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Plastic Footprint Network

Plastic Footprint Guidelines

Data governance

Version 1. November 2023

Convened by EA – Earth Action · www.plasticfootprint.earth

Introduction to the Plastic Footprint Network

Leading organizations have united within the Plastic Footprint Network to chart a new, more effective **path toward plastic pollution mitigation**.

The network's first priority was **unifying the framework** for measuring plastic leakage into a **single, science-based methodology** for organizations to accurately assess the environmental impact of their plastic use. Over **100 professionals** from **35 organizations** worked to establish the resulting methodology, which consists of 11 modules, all optimized for usability and delivery of **actionable results**.

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Objectives

Unifying the methodologies and perspectives of leading scientists, experts, and global practitioners, PFN enables organizations to understand the full impact, or footprint, from the use of plastic in their companies, products, and services.

1. Update and unify plastic footprinting methodologies

2. Ensure the methodology is used consistently by practitioners

3. Disseminate and scale the use of plastic footprinting

4. Explore link with plastic credit schemes, and how to prevent greenwashing claims

Where does this module fit in the PFN landscape?

Guidance

Strategic | Cross-cutting or specific issue

- Introduction to plastic footprinting
- Scopes and boundaries
  Alignment with environmental reporting standards
- new — Data governance — Current module
- 2024 — Target setting and mitigation

Technical

- Technical introduction to plastic leakage
- Glossary

Inventory: Macroplastics

- Packaging
- Textile
- new — Fishing gears
- new — Leakage from export
- new — Release rates
- 2024 — Automotive
- 2024 — Construction

Inventory: Microplastics

- Micro tire dust
- Micro textile fibres
- 2024 — Micro pellets
- 2024 — Micro paint
- 2024 — Micro agriculture

Impact

- new — Impact MariLCA

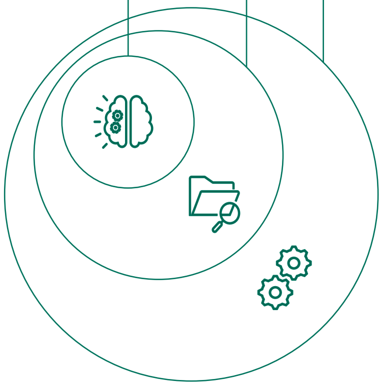
What are the objectives of this module?

This module provides comprehensive guidelines for selecting and utilizing data in the assessment of plastic footprints. It sets standards for data quality and transparency, aiming to maintain consistency across various assessment purposes. In pursuit of this goal, we will address the following three key questions:

1. How can we define clear standards for data quality in plastic footprint assessments?
2. What are the best practices for adapting data selection to suit the specific objectives of different plastic footprint assessments?
3. How can data usage practices be continuously enhanced to keep pace with evolving knowledge and technology in the field of plastic footprints?

At the end of this module, the users should know how to choose the most appropriate data for their plastic footprint assessment.

Structure of the module



1
Tailoring Data Requirements to Diverse Plastic Footprinting Applications

Why different data quality may be used to run plastic footprinting

Target audience: busy reader, scientific journalist

2
Data quality assessment method based on a pedigree matrix

- How to assess the data quality through the pedigree matrix
- Data quality requirement for different footprinting applications

Target audience: scientists, experts

3
A Pragmatic Approach to Achieving Optimal Data Quality for Plastic Footprinting

An iterative approach adapted to project scope and objectives

Target audience: scientists aiming at performing a plastic footprint.

Reading keys: Main take away | Supporting information | Key warning

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Part. 1

Tailoring Data Requirements to Diverse Plastic Footprinting Applications

Why different data quality may be used to run plastic footprinting : taxonomy & definitions.

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Defining data quality requirements aligned with plastic footprint objectives

Why do data quality requirement differ?

Data quality and granularity in plastic footprint assessments vary based on their intended use – whether internal or external.

