Reviewers
Ecouage – done (no feedback)
New ERA – pending

Chapter 8: Measuring Impact (Refill)

Congratulations! You've reached the last section in Open Reuse where you'll learn how to measure the environmental, social, and economic impact of your refill system! You will learn to build simple impact models, apply LCA at different depths, and calculate environmental break-even using return rates and packaging design parameters. The section explains how to quantify packaging avoided and associated CO2 reductions, track metrics with practical calculators and baselines, and assess social outcomes such as green jobs and poverty-tax savings. It also covers ESG reporting needs and gives clear guidance on transparent impact communication that combines credible data with concise storytelling.

Intro to measuring impact

Measuring impact is essential for understanding the true value and effectiveness of reuse systems. By tracking and analyzing your system's impact, you can make better-informed decisions, improve design and operations, and clearly demonstrate the tangible benefits of reuse to stakeholders.

Reuse models generate positive outcomes across three key areas: environmental, social, and economic impact. This chapter will introduce these areas early on to provide context, then delve deeper into key metrics and methods such as Life Cycle Assessment (LCA), cost-benefit analyses comparing reuse to single-use options, calculation of green jobs created, and ways your system helps address the poverty tax.

You will be equipped with practical tools to calculate and track these impacts and receive guidance on how to communicate your impact transparently and effectively. Additionally, depending on your company type and location, you may need to report on your ESG (Environmental, Social, and Governance) performance—reuse initiatives can positively contribute to your ESG outcomes when done properly.

1. Environmental Impact

Introduction to LCA

Life Cycle Assessment (LCA) is a method used to evaluate the environmental impacts of a product or system throughout its entire life—from raw material extraction to end-of-life disposal or recycling. In the context of refill systems, LCA helps compare the sustainability of reuse models against single-use alternatives by assessing factors such as material use, energy consumption, transportation, and washing. By identifying environmental hotspots, LCA supports data-driven decisions to optimize refill systems for lower carbon footprints and reduced waste.

LCA takes time and money to implement properly. You can still get started measuring your environmental, social and economic impact at a high level and work up to a more through LCA over time!

Call our box:

There are several reports on the LCA of refill models with evidence showing that refill has a lower environmental impact.

For example, Eunomia developed a Comparative LCA of reusable and single-use packaging systems for grocery items in the UK. The report showcases a LCA done for the Refill Coalition showing reusable packaging systems in the grocery sector can have significantly improved environmental performance compared to single-use alternatives.

The scope of the report covers two systems, trialled by ALDI (in-store) and Ocado Retail (online), comparing them with single-use equivalents across eight grocery products. Download the full report here: Comparative LCA of reusable and single-use packaging systems for grocery items in the UK - Eunomia

There are many companies that can help you conduct in-depth Life Cycle Assessments (LCAs) to analyze the environmental impacts of your refill system. LCA results, such as CO2 emissions, are commonly calculated based on key assumptions including return rates of reusable packaging. Using accurate return rates is critical for correctly estimating environmental break-even points and overall emissions savings.

To complement detailed LCAs, practical online calculators are available for swift, accessible impact estimations. For example, beeok.com offers a simple, user-friendly tool that calculates environmental impacts directly linked to your refill initiative.

It's important to note that when comparing LCA results, consistency in assumptions and parameters is essential to ensure valid comparisons. Therefore, results should always be interpreted within the context of the specific system design and boundary conditions.

1. Environmental break-even

Environmental break-even refers to the point at which the environmental impact of a product or system (such as a refill or return system) becomes neutral when compared to its alternative (typically single-use). This concept measures when the benefits of reuse, such as reduced packaging waste or lower carbon emissions, outweigh the initial environmental costs, including manufacturing, transportation, and cleaning. Understanding this threshold helps to demonstrate the true sustainability potential of refill and reuse models.

A recent report from Eunomia[1] found that the breakeven point for climate impact for refill systems in the UK is achievable in practical, commercial timeframes – typically between 10–25 uses would breakeven against even the most challenging formats and in some cases this is as low as 2-3 reuses.

For refill companies, you will calculate the impact of your dispensers by helping your customers avoid single-use plastic. Hardware companies are enabling reuse. Help scale reuse and your sales by convincing retailers and brands with data on how reuse can help them save money (especially if that is their primary

[1] Comparative LCA of reusable and single-use packaging systems for grocery items in the UK - Eunomia

driver). Full transparency on the breakeven point, and helping them to showcase their environmental, economic, and social impact. Also how much consumers can save on costs while making an impact. Ensure that you address the aspects that are the biggest concern to your target audience or persona.

