Hubron.
The Essential Ingredient in Plastic Innovation

PIAE 2026

Plastics in **Automotive Engineering**

Strategic Industry Report: Macro Trends, Headwinds, Emerging Segments & Innovations

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This report was prepared with special focus on the perspective of masterbatch and compound producers who supply into the automotive industry.

In March 2026, Hubron's Business Development Manager, **Michael Frisch**, spent some time in Baden-Baden, Germany, at **PIAE 2026**, the Plastics in Automotive Engineering conference.

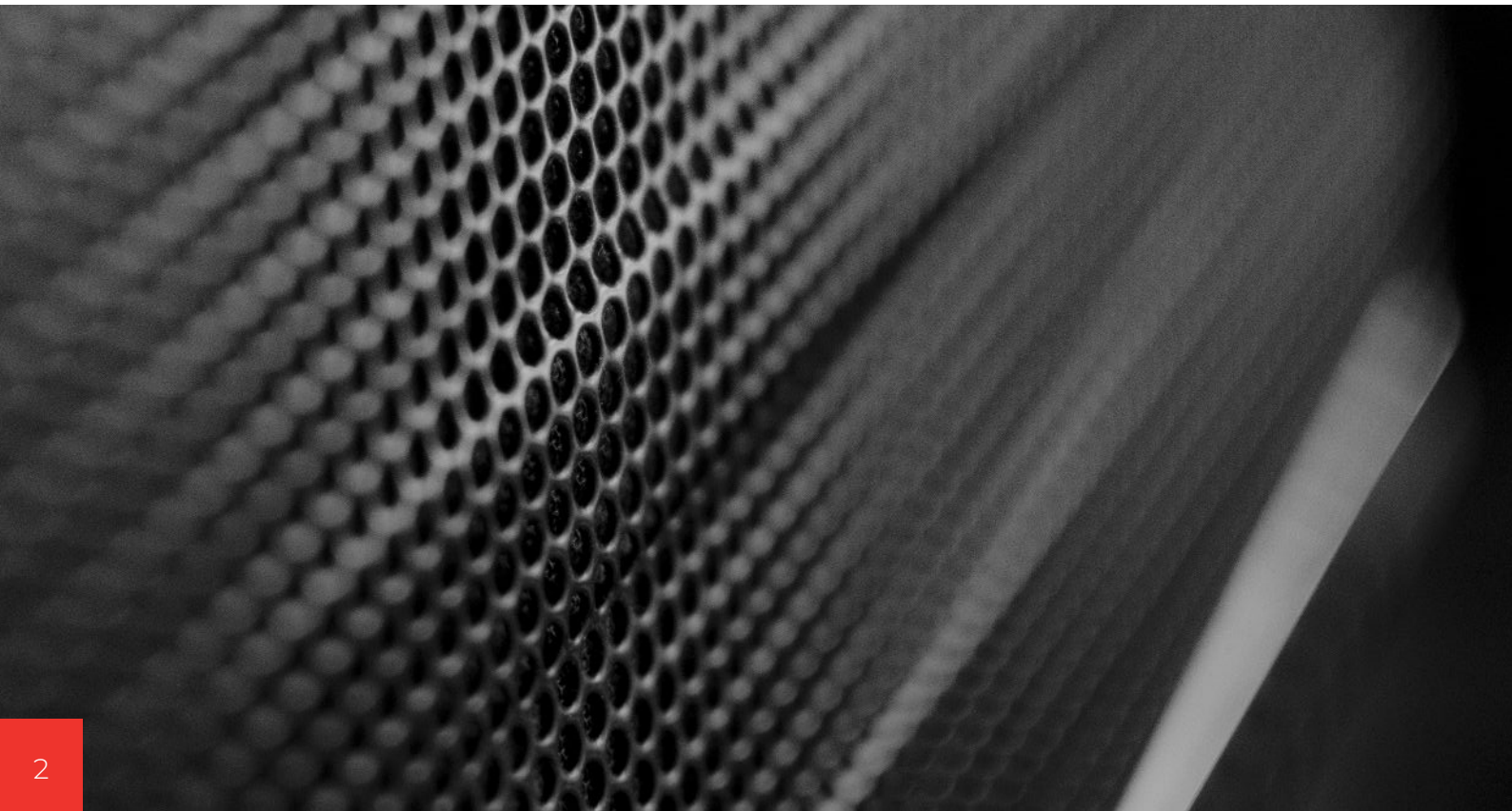
More than 40 technical papers were presented there by carmakers, their suppliers, material producers and research institutes, and together they gave a clear read on where the automotive plastics industry is heading.

