Technical recommendations for calculating the share of reusable packaging under the EU Packaging and Packaging Waste Regulation (PPWR)

Methodology for calculating the share of reusable packaging (PPWR Articles 29–30)

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Author: Fanny Rateau, Senior Programme Manager, Waste – ECOS fanny.rateau@ecostandard.org
Acknowledgement: Sarah Perreard, Co-CEO – Earth Action

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ECOS – Environmental Coalition on Standards
c/o WeWork, Rue du Commerce 31
1000 Brussels, Belgium
info@ecostandard.org

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Executive summary

This note provides technical recommendations to inform the European Commission's forthcoming implementing act under Articles 29 and 30 of the Packaging and Packaging Waste Regulation (PPWR).

Its objective is to establish a harmonised and auditable methodology for calculating and verifying the share of reusable packaging placed on the market by economic operators.

Prepared by Earth Action (EA) for the Environmental Coalition on Standards (ECOS), the methodology defines one clear compliance indicator, the unit-based share of packaging effectively reused, supported by complementary transparency indicators (return, loss and breakage rates, and mass disclosures).

The report also outlines practical implementation measures within the PPWR framework: integration into EPR reporting templates, SME-specific flexibility, and pilot data-collection activities in 2026–2027 to prepare for full deployment.

Context

The EU's Packaging and Packaging Waste Regulation (EU) 2025/40 (PPWR), adopted in December 2024 and entering into force in early 2025, marks a major update of packaging policy across the Union. It sets out binding reuse and waste prevention targets, strengthens reporting and design-for-reuse requirements, and lays down the basis for the European Commission's future implementing acts. Under Articles 29 and 30 of the PPWR, economic operators in certain sectors must start reporting the share of reusable packaging they place on the market, and the Commission is required to define the calculation methodology. In this context, the Environmental Coalition on Standards (ECOS) is producing a technical opinion for submission to DG Environment (DG ENV). The aim is to ensure that the methodology delivered by the Commission is harmonised, auditable, and feasible for operators, while laying a credible foundation for consistent reporting across Member States.

Key methodological issues

Definitions

Reusable packaging

Packaging that is conceived, designed and placed on the market as part of a reuse system to accomplish multiple trips or rotations[1] for the same purpose for which it was conceived, and that is used multiple times within its service life, and that has completed at least one verified reuse cycle within the reporting year, or is demonstrably in active circulation within an operational reuse system (e.g. long-rotation B2B or transport packaging). Reusable packaging must retain its functional and safety performance across intended cycles and remain recyclable at the end of its service life.

Reuse system

The organisational, technical or financial arrangements that enable reusable packaging to be collected, stored and returned, reconditioned (e.g. cleaning, inspection, repair[i]), filled or uploaded, and redistributed for subsequent use, ensuring circulation and repeated utilisation[2].
Such systems may operate as closed-loop (within one organisation or consortium keeping packaging ownership) or open-loop (shared or pooled across market actors transferring packaging ownership), provided they ensure traceability, health, safety and hygiene, as well as data integrity sufficient for reporting and verification.

Clarification – Hybrid formats

Where packaging consists of both reusable and single-use components (e.g. a reusable container with a disposable lid or liner), only the reusable primary containment may be counted toward the reusable share. Single-use ancillary elements shall be disclosed separately.

Clarification – Minimum rotations and durability

Until the Commission adopts specific minimum rotation thresholds by delegated act, operators shall report the intended number of cycles for each packaging format and the actual average number achieved during the reporting year, supported by sampling or tracking data. Packaging should remain fit for purpose and safe throughout those cycles, in line with Annex VI hygiene and performance criteria.

i See also the PPWR Annex VI Part B for further details on reconditioning processes.

System boundaries

Reporting entity

Responsibility for calculating and reporting the share of reusable packaging lies with the economic operator placing the packaging on the EU market[3], as laid down in the PPWR article 30.
This includes producers, importers, fillers or distributors that introduce packaged goods for sale or distribution within the Union.

Where a third-party reuse-system operator (e.g. pooling service, washing hub, logistics consortium) manages the circulation of packaging on behalf of several economic operators, data collection may be delegated contractually, but the reporting responsibility remains with the operator placing the packaging on the market (e.g. the final distributor).

