



# PlasticsEurope Operation Clean Sweep®

Report 2018

## 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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# Foreword

*It is my great pleasure to present PlasticsEurope's Operation Clean Sweep® (OCS) report for 2018. This report highlights many notable achievements in PlasticsEurope's commitment to combatting plastic pollution. I am proud to be able to highlight the continued progress we are making in implementing new and improved programmes, projects and research in this area.*

*The widespread phenomenon of plastic waste in the environment is one of the most alarming challenges we currently face as a global community. Plastics are crucial in enabling more sustainable solutions across a wide range of applications. However, the loss of this valuable material to our environment is unacceptable.*

**“ PlasticsEurope has made the OCS programme a top priority project**

*The plastics industry remains fully committed to contributing to solutions to plastics pollution. As plastic raw materials are among the items found in the environment, our industry has set up the voluntary OCS programme to drive best practice in pellet management and strive towards zero loss of pellets, flakes and powder.*

*PlasticsEurope launched OCS in Europe in 2015. The past four years have already taught us a number of important lessons. The unique structure and design of every manufacturing site requires adapting OCS best practices to different settings, as well as an ongoing approach to developing new solutions.*

*Although it remains challenging to measure progress in terms of quantities contained and to trace the exact source of pellets found in the environment, companies need to keep up the hard work and continuously monitor their own progress. Accidental pellet spills can occur at any point of handling along the plastics value chain – whether during routine processes or in unexpected circumstances, like extreme weather.*

*Within the framework of our broader Plastics 2030 Voluntary Commitment, PlasticsEurope has made the OCS programme a top priority project, setting new targets for its own members. This report is intended to provide an overview of the latest OCS developments in Europe and identify further improvements to prevent pellet loss. I hope it demonstrates how the initiatives launched and implemented over the past year have been contributing to the fight against pellet loss.*

*If you are not yet part of the OCS community, I encourage you to join us!*



**Javier Constante**  
President of PlasticsEurope  
Commercial Vice President, Packaging and Specialty  
Plastics Business EMEA of DOW Europe



# 1. Report summary



There is growing concern about the presence of plastics, including microplastics, in the environment. PlasticsEurope considers any plastic leakage into the environment as unacceptable. Spilled plastic raw materials\* – pellets, flakes and powder – are amongst the largest sources of primary microplastics in the environment. These can end up in soils, waterways and eventually the ocean, contributing to global microplastic pollution. Since the plastics industry (and its value chain) is producing and handling these pellets until their conversion into a final product, it has direct control over their management and containment within its facilities.

Pellet spills can occur at all stages along the plastics value chain, including production, handling, transportation and conversion. To tackle the leakage of plastic pellets, PlasticsEurope created the Zero Pellet Loss (ZPL) voluntary initiative. In 2015, this initiative was combined with the global Operation Clean Sweep® (OCS) programme. PlasticsEurope is the principal host of the OCS programme in Europe and is coordinating its implementation by actively encouraging companies and other associations to join through extensive promotion of the initiative.

In Europe, the number of signatories to the OCS programme has doubled since the last report with now more than 500 signatories from the plastics value chain. As well as actively engaging with the value chain, PlasticsEurope is also cooperating, with a wide variety of stakeholders including NGOs, policy makers and academia at both national and European levels.

By signing the OCS pledge, companies who handle plastic pellets recognise the importance of preventing spillage by committing to implementing measures to reduce leakage into the environment and improving clean-up procedures. This report provides examples of pellet containment measures adopted by PlasticsEurope's members, such as good worksite practices, training for employees and engaging with the value chain.

In addition to these activities PlasticsEurope launched in January 2018 an ambitious "Voluntary Commitment to increasing circularity and resource efficiency" (Plastics 2030). This included a series of ambitious goals on pellet containment.

Following the publication of the Plastics 2030 a vast majority of PlasticsEurope members have now signed-up to OCS, representing around 90% of the membership and more than 98% of market share. A questionnaire to assess progress of implementation has been developed and 100% of PlasticsEurope OCS signatories have responded to it. Finally, following successful collaboration with the Port of Antwerp in 2017, PlasticsEurope has now started several initiatives to engage other major European ports in the OCS programme.

Moving forward in 2019, PlasticsEurope will focus on promoting the implementation of the OCS programme through development of various tools such as a best practices catalogue, a common self-assessment tool as well as a certification scheme. This will be done in parallel with strengthening stakeholder engagement.

\* Hereafter, plastics raw materials (pellets, flakes and powder) shall be referred to as "plastic pellets" or "pellets".

# 2. Plastic pellets in the environment

The majority of plastics pollution is caused by mismanaged waste. There is also an increased interest in how microplastics contribute to this environmental issue.

### BOX 1

**Microplastics** are commonly understood to be solid, insoluble, man-made plastic particles that are under 5 mm in size. Yet, no internationally recognised definition of “microplastic” exists<sup>1</sup>. Primary microplastics are released into the environment as small plastic particles, whereas secondary microplastics are a result of the breakdown of larger articles (e.g. mismanaged plastic waste).

A 2018 study by Eunomia<sup>2</sup> modelled the annual emissions of microplastics into surface waters in the EU, highlighting the three main sources: tyre abrasion, industrial plastic pellet loss and washing of synthetic textiles (Fig. 1). Plastic pellets are estimated to be the second largest source of microplastics entering the aquatic environment in the EU with an annual median emission of 41,000 tonnes (ranging from 3,000 to 78,000 tonnes).

Another assessment from the OSPAR Commission<sup>3</sup> estimates that within the drainage basins of the OSPAR maritime area<sup>4</sup>, between 2,600 and 26,000 tonnes of plastic pellets are released every year. According to this estimate, plastic pellets are the 4<sup>th</sup> biggest source of land-based microplastics entering aquatic systems within the OSPAR region.

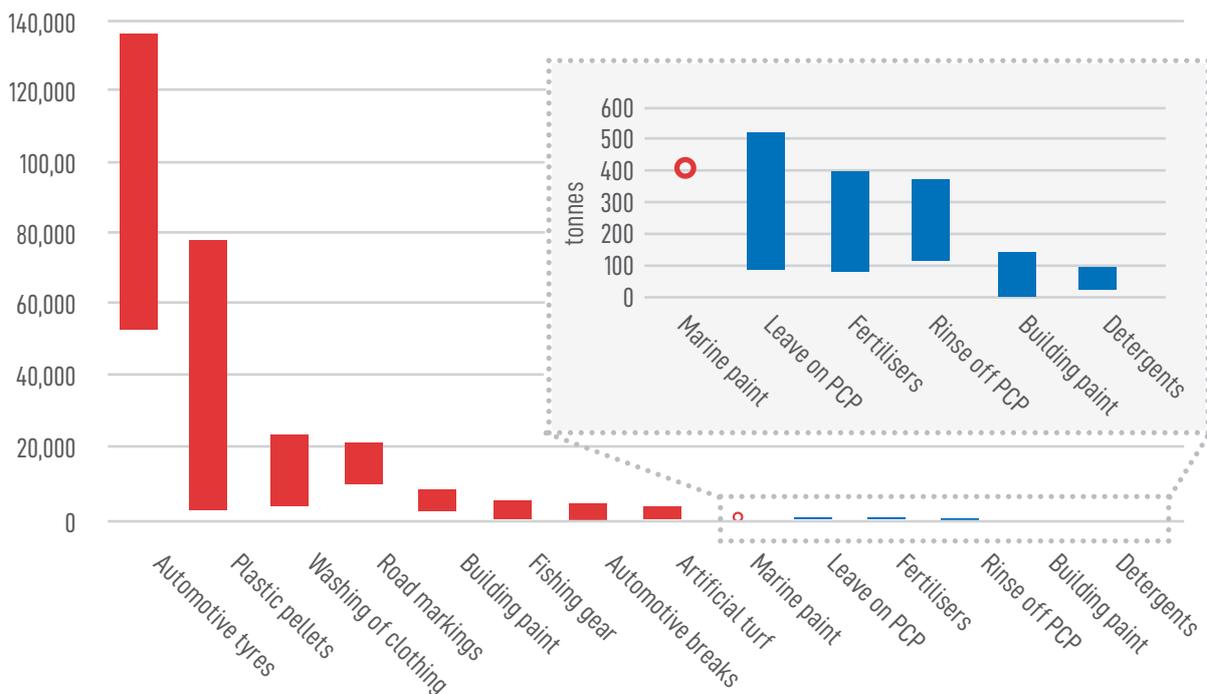


Fig 1. Eunomia and Amec Foster Wheeler modelling of annual emissions of microplastics to surface waters in the EU<sup>2</sup>.



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A highly polluted beach in North Queensferry on the Firth of Forth (Scotland) where pellets are estimated to be present there in the millions.

Quantifying the exact number of plastic pellets entering the aquatic environment, especially at a larger scale, is a very complex task. As no standardised methodology exists<sup>2</sup> to measure the number of plastic pellets, estimates vary as to the exact magnitude of the problem. Despite this, most studies identify plastic pellets as one of the main sources of primary microplastics in the aquatic environment.

Although a common methodology for sampling, sample preparation and analysis does not yet exist, some localised studies indicate that pellets

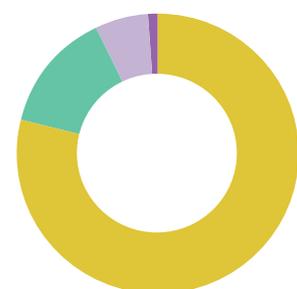
are found in the environment, sometimes in very high quantities<sup>5</sup> (Box 2). While pellets are found in many locations, it is important to note that often other sources of microplastics contribute more to plastic pollution than pellet loss. For example, an Austrian study on the Danube river found that pellets contributed between 4% and 10% of total microplastics, with most originating from littering, fragmentation and road run-off<sup>6</sup>.

OSPAR also has a biological monitoring programme on the quantity and mass of plastics found in the stomachs of northern fulmars

## BOX 2

### MICROPLASTICS ON THE PORTUGUESE COAST<sup>5</sup>

- Marine anthropogenic litter was surveyed from 11 beaches from 2011 to 2013.
- 99% of collected litter items were plastics, of which 68% were microplastics (1-5 mm diameter).
- Pellets were the dominant category overall and were present at particularly high levels on the coastlines closer to industrial areas.
- Marine litter in this region (microplastics including plastic pellets) originate from local land-based sources.



■ Pellets     ■ Fragments  
■ Styrofoam     ■ Foam sponge

(*Fulmarus glacialis*). Using this programme as an environmental quality indicator for the North Sea, OSPAR set a long-term target of having less than 10% of northern fulmars with over 0.1 g of plastic in their stomachs.

However, this target is yet to be reached. According to the latest assessment, 58% of birds contained over 0.1 g of plastic<sup>7</sup> (Fig. 2). The study showed that more than half of the examined fulmars contained plastic pellets in their stomach, amongst other ingested items, with an average of 3.1 pellets (0.07 g) per bird. Therefore, to meet the OSPAR long-term target, greater efforts to combat plastic pollution and improve pellet containment need to be made.

