

BKV PLASTICS
CONCEPTS
RECOVERY

Report 2019/2020

The Competence Centre
of the Plastics Industry

BKV – Competence Centre of the Plastics Industry

The BKV provides the industry with data and facts on matters involving the resource efficiency and recycling of plastics to help with corporate decisions.

ENVIRONMENTAL TOPICS

The BKV offers its expertise on environmental matters with regard to the application and recycling of plastics – irrespective of the particular application.

DATA AND FACTS

The BKV has a broad network of experts to fall back on. It makes the results of its project work available to all interested parties without discrimination.

VISIBLE PRODUCT STEWARDSHIP

The BKV is thus a visible part of the product stewardship of the plastics industry. Its shareholders are plastics producers, plastics processors and plastics machinery manufacturers, plus their respective trade associations.



WORDS

WEL
COMING

BKV GmbH – more valuable than ever

Plastics are still very much in the public eye. As a rule, more attention seems to be paid to plastic waste and what happens to it than to the benefits that plastic products bring during their service life. The simple fact is that plastic litter floating in the sea makes more of an impression and is more visible than savings of CO₂. But also when it comes to its recycling and reuse, the public expects us to come up with convincing solutions for increased, more efficient recycling. We need to work on both issues to be credible and be able to convince people that, also for climate protection, plastics are part of the solution and not the problem. The BKV is occupied intensively with issues of marine littering as well as the recovery, reuse and recycling of plastics. It thus helps the industry to embrace its principles on product stewardship. In this context, the BKV is now more valuable than ever.

Matthias Stechhan
LyondellBasell, head of Sales and Marketing for Polyolefins,
BKV Board Chairman

FORE



Data and facts instead of “truths”

In times of many “truths” that are propagated about plastics in the traditional media – and even more so in the social media – it is particularly important to provide reliable, verified data and facts. The BKV has been doing this successfully for several years, as can be seen from the large number of studies and reports available on our website. At present, issues connected with recycling – both mechanical and chemical – and the use of recyclate are at the focus of discussion. Also the topic of plastic litter in the environment continues to be of considerable public interest. In relation to the questions connected with this and also beyond them, the BKV constantly compiles fresh data and facts that can help not only the plastics industry but everyone else with an interest in the results to keep informed and make entrepreneurial decisions. This brochure provides an indication of the range of topics on which we are working.

Rainer Mantel
BKV, Managing Director

WORD

Marine Litter

With its model, the BKV contributes to the fact-oriented clarification of the ways in which improperly disposed-of plastic waste gets from the land into the sea and in what quantities. The model is constantly being further developed and has now been published in its fourth edition with several special reports.

Standardisation

The BKV financially supports the standardisation work on various committees in the field of “plastics and the environment” at both national and European level. Apart from that, it also provides personnel assistance, and is available as a service platform for coordinating other activities.

Resource efficiency / Circular Economy

What makes most sense in terms of climate protection? To use as little material as possible to manufacture a plastic product even if it cannot be mechanically recycled after its service life, or to design the product in such a way that it is readily recyclable but uses more material in the first place. Questions such as this clearly illustrate the dilemma with this issue.

BKV's
main topics

Market data

Thanks to a study published every two years with the participation of the BKV, it is now clearer than with almost any other material just how much plastic is produced, processed, recycled and returned to the economic cycle in Germany. In the meantime, similar studies have been produced for Europe, and now a first global report has also been compiled.

