BOOK EPD® 2024

Guide to Analysing the Environmental Impacts of our Products

EPD®
ENVIRONMENTAL PRODUCT DECLARATION

Barilla
The Italian Food Company. Since 1877.

2009
FIRST EPD
PUBLISHED

15 YEARS
OF BARILLA
EPD PROCESS
SINCE 2010

+100 EPD
PUBLISHED
UP-TO-DATE*

*Data updated to april 2025

Barilla commitment to measuring and reducing the product environmental impacts have been started in the early 2000s. Following the European Life Cycle Thinking approach, we decided to apply the Life Cycle Assessment methodology. It was the 2009 when we published our first Environmental Product Declaration (EPD) and the year after we developed the first EPD Management System ever for the food industry, certified by a third-part verification.

We decided to undertake such approach for couples of reasons: first, our aim was identifying improvement area actions through the supply chain and, secondly, to communicate the environmental performance of our products.

Nowadays, more than 100 EPDs are published, regularly updated and third party verified: in this way, we can say that the majority of 70% of the sold product volumes has a public certified document available Environmental Product Declaration (EPD).

We decided to write up this Barilla EPD Book, to explain what a Life Cycle Assessment is and how the Barilla EPD Management System works by keeping data collection and calculation models (PCR - Product Category Rules) regulated and updated through a third parties verification activity.

The Barilla EPD Book that you have in your hand is divided into six chapter strictly correlated one to another. On the one hand, the first three chapters explain context, tool, and reference technical standards while the other three chapters describe how the Barilla EPD Management System has been designed and how it works.

In more details, after framing the EPD System within Barilla's sustainability strategies (chapter 1), the book presents the LCA methodology used to calculate the food product impacts (chapter 2), followed by the international rules explanation based on what is possible to communicate through the environmental performance of a product (chapter 3). Furthermore, the book delves into how the Barilla EPD System is organised (chapter 4), explaining how to read a single Environmental Product Declarations (EPDs) (chapter 5). At the end a practical use of EPDs is reported with an example of an environmental impact projects improvement (chapter 6).

We hope that in the pages of this book, beside the content of knowledge, it will emerge the heritage of commitment, passion, and continuous striving towards improvement developed by so many people. I want to thank those who, from agriculture to industry, with their work, have been contributed to develop, maintain, and update the Barilla EPD management system.

Luca Ruini

CONTENTS

1

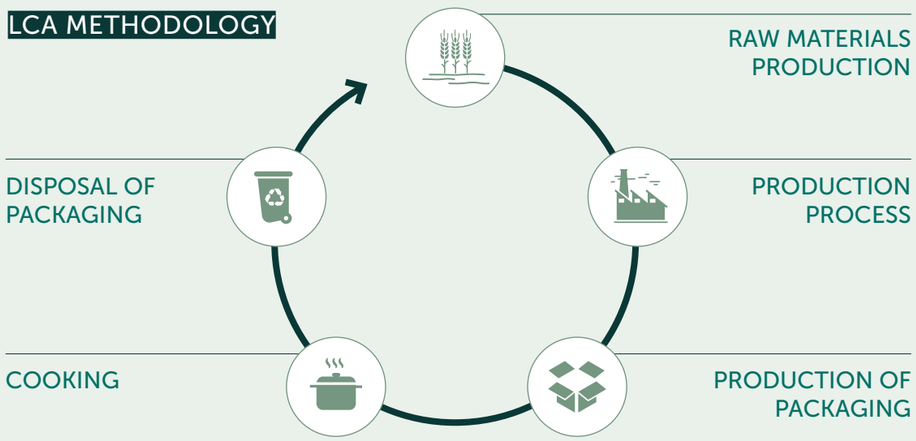
MEASURING THE ENVIRONMENTAL PERFORMANCE OF A FOOD PRODUCT

THE ROLE OF LIFE CYCLE ANALYSIS

Environmental impact assessment of any product can be performed with different methods. Among the assessment methodologies, **Life Cycle Assessment (LCA)** is probably the one that has attracted the most interest in recent years, because it considers all aspects of the supply chain.
The LCA study of a food product involves the analysis of all the activities included in the entire life cycle of the product, starting from the agricultural phase to distribution and consumption, which includes, when necessary, cooking. To make the results of these studies understandable and communicable, key performance indicators (KPI) are used to represent the environmental impacts in an aggregated and simple way.

This methodology provides useful information to guide environmental impact improvement projects and to support communication activities with robust scientific information.

The LCA methodology is increasingly used in environmentally conscious companies. There are numerous publications reporting the results, enabling comparisons and more informed choices by consumers.
However, in order for the comparison between studies to be reliable, there is a need for public and shared calculation rules, availability of reliable data, and recognized indicators for reporting environmental impacts.



LCA HISTORY

Although it is difficult to attribute a precise date to the birth of the LCA methodology, it can be said with certainty that more than 40 years have passed since its first applications in the academic field. The origins of the life-cycle approach to environmental problems date back to the period between 1960 and 1970: in those years, a new, holistic approach to the analysis of production chains was developed that took into consideration not only the production processes, but also all the upstream (e.g., cultivation of raw materials) and downstream (e.g., use of products) steps. However, the term LCA was coined only in 1990 during the SETAC Congress (Society of Environmental Toxicology and Chemistry) in Smuggler Notch (Vermont, U.S.A.) to better characterize the objective of the analyses carried out until then.

Things have evolved since then. The LCA methodology has managed to migrate from the academic to the industrial world, very often becoming the starting point for important innovation and improvement projects. A milestone in the history of this methodology is certainly that which was set by ISO in 1997, with the publication of the first version of the ISO 14040 standard. Further support came from the policies of the European Commission which, under the general approach of life cycle thinking, has launched many initiatives to enhance the most sustainable products from an environmental point of view, up to the recent Product Environmental Footprint (PEF) project.

The main challenge that LCA professionals face today is the use of LCA results for communication and, therefore, for the possible comparison between competing products or processes. Specifically, in fact, environmental parameters (and sustainability parameters in general) previously used only for information purposes (to guarantee transparency to stakeholders) are now increasingly the element on which real marketing strategies are based.

ENVIRONMENTAL IMPACT AND INDICATORS

Environmental impact can be defined as change to the environment, whether adverse or beneficial, wholly or partially resulting from an organization's environmental aspects[1]. Interactions between human activities (e.g., a production process) and the environment are called "environmental aspects".
To better clarify the concept, let's consider, for example, global warming, which can be considered an environmental impact: the environmental aspect that determines this impact is the excessive emission of climate-changing substances into the atmosphere.

There is a cause-effect relationship between environmental aspects and environmental impacts which depends on several factors:

- **the time** and therefore the ability of the environment to return to the initial state, after having disposed of the effects of the alteration suffered. When the environmental aspects are excessive in quantity and frequency this capacity is lost and the environmental impact is manifested.

- **the context**, i.e., the conditions in which environmental aspects occur: if a production process repeatedly emits a certain pollutant into the water, the relative impact will be very different if this happens in a small lake, in a river, or in the middle of the ocean.

- **the chemical-physical mechanisms** that occur in the environment following the release of a pollutant. An example of this is the use of nitrogen fertilizers on soil which, through biochemical reactions, leads to the formation and release into the air of nitrous oxide (N_2O), a gas with a climate-changing power 300 times higher than that of carbon dioxide.

The choice of indicators used to communicate the results of an LCA study must consider the most significant environmental aspects along the analysed supply chain, seeking a balance between the needs of synthesis and scientific rigor.

In the case of agri-food supply chains, the main environmental aspects are those related to the generation of greenhouse gases (e.g., due to the use of fossil fuels, nitrogen fertilizers, etc.), the use of water, the emission of nutrients into surface waters (e.g., nitrogen and phosphorus from biological and chemical fertilizers), and the consumption of non-renewable resources
.
For this reason, the most appropriate indicators in the agrifood chain to communicate its impacts are the **Global Warming Potential**, the **Eutrophication Potential**, **water scarcity**, and the depletion of **non-renewable resources**. Although these do not represent the totality of the impacts, when combined with each other they allow us to consider the most significant environmental aspects.

[1]UNI EN ISO 14001:2004 "Environmental management systems – Requirements and guidance for use"

MAIN IMPACTS OF AGRI-FOOD SUPPLY CHAINS AND KPIs		
	ENVIRONMENTAL IMPACT	**INDICATOR**
Climate change	Global warming is the phenomenon of the rising surface temperature of the planet, with particular reference to the Earth's atmosphere and ocean waters. The main environmental aspects of the agri-food supply chains related to this impact are the emissions of carbon dioxide deriving from the use of fossil fuels, methane from enteric fermentation of farmed animals, and nitrous oxide from the use of nitrogen fertilizers.	Global warming potential (GWP), expressed as a mass of CO_2 equivalent, assesses the emission of all greenhouse gases contributing to global warming. The indicator includes greenhouse gas emissions associated with land use and transformation by human activities that changes its ability to absorb atmospheric CO_2.
Eutrophication	Eutrophication is the phenomenon that occurs when there is an excessive supply of nutrients such as nitrogen, phosphorus, and sulphur in an aquatic ecosystem. This causes the proliferation of algae, increased bacterial activity, and finally, a lowering of oxygen in surface waters which leads to the death of the species present.	Eutrophication potential is expressed in mass of PO_4^{3-} equivalents.
Water scarcity	Water scarcity is the phenomenon that occurs when a living being (or an entire ecosystem) is deprived of the water necessary to meet its needs, within a specific area.	Water scarcity is measured per unit area in a given reservoir relative to the world average and is expressed in m^3 equivalents.
Depletion of non-renewable resources	This impact is mainly related to the consumption of fossil fuels (e.g., used for the production of electricity and tractor fuels) and other non-renewable abiotic resources of non-fossil origin, such as metals and rare earths.	The indicator assesses the amount of fossil energy resources expressed in MJ and in mass of Sb equivalent the amount of non-renewable elements of non-fossil origin used.

CALCULATION RULES

Since 1997, the LCA methodology has been regulated internationally by the ISO standards of the 14040 series "Life cycle assessment", which establish "what must be done" to carry out and validate an LCA study in a complete and rigorous way from a scientific point of view. However, these standards do not define the criteria to be followed in order to adapt the LCA methodology to the various product categories. Therefore, over time, rules have been developed to indicate "how" some specific aspects must be treated: system boundaries, main hypotheses, calculation rules, and so on.

These rules can be divided into two large groups: the "umbrella" protocols and the **Product Category Rules (PCR)**.

"UMBRELLA" PROTOCOLS

"Umbrella" protocols apply indiscriminately to all products, as they regulate methodological aspects common to all product sectors. Standards for calculating individual impact indicators such as those dedicated to greenhouse gas emissions fall into this group. The development of these standards takes place progressively, starting from the first documents published by research organisations or national bodies, which in many cases lead to international standards published by ISO. An example is that relating to the carbon footprint: after the interesting activities of the British Standard Institution (BSI), which culminated in 2011 with the publication of PAS 2050, ISO started the working group that led to the publication, in 2013, of ISO 14067, which is the reference point for the calculation and reporting of the Carbon Footprint of products.
The comparison of different products and their impacts can only be carried out if the requirements set out in these protocols are applied, such as the identical design of the studies for the products to be compared (e.g. the choice of functional unit and system boundaries), the application of the same assumptions and calculation methods, the application of any exclusions from the study in an equivalent way between the two systems being compared.