To summarise, it is clear that although the prevalence of pellets varies, plastic pellets are still finding their way into the environment. The Great Nurdle Hunt<sup>8</sup> (a citizen-science project run by Fidra) records and maps the frequencies and estimated quantities of pellets found on beaches. Originally organised in the UK, the project now includes findings from across the EU and globally. This map (Fig. 3) shows that pellet pollution is still severe in some areas, despite ongoing industry

efforts. Therefore, in order to strengthen the OCS programme, every member of the value chain must continue to implement pellet containment measures both within and beyond their network.



Northern fulmar

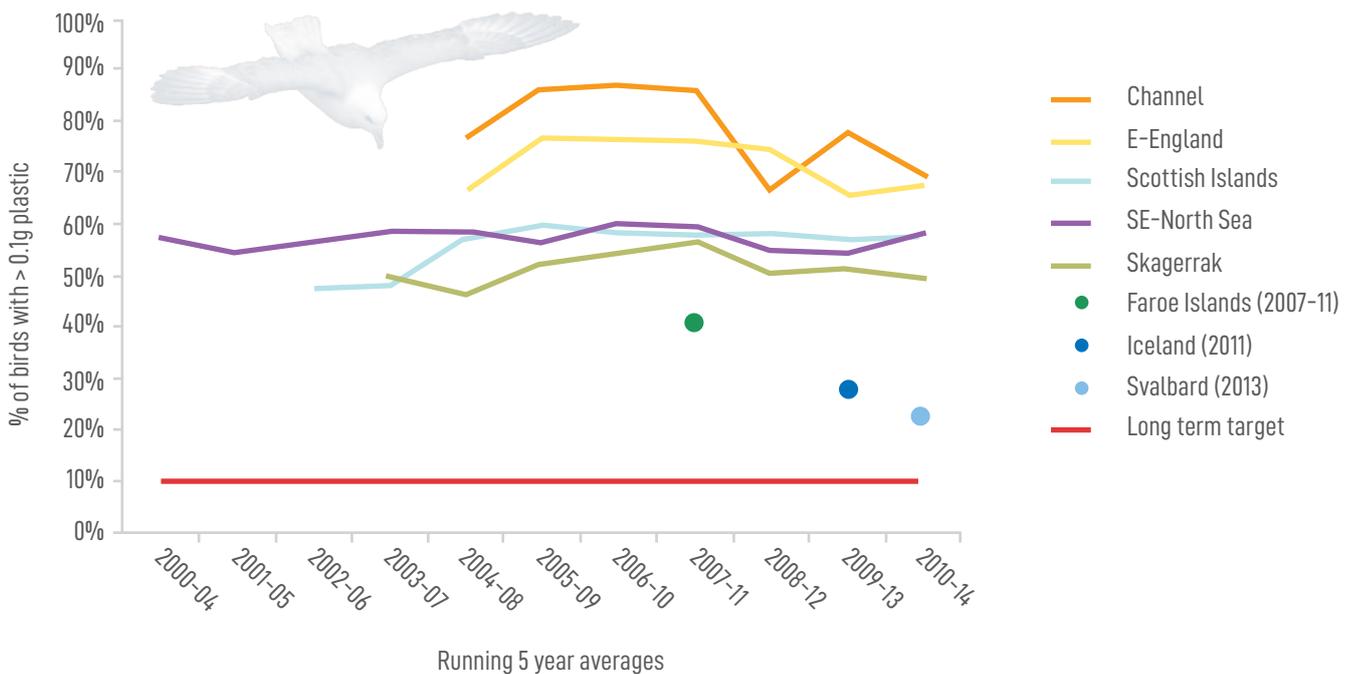


Fig. 2: Running 5-year averages since 2000 showing the percentage of fulmars (%) found with more than 0.1 g of plastics in their stomach<sup>7</sup>.



Fig. 3: A map representing pellet findings collated by Fidra's The Great Nurdle Hunt. The map indicates the number of pellets found by volunteers within a limited search time<sup>9</sup>.

# 3. Sources of pellet spills

There are several different types of raw materials used in the manufacture of plastic products. In Europe, the majority of these raw materials take the form of either round or oval granules of approximately 2-5 mm in diameter, known as pellets<sup>10</sup> or powder (< 1 mm). Flakes consist of mixed plastics materials of various sizes, produced through the recycling of plastics waste.

Unintentional loss of pellets can occur at different stages along the plastics value chain. Spills which occur in closed areas with no possible route into the environment will be contained. However, when spillages occur outside of a closed area, pellets may end up being washed down drains and into waterways before eventually flowing into the ocean (Fig. 4)<sup>11</sup>. This can lead to severe environmental and social impacts<sup>12</sup>. It is therefore important for all workers handling pellets to be trained to quickly react and take the appropriate measures in order to contain these spills.



Whilst high environmental, safety and quality management controls are applied throughout the whole plastics supply chain, material loss can occur during any of the following processes:

- **Production and compounding<sup>13</sup>:** Pellet loss can occur in almost all steps of pellet handling during the first stage of the manufacturing process. These steps include: maintenance and repair, plugging/opening of lines, cleaning of production units and silos, or sampling. It can also be caused by accidental spills during the production and compounding process.

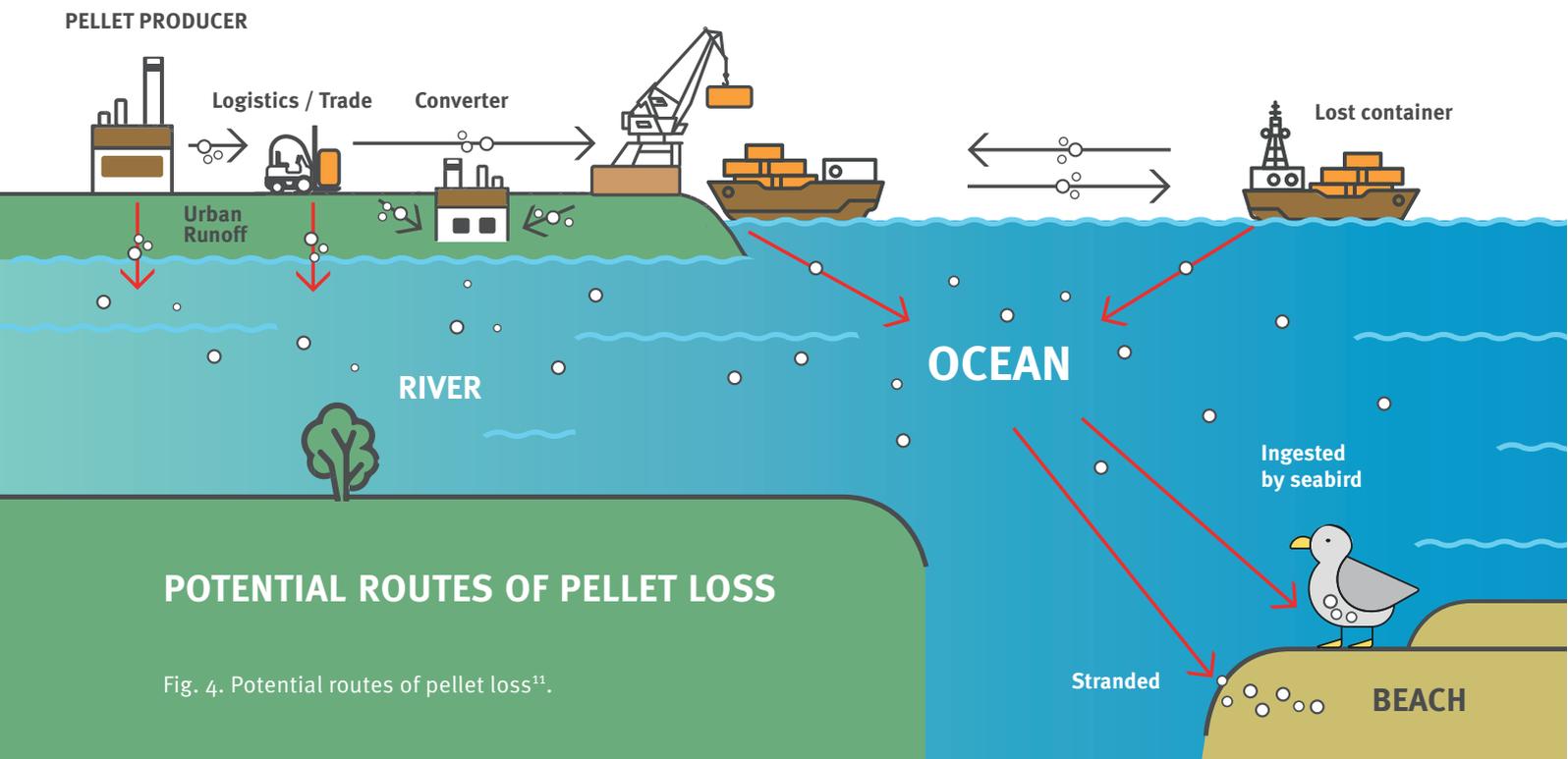
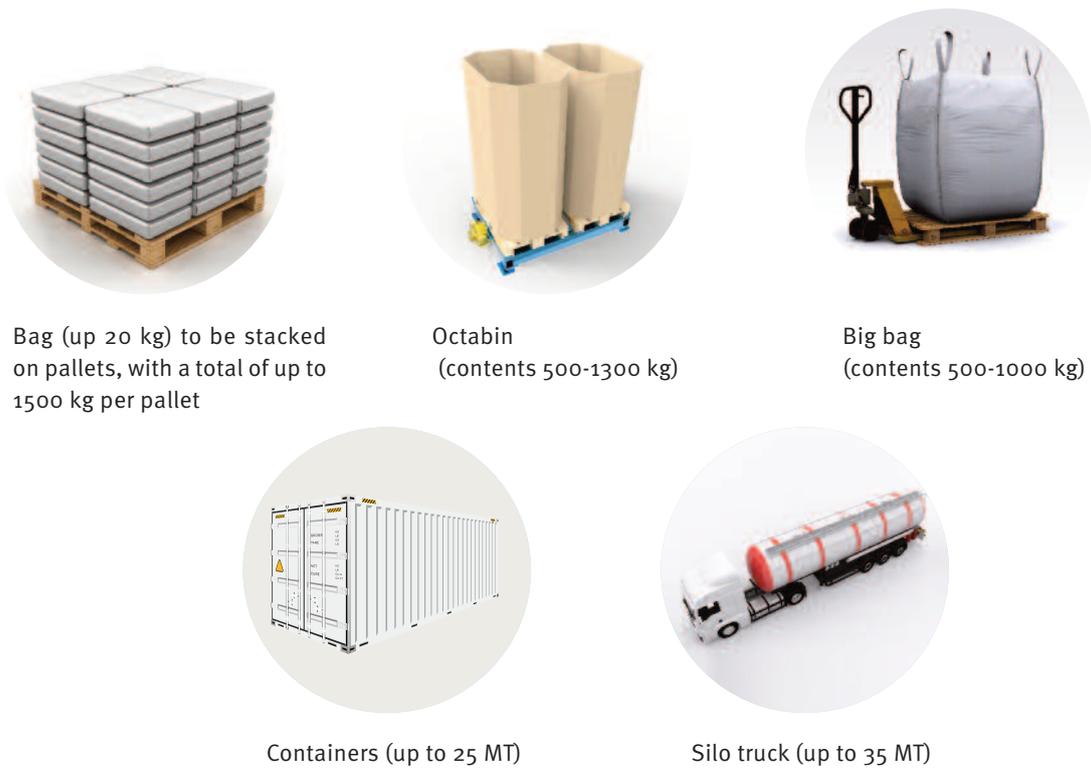


Fig. 4. Potential routes of pellet loss<sup>11</sup>.



