







Projects: Market data: **Comprehensive recycling**

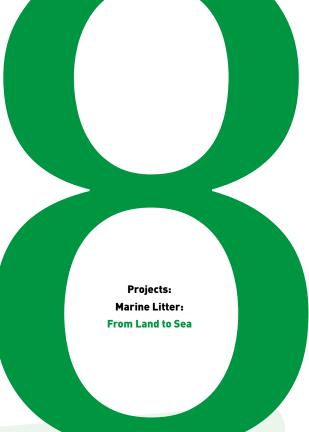
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Projects: At a glance









VISIBLE PRODUCT STEWARDSHIP

The BKV is a visible part of the plastics industry's product stewardship. Its shareholders are companies involved in plastics production, processing and machinery manufacture, as well as their trade associations.

COMPETENCE PLATFORM FOR THE PLASTICS INDUSTRY

The BKV provides the industry with data and facts on the topics of resource efficiency and recycling of plastics to help them in their entrepreneurial decision-making.

END-OF-LIFE TOPICS AND RECOVERY OF PLASTICS

The BKV has specialised expertise in topics involved with the recovery of plastic waste – especially of plastics packaging.

FACT-ORIENTED

The BKV can fall back on a broad network of experts. It makes the results of its project work available to everyone interested, without discrimination.

EDIT

In 2013, the BKV Board agreed on a vision according to which the BKV would develop and operate for the plastics industry an "outstanding competence platform in the competition between materials".

Today, in 2017, we can say we have already come very close to this vision. We now have a broad technical network that extends over the entire value chain. It is second to none. It puts us in a position to quickly pick up on currently volatile and emerging developments that are of importance to the whole industry, and to fill knowledge gaps with our project work. Here, we concentrate completely on drawing up data and facts. After we have processed the results, we make them available to our shareholders and to anyone else who is interested in these issues, without any discrimination. The federations, associations and companies in our group of shareholders can make full use of our results for political discussion and communications.

The issues we deal with involve product stewardship, to which the German plastics industry has committed itself. The list of topics that we could – and should – deal with is longer than we could tackle in one financial year. This reflects on the one hand our human and financial limitations, but, on the other, it provides the motivation for our commitment. The BKV team demonstrates this in its day-to-day work, but so, too, do our supporters on the Board and on the committees. On the Technical Committee (TA), for example, we have a whole pool of technical competence with representatives from many companies along the value chain. This enables us to evolve relevant issues on a sound basis and pour them into the design of new projects. Apart from that, both on the Technical Committee and on the Board, we are accompanied in our work by technical experts, so that we can always be sure we are on the right track.

RIAL

From the wealth of different topics, we select the most relevant and elevate them to our areas of focus. Whether we like it or not.

the topic of marine litter is always present. As part of our self-conception to contribute the underlying facts to a topic, we are continuing to work on a newly developed model to document land-sourced plastic waste in the sea. The second edition has now been published. While solutions to the problem of marine litter are urgently needed, there is still a lack of well-founded know-how on the routes by which plastics get into the marine environment and in what quantities. We are, however, convinced that such know-how is essential in order to significantly reduce further pollution from plastics.

The legislator, too, with a number of already approved and planned amendments to the legal framework of waste management, is raising questions about our plastic materials, which we need to tackle. The question of how it will be possible to meet the more stringent recycling requirements in future is one of these, which we have dealt with from various perspectives and are still working on. I invite you to read the present report to see where we now stand with our project work. I will be pleased to answer any questions you may have or to discuss the reported results.

