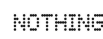




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INSIGHTS BRIEF

Bringing E-Waste Plastics into Policy: Making the Case and Means for Inclusion

Season 5, Episode 2 · Circular Economy Knowledge Series · 24 July 2026

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RECORDING



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This episode was carried out in collaboration with GIZ India, in line with the "Circular Pathways for High-Value Plastics in India" (CP4Plastics).

This brief presents the key points and perspectives shared during Episode 2 of Karo Sambhav's Circular Economy Knowledge Series. Please note that this brief is a synthesis of that specific conversation, not a comprehensive review of the ecosystem. Statements throughout are drawn directly from the discussion. Where a point is not attributed to a named individual, it reflects the broader substance of the conversation rather than one speaker's exact words.

The views expressed are those of the individual speakers and do not necessarily reflect the positions of the series' Principal Sponsors. The Circular Economy Knowledge Series is supported by producers as part of their awareness and outreach commitments under India's E-waste Management Rules. That support enables the series as a public knowledge initiative, and the content of each brief is developed independently.

01



The Problem

Plastics form a large part of every electronic product by weight. They are engineered to meet the performance demands of the particular product they sit in, using specific combinations of resins, additives, and flame retardants. Because these plastics are engineered per product rather than standardized across products, there are many different combinations of plastic type, grade, and additive in circulation. This heterogeneity in engineered plastics is what makes solving for circularity complex, because material that varies from product to product cannot be collected, sorted, and reprocessed as a single stream.

Beyond this, plastics are not consistently marked, sorted, or traceable, and lack the standardization that would make recovery viable; the business case for recycled plastics remains difficult to make against virgin material; and policy has yet to catch up.

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02 Marking and Sorting

Sorting is one place where that heterogeneity becomes an operational problem. Mixing polymer types or grades in the same batch during recycling process degrades the output enough that it can no longer serve the applications the material came from. Plastics therefore have to be separated by grade as well as by type, not simply sorted into broad streams.

Sorting to that level depends on knowing what each piece is, and that information is difficult to ascertain by visual inspection. Plastics across products are either not marked at all or marked inconsistently, and thus a label cannot be trusted to tell a recycler what they are actually holding.

Even in cases where material can be identified, how finely it has to be sorted depends on the specification a buyer requires for their own application. GIZ and Karo Sambhav's own work on e-waste plastic supply chains found that offtake specifications, the standards material must meet to be accepted, were often narrow. Meeting them meant rethinking how collection fed into the rest of the chain, so that material collected is in higher volumes and with greater homogeneity.

Sorting is therefore an economics question as much as a technical one. The narrower a buyer's specification, the more finely material has to be sorted to meet it, and that extra sorting is a cost the recycler carries.

03 Digital Product Passports

One proposed answer to that marking problem is the Digital Product Passport. A DPP is a tag attached to a product when it is made, carrying a record of what it is made of, so that anyone handling it later, whether a repairer, a dismantler, or a recycler, can read the tag instead of guessing.

One catch is that the information has to survive the whole physical journey. A device goes through several rounds of dismantling and sorting before its plastic is isolated, and the tag can get separated from the material well before that point.

Additionally, two products, for example, can both be marked ABS and still not be mixable, because the exact formulation differs due to which the two melt and flow at different rates. A marking may be correct but not specific enough to recycle on, or it may not be correct in the first place.

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Plastics aren't marked consistently across products, they might be marked ABS, but it could be a completely different engineered plastic underneath. There's a real need for better marking practices, especially since these products move across different parts of the world.”

— Dr. Reva Prakash, GIZ India

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Even if a DPP correctly marks a plastic's exact type, a device passes through several rounds of dismantling and sorting before that plastic is isolated, and the information risks getting separated from the material at each step.”

— Stefan de Linde, Minimise

04 Standardization

If marking cannot be relied on to identify material after the fact, the other route is to narrow what has to be identified in the first place. Design for recycling depends on standardization upstream, at the point plastics are first specified and used, since this is what helps make recycling viable downstream. The range of plastic compositions in circulation is set at the design and manufacturing stage, and narrowing that range there can make everything downstream workable. Collection channels can be well built and still not solve the problem, because no amount of collection could make a batch of highly varied material recyclable together.

The EU's Horizon-funded INCREASE project, a multi-organization consortium, has developed a Recyclability Assessment Tool to help designers redesign products for end-of-life recovery.

Standardization carries a trade-off: enough consistency to make recovery commercially viable, but not so much that it closes the door on better materials developed later. A comparable precedent for business-led standardization exists in USB standardization, achieved largely through voluntary adoption, replacing a fragmented landscape of incompatible cables with a shared standard.

A similar shift is already visible in solar panels. Panels carry plastic in two layers, a backsheet and an encapsulant, and both are hard to recover today, since the layers are glued between the cell and the glass and recyclers find it more economical to prioritize metal and glass first. Panels now being manufactured are moving to a glass-to-glass construction that removes the backsheet entirely, leaving only the encapsulant to manage at end of life.