Bag (up to 20 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)

Containers (up to 25 MT)

Silo truck (up to 35 MT)

Fig. 5. Packaging used for transportation

- Packaging:** After production, pellets are packaged either for storage or for transportation to plastics converters or other customers e.g. via logistics hubs. The type of packaging must be carefully selected based on customer needs, mode of transport and compliance with safety requirements in accordance with industry norms and standards (e.g. food and healthcare requirements). 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. There are four main types of packaging used: 25 kg bags stacked on pallets, octabins (large carton boxes), “big bags” (large plastic bags), containers or silos (Fig. 5).
  - Transport and logistics:** Pellets can be transported between different actors along the value chain by road, rail, sea or air. Spillages can occur accidentally or due to improper loading and unloading of pellets via various means of handling (suction pipes used for silos, forklifts used for 25 kg and cranes used for “big bags”, octabins or bulk containers). Small quantities of pellets may be spilled onto the top of a silo-truck during loading and unloading. Those pellets may then fall to the ground whilst in transit or be blown off the truck by wind. Furthermore, cargo ship containers that are not properly secured or positioned can fall into the sea during a strong storm.
- If these containers hold bags of pellets, these can enter directly into the ocean. This risk is increased if containers are ruptured during ship collisions or storms.
- Conversion:** Converters<sup>14</sup> receive pellets in either of the packaging types described above. The pellets are fed into heat extruders or injection moulding machines, to be melted and formed into parts, pipes or other finished goods. The pellets are unloaded, stored and later mixed. Where necessary, they are dried and loaded into installations for processing. Pellet loss can take place at any of these stages if care is not taken or accidents occur.
  - Traders and distributors:** Some pellets are not directly sold to converters by the producers. Trading companies and distributors may buy pellets in large quantities and store them in warehouses for re-sale in smaller quantities to converters. Again, spills can occur during the unloading, storage, repackaging and loading of the pellets.
  - Recycling:** During mechanical recycling, most plastics waste is transformed into similar raw materials such as pellets or flakes. Like virgin materials, recyclates are also at risk of spillages as they undergo the same steps of compounding, (re)packaging, transportation and reprocessing into final products.

# 4. Operation Clean Sweep®

The plastics industry is committed to providing solutions to prevent marine litter. In 2011, leaders from plastics associations around the world signed the Declaration of the Global Plastics Associations for Solutions on Marine Litter. At the time of writing, a total of 75 plastics associations, covering 40 countries have signed the Declaration. It sets out clear objectives for industry action and advocates for close cooperation between a broad range of stakeholders in order to make substantial progress in reducing the impact of marine litter on the environment. Since 2011, over 350 projects to combat marine litter have been completed, are under way or are currently being planned<sup>45</sup>.

Plastic pellets containment constitutes the sixth focus area of the Global Declaration. By signing the Declaration, stakeholders within the plastics industry accept their responsibility and commitment towards zero pellet loss.

In 2013, PlasticsEurope created Zero Pellet Loss (ZPL) to engage the value chain further by increasing stakeholder focus on the issue and highlighting pellet containment as a priority. As a voluntary initiative, ZPL aims to increase awareness, promote best practices and provide guidance and tools to support its members in the implementation of the necessary pellet loss prevention measures.

In 2015, to align and concentrate global industry efforts under a common approach, the ZPL initiative was integrated into Operation Clean Sweep – a programme developed in 1990 by the Plastics Industry Association (PLASTICS, formerly SPI) in the USA. Since then, PlasticsEurope has become the main host of the OCS programme in Europe and actively encourages pellet-handling companies (as well as other associations) to commit to the programme and prioritise its implementation across all industrial sites.

## 4.1. The six commitments of OCS in Europe

By signing the European OCS pledge (see Annex II), each pellet-handling company recognises the importance of preventing spillages into the environment and commits to the following six actions:

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

The programme provides recommendations in the form of a manual on how to deliver against each of the six actions. This manual is based on collective learning and aims to support companies achieve excellence in implementing the necessary measures, in accordance with their own specific set-up. Tools such as customisable checklists for both employees and managers to conduct site and equipment audits and OCS promotion materials such as posters, videos and flyers are also available. Additionally, each company can receive an OCS participation certificate upon request<sup>46</sup>. Signed pledges are centrally filed at PlasticsEurope and signatories are officially listed on the OCS website (see the list of PlasticsEurope's members signatories and associations in Chapter 6.1).

## 4.2. Hosting and promotion along the value chain

Associations act as hosts and support their members in two ways:

- by ensuring that relevant companies along the plastics value chain join OCS to improve containment,
- and providing a platform for best practice sharing.

As the main host in Europe, PlasticsEurope focuses on the following actions:

- 1 Promoting OCS and encourage all relevant members to join the initiative
- 2 Supporting the effective implementation of OCS in all member companies
- 3 Measuring progress and make progress transparent
- 4 Recruiting more associations along the value chain to host OCS or similar programmes
- 5 Sharing knowledge and best practices across companies
- 6 Being a point of contact for external stakeholders.

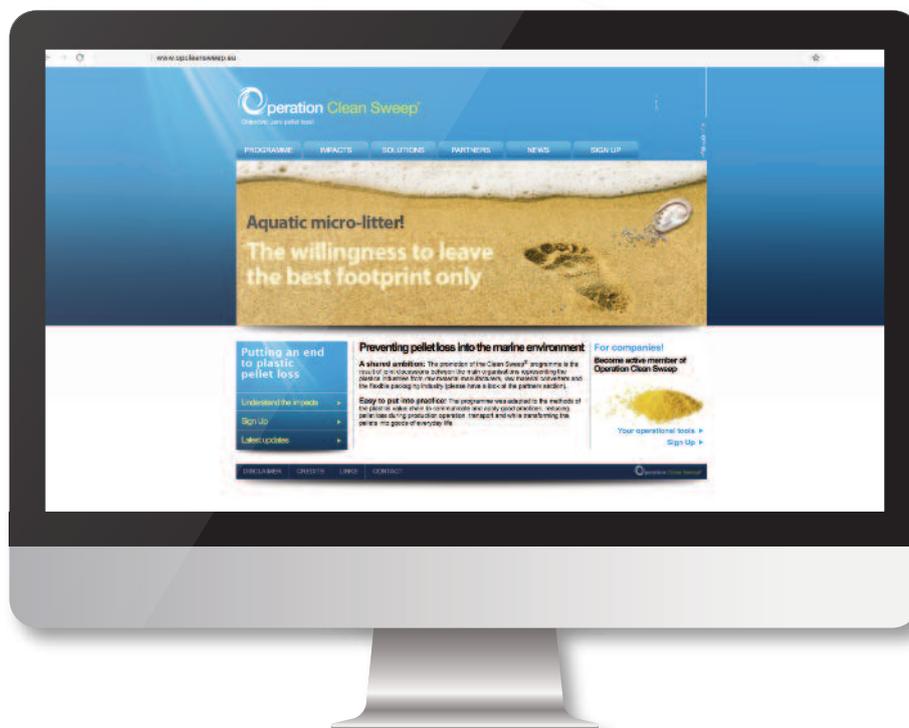
PlasticsEurope has created a dedicated Working Group on Marine Litter Solutions and a Task Force on OCS, made up of several member companies. These groups meet regularly to discuss progress, as well as how to improve the implementation of OCS. They also coordinate activities and participate in sharing best practices among member companies.

Training sessions and workshops have proved instrumental in supporting effective implementation<sup>17</sup>. In November 2018, PlasticsEurope organised an OCS workshop in the Dow premises located in Tarragona. Over the course of the day, the plastics value chain partners in the region of Catalonia gathered to exchange best practices for the OCS programme. Representatives of the Spanish government and the Tarragona port authority also participated in this event, strengthening stakeholder communication and understanding of the OCS programme.

Future events for knowledge exchange and OCS engagement workshops are planned for 2019. National plastics associations will also be involved to keep them updated on latest developments in the programme and encourage organisation of OCS workshops at local level.

In addition, PlasticsEurope has created campaign materials<sup>18</sup> and tool kits, which it regularly updates and improves, to support new OCS signatories in implementing the programme.

[www.opcleansweep.eu](http://www.opcleansweep.eu)



### 4.3 Voluntary commitment on OCS

With its Plastics 2030 Voluntary Commitment, PlasticsEurope has set a series of ambitious targets and initiatives to meet by 2030. A key focus is on preventing leakage of plastics into the environment and improving resource efficiency and the circularity of plastic packaging applications.

To combat marine litter and ensure that all potential pellet leakage points are identified and managed, PlasticsEurope set the following targets for 2018:

- Achieve 100% participation in the OCS programme amongst members to whom OCS is applicable.
- Develop a transparent and harmonised monitoring scheme for the collection of relevant and comparable information from all signed members to measure industry progress.

Progress reports will be published and made available to the EU institutions and key stakeholders annually.

- Engage with at least one other major European port by the end of 2018, following the successful collaboration with the Antwerp port authority in 2017.

PlasticsEurope has also set the following long-term targets:

- Ensure that all major EU industrial pellet-handling ports have taken measures to implement OCS by 2030.
- Expand the work of the platforms with the supply chain and relevant stakeholders both at global, European and national levels with a view to accelerate the implementation of OCS in the plastics value chain<sup>19</sup>.

