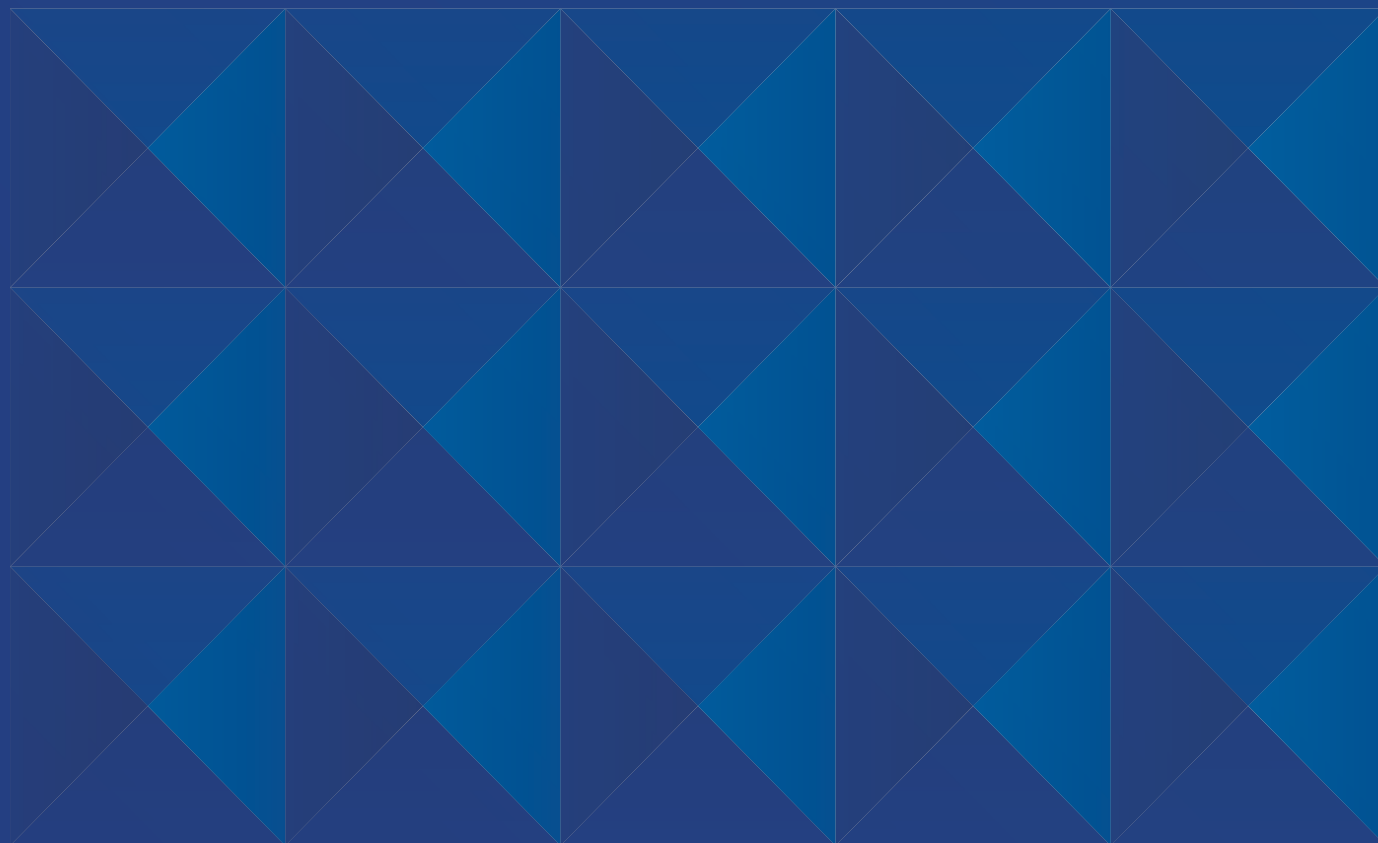


White paper

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# Recycled, Revalued, Repriced: PCR Plastics to 2032

The Development of Prices for Post-Consumer Plastic Recyclate  
in Europe until 2032 / A Prognosis in Three Scenarios



**Porsche Consulting**

**TecPart**  
Verband Technische Kunststoff-Produkte e.V.

**k. PE**  
**GROUP**

**TUM**

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## I. Foreword and acknowledgements

This white paper was jointly developed by Porsche Consulting, TecPart – Verband Technische Kunststoff-Produkte (Association of Technical Plastic Products), and KI•PIE Group. It is aimed at decision-makers along the entire value chain – from plastic production and processing to end-use applications. The paper provides concrete strategic guidance for building a more resilient and future-proof business strategy.

TecPart brings in-depth regulatory and normative expertise from European and national committees and is well positioned to assess political developments relevant to the plastics industry. With members from the fields of plastics processing and recycling, TecPart has broad industry knowledge, particularly regarding the availability and price trends of recycled plastics. This enables TecPart to offer strategically relevant recommendations for a wide range of industrial sectors.

The KI•PIE Group has been providing the European plastics industry with independently researched, in-depth industry intelligence and market price reports for more than 50 years.

Historical price data from the PIE database served as a foundation for the price modelling in this white paper. In addition, PIE's market and pricing experts provided valuable insights into price formation mechanisms.

Porsche Consulting combines deep expertise in the circular economy with industry-specific knowledge from key sectors such as automotive and chemicals. Leveraging its strong consulting methodology and in-house modelling capabilities, Porsche Consulting was able to produce well-founded market forecasts and derive strategic recommendations for action.

The Technical University of Munich (TUM) made a significant contribution for the white paper through its academic expertise. The involvement of TUM researchers ensured the scientific validation of the content. Building on the price modelling, TUM helped open up new perspectives for the plastics processing industry and significantly enhanced the depth and rigour of the white paper.

The authors would like to thank all interviewees and contributors for their valuable support and collaboration throughout the research and development of this white paper.

*Porsche Consulting*  
*KI•PIE Group*

*TecPart*  
*TUM*

## II. Abstract

The shift towards a circular plastics economy presents plastics processing companies in Europe with profound strategic challenges. Driven by ambitious EU regulatory requirements, recycled plastics – in particular post-consumer recyclates (PCR)\* – are becoming significantly more important. Industries such as packaging, construction, and automotive are increasingly competing for limited PCR volumes, leading to noticeable price increases and structural supply constraints.

This white paper analyses the root causes of this development and illustrates how political framework conditions, infrastructure limitations,

and technological trends have changed – and will continue to change – market mechanisms. At the core of the study is a dynamic simulation model that maps the price development of key plastic types up to the year 2032, under various future scenarios.