Internal Use Purposes:

Enhancing Plastic Mitigation Strategy Within the Organization

Internal footprinting serves as the foundation for plastic mitigation strategy, focusing on

- **internal decision-making,**
- **hotspot identification,**
- with **no external communication** involved.

Data granularity and quality requirements for internal use are adaptable. While higher quality data is preferred, meeting acceptable data quality standards suffices for internal purposes

External Use Purposes:

Utilizing Plastic Footprinting for External Communication

The external use of plastic footprinting implies a communication purpose, including claims, narratives, and a commitment to a plastic mitigation strategy:

- developing a **plastic strategy** and setting targets,
- planning a **mitigation strategy** including offset through **plastic credits**,
- **comparing different products**.

High data granularity and quality are critical when the results of a plastic footprint assessment are utilized for external claims and for comprehensive product assessments.

Tailor data requirements to diverse plastic footprinting applications

Four types of usage of plastic footprinting applications have been identified:

1. Corporate screening assessment
2. Product screening assessment
3. Development of mitigation strategy: Target setting, mitigation, disclosure, claims & communication
4. Product plastic footprint (full LCA ISO14040/44)

Requirement of data quality and granularity →

1. Corporate screening assessment
2. Product screening assessment

- More flexibility on the quality and granularity of the data
- Higher quality is nevertheless encouraged

3. Development of mitigation strategy
4. Product footprint (full LCA ISO14040/44)

- Mandatory requirements on the quality of data
- Data transparency, standardization, and validation need to be ensured

⚠ The process of data collection, assessment, and data quality improvement should be (1) **adapted to specific requirements**, and (2) **performed in an iterative process**.

Definitions of different types of data

The plastic footprint aims at measuring the plastic leakage, which is defined as the plastic leaving the technosphere and accumulating in the natural environment (be it soil, air, or rivers and ocean).
In order to perform such plastic footprint, different types of data can be encountered.

Specific vs generic:

Specific:
Specific data in plastic footprinting is detailed and focused on a particular location, product, or material. It includes precise end-of-life data, such as PET polymer usage in bottles within a specific country.

Generic:
Generic data in plastic footprinting is broader and covers a wider scope. It encompasses general information related to waste management, plastic waste, or municipal solid waste and is often applied to larger regions rather than specific situations.

Primary vs secondary data:

Primary Data:
Primary data is information obtained directly from the source, often through methods like weighing quantities conducted by the company itself. It is highly precise and specific but requires significant effort to collect.

Secondary Data:
Conversely, secondary data is derived from external sources, such as literature and external data repositories, to include various factors in calculations. While it is easier to produce, it tends to be less precise compared to top-down data.

Directly weighed vs extrapolated:

Directly Weighed Data:
It refers to quantitative information obtained through direct measurement. This often occurs when a company can measure the weight of its products and the volume of products sold.

Extrapolated Data:
Extrapolated data is derived from estimates based on average values or literature when direct measurement is unfeasible. For instance, it is used to estimate the number of microfibers lost during production without conducting specific tests.

Economic vs quantity:

Economic Data:
Economic data is presented in the form of sales revenue or monetary figures. This type of data is typically expressed in terms of financial transactions, such as the revenue generated from the sale of products.

Quantity Data:
Quantity data is the specific weight or amount of a product typically needed for plastic footprinting. When this weight data is not readily available, it can be derived from sales data and the average weight of the plastic products sold, thus converting economic data into the weight-based data.

Deep dive of primary data & secondary data

PRIMARY data

«Original information collected firsthand for a specific purpose»

In our context:

- Data that come directly from the company or product. Data provided by suppliers or other value chains partners related to specific activities in the company's value chain.
- They are specific and precise but require time and effort to be gathered.

Mass of plastic involved and specifications about it (type, polymers, markets, etc.) typically should come in the form of primary data. Waste management data, or loss rates, can be primary data when the company has direct access to this information or can directly weigh them.

