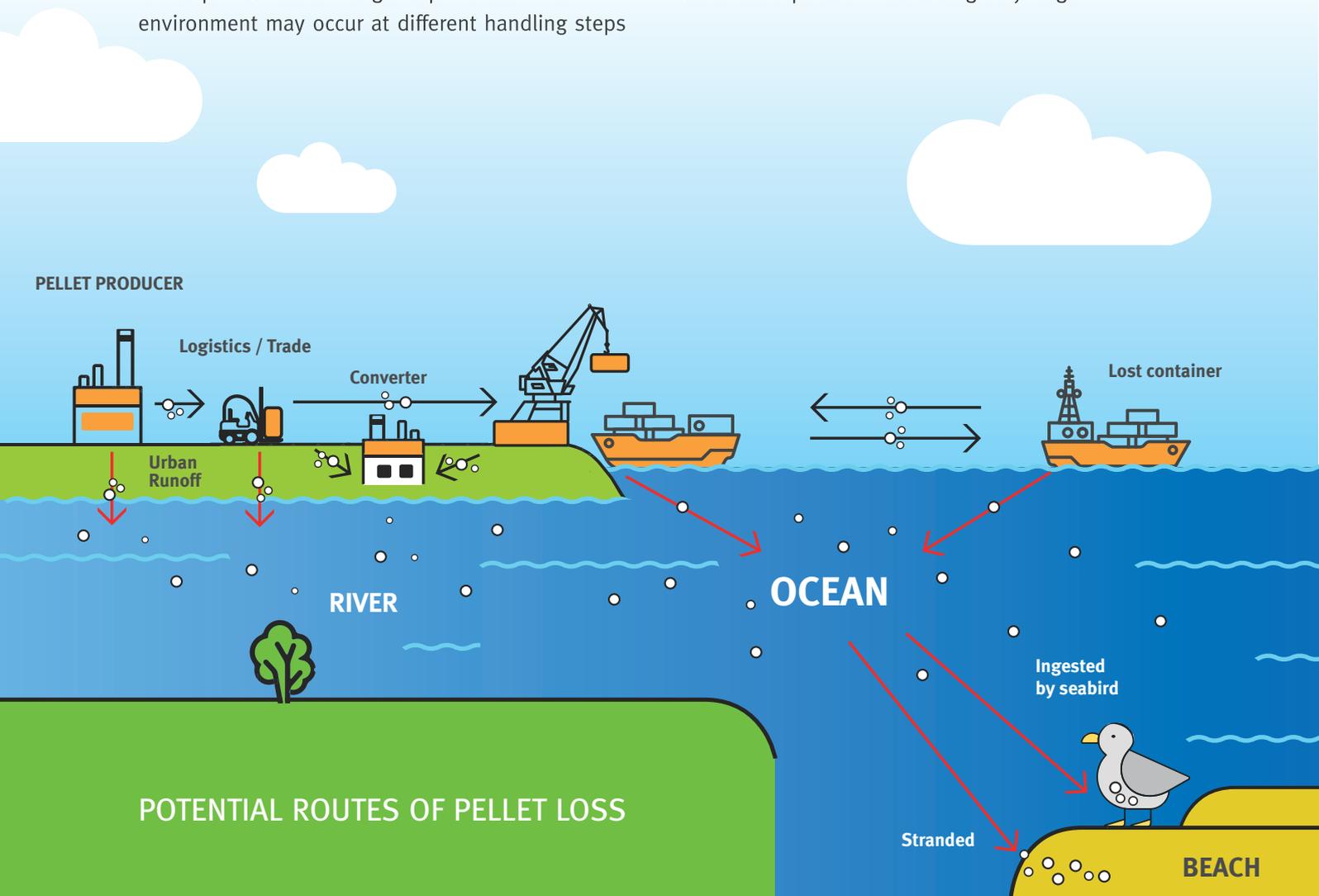


Figure 3. Potential routes of pellet loss⁸

Loss can occur at any of the several steps in the pellet value chain:

- **Production and compounding:** Pellet loss can occur due to careless handling or accidents

during the production and compounding⁹ process, during loading into packaging or other storage units, during transport to or from storage, and during preparation for transport to the customer.

⁸ Based on a graphic by International Pellet Watch (see <http://www.tuat.ac.jp/~gaia/ipw/en/what.html>).

⁹ Compounding is a further step in which pellets get replasticised, mixed with other materials or additives and cut into pellets again. This is done to create particular requested properties such as strength, UV resistance and colour.