Kind regards,

Rainer Mantel

Managing Director of the BKV

Rainer (Youtel



from Board Chairman Matthias Stechhan

BKV - in the interests of the entire value chain

The plastics industry is doing better than it has for a long time. How long this will last, nobody knows, but it looks as if challenging times are approaching. The recycling of plastic waste is again moving back into the focus of expert and public debate about the material itself. At national level, we will, from 2019, be involved with a packaging law that will mean significantly higher recycling quotas. We welcome these higher quotas even though we do not know exactly at the moment how they can properly be met, either ecologically or economically. On the other hand, we must take care to ensure that ecological successes as have been achieved with modern packaging are not counteracted by recycling demands. The topic of marine litter is also putting our industry under increasing pressure. There is reason for concern that plastics in the world's seas and oceans are increasingly damaging their image. Even though the problem is a global one and originally has nothing to do with our plastic, we are called on at this point to work on finding solutions. So that we know the relevant facts to discuss such issues and identify possible

tions, we have the BKV. The expertise and competence of the plastics industry comes together on this know-how platform. On BKV's Technical Committee, employees from companies all along the value chain are working closely together to support the BKV in its project work. On the Board, experienced representatives of the whole industry monitor the work of the BKV. The BKV itself has an expert team that develops the projects in the interests of the shareholders, steers them in the right direction and leads them to useful results. We can, as an industry, be very happy indeed that we have a competence centre such as this at our disposal. It performs a valuable sevice by tackling cross-company issues. I can only express my prace to everyone concerned and send them my warm has ks Keep a upl

Kind regards

Mathia S. c. na. head of Sales and Marketing for polyolefins at Lyong Illesse Lin Central Europe



CHAIRMANMatthias Stechhan
(LyondellBasell)



The Board is the controlling body of the BKV and supervises the management of the BKV. The Board consists of five representatives of the plastics producing industry and five from the plastics processing industry. During the period under review, there were two changes. Three permanent guests supplement the Board, which meets at regular intervals.



VICE CHAIRMAN
Bernhard Borgardt
(Oste-Druck)



Dr. Jürgen Bruder (IK Industrievereinigung Kunststoffverpackungen)



Udo Collet (EBK Kunststoffe)



Peter Heydasch (Dow)



Rainer Kolar (Bischof + Klein)



Up to February 2017: Dr. Melanie Maas-Brunner (BASF)



successor : Dr. Klaus Wittstock (BASF)



Dr. Rainer Rettig (Covestro)



Up to December 2016: Stefan Rieder (Borealis)



successor:
Dr. Michael Scriba
(mtm plastics member of
the Borealis group)

PERMANENT GUESTS:



Dirk E.O. Westerheide (GKV Gesamtverband Kunststoffverarbeitende Industrie)



Dr. Rüdiger Baunemann (PlasticsEurope Deutschland)



Thorsten Kühmann (Fachverband Kunststoff- und Gummimaschinen im VDMA)



Claus-Jürgen Simon (PlasticsEurope Deutschland)



Focus on plastics

The last few years have been characterised by debate at national level about the German resources act ("Wertstoffgesetz"), which finally ended up as a packaging law ("Verpackungsgesetz"). In the first half of 2016, those responsible were still searching for solutions on how the planned content could be incorporated into the law to make it acceptable. At the latest in summer 2016, however, it was clear that the dispute over responsibilities, which basically led to the failure of the resources act, could not be settled. At the well-attended BKV workshop June 21, 2016 in Bad Neuenahr, which was part of the byse Altkunststofftag (International Conference on Recycling of Plastics), it first became public that we were no longer dealing with a resources act but with a packaging act.

The timing of the BKV workshop was well chosen: Just at that time there were signs of a compromise for a packaging law, the basic principles of which were later to become reality. Gunda Rachut, Managing Director of the future "Zentrale Stelle", Thomas Schmid-Unterseh from the German Environment Ministry, Frank Böttcher, then still Managing Director of DKR, Dr. Thomas Mertins from the Deutscher Landkreistag (DLT), and Dr. Clemens Pues from the firm Tönsmeier discussed, under the chairmanship of Dr. Gottfried Jung, then still undersecretary in the Rhineland Palatinate Environment Ministry, a compromise paper from economic associations, and indicated a willingness to compromise with regard to the new regulations mentioned in the paper, which finally became a packaging law.

Packaging law with higher quotas

Since the end of March 2017, the packaging law (VerpackG) has now crossed all the hurdles of the legislation process: On March 30, 2017, it was passed in a last reading in the German Bundestag. The packaging law has, as expected, undergone a few amendments as compromises have been taken into account. Now, as long as there are no objections in Germany's Upper House (Bundesrat), it can cross all the parliamentary hurdles up to the end of the legislation period and come into force on January 1, 2019.