Avoiding double counting

Each packaging unit may be reported by only one economic operator within a given reporting year. If ownership or reporting responsibility transfers (for example, when reusable containers are sold or transferred to another operator, such as for open loop systems), this must be documented and auditable.

Shared pools shall allocate reusable units to participating operators according to a transparent key such as number of fills, units in circulation, or contractual share of the pool.

Geographical boundary

Only packaging used within the EU during the reporting year shall be counted toward an operator's reusable share. Reusable packaging exported outside the EU or imported for use within the EU should be reported separately to ensure accurate national and Union-level statistics.

Temporal boundary

Reporting shall cover one calendar year, including all packaging placed on the market during that year and all reusable units that have completed at least one verified reuse cycle within that period, or are demonstrably in active circulation within an operational reuse system. Units in storage or awaiting first use shall not be included until their first verified cycle.

Calculation basis

Primary calculation basis – unit-based approach

The share of reusable packaging shall be calculated per individual packaging unit placed on the market and used within a compliant reuse system during the reporting year. This unit-based approach ensures material neutrality and represents the functional service delivered by packaging (one container enabling one use), regardless of its material or weight.

Units should be grouped by functional category (e.g. beverage bottles ≤ 1.5 L, takeaway cups ≤ 500 mL, transport crates, etc.) to allow comparison within like-for-like formats.

Supporting disclosure – mass and volume data

Operators shall additionally report, where such information is readily available from existing records, the following supplementary data:

- the mass (kg) of reusable and single-use packaging placed on the market, broken down by material category; and
- where relevant, the volume (L or m^3) of packaging for sectors where volume better represents service delivered, e.g. beverages.

These disclosures are provided for transparency and verification only and shall not be required to generate new measurements or data systems. To limit reporting burden, especially for SMEs, operators may rely on estimates derived from standard weights or supplier specifications where direct measurement is not feasible.

The official reuse share shall be expressed in percentage of units.

Rationale for hierarchy

- Avoiding distortion: A mass-based indicator can over- or under-represent reuse because reusable packaging is often heavier than its single-use equivalent.[4]
  For example, a reusable plastic cup weighing 100 g replacing a single-use cup of 10 g would count ten times more in tonnes even though it provides the same service once.
  Unit-based accounting prevents this distortion, ensuring that reuse is not penalised or artificially inflated due to differences in weight or material.
- Fair comparison across and within materials: A unit-based denominator avoids favouring lightweight plastics over glass or metal and avoids penalising heavier reusable designs within the same material family.
- Compatibility across sectors: Unit-based reporting is the only approach that allows reusable packaging performance to be compared consistently across all sectors (takeaway, beverages, transport, B2B). A volume-based approach may be useful within the beverage sector (Art. 30(2) PPWR), but cannot be applied across sectors, and would therefore fragment reporting. Grouping by functional category, as proposed in this methodology, enables consistent comparison while still allowing beverage volume to be disclosed where relevant.
- Environmental transparency preserved: Mass and volume data can still be reported as supplementary information for assessing greenhouse-gas or resource impacts, without influencing compliance results.[5]
- Policy alignment: Article 29 reuse targets refer to *percentages of packaging used*; a unit-based denominator directly matches that legal framing, whereas weight or volume do not provide a uniform basis across all packaging types.

Metrics and indicators

Indicator overview

Type	Description	Pros	Cons / Gaps
Nominal reuse rate	% of packaging items *designed* for reuse and placed on the market	Simple; aligns with existing EMF / PPWR language	Does not measure actual reuse; may overestimate impact
Effective reuse rate (Primary compliance indicator)	% of total packaging *actually reused* (verified loops within a reuse system)	Reflects real performance; auditable if data available	Requires system-level data (return, loss)
SUP avoided (mass-based disclosure)	kg of single-use packaging displaced by reuse or refill	Conservative, credible; compatible with PFN framework	Proxy for impact, not an official compliance measure Favours lightweighting (e.g. plastics)
Leakage avoided (impact-based – optional)	kg of waste prevented from entering the environment, derived from SUP avoided × leakage factors	True environmental outcome; aligns with PFN/PAF [ii]metric ladder[6] and WBCSD/CSRD reporting[7]	Needs leakage coefficients; data-intensive; too advanced for first PPWR act

Table 1: Overview of reuse indicators: definitions, advantages and limitations

Primary compliance indicator: share of reusable packaging

The effective reuse rate is the only mandatory compliance indicator for PPWR implementation. It represents the percentage of packaging units actually reused within a compliant reuse system during the reporting year, relative to all packaging placed on the market by the same economic operator.