The BKV sets priorities in its project work. At present, the focus is primarily on the following topic areas:

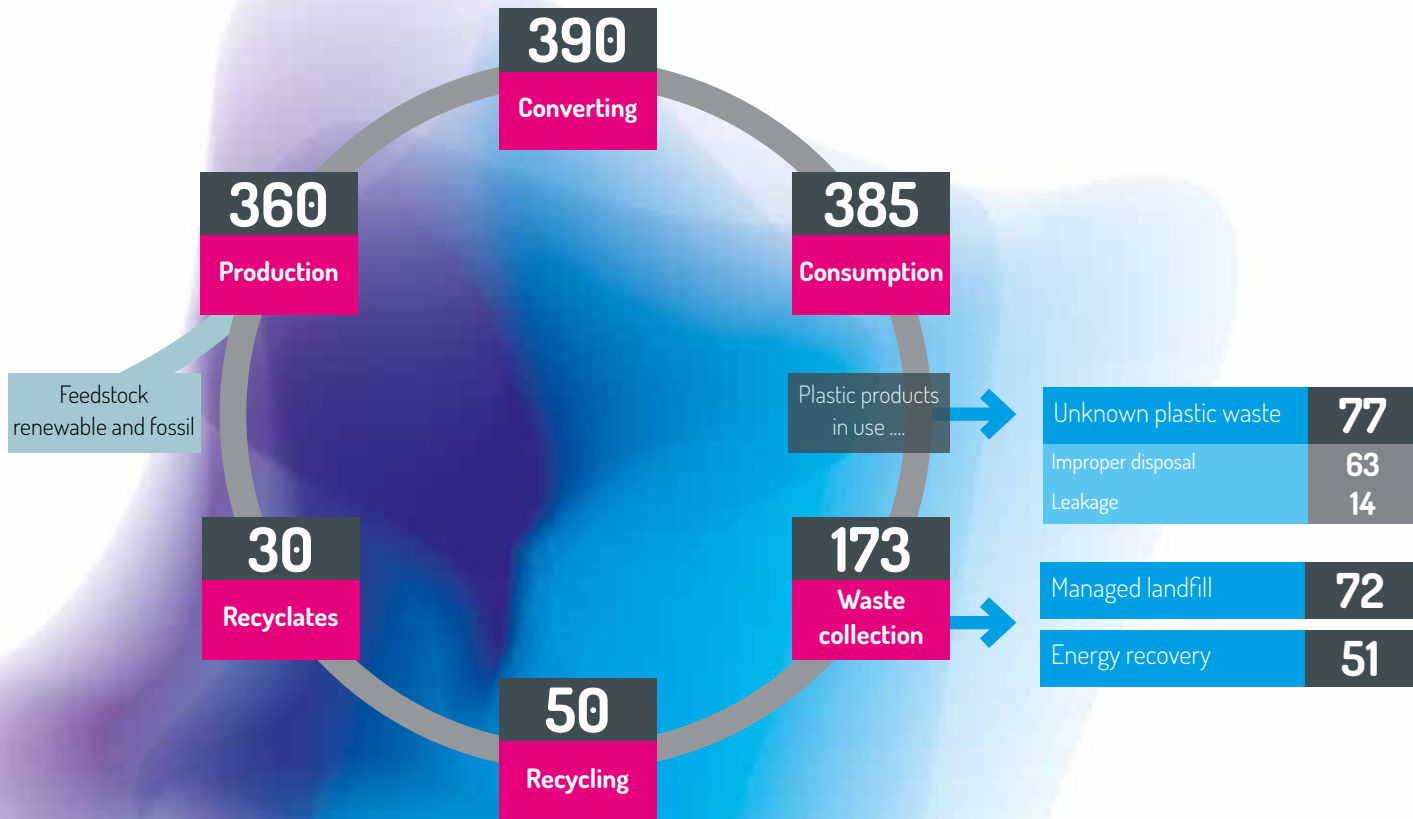
You can find all the studies at
www.bkv-gmbh.de/infothek/studien

Legal framework

What consequences do legal regulations from Brussels and Berlin have on plastics processing and recycling? And to what extent is it possible to carry out in practice what is required in theory by the regulations? The BKV takes a close look at concrete practice, draws up estimates of the consequences, compiles scenarios and identifies potential benefits.

Recovery / Recycling technologies

The basic recycling routes for plastic products have already been developed. In order to meet the ambitious targets of politicians at both European and national level, optimisation and further development are needed, such as the currently discussed processes of chemical recycling. The BKV analyses, evaluates and specifically supports the development of such processes.