For plastics packaging, this means that, from 2019, the recycling quotas will rise and the dual systems must, from the year 2022, instead of

the existing quota for mechanical recycling of 36 percent, account for 63 percent of the licensed quantity. The quota for the material recycling of the collected lightweight packaging must then be at least 50 percent. Especially for plastics, this quota could become a challenge, because the other material fractions (drink cartons, metal/aluminium packaging) are already being recycled at a rate of nearly 100%. The increase in quantity will therefore have to be generated almost entirely from the plastics fraction. Over and above that, the dual systems are called on to align the license fees more strongly to ecological aspects, i.e. to reward packaging that is easy to recycle. To guarantee fair competition and consistent implementation, a central department is to be set up, financed by those responsible for the products, i.e. trade and industry. This central department will serve as a registration and standardisation body. As part of a sovereign arrangement, it will be provided with the necessary instruments for the examination.

The plastics industry, together with trade representatives, had already begun preparing for the funded central organisation "Zentrale Stelle" in 2015. For this, the Federation of German Food and Drink Industries (BVE), the German Retail Association (HDE), Germany's Plastics Packaging Industry Association (IK) and the German Brand Association (Markenverband e.V.) founded the BHIM Zentrale Wertstoffstelle Projektgesellschaft mbH, which was converted in the course of 2017 into a foundation called the "Zentrale Stelle Verpackungsregister" (Central department packaging register).

The BKV is involved in setting up the "Zentrale Stelle" in several respects. On the one hand, it makes the financial contribution for the plastics industry, which is made available as a loan for the setting-up company. Secondly, BKV is also involved in clarifying contextual questions. Here, it is first a case of defining legally relevant terms and, based on this, drawing up processes for implementing the inspection require-

ments resulting from §§ 21 and 22 VerpackG.

Potential for more recycling

Achieving more recycling through ecological design would appear to be an option for legislative activity at both national and European level. Against this background, the BKV commissioned a study in 2016 dedicated to the question of how much potential currently exists in the collected plastics packaging for more recycling if it were designed accordingly without having to make any restrictions on its functionality. The study entitled "Potential for increasing the mechanical recycling of plastics packaging - recycling-friendly design and sorting technique", which was tackled jointly by Prognos AG and GVM Gesellschaft für Verpackungsmarktforschung mbH on behalf of the BKV, showed that two thirds of all plastics from lightweight packaging collection is already recycling-friendly. This means that, in 2015, around 430,000 t was mechanically recycled. Of the remaining third, at least a further 100,000 t could, through simple measures and by retaining the functionality (dispensing with black colouring etc.), be recycled through an appropriate recycling-friendly design. The

research team established further that an additional 120,000 tons or so could be mechanically recycled if the sorting process were optimized. This means overall that, with these two measures alone, the quantity of plastics from lightweight packaging collection that could be mechanically recycled could be raised by over 50 percent.

Whether this will be enough at the end of the day to meet the much higher quotas in the packaging law remains to be seen, particularly as, in addition to the mechanical quota of 63 percent, there is another quota to be tackled. According to the packaging law, at least 50 percent of the total collected packaging waste should, averaged over the year, be recycled. It is possible that this will be an even greater challenge for plastics packaging. On the other hand, not only mechanical recycling will be available but also the method of feedstock recycling, because the term "recycling" covers both variants. At present, less than one percent of the collected plastic waste is used in feedstock recycling, namely as a reducing agent in steel production (see also the article on recycling technologies on page 10).