Example:
Refillable cleaning product containers.
Initially, the environmental cost of manufacturing the refillable container (which may be made of durable materials like glass or metal) and transporting it could be higher than that of single-use plastic bottles. However, once the refillable container is used for multiple refills, the environmental impact of the reusable system becomes lower than continuously producing, transporting, and discarding single-use plastic bottles.

The **environmental break-even** point for this system occurs after a certain number of refills, where the benefits of reduced plastic waste, fewer resources for manufacturing, and lower carbon emissions from fewer shipments outweigh the initial environmental cost of producing the refillable container. This demonstrates how refill systems become progressively more sustainable over time.

Table 3. Sustainability breakeven point of reuse materials for venues and events

Reusable cup material	Single-use alternative
Ceramic	• 10-70 uses to be lower than paper[13] • 70 uses to be lower than polystyrene foam[13]
Glass	• 36 uses to be lower than paper cups[13] • 3 uses to be lower than a PET 0.5 litre bottle[52] • 25 uses to be lower than a PET 2 litre bottle[52]
Reusable polypropylene	• 10 uses to be lower than single-use polypropylene[13] • 20 uses to be lower than paper cups[13]
Stainless steel	• 35 uses to be lower than paper and polyethylene cups [13]

2. Packaging avoided

Every time packaging is reused in a refill or return system, you eliminate the environmental impact associated with producing and disposing of one single-use container. To measure packaging avoided, begin by comparing the weight or volume of the single-use packaging you are replacing with your refill packaging. Calculating your reuse rate will then reveal how many packaging units you prevent from reaching landfill, which directly correlates with CO2 emissions avoided.

Steps to Get Started:

1. Define your measurement unit:
    - Weight (grams or kilograms) or
    - Volume (liters)
2. Establish your baseline: Identify the average weight or volume of the single-use packaging you are replacing (e.g., a 5L detergent container typically weighs XX grams).
3. Track refill volume or units sold: Calculate the total quantity of refill sales in your chosen unit (liters or kilograms).

4. Calculate packaging avoided: Multiply the refill volume or units sold by the baseline packaging weight/volume of the single-use version to estimate total packaging avoided.

Benchmarks for Refill Solutions

Having clear benchmarks is critical to understanding and communicating the environmental impact of your refill initiative. You can create a simple graphic or table illustrating common product benchmarks such as:

- How much plastic is saved per kilogram or liter of product when refilled compared to single-use packaging
- The number of refills required to reach environmental break-even (i.e., when reuse offsets its own footprint)

For example, based on Algramo's experience in Chile:

- Refilling just 1 kg of a staple product in reusable containers can save a substantial weight of plastic compared to single-use packaging.
- In their pilot, some detergent bottles were refilled up to 15 times, significantly reducing plastic waste and related emissions.
- Algramo's whitelabel return rate exceeds 85%, a highly successful metric reflecting customer engagement and effective reuse.

Real-life Impact Example: After 7 months of operation, a refill initiative in the Philippines prevented over 45,000 pieces of plastic from entering the oceans (Video Link).

→ **CALL OUT**
Check out a simple simulation of your potential impact using the Algramo impact calculator! In just seconds you can see the potential impact you could make by switching to refill.
Simulate your impact - Algramo

2. Social impact metrics

Refill systems not only reduce environmental impact by minimizing waste and emissions, but they also generate significant social benefits. These systems create new green and circular jobs along the entire value chain—both directly and indirectly—while supporting local businesses. By increasing demand for locally produced goods, refill initiatives help strengthen community economies.

Importantly, refill systems provide affordable access to essential products for low-income communities through flexible purchasing options that allow buying in smaller quantities at lower cost per unit. This approach helps alleviate economic barriers, enabling more people to access staple goods without the financial strain of upfront large purchases.

Reuse fosters strong and resilient local economies, where activities such as collecting, cleaning, and redistributing reusable packaging create safer, stable jobs that contribute to local wealth building. The rise of reuse services also opens up entrepreneurial opportunities within communities.

Here are some quick facts[2]:

- Reuse creates up to 30 times more jobs than landfills, and they're much safer than recycling jobs.
- Clean, safe reuse jobs have an 84% reduction in industry toxicity score.
- It is estimated that in a 300,000 resident city, a widespread reuse system can create 150-250 local jobs , including transporting, sorting, washing, packing, redistributing, managing, and supervising , that can't be exported.