All figures in million tonnes per year

Material flows – from national to global

How do we stand with plastics when it comes to the frequently expressed call for a circular economy? For this politically volatile question, the report “Material Flow Analysis for Plastics in Germany” is published every two years and offers a reliable, accepted database. Apart from the production, processing, consumption, waste generation and recycling of plastics, it also provides data on the use of plastic recycle. At present, the figures are available for the year 2017 – plus explanations. The study for the year 2019 will appear in autumn 2020. The BKV commissions the study and is supported by numerous stakeholders.

For Europe “The Circular Economy for Plastics – a European Overview” gives an insight into a comparable material flow analysis that also contains data on recycle and its fields of application. The BKV supported the study, which was published by PlasticsEurope.

The pilot study “Global Plastics Flow 2018”, published in 2019, takes – for the first time – a global view. It provides data and facts on the circular economy in 44 countries of the world, which represent around 60 percent of the world’s population and 80 percent of GDP. It not only shows how much plastic waste is collected and disposed of worldwide, but also how much ends up on unauthorised dumps or is disposed of as litter in the countryside.

The studies:

Material flow analysis for plastics in Germany 2017 – The long version can be ordered from www.bkv-gmbh.de/infothek/studien. The short version in German and English can be downloaded free of charge from the same address.

The Circular Economy for Plastics – a European Overview, report free of charge in English from www.bkv-gmbh.de/infothek/broschueren

Global Plastics Flow Study 2018, Management summary and long version free of charge in English from www.bkv-gmbh.de/infothek/studien

Outlook:

In conjunction with the European automotive and plastics industries, BKV has charged RAMBOLL with compiling a study that takes a closer look at the handling of plastic components in end-of-life vehicles for different member states of the EU. It aims to identify deficits and propose useful options for handling them in the future.

The study will be published shortly and can be ordered via the BKV homepage.

Sorting residues from the processing of
lightweight packaging



Light shredder fraction, automotive



WEEE shredder

WEEE: Waste of Electrical and Electronical Equipment



Commercial waste



Technology: Material flows for chemical recycling

It is becoming increasingly clear that the ambitious recycling quotas stated in national and European regulations will be hardly achieved with mechanical recycling alone. Here, chemical recycling processes offer a possibility for producing high-quality plastics based on waste that cannot be recycled mechanically.

Pyrolysis has turned out to be a promising technology*. As part of a new cooperation project between VCI, PlasticsEurope Deutschland and BKV, the Karlsruhe Institute for Technology (KIT) is currently drawing up the fundamental principles for evaluating the pyrolysis process for mixed plastic waste. For this purpose, the Institute initially examined real waste flows with a high plastic content that are not mechanically recycled to establish their suitability for such processes. The study covered sorted residues from the sorting of lightweight packaging, shredder residues from the recycling of electrical and electronic appliances, residues from the sorting of commercial waste, residual plastics from heat-insulating composite systems, and shredder residues from the reprocessing of end-of-life vehicles. The suitability of other plastic-relevant waste flows, for example from agriculture, is to be examined before the end of this year. The results of the current studies should become available by September this year in the form of a report.

*] cf. the BKV study “Thermal Processes for Feedstock Recycling of Plastics Waste” – compiled by KIT and Conversio. A short version with the results in English is available at www.bkv-gmbh.de/infothek/studien. There, the long version can also be ordered at a price of EUR 500 (plus VAT).

Any questions on the studies can be answered by Ulrich Schlotter (ulrich.schlotter@bkv-gmbh.de)

Germany

Plastic waste
1,800

Microplastics: 60
Macroplastics: 1,700



Tyre abrasion
5,000

North Sea, Baltic Sea, Black Sea

Marine Litter: “From Land to Sea” – the model is extended

The fourth edition of the report “From Land to Sea – Model for the documentation of land-sourced plastic waste” (Conversio) is now available. The report and handbook on the model together with all the respective special reports were updated last year and, especially in terms of the data, extended to reflect the present state of science and technology.