## Plastics 2030 Voluntary Commitment

The infographic is divided into several sections:

- Overarching goals:**
  - Prevent leakage of plastics into the environment
  - Improve resource efficiency
  - Improve circularity of plastics packaging
- Different plastics for different products:**
  - Building and construction
  - Electronics
  - Lightweight vehicles
  - Energy
  - ALL ORIENTED TO CIRCULAR ECONOMY
  - Packaging
  - Health
- General commitments:**
  - Prevent the leakage of plastics into the environment
  - Prevent littering: Identification and littering prevention solution of more found items into the environment
  - Prevent pellet loss: Operation Clean Sweep®
  - Improve resource efficiency and circularity of plastics
  - Associate research of alternative feedstocks
  - Product Life Cycle Inventory: update of datasets every three years
  - Extension of waste data collection, including new data on circularity of plastics
  - Eco-design guidelines for plastics packaging finalised by 2020
  - Support standardisation for quality standards for sorted plastics
- Global initiatives:**
  - Global Plastics Alliance: Marine Litter Solutions: 260+ projects in 35 countries
  - World Plastics Council: Support of global initiatives and cooperation with UNEP, G7/G20
- Targets:**
  - by increasing engagement inside and outside our industry
  - by accelerating innovation in the full life cycle of products
  - by reaching in 2040 100% reuse, recycling and/or recovery of all plastic packaging in the whole EU
  - in 2030: 60% reuse and recycling of all plastic packaging
- Sector-specific commitments:**
  - PCEP (Plastic Circular Economy Platform):**
    - Define design guidelines for packaging
    - Encourage demand for recycled
    - Drive R&D of new technologies to convert non-mechanically recyclable plastics into feedstocks to produce new materials
    - Improve mechanical recycling
  - Styrenics Circular Solutions:**
    - Develop technologies to recycle PS/EPS back into original applications
    - Collaborate with value chain to improve collection rates to improve collection and sorting systems for packaging waste
    - Create an independent structure to finance promising technologies
  - ecym (European Circular Economy Model):**
    - Develop technologies to recycle PVC back into original applications
    - Develop eco-efficient and cost-effective PVC packaging materials, increasing shelf-life for PVC packaging products
    - Increase safe and quality PVC recycling, and define targets toward 2030 through VinylPlus®
- Reporting:**
  - Monitoring the progress of the voluntary commitment
  - Action plan and time-based performance indicators
  - Yearly evaluation provided by independent committee

# 5. Implementation of preventative measures to pellet spills

Once they have signed the OCS pledge, signatories begin implementing the OCS programme by taking steps prescribed by the pledge.

As each site is unique, there is no “one size fits all” solution and action plans will vary from company to company. This may mean companies putting in place action plans specifically adapted to their different production sites. The implementation of best practices requires innovative solutions developed according to pre-existing conditions. Facilities currently under development are able to incorporate environmental protection measures into their design. The results of the company’s risk assessment and gap analysis will help identify additional measures that might be needed. These can vary depending on local circumstances, company size and plant infrastructure.

This chapter provides a non-exhaustive overview of several good practices and actions undertaken by companies to address pellet spills.

## 5.1. Improve worksite set-up to prevent and address spills

Different types of measures can be implemented by OCS signatories to improve their worksite practices. Reducing the risk of pellet loss during production or handling is the most effective way of preventing pellet spills. However, in some areas it is difficult to completely avoid spills. For example, when pellets are handled manually (e.g. during quality control sampling, maintenance of equipment or during bag cutting operations when changing packaging) or in areas where bags are being transported with forklifts.

In these situations, specially adapted secondary measures can be implemented, such as collector tanks. It is also important to use appropriate cleaning equipment depending on the area of the production site (i.e. inside and outside usage).

Should pellets still enter the site’s waste water system – even after application of preventative measures by OCS signatories – it is crucial to ensure that they are contained and do not end up in the public waste water system or anywhere else in the environment. There are numerous solutions for waste water filtration from small sieves to large filtration installations. None of these are available in standard sizes, so tailor-made solutions are necessary.

### BOX 3

#### Learning

Implementing pellet loss measures requires intensive and continuous daily work. As a preventive programme, the aim is to reach zero pellet emission into the environment. After several years of implementation, the challenge remains to find innovative solutions to deal with unpredictable events, such as extreme weather conditions.

## 5.1.1. Clean worksite

### BEST PRACTICE

Cleaning hand tools on shadow boards



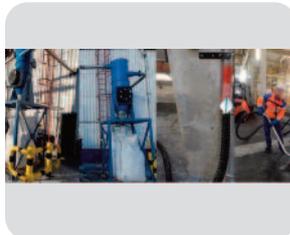
Cleaning tool points with adequate equipment



Vacuum cleaners (internal use)



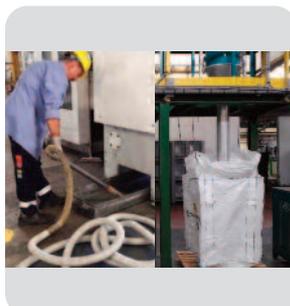
Central vacuum unit



Electric sweeper (internal and external use)



Tray and centralised vacuum system to collect pellets from bag filling areas



### PURPOSE

- Provide adequate tools and in the right areas for removing pellet spills immediately
- Ensure a pellet spill-free workplace

- Provide enough places with the right tools for removing pellet spills
- Enable immediate removal

- Clean up spaces that are difficult to access with a broom

- Allow better and more efficient cleaning by using a vacuum unit to remove powder spillages

Using cleaning machines:

- Improves cleaning operations
- Enables cleaning of indoor paved surfaces in warehouses
- Enables cleaning of pavements

Using a tray to collect pellet loss:

- Helps to avoid spillages onto working surfaces

Using a centralised vacuum system:

- Allows cleaning of the tray
- Allows recovery of pellets in big-bags

## 5.1.2. Preventing spills during production or logistics handling

### BEST PRACTICE

Sealed funnel to fill octabins



### PURPOSE

Implementing spill protection:

- Guarantees zero product loss during the filling of octabins

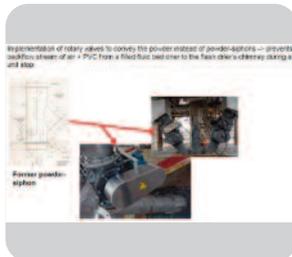
Collector (tank) to capture pellets during sample taking from the pipe system



Using a collector tank:

- Enables prevention of pellets ending up on the ground during sample taking
- Enables collection of lost beads

Rotary valves to convey the powder instead of powder-siphons



Using rotary valves

- Decreases powder losses via chimneys
- Prevent backflow stream of air and powder from a filled fluid bed dryer to the flash dryer's chimney during a unit stop

Lidded containers to carry waste (e.g. swept-up pellets)



- Lidded containers ensure proper disposal (e.g. recycling)

## 5.1.3. Measures for preventing pellet loss during loading and transportation

### BEST PRACTICE

Sealed pipe to load trucks



✓ Pellet spill protection during open truck loading

### PURPOSE

Using a sealed pipe to load trucks:

- Prevents pellet loss during open truck loading procedures

Closed loading system / Hose inserted into containers as they are filled



Prevent pellet spills during the filling of containers:

- Product hose is placed in the container to avoid pellet spill during filling

Use of liner with sleeves when filling containers



- Use of container liner with sleeves at hatch to avoid spill during loading operation

Change from smaller package forms into bulk loading e.g. silos

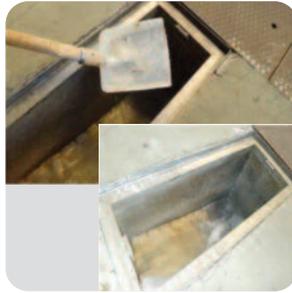


- Encourage customers to change from smaller packaged products (octabins, big bags, etc.) to bulk carriers

## 5.1.4. Pellet retention in water filters, separation and monitoring

### BEST PRACTICE

Installation of settling tanks with strainers



### PURPOSE

Prevent lost pellets from entering the wastewater system:

- Installation of a settling pit with strainer insert
- Pellets can be removed easily and disposed adequately by removing

Sieves in drains



Filtration system on waste water drain:

- Prevent spilled pellets from entering the sewage system

Temporary coverage of drains



- Magnetic installation to prevent lost pellets from entering the wastewater system

Filtrating big-bags when cleaning the units



- During planned cleaning of vessels containing powder, the use of big filtration bags helps containing

Filtration system on waste water sewer



- Continuous rotating screen to separate pellets from the waste water stream and continuous recovery of filtrated particles

Stand-alone pellet filter/sieve



- Collect all (remaining) pellets just before the discharge point

### 5.1.5. Cleaning silo trucks

#### BEST PRACTICE

Plastic bag at the product outlet



#### PURPOSE

- Prevent pellet loss during the cleaning of the containers. All containers are cleaned with dry air before being filled. The plastic bag positioned at the product outlet prevents pellets and other residues from entering the environment.

Blow off installation



- Cleaning station for trucks carrying resin to make sure they leave the industrial site with no pellets stuck

### 5.2. Create and publish internal procedures to achieve zero pellet loss goals

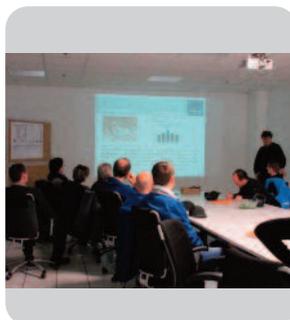
As part of their environmental management systems, sites need to include working procedures and specific instructions for cleaning up after spills. The OCS manual provides guidance and checklists that the signatories can use to review their existing procedures and practices. This can include specific measures for the responsible handling of pellet

spills during daily procedures within the housekeeping plan.

A very effective way to raise awareness within the company is to update a site's Environmental Management System (EMS) to include specific OCS requirements. Another example is sharing relevant OCS good practices and implementation procedures within the Content Management System (e.g. computer network), as well as holding employees accountable (e.g. through KPIs) for preventing pellet spills into the environment.

#### BEST PRACTICE

Workshops



#### PURPOSE

- Raise awareness of responsible pellet handling and disposal methods
- Ensure that pellet spills are addressed appropriately
- Integrate removal of pellet spills into everyday work routines

Awareness and education



- Display OCS posters in the workplace as well as posters with employee testimonials

Site training and incident management system



- Incident management systems and site trainings, with explicit references to OCS for awareness

Video publication



- Show best practice for internal and external audiences

Watch at  [bit.ly/2HnkxNc](https://bit.ly/2HnkxNc)

### 5.3 Auditing performance

To assess the effectiveness and quality of their EMS, each company has a set of audit and inspection rules in place. Some signatories have adjusted their current management systems to adopt specific measures for preventing pellet loss, whilst others have chosen to develop separate OCS assessment and audit schemes. In certain countries and regions (e.g. Germany), OCS is included within the chemical industry's global Responsible Care® (RC) programme. This requires the application of RC management as well as an external third-party assessment and reporting of the full annual RC survey<sup>20</sup>.

### 5.4. Regulatory compliance

To be able to operate, all companies need to ensure compliance with all applicable national and international laws and regulations. Voluntary initiatives such as the RC programme and other

guidelines have led to significant and continuous improvement in the environmental performance of all plastics producing companies in Europe. By updating their EMS and including requirements related to pellet loss, signatories will ensure that OCS becomes a routine practice for facilities in Europe and worldwide.

### 5.5. Encourage partners – engage with the value chain

OCS implementation not only focuses on pellet loss from production sites, but also includes engaging with the value chain i.e. logistics service providers, transportation partners, converters, distributors, recyclers and customers. This involves sharing best practices down the value chain, communication campaigns such as letters and flyers to promote OCS, loading and unloading guidelines for truck drivers and auditing suppliers.



# 6. Achievements in Europe



## 6.1 Number of OCS signatories

By the end of 2018, around 500 companies and associations along the entire plastics value chain in Europe had committed to fighting pellet loss by joining the OCS programme<sup>21</sup> (Fig. 5). The number of OCS signatories has increased significantly since the initiation of the programme in 2015, with

participation more than doubling in 2018 alone. Signatories include 45 PlasticsEurope member companies (Table 1), as well as 26 European plastics and chemicals associations (Table 2). The latest updates on signatories can be found on the OCS website [www.opcleansweep.eu](http://www.opcleansweep.eu).