Supplemented by expert assessments, the study provides practical recommendations for action along the value chain – from product design and industry collaboration to strategic procurement. For decision-makers in the plastics processing industry, this white paper offers a solid basis for identifying risks at an early stage, building resilience, and positioning their business for long-term success in a circular plastics economy.

## Interview

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**Christian Schiller, Cirplus**

*How will the importance of the recycling sector for the plastics processing industry develop over the next few years?*

Without substantial improvements to the Packaging and Packaging Waste Regulation (PPWR) and the planned End-of-Life Vehicles Regulation (ELVR), as well as a fundamental political change of course towards a genuine circular economy, the importance of recycling is likely to decline. We can already see that, because of the major uncertainties and exemptions in the legislation, no one really believes that a significant surge in demand is coming. Should a demand boom nevertheless materialise in the next seven years, high-quality, genuine PCR recyclates from the Far East will be available to close the recycle gap. Unlike the EU, the Chinese government regards the topic as strategically important and is investing massively in the development of high-quality recycling infrastructure.

*Which regulatory and/or market-related challenges do you expect by 2032?*

Legislators have to decide whether to prioritise the use of recyclate over virgin material in the Packaging Act. The short-term survival of many plastics recyclers in Europe depends on this. However, the EU seems to be afraid of its own courage: it does not dare to set a target in law whose compliance depends decisively on market participants facing severe consequences for non-compliance. It may even suspend the quotas entirely.

*How can a high-performance and competitive plastics recycling sector be established in Europe?*

The greatest innovation potential lies in advanced mechanical recycling. Combined with a comprehensive reorganisation of waste streams in Europe and stricter requirements regarding the recyclability or circularity of products, we can tap significant potential in the circular economy. Last but not least, we must not forget ‘reuse’: in terms of its life-cycle assessment, a reusable product is generally superior to a recycled product.

*How will recyclate prices in Europe develop by 2032?*

If the surge in demand comes, we’ll see sharp price jumps in the short term due to limited availability – after all, China won’t be producing primarily for the European market either. After about 12 to 18 months, the situation should normalise as the number of processing plants increases. If the demand boom fails to materialise, prices will languish just below virgin material prices. An exception is likely to be PET recyclate, which is very popular even without quota requirements in the textile, automotive, and packaging industries. The real Gordian knots, however, are in polyethylene and polypropylene and in all engineering plastics – if we are serious about the circular economy.

\*The analyses and forecasts presented in this white paper relate exclusively to the post-consumer recyclate market. The post-industrial recyclate (PIR) segment and the market for engineering thermoplastics have been deliberately excluded due to a lack of reliable data necessary for producing sound and meaningful price forecasts.

### III. Management summary

The European economy is currently experiencing a regulatory turning point towards a circular economy. What began in 2020 with the Circular Economy Action Plan as an overarching vision has now been translated into concrete legal frameworks. The plastics industry, in particular, is at the centre of this transformation.

New regulations such as the Packaging and Packaging Waste Regulation and the planned End-of-Life Vehicles Regulation are sending clear signals: the use of plastic recyclate will become mandatory – whether in beverage bottles, packaging materials of all kinds, or newly produced vehicles.

A key element of this regulation is the requirement that the recyclate content must predominantly come from post-consumer recyclate – i.e. from plastic waste that has already gone through a

use cycle. While post-industrial waste is easier to utilise, the collection and processing of PCR presents the industry with serious challenges. For many companies this means not only higher costs but also increasing dependence on complex supply chains and volatile markets. Driven by regulation, demand is set to rise and a structural supply gap threatens to open from the early 2030s.

The supply shortage is set to intensify no later than 2032, when the ELVR quota requirements come into force. Our forecast indicates that price increases of up to 178% – for example in the case of polystyrene – are entirely realistic. This raises the prospect of a scenario in which PCR becomes a scarce and strategically critical raw material in Europe, with significant consequences for competitiveness and profit margins, particularly in the packaging, chemicals, construction, and automotive industries. To respond effectively, companies must begin setting clear strategic priorities today.

Four key areas for action are emerging:

- Building long-term partnerships within the recycling ecosystem: Direct cooperation between, for example, automotive OEMs and recyclers, waste management companies and technology providers, helps secure access to limited PCR capacities.
- Shifting procurement strategies: Moving away from a short-term focus on price towards strategic raw material security, including through pre-contracts and equity participation models.
- Adapting product and material development: Designing for recycling, substituting materials, adjusting quality requirements, and introducing modular product architectures increase flexibility and reduce cost risks.
- Engaging in collective political advocacy: Cross-sector alliances can help shape funding mechanisms, collection systems, and incentive structures.

In addition, policymakers must also play their part. To close the foreseeable supply gap, further investment is needed in mechanical, physical, and chemical recycling capacity, along with incentives for source-separated collection systems and measures to lower energy-related production costs for recycling companies. Only through a coordinated effort between industry and regulators can a viable, competitive, and sustainable plastics ecosystem be established in Europe.

## IV. Political and regulatory framework

At the time of writing this white paper, the new EU Packaging and Packaging Waste Regulation has come into force. The revision of the End-of-Life Vehicles Directive is being negotiated between EU institutions, and the European Commission is working on revising the WEEE Directive (Waste Electrical and Electronic Equipment Directive). The percentages and volume estimates mentioned below, based on the most recent publicly available information.

The current version of the PPWR sets binding and progressively increasing quotas for the use of recycled plastic in packaging, which will apply from 2030 onwards. For example, PET bottles must contain 30% PCR plastic, while other plastic packaging must include 35%.

At the same time, for contact-sensitive packaging made of PET (for example, in contact with food) a recycled plastic content of 30% is required. For contact-sensitive packaging made from other plastic materials, the required recycled content is 10%. From 2040 onwards, these targets will rise to 50% for PET bottles and 65% for other packaging.

For contact-sensitive packaging, the targets will increase to 50% for PET and 25% for other plastics. As for the revision of the EU End-of-Life Vehicles Directive, various quotas are being discussed. In its legislative proposal from July 2023, the European Commission called for 25% of the plastic in new vehicles to come from post-consumer recyclates once the regulation enters into force. Of that amount, 25% must come from closed-loop recycling, i.e. from end-of-life vehicles.

The Council of the European Union proposed a three-step approach in June 2025. Under this proposal, new vehicles would be required to contain 15% post-consumer recyclates within six years of the regulation entering into force.

