An Initiative of the German Federal Ministry of Education and Research

Plastics in the Environment

sources • sinks • solutions

Industrial plastic pellet loss

Measures to prevent inputs into the environment are necessary

Plastic pellets in front of a factory site: They are released into the environment via storm drains and contaminate it.

Photo: © FiW

In 2019, 14 million tons[1] of plastics were processed by over 7,000 companies[2] in Germany. Companies use so-called pellets or granules of plastic as raw materials for this purpose. In 2019, 12 million tons[3] of these were produced in Germany.

Notwithstanding voluntary efforts by the industry, **15,000 tons of pellets**[1] are released into the environment in Germany every year.

This is why effective measures against environmental pollution caused by plastic pellets are needed.

„Environmental pollution caused by plastic pellets is a problem that requires effective legal regulation."

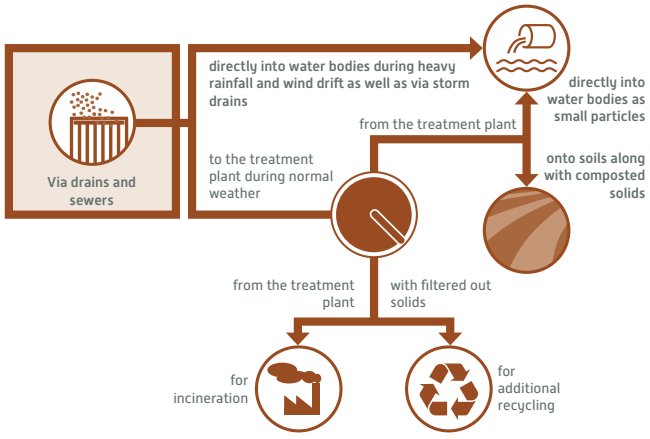
Dr.-Ing. Marco Breitbarth, University of Kassel

Plastic pellets as a source of plastic inputs into the environment

Manufacturers of plastic pellets either sell directly or through distributors to companies that process the pellets into plastic products[2]. During production, processing, transport, storage, waste disposal and recycling, pellets may be released directly into the environment or enter wastewater via drains on roads and factory premises. Causes are, among others, transport accidents, packaging damages or inadequate protective equipment and/or a lack of wastewater processing in the factories and negligence in the handling of the pellets.

The path of plastic pellets into the environment via wastewater

When pellets enter wastewater via drains, they are either flushed directly into bodies of water or into sewage treatment plants. In the Aachen wastewater treatment plant alone, this amounts to **5.5 million plastic pellets** per year. A limited amount of pellets can enter water bodies from the wastewater treatment plants via the effluent. The highest inputs to water bodies occur with the spreading of sewage sludge on fields and directly



Pellets in wastewater can enter water and soil through several pathways.

Graphic: © Maria Daskalakis/pixabay.com

1 References: https://www.vci.de/ergaenzende-downloads/kurzfassung-stoffstrombild-kunststoffe-2019.pdf
2 References: https://issuu.com/plasticseuropeebook/docs/2019_geschaeftsbericht_plasticseurope_deutschland (unter Bezugnahme auf Destatis)
3 References: https://www.umsicht.fraunhofer.de/content/dam/umsicht/de/dokumente/publikationen/2018/kunststoffe-id-umwelt-konsortialstudie-mikroplastik.pdf

Research on the prevention of plastics entering wastewater

The interdisciplinary project „Environmental Policy Instruments to Reduce Plastic Pollution of Inland Waters via Drainage Systems“ examines and classifies the occurrence of plastic pieces of at least 1 mm in size in wastewater treatment plants and street drainage systems in the municipalities of Aachen, Roetgen, Simmerath and Stollberg. Surveys and a laboratory experiment support the analyses. Based on these findings, proposals for environmental policy instruments to prevent these plastic waste inputs are being developed.

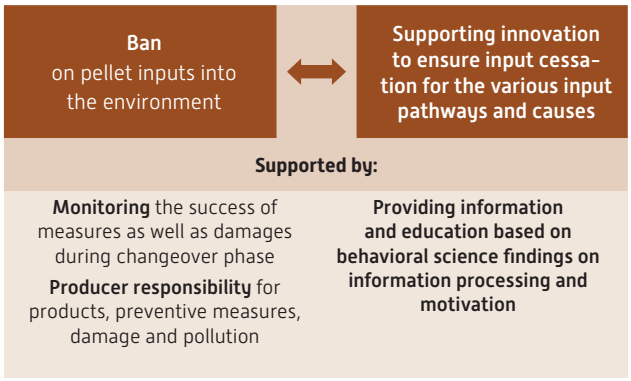
via storm drains as well as during heavy rainfall via rain overflows into retention basins past the wastewater treatment plants.

Which measures against widespread pollution with pellets are effective?

Voluntary commitments and informational or economic measures only have a limited effect. Most promising, therefore, is a legal requirement to prevent inputs into wastewater while simultaneously supporting the development of technical and organizational solutions to counteract pellet emissions. In many cases, this can be achieved by simple means, such as filters in storm drains.

Preventing environmental pollution from plastic pellets: Companies are called upon; legislators are laying the groundwork.

Graphic: © Maria Daskalakis/pixabay.com



Recommendations for measures against pellet loss.

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