Measuring the **social impact** of refill systems involves evaluating how these systems contribute to local communities, employment, and social equity. Below are some metrics you can consider for your reporting:

- **Number of jobs created** - this could include both direct and indirect. How many jobs are created for women?
- **% cost related to local jobs** - this will help you understand your contribution to a just transition and green job creation
- **Low-income access:** Number of low-income households accessing affordable staple goods via refill models. OR Percentage of staple product purchases by low-income users made through refill systems.
- **Poverty tax Savings:** Want to take it a step further and understand the cost-savings for your low-income customers? Customers purchasing low quantities at low cost (through reuse) save $X compared to buying the same amount in single-packaged formats. By gathering this data you can calculate and report savings from the poverty tax.
    - Algramo's work was originally inspired to address the "poverty tax", the surcharge paid by lower income families for staples sold in smaller sizes.
    - GC Walisa 's website highlights many challenges related to poverty tax in South Africa that they are trying to help address through their reuse business.

> "More than half of our country's population are unable to afford basic foods. Most are forced to shop in smaller, more expensive local stores that, on average, charge 30 to 50 percent more for smaller pack items".

Call Out: Empowering Women Through Reuse

Women play a pivotal role in fostering environmentally sustainable consumption and advancing the circular economy. Research shows that companies with greater gender diversity are more likely to operate sustainably, and female entrepreneurs often lead innovation in circular business models.

The GIZ projects across regions like Georgia, South Africa, Albania, Colombia, and Kosovo demonstrate how engaging women in reuse and refill initiatives creates meaningful economic opportunities, supports local communities, and drives social equity. Women's participation ranges from managing reuse logistics to running businesses that contribute to a greener economy.

Tracking the impact of reuse on women's employment is vital. Metrics such as the number of women employed, women-led businesses supported, and gender-sensitive job creation can help you showcase your initiative's social value.

[2] Reuse vs Single-use: Economics — Upstream

By empowering women within reuse systems, you contribute not only to environmental goals but also to building resilient, inclusive economies.

Learn more through GIZ's detailed baseline studies and country-specific reports:

- Circular Economy in Georgia
- Reusable Packaging and Women's Participation in South Africa
- Circular Economy and Women in Albania
- Circular Economy and Women in Colombia
- Circular Economy and Women in Kosovo.[3]

3. Economic Impact Metrics

Measuring the economic impact of your refill solution is critical, as price is the main driver of adoption in both B2B and B2C markets. Demonstrating the financial benefits of refill—not only in cost reduction but also in revenue growth—is essential for scaling your initiative successfully.

Key economic metrics to calculate include:

- Cost Savings: How much do customers save by switching to refill versus single-use products? This can include purchasing smaller volumes at affordable prices, avoiding the "poverty tax," and benefiting from lower packaging and logistics costs.
- Revenue Increase: Measure additional revenue generated through refill sales, repeat purchases, and potentially premium pricing for sustainable options.

Also consider income streams directly tied to the refill solution itself, such as fees for dispensing services or refill station maintenance.

To present your economic impact holistically, link and cross-reference this with the financial planning and forecasting tools outlined in the Finance chapter. This connects the triple bottom line of social, environmental, and economic impact while providing investors and stakeholders with clear financial narratives.

Call Out: Just Transition for Refill Systems

The transition from single-use to reusable packaging is a systemic shift that presents both opportunities and challenges for workers, businesses, consumers, and communities. Scaling reuse must be done in alignment with Just Transition principles, ensuring that environmental progress goes hand in hand with social equity and economic inclusiveness.

[3] Circular Economy in Georgia

A Just Transition means maximizing socio-economic benefits such as creating good green jobs, supporting small businesses, and fostering local economies, while minimizing negative impacts that may arise for workers or communities during the transformation.
Effective Just Transition strategies include:

- Inclusive social dialogue among all stakeholders affected by the change
- Supportive policies and economic incentives to formalize green jobs and training
- An emphasis on equitable access to opportunities across all groups, including vulnerable populations

For a deep dive on the necessary conditions, benefits, and best practices to achieve a Just Transition in reusable packaging, see this detailed Rethink Plastic Alliance Report – A Just Transition to Reusable Packaging.

Communicate Your Impact

Tracking your impact is critical to know how your reuse solution is contributing to waste reduction and social advances. It is equally important to be able to communicate your impact in a way that will help raise awareness, increase customer growth and gain key investments needed to scale. Both data and storytelling are key!

Steps to communicate your impact:

- Identify which key impact metrics matter most to your business. What exactly will you track?
- Establish baseline data , understand the current state for each metric before scaling.
- Track and collect data over time consistently and accurately. How will you collect this data? How often?

Data can be both quantitative (e.g., CO2 reductions, packaging avoided) and qualitative (e.g., stories from low-income communities benefiting from reuse).

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Share your impact! Ways to share your impact:

- Display your impact numbers prominently on your website with regular updates
- Use customer stories and testimonials to convey real-world benefits
- Leverage social media to highlight achievements and share best practices
- Publish a detailed impact report expanding on your data and narratives
- Invite customers to share their stories firsthand
- Include impact data in any investor or funding pitch decks

Above all, be authentic and transparent in your communication!