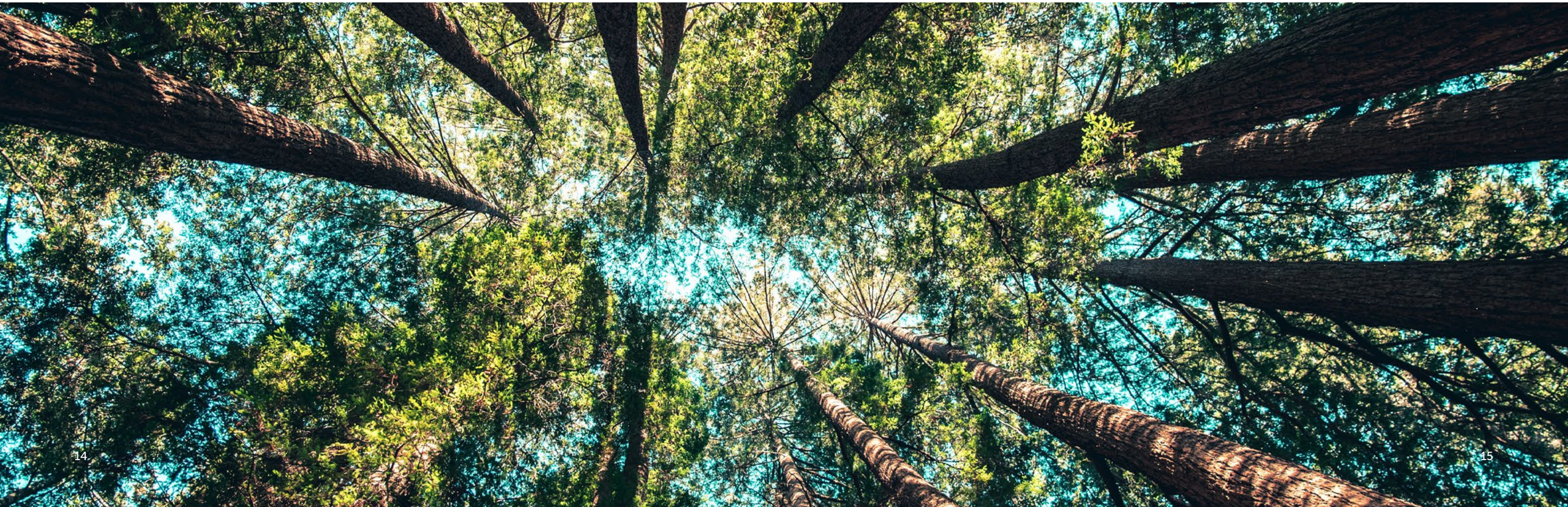
Umbrella protocols, however, do not give an indication of which approaches and assumptions should be applied to the study; for this reason, they refer to the specific requirements defined in the Product Category Rules (PCR), in order to address the need to have shared rules for publishing and comparing the results of LCA studies conducted on similar products.

PRODUCT CATEGORY RULES (PCR)

Product Category Rules (PCR) arise from the need to have calculation rules that make LCA results for the same product category comparable. The standard that first identified the need to use PCR is **ISO 14025**[2], which, since 2006, defines the requirements of systems aimed at publishing environmental product declarations.

Since calculation rules are a key element for comparing claims for similar products, this standard also establishes the procedures for developing PCR documents that contain the calculation rules by product category.

[2]Environmental labels and declarations - Type III environmental declarations - Principles and procedures



THE DATA

Reliable data are crucial to obtain consistent results, and useful for the evaluation of product environmental impacts. The data normally concern **raw materials, energy consumption, packaging, and transport materials**. According to their quality level, they can be classified as primary or secondary and this different level can affect the robustness of the LCA study.

PRIMARY AND SECONDARY DATA	
PRIMARY DATA Data relating to the production phases under consideration, collected through dedicated questionnaires and implying direct access to accounts receivable	In the study of agri-food products, the use of primary data is feasible if you have a good knowledge and control of the supply chain. The census of data in an agricultural supply chain is often expensive, due to the number of processing steps necessary to get to the final food commodity and the number of farmers and / or suppliers who contribute to provide the ingredients, which are often not under the direct control of the production companies.
SECONDARY DATA Data retrieved from databases or previous studies and used when primary data are not available or are not considered representative.	The use of secondary data is unavoidable in an LCA study, as it would be too complex to obtain primary data for each individual process. For this reason, the quality and specificity of the databases used is crucial to obtain reliable results. Their construction passes through systematic data validation procedures that are codified based on ISO reference standards for LCA studies.

DATABASES

The first LCA databases date back to the 90s and the first version of the computer database, now known as Ecoinvent, was produced in 2003 by the Swiss Centre for Life Cycle Inventories. Since then, Ecoinvent has undoubtedly been the most widely used data source in the world.

The construction of the database takes place through an "open" process of data provision by all interested organizations that access the project, through a "data provider toolkit" that submits the information received to a systematic validation path. In the wake of Ecoinvent, many other databases have been developed. The most representative for the agri-food sector are certainly Agri-Footprint, Agribalyse, and the World Food LCA Database (WFLDB).

Eventually, many trade associations, including Plastics Europe, FEFCO, and Worldsteel, constantly publish data on the packaging materials used to make the analogue model of the product under study.

DATA QUALITY REQUIREMENTS

The main requirements of the data to be used in LCA studies are referred to by the **ISO 14044** standard and concern:

• **temporal coverage**, meaning that data should refer to a well-defined and sufficiently up-to-date period. This aspect is very relevant, for example, in the case of electricity, whose impacts undergo variations over time due to the evolution of the energy mix towards renewable sources;

• **geographical coverage**, i.e., the data chosen should relate to the regions examined. In this case, the most significant examples concern the areas in the case of cultivation or the electricity production that differs from country to country based on the energy resources used;

• **technological relevance**, in the sense that the data should be specific to the processes analysed. An example in this area can concern the choice between virgin or recycled steel: the material is the same in both cases, but they are made with different processes;

• the **statistical accuracy** and **reliability** of the information used;

• the **reproducibility of the measurements carried out for data acquisition**, which should always be ensured.

DATA REPRESENTATIVENESS

Another way to assess the data used in an LCA study is to evaluate how representative the data you use is with respect to the process being analysed.

Regardless of whether primary or secondary data is used, it can be specific if it refers exactly to the process being analysed, or generic if it refers to a similar process.

Let's consider an example to clarify the difference. In the study of the production of a particular packaging made from a plastic polymer, the impact on raw materials should be analysed considering the specific data of the correct polymer (e.g. PET).

If the polymer is not known, or production data are not available, it is possible to estimate the impacts using data from another polymer, which in this case falls into the generic category.

The less generic data used, the more accurate the results of a study.

2

COMMUNICATING THE ENVIRONMENTAL PERFORMANCE OF A FOOD PRODUCT

VOLUNTARY COMMUNICATION AND ENVIRONMENTAL LABELS

Correctly communicating the environmental performance of a product is often very complex and failure to comply with the guidelines can confuse the consumer and have negative repercussions on the company's reputation. To prevent this risk, three types of voluntary environmental labelling have been introduced and regulated at international level:

- **Environmental labels** (Type 1 labels);
- **Self-declarations** (Type 2 labels);
- **Environmental product declarations** (Type 3 labels).

The ISO 14020 standard establishes the general principles for their development and application, referring the specific aspects to the relevant standards:

- **ISO 14024** or Type 1 declarations;
- **ISO 14021** for Type 2 declarations;
- **ISO 14025** for Type 3 declarations.

The purpose of the individual labels is to encourage the demand for "virtuous" products from an environmental point of view, conveying accurate and verifiable information about direct and indirect environmental aspects.

The choice of the label type to be used depends on the final communication target, which can be the consumer (business to consumer, B2C) or other producers (business to business, B2B).

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ENVIRONMENTAL LABELS – TYPE I DECLARATIONS

This type of label is regulated by the ISO 14024 standard and rewards the environmental excellence of a product that has exceeded the criteria of the category to which it belongs. The obtainment of the label is subject to a third-party verification that establishes whether the thresholds have been met for the product category analysed.

The environmental criteria are developed following a life cycle approach, aimed at identifying the significant environmental aspects of the products under study, from the production of raw materials to the eventual final disposal. The aim is to promote the reduction of impacts from production processes on ecosystems and associated resources and to provide the consumer with information on the efficient use of the final product.

An example of Type I labelling is the European Eco-label introduced by the European Commission (ec.europa.eu/ecat/), which, to date, does not have food criteria available.

SELF-DECLARATIONS – TYPE II DECLARATIONS

These are environmental claims based on self-declarations of the manufacturer, governed by the **ISO 14021** standard.
Normally intended for the final consumer, they are therefore reported both on product packaging and on other channels (websites, social media, advertising, etc.).
Being easy to implement, they are therefore subject (consciously and unconsciously) to the practice of greenwashing[3] if you do not follow the rules dictated by the standard, which provides guidance in formulating clear, transparent, and non-misleading communication. Among the many examples, the best known is the self-declaration of the percentage of recycled material used, often accompanied by the symbol of the "mobius cycle" and its percentage.
Self-declarations are not subject to third-party verification but may be subject to checks by the competent authorities, which in Italy are: the Institute of Advertising Self-Regulation (https://www.iap.it/), the Italian Competition Authority (https://www.agcm.it/) and the Public Prosecutor's Office.

[3] Practice of making misleading assertions

ENVIRONMENTAL PRODUCT DECLARATIONS (TYPE III)

In recent years, alongside the growing use of the LCA methodology to study the environmental impacts of products, there has been an increasing use of study validation systems aimed at accrediting communication campaigns. One of the most commonly used validation systems is the **Environmental Product Declaration (EPD)**.

The EPD presents the environmental profile of a product, validated on specific calculation rules (PCR). It is a sort of "environmental identity card" created to satisfy **"business to business" (B2B)** communication, although there are increasing applications to products that actually reach the final consumer (or **"business to consumer" (B2C)**). One of the reasons for the use of such a complex tool for B2C communication (which is generally more "simple" and less technical) lies in the fact that the EPD can be a **good compromise** between an LCA study, which by its nature must be very technical (and often dense with confidential information), and the need to provide understandable information that has been summarised and verified.

It should be remembered that the validation of an EPD document certifies the **correct application** of **PCR** and not the environmental excellence of the product to which they refer. In other words, these statements are intended to promote transparency of information. The preferability of the product over another belonging to the same category, from an environmental point of view, can be assessed by the reader of the document through the comparison of the respective declared environmental impacts.

SUMMARY			
	ENVIRONMENTAL LABELS **(TYPE 1)**	SELF-DECLARATION **(TYPE 2)**	ENVIRONMENTAL DECLARATIONS **(TYPE 3)**
PURPOSE	Selection of the most virtuous product	Communication of environmental characteristics	Declaration of validated data
TYPICAL RECIPIENT	B2B, B2C	B2C	B2B
VERIFICATION REQUIRED	YES	NO	YES
LCA STUDY REQUIRED	NO	NO	YES
ADVANTAGES	Credibility Selectivity Simplicity	Marketing-oriented Ease of understanding	Credibility Data comparability
DISADVANTAGES	Need for approved criteria	Risk of greenwashing	Difficult to understand
REFERENCE STANDARDS	ISO 14024:2018	ISO 14021: 2021	ISO 14025: 2010

ENVIRONMENTAL PRODUCT DECLARATIONS (TYPE III)

Environmental Product Declaration (EPD) systems are developed in application of the ISO 14025 Standard, which establishes the following requirements:

- each system must have a manager (the so-called "**Program Operator**") who defines the operating **regulations** and keeps the **register** of validated environmental product declarations updated;
- each program operator must maintain a **register of Product Category Rules (PCRs)** that must be approved following a **public consultation**;
- the operating regulations must define the **rules** for the **validation** of declarations, the **accreditation of verifiers**, and the **conditions of use of EPDs** (including the logo attesting their validity).