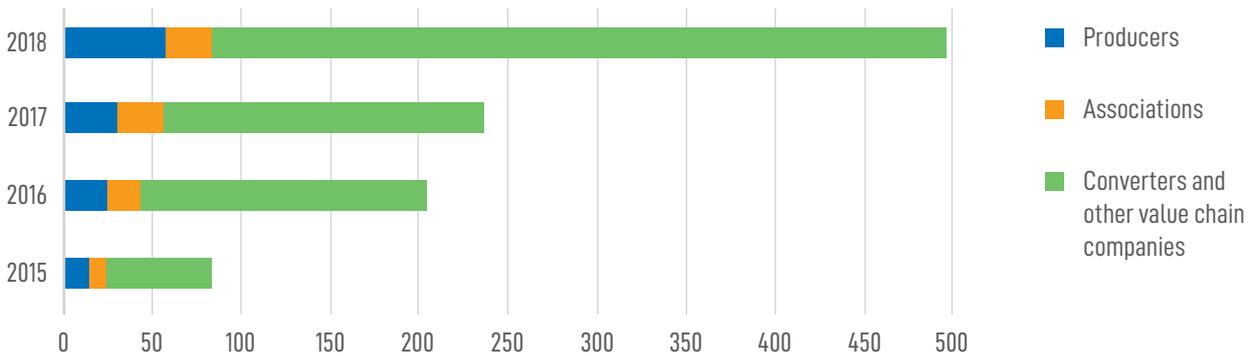


Fig. 5. Number of OCS signatories in Europe from 2015-2018

The Plastics 2030 Voluntary Commitment sets the target to achieve 100% participation in the OCS programme of applicable PlasticsEurope members by the end of 2018. With an increase of 19 new signatories in 2018, PlasticsEurope has thus far achieved a participation rate of 88% (Fig. 6). It is worth noting however, that these signatories represent the vast majority (98%) of PlasticsEurope members' sales. Moreover, out of the 6 remaining companies to sign-up, 2 have already committed to joining the OCS programme. This positive trend confirms plastics manufacturers' commitment to fighting pellet loss.

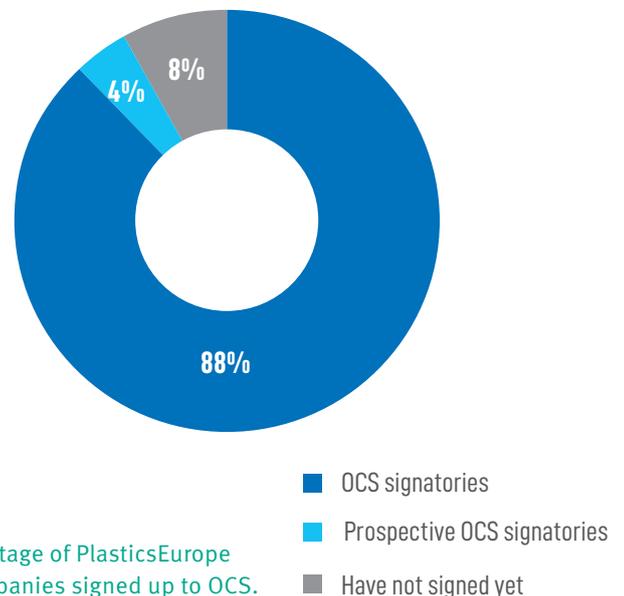


Fig. 6. Percentage of PlasticsEurope member companies signed up to OCS.

Table 1. PlasticsEurope member companies signed up to OCS.

ARKEMA	DYNEON	LANXESS	SYNTHOS
BASELL ORLEN POLYOLEFINS	ELIX POLYMERS	LYONDELLBASELL	TOTAL PETROCHEMICALS
BASF	ERCROS	NOVAMONT	TRINSEO
BEWI STYROCHEM	EVAL EUROPE	RADICI	UNIPOL
BOREALIS	EVONIK	RAVAGO PLASTICS	VERSALIS
BRASKEM	EXXONMOBIL CHEMICAL COMPANY	REPSOL	VESTOLIT
CHEMOURS	GABRIEL TECHNOLOGIE	SABIC EUROPE	VICTREX
CHEVRON PHILLIPS	HUNTSMAN ADVANCED MATERIALS	SHELL CHEMICALS EUROPE	VINNOLIT
COVESTRO	INEOS	SHIN-ETSU PVC	VYNOVA
DAIKIN	INEOS STYROLUTION	SIBUR	
DOW EUROPE	INOVYN	SOLVAY	
DUPONT DE NEMOURS INTERNATIONAL	JACKON	SUNPOR KUNSTSTOFF	

*“With an increase of 19 new signatories in 2018, PlasticsEurope has now achieved a participation rate representing the vast majority (98%) of our members’ production. This demonstrates once more the leading role of plastics manufacturers towards zero pellet loss.”*

**Karl-H. Foerster**

Executive Director of PlasticsEurope

Table 2. Plastics and Chemicals Associations signed up to OCS.

Organisation	Region	Value Chain Position
Albanian Plastics Converters Association (APKA)	AL	Converter
Spanish Association of Plastics Industry (ANAIP)	ES	Converter
British Plastics Federation (BPF)	UK	Producers, Converters, Recyclers & Distributers
Danish Plastics Federation	DK	Producer & Converter
Elipso	FR	Converter
EUMEPS Power Parts	EU	Converter
Fachverband der Chemischen Industrie Österreichs (FCIO)	AT	Chemicals, Plastics Producer & Converter
FEBETRA	BE	Transport
Fédération de la Plasturgie et des Composites	FR	Producer, Converter, Recycler
Association for Chemistry, Plastics and Life Sciences Industries (essenscia)	BE	Chemicals Producer
Finnish Plastics Industries Federation (FIPIF)	FI	Producer & Converter
Go4Circle	BE	Recycler
IK Industrievereinigung Kunststoffverpackungen e.V.	DE	Converter
Innovation and Chemical Industries (IKEM)	SE	Chemicals & Plastics Producer
Italian Chemical Industry Federation (Federchimica)	IT	Chemicals Producer
Italian Plastics and Rubber Processing Machinery and Moulds Manufacturers Association (AMAPLAST)	IT	Converter & Machine Producer
Koninklijk Verbond der Beheerders van Goederenstromen (KVBG) c.v.b.a.	BE	Logistics
Nederlandse Rubber en Kunststofindustrie (NRK)	NL	Producer & Converter
Portuguese Association of Plastics Industry (APIP)	PT	Converter
PlasticsEurope aisbl	EU28, CH, NO, TR	Plastics Producer
Port of Antwerp	BE	All
Pro-K (Industry Association Semi-finished products and Plastic Consumer Products)	DE	Converter
Serbian Plastic Association (JUPLAS)	RS	Converter
The European Plastic Pipes and Fittings Association (TEPPFA)	EU28, CH, NO, TR	Converter
Transport en Logistiek Vlaanderen	BE	Transport
Turkish Plastics Industry Foundation (PAGEV)	TR	Producer & Converter

## 6.2 Progress of OCS implementation

### The OCS questionnaire – Results

Through its Plastics 2030 Voluntary Commitment, PlasticsEurope is committed to developing a transparent and harmonised scheme to monitor industry progress on OCS implementation and report to EU institutions and key stakeholders annually. To fulfil this commitment, the first OCS questionnaire (see Annex I) was created and distributed to all member companies of PlasticsEurope (and their facilities) who had signed the OCS pledge. The questionnaire was reviewed by Flora & Fauna International (NGO) prior to being

sent to signatories and will be revised according to stakeholder feedback in preparation for 2019's monitoring. As this is the first questionnaire of its kind, it will serve as the baseline for reporting progress over the coming years.

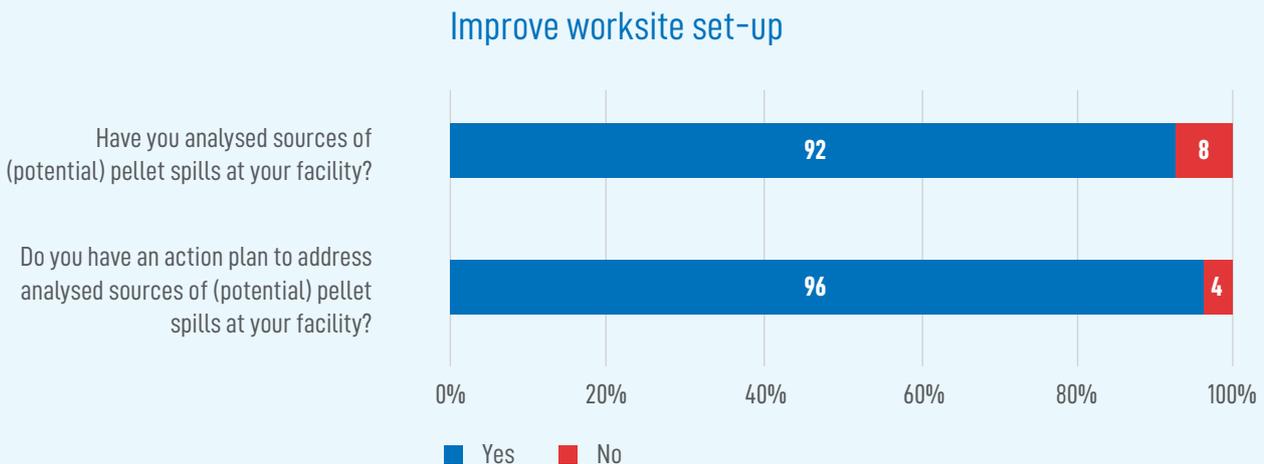
The OCS questionnaire was completed by 100% of PlasticsEurope's member companies that had signed up to OCS at the time it was issued in July 2018. The results are representative of 176 facilities operated by 34 PlasticsEurope member companies with production facilities in Europe where OCS is applicable. These facilities are located in 18 countries across Europe (including sites in Russia and Turkey).

### Improve worksite set-up to prevent and address spills

The OCS questionnaire findings show that the majority of facilities that have committed to the programme have improved their worksite set-up to prevent and/or clean-up pellet spills. More specifically, 92% of the facilities have analysed

their current and/or potential sources of pellet spills and 96% have an action plan in place to address them.

To improve their worksite management, the facilities have put in place several measures and actions adapted to their individual needs and capacities (see chapter 5.1.).

