Fostering a Circular Economy for Expanded Polystyrene

Executive Summary

Using EPS as a case study, this paper highlights data and research available to support policy decisions that address plastic pollution and other environmental factors informing the development of the ILBI. This paper provides recommendations supporting the use of balanced information from third-party, peer reviewed research to support a comprehensive analysis of the policy options under consideration.

Call to Action

The Global EPS Sustainability Alliance calls upon policymakers to take a holistic approach when establishing policy related to plastics and the environment that includes:

- Reliance on fact-based research and existing international standards.
- Define the various aspects of the circular economy.
- Implement life cycle assessments (LCAs) and product category rules (PCRs) based on ISO 14025 standard for Type III Environmental Product Declarations (EPDs).[1]
- Incorporate a continuous improvement process to encourage policy optimization.
- Collaborate with industry leaders to explore implementation feasibility and widespread adoption of existing policies, to include harmonized extended producer responsibility (EPR).

The Global EPS Sustainability Alliance (GESA) believes this approach will ensure the proposed solutions effectively and efficiently address environmental concerns. GESA welcomes the opportunity to collaborate on policy ideas and discuss the information found within this paper.

Achieving Circularity: Closing the Information Gap

EPS manufacturers are disproportionately scrutinized when sharing industry expertise compared to their NGO counterparts. It is incumbent on policymakers to employ the use of all available research and partner with a broad spectrum of stakeholders to fully understand and assess the net environmental impacts of policies under consideration. The University of Portsmouth, "A Global Review of Plastics Policies to Support Improved Decision Making and Public Accountability," evaluated 100 regulatory and voluntary policies from recycling mandates to material bans and national pacts. This study concludes there is a lack of evidence for most of the policies to measure their effectiveness.[2] In view of its findings which are, "largely cognizant with wider literature on policy effectiveness," the absence of conclusive results indicates the need for a systematic review of policy options for global implementation.

A large body of independent, third-party research supports a continuing role for EPS in a new circular economy. However, and despite this evidence, policy proposals routinely name EPS as a "problematic plastic." Consider, "Environmental and Health Hazard Ranking and Assessment of Plastic Polymers

[1] What is a Product Category Rule (PCR)?, Labeling Sustainability, Staaf, D.

[2] "A global review of plastics policies to support improved decision making and public accountability." University of Portsmouth Global Plastics Policy Centre, 2022. https://plasticspolicy.port.ac.uk/wp-content/uploads/2022/10/GPPC-Report.pdf

Based on Chemical Composition"[3] which lists EPS resin as 34th in an analysis of 36 polymers, stating that the hazard ranking versus global annual production for EPS is "not particularly hazardous." However, such data points seem to be ignored when stakeholders call for limitations on EPS.

GESA urges policymakers to commission the fair use of established research and scientific findings using criteria that can establish its value to the decision-making process. GESA further recommends establishing a scientific review process that is accountable to the integrity of data use in the evaluation of policy efficacy.

Establishing Clear Criteria for Evaluating Relevant Materials

As there are often misconceptions around definitions behind commonly used terms such as "recycling" and "problematic plastics," establishing criteria is crucial to develop and communicate effective solutions. Plastic policies should not generalize and group different types of plastics and related materials into one category. Though plastics have generally been used to encompass a larger group of materials, there is often conflation around EPS and other polystyrene materials, as well as other plastic foam products composed of similar materials (e.g., expanded polypropylene EPP). More specific language that points to the complexities and differences of materials can help inform policy decisions and further ensure more accurate interpretation for policy implementation.

Recommendations

The following policy recommendations can ensure EPS transport packaging continues to meet the circular economy principles embedded within the United Nations Environment Programme.[4] In order to effectively analyze proposed solutions and accurately address problems across different industries, policies should establish research-based criteria. These criteria should include: A decision tree which accounts for the environmental performance, variable circumstances of use and choice of substitute materials.

- A minimum threshold for plastic products that are avoidable (e.g., straws) or problematic (potential to contaminate recycling streams) should be addressed with separate criteria.
- The variability of polymer subsets, rather than generalizing each category of plastic.
- All phases of the circular economy, not just end-of-life management.

Policymakers can benefit by looking to models such as the International Standards Organization which have demonstrated that clear criteria can help support innovation and provide solutions to global challenges.[5]

The Need for Standardized Methodology in Environmental Impact Assessments

The lack of life cycle impact assessments for many packaging materials contributes to proposed policy solutions that fail to fully capture potential impacts. The lack of standardized comparative methodologies across industries to assess environmental impacts has led to false conclusions based on misperceptions. Without reliable data, regulatory decisions about product design and material selection will continue to be misguided and ineffective.

