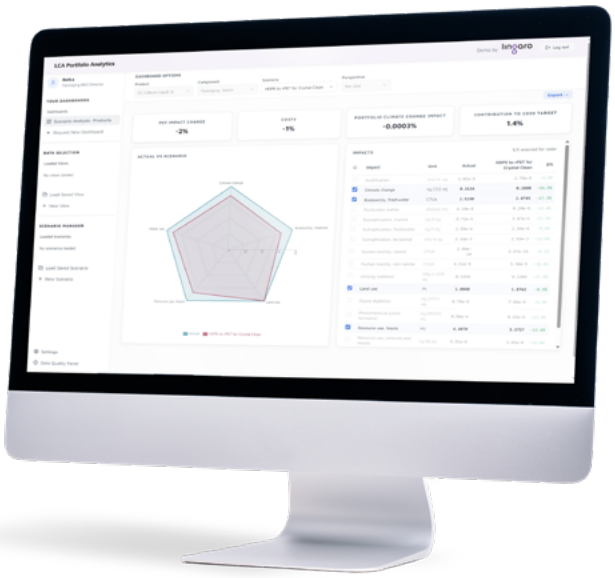
Case Study

Sustainable Packaging Through LCA Automation

How a Fortune 500 company enables packaging sustainability analytics across a large SKU portfolio.

The Client Profile

Lingaro partnered with a Fortune 500 company aiming to reduce its carbon footprint and promote a circular economy through sustainable packaging. To achieve these goals, the client needed to understand the specific environmental impacts of its packaging and evaluate the effectiveness of proposed sustainability initiatives.



Challenge

The client possessed a large product portfolio with thousands of different packaging combinations. They needed to understand the environmental impacts of their packaging to enable their sustainability transformation. The gold standard for understanding product sustainability is life cycle assessment (LCA). It examines a product's whole life cycle through a standardized and recognized methodology.

The client faced three key challenges in scaling LCAs:

- **High LCA costs prohibiting portfolio coverage:** Costs of LCAs conducted by in-house experts and third-party consultants could surpass 10,000 USD per SKU, making it impossible to cover more than 10% of packaging with LCAs within a reasonable budget.
- **Slow LCA turnaround unfit for R&D:** Product designers needed to be able to explore alternative designs and see their impact in real time. Manual LCA turnaround times could extend to months, once answers arrived, they were no longer relevant for decision-making.
- **Lack of integration with life-cycle costing (LCC) tools:** Initiatives and designs needed to be evaluated for financial impacts. However, diverse tools required manual merging of LCA and cost data as well as reconciliation of differences between cost-modeling approaches.