HOW MANY DIFFERENT PROGRAM OPERATORS

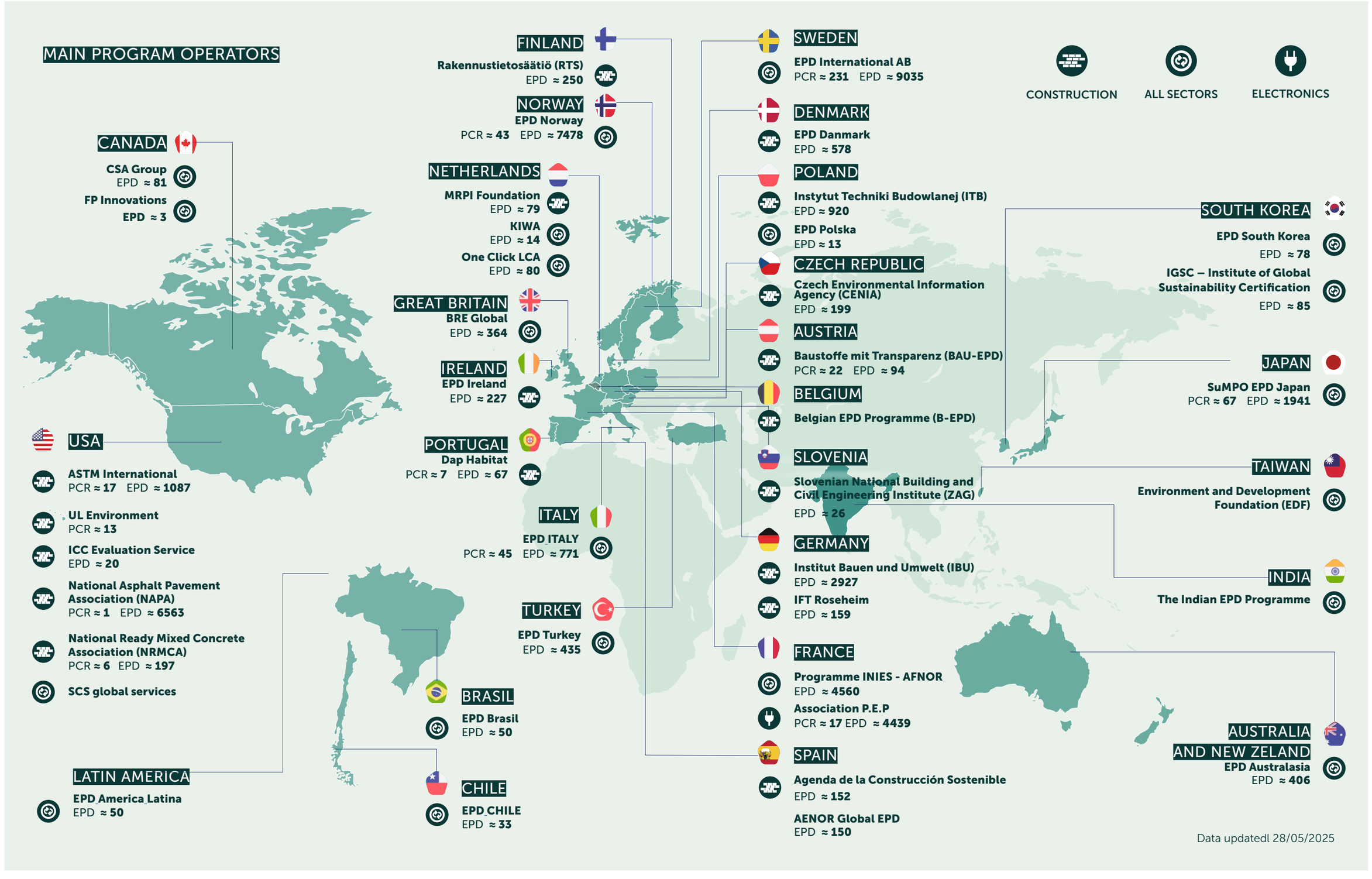
In recent years, many Program Operators have been created to offer registration services of EPD to interested companies. In almost all cases, these were created to meet a need for communication and transparency at national level and were developed by public or public-private organizations.
This "local" approach in many cases constitutes a barrier to use by foreign companies that may find it difficult to adopt rules that are little known internationally, even more so if they are only available in the local language.

As a response to a national need, in 1999 the "Swedish EPD system" was born, and after a few years became the current **International EPD® System**, which today represents the most recognized system globally that that serves the entire international market and all product categories.

Similar international (or at least European) importance has also been acquired by the **IBU system (Institut Bauen und Umwelt - Institute for Building and Environment)**.
Born from a mixed public-private initiative in Germany, the IBU system is becoming a reference point in the construction sector.
The proliferation of the various operators has created a need for coordination that in some cases has materialized in the stipulation of mutual recognition agreements between the systems.
Once again, the International EPD® System and the IBU have acted as pioneers, presenting in 2013 an agreement that allows companies to use both logos for certification obtained in one of the two systems.

These agreements have found an interesting outlet in the construction sector with the creation of the EcoPlatform[4] consortium, which aims to harmonize the rules for the realization of EPDs for construction products among the different Program Operators.

[4] www.eco-platform.org/


MAIN PROGRAM OPERATORS
CONSTRUCTION
ALL SECTORS
ELECTRONICS
CANADA
CSA Group
EPD ≈ 81
FP Innovations
EPD ≈ 3
USA
ASTM International
PCR ≈ 17 EPD ≈ 1087
UL Environment
PCR ≈ 13
ICC Evaluation Service
EPD ≈ 20
National Asphalt Pavement Association (NAPA)
PCR ≈ 1 EPD ≈ 6563
National Ready Mixed Concrete Association (NRMCA)
PCR ≈ 6 EPD ≈ 197
SCS global services
LATIN AMERICA
EPD America Latina
EPD ≈ 50
FINLAND
Rakennustietosäätiö (RTS)
EPD ≈ 250
NORWAY
EPD Norway
PCR ≈ 43 EPD ≈ 7478
NETHERLANDS
MRPI Foundation
EPD ≈ 79
KIWA
EPD ≈ 14
One Click LCA
EPD ≈ 80
GREAT BRITAIN
BRE Global
EPD ≈ 364
IRELAND
EPD Ireland
EPD ≈ 227
PORTUGAL
Dap Habitat
PCR ≈ 7 EPD ≈ 67
ITALY
EPD ITALY
PCR ≈ 45 EPD ≈ 771
TURKEY
EPD Turkey
EPD ≈ 435
BRASIL
EPD Brasil
EPD ≈ 50
CHILE
EPD CHILE
EPD ≈ 33
SWEDEN
EPD International AB
PCR ≈ 231 EPD ≈ 9035
DENMARK
EPD Danmark
EPD ≈ 578
POLAND
Instytut Techniki Budowlanej (ITB)
EPD ≈ 920
EPD Polska
EPD ≈ 13
CZECH REPUBLIC
Czech Environmental Information Agency (CENIA)
EPD ≈ 199
AUSTRIA
Baustoffe mit Transparenz (BAU-EPD)
PCR ≈ 22 EPD ≈ 94
BELGIUM
Belgian EPD Programme (B-EPD)
SLOVENIA
Slovenian National Building and Civil Engineering Institute (ZAG)
EPD ≈ 26
GERMANY
Institut Bauen und Umwelt (IBU)
EPD ≈ 2927
IFT Roseheim
EPD ≈ 159
FRANCE
Programme INIES - AFNOR
EPD ≈ 4560
Association P.E.P
PCR ≈ 17 EPD ≈ 4439
SPAIN
Agenda de la Construcción Sostenible
EPD ≈ 152
AENOR Global EPD
EPD ≈ 150
SOUTH KOREA
EPD South Korea
EPD ≈ 78
IGSC – Institute of Global Sustainability Certification
EPD ≈ 85
JAPAN
SuMPO EPD Japan
PCR ≈ 67 EPD ≈ 1941
TAIWAN
Environment and Development Foundation (EDF)
INDIA
The Indian EPD Programme
AUSTRALIA AND NEW ZELAND
EPD Australasia
EPD ≈ 406
Data updatedl 28/05/2025

THE INTERNATIONAL EPD® SYSTEM

One of the most active schemes at the international level is the International EPD® System. Born in Sweden in 1999, in 2003 the system was the subject of a LIFE project funded by the European Commission that allowed it to cross national borders and assume international relevance.

The consolidated experience has brought the International EPD® System to a level of technical knowledge that makes it a point of reference for all similar emerging initiatives, to the point that in 2013 it obtained the certificate of conformity to the ISO 14025 standard.

EPD®
ENVIRONMENTAL PRODUCT DECLARATION

NUMBERS OF THE INTERNATIONAL EPD SYSTEM

Over	Over	Over	Over	Over	Over
10000	**170**	**400**	**50**	**100**	**20**
EPD registered	**PCR** registered	**Companies** involved	**Countries** around the world	**Independent** verifiers	**Certification** entities

THE INTERNATIONAL EPD SYSTEM IN THE WORLD

- Mutual recognition with several **other program operators**: Global EPD, IBU, EPD Norge, SCS Global Services.
- TThe International EPD System has a **global service network** (independent licensees) with exclusive representations in the following territories: Argentina, Australia, Bangladesh, Brazil, Chile, Egypt, India, Mexico, New Zealand, Southeast Asia (Indonesia, Malaysia, the Philippines, Singapore and Vietnam) and Turkey.
- EPDs **with global validity** accepted in various Green Building Schemes (e.g. BREEAM, LEED), Building Information Management (BIM) software for building LCAs and Green Public Procurement.

Data updated to 30/03/2022

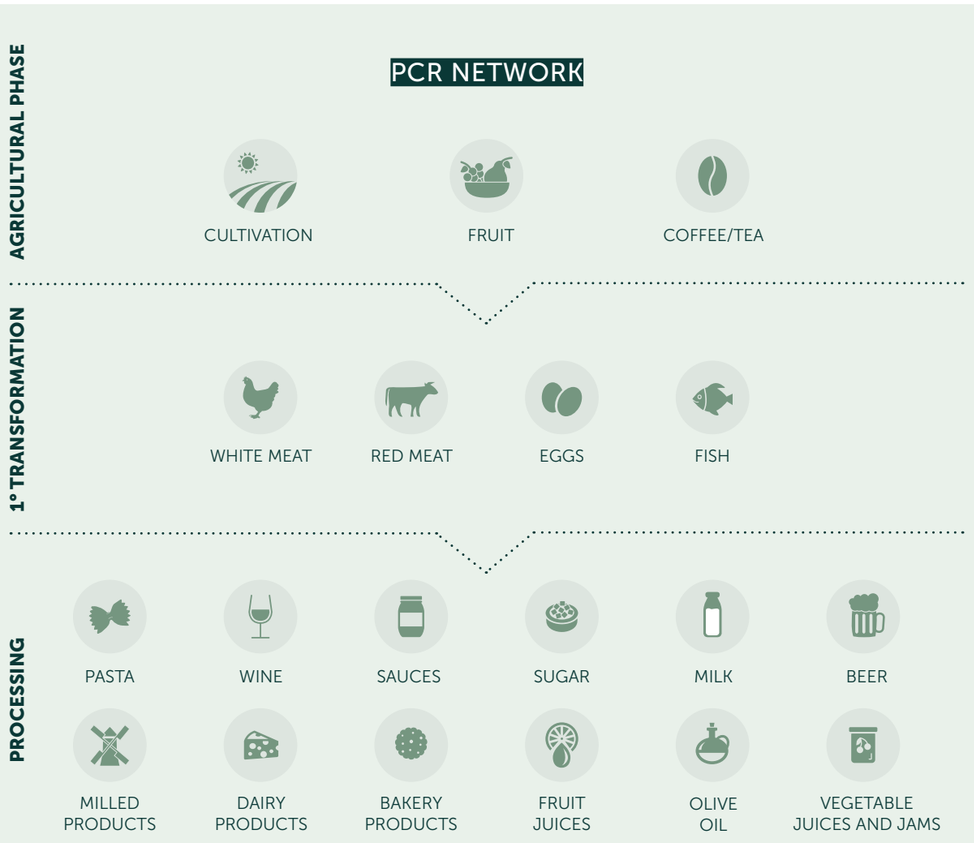
Furthermore, since 2013, the International EPD® System has launched an initiative to harmonize and "network" the calculation criteria to be used for the environmental assessment of food products.

Thus, the first **"PCR network"** was born, which included streamlining activities based on two basic principles:

1. **Aggregate products with different codes**, using the methodological approach for calculating impacts as the uniting criterion (e.g., corn, wheat and rye are different products, but the rules for assessing impacts are the same, so a single PCR has been prepared related to agricultural products: so-called "arable crops");

2. Use PCRs in a modular way (e.g., in PCRs related to the calculation of impacts of pasta and beer, the PCR "arable crops", which is related to the cereal cultivation, can be invoked).

IN 2013 THE "PCR NETWORK" WAS BORN



3

BARILLA'S EPD SYSTEM

FROM THE FIRST STUDIES TO THE CERTIFICATION OF THE BARILLA EPD PROCESS

Barilla has chosen to develop and publish the environmental declarations of its products by adhering to the International EPD System.

This choice is due to some factors:

- the International EPD System **is the first and longest-lived Program Operator**, and this pioneering approach has allowed it to develop a high technical credibility;
- its process of **preparing** and **approving** product category rules (PCRs) involves a public inquiry;
- by applying its operating scheme, it is possible to **develop a Certified EPD process**.

Barilla's journey **began in 2000** with the **first LCA studies** on semolina pasta, aimed at mapping impacts, identifying significant impacts, and planning possible improvement actions.

The in-depth analysis was extended to the supply chains of bakery products, packaging systems, and distribution, allowing greater resource-use efficiency in the following years.

It was then decided to raise the level of reliability of the studies: in **2009 the first project for the certification** of the **environmental product declaration** was born, regarding **pasta** produced in Italy.
The experience Barilla has gained in this field has allowed it to contribute significantly to the drafting of PCRs for the calculation of the impacts of dry pasta, reaching their **first publication in 2011**.

FROM THE FIRST STUDIES TO THE EPD PROCESS

2000
FIRST STUDIES
Barilla begins its LCA experience with a life cycle study of durum wheat semolina pasta.

2009
FIRST PASTA EPD
In 2009, the first edition of the pasta EPD is published. It is the world's first document about this product.

2010
CERTIFICATION OF THE SYSTEM
Barilla develops the first certified EPD system in the food industry.

2011
FIRST MULINO BIANCO EPD

2012
FIRST HARRY'S & PAVESI EPD

2013
PCR NETWORK
Barilla contributes to the PCR network implemented by the international EPD System.

2014
60EPD PUBLISHED

2015
Special EPDs for pasta and sauce expo.

2018
PEF
Participation in the PEF project thanks to EPD experience.

2019
Use of the Gran Cereale EPD for Carbon Neutrality.
Participation in the Made Green in Italy Scheme project with experience gained from EPD.