- **Conversion:**¹⁰ In most cases, pellets are loaded into heated extruders or injection moulding machines to produce items such as pipes or other parts, or goods for use in daily life. Converters receive pellets either in silo trucks for large production or packed in smaller units down to 25 kg bags. The pellets are unloaded, stored and later mixed, dried and loaded into the machines. Pellet loss can occur at any of these steps if care is not taken or accidents occur.
- **Logistics:** Pellet spill incidents can occur during the loading and unloading of pellets using suction pipes for silos and forklifts or cranes for (big)bags, octabins or bulk containers. Pellets can be lost due to improper loading and unloading or accidents. For example, containers that are not properly secured or wrongly positioned can topple off a ship into the sea during a strong storm. If the containers hold bags of pellets, these can get spilled straight into waterways. Small quantities of pellets might get spilled on a silo-truck roof during (un)loading. Those pellets may then fall to the ground during cornering or be blown off the truck by wind.
- **Trading:** Some plastics are not directly sold to the converter by the producer. Trading companies purchase pellets and store and otherwise handle them before selling them on to

converters. Once again, spills can occur during the unloading, storage, repackaging and loading of the pellets.

- **Recycling:** When plastics waste is transformed into new raw materials, pellets or flakes are often the final product. These are handled similarly to virgin material and are subject to the same leakage risks as for virgin material.

3.1. Packaging and storage

After production, pellets are packaged in a number of ways for storage and for transportation from production sites to plastic converters or other customers via logistics hubs. Types of packaging include 25 kg bags stacked on pallets, octabins (large carton boxes), “big bags” (large plastic bags) or silos. Transportation takes place by road, rail, sea or air.

The type of packaging must be carefully selected on the basis of customer needs, mode of transport and compliance with safety requirements in accordance with industry norms and standards. Each form of packaging and transport needs to be reviewed with respect to the potential for leakages and pellet spills, so that individual preventive solutions can be implemented.



Bag (contents 20-25 kg) to be stacked on pallets, with a total of up to 1500 kg per pallet



Octabin (contents 500-1300 kg)



Big bag (contents 500-1000 kg)



Silo truck (up to 35 MT)

¹⁰ Converter is a term often used to describe companies which convert pellets into final plastic parts.

