Summary

of

‘Potential for the Use of Recycled Plastics in the Production of Plastics Packaging in Germany’

Study

conducted by

GVM Gesellschaft für Verpackungsmarktforschung mbH

Commissioned by

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Background information

Currently the material plastic is widely discussed. On EU level as well as in Germany, directives and laws about the processing, handling and waste treatment of plastics have been reviewed and drafted, for example the Packaging and Packaging Waste Directive 2018 or the Packaging Law from 2019. Further strategies and plans like the 'Green Deal' and the New Circular Economy Action Plan (2020) have been published.

One focus of the reviews and plans is to increase the amount of recycled content in plastic packaging. In Germany around 30 % of processed plastics are used in packaging. In 2015 the EU commission already published the EU-Plastics Strategy (Circular Economy Action Plan) which will be continued as mentioned in the Green Deal. One goal of the EU is the application of 10 Mio. t recyclates by 2025. Self-commitments of the industry promised the use of 6.4 Mio. t in contrast to an offer of 11 Mio. t recycled plastics by 2025. The Circular Plastics Alliance (CPA) targets to close this gap between offer and demand by 2025.

The goal of the EU to increase the application of recyclates raises the following questions about the current market situation: How compatible are supply and demand? And how is the potential to apply recyclates in manufacturing of plastics packaging?

This study was conducted by the Gesellschaft für Verpackungsmarktforschung mbH (GVM) on the behalf of BKV GmbH.

Objective

The target of this study is to clarify the situation of the recycled plastics market. Therefore, current supply and application potential of recycled plastics were calculated as well as their meaning for the self-commitments of the industry.

Further aims are the identification of bottleneck factors for the use of recyclates in packaging and concluding recommendations for action for all involved actors.

Investigation scope

The study focuses on packaging plastics like PET, PP, PE and PS subdivided into PO, PET and others and the production numbers in Germany in 2017. Different categories are used to show the supply and application potential: Segments (bottles, films and small cans, large packaging), plastic type and processing cluster (injection moulding, blow molded containers, films and others).

Data for the study was collected through the GVM data base, interviews and questionnaires with experts and technical discussions in workshops with IK Industrievereinigung Kunststoff-verpackungen e.V. and BDE Bundesverband der Deutschen Entsorgungs-, Wasser- und Rohstoffwirtschaft e.V..

Methodology & Results

To analyse supply and application potential it was necessary to identify and to define general requirements for the quality of recyclates. Therefore, answered questionnaires of processors were evaluated to find relevant characteristics and standards on the quality of recyclates.

The evaluation of the questionnaires has shown that there is a big variety of information and data about recyclates with a lack of numbers and details on their characteristics. Type and scope of information on formulas vary strongly, which makes it difficult to compare the quality of recyclates. So far, norms and standards for the measuring of minimum requirements of quality do not exist for recycled plastics. Though, they are important for the acceptance and treatment of recycled plastics.

Based on the results of the questionnaires criteria defining different levels of restrictions of recycled plastics for the use as packaging material have been derived (figure 1).

Characteristics of recyclate for packaging		expressions and restriction level for the application potential of recyclates			
		moderate restriction	substantial restriction	Large restriction	Not usable
Must-have characteristic	Primary packaging function	unaffected	unaffected	unaffected	affected
	admission	Not necessary or available at the moment	Not necessary or available at the moment	Not necessary or available at the moment	Necessary, not available at the moment
Technology	physical characteristic	unaffected	slightly restricted	restricted	Severely restricted
	Processing function/ output	unaffected	slightly affected	affected	Severely restricted
Sensor system	smell	unaffected	Not disruptive	Slightly disruptive	More than slightly disruptive
	transparency	Maximal a slightly turbidity	Clear turbidity	opaque	-
	colouring / printability	not more than slightly restricted	restricted	Severely restricted	-
	haptic	restricted	restricted	restricted	-
	gloss	restricted	restricted	restricted	-
Ecology	material efficiency	only slightly affected	affected	Strongly affected	-

Figure 1: Overview of the different levels of restrictions for the application potential of recyclates in packaging

Against this background, the application potential for each level was calculated. Must-have characteristics need to be fulfilled; otherwise, the recyclates cannot be used for the production of plastics packaging. Depending on the restriction level the application potential is between 22 % and 51 % or rather between 960 kt and 2,221 kt. The amount of currently inserted recyclates in packaging (450 kt) can be increase plus 510 kt if conditions of the level “moderate restrictions” are applied (figure 2).