European plastics strategy at the planning stage

At EU level, too, the search is on for legislative possibilities to increase the recycling and re-use of goods. At the beginning of 2017, the Commission presented a timetable for the field of plastics within the EU waste management package. In this, the Commission announced that it would present a plastics strategy in autumn 2017. The waste management package covers, in addition to the timetable, reforms to the waste framework directive, landfill directive, directive on packaging and packaging waste, and the directives on spent batteries, end-of-life vehicles and old appliances. The announced plastics strategy, which will be oriented to the overall value chain to take account of the entire life cycle, is aimed among other things at uncoupling plastics production from fossil raw materials, the material (mechanical) recycling of plastics and improving their recyclability with respect to economic viability, quality and quantity and, of course, reducing the input of plastics into the environment



Despite all the undisputed benefits that plastics offer – also under ecological aspects – and all the successes in waste treatment, marine litter is damaging the image of plastic materials. Reports regularly appear in the media focussing on the pollution of the waters with plastic waste. A "life without plastic" is also being increasingly preached. The focus here is especially on the hazardous effects and consequences of plastics, especially microplastics.

Image in danger

At present, the growth figures in the plastics industry argue against any lasting harm to the material's image, but certain consequences are nevertheless recognisable in some areas. So that the plastics value chain does not incur any damage overall, a clarification of the facts directed at the perception of both politicians and the general public is needed. In the field of marine litter, for example, very little attention is paid to the fact that, in countries with well-functioning waste management systems, the discharge of plastics into the marine environment is comparatively low.

The BKV contributes to the clarification of the facts by providing the necessary information and carrying out corresponding projects in the after-sales segment. Here, in the field of marine litter, the BKV is concentrating on land-sourced littering, in other words on plastics that get into the marine environment from the land. The emphasis here is firstly on prevention – how to prevent plastic waste getting into the sea in the first place – and secondly on the collection and evaluation of data and facts, especially on mass flows.

New model project at the planning stage

In the field of prevention, thought is being given to establishing a new project based on an idea developed at the first Marine Litter Workshop in 2013 in Berlin. It would involve, in a region with no regulated waste disposal, showing how significant discharges of plastic waste can be reduced by setting up a structured waste management system. We are, however, well

aware of the difficulties of setting up and implementing a project of this kind and we know that it also takes time. Results can therefore only be expected in the medium to long term.

BKV model for data recording

In the field of "Data and facts", the BKV has, since the beginning of 2016, been distributing the model "From Land to Sea - A model for recording land-based plastic litter". This approach is being constantly updated with new data and findings. The second edition of the report and handbook on this model are now available in German and English (can be ordered free of charge from http://www.bkv-gmbh.de/en/ info-zone/studies). The status of the model is critically examined at regular expert workshops. Suggestions for improvement resulting from these workshops are thoroughly examined and, if appropriate, are incorporated. This is a procedure that has proved very successful. So far, the model has only looked at Germany's discharges into the North Sea, but consideration is now being given to extending the model to other regions or seas. The first steps in this direction were made by integrating the

model into a consortium project. The BKV also intends to expand these activities. After all, the target is still to make the model a recognised tool used in scientific practice. In this respect, the BKV is on the right path.

Over and above the previously mentioned activities, the BKV supports a project that is indirectly concerned with the avoidance of littering and basically goes back to an idea that emerged from the BKV workshop in 2013, namely the development of a guideline for the ecological design of packaging. For this, the IK Industrievereinigung Kunststoffverpackungen e.V. (German Association for Plastics Packagings and Films) set up a "Round Table Eco Design of Plastic Packaging". Representatives from the entire value chain meet up regularly to discuss their experiences and jointly encourage the eco-design of plastics packaging. Drawing up a guideline to this effect is the chief objective. At interpack 2017 in Düsseldorf, the project was presented to a broader trade public for the first time. More information on this can be found at

www.ecodesign-packaging.org/en.

Marine litter newsletter

Together with its partners, the FCIO (Austria's Chemical Industry Association), IK Industrievereinigung Kunststoffverpackungen e.V., PlasticsEurope Deutschland e.V. and VDMA Fachverband Kunststoff- und Gummimaschinen e.V, the BKV annually publishes three newsletters. In one newsletter on the subject of land-sourced litter, which asked the question how plastic waste in the sea can be avoided, there is a report on the present status of BKV projects with some important new developments in research and science as well as in politics and industry. The newsletter also contains interesting general news concerned with the subject of marine litter. Apart from that, readers have an opportunity to obtain information and estimates on current projects or activities in a brief interview with selected experts. The newsletter is available in German and English. It is free of charge and can be ordered at http://www.bkv-gmbh.de/en/info-zone/marine-litter-newsletter.