This report gathers what he brought back. It looks at the three forces reshaping the sector:

- Electrification
- Tighter recycling rules
- The growing use of artificial intelligence

For each area, the report works through what changes mean for the companies that supply materials into vehicle production.

The findings summarised here were first presented by the OEMs, suppliers and research institutes speaking at the event. We have drawn them together into one view, written for anyone in the masterbatch and compound world, including end users, procurement teams, and technical teams – all the way through to distributors. The report is perfect for understanding where the next decade is heading so planning can occur as early as possible.



1. Executive Summary

At the PIAE conference 2026, more than 40 technical papers were presented by OEMs, Tier-1 suppliers, material producers and research institutes. The overall picture is clear: the automotive plastics industry is in a phase of structural change. The main drivers are electrification, new recycling regulations and the use of artificial intelligence. For masterbatch and compound producers, this situation means both new challenges and concrete growth opportunities.

The EU End-of-Life Vehicles Regulation (ELV Regulation), in force since 13 August 2026, is the most important regulatory change for material requirements. Its recycled content targets for plastics apply from 2032. From 2032, 15% of the plastics used in newly approved vehicle types must come from recycled material. This share will increase to 25% by 2036. An important additional requirement is that at least 20% of the recycled content must come from closed-loop recycling of end-of-life vehicles. The targets count post-consumer plastic specifically, and tyre elastomers and most thermosets are excluded from the calculation.

Five important areas of action can be identified for masterbatch and compound producers:

1. PCR integration at scale: It is now necessary to develop stable colour and additive systems for post-consumer PP, PA and PBT with variable raw material quality.

2. Functional compounds: The requirements from EV platforms make thermally conductive, radar-transparent, flame-retardant and EMI-shielding compounds more and more important. These product groups have higher margins than standard compounds.

3. Monomaterial concepts: OEMs and Tier-1 suppliers are already actively replacing multi-material composites. Compounds which make recyclable monomaterial solutions possible are in demand.

4. AI-supported process reliability: Variable recyclate quality causes problems in processing. Suppliers who can deliver well-characterised batches with processing data will be preferred.

5. Sustainability communication: CO_2 footprint per kilogram, certified recycled content and digital product passports are becoming more and more important in purchasing decisions.

2. Macro Trends Which Are Changing the Industry

2.1 Electrification as the Central Driver

Battery-electric vehicles are now setting the design requirements. Aerodynamic drag directly influences driving range, so active aerodynamic components like active grille shutters and deployable aeroblades are already standard even in SUV segments. The Porsche Cayenne Turbo Electric, for example, reaches a claimed drag coefficient (cW) of 0.25. This has direct consequences for material requirements: visible aerodynamic parts must combine stone chip resistance, UV stability, dimensional accuracy and good coatability for PUR systems.

At the same time, battery weight (300 to 550 kg in current vehicle platforms) increases the pressure to reduce weight in all other structural and trim parts. Polypropylene remains the most used polymer in automotive interiors and makes up approximately 40% of the total plastic weight in a vehicle. This makes PP the most important material both for weight reduction and for meeting the new recycling requirements.

2.2 The European Glass Fibre Reinforced Plastic (GFRP) Market Is Under Pressure

According to the AVK market report 2024, the production volume of composites in Europe decreased by 5.6% and reached only 2,416 kt. This is the lowest level since 2012. The European share of the global composites market fell to around 18%. The reasons are structural problems: high energy prices, high labour costs, bureaucratic burden and the shift of automotive production to other regions. German OEM production declined by more than 5% in the first nine months of 2025. This also directly reduces volumes for compound and masterbatch suppliers in Europe.