05 The Business Case

This brings the question to commercial viability. Any system of this kind needs a business case strong enough to stand on its own. Regulation has an important role, but if the economics never work without it, the system stays dependent on regulatory intervention indefinitely rather than growing under its own weight.

The central constraint is the price recycled plastic can be sold at. For a manufacturer choosing between recycled and virgin material, recycled plastic is currently the more expensive option, so the demand side has little reason to switch.

The recycler is caught on the other side of the same problem. Waste has to be purchased before anything can be done with it, and converting it into good-quality recycled plastic requires substantial further investment. If that investment is made, the resulting material is priced beyond what manufacturers are currently willing to pay. If it is not, the quality is too low to sell. In both cases the recycler is left unable to recover the cost.

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Any OEM or producer can make whatever plastic mix they want, and there's no standardization today. It becomes a careful balance of what a free market should be allowed to make, standardizing enough to make recovery viable, without locking out better materials that come along later.”

— Stefan de Linde, Minimise

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Solar panels have plastic in two layers, the backsheet and the encapsulant, which are hard to recover today. Panels being manufactured now are eliminating the backsheet for a glass-to-glass design, so going forward only the encapsulant will need to be managed.”

— Dr. Akanksha Tyagi, CEEW

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I think a strong driver should always be business, first of all. Recyclable plastics have a very hard time competing to virgin plastics, and that is a price thing. No amount of policy will really solve the fact that if you bring it into policy, you're going to have to somehow also financially subsidize something that is making a loss.”

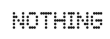
— Stefan de Linde, Minimise



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One route to better economics looking at same materials that appear in other waste streams and processing them together. Shared facilities raise the volume moving through a plant and spread fixed costs across more than one stream. End-of-life vehicles are the clearest case, since they use the same engineered plastics and arrive in considerably larger volumes.

Where the economics still do not close, an initial regulatory push has a role: not to sustain the system permanently, but to build enough demand for it to begin working on its own.

06 Grounding Policy in Evidence

Across India, the EU, and China, there is currently no strong, focused policy attention on e-waste plastics specifically, though ongoing R&D exists, including GIZ's work to develop a circular value chain for these materials. Part of this comes from how existing frameworks are structured: certificate generation under Extended Producer Responsibility (EPR) frameworks is tied to metal recovery, missing plastics, which has reshaped collection and recycling priorities toward metal recovery. Mandates for the use of recycled content exist for other product streams, but not yet for electronic products.

Panellists also shared that any future requirement would need to be grounded in evidence. Action research, carried out with manufacturers and recyclers rather than about them, establishes what they can realistically implement. This matters because products and their plastics vary widely in how they are built, assembled, and where they ultimately end up.

This kind of research on multiple fronts includes examining feasible design changes for a manufacturer mandate, and separately, the collection, dismantling, and disposal side of the supply chain for improving economic viability, feeding into decisions on incentive schemes, viability gap funding, or production-linked incentives. Similar work exists in Europe, the Americas, and East Asia, but each operates within a different society, infrastructure, and set of consumer behaviors, so research grounded specifically in the Indian context is necessary rather than directly applying findings from elsewhere.

Simultaneously, a balance needs to exist between backing action with research and thoroughness, and moving with enough urgency given how pressing the problem already is. Much of the sector's current focus is on today's waste volumes, building infrastructure, technology, and skills, including amendments shifting regulatory focus from a metal-heavy view toward broader environmental and pollution mitigation.

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Policy and regulation in this space need to be evidence-based, and that evidence has to be built through action research and demonstrations, for example, examining what design changes manufacturers can realistically implement, or how a product is assembled relative to the materials used in it.”

— Dr. Akanksha Tyagi, CEEW

07 Closing

What this points to going forward is continued action research to build the evidence policy needs, business models that can compete with virgin plastics on price, and a deliberate effort to bring standardization into the same conversation as design and collection, rather than treating them as separate problems.



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ABOUT THE SERIES

The Circular Economy Knowledge Series is Karo Sambhav's webinar platform advancing India's circular economy.

The series brings together policymakers, regulators, researchers, industry leaders, and practitioners to engage with the ideas and systems that will define how India produces, uses, and recovers resources.

The webinar draws attendees from across the full value chain of this space: government bodies and ministries, research institutions, technical and industry organizations, and experienced practitioners who are actively shaping where this space goes next. This makes it one of the few platforms where knowledge and accountability share the same space.

ABOUT THE SPONSORS

The Circular Economy Knowledge Series is sponsored by Apple, Dell Technologies, Canon India, Cisco, and Nothing. By enabling this platform, they are actively contributing to the growth of circular economy knowledge and responsible waste management in India, bringing critical conversations to the people and institutions that need them most.

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