4. Operation Clean Sweep®

4.1. Hosting and promoting OCS along the value chain: A joint effort

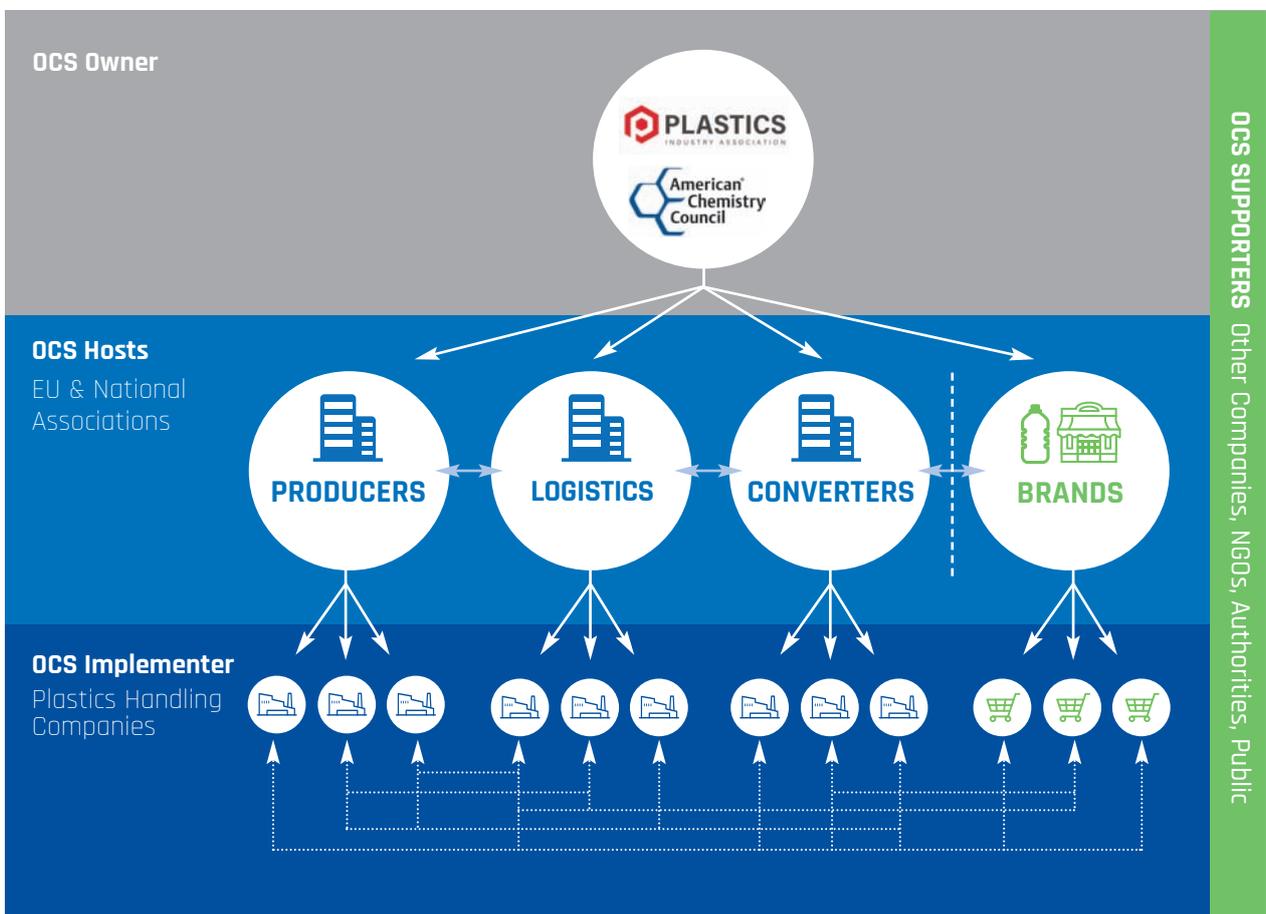


Figure 4. Relationship between OCS Hosts & OCS Implementers along the value chain

Associations function as hosts for OCS, both to ensure that relevant companies along the plastics value chain join OCS and take action and to

provide a platform for best practice sharing. The table below lists European associations that are currently engaged in OCS or similar programmes.

Organisation	Region	Pellet Loss Initiative Name	Value Chain Position
Albanian Plastics Converters Association (APKA)	AL	OCS	Converter
British Plastics Federation (BPF)	UK	OCS	Producers, Converters, Recyclers & Distributors
Danish Plastics Federation	DK	OCS	Producer & Converter
Elipso	FR	OCS	Converter
Fachverband der Chemischen Industrie Österreichs (FCIO)	AT	Zero Pellet Loss	Chemicals, Plastics Producer & Converter
Fédération de la Plasturgie et des Composites	FR	OCS	Producer, Converter, Recycler
Association for Chemistry, Plastics and Life Sciences Industries (essenscia)	BE	OCS	Chemicals Producer
Finnish Plastics Industries Federation (FIPIF)	FI	OCS	Producer & Converter
IK Industrievereinigung Kunststoffverpackungen e.V.	GER	Null Granulatverlust	Converter
Innovation and Chemical Industries (IKEM)	SE	OCS	Chemicals & Plastics Producer
Italian Chemical Industry Federation (Federchimica)	IT	OCS	Chemicals Producer
Italian Plastics and Rubber Processing Machinery and Moulds Manufacturers Association (AMAPLAST)	IT	OCS	Converter & Machine Producer
Nederlandse Rubber en Kunststofindustrie (NRK)	NL	OCS	Producer & Converter
PlasticsEurope	EU28, CH, NO, TK	OCS	Plastics Producer
Serbian Plastic Association (JUPLAS)	RS	OCS	Converter
Spanish Association of Plastics Industry (ANAIP)	ES	OCS	Converter
Turkish Plastics Industry Foundation (PAGEV)	TK	OCS	Producer & Converter

Table 2. List of associations in EU28, CH, NO, TK hosting a pellet loss prevention campaign

As a host, PlasticsEurope focuses on the following objectives:

- 1 Promote OCS and encourage all relevant members to join the initiative
- 2 Support the effective implementation of OCS in all signed member companies
- 3 Measure progress and make progress transparent
- 4 Recruit more associations along the value chain to host OCS or similar programmes

- 5 Share knowledge and best practices across companies
- 6 Be a point of dialogue for external stakeholders

PlasticsEurope has created a dedicated Working Group on Marine Litter Solutions and Pellet Loss Prevention. This group, consisting of 14 companies, regularly meets to discuss the progress of and improvements to the OCS programme, to coordinate activities and to share best practices among member companies.

Training sessions and workshops have proved to be instrumental in supporting effective implementation. A first workshop for PlasticsEurope members was organised in August 2014 to provide members with insights into the implementation of the Zero Pellet Loss initiative as it was then known. In September 2016, a two-day practitioner workshop was held to further promote the exchange of best

practices and knowledge, and jointly find solutions to current challenges. Building on the success of these workshops, future annual knowledge exchange and OCS engagement workshops are planned.

In addition to this, PlasticsEurope has adopted and is constantly improving the campaign materials and tool kits such as presentations, posters and videos.



Experts attending the practitioner workshop

4.2. The 6 commitments in the OCS pledge

By signing the OCS pledge, each company recognises the importance of preventing pellet loss into the environment and commits to OCS by implementing the following 6 actions:

- 1 Improving worksite set-up to prevent and address spills;
- 2 Creating and publishing internal procedures to achieve zero pellet loss goals;
- 3 Providing employee training and accountability for spill prevention, containment, clean-up and disposal;
- 4 Auditing performance regularly;
- 5 Complying with all applicable state and local regulations governing pellet containment;
- 6 Encouraging partners (contractors, transporters, distributors, etc.) to pursue the same goals.