2021
72EPD PUBLISHED

2023
87EPD PUBLISHED

2024
94EPD PUBLISHED

FROM PROJECT TO PROCESS

Barilla's growing interest in verifying and publishing data on the environmental impacts of its products led to the decision to design the **first EPD process management system in the food sector, certified in 2011**.

This has made it possible to:

- **certify** the set of **processes** that lead to the creation of an environmental statement, with the advantage of **shortening the publication time of an EPD**, especially for products belonging to the same category.
- **simplify** compliance **checks** with **the latest rules** (PCR and GPI[5]) published by the International EPD® System, through the **construction of calculation models** applicable to numerous products in the same category;
- **systematize** data collection and updating processes;
- **make it easier** to check the validity of published EPDs and update them;
- **facilitate the monitoring of the skills** of all actors involved and identify any training needs;
- **increase** the levels of **sharing** and **checks** of results, involving different company functions;
- **optimize LCA study reporting**.

[5] General Programme Instructions, a document that defines general rules valid for all LCA studies aimed at preparing an EPD in the International EPD System

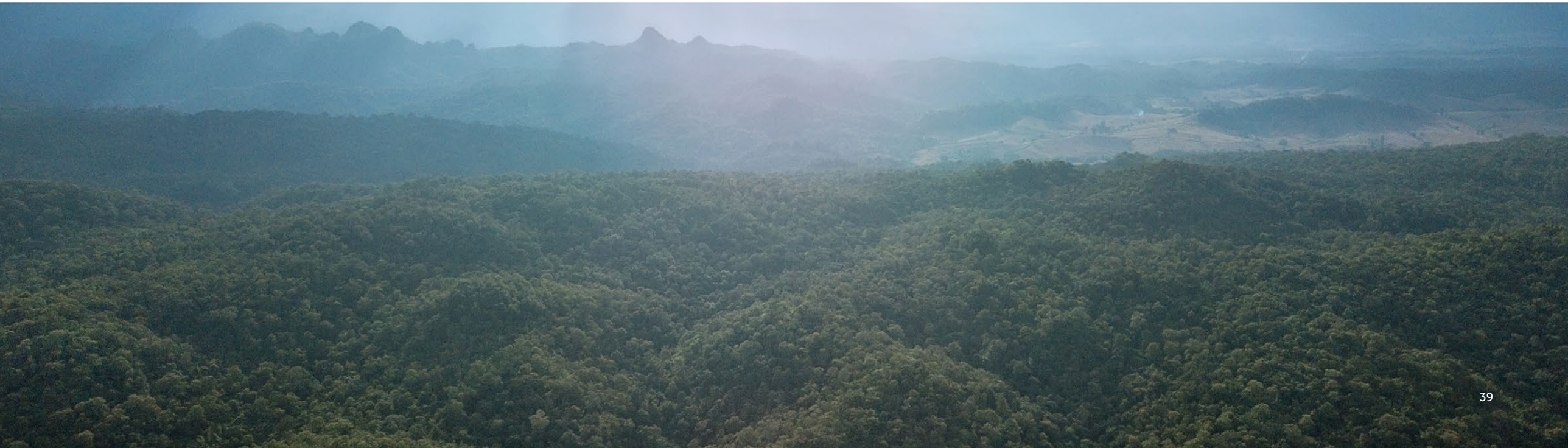
LUCA RUINI, BARILLA EPD PROCESS OWNER

Barilla has developed the first certified EPD system in the food industry.

"For Barilla it is important to know the environmental impact of its activities and products, in order to:

- *Identify opportunities for environmental improvement in production processes and supply chains;*
- *Use a single language to deal with environmental issues at all levels, from operational to managerial;*
- *Have validated and reliable data and indicators useful both for research and development actions and for external communication activities with respect to Barilla environmental policy, programs and related activities.*

The EPD process has been implemented to help achieve these goals, with the aim of publishing as much verified information as possible for each brand and product category."



THE BARILLA EPD PROCESS

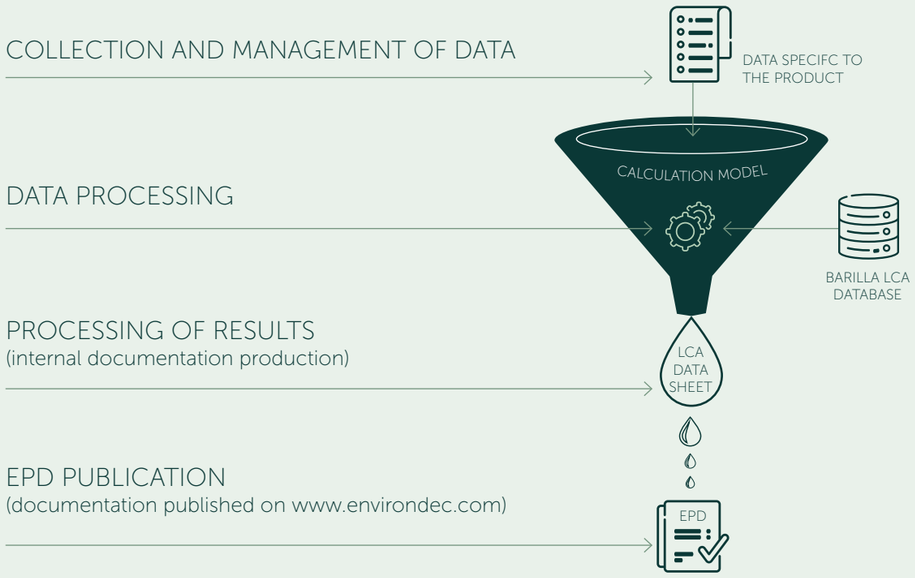
In the Barilla EPD process, the execution of LCA studies and the preparation of EPDs is based on the interaction of three elements:

1. **Product-specific** data;
2. The Barilla **database**;
3. Calculation **models**.

The product-specific data is collected and processed in the calculation model together with data contained in the Barilla database to generate the environmental impact indicators. The processed results are collected in a spreadsheet (LCA Data Sheet), used for the preparation of the EPD.

The EPD process defines the operational activities that, by integrating these three elements, lead to the production of reliable and consolidated data ready for publication.

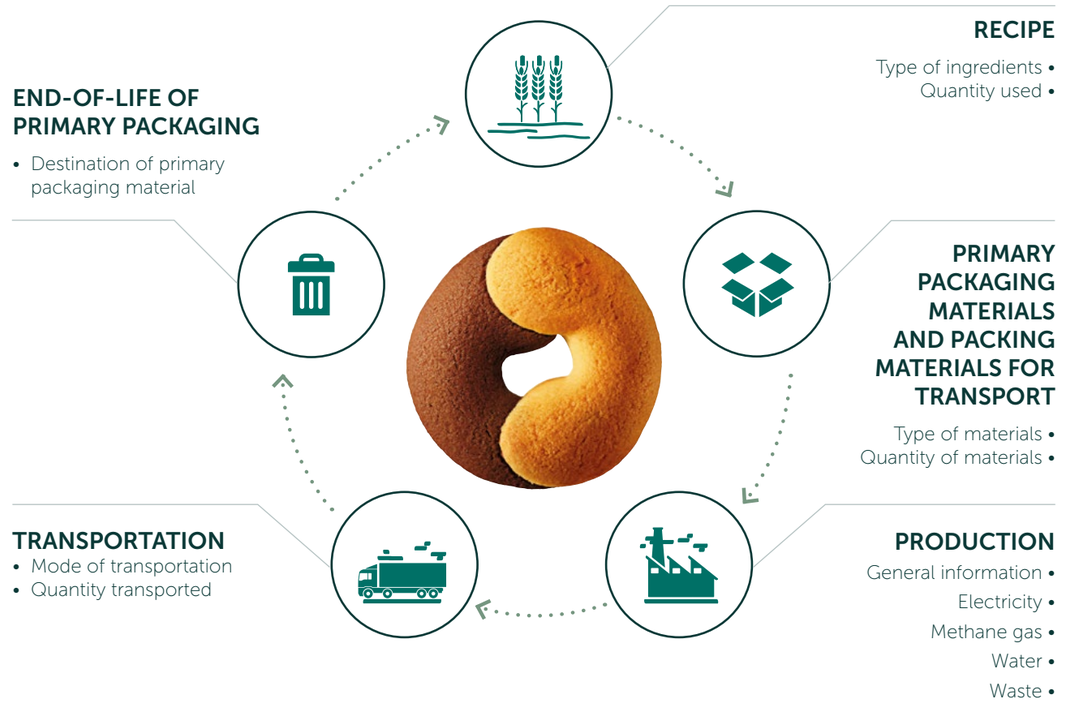
WORKFLOW AND TOOLS FOR THE PRODUCTION OF AN EPD DOCUMENT



PRODUCT-SPECIFIC DATA

Product-specific data must be collected and analysed for each EPD to be produced. This includes information on:

- the recipe, with the type and quantity of ingredients used for the production of a unit of product (e.g. grams of flour, sugar, and eggs used per 1 kg of biscuits);
- the packaging bill of materials, which shows the quantity and type of materials for both the primary packaging (associated with the sales unit) and of the packaging for transport to the point of sale;
- the production plants and the specific consumption of the production lines where the product is processed;
- the modes of transport and the distances travelled during the distribution of the final product;
- the end-of-life of packaging.



THE BARILLA DATABASE

The database contains data modules that, together with product-specific information, allow the calculation of the product's environmental impact.

Each data module is a model of a real process (cultivation, production, transport, etc.) that contains quantitative information on the environmental aspects of the process it represents.

For example, the module of a Barilla production plant contains a series of data, referring to the production of 1 kg of finished product, which makes it possible to evaluate the environmental aspects and impacts related to: production and consumption of electricity (including information on renewable or non-renewable sources), fuels and water, treatment of waste and wastewater produced, transport of auxiliary materials to the plant, and transport of waste and scraps to treatment sites.

All modules are verified and made available for the development of new EPDs.

The main data module categories concern:

- The **raw materials** (ingredients) used in the recipes of the products (e.g., semolina, soft wheat flour, eggs, milk, etc.);
- The **packaging materials** used for the storage and transport of the product (e.g., multilayer films for biscuits, stretch films, pallets, etc.);
- The production of **electrical** and **thermal energy**;
- Barilla **production plants**;
- The **means of transport** used for the distribution of products by land, sea, or air.

For the realization of the modules, information from specific data collections of Barilla's processes or its suppliers (primary data) is used; when it is not possible to use primary data, secondary data retrieved from commercial databases (e.g., Ecoinvent, Agri-Footprint), verified and published EPDs of other companies, or literature data are used.

Whenever more up-to-date or specific data becomes available, existing modules are updated or new ones are created and then tested.

The **Simapro©** software (one of the main software to perform LCA studies) is used to manage the database and calculations.

THE DATA COLLECTION TOOL

In 2012, Barilla implemented a **web platform** for collecting and processing information **from all Barilla Group plants**.

Each production site can, through accredited users, access an online data collection questionnaire with specific questions relating to, for example, energy and water consumption, emissions and waste production.

The plant questionnaires are then **validated** through a control process managed by the HSEE (Health, Safety, Environment and Energy) department.

Results are used for the preparation of the sustainability report published annually by the company, for the LCA studies carried out for the preparation of EPDs, and for the Carbon Neutrality Process of some of the group's brands.