This share would then increase to 20% within eight years, and further rise to 25% within 10 years. In addition, the proposal suggests that the European Commission should be granted the authority to grant temporary exemptions from the quota requirements in cases where material shortages occur or where prices become excessively high.

In July 2025, the European Parliament voted in favour of easing the strict recycled content targets originally proposed. According to its position, new vehicles should still contain 20% recyclates within six years of the regulation's entry into force, of which at least 15% must come from end-of-life vehicles. However, the Parliament's proposal also allows for the use of post-industrial recyclates, which may be used to cover up to 50% of the target value. Still under discussion is the scope of application – specifically, which vehicle types will be included. It remains unclear whether the revised End-of-Life Vehicles Directive will also apply to trucks, buses, or motorcycles.

In relation to the revision of the WEEE Directive, the European Commission published an initial evaluation in July 2025. According to the findings, around half of all e-waste in the EU is not collected at all. As a result, most EU Member States are

expected to fall significantly short of the 65% collection target. In fact, only around 40% of collected WEEE waste is currently being recycled. It remains unclear whether the revised WEEE Directive will include specific targets or quotas for the use of recycled plastics.

With regard to the German market, if the average recycled plastic content were to rise to 40% in the packaging sector, 20% in the automotive industry, and 20% in electrical and electronic applications, this would result in an annual demand of approximately 3.6 million tonnes\* of recycled plastic. This compares with 6.4 million tonnes of plastic waste generated annually in Germany. In other words, around 56% of plastic waste in Germany would need to be recycled in order to meet national demand for recycled plastics.

\*Plus future 'organic' volume growth in the proportion of plastics used in vehicles due to the transition to electromobility.

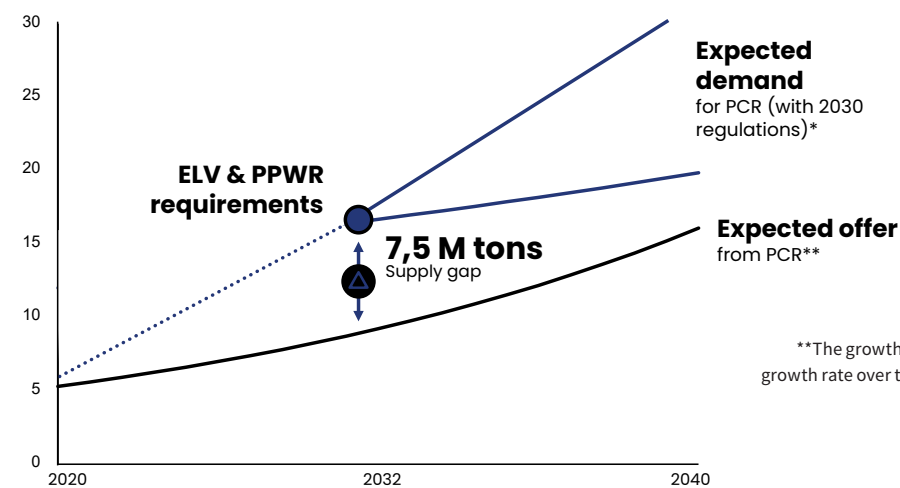
According to the timeframe considered in the study Material Flow Analysis of Plastics in Germany, the country's recyclates market is growing at an annual rate of approximately 2.7%. If this trend continues, the market would not reach the required volume of recycled plastics until 2032.

However, this projection does not take into account the quality requirements for recyclates, nor any additional growth in demand from other application areas such as construction products, consumer-facing goods, or agricultural materials.

It is therefore to be expected that the German market will need to rely on additional sources from elsewhere in Europe and internationally in order to meet its recycling targets.

Currently, it is estimated that the total annual output of recycled plastics across Europe amounts to around 7.7 million tonnes. Given the level of demand from Germany alone, this would mean that approximately half of the entire volume of recyclates available in Europe would be required by a single member state.

#### PCR RECYCLATE DEMAND [in millions of tons]



\*Assuming the distribution of plastic consumption across sectors remains unchanged, and that all sectors except automotive and packaging continue to use the same proportion of PCR as in 2021.

\*\*The growth rate for waste recovery is based on the average annual growth rate over the past 15 years, and the recyclate output corresponds to 55% of the waste input.

source: Porsche Consulting, Plastics Europe, Statista, OECD.

## A look beyond the horizon

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**Prof. Dr Ulrich Müller-Steinfahrt, University of Applied Sciences Würzburg-Schweinfurt**

*Since the coronavirus pandemic, the logistics sector has been characterised by disruptions and fractured supply chains. When do you expect a return to normal?*

Disruptions in supply chains are still present. Transport capacities – particularly in intercontinental trade remain distributed differently than before. In addition, geopolitically driven trade restrictions have led to a reorientation of supply chains. It will likely take another two to three years before supply chains stabilise.

*In your view, are transport costs – especially for sea freight – likely to go down or up in the long term?*

From my perspective, rising freight rates are to be expected. At present, transport capacities are being reduced. The industry is also consolidating, which will result in fewer, larger shipping companies with significant market and pricing power. If we see an economic recovery in major economies (China, the US, the EU), demand for transport will rise again – and with limited freight space available, rates are likely to increase accordingly.

*Could higher freight rates be used to regulate plastic imports at dumping prices?*

No, regulating freight rates is not the right approach. Import restrictions would have to be implemented through import duties.



## V. Methodology and assumptions behind the price forecast

### Methodology and assumptions behind the price forecast

To provide companies with a robust foundation for strategic decision-making, this white paper applies a structured, three-stage analytical approach. The aim is to calculate and assess the price development of PCR plastics up to the year 2032 under different future scenarios – and to derive strategic recommendations for action.

#### 1. Identification of key price drivers

The first step involved identifying the main factors influencing the pricing of PCR materials. These include structural variables such as recycling capacities, material yield, sorting quality, and infrastructure availability, as well as politically induced demand impulses. The analysis distinguishes between market-driven demand, which is highly price-sensitive, and regulation-driven demand, which is largely price-inelastic. This distinction is crucial, as regulatory interventions fundamentally alter market

dynamics: once quotas become mandatory, price loses its steering function – availability becomes the dominant factor. These drivers were validated through a structured evaluation of market reports and industry analyses.

In addition to traditional factors like virgin material prices and recycling costs, the analysis also considered external influences such as import restrictions, seasonal demand variations, quality standards, and the market perception of recyclates. Only structurally relevant and data-quantifiable factors were integrated into the model.