One important innovation involves the model itself: In addition to the quantity of improperly disposed-of plastic waste that ends up in the seas that are of relevance for Germany – North Sea, Baltic Sea and Black Sea – figures are now also given on the “input volumes”. From this it is now possible to see how much of this plastic waste already lands in the discharge pathways and discharge sources given in the model.

Through additional data illustrating the relevant transfer and loss factors, the calculations in the model become even more transparent. Also new is the inclusion in the report of the results from the study on tyre abrasion. They are listed separately from the quantities of macroplastics and microplastics.

Summarising we get the following picture:

In total, around 1,800 t of improperly disposed-of plastics that can be assigned to Germany are discharged every year into the North Sea, Baltic Sea and Black Sea. Of this,

approx. 60 t are microplastics,

approx. 1,700 t are macroplastics and

additionally approx. 5,000 t are tyre abrasion.

Compared with the previous versions of the “From Land to Sea” report, the total discharge of microplastics into the seas has fallen, but the total discharge of macroplastics has risen. This is essentially due to the improved data situation, which enabled more valid calculations in the last update. The results of the other special reports on the topics of “littering” and “compost and digestate” are also now included in the calculations of the model.

The report and handbook for the model can, like the special reports, be ordered free of charge at www.bkv-gmbh/infotehk/studien. An English version of the report is also available.

Your contact for these topics is Stephanie Cieplik (stephanie.cieplik@bkv-gmbh.de)

Recyclate in plastic packaging



Potential quantity

960,000



Actual quantity

450,000



Quantity obtained from
post-consumer waste

180,000

All figures in tonnes per year

Circular economy: recyclate for packaging

At a political level in Europe – also in Germany – a number of amendments to legal regulations regarding the production of plastics, their use and the handling of plastic waste have either already been implemented or are at the planning stage. The focus here as before is on the aim to increase the use of recyclate in plastic products. The EU, for example, wants around 10 million tonnes of recyclate to be used by the year 2025. How realistic is that?

Let us take plastic packaging: Around a third of plastics consumption in Germany is used for packaging. The Society for Packaging Market Research (GVM) has, on behalf of the BKV, examined how much recyclate can be used in packaging. To do this, it has analysed the market situation of plastic recyclate with the plastics typically used for packaging, namely PE, PET, PP and PS, based on the data from 2017. During the course of the study, the market research team looked at the supply potential and application potential of recyclate for packaging, and what volumes are actually used. The analysis was made at different levels: segments (bottles, film and small containers, large packs), type of plastic, and form of processing (injection moulding, blow moulding, film and other).

The authors arranged the results in a grid, which they developed on the basis of a survey among plastics processors. The grid indicates with what limitations the respective plastic recyclate can be used, and ranges from “with moderate limitations” to “not possible”. The research team calculated that the annual application potential “with moderate limitations” is around 960,000 tonnes – which is 510,000 tonnes more than is currently used. At the end of the study, the authors list the present obstacles on the market and give, for all market players, a number of recommendations for overcoming these obstacles.

The study, which comprises 103 pages, can be ordered at a price of EUR 500 (plus VAT) from www.bkv-gmbh.de/studien. Under the same address, a short version of the study is also available free of charge in German and English.

Further information is available from Ulrich Schlotter (ulrich.schlotter@bkv-gmbh.de)

ISO/TC 61/SC 14
»ENVIRONMENTAL ASPECTS«



Secretariat: DIN (Germany)
Committee Manager: Stefanie Bierwirth
Chairperson: Dr Eric W. Bischof, Covestro

DIN NA 054-03-01 AA
»PLASTICS AND THE ENVIRONMENT«



Secretariat: DIN (Germany)
Project manager: Stefanie Bierwirth
Head: Rainer Mantel

Committees on the topic of
"Plastics and the environment"

CEN/TC 249/WG 24
»ENVIRONMENTAL ASPECTS«



Secretariat: DIN (Germany)
Secretary: Stefanie Bierwirth
Convenor: Rainer Mantel

Standardisation: “Plastics and the environment”

The importance and the benefits of standardisation are being increasingly acknowledged among those involved in the industry, as is shown by the rising numbers of delegates on national, European and international committees for plastics and the environment. At present, various standardisation projects in this field are already ongoing or at the planning stage. The BKV is actively involved in some of these.