The indicator is unit-based and avoids weight-related biases, ensuring that reusable packaging made from heavier materials (e.g. glass, steel) is not penalised compared to lighter alternatives. The methodology applies consistently across materials while recognizing that reuse performance may differ by material category.

Supporting indicators recommended for transparency

Economic operators and Member States may also report complementary information to improve transparency and comparability, including:

- Nominal reuse rate: share of packaging designed for reuse, to show design ambition.
- Return rate: proportion of reusable units returned to the reuse system after use.
- Loss and breakage rate: proportion of reusable units removed from service before completing their intended cycles.
- Mass disclosure (by material): total weight of reusable and single-use packaging placed on the market, by material category.

ii Plastic Footprint Network (PFN) and its Plastic Pollution Mitigation Action Framework (PAF). www.plasticfootprint.earth

- Volume disclosure (where relevant): total litres or cubic metres of packaging used, for sectors such as beverages.

These supporting indicators are informative; they do not alter the compliance result but help authorities and stakeholders assess system performance and environmental benefits. The level of granularity of the required information should take into account the burden on reuse operators, especially smaller ones.

Indicator hierarchy and interpretation

The unit-based share of reusable packaging serves as the sole official compliance indicator under the PPWR. It expresses, in a clear and material-neutral way, the proportion of packaging that has been genuinely reused within a compliant reuse system during the reporting year. This primary metric is designed to be auditable and comparable across materials and market sectors.

Complementary indicators play a supporting role. Mass and volume disclosures provide visibility on material flows and can inform broader analyses of resource efficiency or greenhouse-gas performance, but they do not affect compliance results. Regarding volume, functional categories can be differentiated (e.g. beverage bottles ≤ 1.5 L, takeaway cups ≤ 500 mL, transport crates, etc.) for comparing similar packaging formats.
Performance indicators, such as return rate, loss and breakage rate, and effective reuse rate, add depth and credibility to reporting. They help operators and authorities understand how efficiently a reuse system functions and where improvements are needed, without complicating the core compliance calculation.

Taken together, this hierarchy ensures that the PPWR reporting framework remains both simple and robust: a single, harmonised metric for regulatory compliance, complemented by optional data that strengthen transparency and enable continuous improvement of reuse systems.

Treatment of hybrid systems and avoidance of double counting

Hybrid or composite packaging systems

Where a packaging format consists of both reusable and single-use components, such as a reusable container paired with a disposable lid, film or liner, only the reusable primary containment element (the part delivering the main packaging function) shall be counted as one reusable unit for the purpose of calculating the reuse share.

Auxiliary single-use elements shall not be counted in units and shall instead be reported in mass within the supporting disclosure tables, to ensure transparency on remaining single-use material flows without distorting the unit-based compliance indicator.

This approach ensures that, for example, a reusable cup with a single-use lid counts as one reusable unit, while the disposable lid is recorded separately as single-use packaging (mass-based disclosure).

Integrated or inseparable components

Where reusable and single-use elements are integrated or cannot be easily separated, the packaging may be reported as reused provided that:

- the single-use element serves only auxiliary functions (e.g. closure, film, label, or hygienic protection) and represents no more than 20 % of the total packaging weight;[8]
- the reusable portion performs the primary containment function and remains in service for multiple uses under the same reuse system; and
- the single-use component is collected, cleaned, or otherwise managed by the operator or reuse-system manager to ensure proper recovery and recycling.