THE CALCULATION MODEL

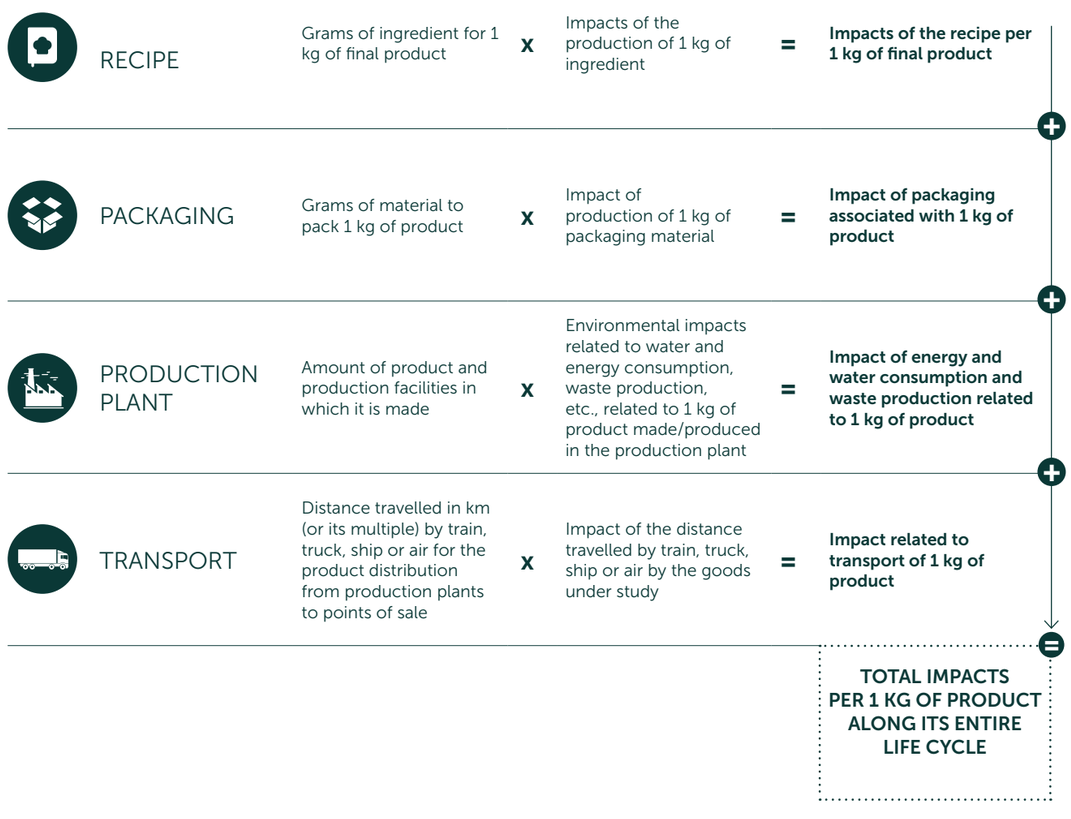
The calculation model is the backbone of data processing and results for a given product category.

It is developed to reflect the specific characteristics of a product group while ensuring compliance with the Product Category Rules (PCRs).

The Barilla EPD process includes calculation models for certain product categories such as pasta, bakery products, and sauces.

The rules that apply to all product categories are described in a methodological document, which is periodically reviewed to follow the updates of the calculation rules.

HOW THE CALCULATION MODEL WORKS



THE MANAGEMENT OF THE EPD PROCESS

The **Barilla EPD process** works as a management system, with specific documents (manual and procedures) describing the processes and activities planned.

The management of the Barilla EPD process involves the planning and organization of activities in three main workflows:

1. the EPD project;
2. the database update;
3. the creation / updating of calculation models.

The EPD project of a specific product is the main workflow that starts from the collection of product-specific data, passes through processing and intermediate checks, and finally leads to the verification and publication of the specific EPD document. For the execution of an EPD project, the calculation model and the database are used. If either of these items is not available and up-to-date, you must temporarily suspend the EPD project to enable workflows that affect the database or calculation model.

The database is the heart of the system: it is essential to have validated and updated information to quickly and reliably produce environmental declarations. Database updating is carried out at least once per year in line with the availability of information relating to Barilla production processes.

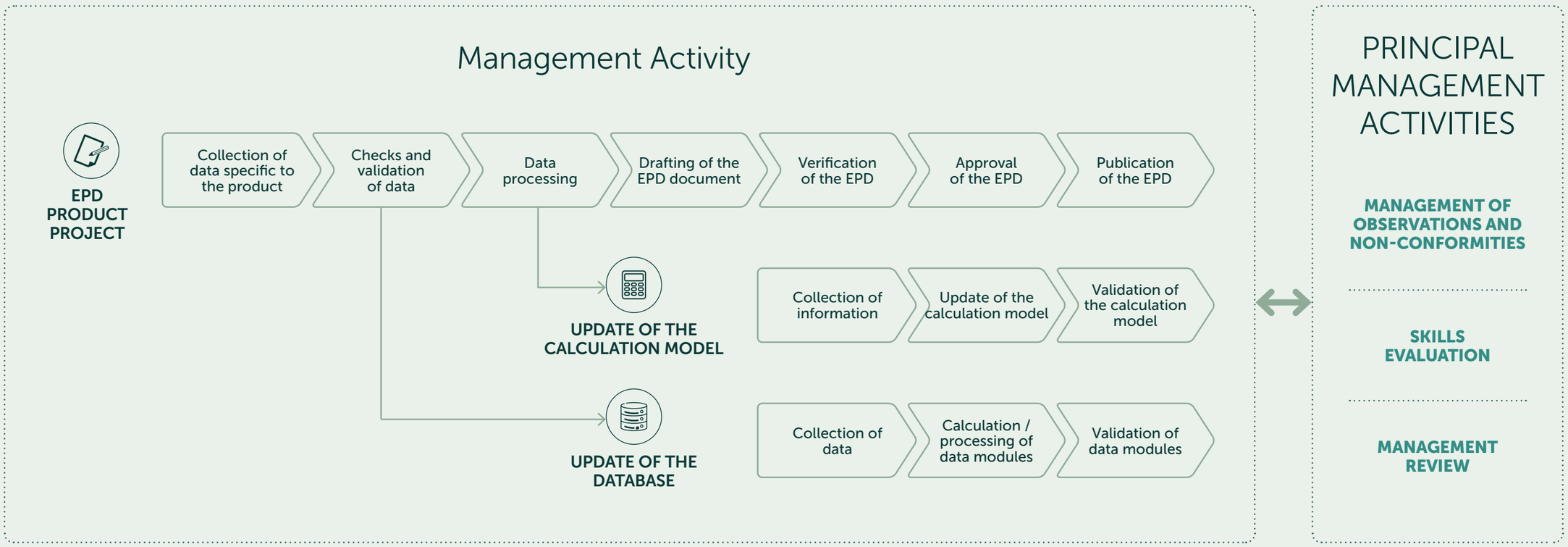
More generally, it is carried out whenever the need arises during the quality control of the data used in an EPD project (e.g., the use of a new raw material).

The calculation models, specific to each type of product, must be updated to maintain compliance with the Product Category Rules (PCR), which are periodically reviewed by the International EPD® System. They can also be modified to accommodate comments that emerged during the verification of individual EPDs or the EPD process and to consider changes in the production process of the specific product category.

If there is a need to prepare an EPD of a product belonging to a category not covered by a calculation model, it is necessary to set up a new model considering the relevant PCR and the information and type of data available internally for that type of product and, if necessary, integrate them.

The new calculation model is verified and approved by the experts of the processed data (for example, those responsible for the data relating to the strategic raw materials used in the product recipes) and fed into the system.

BARILLA EPD PROCESS ACTIVITIES



The activities attributable to these three flows are planned at the beginning of each year to ensure the efficiency of the entire process. This allows the necessary updates and revisions to be carried out in good time, preventing EPD projects from slowing down or being suspended as much as possible.

The **management** of the three workflows is guaranteed by a series of transversal activities, such as:

- **Constant** verification of the updating of the standards and reference rules;
- **Updating** of management system documents;
- **Planning** of internal and external verification activities to ensure the reliability of all elements of the EPD process;
- **Management** of observations or non-conformities that emerged during data or process verifications;
- **Assessment** of the skills of the actors involved and planning of the training deemed necessary.

DOCUMENTS REGULATING BARILLA'S EPD PROCESS

ISO 14040:2021 - Environmental management - Life cycle assessment - Principles and framework

ISO 14044:2021 - Environmental management - Life cycle assessment - Requirements and guidelines

ISO 14025:2010 - Environmental labels and declarations - Type III environmental declarations - Principles and procedures

GPI - International EPD® System General Programme Instructions

PCR 2010:01 Uncooked pasta, not stuffed or otherwise prepared

PCR 2011:07 Pasta cooked, stuffed or otherwise prepared, couscous

PCR 2010:19 Sauces, mixed condiments and mustard

PCR 2012:06 Bakery products

PCR 2013:04 Grain mill products

PCR 2020:07 Arable and Vegetable crops

The **manual** regulates the process management

The **methodological report** collects the assumptions valid for all the EPDs carried out within the process and describes the data processing methods

The **calculation models** include a document describing the processing to be done for each type of product and pre-set calculation spreadsheets

The **process log** contains the planning of activities, the list of database modules and EPDs managed by the process, the recording and monitoring of the progress of all management activities, and the quantification and periodic recording of process indicators

The **annexes to the register** with the list of the audits carried out and their outcome

THE RELIABILITY OF THE EPD PROCESS: MULTI-LEVEL VERIFICATION

The reliability of the entire EPD process is ensured by audits conducted for each activity and at three levels:

1 CALCULATION MODELS
AND DATA MODULES IN THE DATABASE

2 DATA PROCESSING
FOR EACH EPD PROJECT AND RELATED DOCUMENT THAT MUST BE PUBLISHED

3 MANAGEMENT SYSTEM
OF THE ENTIRE EPD PROCESS

This provides an internal audit (as with the two previous levels) and an audit conducted by a third party that finally issues the certification of the EPD process.

THE ACTORS OF THE EPD PROCESS

The process entails the involvement and collaboration of different actors, whose skills are periodically assessed, and for whom specific training activities are provided if necessary.

Overall, almost **80 people** are involved in the EPD process in a more-or-less continuous or direct way.

ROLE IN THE EPD PROCESS	ROLE DESCRIPTION	NUMBER OF PEOPLE INVOLVED
OWNER EPD PROCESS	Oversees the entire EPD process, evaluating strategic decisions and approving documents	2
RESPONSIBLE OF EPD PUBLICATION	Revises the final version of the EPD document and gives instructions for publication on the International EPD® System website	1
EPD PROCESS MANAGER	Deals with the operational management of the process, keeps the documentation, calculation models, and database up to date	2
LCA ANALYST	Deals with all the processing necessary for the impact assessment and the preparation of EPD documents	7
GRAPHICS DEVELOPER	Create graphic models for EPD documents	2
DATA MANAGER	Responsible for providing data and information useful for the realization of individual EPDs. The data managers are always internal to Barilla and experts in the various phases of the product life cycle (e.g., raw materials, packaging, production process, etc.).	30
DATA EXPERT	Supports data collection, validation of some LCA calculations, and final checking of EPD documents before their publication. This role is also covered by several people based on existing skills for specific aspects of the process or responsibilities related to the various Barilla brands.	20
DATA VERIFIER	Internally validates database processing and modules, based on their knowledge on specific topics.	7
EPD VERIFIER	Deals with internal audits of: EPD documents, database data (product-specific data, processing of results), and correct updating of calculation models.	2
PROCESS VERIFIER	Regularly conducts internal audits on the EPD process to verify its compliance with reference standards and rules.	2
VERIFICATION BODY	Third-party that performs the audit of the process management system and is accredited to issue the certification of conformity to the reference standards.	3

