

Circular Economy for Enterprises

Standardization

Circling the Square – Exploring the Current Landscape of Sustainability Standards and Circular Practices

Cristina Di Maria & Claudio Perissinotti Bioni

UNI – Italian Standardization Body



1st March 2024, Aarhus, Denmark

Who is bothering you today?



[Cristina Di Maria](#)

Research Project Manager



[Claudio Perissinotti Bioni](#)

Technical Project Manager

An exercise to get to know each other

www.menti.com

8694 8870



Results

Can you describe yourself in 3 lines?

20 responses



Agenda

Circular Economy Standards

- An overview of Circular Economy standards
- UNI TS 11820 – Circularity indicators
- Measuring Circularity: not an easy task...

Standards to support sustainability

- The CircThread Standardization Toolkit
- The future Digital Product Passport
- What's missing yet?



Circular Economy Standards

Claudio Perissinotti Bioni

Circular Economy for Enterprises

1st March 2024, Aarhus, Denmark

Circular economy standards – WHO, WHERE, WHEN?



UNI/CT 057
Economia circolare

2019

95 participants
(ITALIAN organizations)



CEN/TC 473
Circular economy

2023

31 participants
(EU countries)



ISO/TC 323
Circular economy

2018

100 participants
(WORLD countries)

Circular economy standards – WHO, WHERE, WHEN?



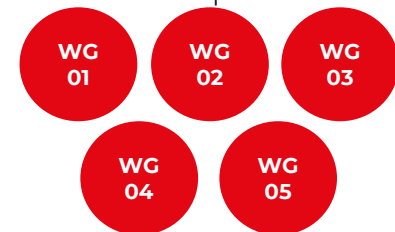
UNI/CT 057
Economia circolare



CEN/TC 473
Circular economy



ISO/TC 323
Circular economy



CIRCTHREAD
LIAISON

WG – Working Group (GL in Italian)
AHG – Ad Hoc Group

Circular economy standards – Working groups

-    **Terminology**, principles, frameworks and management system standard
-    Practical approaches (**business models**) to develop and implement CE
-   **Measuring and assessing circularity**
-   Circular Economy in practice: experience feedback (**good/best practices**)
-   Product circularity data sheet
-  **Information sharing**
-  **Extended User Responsibility**



Circular economy standards - OVERVIEW



ISO 59004

Vocabulary, principles and guidance for implementation



ISO 59020

Measuring and assessing circularity performance

UNI/TS 11820



ISO 59010

Guidance on the transition of business models and value networks



ISO 59040

Product circularity data sheet



ISO/TR 59031

ISO/TR 59032

UNI/TR 11821

Analysis of cases studies
Review of existing value networks

2022 2023 2024 2025

Publication dates

Circularity measurement: UNI/TS 11820:2022

UNI/TS 11820 – TABLE OF CONTENTS

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9. CALCULUS OF THE CIRCULARITY LEVEL

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Normative

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APPLICATION**

Informative

UNI/TS 11820 - SCOPE

SPECIFICA
TECNICA

Misurazione della circolarità - Metodi ed indicatori per la misurazione dei processi circolari nelle organizzazioni

UNI/TS 11820

NOVEMBRE 2022

Measuring circularity - Methods and indicators for measuring circular processes in organizations

La specifica tecnica definisce un set di indicatori applicati a livello meso e micro, atti a valutare, attraverso un sistema di rating, il livello di circolarità di una organizzazione o gruppo di organizzazioni.
Il sistema di rating non prevede livelli minimi di circolarità, ma fornisce una valutazione sul livello raggiunto.

TESTO ITALIANO

ICS 13.020.10



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UNI/TS 11820:2022

Pagina 1

Scope

This technical specification defines a **set of circular economy indicators** to assess, with a **100-base measurement system**, the level of circularity of an organization or group of organizations, including Public Administrations.

These indicators are applicable at the following levels:

- **micro** (single organization, municipality, city);
- **meso** (group of organizations, inter-organizations, industrial or territorial clusters, industrial areas and districts, production and materials chains, territories, regions, metropolitan areas, provinces).

