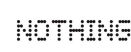




Knowledge Partner



Principal Sponsors



INSIGHTS BRIEF

Closing the Loop on E-Waste Plastics: Building the Business Case

Season 5, Episode 3 · Circular Economy Knowledge Series · 18 August 2026

EPISODE SPONSOR



Apple, Dell Technologies, Canon India, Ericsson, Tejas Networks, Cisco, boAt, Nothing

IN COLLABORATION WITH



Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH ([GIZ India](#))

KNOWLEDGE PARTNER



[WEEE Forum](#)

KEYNOTE SPEAKER



[Shri Surendra Gotherwal](#), Ministry of Electronics and Information Technology (MeitY)

PANELISTS



[Pranshu Singhal](#), Karo Sambhav · [Sukrit Bharati](#), Virtuoso Optoelectronics Limited · [Sanjay David](#), Covestro India
[Theresa Aigner](#), Fraunhofer IZM Berlin · Moderated by [Shivangi Aggarwal](#), Karo Sambhav

RECORDING



[Watch on YouTube](#)

This episode was carried out in collaboration with GIZ India, in line with the "Circular Pathways for High-Value Plastics in India" (CP4Plastic) project.

This brief presents the key points and perspectives shared during Episode 3 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.

IN THIS BRIEF

- | | |
|--|--|
| 01 Keynote: On Policy and Infrastructure | 04 Two Loops That Are Already Closing |
| 02 The Problem: E-Waste Plastics Aren't a Single Material Feedstock | 05 How Can We Create More Loops |
| 03 Starting From the Application: Creating Smaller Loops | 06 Closing: Plastics, Grade by Grade |

01 Keynote: On Policy and Infrastructure

Episode 2 of this series closed on three requirements: action research to build the evidence policy needs, business models that can compete with virgin plastics on price, and standardization brought into the same conversation as collection. Shri Surendra Gotherwal of the Ministry of Electronics and Information Technology (MeitY) opened this session by setting out what the public sector has already put in motion.

Citing the Global E-Waste Monitor, he placed India as the world's third-largest generator of e-waste, at over 4.17 million metric tonnes on 2022 data, and as the third-largest consumer of secondary raw material. He linked that demand to rising domestic manufacturing investment, including the recent India Semiconductor Mission 2.0.

He shared MeitY's funded project converting e-waste plastic into 3D filament, and processing about four different grades of e-waste plastic for applications including automotive and electrical and electronic appliances.

Its autonomous body, the Centre for Materials for Electronics Technology (C-MET), has developed recycling process technology for circuit boards, lithium-ion batteries, and solar panels, alongside a Restriction of Hazardous Substances (RoHS) compliance testing lab in Hyderabad.

He said the ministry has started work on a Digital Product Passport with GIZ's support, after noting Japan's eco-design and traceability work and the European Union's own Digital Product Passport framework. He also described a pilot programme to set up e-waste recycling clusters that combine plastics recovery with printed circuit board (PCB) recycling, using processing technology from the Central Institute of Petrochemicals Engineering and Technology (CIPET).

He pointed to two existing funding routes. The Ministry of Micro, Small and Medium Enterprises (MSME) cluster scheme offers up to 70 percent capital subsidy toward a common facility centre in a qualifying cluster, which he suggested an e-waste plastics recycling cluster could apply for. Haryana's state-level electronics waste recycling policy carries capital and operational incentives for e-waste recycling units.

Shri Surendra Gotherwal also named where he sees the gap. Shredding, he was explicit, is not the challenge; the difficulty lies in identifying which plastic is which, separating it, and processing it safely back into remanufacturing. E-waste carries many different plastics, and different grades support different business models and markets, so scaling depends on matching identification and processing to demand for that particular grade.

Additionally, he described the ministry's role as extending beyond research to awareness and capacity building, with activity running under Mission LiFE (Lifestyle for Environment).

02 The Problem: E-Waste Plastics Aren't a Single Material Feedstock

Plastics make up roughly a quarter of every electronic device by weight, yet they remain one of the least recovered materials in the e-waste stream. Two separate reasons make this so. The first is on the material side. Sanjay David of Covestro India pointed out that the plastic inside e-waste isn't one material, it's an unmanageable range of polymer blends and additive combinations.

“

Almost 25% by weight is plastics in e-waste. And in this 25%, you will find zillions of combinations.”

— Sanjay David, Covestro India

Covestro invented polycarbonate and has offered PCR (Post-Consumer Recycled) grade polycarbonate for ten years, but has never sourced that feedstock from e-waste.

“

At Covestro, we are the inventors of polycarbonates. For ten years, we've been offering PCR grades, and sad to say, we have still not found a source from e-waste to be our feedstock. It's all from other industries, because there's more consistency and certainty, and the recyclability is easier.”

— Sanjay David, Covestro India



Knowledge Partner



Principal Sponsors



The second reason has nothing to do with the material itself, but a challenge during collection of e-waste. Pranshu Singhal of Karo Sambhav explained that collection can't be selective about what comes in.

“

People give you what they wish to recycle. How can we stop someone from giving a mouse and only giving an AC, saying no to a keyboard while saying yes to a speaker? The reality is, when we talk of recycling, we can't be selective. Selective is breaking the trust of a consumer. Historically, e-waste has been mismanaged is because there have been very selective picking of certain varieties of materials.”

— Pranshu Singhal, Karo Sambhav

E-waste plastics is a material that varies combination to combination and exists in a collection system that can't discriminate by type.

03



Starting From the Application:

Creating Smaller Loops

The panel converged, independently, on a different starting point: define the application of the recycled plastics, and then to trace backward to find the waste that can supply it, rather than starting with e-waste collection and then sorting it into use.