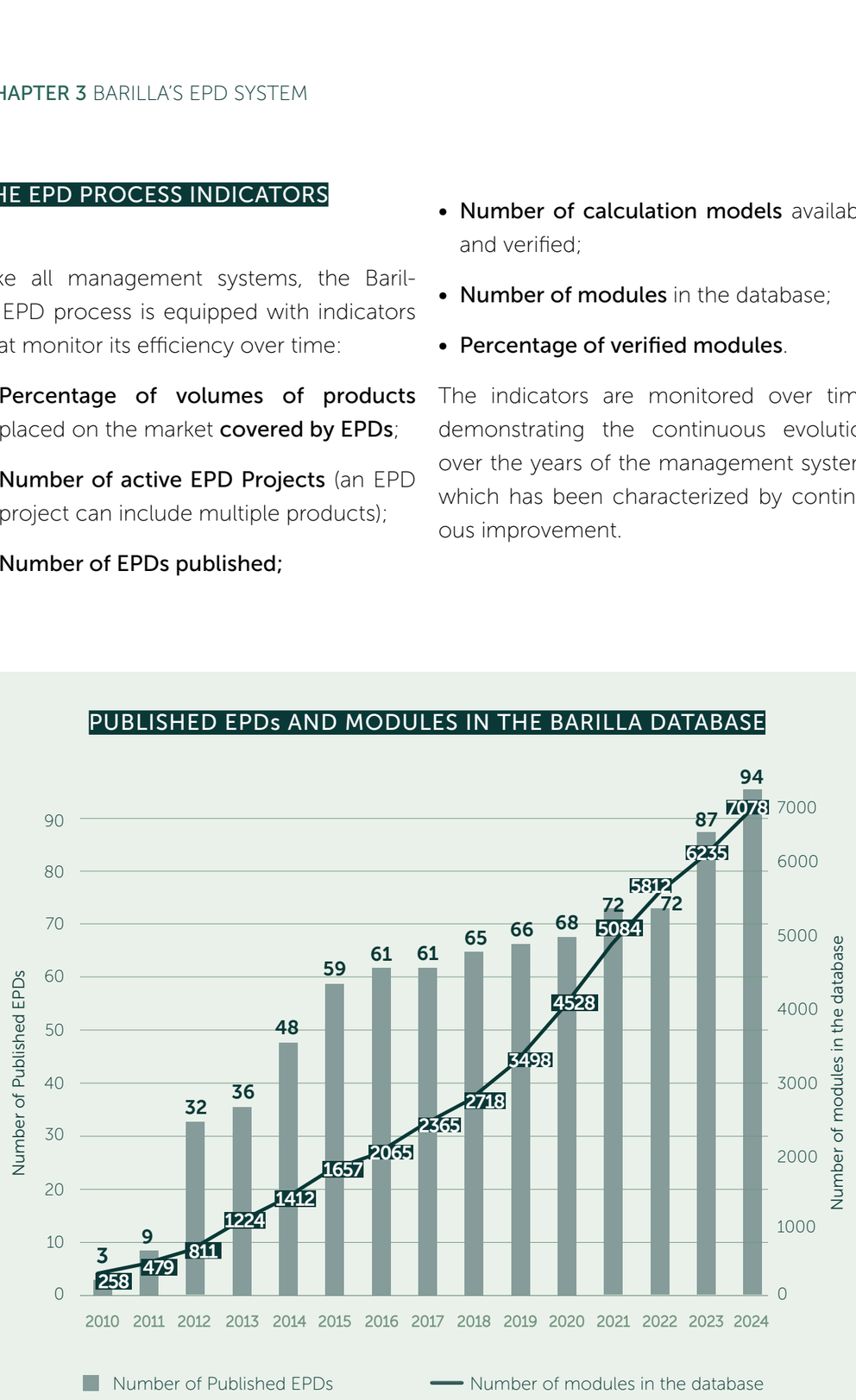
THE EPD PROCESS INDICATORS

Like all management systems, the Barilla EPD process is equipped with indicators that monitor its efficiency over time:

- **Percentage of volumes of products** placed on the market **covered by EPDs**;
- **Number of active EPD Projects** (an EPD project can include multiple products);
- **Number of EPDs published;**
- **Number of calculation models** available and verified;
- **Number of modules** in the database;
- **Percentage of verified modules**.

The indicators are monitored over time, demonstrating the continuous evolution over the years of the management system, which has been characterized by continuous improvement.

PUBLISHED EPDs AND MODULES IN THE BARILLA DATABASE

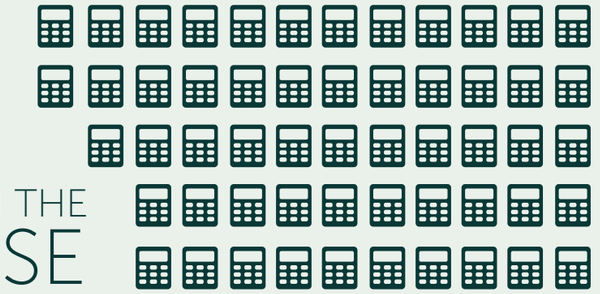


Data updated 31/12/2024

BARILLA EPD SYSTEM IN NUMBERS

OVER **80** ACTIVE EPDs

OVER **5,000** OPERATIONS IN THE DATABASE



OVER **1,400,000** TONNES OF PRODUCT COVERED (70%)

Data updated 31/12/2024

4

GUIDE TO READING A BARILLA EPD

EPD®s OF BARILLA PRODUCTS

An EPD provides different interpretations and can therefore be addressed to various stakeholders. It reports quantitative information concerning the characteristics of the product (e.g., nutritional values), environmental indicators (e.g., carbon footprint), and the distribution of impacts along the various phases of the life cycle.

It also presents equally interesting qualitative indications; for example, programs that are implemented to reduce the impacts of products.

Each EPD, with a registration number that makes it unique, is published in a public international register (www.environdec.com).

EPDs PUBLISHED BY BRAND AS OF 31/12/2024

32	Mulino Bianco	4	Pan di Stelle
25	Barilla	8	Gran Cereale
11	Wasa	1	Voiello
5	Pavesi	1	Misko
6	Harrys	1	filiz

ENVIRONMENTAL PRODUCT DECLARATION

EPD®

DAL 1877 Barilla®

STRUCTURE OF AN EPD

PRODUCT CHARACTERISTICS

NUTRITIONAL INFORMATION (per 100 g)		
Energy		
Fats		
Carbohydrates		
Fiber		
Protein		
Salt		

DESCRIPTION OF THE SUPPLY CHAIN

UPSTREAM — CORE — DOWNSTREAM

Cultivation · Milling · Packaging · Production · Distribution · Cooking · End-of-life of packaging

ASSUMPTIONS AND DATA FOR THE CALCULATION OF IMPACTS

GENERAL INFORMATION

WATER

ELECTRICITY

WASTE

NATURAL GAS

RESULTS

SEMOLINA PASTA, BLUE BOX

	UPSTREAM		CORE	DOWNSTREAM		TOTAL
ENVIRONMENTAL IMPACT INDICATORS						
OUTFLOWS FROM THE SYSTEM						
RESOURCE USE						
WASTE						

PRODUCT CHARACTERISTICS

Each EPD opens with the identification of the product and its main characteristics.
For food products, therefore, the reader immediately comes across its ingredients and the nutritional values.

This information is valuable if the impacts of different products are compared.

It is essential to consider products with similar functional and nutritional characteristics.

The ingredients are illustrated similarly to what is reported on the product packaging.

Similarly, the nutritional characteristics reflect the indications on the packaging, with the value of the principal nutrients per 100grams of product.

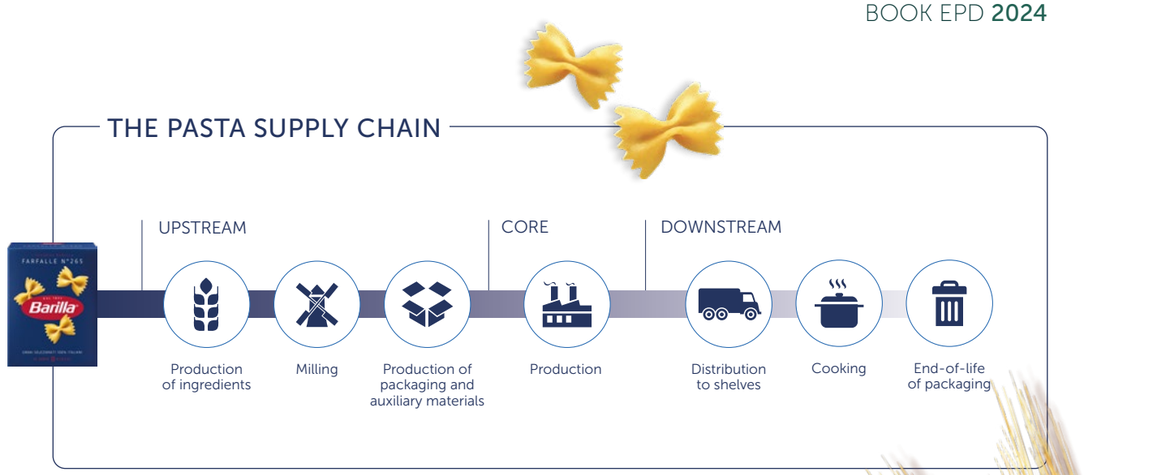
NUTRITIONAL INFORMATION (per 100 g)		
Energy	Kcal - KJ	
Fats	g	
Carbohydrates	g	
Fiber	g	
Protein	g	
Salt	g	

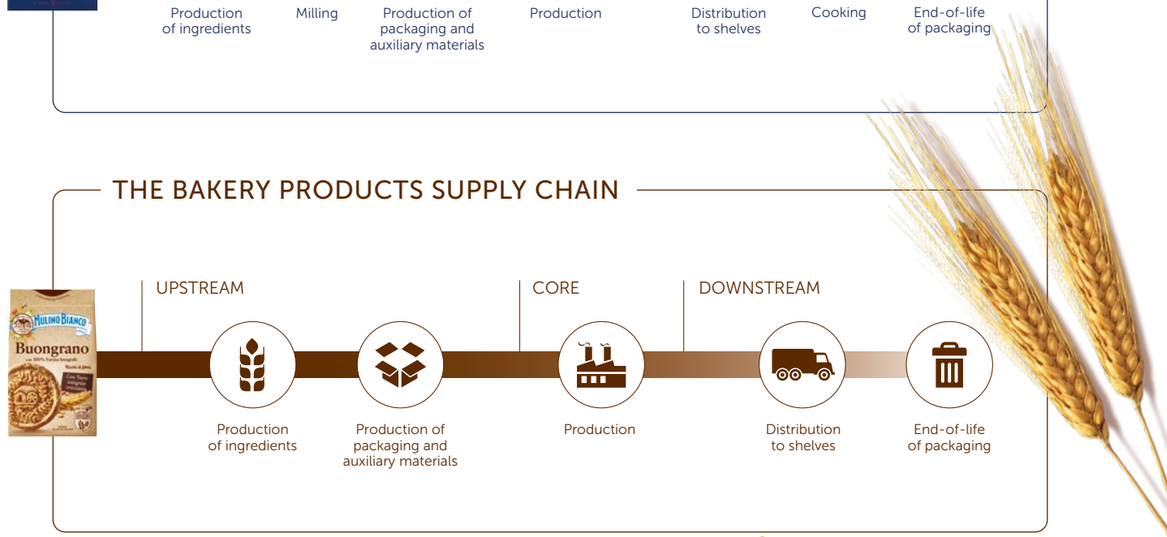
DESCRIPTION OF THE SUPPLY CHAIN

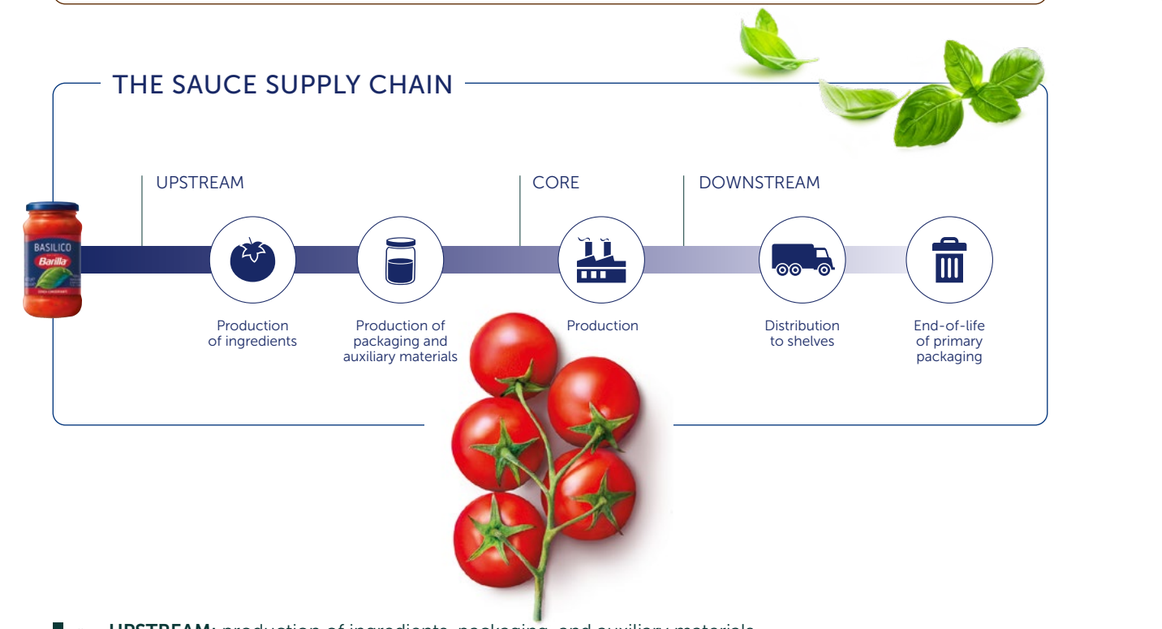
Each EPD contains a detailed description of the supply chain considered and the explanation of the phases, including the assumptions adopted to conduct the LCA analysis.
Each supply chain can have specific characteristics. For example, in the pasta supply chain, the wheat milling phase is explained, and the cooking of pasta is also analysed.

For bakery products, the storage or cooking phases are not considered, as the products do not require refrigeration to be stored at the consumer's home, nor to be cooked before consumption.

The same assumption has also been adopted for Barilla sauces.