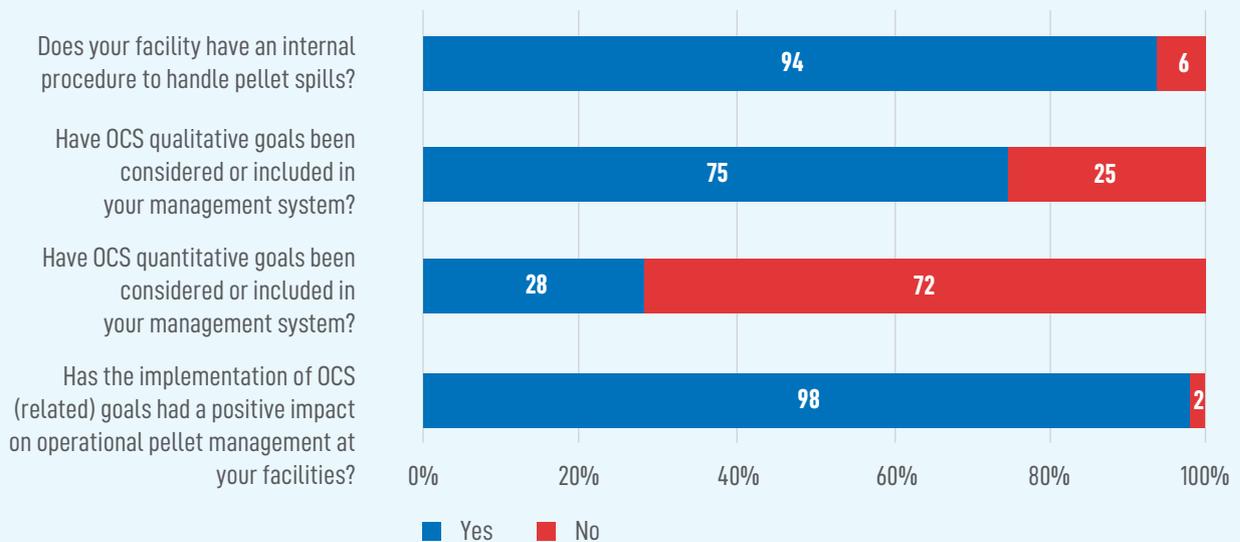


## Internal procedures towards eliminating pellet loss

The results show that 94% of facilities have internal procedures to address pellet spills. Moreover, the majority of facilities (75%) have introduced qualitative pellet loss reduction goals in their management system with 28% adopting quantitative targets. In addition, almost all

facilities (98%)<sup>22</sup> responded that OCS implementation had had a positive impact on operational pellet management. Examples of improved pellet management highlighted by the questionnaire include support from top management, increased employee awareness and improved procedures such as faster response to pellet spills and shorter cleaning intervals.

### Internal procedures

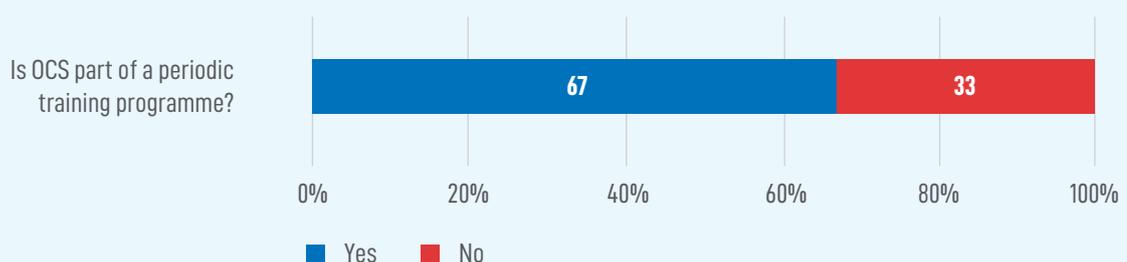


## Employee training and accountability

Two thirds of the facilities (67%) include OCS as part of a periodic training programme to raise employee awareness of pellet containment and preventing and handling spills. According to respondents, periodic trainings can range from monthly to biannually, or take place on demand.

Most facilities have put an annual programme in place. The training can be dedicated solely to OCS, or OCS can be integrated into a more general training (e.g. environmental, health & safety or waste management). Among the facilities that conduct periodic training sessions, the majority reported that 100% of employees take part.

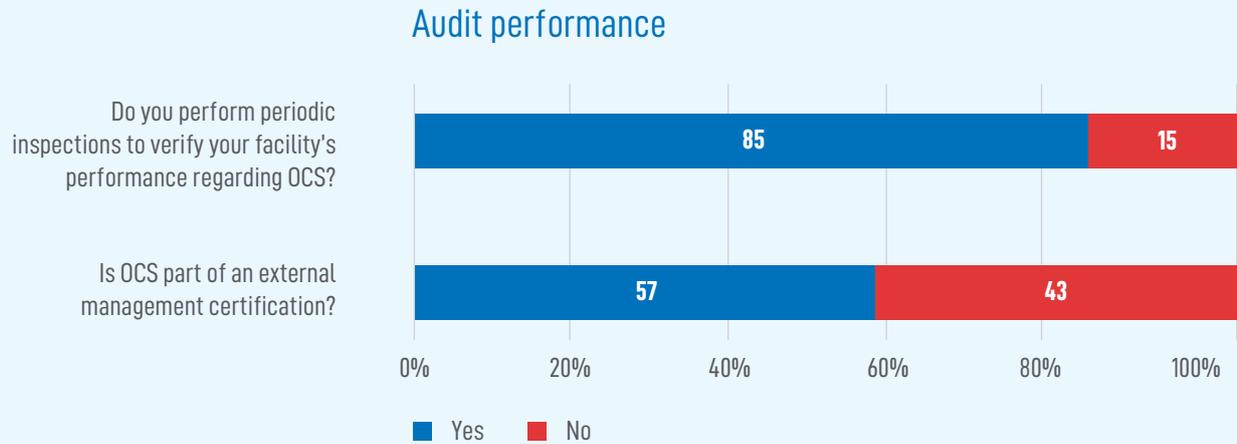
### Employee training and accountability



## Audit performance

For most facilities, OCS forms part of an internal and/or external audit. 85% of facilities perform periodic inspections to verify their performance in

relation to OCS. Furthermore, for 57% of facilities surveyed, OCS is part of an external management certification scheme such as ISO 14001, ISO 9001 and EMAS.



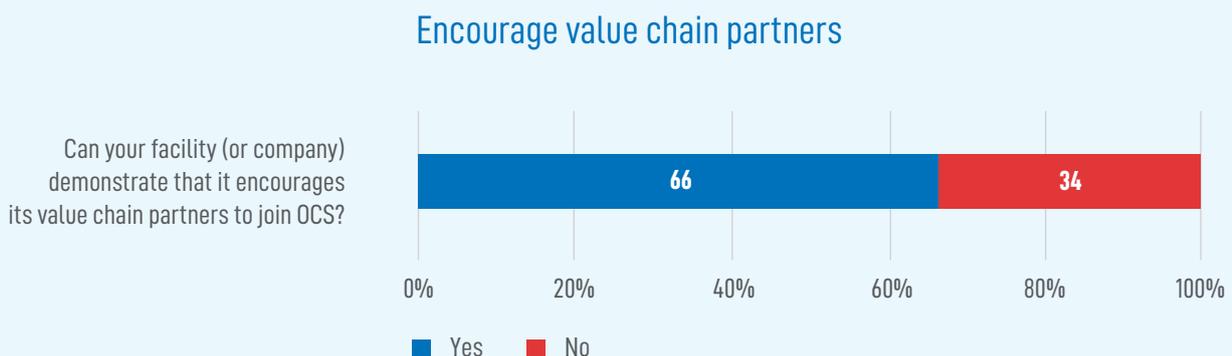
## Compliance with applicable national or local regulations<sup>23</sup>

In Europe there are no national or local regulations that specifically address pellet containment and loss. At the EU level, the Industrial Emissions Directive (2010/75/EU) makes no reference to plastic pellets. And neither local nor national

regulatory authorities in Europe currently require facilities to report data specific to pellet containment and loss (e.g. volume or weight of pellets). Nonetheless, most facilities have a process in place to verify their compliance with existing local and national regulations, even if they are not pellet specific.

## Encourage value chain partners to join OCS

Two thirds of facilities surveyed (66%) can point to active engagement in encouraging their value chain partners to join OCS.



## Conclusions

The OCS questionnaire is the first step of the annual monitoring programme used to evaluate the progress of PlasticsEurope's member companies towards achieving zero pellet loss. The results show that most of the facilities which have committed to OCS have improved their performance in pellet containment. Most of the facilities have implemented measures and actions to prevent pellet spills into the environment, as well as developed programmes to educate their employees and raise awareness along their value chain. The majority have also adopted internal procedures to prevent and address pellet spills, as well as included qualitative goals around pellet loss in their management system. Two thirds of facilities provide periodic training to their employees and actively encourage value chain partners to join OCS.

Overall, the plastics industry has made substantial progress in implementing the OCS programme.

However, applying effective pellet containment measures requires ongoing efforts and enhanced collaboration among all partners along the value chain.

### BOX 4

#### Towards an harmonised methodology

Due to the lack of recognised scientific methods for measuring pellet loss, it is difficult for companies to establish quantitative goals and measurements in their management systems. For this reason, most companies use qualitative goals to assess pellet containment. Developing an harmonised methodology for the quantitative measurement of pellet loss is a challenging task that the industry is considering for the future.

## 6.3 Port initiatives



PlasticsEurope and other OCS hosts have launched a number of initiatives to improve pellet containment

in major European ports that act as hubs for the transportation of polymers. The first successful initiative started in 2017, when the Port of Antwerp (PoA) in Belgium committed to OCS<sup>24</sup>.

Covering an area of 12,068 hectares, the PoA is the leading polymer hub in Europe, with millions of plastic pellets produced, handled and transported through the area every year. In October 2017, the entire plastics value chain joined forces under one common goal: prevent pellet loss. The PoA authority, PlasticsEurope, essenscia (the Belgian Federation for Chemistry and Life Sciences Industries) and Voka (The Flemish Chamber of Commerce and Industry) came together to sign a commitment to implement a common approach to pellet containment with the help of the OCS programme.

Although some companies within the PoA had already signed the OCS pledge, this collaboration united the entire value chain. Along with the six commitments to OCS that every company agreed to upon signing, the plastics industry agreed to support the PoA authority in screening the port and establishing a monitoring programme for pellet accumulation hotspots. Several litter clean-ups have also been organised by the plastics industry in different locations across the port, with more due to follow. With very encouraging initial results, the PoA has set a great example for other major European ports.



More recently, thanks to the support of the British Plastics Federation (BPF),

Teesport became the first UK port to take action against pellet loss, when its operator PD Ports signed the OCS pledge in September 2018. Teesport is one of the major transport and logistics hubs in Northeast of the UK<sup>25</sup>. Elsewhere in Europe, discussions with the Port of Tarragona in Spain have begun and PlasticsEurope is looking to engage with several other ports in 2019.

# 7. PlasticsEurope engagement with stakeholders

## 7.1 Value chain involvement

The potential for the OCS programme to increase its impact lies in its ability to reach and involve the whole plastic value chain. In this context, PlasticsEurope has been working with various associations representing companies from different sectors within the plastics sector at both national and European level.

### Safety & Quality Assessment for Sustainability (SQAS)<sup>26</sup>

A successful collaboration has been established with Cefic (European Chemical Industry Council) and the revamp of its SQAS in 2018. This system undertakes “uniform third-party assessments to evaluate the performance of Logistics Service Providers and Chemical Distributors”. SQAS reports allow chemical companies to evaluate their logistics service providers according to their own standards and requirements. Since it provides a detailed factual assessment report on environmental issues, both Cefic and PlasticsEurope have taken the opportunity to include questions on pellet containment. The new version of SQAS was launched in January 2019. This helps raise awareness amongst logistics service providers about pellet loss and potential solutions.