UNI/TS 11820 – NORMATIVE REFERENCES

Some examples:

UNI EN ISO 14064-1 **Greenhouse gases** - Part 1: Specification with guidance **at the organization level** for quantification and reporting of greenhouse gas emissions and removals



UNI EN ISO 14064-2 **Greenhouse gases** - Part 2: Specification with guidance **at the project level** for quantification, monitoring and reporting of greenhouse gas emission reductions or removal enhancements

UNI EN ISO 14067 Greenhouse gases - **Carbon footprint of products** - Requirements and guidelines for quantification



UNI EN ISO 26000 Guidance on **social responsibility**



UNI ISO 20400 **Sustainable procurement** — Guidance

UNI/TS 11820 – TERMS AND DEFINITIONS

99 definitions, to clarify the meaning of each term.

Circular economy

Economic system which, through a systemic and holistic approach, aims to maintain circular the flow of resources by recovering, retaining or adding to their value, and which at the same time contributes to sustainable development.

Circularity

degree of alignment with the principles for a circular economy

Circularity level

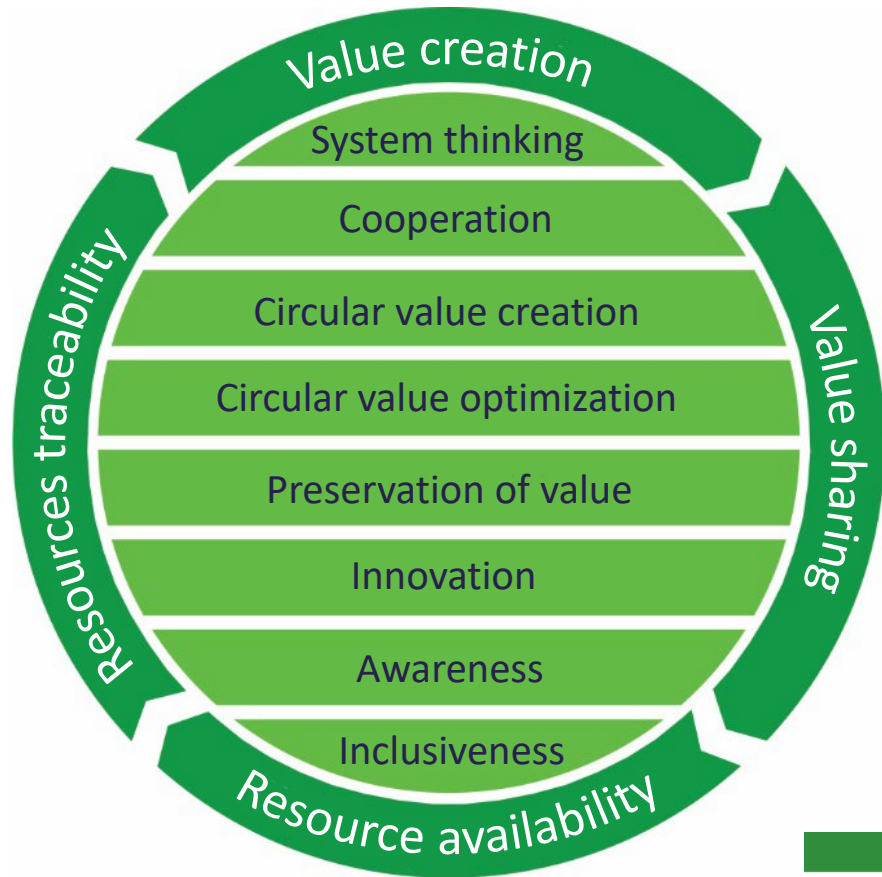
method of processing the indicators, to obtain the level of circularity of the organization

System boundaries (or **assessment perimeter**): Limits, both spatial and temporal, which define which unitary processes must be included in the study



An incorrect interpretation of a definition could lead to misunderstanding the meaning of the text (or worse) to incorrectly calculate an indicator!