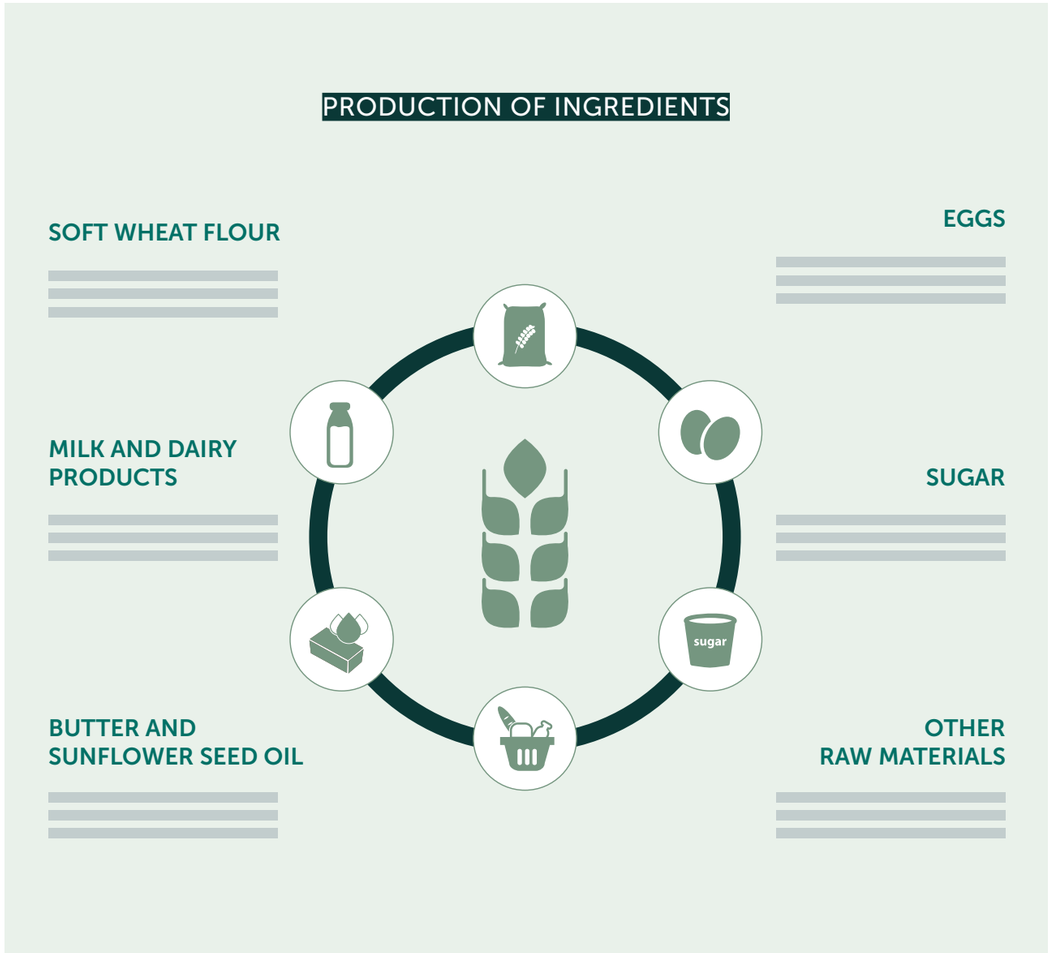


- » **UPSTREAM**: production of ingredients, packaging, and auxiliary materials
- » **CORE**: production process
- » **DOWNSTREAM**: product distribution, storage and use at home, disposal of packaging

ASSUMPTIONS AND DATA

The assumptions and data used determine the quality of the results obtained. EPDs of similar products share the same basic assumptions, imposed by the Product Category Rules (PCR). Barilla EPDs dedicate several pages to describing the assumptions and type of data used in the study.

For example, the section dedicated to the recipe of any cookie illustrates the ingredients and explains the data and assumptions used to calculate their impacts.



RESULTS

The heart of each EPD is represented by the section about the environmental indicators, all referring to 1 kg of the product under study. For each indicator, the total value and its contribution for each phase of the supply chain is reported.

INVENTORY INDICATORS

The inventory indicators provide information on environmental aspects related to the consumption of energy and material resources (inputs) or to the production of waste, energy, and recoverable materials (output streams).

USE OF RESOURCES		
RENEWABLE PRIMARY ENERGY RESOURCES data in MJ	Use as an energy carrier	How many primary energy resources (renewable or non-renewable) were used as raw material and energy carrier. Primary resources used as raw material are evaluated by considering the energy content embedded in the materials that make up the product and potentially recoverable at the end of life. Energy carriers are those forms of energy that lend themselves to being transported through appropriate networks to the place of use (e.g., coal, methane, biomass, hot water, electricity).
	Use as a resource	
NON-RENEWABLE PRIMARY ENERGY RESOURCES data in MJ	Use as an energy carrier	
	Use as a resource	
Secondary raw materials (g)		How much recycled material has been used, coming from scraps or process waste, or from end-of-life products, downstream of a recycling process.
Renewable secondary fuels (MJ, net calorific value)		How much fuel recovered from waste (from wood, tires, oil, etc.) was used to replace a primary fuel.
Non-renewable secondary fuels (MJ, net calorific value)		
Water use (litres)		How much water was consumed.
OUTFLOWS FROM THE SYSTEM		
By-products intended for animal nutrition (g)		How many by-products associated with the product under study are intended for end-of-life animal feed.
Components for reuse (g)		How much material is potentially reusable (usable for the same purpose for which it was designed) at the end of its life.
Recycling materials (g)		How much material is recyclable at the end of life.
Materials for energy recovery (g)		How much material is recyclable at the end of life.
Exported energy, electricity (MJ)		How much energy comes out of the system under study in the form of electricity, heat, or fuel. Electricity and heat can be produced, for example, by co-generators or tri-generators and transferred to the distribution network; The energy contained in the materials is estimated to be recovered after incineration or landfilling.
Exported, thermal energy (MJ)		
WASTE		
Hazardous waste for disposal		How much hazardous waste is sent for disposal, except radioactive materials.
Non-hazardous waste for disposal		How much non-hazardous waste is sent for disposal.
Radioactive waste for disposal		How much waste containing radioactive material is destined for disposal.

ENVIRONMENTAL IMPACT INDICATORS

Environmental impact indicators quantify the effects of the environmental aspects of the system under study.

GLOBAL WARMING POTENTIAL - GWP (g CO_2e)	Fossil	Greenhouse gas emissions from material of fossil origin (e.g., natural gas, diesel...).
	Biogenic	Greenhouse gas emissions from biomass (aerobic/ anaerobic combustion or degradation of biomass, enteric emissions...).
	Land use and change	Greenhouse gas emissions associated with land use for human activities that modify its ability to absorb atmospheric CO_2.
Acidification - g SO_2 equivalent		Contribution to the phenomenon whereby atmospheric precipitation is more acidic, causing damage to the ecosystems into which it falls.
Eutrophication - g PO^{3-}_4 equivalent		Contribution to the phenomenon whereby aquatic systems have an algal bloom due to an increase in nutrients. This reduces oxygen and leads to the death of aquatic species.
Photochemical oxidant formation potential- g NMVOC equivalent		Contribution to the phenomenon by which a polluted ozone layer is created in the lower atmosphere, by interaction between air pollutants and light.
Abiotic depletion potential - elements g Sb eq		How many 'non-living' natural resources (fuels, metals, rare substances, ...) are used, of fossil or non-fossil origin.
Abiotic depletion potential, fossil fuels - MJ, net calorific value		
Potential water scarcity, m^3 eq		Contribution to water deprivation for humans and ecosystems

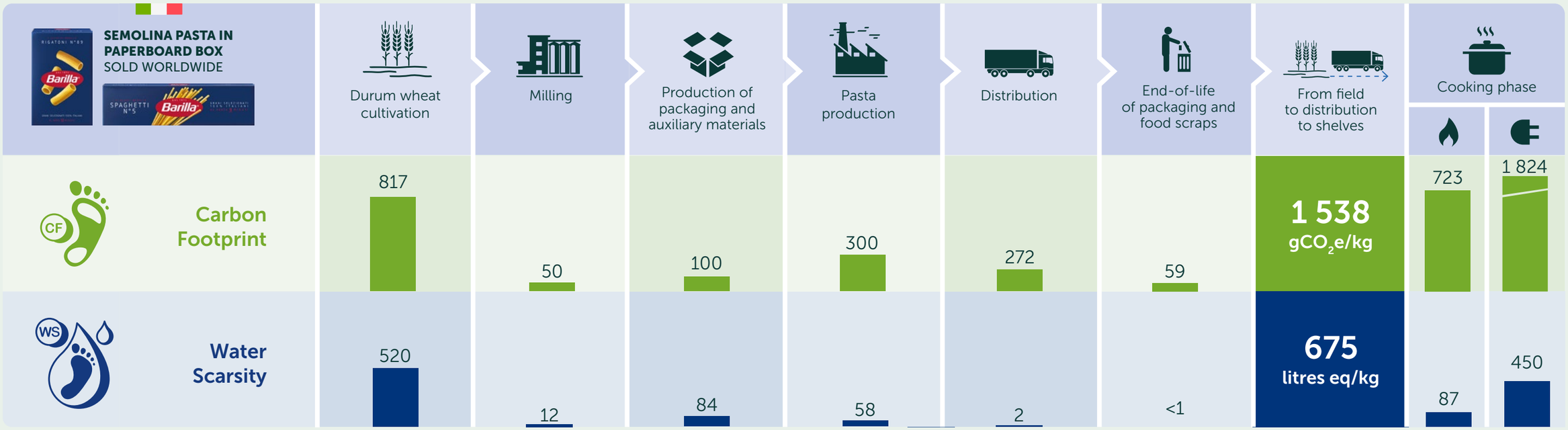
ENVIRONMENTAL PERFORMANCE

A page is dedicated to representing the environmental impacts associated with the life cycle of the product in a summarizing and informative way, through the main footprints in agri-food production: **Carbon Footprint, Water Scarcity.**

The **Carbon Footprint**, quantifies the emissions of all greenhouse gases – expressed in terms of carbon dioxide equivalent (CO_2e) emissions – that contribute to global warming. This indicator also includes greenhouse gas emissions associated with the use and transformation of land use by human activities that changes its ability to absorb atmospheric CO_2.

The **Water Scarcity** assesses the potential for water deprivation for both humans and ecosystems, based on the remaining available water per unit area with reference to the world average, after meeting the water demand of humans and ecosystems.

This is because the water deprivation potential for another user is directly proportional to the amount of water consumed and inversely proportional to the remaining available water per unit area and time. It is expressed in m^3 or litres equivalent.



Semolina pasta in paperboard box sold Worldwide, revision 12 of 2025

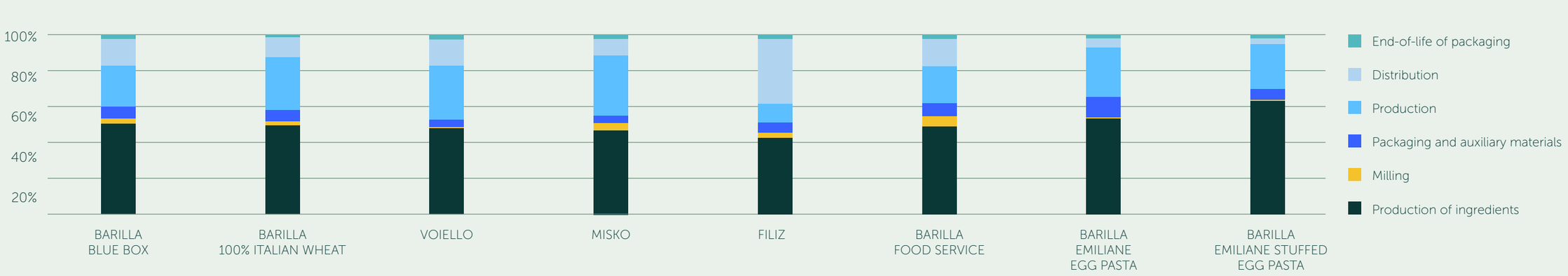
5
WHAT AN EPD® IS FOR

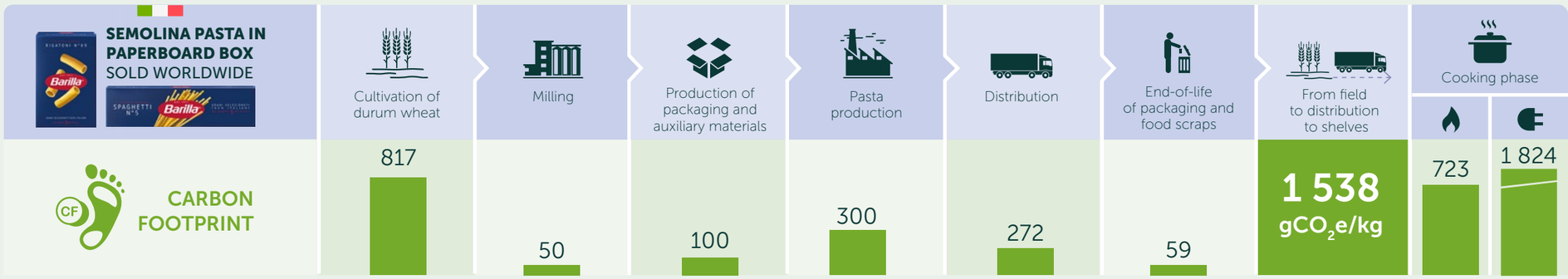
KNOW THE SUPPLY CHAINS AND THEIR IMPACTS

An EPD needs an LCA study and therefore an in-depth analysis of the supply chain and the individual phases that lead to the realization of the final product. This approach has allowed Barilla to understand and quantify the contribution of each production step to the overall impact of the final product. Consider, for example, the **pasta production chain**: the phases that have the greatest impact on carbon footprint are the cultivation of durum wheat, the production process, and the cooking phase.