The quotas laid down by law on what percentage of plastics has to be recycled have so far been met without problem by countries like Germany. However, the requirements will soon become stricter. Everyone is basically agreed that higher recycling quotas can be met in this country, and yet years of discussions on amending the law - which dealt less with the quotas than with matters of responsibility have led to a certain stagnation on the subject of plastics recycling. This will change now that a compromise has been found in Germany in the form of a packaging law. The law, which is due to come into force at the beginning of 2019, will make much higher demands on plastics and their recovery. The main statistics:

- The mechanical recycling quota of currently 36 percent will rise by the year 2022 to 63 percent of the quantity licensed with the dual systems.
- Independently of this, at least 50 percent of the quantities of packaging made of metal, plastics and composites collected by these systems must be sent for recycling (quota for lightweight packaging).
- The dual systems must take greater account of ecological aspects when calcu-

lating the licensing fees. This means giving an advantage to recyclable packaging compared with packaging that is more difficult to recycle.

In view of these significantly stricter requirements, the question is to what extent these challenges can be mastered from a technical point of view. Even if it may appear technically feasible, an examination still needs to be made as to whether the relevant technology is actually available.

New main topic: Recycling technologies

Against this background, the BKV has decided to make another topic one of the areas of focus of its project work, namely recycling technologies. We do, however, take this term very broadly. First of all, we mean technologies that serve to process and separate complex composites containing a high proportion of plastics. Secondly, we mean technologies for separating mixtures of different plastics. And thirdly, we take the term to mean processes for the feedstock recycling of plastics. Processes such as pyrolysis and gasification are well-known from the past. Now, the first step will be to de-

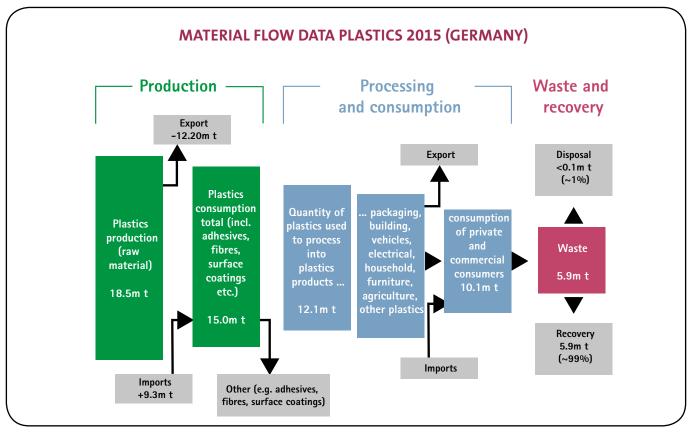
termine the current status with these processes. From earlier studies, we are more or less au fait with the situation up to the year 2010. We now intend to look at more recent developments and describe their competitiveness and performance. It will also be very interesting to look at the question of where interfaces could exist to potential buyers of the resultant products.