UNI/TS 11820 - PRINCIPLES



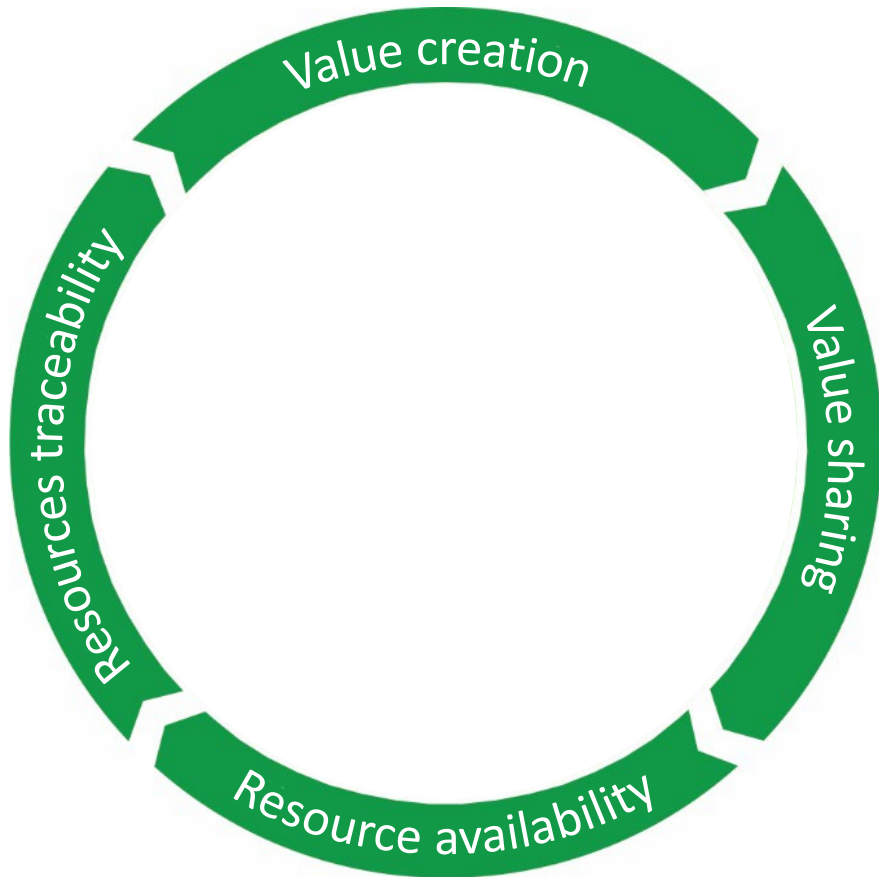
■ Principles of inspiration
■ Operating principles

Sources:

10 R (Reduce, reuse, recycle, recover...)
8 ISO 59004 principles
6 BS 8001:2017 principles
3 Ellen MacArthur Foundation principles
7 operating principles by Suarez-Eiroa

Each indicator is linked with (at least) 1 principle! All principles covered

UNI/TS 11820 - PRINCIPLES



Value creation

Create and regenerate value no longer making use of the typical resources of the linear economic system, but starting from accessible and fair resources throughout the value network, decoupling economic activity from the consumption of non-renewable resources.

By way of example, these include actions that favor the use of renewable raw materials, secondary material resources, by-products or outgoing water and energy resources from industrial/civil processes otherwise lost to the environment

Value sharing

Create mutual value between organizations within a system or systems.

By way of example, agreements stipulated with actors of different and varied nature with the aim of carrying out circular actions include

Resource availability

Consider the availability of the planet's resources in and out of organizational processes, keeping the flow of resources circular for as long as possible, with a view to sustainable development

Resource traceability

Monitor and manage circular economy data of resources entering and exiting an organization's processes

Resource traceability - FOCUS

DPP is a tool for traceability!



CEN/CLC/JTC 24

Digital Product Passport

Reference information	
1.	Harmonised standard(s) on unique identifiers
2.	Harmonised standard(s) on data carriers and links between physical product and digital representation
3.	Harmonised standard(s) on access rights management, information, system security, and business confidentiality
4.	Harmonised standard(s) on interoperability (technical, semantic, organisation)
5.	Harmonised standard(s) on data processing, data exchange protocols and data formats
6.	Harmonised standard(s) on data storage, archiving, and data persistence
7.	Harmonised standard(s) on data authentication, reliability, integrity
8.	Standards on APIs for the DPP lifecycle management and searchability

3.49 tracking system

A tool that tracks information on resources, products and by-products. Some examples of tracking systems are product passport, RFID systems and IoT sensors.