[3]"Environmental and Health Hazard Ranking and Assessment of Plastic Polymers Based on Chemical Composition." Science of The Total Environment, Elsevier, 12 June 2011, www.sciencedirect.com/science/article/pii/S0048969711004268.

[4]"Understanding Circularity," United Nations Environment Programme, https://buildingcircularity.org/

[5]International Organization for Standardization, https://www.iso.org/home.html

Recommendations

Life Cycle Assessments (LCAs) should be stipulated to provide a comprehensive and systematic approach to analyzing the life cycle impact of products, that covers raw material extraction to end-of-life disposition, such as recycling or reuse. As suggested by the Life Cycle Initiative, "a life cycle approach also helps [address] potential trade-offs between environmental impacts and sustainability pillars and can orient the selection of the best solutions for the environment with best socio-economic implication".[6]

- The creation of Product Category Rules for various packaging material types would facilitate the use of comparative environmental impacts. PCRs are a building block for certified Environmental Product Declarations (EPDs) that can be used to specify packaging materials and better inform policy decisions. PCRs are developed via consensus under the ISO 14025 standard Type III Environmental Product Declarations.
  - PCRs and EPDs ensure transparency, credibility, and comparability across industries and provide a standardized framework for evaluating environmental factors such as resource consumption, energy usage, and waste generation.
  - This uniform framework would allow consumers, manufacturers, and policymakers to make informed decisions toward a more sustainable future and mitigate unintended consequences.
- Policymakers might consider the work of the International Environmental Product Declarations (EPDs), which is the world's first and longest operational EPD program, founded by the Swedish Environmental Protection Agency.
  - This program is open to private and public organizations, publishing EPDs from 400+ organizations in 50 countries, encouraging the use of more sustainable materials and practices across industries.
  - The establishment of EPDs not only provides transparency into the industry but establishes trust through involved stakeholders.

The Risk of Potential Bans: Alternative Materials Contribute to Unintended Consequences

Recognizing the unintended consequences from alternative materials is key to ensuring that circular economy principles are implemented and maintained. Policymakers must consider the unintended environmental and economic consequences of replacing EPS with alternative materials. Research has shown that replacing EPS packaging with alternative materials would result in substantially more packaging weight and increases in energy usage and emission rates during the transportation of goods, negatively impacting the economy and the environment.[7]

The Portsmouth University study cited above also reviewed policies addressing EPS food containers and found little evidence of the effectiveness or ineffectiveness of bans, demonstrating the need for further research on net environmental impacts.[8]

[6]"A Life Cycle Approach to Plastic Pollution," Life Cycle Initiative, 2023, https://www.lifecycleinitiative.org/activities/life-cycle-assessment-in-high-impact-sectors/life-cycle-approach-to-plastic-pollution/

[7]Franklin Associates, A Division of Eastern Research Group (ERG), "Life Cycle Impacts of Plastic Packaging Compare to Substitutes in the United States: Theoretical Substitution Analysis," American Chemistry Council, April 2018, https://www.americanchemistry.com/better-policy-regulation/plastics/resources/life-cycle-impacts-of-plastic-packaging-compared-to-substitutes-in-the-united-states-and-canada-theoretical-substitution-analysis

[8]"A global review of plastics policies to support improved decision making and public accountability." University of Portsmouth Global Plastics Policy Centre, 2022. https://plasticspolicy.port.ac.uk/wp-content/uploads/2022/10/GPPC-Report.pdf

Recommendations

As plastics policies are developed and implemented, a process of continuous examination and evaluation which engages industry stakeholders and aligns environmental policies with economic stability and viability is necessary. Policymakers must implement a continuous improvement process that:

- Includes a reverse mechanism for unintended consequences, ensuring ineffective solutions are identified and amended on an ongoing basis.
- Identifies an implementation mechanism designed to remediate any unforeseen circumstances.

Policies might also consider harmonized reporting on extended producer responsibility (EPR) programs that:

- Are based on universal reporting parameters and standards to ensure policies are effective in promoting recycling and circularity.
- Establish effectiveness criteria to evaluate outcomes.
- Create an information sharing portal that publishes best-in-class EPR policy framework development, proven implementation methods and effective funding schemes.

Conclusion

Current policy considerations lack methodologies for executing environmental impact assessments, don't address the need to prevent unintended environmental consequences for alternative materials and fail to explore newer, more advanced solutions. As such, this paper calls upon policymakers to take a holistic approach to establishing policies as noted in the Call to Action above.

The Global EPS Sustainability Alliance welcomes the opportunity to collaborate on policy ideas and discuss the information found within this paper.

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