In Germany almost half of the current plastics packaging production volume (4,378 kt) cannot be produced with recyclates.

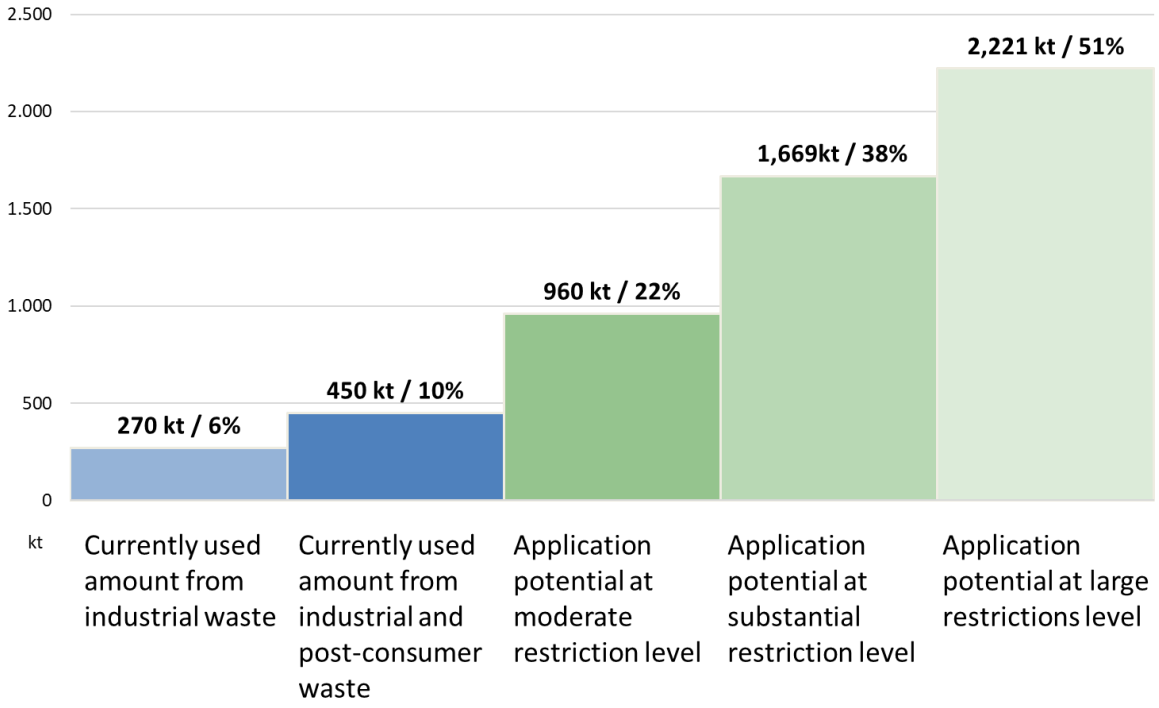

Figure 2: Application potential of plastic recyclates by restriction levels

Overall, 1,766 kt recyclates has been applied in plastic processing in Germany in 2017. From this amount 450 kt were used in plastics packaging, which includes 180 kt (~40 %) recyclates from post-consumer waste. The percentage of recyclates out of packaging recycling is around 45 %.

Through a shift of the current amount of recyclates (1,766 kt), which fulfill the requirements of the level with moderate restrictions for the use in packaging production (4,378 kt), a supply potential of 855 kt is yielded. This means there is a gap of more than 100 kt between supply and application potential which should be used to exploit the whole application potential.

In 2016 the amount of recyclates from post-consumer waste was 3.9 Mio. t in the EU. This amount has to increase by more than 160 % to meet the targeted volumes of 10 Mio. t of the EC. Assuming an equal participation of each EU member and all applications (raising the use of recyclates by more than 160 %) the use of recyclates from post-consumer waste would need to grow up to almost 1.2 Mio. t in Germany. This aligns with the goal set by the IK Industrievereinigung Kunststoffverpackungen e.V. (IK) of applying 1 Mio. t recyclates in packaging by 2025 if the necessary quality can be delivered.

Conclusion

The amount of recyclates from post-consumer waste needs to quadruple (factor 3.8) to reach the application potential of 960 kt, without shifting recyclates from other sectors to the packaging application. This means an additional need of 510 kt recyclates from post-consumer waste (figure 3).