Where the share of single-use elements exceeds this threshold, or the components cannot be separated or managed within the reuse system, the entire unit should be reported as single-use. The weight of the single-use element shall still be reported separately in the mass-disclosure table for transparency.[iii]

Cross-border use

Reusable packaging used within the EU shall be included in EU reporting even when it crosses Member-State borders, provided it remains within an EU-registered reuse system.
Packaging exported for use outside the EU shall be excluded from the EU reuse share but disclosed separately for transparency.
Conversely, imported reusable packaging used in the EU shall be included in the numerator and denominator for the reporting economic operator.

Temporal boundary

Only reuse occurring during the reporting year shall be counted, in line with the PPWR article 30. Packaging placed on the market but not yet reused during that year may be carried forward and counted in the year of its first verified reuse.

Adjustments for effective reuse, losses and breakage -including verification and reporting frequency

Principle – count actual reuse, not design-for-reuse

Only packaging units that have completed at least one verified reuse cycles during the reporting year, or that are demonstrably in active circulation within an operational reuse system (e.g. long-rotation transport or B2B packaging), shall be counted as reusable.

Packaging that is merely *designed* for reuse but has not yet entered circulation shall not be included until its first documented use.

Minimum reuse performance (based on operational data)

To avoid inflated reporting, reusable packaging should be counted only when it has completed at least one verified reuse cycle within the reporting year, or is demonstrably in active circulation within an operational reuse system (e.g., long-rotation transport or B2B systems).
At this stage, the Implementing Act should not set numeric minimum rotation thresholds for each packaging type. Instead, format-specific averages should be established later, based on:

- empirical rotation data collected across Member States.
- the Commission's ongoing preparatory studies, e.g. with Ramboll.
- reporting data provided under Article 30.

This approach ensures environmental credibility without prematurely introducing sector-specific numeric thresholds unsupported by operational evidence.

Note: Evidence from mature reuse systems (e.g. beverage bottles with typical rotation values in the 15–25 range, as referenced in the draft preparatory study from Ramboll Germany[9]) demonstrates that high average lifetimes are technically and economically achievable. These figures, however, represent operational benchmarks. The forthcoming delegated act will need to translate such operational data into harmonised minimum rotation thresholds. Until those thresholds are established, this methodology applies the conservative PPWR-aligned criterion of one verified reuse cycle per

iii This 20 % weight threshold follows the approach established in the French national reuse-reporting framework, as presented in CITEO's Practical Guide for Reuse Reporting (2024, p. 14 and Appendix 3).

reporting year, or demonstrable active circulation for long-rotation formats, ensuring robust reporting without pre-empting the Commission's decision on final minimums.

Further considerations on durability, lifespan, and functional integrity of reusable packaging are explored in ECOS's technical paper on durability criteria (ECOS, 2025).[10]

Tracking requirements

The methodology does not mandate individual item tracking.[11]
Economic operators and reuse-system managers may use aggregate, statistical or digital methods, (including batch-level inventory, deposit-return records, refill transaction data or representative sampling) provided that the data are documented, verifiable and sufficiently accurate to support third-party assurance of reuse, loss and return rates.
Systems with digital traceability (e.g. QR, barcode, RFID) may report directly from those datasets, but this remains optional.

Loss and breakage treatment

Packaging lost, damaged or retired from the system before completing its intended cycles shall be excluded from the reusable count for the reporting year.
Such units should be recorded under "losses" and, where applicable, under end-of-life recycling statistics.

Data assurance

Reuse-system operators shall maintain records enabling verification of all parameters above and provide the reporting economic operator with a summary statement for audit purposes.
Missing or uncertain data shall be treated conservatively, that is, assumed to reduce rather than increase the reported reuse share.

Proposed calculation methodology

Purpose and principles

The methodology establishes a consistent and verifiable process for calculating the share of reusable packaging used by economic operators, in line with Articles 29 and 30 of the PPWR.
It is guided by three principles:

- Harmonisation: a common framework enabling comparable results across Member States and materials,
- Auditability: transparent data sources and traceable records suitable for third-party verification,
- Practicality: proportional requirements that can be met by both large systems with digital traceability and smaller operators using manual or statistical methods.

The objective of this methodology is to provide a transparent, conservative, and reproducible process for quantifying and verifying the share of packaging effectively reused within compliant reuse systems.