Theresa Aigner of Fraunhofer IZM Berlin described this as the working method behind the EU-funded INCREASE project, which set out to raise the use of recycled plastics in electrical and electronic equipment.

“

We had five challenging applications where we already knew which type of material we were looking for, and identified the specifications for that. Only then did we look into which waste streams from e-waste we could source it from.”

— Theresa Aigner, Fraunhofer IZM Berlin

Sukrit Bharati of Virtuoso Optoelectronics shared his experience from the factory floor. He differentiated between the types of waste generated at different points in a product's life cycle. The first is design waste, the runners and offcuts generated at the moulding stage. Because the exact origin, grade, colour, and intended use within the product are all already known, 95 to 100 percent of this material can be re-integrated directly back into production. The second is process waste, a smaller share of the overall waste generated, arising from rejections and breakage during manufacturing. The third is post-consumer waste, which is where the difficulty starts, because by then the product's history is gone. At Virtuoso, design and process waste already get reground and reused within the same or an adjacent product line.

What makes the first two recoverable is that their end application is already known. Bharati is working the same way backwards that Aigner described, only inside a single factory.

Timing narrows the loop further. Bharati said plastic that ages, or is exposed to UV or sunlight, becomes harder to recycle as its molecular properties shift, while material reprocessed within days of generation is far easier to work with.

Engineered plastics, the same additive-heavy blends that make a product perform better, are also the ones that get harder to recycle once they're in the field, a trade-off he named directly rather than resolved.

His broader proposal during the webinar extends the same known-source logic to whole products.

“

If you look at the entire problem in one set, I think it's way too complex to solve. But if you can create these smaller loops, I think the ecosystem is more viable and doable, because everybody likes the concept of being environmentally conscious, but nobody likes the concept of paying more for it. This is a more doable mission instead of trying to solve it at a macro level, which is much more complex.”

— Sukrit Bharati, Virtuoso Optoelectronics

Bharati added that recycling alone may not create enough value to sustain such a loop, a refurbishment step alongside it makes the economics work better, but that this is harder to execute in India than in markets with fixed replacement cycles, because a product here typically passes through several owners before reaching end of life, by which point it may be too degraded to recover.

04 Two Loops That Are Already

Closing

Sanjay David shared two concrete instances of this kind of narrow, matched loop.

“

We are working on a project now within this initiative with GIZ and Karo Sambhav, where we are looking at very targeted waste streams. What we're looking at now is a huge end-of-life of energy meters. The government had a mandate of around 250 million energy meters being replaced, so 250 million energy meters are going to reach end of life. There is good scope for us to look at this one particular stream and build a circular loop around it.”

— Sanjay David, Covestro India

The second example comes from Covestro's demonstrated project that recovers high-value plastics from end-of-life vehicles and puts them back into new vehicles. This pilot targets one specific component, the headlight lamps, which holds the requirement for clear plastic. This is a narrow specification where the loop can actually close.

“

We've already demonstrated this in Europe, spearheaded from China, for end-of-life vehicles, where the high-value plastics from the vehicles are brought back into the vehicle itself. This has been demonstrated, but the motivation for investment, to see this entire picture evolve, that's becoming a bit of a challenge. Few people see it, other stakeholders don't.”

— Sanjay David, Covestro India

David was careful not to overstate what this proves. India's repurposing value chain, in his words, is still being built in pieces, and the technologies capable of solving material recovery at a true macro level, chemical recycling processes like chemolysis among them, have not yet been scaled anywhere globally. Narrow loops work. They haven't yet added up to a system.

05 How Can We Create More Loops

Loops of this kind do not multiply on their own. Several things have to be true before they can.

On design, Theresa Aigner described a persistent gap between the world that designs products and the world that recycles them.

“

We usually see that the design world doesn't really talk to the recycling world. There is a knowledge gap there. Designers are trained to design products, not trained to design recyclable products. There's really a gap between these two worlds, the production world and the recycling world.”

— Theresa Aigner, Fraunhofer IZM Berlin

The recyclability assessment tool she co-developed under the INCREASE project closes that gap: it lets a designer evaluate a concept's recyclability without understanding the recycling system itself, early enough in a product's life to still make changes. She further noted the tool's judgments aren't universal, since it was built against the European recycling context, where disassembly is minimal.

“

The recycling system this tool is based on refers to the European context, where very few disassembly steps happen. For examples, screws are marked as moderately recyclable by this system. But in the Indian context, where a lot more disassembly is happening, a screw might be a good option too, because you can assume it would be unscrewed.”

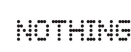
— Theresa Aigner, Fraunhofer IZM Berlin



Knowledge Partner



Principal Sponsors



06 Closing: Plastics, Grade by Grade

Shivangi Aggarwal closed the session by sharing that plastics cannot be treated as a monolith material and need to be looked at on a much smaller, more broken-down scale, polymer by polymer or grade by grade. She said a balancing act is needed: tackling the waste generated today, even if that means some level of downcycling, as long as it is not as severe as what is happening in the current system, and it addresses some of the socioeconomic problems in current recycling chains, while simultaneously working on upstream interventions at a material or product level. Multiple interventions, she said, need to run at the same time.

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, Ericsson, Tejas Networks, Cisco, boAt, 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.

CONTACT KARO SAMBHAV

CORPORATE ADDRESS



408 & 409, Fourth Floor, Suncity Business Tower,
Sector 54, Golf Course Road, Gurugram, Haryana
122002, India

WHATSAPP



+91 92892 36008

EMAIL



engage@karosambhav.com

WEBSITE



www.karosambhav.com