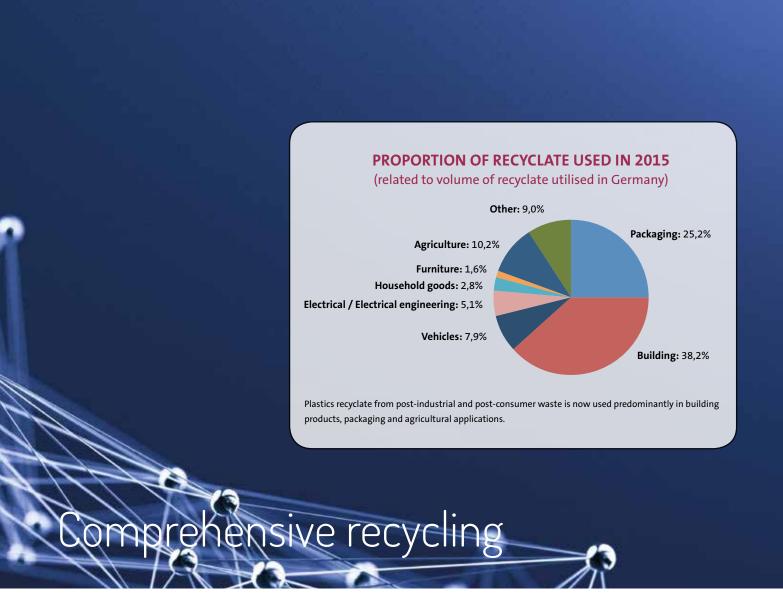
Only when this fundamental work has been completed will it be possible to evaluate what and to what extent individual developments in this field could contribute to the amount of material that is recycled. This is important first and foremost for meeting the quota on lightweight packaging. We can then also estimate for the plastics industry where gaps still exist in attaining the targets set by the legislator.

But we are unlikely to get that far during the course of this year. We want to use 2017 to first draw up a system for tackling the matters described above and to identify where gaps in our knowledge exist that we can close as part of our project work.









The data from the study on the production, processing and recovery of plastics in Germany are broadly accepted and regarded as a valid and serious source. Quite rightly so, because many trade associations and organisations in the plastics industry are behind the study. Apart from the BKV GmbH, they are PlasticsEurope Deutschland e.V., IK Industrievereinigung Kunststoffverpackungen e.V., VDMA Fachverband Kunststoff- und Gummimaschinen e.V. and the byse Bundesverband Sekundärrohstoffe und Entsorgung e.V.. We also receive support from other quarters in compiling the data, which are updated every two years. They document the fact that Germany has a virtually 100 percent recovery rate for plastic waste.

The latest data appeared at the end of 2016, relating to the year 2015. The report showed that the volume of plastic waste amounted

to 5.9m t, of which more than 99 percent was recycled: 45 percent by mechanical recycling, 1 percent percent by feedstock recycling and 53 percent for energy generation. Mechanical recycling has increased significantly at the expense of energy recovery. The study proves once again that, in the field of plastics recoverv. the established market structures function well and should continue to do so in the future. The study also illustrates on the basis of different areas of application why the volume of plastic waste is now significantly below the consumption volume. This is connected among other things with the extremely different utilisation times. As a rule, for example, packaging products are very short-lived, and around 93 percent of them reappear in the waste the same year they were produced. In contrast, only around 22 percent of building applications - some of which have a service life of up to 80 years - appear as waste the same year.

Where is recyclate used?