At European level, for example, the CEN/TC 249/WG 24, chaired by BKV’s managing director, Rainer Mantel, is dealing with the vocabulary in the field of plastics and the environment. The aim is to use uniform terminology in Europe in the waste industry and circular economy. These also include aspects such as biodegradable and bio-based plastics, the ecological footprint, and microplastics. Existing standards were taken over into the new glossary, and gaps have been closed with unambiguous definitions and explanations. An initial version in English is due to be published as a European standard before the end of 2020, and should be taken over by the respective national standardisation institutes in the respective national language.

There is also a move to standardise the terminology at national level. Until now, for example, there has been no general consensus as to what a recycle is. In the 2019 working committee “Recycling of plastics in the circular economy”, within the DIN Standards Committee on Plastics (FKN) – in which the BKV is also actively participating – the first step involves sifting through and examining existing standards with regard to recyclates, their properties and the processes for examining them.

In addition to its work on the committees, the BKV makes itself available as a service platform for all standardisation activities in industry. For example, it now coordinates the work of an advisory group, which was set up to coordinate all the activities.

Further information can be obtained from Rainer Mantel (rainer.mantel@bkv-gmbh.de)

Other current studies

Thermal Processes for Feedstock Recycling of Plastics Waste (KIT/Conversio, 2019)

Of the 80 identified processes for the feedstock recycling of plastic waste, the authors found only four with sufficient data to evaluate them under the aspects of their technology readiness level and their economic basis. Pyrolysis turned out to be the most promising technology.

Potential to increase the mechanical recycling of plastic packaging - recycling-friendly design, sorting technique (Prognos/GVM, 2016)

Designing plastic packaging in such a way that it is suitable for recycling is essential for raising the recycling level. The study examined how much more plastic packaging could be recycled if it were appropriately designed.

Titanium dioxide in plastics (Conversio, 2019)

Before TiO₂ dusts were classified as a “probably carcinogenic substance” in Appendix IV of the CLP regulation, the BKV had a study carried out on the consequences this would have on the entire process chain of plastics processing, right through to the material recycling. As a result, a quantification of the concentrations in plastics processing and plastics recycling, based on comprehensive data, is now available.

Generation and management of EPS and XPS waste in 2016 in Germany in the packaging and construction industries (Conversio, 2017)

The study provides a complete EPS/XPS material flow analysis of packaging and building waste, and also describes the current situation with HBCD-containing waste. In addition, the study offers an estimate of future volumes and derives from this a forecast of the development of HBCD volumes in building waste up until 2050. The study is available in German and English.

All available studies can be found at www.bkv-gmbh.de/infotohek/studien

Ongoing projects

Marine Litter – MicBin

The BKV is participating in a joint project to examine and model the discharge and final destination of microplastic in the region of the river Danube.

Plastic-relevant waste flows in Germany

In view of the demanding circular economy targets, relevant waste flows for plastic are to be identified and volumes quantified for recycling.

Ecological assessment for composite film

Composite film that is at present not regarded as recyclable can often be replaced by recyclable solutions – but with the downside that the material consumption is much higher. Whether the achieved recyclability justifies the additional expense, also ecologically, is to be clarified by the ecological assessment.

“Ramboll study” ELV Treatment

As part of this study, the handling of plastic parts in different member states of the EU is looked at more closely, deficits are identified and suitable options developed for handling them in the future.