## 7.2. Examples from the regions

### Western region:

- In **the Netherlands**, a meeting was held with the Port of Rotterdam authorities in May 2018 to identify sources of pellet loss in the area and potential actions to combat them.

- In **France**, awareness raising activities along the value chain of the OCS programme were carried out by ELIPSO (the French packaging association). OCS was presented to member companies in a seminar (January 2018), as well as during their General Assembly in March 2018.
- In **Belgium**, PlasticsEurope is continuing to raise awareness of value chain organisations and companies, such as converters and recyclers. A seminar for Small and Medium Enterprises (SMEs) in logistics was also held in November 2018.

### Central region:

- In **Poland**, two training sessions on marine litter and OCS took place in March and November 2018 for Basell Orlen Polyolefins staff, following two introductory workshops carried out in 2017. PlasticsEurope Polska also organised an introductory training on the importance of OCS in tackling plastic pollution and on the practicalities of its implementation for Synthos, a new signatory of the OCS pledge. Information meetings for the Polish Styrofoam Producers Association were also held to discuss OCS, with the latter expressing its interest in joining the programme.
- In **Germany**, PlasticsEurope Deutschland has established in cooperation with VCI, Verband der Chemischen Industrie, the Responsible Care practice project “zero pellet loss” since 2013. The procedure underlies an annual reporting as well as Third Party auditing of VCI’s Responsible Care®. This practice project concretises OCS in Germany towards the pellet producers at the same sites of chemical industry by applying the



management of Responsible Care®. In this way, the measures of the OCS pledge are completely included and implemented. Recently, the German processors and converters of packaging and of consumer goods have successfully established their voluntary initiatives to achieve zero pellet loss.

- In **Austria**, plastics producers and converters have decided to implement OCS by integrating it into the Austrian Responsible Care® programme.

A joint “pact” between the Austrian plastics industry and the Ministry of Environment on behalf of the Austrian Government has been signed in 2015. The pact has been supplemented by an evaluation programme performed by the Austrian Umweltbundesamt (EAA – Environment Agency Austria). On this basis, more than 90% of the Austrian plastics consumption are covered by the pact, today. The current Federal minister of sustainability, Elisabeth Köstinger, who facilitates the 2018 Austrian Presidency of the EU Council with regards to environmental protection, is well aware of the pact and regularly quotes it as a best practice example from our industry.

### Iberian region:

- In **Spain**, several actions to identify the routes through which microplastics enter freshwater took place in 2018. For example, PlasticsEurope collaborated with the NGO Paisaje Limpio on a

project to identify sources of litter in rivers, with local action taking place in the Henares river where pellets are often found. In addition, a meeting with the Association of the Chemical Industry of Tarragona was held in February 2018 to promote OCS and discuss the potential involvement of the Port of Tarragona in the programme.

A dialogue is also currently ongoing with the Spanish Ministry of Ecological Transition to provide updates on OCS implementation and share knowledge of microplastics sources in the region. A team from PlasticsEurope Iberia participated for the third time in the CONAMA Congress (the biggest environmental congress held in Spain every two years) with an information stand and a presentation outlining OCS as a tool to tackle marine litter. In November, a workshop on marine litter was organised in Tarragona with participants from the whole value chain - producers, converters, logistic operators - and Port authorities.



Participants in the OCS workshop in Tarragona (November 2018).

- In **Portugal**, a meeting took place with the new manager of APIP (Portuguese Plastics Converters Association) to discuss the OCS programme and potential participation.

### Northern region:

In the Northern region, PlasticsEurope has been supporting the implementation of OCS in collaboration with the British Plastics Federation (BPF), Finish Plastics Industries Federation (FIPIF), Innovation and Chemical Industries in Sweden (IKEM), Estonian Plastics Association (EPA) and Danish Plastics Federation. This has produced encouraging results, as many local companies have now signed up. Highlights include:

- EPA in **Estonia** committing to OCS as a new supporting member;
- The initiation of a dialogue with logistic partners in **Finland**;
- Interest from retailers in the **UK** to promote OCS in their value chain;
- The UK recently receiving its 100<sup>th</sup> OCS pledge.

In February 2018, a workshop on OCS best practices was organised in the UK by BPF with 26 members attending. A session on best practices as part of a broader event on marine litter took also place in February, with representatives from leading retailers and brands, policy advisors and company managers within the plastics value chain in attendance.

### Mediterranean region:

The OCS programme is included on the agenda of Mediterranean Advisory Board meetings. The programme was presented in Milan in May 2018, and later in October in Athens. In Milan, the meeting was attended by representatives from plastics producers and converters from several Mediterranean countries (e.g. Albania, Bosnia-Herzegovina, Bulgaria, Croatia, Greece, Romania, Serbia), as well as COREPLA, the Italian National Consortium for the Collection and Recycling of Plastic packages. OCS was also presented at several other events organised by PlasticsEurope Italia, COREPLA and Federchimica, the Italian Federation of the Chemical Industry, which were attended by several member companies.

## 7.3. NGOs, policy makers and academia

In addition to engaging with value chain partners, dialogue with stakeholders such as NGOs, policy makers, academia and the general public is essential to develop a broader understanding of concerns, needs and expectations relating to marine litter and pellet loss prevention, and to be able to discuss challenges and potential solutions. In particular, the complexity of marine litter solutions and pellet loss prevention requires informed decision-making and collaborative efforts involving many parties and perspectives. Presentations made during conferences or meetings have proven to be a very effective way of raising awareness of the pellet loss issue for many stakeholders.

PolyTalk<sup>®</sup> was created by PlasticsEurope as a forum to share knowledge, engage with various stakeholders, discuss key issues, identify common goals and opportunities, and mobilise actors. In 2018, PolyTalk<sup>®</sup> was held in Malta and focused on the theme: “Together we must save our oceans from litter”. The event attracted over 190 participants from international organisations, public bodies, such as the European Commission, Federal Ministries and Authorities, NGOs, the plastics industry and academia. Pellet loss and the OCS initiative was a central topic during the session “Preventing Plastics Litter in the Environment – a Value Chain Effort”. The OCS programme was presented, with plastic pellet loss highlighted as a widespread issue in coastal Europe. Specific actions taken by member companies were showcased to encourage sharing of best practices. More generally, ways to ensure the effectiveness of the OCS programme and achieve effective pellet management along the entire plastics value chain were discussed.

PlasticsEurope also engages with environmental protection organisations. Together with the British Plastics Federation (BPF), PlasticsEurope 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 preventative measures on their agenda. The meetings provided local insights, enhanced collaboration for pellet loss prevention and resulted in the promotion of Operation Clean Sweep<sup>®</sup> on the Great Nurdle Hunt website since 2012.

In the last two years, PlasticsEurope has provided its input for several reports from consulting agencies (for example MEPEX and Eunomia), commissioned by Austria, Norway, Germany, UK, the Netherlands, Spain and France. The intention was to provide an evidence base for authorities to assist them in their efforts to understand better the issue and consider potential solutions and policies.

PlasticsEurope also has an observer status within the OSPAR Commission. OSPAR recently drafted a background document on pellet loss to understand the issue better with a view to developing solutions<sup>27</sup>. Similar activities are being carried out

by HELCOM and other Regional Seas Conventions. PlasticsEurope has contributed to this work through the organisation of site visits for OSPAR members to industrial facilities. The site visits provided practical information to Member State representatives on how pellets are produced, handled and transported, as well as insights into how accidental pellet spills might occur and how they can be prevented.

Interacting with stakeholders through social media channels such as Twitter or LinkedIn provide additional value and enables PlasticsEurope to monitor, identify and highlight pellet loss findings.

# PolyTalk® 2018



# 8. Outlook

2018 has been a milestone year for the plastics industry, with the adoption of the European Commission's Strategy for Plastics and "Plastics 2030", PlasticsEurope's Voluntary Commitment.

This voluntary commitment contains a set of targets and initiatives focusing on the prevention of plastics leakage into the environment and raises the bar even higher in terms of what needs to be achieved to ensure a cleaner, more sustainable future.

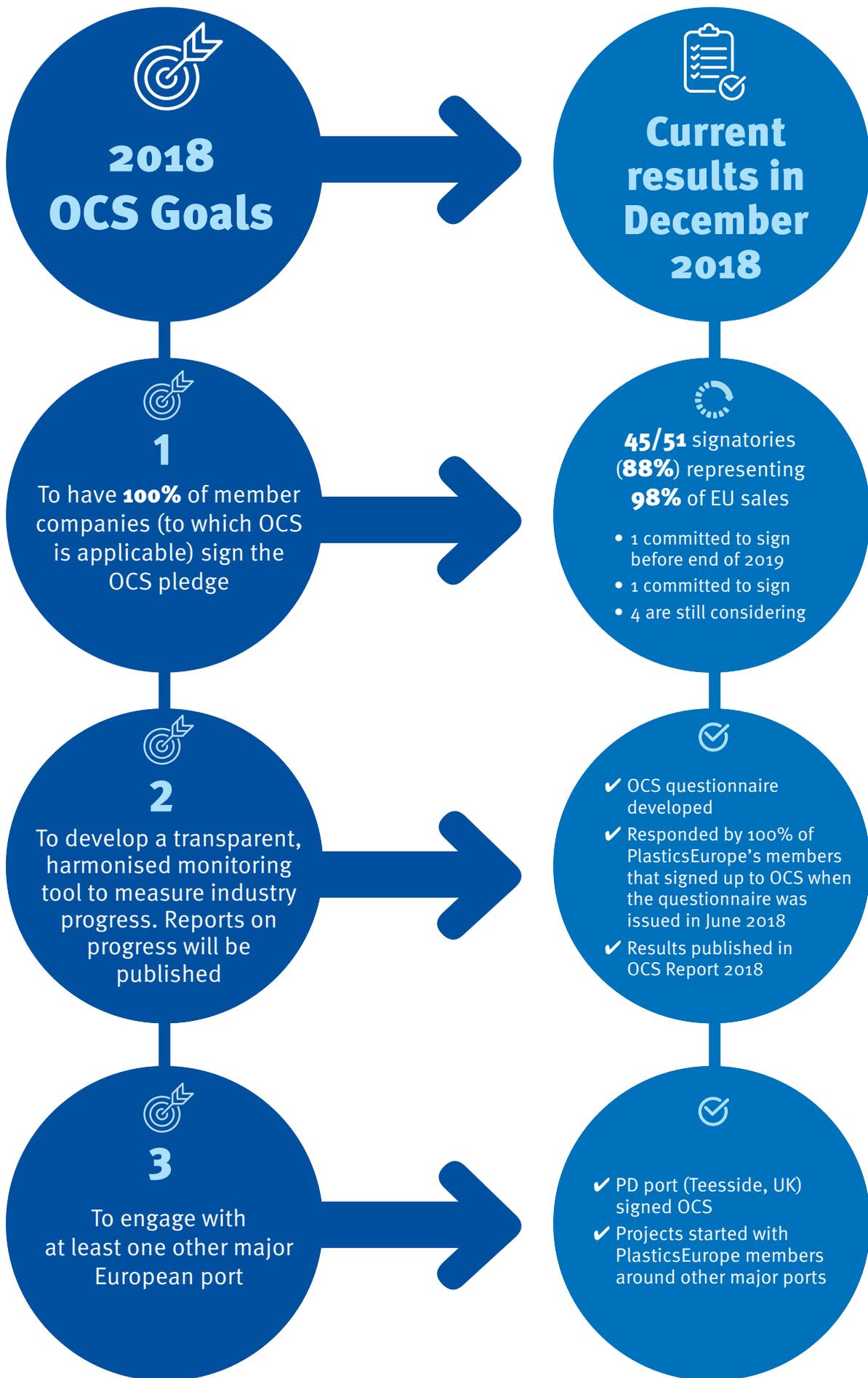
In this spirit, PlasticsEurope has decided to recognise the OCS programme as one of the top priorities for plastics manufacturers.