According to the product category rules, the impact of the cooking phase is not included in the total impact reported in the EPDs and the result, reported separately, is variable as it is strongly correlated with consumer habits.

CONTRIBUTION OF LIFE CYCLE PHASES TO THE WHOLE IMPACT: SEMOLINA, EGG, AND STUFFED PASTA

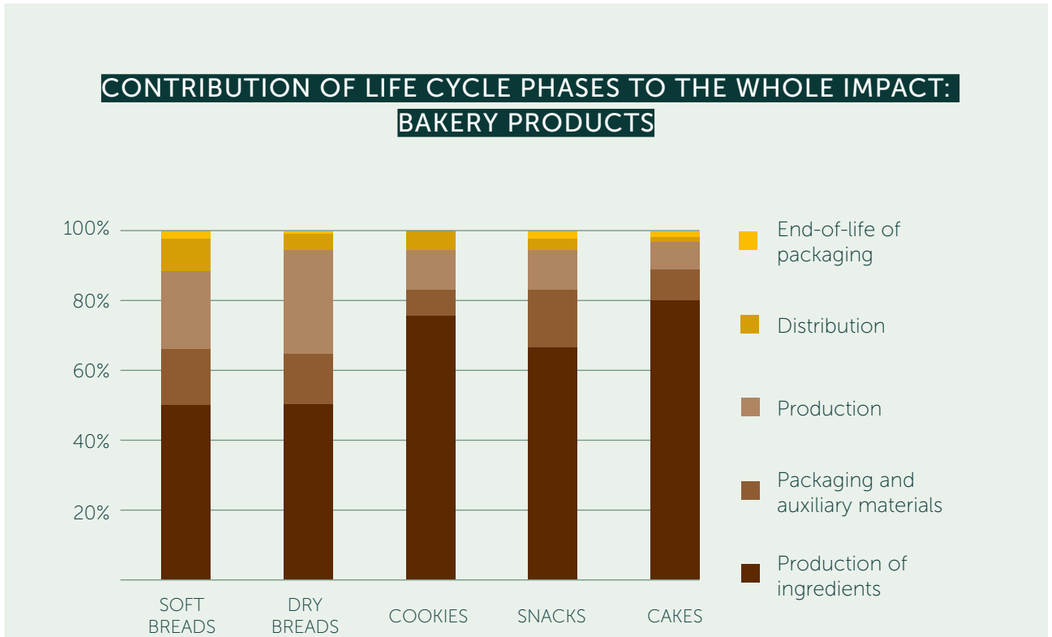




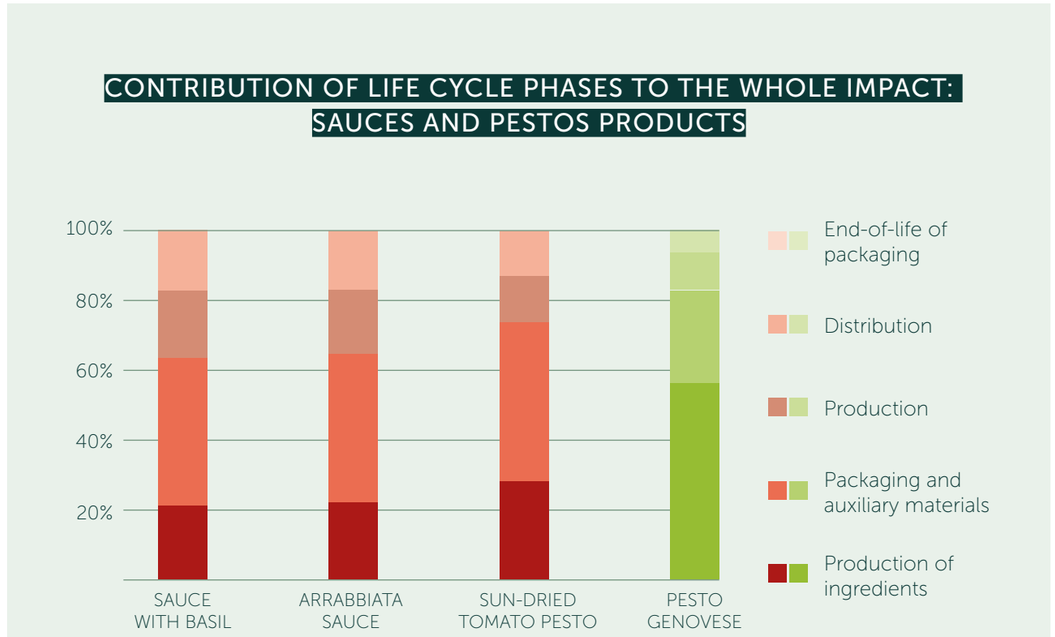
EXAMPLE OF THE IMPACT OF COOKING BARILLA BLU BOX PASTA

The cooking of the pasta has a highly variable impact depending on the minutes of cooking time using certain techniques, the preferences of the consumer, and the impact of the production of the energy required to cook the pasta, which depends on the energy mix of the country under analysis.

For **bakery products** (biscuits, soft and crisp breads, snacks, and cakes) the most important phase by far for the emission of greenhouse gases is that linked to the production of ingredients, followed by the creation of packaging materials.



As far as **sauces and pesto** are concerned, packaging production is the phase that has the greatest impact on the carbon footprint of these products, since it is entirely made of glass. The production of ingredients, unlike the primacy it holds for pasta and bakery products, is second in terms of importance.



IDENTIFY IMPROVEMENT PROJECTS

LCA and EPD results allow Barilla to understand where to direct corporate efforts to improve the environmental performance of its products and monitor them over time.

Since 2010, several projects have been initiated, concerning:

- The **production of raw materials** relevant to Barilla (e.g., durum wheat, soft wheat, rye);
- **The reduction of energy consumption** of production plants;
- The **evaluation** of **alternative packaging**
- The **evaluation** of alternative logistics solutions (e.g., intermodal solutions);
- **Increase consumer** awareness about the phases they can manage directly such as cooking pasta and disposing of packaging.

Each EPD contains a section called "additional information" in which the company can share with the reader information of interest related to products and environmental issues that go beyond the reporting of impacts.

Barilla uses this opportunity to describe its constant commitment and projects.

DURUM WHEAT PROJECT TIMELINE

Since 2010, a team of Barilla professionals has conducted several studies to identify the main areas of durum wheat cultivation in Italy and the least environmentally harmful farming systems.

One of Barilla's goals for the future is a commitment to increasing the dissemination of research, findings, and practices to further reduce the environmental impacts of the durum wheat supply chain.

2009

LCA OF PASTA
The EPDs show that 60% of the GWP of pasta is due to the cultivation of durum wheat.

2010

THE DURUM WHEAT PROJECT BEGINSS
A multidisciplinary team, composed of agronomists and LCA experts, begins to study agricultural systems in order to identify how to increase sustainability in the cultivation of durum wheat.

2011

THE MANUAL FOR THE SUSTAINABLE CULTIVATION OF DURUM WHEAT
As a result of the project, a manual outlining the sustainable agricultural practices has been published and delivered to farmers.

2012

GRANODURO.NET
granoduro.net is being developed with Horta and given to farmers. Granoduro.net supports farmers by providing information such as density optimal seeding, nitrogen requirements, disease risk, and weather forecasts.

granoduro.net

2013

CONTRACT WITH FARMERS FOR THE SUSTAINABLE CULTIVATION OF DURUM WHEAT
Starting in 2013, bonuses are given to farmers who grow durum wheat using sustainable agricultural practices.

2017

NEW MANUALS AND INCREASED APPLICATION OF THE BSF
Four new Handbooks for Sustainable Wheat Cultivation have been developed, also involving foreign countries, and four more are in development. Compared to 2013, the total area cultivated by the BSF method (granoduro.net) has more than doubled.

2020

THE DURUM WHEAT MANIFESTO
In Italy, in 2020, the Barilla brand launches its first pasta made with 100 percent Italian wheat: this achievement is possible thanks to the involvement of producers and the increasingly widespread application of responsible agricultural practices.
For more information, visit the dedicated page on the Barilla website.

BARILLA SUSTAINABLE FARMING (BSF) PROMOTES MORE EFFICIENT FARMING SYSTEMS IN ORDER TO PROVIDE SAFE AND QUALITY AGRICULTURAL PRODUCTS IN A WAY THAT PROTECTS AND IMPROVES THE NATURAL ENVIRONMENT AND THE SOCIAL AND ECONOMIC CONDITIONS OF FARMERS.

Mulino Bianco Charter is a set of **10 rules** for the sustainable cultivation of common wheat, covering more than **100 Mulino Bianco products**. With the Mulino Bianco Charter, Barilla not only brings quality to its products, but also supports the work of farmers' communities and promotes biodiversity by safeguarding pollinating insects.

The pillars of the Mulino Bianco Charter

For the PLANET

- Biodiversity
- Crop rotation plan for natural soil fertility
- We support the development of pollinating insects

For the SUPPLY CHAIN

- Selected and certified seeds
- Reduction of chemicals during grain storage
- Systems of traceability
- Use of decision support systems (DSS)

For the COMMUNITY

- Certified sustainability
- More control
- Transparency
- Transfer of value

In 2023, approximately 317,000 tons, 2000 ha of flower beds and 48,000 ha of common wheat managed according to the Mulino Bianco Charter

mulinobianco.it/lacartadelmulino

COOKING PASTA ACCORDING TO BARILLA

With the aim of spreading greater awareness among its consumers, Barilla has developed guidelines for responsible behaviour to be followed during pasta cooking, one of the most important phases of the process in terms of impact. Barilla suggests passive cooking to reduce the carbon footprint, thanks to the saving of greenhouse gas emissions related to energy use, without altering the quality of the product.

PASSIVE COOKING

Pasta can be cooked more efficiently by keeping the flame on for only the first 2 minutes of cooking and then, in the remaining time, turning off the flame and covering the pot with the lid. The cooking method recommended by Barilla does not affect the organoleptic properties of the product but requires attention during the cooking phase: the pasta must be completely immersed in the water and stirred regularly.

Cooking time: 10 min

COOKING METHODS FOR 80g OF PASTA	TRADITIONAL COOKING	PASSIVE COOKING
		
	Active cooking **10 min**	Active cooking **2 min** + Passive cooking **8 min**
REDUCTION OF CO_2e EMISSIONS RELATED TO THE BOILING AND COOKING PHASES OF THE PASTA		 **-62%**

Main assumptions adopted:

- Portion of dry pasta: 80 g
- Amount of water: 1 l of water x 100 g of pasta
- Total cooking time: 10 minutes

The calculated savings in greenhouse gas emissions are valid for both gas cooking and electric cooking.

+80 PEOPLE
INVOLVED IN THE PROCESS

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Artur Panis
Babakhina Anastasiya
Bellan Martina
Bertinazzi Laura
Boeri Fabrizio
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Bottazzi Oscar
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Brosseau Serge
Burlon Davide
Canali Giacomo
Cassinotti Sabrina
Chevalier Denis
De La Rosa German
De Nicolò Massimo
De Pieri Massimo
De Pisapia Sergio
Del Regno Martina
Deon Valeria
Di Donato Isabella
Di Giacomo Maria
Di Leva Sabino
Falconi Francesca
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GUIDE TO ANALYSING THE ENVIRONMENTAL IMPACTS OF OUR PRODUCTS

This book describes how the Barilla EPD System, created more than 10 years ago to analyse the environmental impacts of products, works: from the activities necessary to keep it up to date to the checks to guarantee its certifiability. It starts from a framework of the tools and technical standards underlying the creation of an EPD up to the definition of its role in projects to improve environmental performance.