Marine Litter – Continuation of the model on discharge pathways

The model “From Land to Sea – Model for the documentation of land-sourced plastic waste”, developed on behalf of the BKV, is being further developed and, accordingly, the latest findings are incorporated.

Plastic waste and recycling – Legal situation and status

An overview of the legal framework of plastic recycling appeared for the first time in 2006. It has now been thoroughly revised and updated.

Eco design – Guideline

The guideline published in June 2019 under www.ecodesign-packaging.org has since been tested in practice by various parties. The evaluation of the tests is used for continuous updating.

Recycling balance for packaging

The BKV supports the annual survey of the GVM on the recycling of packaging.

BKV Board

The Board is the controlling body of the company and supervises the management of the BKV. It comprises five representatives from the plastics producing industry and five from the plastics processing industry. Three permanent guests supplement the Board which meets on regular occasions.



Chairman:
Matthias Stechhan
(LyondellBasell)



Vice Chairman:
Bernhard Borgardt
(Ostedruck)



top row:

Marc van den Biggelaar (DOW),
Udo Collet (EBK Kunststoffe),
Dr. Martin Engelmann (IK Industrie-
vereinigung Kunststoffverpackungen) ,
Michael Freutsmiedl (Borealis)

bottom row:

Dr. Christian Haessler (Covestro),
Dr. Tobias Lührig (Bischof + Klein),
Roland Strassburger (Schütz),
Dr. Klaus Wittstock (BASF)

Permanent guests:

Thorsten Kühmann
(Fachverband Kunststoff- und
Gummimaschinen im VDMA)
Claus-Jürgen Simon
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Amoco Chemical (Europe) S.A.	Evonik Performance Materials GmbH	RPC Neutraubling GmbH
Arbeitsgemeinschaft Kunststoffe und Folien GbR	Gesamtverband kunststoffverarbeitende Industrie e.V. (GKV)	RPC Packaging Belgium N.V.
Baerlocher GmbH	Greif Germany GmbH	RPC Packaging Holdings (Deutschland) B.V. & Co. KG
Basell Polyolefine GmbH	Heuchemer Verpackung GmbH & Co. KG	RPC Wiko GmbH
BASF Lampertheim GmbH	IK Industrievereinigung Kunststoffverpackungen e.V.	SABIC Deutschland GmbH
BASF Polyurethanes GmbH	Industrieverband Kunststoffbahnen Europe e.V. (IVK)	Schütz GmbH & Co KGaA
BASF SE	Ineos Manufacturing Deutschland GmbH	Seufert Verpackungen GmbH
Bilcare Research GmbH	INOVYN Deutschland GmbH	SL Packaging GmbH
Bischof + Klein SE & Co. KG	INOVYN Schkopau GmbH	STRUBL GmbH & Co. KG Kunststoffverpackungen
Borealis Polymere GmbH	Mauser-Werke GmbH	Total Petrochemicals & Refining SA/NV
Borealis Polyolefine GmbH	MKF-Schimanski-Ergis GmbH	Verband Deutscher Maschinen- und Anlagenbau e.V. (VDMA)
Covestro Deutschland AG	Müller AG Plastics	Versalis Deutschland GmbH
Dow Olefinverbund GmbH	Nordfolien GmbH	Weener Plastik GmbH
Dürrmann GmbH & Co. KG	Petainer Lidköping AB	

BKV Information

The BKV keeps the industry informed via regular newsletters and invites representatives to attend various specialist events.

The weekly **BKV Newsletter** summarises the media reports and provides information on current news and developments connected with plastics recycling.

The **Marine Litter Newsletter** is published three to four times a year with reports and interviews on research and projects on the topic of marine litter.

As part of the annual International Conference on Recycling of Plastics organised by the bvse, the **BKV Workshop** brings together experts to discuss current topics connected with plastics recycling.

The **BKV Symposium** offers scientific contributions and discussions on current trends in plastics recycling to a specialist audience.

More information and registration for the newsletters at www.bkv-gmbh.de/info

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