#### 2. The model's system logic

The identified drivers were incorporated into a system-dynamics model that simulates price formation based on supply-demand balances. The model operates at the level of individual plastic types and takes into account varying recycling efficiencies and elasticities for each material category.

For example, PET demonstrates greater resilience to price fluctuations due to its high recycling yield and well-established collection systems. In contrast, PS and mixed polyolefins are structurally more constrained and therefore carry a higher degree of price risk.

The model's system logic is based on a classic market equilibrium of supply and demand, enhanced with dynamic elements such as recycling capacity, sorting performance, export volumes, and regulatory quotas.

Demand is broken down into three components: regulation-driven demand, market-driven demand, and export demand. On the supply side, the model accounts for both domestic recycling output and import volumes. Prices are determined by calculating the imbalance between supply and demand, weighted according to the respective price elasticity.

The model deliberately abstracts from individual cost elements such as energy prices or logistics costs, as these tend to fluctuate significantly in practice and are difficult to forecast. Instead, the focus is placed on structural bottlenecks that are likely to dominate price formation in the long term.

### 3. Scenario-based strategic outlook

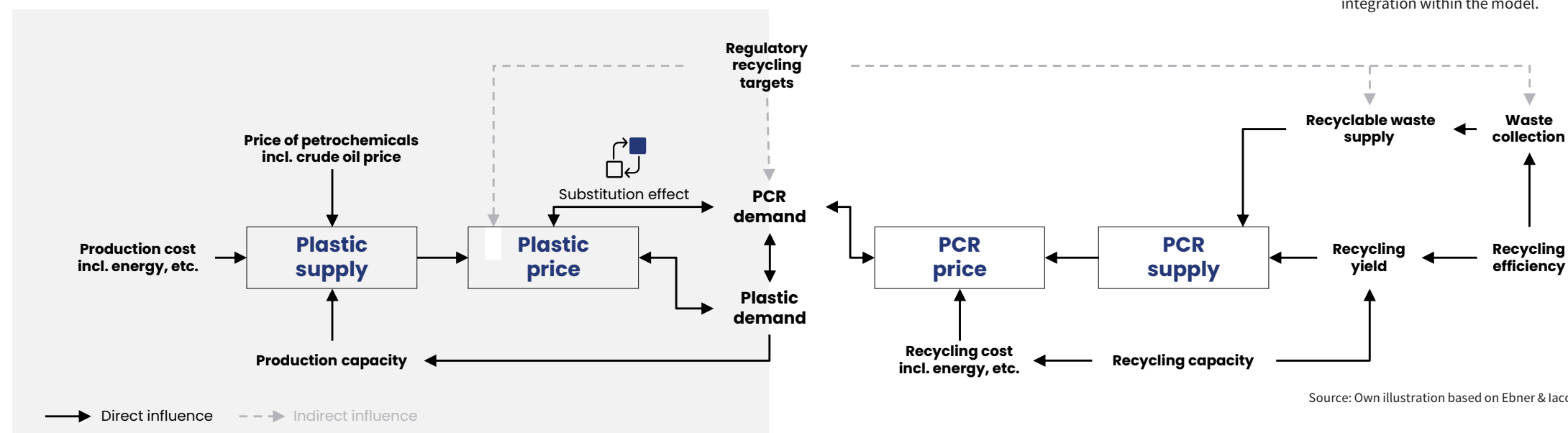
Given the uncertainty surrounding future developments in regulation, market dynamics, and infrastructure, a scenario-based approach was adopted. Three scenarios – Base Price, Mixed Price, and High Price – represent different combinations of political ambition, market behaviour, and infrastructural capability.

These scenarios systematically vary key parameters such as total demand, PCR quotas, voluntary market uptake, recycling capacities, sorting efficiency, import volumes, and export behaviour. They serve as the framework conditions for the modelling process and highlight the circumstances under which price volatility could become the new normal – and how companies can enhance their resilience through targeted measures such as long-term supply contracts, vertical integration, or choosing materials that are more recycling-friendly.

#### Limitations of the model

Not all relevant influencing factors could be incorporated into the quantitative modelling. Although logistics costs, tariffs, energy prices, financing costs, and the insurability of recycling facilities were identified as relevant, they could not be included due to a lack of reliable data or structural integration within the model.

System logic of the market for virgin and PCR plastics



Source: Own illustration based on Ebner & Iacovidou (2021)



## A look beyond the horizon

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Stefan Neuburg, GGW Group

*Is it true that fires occur more frequently in the plastics recycling industry than elsewhere?*

There is currently no reliable data on the frequency or causes of fires specifically in plastics recycling facilities. While fires do occur from time to time in various recycling operations, we do not observe a particular concentration of incidents in plastics recycling specifically.

*Do insurers cancel contracts with plastics recyclers more frequently than average after a loss?*

In general, we are seeing insurers becoming increasingly cautious across the entire recycling sector, with many no longer offering property insurance at all. This trend is not limited to plastics recyclers but affects all areas of recycling. Cancellations following a claim are standard practice in the insurance industry.

*How difficult is it for a recycling company to obtain insurance in the first place?*

In recent years, it has become noticeably more difficult for recycling businesses to obtain adequate insurance cover. Requirements for preventive fire protection have often increased, and premiums are also rising. While we wouldn't yet speak of a general "insurance crisis", there are indeed businesses that, due to their individual risk profiles, are currently unable to secure any insurance cover.

*What do plastics recyclers need to do to obtain insurance?*

Above all, they need to implement effective fire protection measures – whether structural, technical, or organisational. These steps are usually essential to ensure that the business is insurable at all.