Indicator	Status 2025–2026
EU GFRP market volume	2,416 kt (−5.6% vs. 2023; back to 2012 level)
European market share (global)	Approximately 18% (decreasing)
New EU car registrations	Still below the 2019 level; BEV share is increasing
German OEM production	>5% decline; market share losses in China and USA continuing
Energy and labour costs	+15% compared to other European countries; significantly higher than Asia or USA

2.3 The ELV Regulation Changes the Whole Supply Chain Logic

The ELV Regulation is the biggest regulatory change for automotive materials in many years. Almost all papers on sustainability topics at PIAE referred to these requirements. The recycled content targets mean that compound producers have to fundamentally rethink their raw material sourcing.

Timeline	Requirement
From 2032	15% of plastics by weight from recycled material; 20% of this must come from ELV closed-loop recycling
From 2036	25% recycled content (20% from ELV closed-loop recycling)
Dismantling requirement	Selected plastic parts must be dismantled before shredding
Extended producer responsibility	OEMs are responsible for the downstream material recovery

3. Main Challenges for Masterbatch and Compound Producers

3.1 Variable Quality of Post-Consumer Recyclates

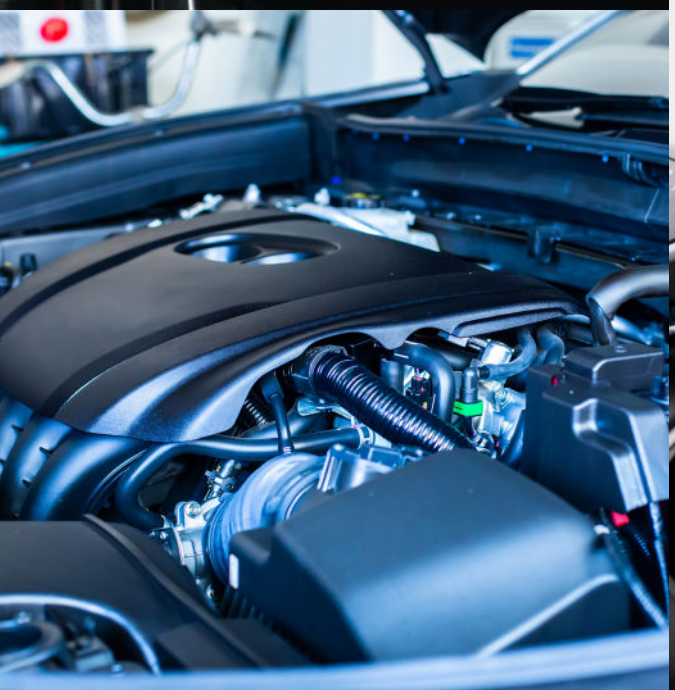
Several presentations at PIAE showed clearly that the main technical problem with PCR materials is quality variability. Feedstocks from household packaging differ in molecular weight, contamination, colour and filler content. Systematic sourcing protocols, batch-by-batch quality certificates and the ability to compensate for lot-to-lot variations by adjusting additives and fillers will become basic competencies. Price premiums for guaranteed PCR quality grades are already appearing in the market.

3.2 Colour Matching With PCR Content

Borealis showed that the range of colors which can be achieved with PCR PP compounds is more limited compared to virgin material. Bright colors are practically not possible with high PCR content. Darker and neutral colors are achievable, but need 20 to 40% higher pigment concentrations to compensate for the variable base color of the recyclate. On the other side, more and more designers are intentionally working with the visual character of recyclate materials and use multi-spot or speckled surface structures which make the recycled content visible. These effect surfaces however require a reformulation of the compound to keep the mechanical properties stable.

3.3 Multi-Material Designs Make Recycling Difficult

Volkswagen, along with Volkswagen Nutzfahrzeuge (Volkswagen Commercial Vehicles) and Škoda, presented a clear argument: every material combination, every adhesive joint and every coating in an interior component makes end-of-life recycling more difficult or more expensive. Classic soft-touch surfaces with PVC-slush, PU-foam and PP carrier material are in practice not recyclable at relevant scale. The trend towards monomaterial designs (PP/TPE combinations, PA sandwich structures, all-PP organosheet hybrids) will change which material families are used in the future. PVC and thermoset-based assemblies are most affected by this change.