The programme provides recommendations for each of the six implementation steps in the form of a manual. This manual is based on collective learning and is aimed at supporting companies in their efforts to achieve excellence in implementation. The OCS manual and tools can be downloaded from www.opcleansweep.eu.

The signed pledges are centrally filed at PlasticsEurope and signatories are officially listed on the OCS website. (see the list of companies in Chapter 5.4.1).

Operation Clean Sweep
Company Pledge to Prevent Resin Pellet Loss

Our company recognises the importance of preventing the loss of resin pellets into the environment and is committed to implementing the Operation Clean Sweep programme. We will be an OCS Programme Partner, strive towards "Zero Pellet Loss" and make changes to:

- 1 Improve our worksite(s) set-up to prevent and address spills,
- 2 Create and publish internal procedures to achieve zero pellet loss goals,
- 3 Provide employee training and accountability for spill prevention, containment, clean-up and disposal,
- 4 Audit our performance regularly,
- 5 Comply with all applicable local and national regulations governing pellet containment,
- 6 Encourage our partners (contractors, transporters, etc.) to pursue the same objectives.

Operation CleanSweep® is trademarked by SPI

Company Pledge to Prevent Resin Pellet Loss

Company name: _____
 Address: _____
 City: _____
 Zip Code: [] [] [] [] [] [] Country: _____
 Company / Site Manager
 Name and Title: _____
 Email Address: _____
 Phone: _____ Fax: _____
 (Company stamp) _____ Date: _____
 Signature: _____



Copy of OCS Pledge

4.3. Target setting: An important tool for progress measurement

4.3.1. Target level 1: Number of signatories to OCS

At the time of publication of this report, 50 percent of the PlasticsEurope members to whom OCS is applicable¹¹ have signed the OCS pledge, including

the largest plastics producers and all steering board members. By volume, this covers the majority of the plastics production in Europe. PlasticsEurope has set itself the target of increasing this number to 100 percent by end of 2017.

By the date of publication of this report, the companies listed below have signed the OCS Pledge. The latest updates on signatories can be found on the website www.opcleansweep.eu.

¹¹ Operation Clean Sweep® and other equivalent pellet loss initiatives are only applicable to those member companies handling and/or producing solid plastics materials (i.e. pellets, powder and flakes).

BASF	Ercros	SABIC Europe
BEWI Insulation (SE)	Evonik	Solvay
Borealis	ExxonMobil	Total
Braskem	INEOS	Trinseo
Chevron Phillips Chemicals	INEOS – Styrolution	Versalis
Covestro	Inovyn	Vestolit
DOW EUROPE	Lanxess	Vinnolit
DuPont	LyondellBasell	Vynova
Elix Polymers	Repsol	

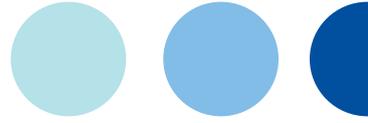
Table 3. PlasticsEurope member companies which have signed the OCS Pledge

4.3.2. Target level 2: Progress of OCS implementation

Companies are currently at different implementation stages and there is no “one size fits all”

solution. PlasticsEurope and its members have set a target of developing a scheme that allows the collection of information on and reporting about progress and establishing implementation targets for all signatories by the end of 2017.

5. Implementation of Pellet Spill Prevention Measures



After having signed the OCS pledge, signatories take the following steps to start rolling out the programme:

- 1 Communicating to all sites and commercial teams about the company’s commitment;
- 2 Raising awareness and implementing training activities for employees about OCS;
- 3 Assessing the status quo at each plant and facility to determine gaps, risks, and prioritisation areas;
- 4 Mapping emission points, collection points, cleaning methods, containment capabilities, isolation, and identifying weather conditions that increase the risk of pellet losses;
- 5 Developing an action plan for each production site/area.