SECONDARY data

«Pre-existing data gathered by others and used for various purposes»

In our context:

- Data that are collected from other sources: industry-average, scientific research, external measurements, existing data repositories, government statistics, etc.
- They are not specific to the company or product, but they replace what cannot be weighed directly.

Waste management data, loss rates and release rates are example of what can be given as secondary data, as it is difficult to weigh them directly and there is often good research on the topic.

Company data on **production** (primary data) & Waste management or loss rates data (primary or secondary data) & Release rates (secondary data) → Plastic footprint

Part. 2

Data quality assessment method based on a pedigree matrix

How to assess the data quality through the pedigree matrix.

Definition of pedigree matrix

Pedigree matrix :

The pedigree matrix is a valuable tool used to assess data quality in the context of plastic footprinting, as commonly employed in Life Cycle Assessment (LCA) databases and the National Guidance for Plastic Pollution Hotspotting and Shaping Action from UNEP.

This matrix provides a structured approach to evaluate the quality of data. It consists of criteria to evaluate data sources based on factors like data collection methods, transparency, peer review, and validation processes.

The matrix assigns data quality scores to support users in distinguishing between reliable and less reliable data.
There are five levels of scores, with score 1 representing the highest data quality, while score 5 corresponds to the lowest data quality.

Assessing data quality with a pedigree matrix is crucial for accurate and credible environmental impact assessments in plastic footprinting and LCA, ensuring the use of sound and transparent data in these evaluations.

	1 BEST	2 GOOD	3 AVERAGE	4 BAD	5 WORST
RELIABILITY	Verified (e.g. peer-reviewed or highly trustable source) data based on measurements, multiple sources showing coherent values	Verified data based on calculation, multiple sources showing coherent values	Unverified data from measurement or calculation and/or from single source	Documented estimate	Undocumented estimate
TEMPORAL CORRELATION	Less than 3 years of difference with date of study	Adapted to the year of reference based on clear population or GDP correlation	Adapted to the year of reference based on unclear population or GDP correlation	Not adapted to the year of reference (< 10 years old data)	Not adapted to the year of reference (> 10 years old data)
GEOGRAPHICAL CORRELATION	Data is complete and representative of the area of study	Data extrapolated to the area of study based on weighted average (multiple archetypes)	Data extrapolated to the area of study assuming homogeneous conditions	Data extrapolated to the area of study in spite of un-homogeneous conditions	Data from unknown area or with very different conditions
GRANULARITY	Data is complete and representative of the polymer/application/sector of interest	Modelling based on allocation rules (comprehensive and specific)	Modelling based on allocation rules (non comprehensive or unspecific)	Modelling based on global average	Modelling based on estimates

Source: UNEP (2020). National Guidance for Plastic Pollution Hotspotting and Shaping Action

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How to assess data quality through the pedigree matrix

In plastic footprinting, the data quality pedigree matrix comprises four key criteria:
Reliability - Temporal correlation - Geographical correlation - Granularity

This table introduces the specific definitions for plastic footprinting and provides guidance on evaluating data quality for each indicator.

Indicator	Specification of definition in plastic footprinting
Reliability	Used to assess if data is reliable or verified (e.g. peer-reviewed or trustable source) Data obtained from measurements is preferable to data based solely on calculations. Multiple sources showing coherent values are more reliable than a single data source. Pure estimated values are properly documented.
Temporal correlation	The degree to which the dataset reflects the actual time (e.g., year) or age of the activity. Less than 3 years of difference with date of study represents the best quality of data.
Geographical correlation	Geographical correlation assesses the extent to which the data accurately represents the study area. The order of the score of best data quality is as follows: Score 1: subnational Score 2: country level Score 3: regional Score 4: global average Score 5: estimated or extrapolate
Granularity	Granularity refers to whether the data is complete. The order of the best data quality scores is as follows: Score 1: polymer by application by sector of interest, Score 2: polymer level by flexible/rigid data Score 3: polymer level data Score 4: flexible/rigid data Score 5: generic all polymer data.