4. Material Innovations: New Compound Categories

4.1 Functional Compounds for EV Applications

Electric vehicle platforms require new types of compounds that did not exist as standard products a few years ago. The following product categories show the highest growth potential:

- **Radar-transparent engineering plastics:** PBT, PBT/PET and PBT/PC blends with defined dielectric constant (Dk 2.9 to 4.0) and dissipation factor (below 0.015) for ADAS radome applications. LG Chem showed detailed formulation data including flat glass fiber reinforced grades which reduce radome warpage by more than 40%. PCR content of up to 50% is possible while keeping full ADAS performance.

- **Thermally conductive, electrically insulating compounds:** In-plane thermal conductivity of 1.0 to 1.7 W/m·K (compared to 0.4 to 0.5 W/m·K for standard GF-filled grades) for radar housings and power electronics. These compounds require non-electrically conductive filler systems, which is technically demanding.

- **Flame-retardant thermoplastic composites for battery housings:** A flame-retardant FR-PP composite passed relevant fire and thermal runaway tests (UL 2596, GB 38031) without additional thermal protection layers. Weight reduction of 15% compared to SMC reference parts was shown.

- **Low-shrinkage thermosets for axial flux motors:** Mercedes-Benz showed a detailed material screening for phenolic moulding compounds in rotor applications. The requirement is post-cure shrinkage below 0.1% and good creep resistance above 130°C. Carbon-fibre-filled phenolics (PF-CF50) with filler content below 60 wt.% showed the best results.

4.2 Bio-Based Polymers in Technical Applications

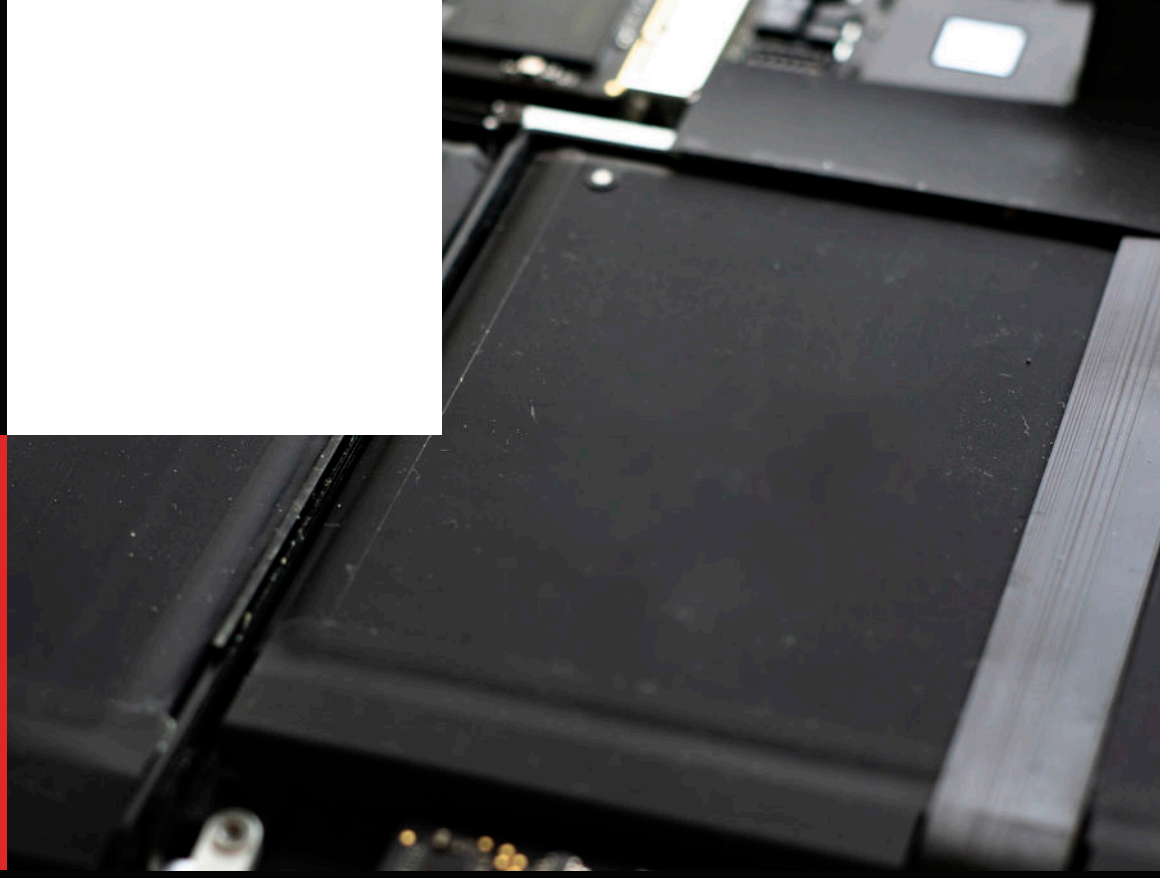
The University of Stuttgart presented results on the durability and stabilisation of bio-based polymers including PA510, PA1010, PLA, PHBV and BioPE/lignin blends. Bio-based polyamides PA510 and PA1010 with UV stabilisation showed good automotive interior performance including resistance to sunscreen and isopropanol. Reinforcement with regenerated cellulose fibres (viscose) in PA and PHBV showed 17 times higher notched impact strength compared to unreinforced PHBV and 14% lower density than glass fibre compounds. These materials are still in early stages but they show the direction for future bio-based compound development.