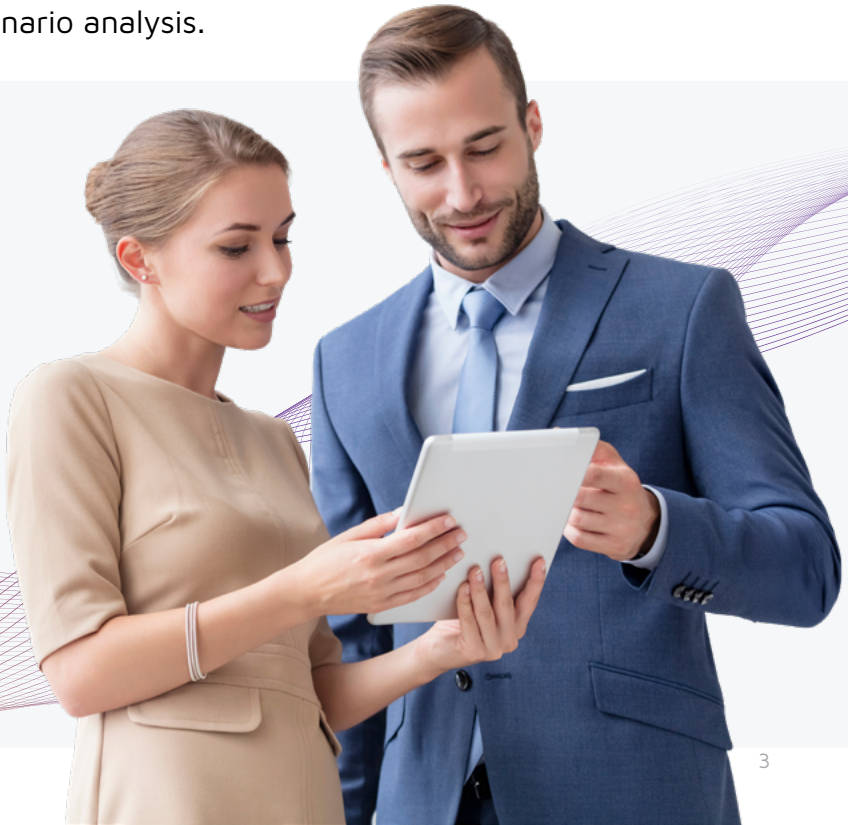
Solution

What is the Automated LCA Platform? The Automated LCA Platform is a data integration platform that evaluates packaging sustainability within a data lake running on the client's preferred infrastructure. It empowers sustainability and R&D teams with rapid, automated LCA and LCC, significantly improving LCA portfolio coverage (reaching more than 98%) and ensuring real-time visibility into environmental impacts without the need for expensive manual assessments that previously took months to complete.

Why it performs well:

- **Domain (Industry & Technical Expertise):** Built to precise specifications from LCA and packaging experts, the back-end calculation logic applies complex LCA models to vast enterprise datasets. This expert-guided approach ensures automated outputs strictly align with external standards (such as PEF and ISO) while supporting custom recyclability metrics.
- **Design (Technical Architecture):** Lingaro architected a robust, backend-intensive data lake that automates data ingestion. It seamlessly merges packaging bill of materials (BoM) with primary and secondary LCA data. It also integrates internal and external life cycle costing (LCC) data for Extended Producer Responsibility (EPR) fees into a single unified analytical engine.
- **Adoption (User Enablement):** This back-end processing is surfaced through intuitive front-end analytics and Ecodesign dashboards, empowering users to utilize combined environmental and cost data for hotspot identification and scenario analysis.

Lingaro partners with clients to turn their data into insights that drive business impact.
We do it by uniquely combining business and technical **DOMAIN** knowledge, human-centered **DESIGN**, and industry-leading **ADOPTION** capabilities, all augmented by AI.



Impact

Lingaro built an automated LCA data lake that scaled to full packaging portfolio coverage by LCAs, enabling hotspot identification across eight environmental impacts and five recyclability criteria. Real-time updates reflect portfolio and volume changes, while secure deployment keeps BoM and cost data in-house and aligned with standards and IT requirements.

With Lingaro's solution, the company improved core LCA capabilities, moving from slow manual studies to continuous product-level insight, including:

- **Scenario turnaround:** from two to three months to near-instant simulations for analysis of new packaging designs and portfolio changes.
- **Environmental impact and cost combined:** joint environmental and cost analytics in one tool enabling identify of cost-effective decarbonization options paths.
- **Standards-aligned:** full LCAs aligned to PEF/ISO where allowed by primary data.

>98%
LCA portfolio coverage

<50 USD
per SKU for LCA analysis

>60%
packaging costs modeled

"This platform enabled a strategic shift to phase out virgin plastic packaging. We measure our success not by the daily users of the platform but by the millions of kilograms of CO_2 equivalent avoided and the millions of USD in packaging costs saved for our client."

Maciej Drwal, Sustainability Strategy Consultant

Tired of slow manual studies and prohibitive per-SKU costs?

Automate your LCAs, achieve full portfolio coverage, and turn months of waiting into instant calculations.

Contact us

Achieve More With Data & AI