Indicator 03

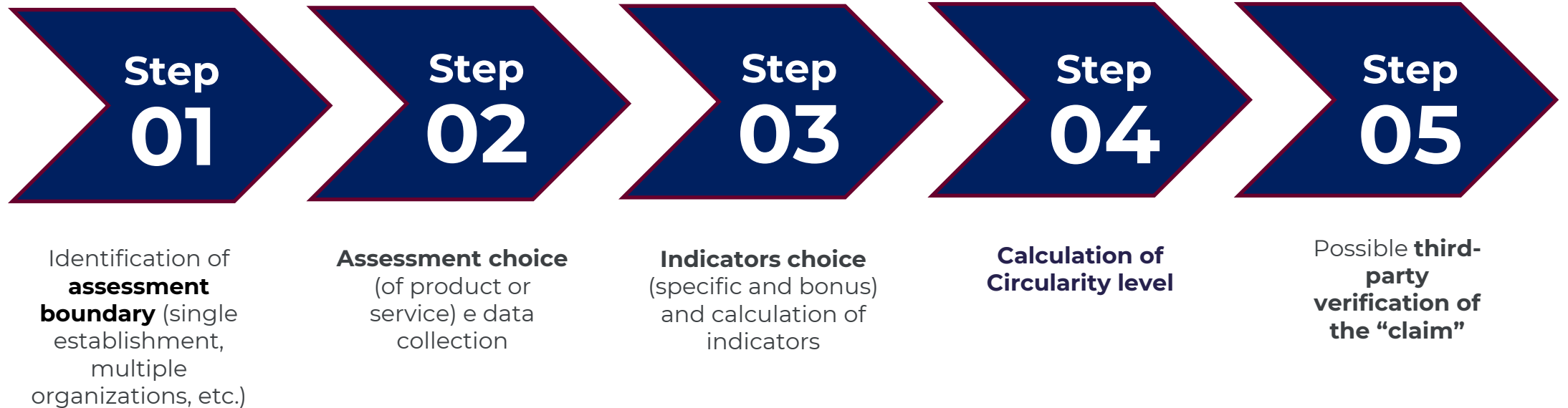
Material resources (incoming) provided with a tracking system (e.g. product passport) compared to total material resources (incoming)

Indicator 29

Material resources, products and by-products (outgoing) in year n provided with a tracking system (e.g. product passport) compared to total outgoing material resources, products and by-products in year n