## VI. Scenarios for the development of PCR prices

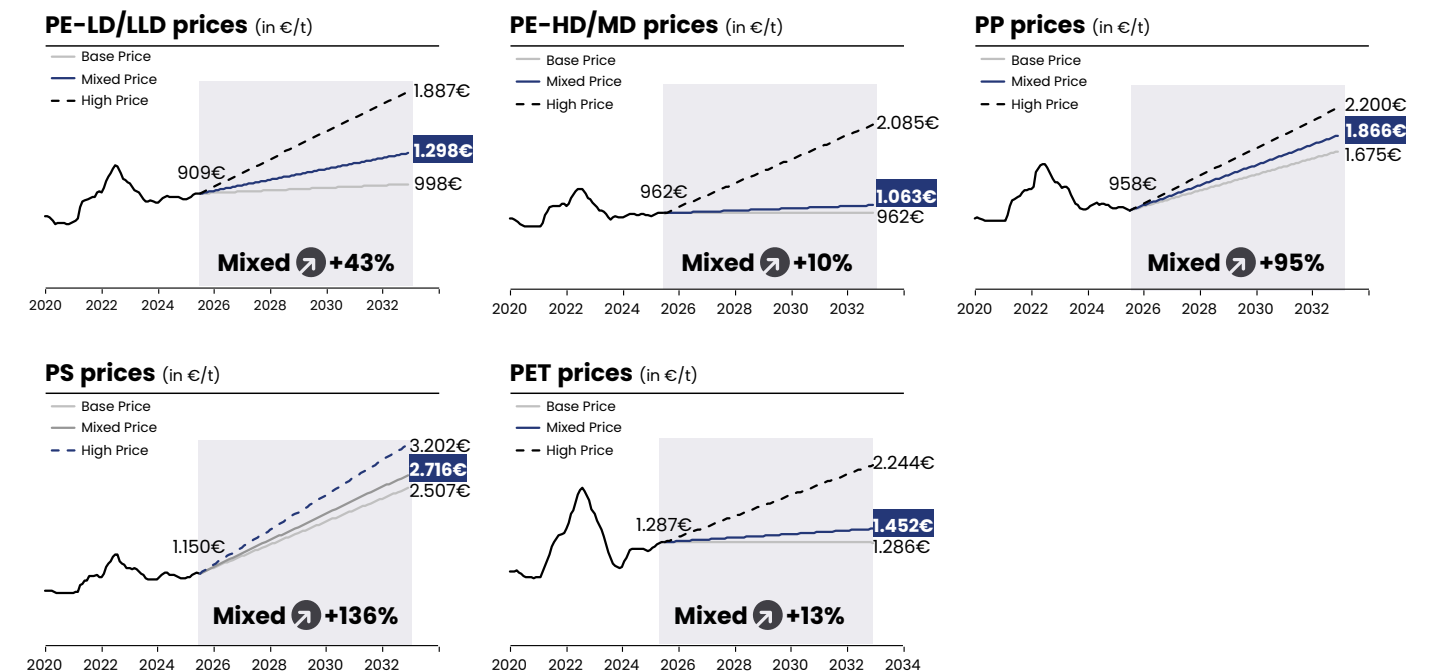
### Strategic scenario development: Three future paths for PCR prices to 2032

The pricing of post-consumer recyclates over the coming years will be shaped primarily by regulatory targets, infrastructure capacity, and the behaviour of market participants. To provide businesses with a robust basis for strategic decision-making, three pricing scenarios have been developed, each illustrating a different trajectory through to 2032.

These scenarios vary in terms of political ambition and market response, and they highlight how

the pace of infrastructure development, price risks, and supply conditions may shift depending on the context. A common assumption across all scenarios is that regulation-driven demand is entirely price-inelastic: once quotas become mandatory, availability – not price – becomes the decisive factor.

In contrast, market-driven demand remains highly price-sensitive: when virgin materials are cheaper and there is no regulatory obligation, the market tends to favour new, non-recycled materials.



Source: Own illustration



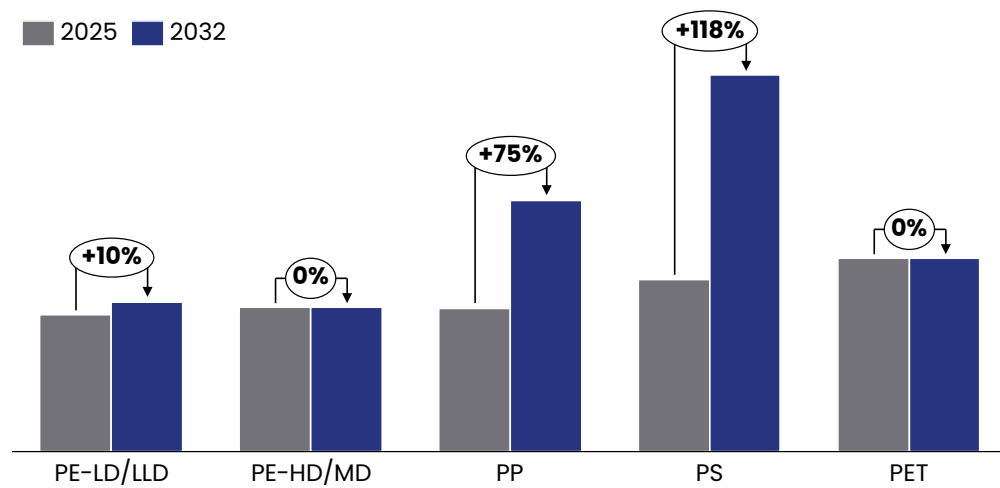
### Price impacts vary significantly by scenario and plastic type

#### Base price scenario: Regulation takes hold, infrastructure follows

Market dynamics: EU regulatory measures – such as the PPWR and ELVR – are fully implemented. Demand for PCR rises in line with quota requirements, but it is entirely price-inelastic. Infrastructure develops at a moderate pace: recycling capacity and sorting performance improve, but not across the board.

Voluntary demand remains stable but plays a secondary role. Price trends show clear differentiation by material type: while HDPE/MDPE remains stable, prices for PP and PS rise significantly – an indication of structural limitations in those streams.

Base price scenario – price comparison 2025 vs 2032 (in %)



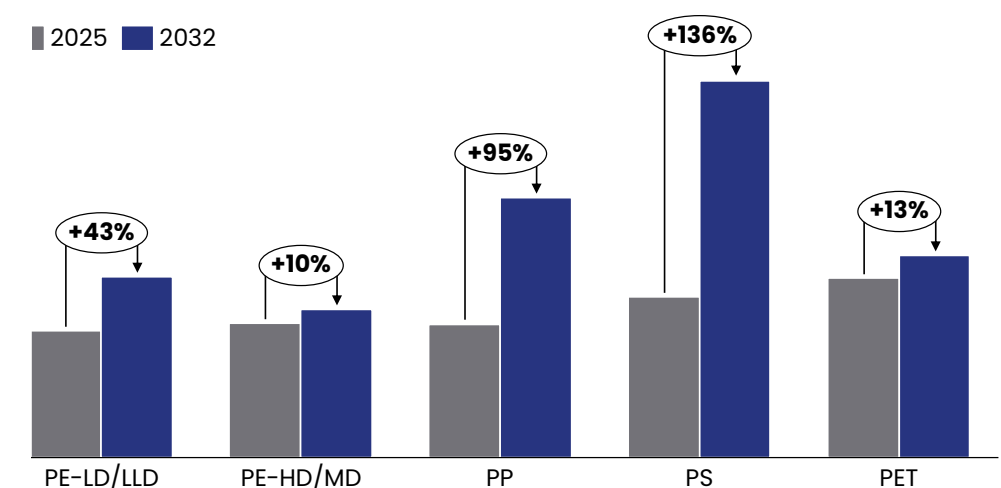
Source: Own illustration

### Mixed price scenario: Ambition meets reality

Market dynamics: Political ambition is high, and regulatory quotas are broadly enforced. At the same time, the reality of infrastructure development becomes apparent: capacity expansion is selective, sorting performance improves in certain areas, and imports stagnate.