Calculation workflow

The calculation follows five main steps:

- Define the reporting boundary: the economic operator placing packaging on the market (Section 3.2).
- Collect input data: total packaging units placed on the market (by functional category and material) and reusable units that completed at least one verified reuse cycle during the reporting year, or were demonstrably in active circulation.

- Apply adjustments: exclude units lost, damaged, or retired before first reuse; document return and reconditioning rates (Section 3.4).
- Compute the indicator: derive the share of reusable packaging as the ratio of reusable units to total units placed on the market.
- Document supporting parameters: report loops achieved, loss/breakage rate, and return rate for assurance and benchmarking.

Formula

For transparency, the calculation of the compliance indicator can be expressed as:

$$\text{Share}_{reuse}(\%) = \frac{N_{reuse,active}}{N_{total}} \times 100$$

Where

$N_{reuse,active}$= number of reusable packaging units that completed at least one verified reuse cycles during the reporting year, or are demonstrably in active circulation within an operational reuse system, (e.g. long-rotation B2B or transport packaging), and

N_{total}= total packaging units placed on the market by the same operator in the same year.

Supporting indicators (effective reuse rate, return rate, loss rate) are calculated from the same dataset using the definitions in Section 4.

Simplified approach to calculating the number of reused units

To minimise reporting burden, operators may calculate the number of reusable units for the reporting period using a simplified approach based on operational data from the reuse system:

$$N_{reuse,active} \approx (\text{collection rate} - \text{decommissioning rate}) \times N_{total}$$

This approximation is acceptable where the reuse-system operator can provide reliable data on:

- the collection rate (proportion of all packaging units placed on the market during the reporting year that are returned to the reuse system after use), and
- the decommissioning rate, also referred to operationally as the rejection rate (proportion of all packaging units permanently removed from circulation during the reporting year due to damage, loss or end-of-life).

This approach provides a practical and auditable proxy for the number of units that completed a reuse cycle, while avoiding the need for detailed unit-level tracking.
In most operational reuse systems, collection and rejection rates are routinely monitored for operational purposes (e.g. washing, stock management), making them readily available for reporting.[12]

Operators with more granular tracking data may report directly from those datasets.

Parameters to report and data collection requirements

To ensure transparent and verifiable reporting under Articles 29–30 PPWR, each economic operator shall report a minimum set of performance parameters for all reusable packaging formats used during the reporting year. These parameters reflect the operational performance of the reuse system and support consistent verification across Member States.

Reporting parameters (operator-level)

Each operator shall report, per packaging format:

- Loops achieved ($C_a$vg): average number of reuse cycles per format during the reporting year.
- Loss/breakage rate (L): percentage of units removed from service before intended lifetime.
- Return rate (R): percentage of units returned after use.
- Material type and mass: for transparency, disaggregated by packaging format.
- System type: closed-loop, open-loop, or hybrid, as defined in Annex VI PPWR.
- Average number of reuse cycles per packaging format during the reporting year.

These parameters support assurance of reuse performance but do **not** set minimum cycle requirements. Cycle thresholds will be defined separately in future Commission acts once empirical data become available.

Performance parameters for quality assurance (system-level data)

Each reuse system shall collect and retain the underlying data enabling verification of the parameters above. At minimum, they shall maintain::

- Number of active reusable units ($N_a$ctive) in circulation.
- Average number of reuse cycles achieved ($C_a$vg) for each packaging format.
- Loss and breakage rate (L).
- Return rate (R).
- Reconditioning or washing rate (W): percentage of returned packaging restored for further reuse.

These data may be obtained through digital tracking, batch-level inventories, deposit-return records, refill transaction logs, or statistically representative sampling. All data sources must be documented and traceable for verification by the competent authority.

Data collection

Data may be obtained through:

- Digital tracking (QR codes, barcodes, RFID, or app-based return records) where available;
- Aggregate or batch-level inventories maintained by reuse-system operators (e.g. deposit-return or pooling services);
- Transaction records for refill or return-at-store models; or
- Verified manual sampling for smaller systems, following statistically valid procedures.

All data sources must be documented and traceable. Where inconsistencies or missing values occur, conservative corrections shall be applied to avoid overstatement of reuse performance.

