FPA ENVIRONMENT SEMINAR 2026 | SESSION REPORT

AI and life cycle assessment: better data, stronger decisions

Measuring innovation: The role of AI and life cycle assessment

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KEY POINTS

- AI is reducing the time needed for life cycle assessments and checking supporting evidence, but automated classifications can produce serious errors.
- Greyparrot reported using computer vision in waste facilities across more than 20 countries and collecting over 50 billion waste data points in the previous year.
- Real-world sorting data can reveal a gap between theoretical recyclability and what happens to packaging after disposal.
- Packaging material composition and environmental claims still require technically competent assessment and, where appropriate, physical testing.
- A single carbon number on packaging is difficult to interpret or compare without consistent methodology and context.

THE PANEL



Anja Prevodnik, Greyparrot

Anja works with AI-based computer vision systems to analyse materials moving through recycling and sorting facilities.



Kiran Trivedy, The Carbon Trust

Kiran works on lifecycle assessments, product carbon footprints and assurance of companies' environmental calculations.



Dr Alan Campbell, The LCA Center

Alan specializes in forensic lifecycle assessment, packaging material analysis and verification of technical specifications.

FULL SESSION REPORT

Artificial intelligence can help packaging businesses assess carbon impacts, understand waste flows and verify environmental information more efficiently, but it is no substitute for reliable data, technical expertise or independent judgement. That was the central message from a panel examining how AI, life cycle assessment (LCA) and emerging technologies could support better environmental decisions at the FPA Environment Seminar.

The discussion brought together Anja Prevodnik of Greyparrot, Kiran Trivedy of the Carbon Trust and Dr Alan Campbell of The LCA Center. While the speakers approached the subject from different disciplines, all emphasised the importance of reconciling digital information with the physical reality of the packaging being assessed.

Using AI to make life cycle assessment more accessible

Trivedy explained that calculating a product carbon footprint or life cycle assessment can require extensive data gathering and specialist expertise, particularly for companies with large product ranges. AI is increasingly being used to interpret bills of materials, select relevant emissions factors and extract information from invoices and technical documents.

Those applications could significantly reduce the time needed to prepare assessments and check supporting evidence. However, he described an example in which an automated system had classified steaks as tea when assigning an emissions factor, producing an apparently dramatic reduction in the carbon footprint of a supermarket's meat department. The error illustrated how a plausible-looking result can conceal a fundamental mistake.

AI can also assist with assurance by extracting figures from large volumes of electricity and gas bills and comparing them with the inputs used in an LCA. Trivedy said the benefits depend on understanding what the technology has done and ensuring appropriate human review.

Packaging forensics: The product must match the paperwork

Campbell warned that environmental assessments can be undermined before any calculations begin if product specifications or supplier information do not accurately describe the packaging being evaluated. His organisation uses a forensic approach, combining packaging expertise with physical analysis, to establish actual material composition.

He said technical data sheets and the products they purport to describe do not always match. A credible assessment may therefore require laboratory methods, including X-ray or infrared analysis, to identify components and manufacturing processes. AI may help process documentation, but it cannot establish chemical composition from paperwork alone.

The panel distinguished this kind of physical verification from Greyparrot's computer-vision approach, which is designed to classify objects visually in waste streams. Both can provide useful evidence, but they answer different questions.

What happens when packaging reaches a sorting facility?

Prevodnik explained that Greyparrot installs camera-based analysers above conveyor belts in sorting and recycling facilities. The system uses computer vision to identify objects by material, brand and visible characteristics such as colour and shape. She reported deployments in more than 20 countries and more than 50 billion waste data points collected in the preceding year.

Combining measurements from different points in the sorting process can help reveal whether packaging that is assumed to be recyclable is actually recovered. Conversely, it may show that some materials perform better in real facilities than conventional assumptions suggest.

The systems use RGB cameras, supported by human annotation and models trained on large image datasets. Prevodnik acknowledged that visual identification has limitations and that specialist input from packaging manufacturers is needed, particularly for complex materials such as composite fibre packaging.

She argued that measured end-of-life data can strengthen life cycle assessments, which have often relied on broad national recycling averages that may not adequately reflect the experience of particular foodservice packaging formats.

Primary evidence remains the goal

The panel discussed the merits and limitations of secondary LCA databases such as ecoinvent. Trivedy said established databases provide a useful starting point for businesses conducting their first assessment, helping identify major environmental hotspots before detailed supplier information is available.

However, both he and Campbell stressed that primary, geographically and technologically relevant information improves confidence in the results. As businesses repeat assessments over time, better supplier and operational data should make it easier to identify whether investments and design changes have actually reduced impacts.

The speakers also cautioned that AI can make an assessment look more detailed while obscuring how the underlying figures were generated. Documenting data sources, assumptions and automated decisions is therefore increasingly important for independent assurance.

Should packaging carry a carbon footprint?

An audience question explored whether consumers might eventually see a single carbon figure on packaging, potentially allowing products or packaging formats to be compared directly.

Trivedy explained that the meaning of an individual carbon number is not necessarily obvious to consumers. Different permitted modelling choices and data sources can lead to different results, meaning a lower figure on one pack does not automatically demonstrate superior performance to another.

The panel discussed the possible use of energy consumption as a simpler measure, but noted that kilowatt-hours alone do not capture the carbon differences between energy sources. More reliable comparative labels may become possible as primary data improves, but comparisons still require context and consistent assessment methods.

Accounting for AI's own environmental footprint

Professor Alaster Yoxall raised the energy and water use associated with AI and asked whether this should be included in environmental assessments.

Trivedy distinguished between an LCA of a packaging product, for which the assessment activity is not normally part of the product system, and the organisational emissions associated with the services and technology used to conduct it. He suggested that some companies' existing IT-related emissions accounting may not fully reflect differences in the energy intensity of AI services.

The exchange highlighted the need to evaluate emerging technology not only by its ability to improve environmental decision-making, but also by understanding the resources needed to operate it.

Data that enables collaboration

In closing, Prevodnik emphasised that auditable operational data can create a more constructive discussion between producers, waste managers and policymakers, replacing assumptions and disagreements with evidence about how packaging actually behaves in the recycling system.

Campbell returned to the risk of poor-quality inputs and warned against treating AI as a universal solution. The central challenge, he argued, is ensuring that the data and the physical product match.

For foodservice packaging businesses, the session offered a practical conclusion: AI can accelerate analysis and reveal important patterns, but sound environmental decisions still require accurate material specifications, transparent methodology, real-world evidence and professional scrutiny.

SESSION PHOTOGRAPHY





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This is an editorial account and not a verbatim transcript.