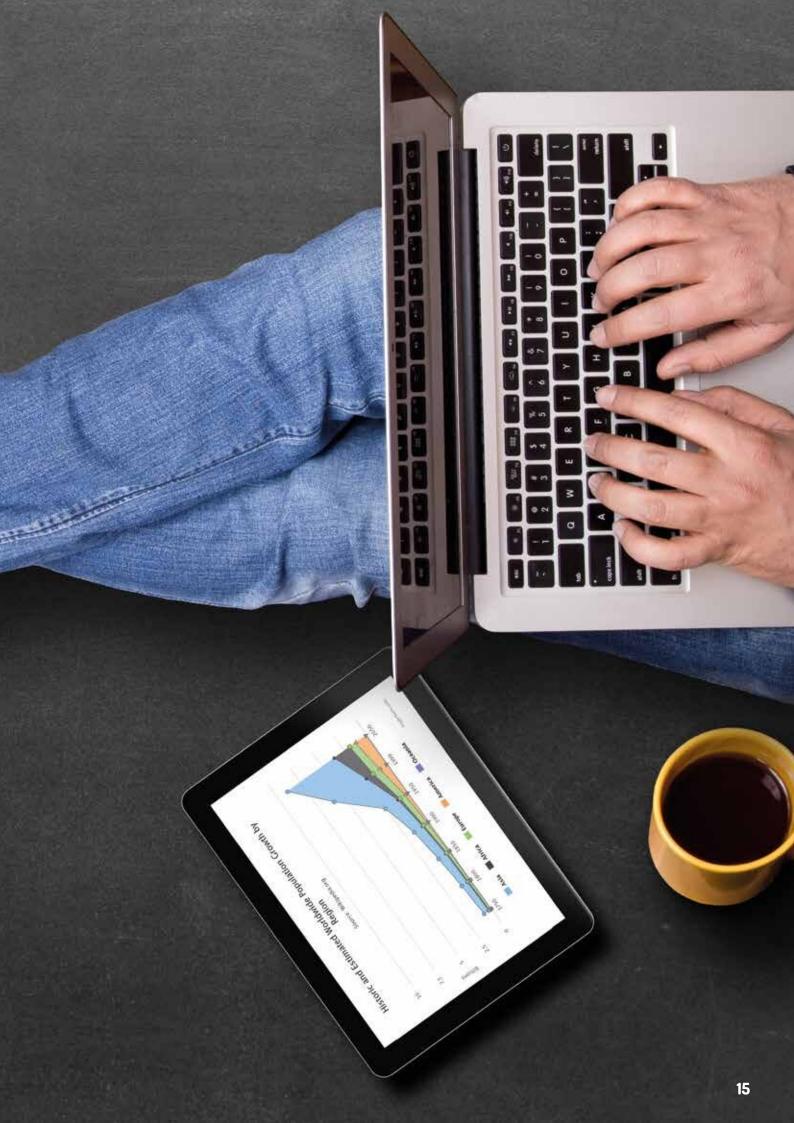
Valid information on where recyclate from production scrap, processing scrap and consumer waste is used appeared for the first time in the study for 2015. It showed that the main fields of application are the building, packaging and agricultural segments as well as technical applications. The design of the study is now to be extended. At the moment, the customers are examining to what extent more than just the fields of application for recyclate in Germany could be documented. It would be interesting, for example, to have detailed statistics on the volume flows of recyclate. In 2017, tools for this are to be developed and tested. If the test phase is successful, they could be deployed next year.

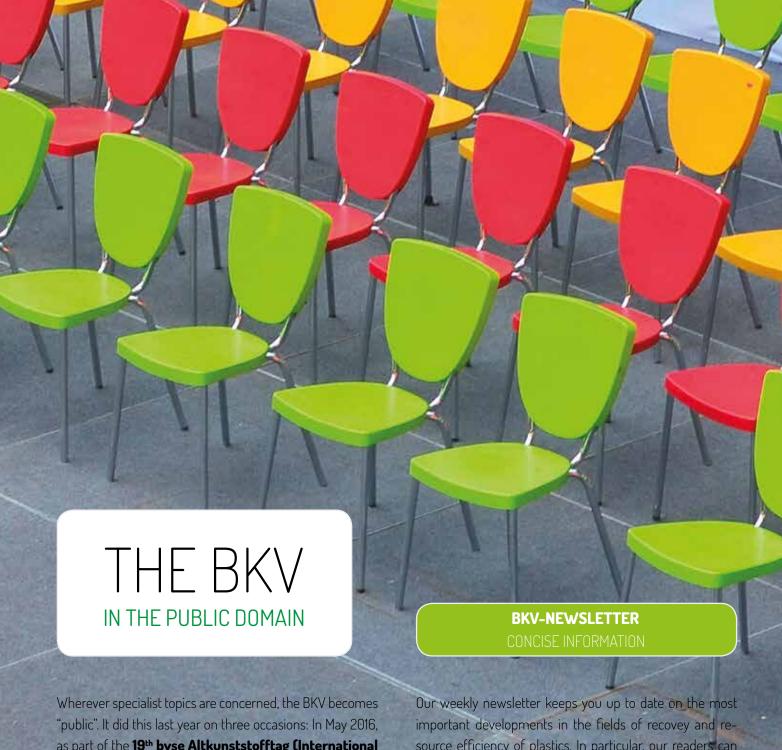
AT A GLANCE

Main areas of focus in 2017

The following table gives an overview of the main topics the BKV is currently working on. Even though the overview is not complete, it does give a good insight into the project work. The possibility also exists of contacting the BKV if a specific issue is of interest.