Defining data requirement through pedigree matrix for diverse purposes

The minimum requirements for plastic footprint assessments vary depending on the application, whether it is intended for internal or external purposes.
In general, a minimum requirement for plastic footprinting necessitates a score lower than 2 for at least 80% of the impacts.
It is highly encouraged to utilize higher quality data to enhance the accuracy of the footprint assessment.

Indicator	Minimum requirement for internal use	Minimum requirement for external use
Reliability	Estimated data well documented.	Data validation and transparency are essential.
Temporal correlation	Not more than 10 years.	Less than 5 years.
Geographical correlation	Mandatory country level unless primary data is not available, in this case regional level is acceptable, with a plan to improve over time.	National level is mandatory.
Granularity	Generic all polymer data is acceptable.	Flexible/Rigid is a mandatory requirement, however, utilizing data with higher granularity is highly encouraged in order to achieve greater precision.

Assess the data quality through pedigree matrix

This table represents an example of how data quality is assessed through a pedigree matrix by comparing two widely used data sources: PLASTEAX data and WaW 2.0 data improved by EA.

1. Each indicator is assigned a score, along with explanatory comments for each score level.
2. The final score is calculated by averaging all the indicators to determine the Quality Score.

In summary, the PLASTEAX data proves to be highly adaptable for both internal and external applications.

Assess data quality by one indicator

Indicator	PLASTEAX[1]		WaW 2.0[2] Improved by EA	
	Score	Comment	Score	Comment
Reliability	1	Verified data, Multiple source, Bottom up & top-down data	2	Verified data
Temporal correlation	2	In this example we assume a case where production and trade data are <3 years but some of the literature is >3 years old.	2	Depending on the year of reference
Geographical correlation	1	Country level	1	Country level
Granularity	1	‘Polymer’ x ‘Application’ x ‘Sector’	5	‘All polymer’ level
Average Score	1.25		2.5	
Quality Score	**A**		**B**	

Average Score	Quality Score
1 - 1.5	A
1.6-2.5	B
2.6-3.5	C
3.6-4.5	D
4.6-5	E

Sources:

1. *EA - Environmental Action (2023) Plasteax , model version 2.0 (www.plasteax.earth)*
2. *Kaza, Silpa; Yao, Lisa C.; Bhada-Tata, Perinaz; Van Woerden, Frank. 2018. What a Waste 2.0: A Global Snapshot of Solid Waste Management to 2050. Urban Development. © Washington, DC: World Bank. (http://hdl.handle.net/10986/30317)*

Part. 3

A Pragmatic Approach to Achieving Optimal Data Quality for Plastic Footprinting

An iterative approach adapted to project scope and objectives.

Pragmatic Approach : Iterative process adapted to project scope and objectives

Data quality requirements in plastic footprinting and Life Cycle Assessment (LCA) should be inherently context-specific, tailored to the specific goals and focus of the assessment.

Blanket requirements for data quality may be inefficient and impractical, particularly when dealing with diverse industries and varied environmental concerns.

For example, it would make no sense to set strict data quality rules for aspects such as flexible or rigid packaging, when assessing the environmental effects of a construction company, which might primarily deal with issues related to PVC or microplastics.

In such situations, the key is to give priority to the data elements that matter the most in that particular situation.

The approach should shift from predetermined data quality requirements to a more adaptive and pragmatic one.

Practitioners should aim for a dynamic process, where they initially start with the available data, even if it may not be of top-notch quality.

Then, as the analysis unfolds, they can iteratively improve data quality where needed to meet the contextual demands of the assessment.

One useful guideline in this iterative process is to **aim for 80% coverage of the total metric assessed** (plastic leakage) with data of good or excellent quality (indicated by a low pedigree score, typically **<2**).