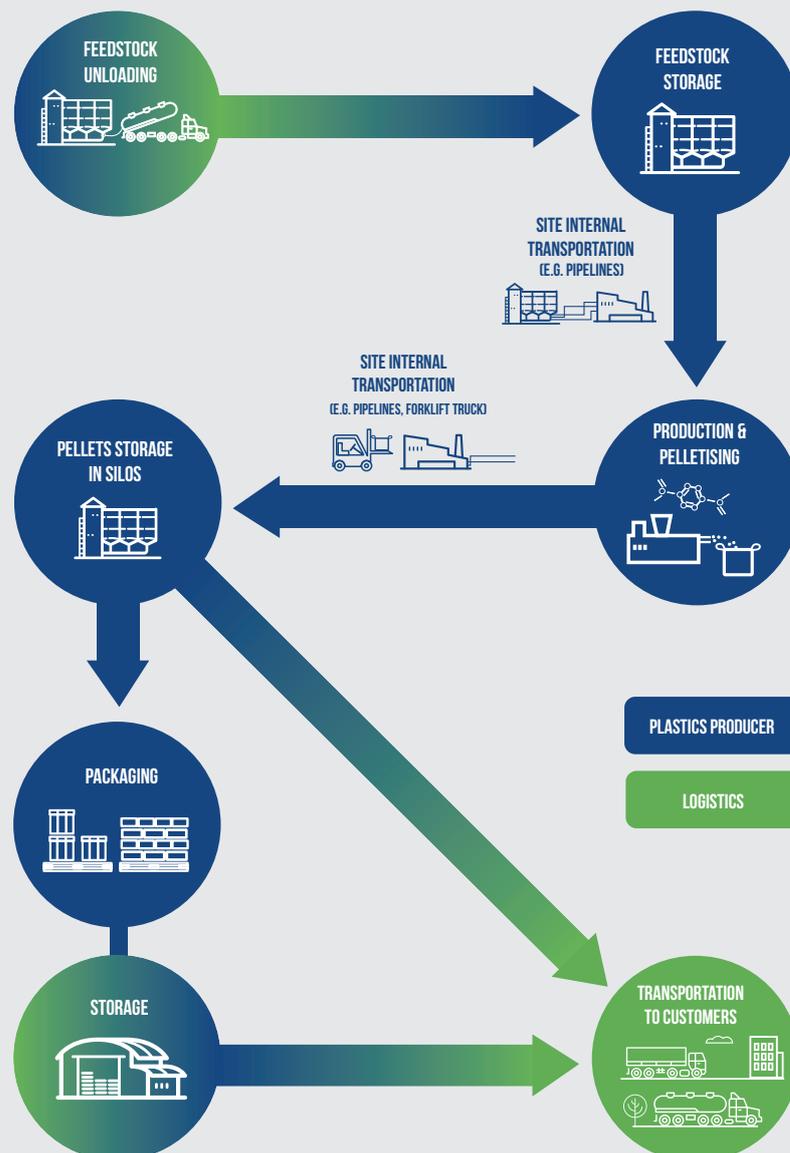


Figure 5. Plastics production work flow

As there is no “one size fits all” solution, the action plans vary from company to company, and even between production sites. The measures that a company needs to take to be effective and efficient and which priorities need to be set depend on the local situation, company size, plant infrastructure and individual working processes, as well as the specific sources of spills and the result of the company’s risk assessment and gap analysis.

This chapter gives an overview of various good practices and actions undertaken by different companies to address pellet spill prevention. This overview is non-exhaustive and respectful of companies’ intellectual property.

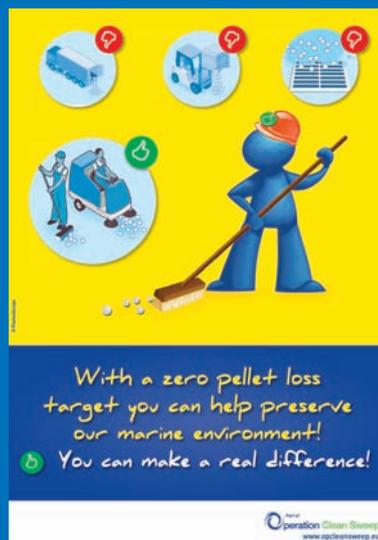
5.1. Employee training and accountability

Any certified environmental management system includes employee training, accountability and the establishment of a continuous improvement process using the Deming circle,¹² 6 Sigma, Kaizen and similar models for the implementation.

In addition, many OCS signatories have developed specific employee awareness campaigns and communication tools such as posters and flyers and placed them across the plants in strategic locations where they will best capture the attention of employees and truck drivers. These make use of eye-catching symbols and simple messages in order to overcome language barriers.



PlasticsEurope poster, available for all companies



Awareness & education flyer



Employee training

¹² Deming circle: An iterative quality management tool for the continuous improvement of implemented measures.

To answer basic questions about OCS and ensure common understanding, some companies have created electronic glossaries accessible on their intranet. Employees are kept further informed about ongoing OCS measures via company newsletters or online articles on the intranet.

Interactive workshops have also proved to be effective in improving employee responsibility and ownership. During these workshops, employees came up with their own suggestions for more efficient and effective measures. Following the workshops, employees were able to identify potential leakage points such as equipment loading, extrusion, pelletising and product filling, and come up with improved measures such as increasing cleaning intervals, installing additional retention systems in wastewater drainage or making changes to the location of equipment.

