

A Strategic Approach to **Recycled Content** in Home Appliances

APPLiA, representing the home appliance industry in Europe, advocates for the increased and effective use of recycled materials where it is both feasible and environmentally beneficial. As an industry committed to the circular economy, we see the value in secondary raw materials. However, we urge a cautious, considered, and evidence-based approach to the potential introduction of mandatory recycled content targets. Such requirements necessitate careful, product-specific evaluation within established frameworks like the Ecodesign for Sustainable Products Regulation (ESPR), underpinned by thorough, independent impact assessments. It is crucial to recognise that circular design often entails a trade-off between multiple sustainability objectives, such as high energy efficiency and recyclability, and there is rarely a single, universally optimal sustainable design solution.

Key Challenges in Using Recycled Content in Home Appliances

The integration of recycled content into home appliances presents a complex set of challenges that must be thoroughly understood and addressed to ensure that policy measures are effective and do not lead to unintended negative consequences.

1. Limitations of "One-Size-Fits-All" Mandates and General Supply Issues

A "one-size-fits-all" horizontal mandate for recycled content fails to acknowledge the diverse technical constraints, specific product requirements, and critical performance characteristics (e.g., durability, safety, energy efficiency) essential to different home appliances. Furthermore, significant challenges persist regarding the consistent quality, sufficient availability, and overall security of supply, particularly for recycled plastic materials that are essential for high-performance applications within our sector.



2. Specific Challenges Associated with Recycled Plastics

The use of recycled plastics in home appliances faces several difficulties:

- **Economic Viability:** The cost of recycled plastics is heavily influenced by waste collection, sorting systems (including transport of lightweight yet bulky plastic waste), the need for additives and stabilisers to meet performance requirements, processes for cleaning and recompounding and the check for the batch quality and related conformity. While recycled resin can sometimes be less expensive than virgin resin, these additional costs negate savings. Moreover, the price of virgin plastic fluctuates with oil prices, making it difficult to develop a stable, long-term business case for recycled plastic of sufficient quality. For recycled plastics to gain widespread adoption, their cost must be competitive with that of virgin plastics.
- **Quality and Performance:** The industry must maintain stringent quality control for every batch of recycled plastics, a level of scrutiny not typically required for virgin materials. Plastics cannot be infinitely recycled. Incorporating recycled plastics into home appliances requires diligent management of quality and performance, primarily due to their inherent variability compared to virgin materials, which can affect mechanical strength, thermal resistance, and long-term durability. Manufacturers face challenges in achieving consistent aesthetics, such as colour and surface finish, and must rigorously ensure chemical safety by mitigating risks from potential contaminants and legacy additives.
- **Maintaining Product Integrity and Safety:** A primary concern for the home appliance industry is that the use of recycled plastics must not compromise the safety, durability, or performance of products that consumers rely on. Using recycled plastics in home appliances can introduce several safety concerns that manufacturers must meticulously address to protect consumers. These primarily revolve around chemical contamination, altered material properties, and regulatory compliance.
- **Availability and Security of Supply:** The limited and unreliable availability of high-grade recycled plastics that meet the specific performance and safety requirements for appliance manufacturing presents a significant challenge. This scarcity often results in price premium and hinders manufacturers' ability to consistently incorporate recycled materials into their products at scale. Furthermore, the security of a stable and predictable supply chain for these recycled plastics is a major concern, as fluctuations in waste collection, sorting infrastructure, and recycling technologies can directly impact the availability of suitable feedstock for the appliance industry. This uncertainty can create difficulties in long-term planning and investment in the use of recycled content.



- **Ensuring production continuity:** the use of recycled plastics - mostly in combination with virgin plastics - will require a redesign of the plastic part or component in order to ensure its functional requirements. Such a redesign to a certain virgin-recyclate-mix affects the production process as it will require a change of the injection mould and production times (injection time, mould closing time, cooling time). Both effects will affect production costs in addition to higher costs to tool cleaning caused by impurities in the material.
- **Regulatory and Supply Constraints:** The use of recycled plastics is limited by stringent regulatory requirements under RoHS and REACH, as well as food contact regulations, which currently restrict the available food-contact grade recycled plastic primarily to r-PET from food containers. This often precludes the use of other post-consumer recycled plastics that do not meet these specific properties, creating a de facto barrier.
- **Verification on the product:** There are currently no analytical methods available for directly measuring the recycled material content in a product. As outlined in EN 45557, the verification of recycled content therefore relies on documentary proof provided by the relevant operator in the chain of custody. It should be carefully considered that at the material level, recycled plastics cannot be distinguished from virgin plastics. This means that any claim on the recycled content cannot be physically and reliably verified nor enforced. Neither the manufacturers nor the market surveillance authorities have the means at their command to verify if suppliers of components have correctly declared recycled content or not.