However, it is important to recognize that the exact data quality required can't be known in advance, as it depends on the specifics of the analysis. This adaptive approach acknowledges that, in complex assessments like plastic footprinting, practitioners may have to work with imperfect data initially and refine it as the analysis progresses. It ensures that the data quality requirements align with the assessment's goals and industry-specific nuances, ultimately leading to more accurate and meaningful results.

In summary, context-specific data quality requirements in plastic footprinting and LCA should be fluid and responsive. Practitioners should progressively enhance data quality as the analysis takes shape, aiming to cover a significant portion of the impact with high-quality data for a more precise evaluation.

Conclusion

Effective data governance is essential for ensuring that data quality is pertinent to various plastic footprinting assessments.

Note: The data quality for microplastic is not yet categorized as certainly as macroplastic. Therefore, the assessment of the microplastic footprint will be conducted with less strict differentiation. Further research will be undertaken.

Screening & internal use

No specific data quality constraint is required when doing a screening for internal use.

Following the results of the screening which will points to hotspots, an iterative approach is advised, where the final assessment should ensure that 80% of the final product must be covered by data with a score lower than 2.

Basis for mitigation strategy

In the context of plastic mitigation strategy footprinting, the **iterative data improvement approach**, considered a best practice, ensures adaptability to various project scopes and objectives, leading to enhanced efficiency and relevance.

Credit & specific actions

In the context of external communication or specific actions, the pedigree matrix imposes **mandatory and stringent data quality requirements** (e.g., necessitating the use of best-in-class polymer-specific data).

It mandates data of the highest standards and exceptional quality, necessitating strict adherence in the selection and utilization of data.

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References

1. UNEP (2020). National Guidance for Plastic Pollution Hotspotting and Shaping Action
2. EA - Environmental Action (2023) Plasteax , model version 2.0 (www.plasteax.earth)
3. Kaza, Silpa; Yao, Lisa C.; Bhada-Tata, Perinaz; Van Woerden, Frank. 2018. What a Waste 2.0: A Global Snapshot of Solid Waste Management to 2050. Urban Development. © Washington, DC: World Bank. (http://hdl.handle.net/10986/30317)

Our commitment to continuous improvement

The Plastic Footprint Network's successful collaboration is built on pillars of:

- Open
- Non-competitive and productive dialog
- Leveraging science and supporting ongoing research
- Broadly empowering global stakeholders (product manufacturers, brand owners, Treaty negotiators, regulators, consultants, NGOs, etc) to effectively do their part to address the plastic pollution crisis.

Given corresponding commitments to transparency and continuous improvement, we welcome and encourage your feedback and input on this document so that the methodology can continue to be enhanced and refined.

Thank you for supporting the work of the Plastic Footprint Network.

Contact us at: contact@plasticfootprint.earth

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Our mission is to continuously advance Plastic Footprint Methodology, ensuring it remains at the forefront of sustainable practices and promoting its widespread adoption. By empowering companies to rigorously assess, enhance, and transparently report their plastic footprints, we aim to make significant strides in mitigating the plastic pollution crisis.

Plastic Footprint Network

The Plastic Footprint Network
is convened by EA – Earth Action

earth action

This working group was led by:

earth action & WWF

With the participation from:

rePurpose, Seven Clean Seas, south pole, SYSTEMIQ

PFN secretariat is led by

earth action & south pole

Scientific Committee

Anthesis, earth action, SYSTEMIQ, Quantis, south pole, MarILCA, CIRAIG, Polytechnique Montréal, Minderoo Foundation, WWF

2023 members

ampliphi, Anthesis, CleanHub, ClimeCo, CIRAIG, ConsultantSeas, Decathlon, earth action, evea, Evalueserve, GDFA, MarILCA, Mars, Minderoo Foundation, P&G, Polytechnique Montréal, Plastic Credit Exchange, Quantis, Removall Carbon, rePurpose, 2° Life, Seven Clean Seas, south pole, sympatex, SYSTEMIQ, Thai Union, The Ocean Race, Verra, WBCSD, WWF, Zero Plastic Oceans

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