5.2. Good worksite practices

Listed below are some examples of measures taken by OCS signatories that illustrate the variety and effectiveness of the actions undertaken. Because some of the measures implemented are process-integrated and specifically incorporated into the companies' intellectual property, not all of the initiatives can be disclosed here. Moreover, due to the different set-up of individual plants and depending on the outcome of the gap and risk analysis for the individual companies, not all of the signatories will have implemented the measures mentioned below.

5.2.1. Clean worksite

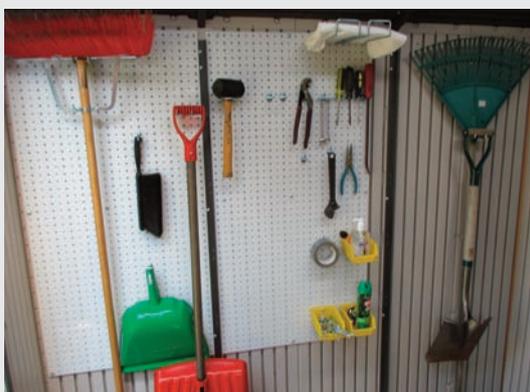
“Fit for purpose” cleaning equipment has been installed on the production site. Different types of cleaning equipment for inside or outside, whether mobile or not, are used by dedicated staff who work continuously to keep the working environment clean.



Outdoor cleaning equipment



Indoor cleaning equipment



Easily accessible cleaning equipment is provided at identified pellet loss points

5.2.2. Preventing spills during production or logistics handling

Reducing the possibility of pellet loss during production or logistics handling is the most effective way of preventing pellet spills.

Vessels, inlets or outlets can come in many different sizes. Pipes, hoses and gates need to have the right diameter, degree of overlap or offer an additional cover that seals the process and prevents bouncing pellets. Where necessary, additional funnels have been installed to close gaps, increase overlap and bridge the size difference between the vessels.



Additional funnels ensure that pellets can't fall out at the sides



Soft tips on fork lift trucks prevent tearing of bags

The thin tips of forklift blades can punch holes in packaging if not directed with care. Such holes may result in the need for a clean-up and should be attended to immediately. "Sumo Gloves" are available on the market, which are applied to fork tips to increase and soften the contact surface and reduce the risk of damage to packaging.

5.2.3. Eliminating losses from primary processes

In some areas it is not possible to completely avoid spills, such as in places where pellets are handled manually. This might include weighing rooms where

batches of plastics with a specific property or colour are prepared, or in areas where materials are transported with a forklift. In such instances, specially designed additional secondary measures have been installed, for example, a collection bin for capturing the pellets.



Improve weighing provisions by collecting spilled materials in drums



Pellets collected separately from other types of waste

In order to ensure the proper cleaning of any transport equipment, whether it is a silo, container or

packaging, companies have implemented regular extra training for employees and truck drivers.

Bulk containers must only be released after they have been completely emptied and checked. Their delivery/release papers will only be issued after this has been properly carried out.

Dust suction systems have been installed at critical points in areas where plastic dust can be formed mechanically, such as where loading and unloading

take place. Another effective measure for preventing spillage during the unloading process is the use of suction lances (pumps).

More examples of simple but effective measures to prevent pellets escaping into the environment are shown below.

› Measures for preventing pellet loss during loading and transport



Additional transport boxes reduce losses during transport



Additional sheets prevent pellets falling through the pallet



Double secured transport cases

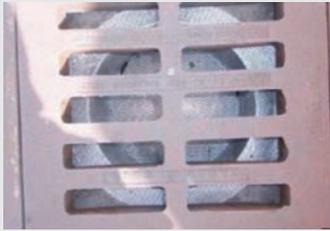
5.2.4. Water filtration, separation and monitoring

Should pellets enter the production site's waste water system, it is critical to ensure that they are filtered out to prevent them reaching the public waste water system or surface waters.

Companies have applied a variety of solutions for waste water filtration. There are no standard sizes

or ready-made solutions, and the system needs to be tailored to suit the collecting baskets or sieves. Perforated steel plates, for example, have proven to be very efficient since they are highly resistant to atmospheric agents. Where necessary, companies have taken further measures to improve their waste water systems and/or storm water run-off systems in order to prevent plastics entering public water or surface water systems.

› Examples of pellet containment and filtration systems employed by OCS signatories



Drainage sieve



Special stainless steel sieve to cover round outlets in canal



Temporary cover for drains during cleaning of spills

The inspection and monitoring of water filtration and treatment equipment is part of the regular maintenance protocol. In order to prevent pellet loss, more stringent protocols such as additional cleaning intervals have sometimes been implemented, such as switching from monthly cleaning to shorter time intervals – even daily – depending on observation. Employees regularly inspect, clean and, where appropriate, repair specific water treatment equipment close to the source, especially after heavy rainfall or in periods of high water levels.