When considering the current application of recycled content, the available data could be misleading, as it could also refer to instances when the recycled input is downcycled, rather than recycled. To be integrated into a home appliance, the quality of the recycled content needs to be as good as that of the virgin material.

The mechanical treatment of discarded appliances at the recycling facility has to be taken into account as well. Given that appliances are currently shredded during recycling, it cannot be expected that recyclers would dismantle the appliance to access a specific polymer part to recycle it.

3. Considerations for Recycled Metals

While metals generally demonstrate good recycling rates and a functional market for recycled metals exists, specific challenges remain for the home appliance sector:

- **Supply Chain Control:** Appliance manufacturers typically do not have direct control over the exact amount of recycled content in the bulk metal supply



they receive.

- **Fixed Supply and Inter-Sectoral Competition:** The overall supply of waste metal is fixed, dependent on the scrapping rates of end-of-life products like cars and appliances. Minimum recycled content requirements for home appliances could inadvertently divert the supply of recycled metals (e.g., steel) from other vital sectors, such as the construction industry, without increasing the overall recycled output.

4. The Evolving Nature of Products and Recycling Streams

The dynamic nature of product design and recycling processes adds further complexity:

- **Long Appliance Lifetimes:** Home appliances often have long operational lifetimes (15-20 years). Consequently, any significant changes in their material composition will only be reflected in the recycler's stream and available recycling data much later than their date of placing on the market. Current recycling data represents materials and methods available today (from products placed on the market 15 to 20 years ago), not necessarily those of products now being placed on the market.
- **Technological Advancements:** Continuous improvements, particularly in energy efficiency, lead to changes in product technology and material composition. This means the recycling stream for similar products could differ significantly over a 15-year period. The evolution of treatment technologies and processes at recyclers' facilities will also significantly influence future recycling outcomes.

APPLiA's Recommendations for Effective and Pragmatic Recycled Content Policies

To ensure that policies on recycled content are practical, contribute positively to the circular economy, and support continued innovation in the home appliance sector, APPLiA proposes the following key considerations:

1. Mandatory recycled content targets or minimum requirements should be approached with significant caution

APPLiA strongly emphasises the need to assess or set any recycled content requirements on a product-by-product basis rather than applying horizontal measures across diverse product categories. A one-size-fits-all approach does not account for the specific technical feasibility, safety requirements, and market realities of different appliances.



In general, APPLiA does not support the introduction of minimum requirements on recycled content in products. Due to the darker color of recycled plastics, mandatory use would severely limit design options for light-colored products.

Furthermore, APPLiA does not recognise the need for a third-party verification approach for recycled content in products. Looking at the recommendations provided by the consultant running the [ecodesign study on the scarcity of materials, critical raw materials, and recycled content](#), we also question the proposal to use third-party certification as a means for verification. First of all, verification is conducted solely by the Market Surveillance Authority; no certification is equivalent to verification. Additionally, we believe that implementing third-party certification for this specific parameter would be disproportionate, and a clear assessment of the impact on costs and burdens for industries should be carried out. APPLiA strongly supports self-declaration by manufacturers based on a harmonised standard as a means to ensure enforceability and a level playing field. Nevertheless, APPLiA recognises that the current verification of both third-party certifications and self-declarations relies solely on documentation. Given the substantial proportion of household appliances imported from overseas, the reliability of such paper-based checks is questionable.. Regardless of how recycled content is being addressed, a proper Impact Assessment needs to be carried out.

2. Prioritising Quality as the Cornerstone for Secondary Raw Material Uptake

APPLiA strongly champions the establishment and effective implementation of minimum quality specifications or standards for recyclates (recycled materials).