PROJECT	WHAT IT'S ALL ABOUT
Recycling technologies	Drawing up a systematic approach to the question of which feedstock recycling methods can contribute to meeting the recycling quota for lightweight packaging.
"Recycling module" for the plastic material flow	Development of tools to document volume flows of recyclate used in Germany.
Marine litter: Model for the recording of land-based plastic litter	Development of a strategy on how the model can be further established as a recognised tool in Europe.
Legacy additives: Reach and recycling	Drafting of a guideline for practical application in order to be able to produce and use recyclate while ensuring legal compliance in the area of conflict between waste legislation and materials legislation.
EPS market analysis	Special survey on EPS/XPS waste in Germany in 2015.
Guideline on the ecologically friendly design of plastic packaging	Support for the activities of IK Industrievereinigung Kunststoffverpackungen e.V. in drafting a practical guideline for the eco-friendly design of plastic packaging.
Contributions to work on standardisation	Maintaining the possibility to exert an influence in the field of so-called "soft/political" standards.
Ecological positioning of plastic-plastic composite packs	Drafting of facts to evaluate para. 21 VerpackG on the topic of recycling-friendly design.
Recycling balance for packaging	Support for the annual survey of the GVM on recovery volumes of packaging in 2016, which also serves as the basis for reporting the figures to the EU.
PackTheFuture Award 2017	Support for particularly innovative and sustainable packaging solutions.





as part of the 19th byse Altkunststofftag (International Conference on Recycling of Plastics) in Bad Neuenahr, it organised a well-attended workshop on the legal framework for plastics recycling. In September 2016, it organised a workshop in Berlin for its shareholders and other stakeholders in its network on the results of new studies. And in October it was also present with a small stand on the Science Campus of the world's largest plastics fair in Düsseldorf, K 2016.

source efficiency of plastics. In particular, our readers can find out:

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SHAREHOLDER MEETING

TASKS

The shareholder meeting decides on the approval of the financial statements and the distribution of the profit, and also approves the actions of the Chairman and the Board.

BOARD

TASKS

The Board is the controlling body of the BKV and supervises the management.

MANAGEMENT

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COMMITTEES

POLITICAL COMMITTEE (PA)

TASKS

Advise the BKV in fundamental matters of their work.

TECHNICAL COMMITTEE (TA)

TASKS
Support the BKV
in technical matters.

Technical Committee (TA)

On the Technical Committee, experts from companies and associations that are share-holders of BKV come together to discuss and evaluate initiatives on projects that may be proposed by the BKV team, the Board, the shareholders or the Political Committee. The Technical Committee may also propose projects itself. Subsequently, it makes recommendations to the Board, which finally decides on the projects to be tackled. In addition, the Technical Committee accompanies the technical side of the projects and reports to the Board.

Political Committee (PA)

The Political Committee advises the BKV on the socially relevant issues and serves primarily to exchange information and opinions between political enforcement, associations and NGOs. It meets at irregular intervals and discusses in particular topics involving the recycling of plastics. Through the different viewpoints of its members, the PC provides the BKV with a valuable impetus for the orientation of its project work.

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IK Industrievereinigung Kunststoffverpackungen e.V.

Industrieverband Kunststoffbahnen Europe e.V. (IVK)

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MKF-Ergis GmbH

Müller AG Plastics

Nordfolien GmbH

Petainer Lidköping AB

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RPC Packaging Belgium N.V.

RPC Packaging Holdings (Deutschland) B.V. & Co.KG

RPC Wiko GmbH

SABIC Deutschland GmbH

Schütz GmbH & Co. KGaA

Seufert Verpackungen GmbH

SL Packaging GmbH

Strubl KG Kunststoffverpackungen

TOTAL Petrochemicals & Refining SA/NV

Verband Deutscher Maschinen- und Anlagenbau e.V. (VDMA)

Versalis Deutschland GmbH

Weener Plastik GmbH