5.2.5. Cleaning silo trucks

Another potential opportunity for pellets to escape into the environment is during the loading and unloading of silo trucks when filling is not done precisely. This risk can be mitigated by providing regular training to personnel and truck drivers, carrying out regular inspections and implementing closed loading systems. If this is not possible, spill protection devices or sealed filling systems can be installed, or air blowers (open or closed) used to blow off the remaining pellets after loading.

› Measures for preventing pellet loss during loading



Precise filling of silo truck



Precise filling of silo truck



Spill protection during loading



Closed loading systems where possible



Closed air blower



Open air blower to blow off granules



Small quantities of pellets can be lost during unloading at a rail siding. The track bed with stones hinders proper cleaning, so after the original track bed had been cleaned, a small blacktop culvert was added along the unloading area to simplify the cleaning process for this area.

5.3. Internal procedures

Every company has practices in place as part of their environmental management system, including working procedures and specific instructions for cleaning up after spills have occurred or have been reported, inspection procedures, reporting of incidents, etc. The OCS manual also provides guidance and checklists which can be used by signatories to review their existing audit systems, working procedures, practices and tools, and to make changes to improve the prevention of pellet spills.

Another effective method for companies to raise awareness of pellet loss prevention is to include marine litter prevention as a significant aspect of their environmental management system, their site procedures and/or their Responsible Care® programme.

5.4. Auditing performance

Every company has a set of audit and inspection regimes in place to assess the quality, robustness and effectiveness of its environmental and health and safety management systems.

As part of the OCS programme, some companies have adjusted their existing management systems to draw more attention to the issue of pellet loss. Others are developing specific OCS assessment and audit schemes.

Depending on their individual structure and culture, companies decide which is the more effective and efficient method, and whether these measures should be integrated into existing environmental and safety audit schemes or form separate ones. The main point is that both methods put a special focus on the sound management of pellet containment so that risks and gaps are spotted and evaluated, and mitigating and preventive measures are taken.

5.5. Compliance with regulations

The key to every company's licence to operate is ensuring compliance with all applicable national and international laws and regulations. Standards like ISO 14001 and ISO 19600, as well as voluntary commitments like Responsible Care® and other guidelines, have led to a significant and continuous improvement in the environmental performance of all plastics producing companies in Europe.

All plastics manufacturers in Europe have extensive compliance management systems in place to ensure strict adherence to all applicable laws and regulations. Becoming a signatory to the OCS Pledge means committing to maintaining and even exceeding these standards and minimum legal requirements.

5.6. Engaging with the value chain: Transporters, distributors and contractors

OCS signatories are committed not only to ensuring that proper pellet loss measures are established on their own premises, but also to taking the next step and engaging with logistics service providers, transportation partners and customers. This is vital for preventing pellet loss during transport to plastic converters and distributors.

It is extremely important to engage with transportation partners and logistics service providers (LSP) and ensure that they implement pellet spill prevention measures, as many losses occur at transport interfaces (loading, unloading, handling). OCS Signatories have started to train and raise the awareness among truck drivers or external service providers on site so that they are aware of the company's OCS guidelines and instructions.

For example, letters explaining OCS have been sent out to transportation companies and their respective associations, OCS has been put on the agenda of meetings between producers and transporters, and an article has been published in a transport association's newsletter. As a result, some logistics companies have already become OCS allies in order to further raise awareness within their associations and to encourage more companies to collaborate.

Furthermore a new loading and unloading procedure has been developed by CEFIC, ECTA, PlasticsEurope and its member companies in order to address relevant environmental and safety aspects and highlight the need for prevention and mitigation of pellet losses.

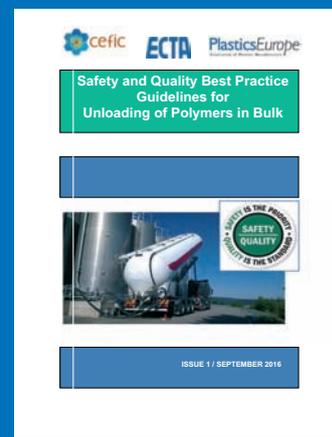
› Awareness and education material addressing the logistics sector



Dedicated flyer for visiting bulk transporters



Example of article in transport association's newsletter



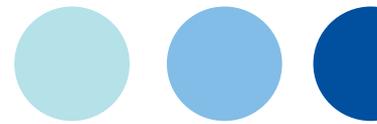
Unloading guidelines released by CEFIC with ECTA & PlasticsEurope¹³

Companies also expect their contractors to adhere to the same standards and procedures as any of their employees. In order to ensure this, especially where there are many contractors present on site (for example, during plant maintenance operations or “turnarounds”), signatories have put special

emphasis on providing training to and raising awareness among contractors to inform them and ensure that they also respect and apply the good housekeeping procedures and rules in order to avoid pellet loss.