- **Necessity for Uptake:** Ensuring adequate and consistent quality is a fundamental prerequisite for increasing the incorporation of recycled materials, particularly plastics, into new products. Robust quality specifications are crucial for ensuring manufacturer confidence in the reliable use of secondary raw materials.
- **Comprehensive Standards:** This need for quality specifications extends beyond plastics to encompass precious metals and Critical Raw Materials (CRMs) recovered from Waste Electrical and Electronic Equipment (WEEE).
- **Leveraging Proven European Standards:** We strongly favour the mandatory adoption of existing, well-developed European Standards (CEN/CENELEC), such as the EN 50625 series (collection, logistics & treatment requirements for WEEE) and EN 50614 (preparing for re-use of WEEE), as the benchmark for quality in WEEE treatment. Legally requiring compliance with these standards is the most effective means to ensure high-quality treatment processes across the EU.



- **Benefits of Enforced Standards:** Enforcing treatment standards will improve the quality of the secondary raw material output, making it more suitable for re-entry into manufacturing loops. It will also create a level playing field for treatment operators, preventing waste flows from being diverted to sub-standard facilities, and providing greater legal certainty for manufacturers regarding compliance and product safety.

3. Ensuring Coherent and Complementary Policy Design

- **Integration with ESPR and Tailored Targets:** Recycled content policies must be developed coherently within the ESPR framework. As highlighted in the European Commission's Communication on the Clean Industrial Deal (26.02.2025), new legislative measures should be "complementary to and facilitate the rolling out of the Ecodesign for Sustainable Product Regulation". Therefore, recycled content targets must be tailored to specific material streams and product categories, reflecting differences in application-specific requirements, market maturity, and technological feasibility, rather than introducing new, potentially conflicting, product design requirements.
- **Based on Robust Standards:** Recycled content targets should be grounded in internationally recognised standards, such as ISO 14021 (for self-declared environmental claims, including recycled content) and EN 45557 (covering material efficiency aspects in ecodesign). The integrity of calculation and verification methods, such as the mass balance approach, must be ensured, and both post-industrial recycled (PIR) and post-consumer recycled (PCR) materials should be eligible under such targets where appropriate and verified. Nevertheless, as mentioned above, it must be acknowledged that currently, these standards are based on documentation inspection and it can't ensure proper verification and enforceability of requirements on the market.

4. Creating an Enabling Environment for a Global Circular Economy

- **Recognising Global Supply Chains:** Recycled content requirements must acknowledge the global nature of industrial supply chains. Policies should prioritise material quality, robust traceability, and verified environmental performance, irrespective of origin. Arbitrary geographic restrictions on eligible recycled materials risk fragmenting markets, increasing costs, and potentially undermining overall environmental outcomes.
- **Facilitating Cross-Border Trade of Secondary Raw Materials:** For secondary raw materials to compete effectively with primary resources and move to where they can be best used, their cross-border movement must be streamlined and incentivised. Policy frameworks should enable the efficient and simplified shipment of quality-assured recycled materials to recognised



manufacturing and recycling hubs, removing undue administrative barriers that currently constrain circularity.

- **Fostering Regional Innovation Hubs for Recycling Excellence:** Policymakers should actively promote the development of regional clusters of excellence focused on recycling. These hubs, supported by targeted financial incentives and conducive regulatory environments, can serve as catalysts for advancing recycling innovation, scaling new and improved sorting and recycling technologies, and optimising regional flows of secondary raw materials.

Comments to the Ecodesign study

APPLiA also provided written comments to the “Ecodesign preparatory study for product specific measures on scarce, environmentally relevant and critical raw materials and on recycled content - Study Report Phase 2”. Please consult the **Excel file** submitted on that occasion.

Conclusion

APPLiA and its members are committed to advancing the goals of the circular economy and enhancing the sustainability of home appliances. We believe that increasing the use of recycled content is an important part of this journey. However, success hinges on a pragmatic, holistic, and quality-focused approach. Policies must be carefully designed, integrated with existing frameworks like ESPR, based on thorough impact assessments, and supportive of robust quality standards, global markets, and continuous innovation. By working collaboratively, policymakers and industry can develop effective strategies that genuinely enhance the circularity of materials in the home appliance sector while upholding product performance, safety, and consumer trust.

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