Demand is largely regulation-driven, with price elasticity declining. Price trends diverge by material: PP and PS see significant increases, while HDPE/MDPE and PET remain relatively stable.

Mixed price scenario – price comparison 2025 vs 2032 (in %)



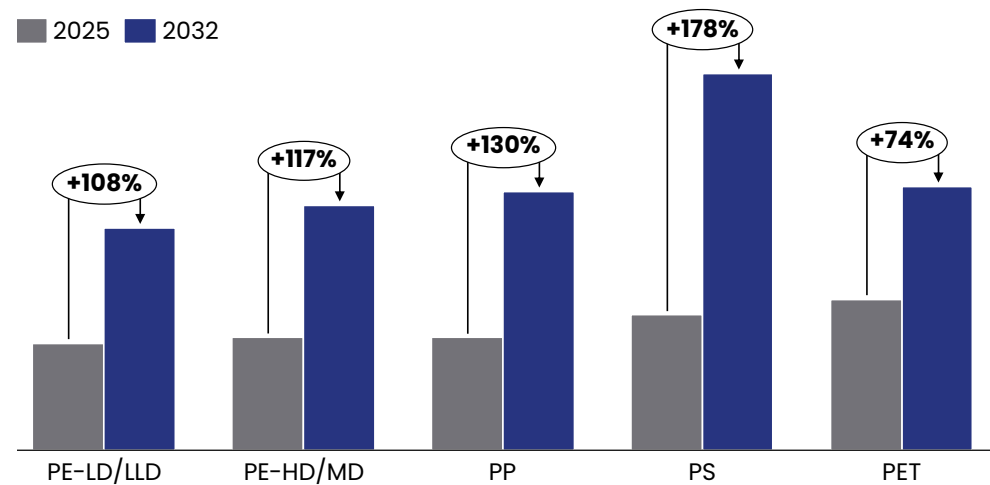
Source: Own illustration

### High price scenario: Political pressure meets structural limitations

Market dynamics: In the high price scenario, the transition to a circular plastics economy is driven forward with maximum regulatory force. Quotas are high and strictly enforced. At the same time, infrastructure expansion falls significantly short of demand: sorting capacities stagnate, investments in new facilities are lacking, and imports are restricted by political barriers or trade conflicts.

Demand for PCR is entirely inelastic – it arises from regulatory obligation and is independent of price levels. Supply cannot keep pace with this development. The result is structural shortages that lead to sharp price increases. Materials with low recycling efficiency, such as polystyrene, are particularly affected due to poor yields and limited processing capacity.

High price scenario – price comparison 2025 vs 2032 (in %)



Source: Own illustration

### Conclusion

The three scenarios demonstrate just how significantly the pricing of PCR plastics is shaped by political objectives and the realities of infrastructure. For businesses, this means that price forecasts alone are not enough. A deep understanding of the structural drivers and their

interdependencies is essential – along with the ability to respond flexibly to different future pathways. These scenarios offer a strategic tool to help companies anticipate risks, prioritise investments, and future-proof their procurement strategies.

## Interview

### ” Andreas Vogt, Vogt-Plastic

*How will the role of the recycling industry in the plastics processing sector develop in the coming years?*

That depends on political will – and on society's willingness to support it. Plastics recycling can only progress within a solid regulatory framework. At present, it's still cheaper to produce fossil-based virgin plastic and incinerate waste than to create secondary plastics from it. In Germany, packaging has had such a regulatory framework since 1991 – initially through the Packaging Ordinance and now via the Packaging Act. The PPWR, which has now come into force, goes far beyond that kind of policy framework and acts more like an “industrial policy”, intervening in many detailed aspects of the value chain. That carries a considerable risk of unintended consequences.

*What regulatory and/or market-related challenges do you foresee between now and 2032?*

One of the most significant regulatory challenges for the plastics recycling industry will be the final design of minimum recycled content quotas for food packaging made from polyethylene and polypropylene. High-quality recyclates from mechanical recycling are and will remain in short supply in this area. Using chemically recycled material will drive up the cost of PE and PP packaging, likely resulting in substitution with poorly recyclable alternatives such as plastic-paper composites. We fundamentally support minimum recycled content quotas – but not for PE and PP food packaging.

## VII. Strategic orientation

### Strategic orientation

The analysis of future PCR price formation makes one thing clear: the market logic is undergoing a fundamental shift. To effectively mitigate the price risks associated with PCR, a holistic and strategically aligned approach is required – one that combines market-based levers, regulatory frameworks, and technological innovation.

#### 1. Long-term partnerships for sustainable plastics cycles

Long-Term Agreements (LTAs) are gaining strategic importance in PCR procurement. In a market shaped by volatility and limited availability, LTAs offer price stability and planning certainty. They also create the conditions needed to develop new and diversified supply capacities.