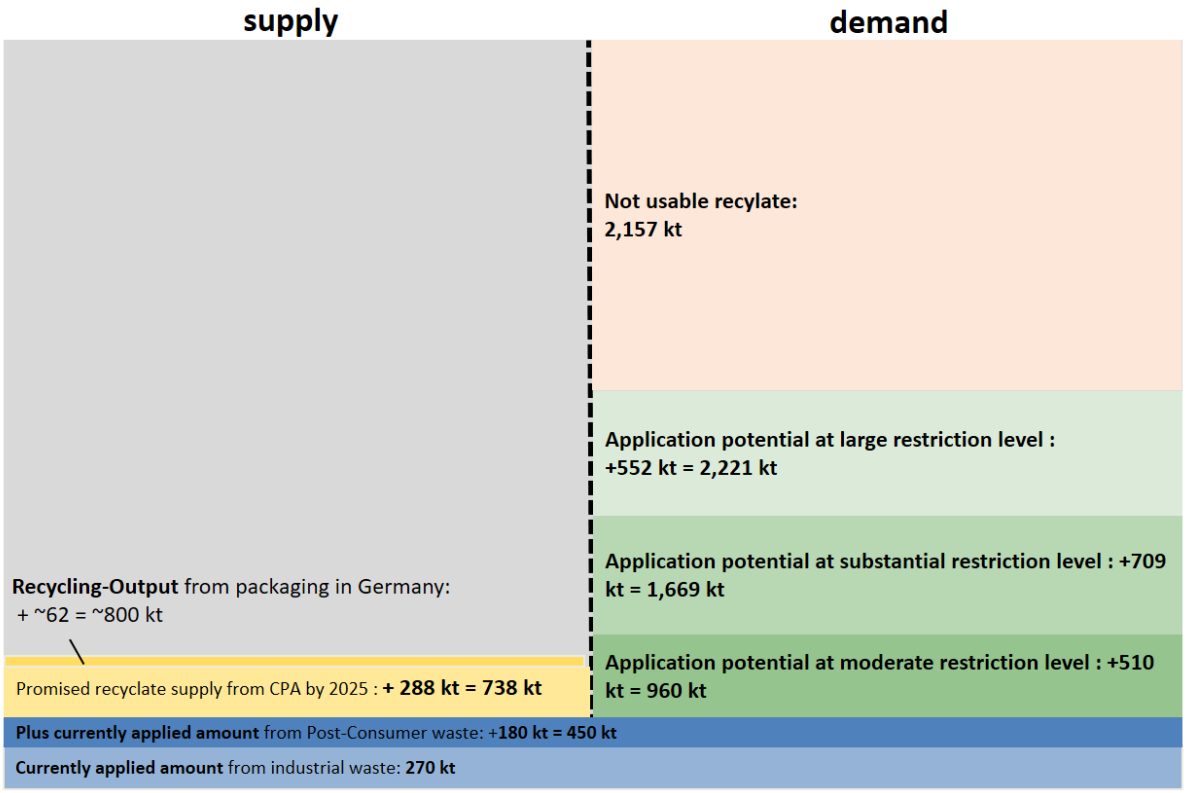

Figure 3: Overview on supply potential and application potential for each restriction level and goal.

Following bottleneck factors for the application of recyclates in packaging can be derived:

- Supply potential
- Willingness of fillers, dealers and brand owners to implement feasible objectives
- Compliance of requirements of packaging und the quality profile

All concerned parties of the economy cycle of plastics are asked to overcome the presented barriers to promote a market for recyclates and to comply with the EU targets. Figure 4 shows the derived recommended actions for each actor.

Politics	Creating incentives and promoting investigations
	More education
	Accelerating admission processes
	Solving conflicts of interest , stopping symbol politics
Packaging material and packaging producer	Developing innovative packaging solutions
	Enhance transparency
Filler, distributors and trade	Thinking in circularity
	Accepting restrictions
	Realistic requirements on quality
	More flexibility, no green washing
Consumer	To honour recycling capability and content of recyclates
	Accepting restrictions
	Improving quality of collection
	Separation of commercial waste
Waste management	Standards of qualities, constant quality
	Better information
	Exploiting existing possibilities
	Collection in public areas and other equal arise places
All parties	networking of the value chain
	Coordination of measures and initiatives
	Recyclates as independent products

Figure 4: Recommended actions for each party

The full study can be ordered against a fee of 500 EUR plus VAT on the BKV GmbH website (only available in German):

https://www.bkv-gmbh.de/en/info-zone/studies.html.