¹³ <http://www.cefic.org/Industry-support/Transport—logistics/Best-Practice-Guidelines1/General-Guidelines/>.

6. Engagement with Stakeholders Beyond the Plastics Value Chain



In addition to engaging with value chain partners, it's important to establish close dialogue with interest groups such as NGOs, authorities and the general public in order to promote a sound, mutual understanding of the concerns, needs and expectations relating to marine litter and pellet loss prevention, and to discuss issues, expectations and possible solutions. In particular, the complexity of marine litter prevention and pellet loss prevention requires informed decision-making and collaborative efforts involving many parties.

PlasticsEurope has therefore participated in a variety of stakeholder dialogues such as OSPAR's¹⁴ Microplastics conference in December 2015, followed by further meetings with authorities from OSPAR member states, among them Belgium and France.

PlasticsEurope also became an official observer at OSPAR to contribute to the development and

implementation of marine litter prevention measures addressed under the Regional Action Plan. The association has also joined and supported various research projects with the aim of better understanding the issue of microparticles in the marine environment (GESAMP – Microplastics in the ocean¹⁵) and investigating potential solutions (BIOCLEAN¹⁶).

In order to share knowledge and provide an opportunity for open dialogue between industry and other stakeholders, PlasticsEurope organised the Polytalk¹⁷ conference in Brussels in March 2016. The event was attended by more than 250 participants. The OCS initiative was one of the topics of this conference, and member companies shared their experiences of pellet containment solutions, for example presenting advanced pellet packaging solutions.



Various stakeholders share their knowledge and exchange opinions at PolyTalk 2016

¹⁴ For more information on OSPAR, visit <http://www.ospar.org/>.

¹⁵ For more information on GESAMP, visit <http://www.gesamp.org/>.

¹⁶ For more information on BIOCLEAN, visit <http://www.biocleanproject.eu/>.

¹⁷ For more information on Polytalk, visit <http://www.polytalk.eu/>.

PlasticsEurope also engages with environmental protection organisations. Together with the British Plastics Federation (BPF), they have held meetings with Fauna & Flora International and Fidra, two of several organisations that have placed the presence of pellets in the environment and the call for loss prevention on their agenda. The meetings provided local insights, generated solutions for pellet loss prevention and resulted in the promotion of Operation Clean Sweep® on the Great Nurdle Hunt website.

In the last two years, PlasticsEurope has provided input into a number of reports from consulting agencies (for example MEPEX and Eunomia), commissioned by Austria, Norway, Germany, the UK, the Netherlands, Spain and France. The intent was to provide an evidence base for nations and authorities that will assist them in their attempts to better understand the issue and consider solutions and policies.

Some companies have also invited EU and national authorities to visit their sites in Austria and France to gain greater insight into pellet production and containment measures.

PlasticsEurope and its members take stakeholder feedback seriously. Based on OSPAR's Rotterdam Conference in 2015 which addressed pellet loss among other things, several improvements were adopted relating to value chain outreach, increased transparency on Operation Clean Sweep® and target setting, and these have become part of the initiative.

Interacting with the public through channels such as Twitter provides additional value and enables PlasticsEurope to hear, identify and highlight pellet loss findings for the relevant stakeholders. This may subsequently lead to further investigation and initiate an improvement process.

Outlook

Plastic pellets like any other product do not belong as litter in the environment. Although a major reduction of pellet losses by 75% over the last decades can be observed, more needs to be done.

Pellet loss is a major concern for industry and losses must be prevented in a joint effort across the entire plastics value chain.

Operation Clean Sweep® was initiated to improve awareness, accelerate prevention and facilitate experience sharing. Each OCS signatory is implementing the best solutions fitting to their sites and processes. Pellet loss prevention as part of quality and environmental management programmes is a continuous journey ensuring that all potential leakage points are covered.

This report represents a first overview by PlasticsEurope and its OCS signatory members describing how the OCS programme has been and continues to be implemented.

Next steps are to increase the level of member company participation to 100 percent¹⁸ by the end of 2017 and to develop a reporting scheme for the collection of relevant and comparable information from all signed members.

As pellet loss may occur at different handling and processing stages in the value chain, we are reaching out to associations and companies that are part of this plastics value chain in Europe and globally via the Global Plastics Alliance. The European OCS hosting associations are planning a workshop during 2017 to discuss and define further steps to improve and intensify stakeholder involvement.

We also continue to actively engage with other interest groups, as these dialogues are vital for enhancing mutual understanding and advancing long-term, collaborative solutions.

We therefore also encourage you to provide us with feedback on this report.

The publication of an updated report is planned for 2018.

¹⁸ Operation Clean Sweep® and other equivalent pellet loss initiatives are only applicable to those member companies handling and/or producing solid plastics materials (i.e. pellets, powder and flakes).

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