Within the EU in particular, LTAs can act as a key lever to unlock investments in recycling infrastructure. Early demand commitments

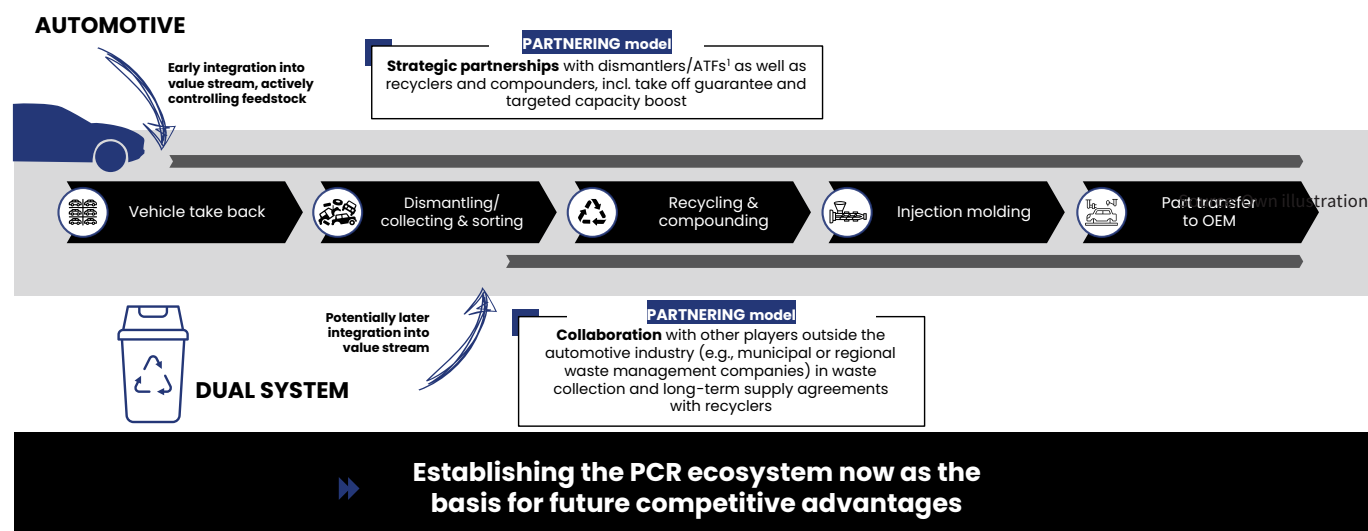
provide recycling companies with the economic security needed to invest at scale in sorting, processing, and compounding.

Without such advance commitments, many projects remain underfunded, delaying the urgently needed diversification of PCR sources.

For businesses, LTAs are far more than just a procurement tool – they are an essential part of risk management. They offer protection against sudden market disruptions, strengthen resilience across the value chain, and enable proactive cost control.

Combined with targeted supplier diversification, LTAs form the foundation of a robust system: companies secure long-term volumes, suppliers gain the confidence to invest, and the industry reduces its dependency on individual markets. This dual strategy lays the groundwork for a resilient, competitive, and sustainable PCR supply in Europe.

Long-term partnerships ensure OEMs have a secure supply of recyclate



### 2. A paradigm shift in procurement strategy

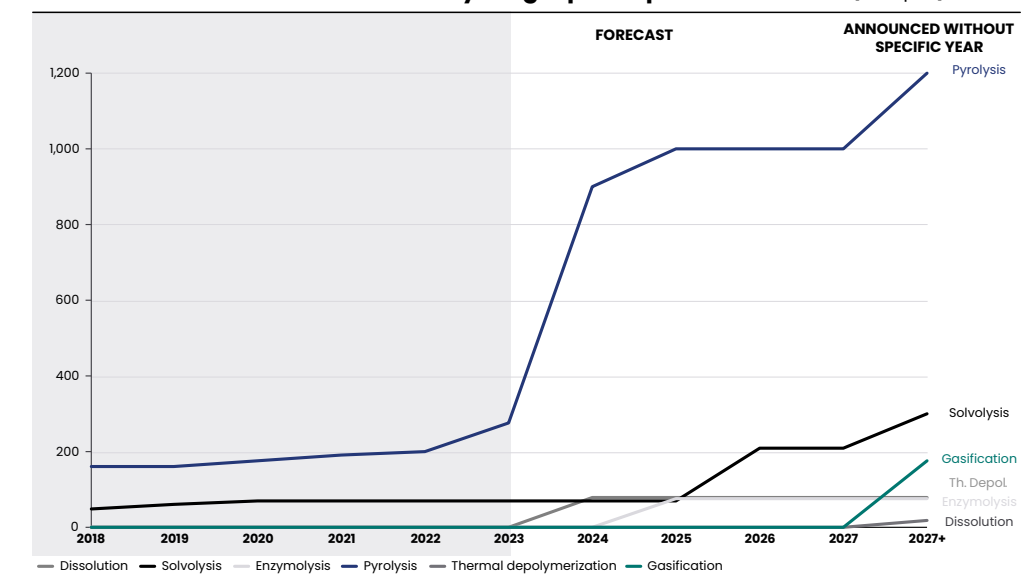
European companies face the strategic challenge of securing early access to PCR materials from outside the EU, while simultaneously supporting the development of new recycling capacity within Europe. This engagement must go beyond traditional procurement activities and take the form of equity investments, joint ventures, or long-term offtake agreements – particularly during early project phases, in order to provide investment security to new market players.

At the same time, the procurement function must evolve structurally: a purely cost-driven supplier selection increases vulnerability to market shocks.

Going forward, resilience and geopolitical risk must become integral components of companies' supply chain architecture, procurement strategies, and budget planning.

Businesses are called upon to align their procurement decisions with long-term supply security objectives – even if this entails higher costs. These additional expenses should be understood as a strategic investment in supply chain security and brand reputation – comparable to an insurance policy against future supply bottlenecks.

Installed and future advanced recycling input capacities EU27+3 [in kt p.a.]



source: based on nova-Institute (2024).

### 3. Adapting product design as a lever for a circular plastics economy

The targeted use of recyclable plastics is a key lever for strengthening recyclability and securing future PCR material flows. Companies must consistently align their product design with circularity. This starts with the use of mono-materials rather than complex plastic mixtures to simplify sorting and reprocessing.

In addition, design-for-recycling principles such as detachable connections (e.g. clips instead of adhesives) must be implemented across the board to enable the recovery of single-material streams.

Moreover, a rethink is required regarding quality requirements, particularly in strictly regulated industries such as automotive. The use of pure, mechanically well-recyclable plastics such as polyethylene should be prioritised over highly specialised polymer blends.

Lowering existing quality requirements in favour of recyclability is not a step backwards, but a strategic move towards industrial sustainability and security of supply.



#### Impeccability

Recycled plastics should be free from contamination.



#### Batch consistency

Material quality should be consistent across different batches.



#### Thermomechanics

Recycled plastic parts must exhibit mechanical properties (e.g. tensile strength, viscosity and melt index) and withstand thermal loads.



#### Odour

Recycled materials should not exhibit unpleasant or undesirable odours.



#### Health compatibility

Recycled plastics must not contain harmful chemicals that could endanger health or the environment



#### Regulatory conformity

Recycled plastics must comply with applicable legal requirements (e.g. recycling quotas).



#### Traceability

The origin and composition of the recycled material must be ensured and be traceable.



#### Colour aesthetics

Recycled plastics should have a uniform colour and be free from discolouration.