Inspiration: Sykell Impact Report
Want to highlight your impact but not sure how? Take a look at the recent impact report from Sykell as inspiration. The report clearly showcases the impact of their EINFACH MEHRWEG and Circular ERP solutions, including LCA analysis, impact numbers and learnings throughout their journey. Access the full report on their website: Home

Additional Resources

- Help companies understand progress through reuse: Measuring reuse in the Global Commitment

- To avoid fragmented reporting and build consumer trust, harmonizing impact measurement standards is urgent. Read the full WEF report on this topic: Scaling Reuse Models 2023
- Reuse vs Single-use: Economics , Upstream

It is becoming urgent to harmonize the way in which standards are set and progress measured. According to a recent WEF report, a fragmented approach in target-setting and measurement would slow down the widescale adoption of reuse models, create inconsistency in the quality of reporting and lead to a loss of consumer confidence. Read more details in the full report:
WEF_Scaling_Reuse_Models_2023.pdf

Case Study: EcoTrace – Digital Refill Solutions Empowering Kenyan Communities

EcoTrace, a YEH alumni and social business in Kenya, offers a digital-based refill system for essential household products like detergent and cooking oil through a network of mobile and stationary refill stations. Targeting low- and middle-income communities, EcoTrace provides affordable access by eliminating costly single-use packaging and enabling flexible, small-quantity purchases.

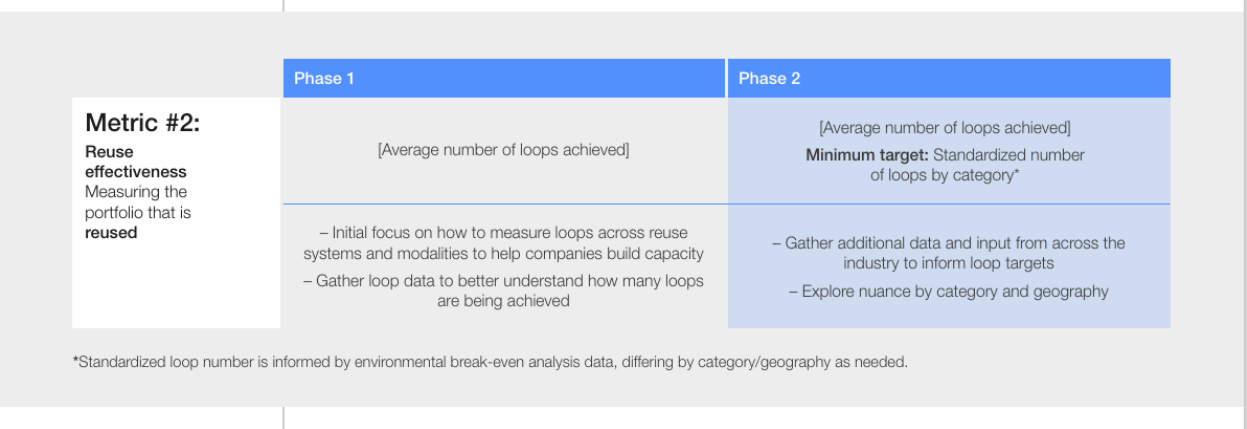
Impact Highlights:

- Environmental: Significant reductions in single-use plastic waste and associated CO2 emissions through widespread container reuse.
- Social: Creation of green jobs, especially empowering women and youth in local retail and refill operations.
- Economic: Consumers save up to 20% compared to sachet purchases, increasing purchasing power and affordability. Retailers benefit from streamlined inventory management and higher sales.

Communication Approach:

EcoTrace combines data-driven metrics (plastic avoided, CO2 saved) with compelling stories from users, shared via social media, community engagements, and impact reports. Their transparency and authentic storytelling have boosted customer loyalty, attracted funding, and expanded refill adoption.

EcoTrace exemplifies how innovative, circular business models can deliver triple-bottom-line impact while building resilient, inclusive economies.



	Phase 1	Phase 2
Metric #2: **Reuse effectiveness** Measuring the portfolio that is **reused**	[Average number of loops achieved]	[Average number of loops achieved] **Minimum target:** Standardized number of loops by category*
	– Initial focus on how to measure loops across reuse systems and modalities to help companies build capacity – Gather loop data to better understand how many loops are being achieved	– Gather additional data and input from across the industry to inform loop targets – Explore nuance by category and geography

*Standardized loop number is informed by environmental break-even analysis data, differing by category/geography as needed.

Congratulations on completing the Open Reuse guide to refill! We'd love to get your feedback on your experience, where we can improve and your plans to implement learnings! Please take 5 minutes to complete this brief survey!