Verification

Reported data should undergo annual verification through limited assurance or an equivalent internal control recognised by competent authorities.
Verification shall confirm:

- the completeness and accuracy of packaging data (total and reusable);
- the plausibility of reuse, loss, and return rates; and
- the traceability of supporting evidence from reuse-system operators.

All monitored parameters must be based on verifiable data; where data gaps exist, default values shall be conservative, ensuring that reuse performance is not overstated.

Competent authorities may conduct random audits or request additional documentation as part of Member-State reporting to the Commission.

Avoiding double counting

Each packaging unit may be reported by one economic operator only within a given reporting year.
If ownership or reporting responsibility is transferred (for example, from a pool operator to a brand owner), this must be documented and auditable.

Shared or pooled reuse systems shall allocate packaging to participating operators using a transparent allocation key, such as the number of fills performed, average inventory share, or contractual service volumes.

Pool operators must keep allocation records available for audit by the competent authority.

Implementation considerations

Integration within the PPWR framework

The methodology can be operationalised through the implementing act foreseen under Article 30(3), accompanied by Commission guidance and a standardised reporting template. The template should collect, for each operator and format category:

- total packaging units placed on the market;
- reusable units that completed at least one verified reuse cycle during the year, or were demonstrably in active circulation;

- return, loss and breakage rates, where such data are made available by the reuse-system operator (e.g. deposit-return operator, pooling service, or washing hub)iv; and
- mass data by material type, where such information is readily available from existing records (e.g. supplier specifications, standard weights).

This harmonised format would ensure comparability across Member States and facilitate consolidation by Eurostat. The European Commission could integrate the template within the existing EU Packaging Waste Data Collection System used under Regulation (EU) 2019/1020, thereby avoiding duplicate submissions.[13]

Linkages with Extended Producer Responsibility (EPR)

The methodology complements and strengthens EPR mechanisms. EPR schemes can use the reported share of reusable packaging to:

- modulate fees, granting reduced contributions for verified reusable formats;
- track progress toward national prevention targets; and
- incentivise reuse infrastructure investment (e.g. washing hubs, logistics).

To ensure alignment, national authorities should reference the same definitions and parameters (Sections 3–5) in their EPR fee-modulation criteria. This will prevent divergent interpretations of what constitutes "reusable packaging" under PPWR and under EPR legislation.

Flexibility for SMEs and transition period

Small and medium-sized enterprises should be allowed to use simplified reporting templates and sampling-based estimates, provided these are documented and verifiable. Shared or cooperative reuse systems (e.g. regional pooling platforms) can help SMEs meet data and verification requirements collectively.

During the initial data-collection phase (2026–2027), the Commission and Member States could promote pilot projects to test data-collection methods and default values before full mandatory reporting begins. This phased approach would enhance data reliability while limiting administrative burden.

Capacity-building and guidance

The European Commission, in collaboration with the reusable packaging value chain, including civil society, should develop practical guidance on:

- setting up digital or aggregate tracking systems;
- defining sampling methodologies; and
- applying conservative corrections for incomplete datasets.

Regular technical workshops and data-quality reviews could support continuous improvement of reuse reporting and ensure harmonised implementation across the Union.

Conclusion

This note proposes an auditable and practicable methodology for calculating the share of reusable packaging under the PPWR. It combines scientific rigour with regulatory feasibility, ensuring that data reported by economic operators are comparable, verifiable, and environmentally meaningful.

iv Where return, loss and breakage data are not directly held by the economic operator, they shall be obtained from the reuse-system operator through contractual arrangements, in line with Articles 12 and 30 PPWR. The reporting operator is not required to generate these data independently.

Key recommendations include:

- Use of a unit-based primary compliance indicator to ensure material neutrality, complemented by mass and volume disclosures for transparency;
- Application of conservative assumptions and annual verification;
- Integration of the methodology into PPWR reporting templates and EPR fee-modulation schemes, with simplified options for SMEs; and
- A pilot phase (2026–2027) to test data-collection approaches and refine parameters before full enforcement.

By adopting this methodology, the European Commission can ensure that the forthcoming implementing act delivers credible, harmonised, and policy-relevant information on reuse across all Member States, supporting fair implementation of Article 29 targets and driving genuine progress toward a circular packaging economy.

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