### 4. Joint political action for circular plastics systems in Europe

Ensuring PCR availability requires more than technical solutions: it demands coordinated, cross-sector engagement along the entire plastics value chain. Major European players such as automotive OEMs, tier-1 suppliers, chemical companies, recyclers, and waste-management operators, even direct competitors, must, work together – in strict compliance with anti-trust regulations – to create the conditions for a functioning circular economy and present a united front to political decision-makers.

A joint approach would enable the industry to define uniform requirements for a resilient European PCR value chain. These include regulatory support to accelerate local recycling-capacity expansion or technological development in the field of chemical recycling. Equally decisive are state-supported financing instruments – such as guarantees, credit lines, or insurance solutions that reduce investment risk and mobilise private capital for capital-intensive, long-term projects. Jointly articulated needs have greater political impact and increase the likelihood of implementation.

## A look beyond the horizon



**Dr. Matthias Ballweg, Circular Republic**

Plastics recycling from textiles is a rapidly growing market. The introduction of Extended Producer Responsibility (EPR) regulations, planned for 2028, is expected to give the sector a further boost. Essentially, EPR works like the Green Dot scheme. However, it is likely to include provisions allowing textile producers – i.e. the major clothing brands – to reduce their fees if they use recyclates. This will stimulate both supply and demand at the same time.

In addition, there are already numerous start-ups pioneering in this space. One such newcomer, Eeden, has developed a process capable of recycling blended fabrics made of synthetic and cotton fibres together. This is a critical breakthrough for textile recycling, as more than half of all textiles are not made purely from cotton or polyester but are blended materials.

## Interview

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**Ralf Düssel, Plastics Europe Deutschland**

*How will the role of the recycling industry evolve for the plastics processing sector in the coming years?*

Given the political targets, societal demands, and the need to build a resilient raw material supply in Europe, the recycling industry will become increasingly important to the plastics sector. For plastic manufacturers, one thing is clear: to meet the legally mandated targets for recyclate use, all available technologies must be utilised. This means massively scaling up mechanical recycling and rapidly expanding chemical recycling. However, the industry will only succeed in transforming into a climate-neutral circular economy if it remains internationally competitive. Therefore, competitive energy and raw material prices, cutting red tape, and speeding up approval procedures must remain top priorities.

*What regulatory and/or market challenges do you anticipate by 2032?*

Recycling will be strengthened by a range of regulatory measures, such as the Packaging Regulation, the End-of-Life Vehicles Directive, the WEEE Directive and Ecodesign criteria. At the same time, we're seeing a dual displacement effect: Europe's plastics production has already lost significant international competitiveness. Although global demand is rising, the volume of plastics produced within the EU is declining. Moreover, cheap imports are increasingly outcompeting domestic producers. This is a trend visible across the entire value chain. We urgently need an effective industrial policy to counteract it.

## VIII. Vision

The dynamic price development of PCR is increasingly presenting both strategic and operational challenges for the plastics industry. However, these challenges do not need to be tackled in isolation – they can be addressed collaboratively within a broader PCR ecosystem.

To make sound decisions, continuous monitoring of market and polymer price developments is essential. The industry information service PIE provides a reliable foundation for this: companies can transparently track specific recyclate prices there and incorporate them into their planning and procurement processes – a crucial step in identifying and managing price risks at an early stage.

Porsche Consulting supports companies in evaluating the economic impact of PCR use on case-by-case basis. In close collaboration with

departments such as procurement and product development, robust calculation models and scenarios are developed. These cover cost structures, material specifications, partnership models, and design-for-recycling indices across the entire circular value chain.

However, the transformation towards a circular plastics economy cannot be accomplished by companies alone. To shape a European PCR ecosystem, Porsche Consulting leverages an existing network of chemical companies, recyclers, OEMs, and other stakeholders along the value chain.

Within industry association TecPart, key political and systemic issues are addressed collectively. The association provides a platform for sharing best practices, discussing regulatory framework conditions, and unified positions to engage with policymakers.

## Interview

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**Prof. Dr. Thomas Müller-Kirschbaum, Circular Valley**

*Which regulatory and/or market-related challenges do you expect by 2032?*

The greatest regulatory challenges arise from the PPWR and the quotas contained therein. In the non-food sector, these requirements can largely be met using mechanically recycled plastics. In the food sector, however, it is already clear that compliance won't be possible without chemically recycled plastics sourced from household waste (e.g. polyolefin packaging or PET trays from the yellow bag/yellow bin). At present, the plastics recycling loop in the food sector only works for PET beverage bottles. In any case, increasing demand will lead to a significant rise in recycle prices. With chemically recycled plastics such as PET, there is an added complication: under current regulations, the mass balance approach does not allow the recycled content derived via chemical recycling to be labelled on packaging. This is problematic for brand manufacturers, as end consumers pay close attention to the recycled content in product declarations. A major challenge of the PPWR is that significantly less recycle from European facilities will be available than is actually needed in Europe. There is a lack of sufficient investment. As a result, it is expected that the additional European demand for recyclates will be met primarily through imports from Asia. Beyond the need to comply with European regulations, this also means that the expertise and capability in recycling will develop in Asia, rather than within Europe.

*How are recycle prices likely to develop in Europe by 2032?*

Prices fluctuate significantly and are not directly tied to the price of fossil-based virgin materials. It is likely that prices will be around 50% higher than for virgin plastic. Chemically recycled plastics are even more expensive. At present, there are no large-scale chemical recycling plants in Europe for polyolefins (polyethylene and polypropylene) or PET. As such, current market prices are not based on functioning supply and demand dynamics. The cost of chemically recycled plastics depends heavily on the specific recycling process, which in turn varies by material. Key factors include the capital costs of the complex facilities, the ongoing costs of often highly energy-intensive processes, the quality of input materials, and the yields achieved by the process. From a purely technical perspective, chemical recycling will be more expensive for most plastics than mechanical recycling. In one cost scenario for a closed-loop plastics system, we assumed costs would be double those of fossil-based virgin materials. However, where prices will ultimately settle remains unclear - especially if, as expected, Asian recycle producers adapt to fill the gap left by insufficient European capacity.

## IX. Sources and imprint

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### Imprint:

Publishers:

Kunststoff Information GmbH

Porsche Consulting GmbH

TecPart e.V.

### Responsible according to German press law:

Kunststoff Information GmbH, Saalburgstr. 157, 61350 Bad Homburg, [www.ki.de](http://www.ki.de)

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