Now that we have almost achieved our target of having every PlasticsEurope member signed up to OCS, we must further our efforts on implementation. 2019 will be a crucial year in this process. We will:

- Develop and disseminate the right tools to support companies in furthering implementation of the programme, such as a best practices catalogue.
- Develop a common assessment tool, together with our members and national partners, allowing them to identify the most effective ways to improve pellet containment.
- Initiate the development of an OCS certification scheme, which will apply to all plastics manufacturers, without creating substantial additional burdens.
- Update and improve the 2018 OCS questionnaire for better external progress reporting by plastics manufacturers.
- Continue our work in developing stakeholder engagement with major industrial pellet handling ports and clusters, such as in Antwerp and Teesside. In this regard, each of PlasticsEurope's regional centres will identify and engage with at least one industrial pellet handling cluster by the end of 2019.
- Raise awareness of pellet loss through developing the role of multi-stakeholder platforms within the supply chain with a view to accelerating the implementation of OCS. In addition, we will strengthen collaboration with all other association signatories from the plastics value chain to help them raise awareness of the programme and support their members.

Operation Clean Sweep® achieved numerous goals in 2018, and with many more targets set for the coming years, PlasticsEurope confirms its strong commitment towards a zero pellet environment.





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## Endnotes and sources

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8. See <https://www.nurdlehunt.org.uk/>
9. Over 1500 searches have been added to the map to date. The map also includes contributions from surveys of other European organisations, such as Legambiente (Italy) and hotspots from a national survey in France (SOS mal de Seine). Each survey adopts differing methodologies, with colours representing low (yellow), medium (orange) and high (red) levels of pollution.
10. "Pellet" is defined according to the ISO 472:2013 (Plastics – Vocabulary) 2.684 as "a small mass of preformed moulding material, having relatively uniform dimensions in a given lot, often used as feedstock in moulding and extrusion operations". Pellets are often referred to colloquially as nurdles.
11. Based on a graphic by International Pellet Watch (see <http://www.tuat.ac.jp/~gaia/ipw/en/what.html>).
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  - 1) Gall, S. C., & Thompson, R. C. (2015). The impact of debris on marine life. *Marine pollution bulletin*, 92(1-2), 170-179.
  - 2) GESAMP. (2015). *Sources, fate and effects of microplastics in the marine environment: a global assessment* (Kershaw, P. J., ed.). (IMO/FAO/UNESCO-IOC/UNIDO/WMO/IAEA/UN/UNEP/UNDP Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection). Rep. Stud. GESAMP No. 90, 96 p.
  - 3) Anbumani, S., & Kakkar, P. (2018). Ecotoxicological effects of microplastics on biota: a review. *Environmental Science and Pollution Research*, 1-24.
13. Compounding is a further step in which pellets get replastified, mixed with other materials or additives and cut into pellets again. This is done to create particular properties such as strength, UV resistance and colour.
14. Converter is a term often used to describe companies which convert pellets into final plastic parts.
15. The most recent progress report provides an update on projects carried out under the Declaration and can be downloaded from [www.marinelittersolutions.com](http://www.marinelittersolutions.com).
16. The OCS pledge, as well as the manual and tools can be downloaded from [www.opcleansweep.eu](http://www.opcleansweep.eu).
17. Please also see Chapter 8.2 "Examples from the regions" of this report.
18. A welcome pack is in preparation, consisting of communication and promotional materials for new OCS signatories.
19. This platform will be a multi-stakeholder group that seeks to increase interaction among stakeholders and identify barriers and opportunities towards a common goal.
20. The 2017 VCI Responsible Care report® is available (in German) here: [www.vci.de](http://www.vci.de)
21. Companies can sign up to OCS either at corporate level or individually per site/facility. This lack of consistency influences the number of signatories and one OCS signatory (pledge) might cover one or several sites/facilities.
22. The question was optional and due to late inclusion in the questionnaire it was not distributed to all the facilities. The question was answered by 86 facilities.
23. The questions regarding compliance with national and local regulations were misinterpreted by some responders. Due to this fact, the results are presented qualitatively.
24. For more information on the OCS Port of Antwerp initiative, please read the report: [https://www.plasticseurope.org/application/files/1715/1712/4879/ocs\\_report2017\\_antwerpen.pdf](https://www.plasticseurope.org/application/files/1715/1712/4879/ocs_report2017_antwerpen.pdf)
25. More information about the PD Teesport commitment to OCS can be found here: <http://www.pdports.co.uk/en/corporate/news-events/news-articles/Dates/2018/9/PD-Ports-becomes-the-first-UK-port-operator-to-commit-to-preventing-plastic-pellets-from-leaking-into-the-sea/>
26. SQAS is a key element of Responsible Care® in logistics operations. SQAS reports are used to support the dialogue between chemical companies and their Logistics Service Providers (LSPs) as part of a continuous improvement process. For more information, visit the SQAS website: <https://www.sqas.org>
27. OSPAR Commission. (2018). OSPAR Background document on pre-production Plastic Pellets. Retrieved from: <https://www.ospar.org/documents?v=39764>.

# Annex I: PlasticsEurope OCS questionnaire

## Questionnaire for sites/facilities Name/Location/Country

Please answer "1" in the relevant column (see example in o.a)		Yes	No
<b>0 Pledge Signatory and Responsibility</b>			
<b>0.a</b>	Are you aware of the responsibilities and commitments set in the OCS pledge for your company/facility? <i>Explanation: OCS in this questionnaire is referring to the "Operation Clean Sweep" pledge of PlasticsEurope and/or alike programs that might have a different name (e.g. Zero Pellet Loss...).</i>		
<b>1 Improve our worksite(s) set-up to prevent spills</b>			
<b>1.a</b>	Have you analysed sources / spots of (potential) pellet spills at your facility?		
<b>1.b</b>	Do you have an action plan to address analysed sources / spots of (potential) pellet spills at your facility? <i>Explanation: This action plan should follow SMART principles. Measures of the action plan include physical pellet containment (process integrated measures and/or end of pipe techniques), managerial level, trainings/awareness...</i>		
<b>1.c</b>	List one or more examples of measures and/or actions that have been implemented at your facility <i>Open space for examples</i>		
<b>2 Have in place internal procedures towards "Zero Pellet Loss" goals</b>			
<b>2.a</b>	Does your facility have an internal procedure to handle pellet spills? <i>Explanation: It does not have to be an OCS dedicated procedure but can be embedded into existing management system procedures.</i>		
<b>2.b</b>	Has OCS / "Zero Pellet Loss" (related) goals been considered or included in your management system?		
	Qualitative goals		
	Quantitative goals		
<b>2.c</b>	Has the implementation of OCS/"Zero Pellet Loss" (related) goals had a positive impact on operational pellet management at your facilities?		
<b>2d</b>	Please provide details (e.g. support from top management, increased employee awareness, improved handling of pellets on and around the site, faster response times to mitigate any spills)		
<b>3 Provide employee training and accountability for spill prevention, containment, clean-up and disposal</b>			
<b>3.a</b>	Is OCS part of a periodic training programme?		
<b>3.b</b>	Please give details on frequency of training programmes and percentage of relevant employees receiving this training Frequency: % of employees receiving training:		
<b>4 Audit our performance regularly</b>			
<b>4.a</b>	Does your facility perform periodic inspections to verify your performance regarding OCS? <i>Explanation: Such inspection and walkthrough may be part of internal or external audit(s), self-assessment or supervisor walkthroughs.</i>		
	<i>Open space for comments</i>		
<b>4.b</b>	Is OCS part of external management certification (e.g. ISO14001, EMAS, ...)? <i>Explanation: External Management Certification could per example be achieved by identifying OCS as a "compliance obligation" as part of ISO certifiable management systems.</i>		
<b>5 Comply with all applicable local and national regulations governing pellet containment</b>			
<b>5.a</b>	Do you maintain an updated list of applicable local and national regulations governing pellet containment and loss? <i>Explanation: applicable local and national regulations governing pellet containment and loss can be specific (e.g. Volumes or weight of pellets) or more generic (e.g. Total Organic Carbon (TOC)/Total Suspended Solids (TSS), dust emission, ...).</i>		
<b>5.b</b>	Does your facility have a process to verify compliance with local and national regulations governing pellet containment and loss?		
<b>5.c</b>	Do the facility's local or national regulatory authorities require reporting of data specifically related to pellet containment and loss (e.g. Volumes or weight of pellets)?		
<b>6 Encourage our partners (contractors, transporters, distributors, etc.) to join the programme as well?</b>			
<b>6.a</b>	Can your facility (or company) demonstrate that it encourages its value chain partners (e.g. contractors, transporters, distributors, etc.) to join the OCS programme? <i>Explanation: There are different ways to encourage your value chain partners: via letters, mails, agenda point in meetings, part of supplier audits, talks and dialogue with truck drivers, customers and other companies when they are at your facility.</i>		
	<i>Open space for comments</i>		



# Annex II: OCS Pledge



## Company Pledge to Prevent Resin Pellet, Flake and Powder 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 Clean Sweep® is trademarked by PLASTICS Industry Association

### Company Pledge to Prevent Resin Pellet, Flake and Powder Loss

**Company/Association:**

Producer    Converter    Logistic    Recycler

Other:

Name:

Address:

City:

Postal Code:

Country:

**All sites covered by this pledge - Site name & country/region:**

**OCS Accountable Person ( for correspondence):**

**Company Representative (signing the pledge):**

Name:

Name:

Title:

Title:

Email:

Email:

Phone:

Does your company belong to any association/federation which has signed OCS?    Yes    No

If so, please specify:

I would like the name of my company to be published on the Operation Clean Sweep® (EU) website and agree to be used in specific, Operation Clean Sweep® related, PlasticsEurope communications: As soon as possible.	After 6 months from signing the pledge.
---	---

Company stamp:

Name:

Date:

Signature:



To join the OCS programme, please fill in the pledge on the back of this page, sign it and send it to:

 [info@plasticseurope.org](mailto:info@plasticseurope.org)

Or by post to:



An aerial photograph showing the edge of a sandy beach where turquoise ocean waves are washing onto the shore. The water is clear and bubbly with white foam. The sand is a light tan color.

***Let's work together  
towards Zero Pellets Loss!***





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