5. Design and Surface Technologies

5.1 In-Mould PU Coating: Opportunity or Problem?

Volkswagen gave the most balanced analysis of PU in-mould coating technology at the conference. The positive aspects are: CO_2 reduction of up to 60% compared to conventional wet painting, almost no overspray waste, and a layer thickness of 500 µm which can cover surface defects in PCR substrates and therefore allows higher recycled content in visible exterior parts. The negative aspect is that thermoset PU cannot easily be separated from the PP substrate at end of life. Without working recycling systems for this material combination, PU-coated parts create a new type of composite waste.

The practical conclusion is: PU in-mould coating compounds are a growth segment for compound producers (PCR-PP substrates, high-flow grades for bumpers and trim parts). But the end-of-life question requires chemical recycling solutions (glycolysis of the PU fraction plus rPP substrate recovery) to be developed at the same time. Technical feasibility has been shown in several studies; commercial scalability still needs to be proven.



6. Growth Segments: Where New Business Is Developing

6.1 Battery Housing Systems

Battery housings are the largest new compound application which has been created by the shift to electric vehicles. Current designs are mostly based on aluminium but are increasingly being challenged by alternative approaches:

- **Thermoplastic composite trays** (PP organosheet with injection overmoulding): Weight reduction of 15 to 40%, thermal runaway protection integrated, electrical isolation and crash resistance without separate thermal barriers.
- **Thermoplastic cold plate foils:** Multilayer PP/PA/PET foils which replace aluminium cold plates. Heat transfer coefficient above 1,200 W/m·K is reached. TIM paste is no longer needed and assembly costs are lower.
- **Functional EMI-shielding composites**: Shielding is integrated at compound level. Separate metallic foil layers in inverter and OBC housings are no longer needed.
- **Expanded polyamide (EPA) particle foams:** Cell holders and insulation elements for cylindrical cell packs. Compared to standard EPP these materials have higher temperature resistance and better media resistance.

6.2 ADAS Sensor Modules: High Requirements, Good Margins

The transition from Level 2 to Level 2+ autonomous driving is leading to strong growth in the long-range radar (LRR) module segment. The material requirements for this application were set out in detail: PBT grades with defined dielectric properties (Dk 2.9 to 4.0), flat-fibre reinforced low-warpage grades (warpage reduced by more than 40% compared to standard GF grades), laser-weldable PBT/PET and PBT/PC blends, and also thermally conductive housing grades. Most recently, PCR-PBT grades with up to 50% recycled content have been added which still meet all ADAS performance requirements. This shows that sustainability requirements can be met in this segment without reducing performance.

Turning These Findings Into Materials

The trends in this report point clearly to recycled content becoming mandatory. In addition, electrified platforms are reshaping what compounds have to do. As a result, the ability to hold performance steady across variable material is turning into the technical competency that matters most.

Hubron has spent more than 90 years working on carbon black dispersion, additive systems and custom formulation across demanding applications, including automotive interior and exterior components. As recycled content targets and new performance requirements arrive, those are the questions arriving from our customers, and the ones we're already working through.

If you're planning for what the next decade asks of your materials, we're here to help.

Get in Touch

This report reflects Hubron's analysis of automotive plastics industry direction, informed by attendance at PIAE 2026 in Baden-Baden.

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