UNI/TS 11820:2022

UNI/TS 11820 - PROCESS



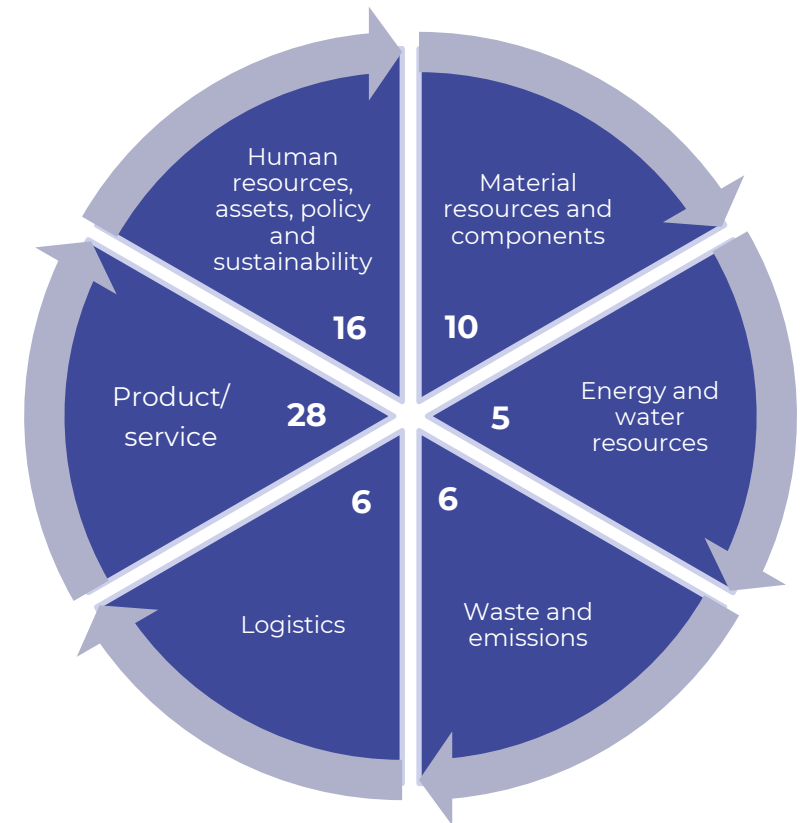
UNI/TS 11820 - INDICATORS

69
Product
Organizations

71
Indicators

55
Service
Organizations

- **core indicators (8, 7)**: this category includes all indicators for which compilation is mandatory;
- **specific indicators (50, 40)**: compilation of at least 50% is mandatory;
- **bonus indicators (11, 8)**: this category includes all indicators for which compilation is optional. Compilation of one or more bonus indicators will guarantee a higher final score.



UNI/TS 11820 Indicator categories

UNI/TS 11820 - INDICATORS

69
Product
Organizations

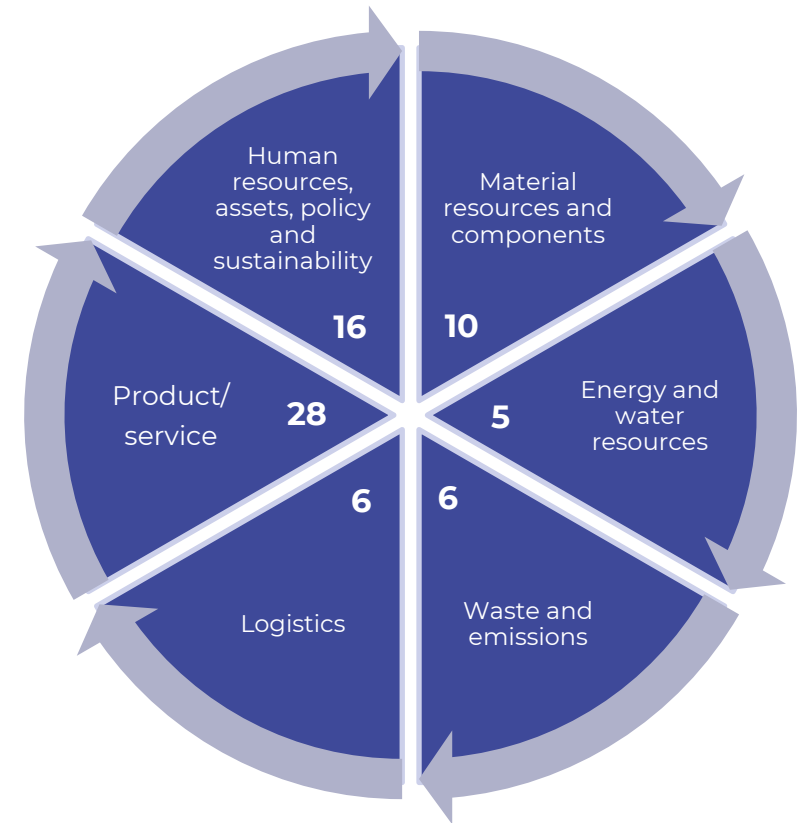
71
Indicators

55
Service
Organizations

For product organizations:
minimum **33 indicators** to fill in

For service organizations:
Minimum **27 indicators** to fill in

Note: 6 indicators are to be filled in only if they meet the specific conditions



UNI/TS 11820 Indicator categories

UNI/TS 11820 – INDICATORS TABLE

#	Description	Type of measurement	Unit of measure	Type of data. input, output or internal	Calculation of indicator		Correlated definitions	Type of assessment: service (S), product (P), product/service (P/S)	Type of indicator: core (1), specific (2), bonus (3)
					Numerator	Denominator			

For each indicator:

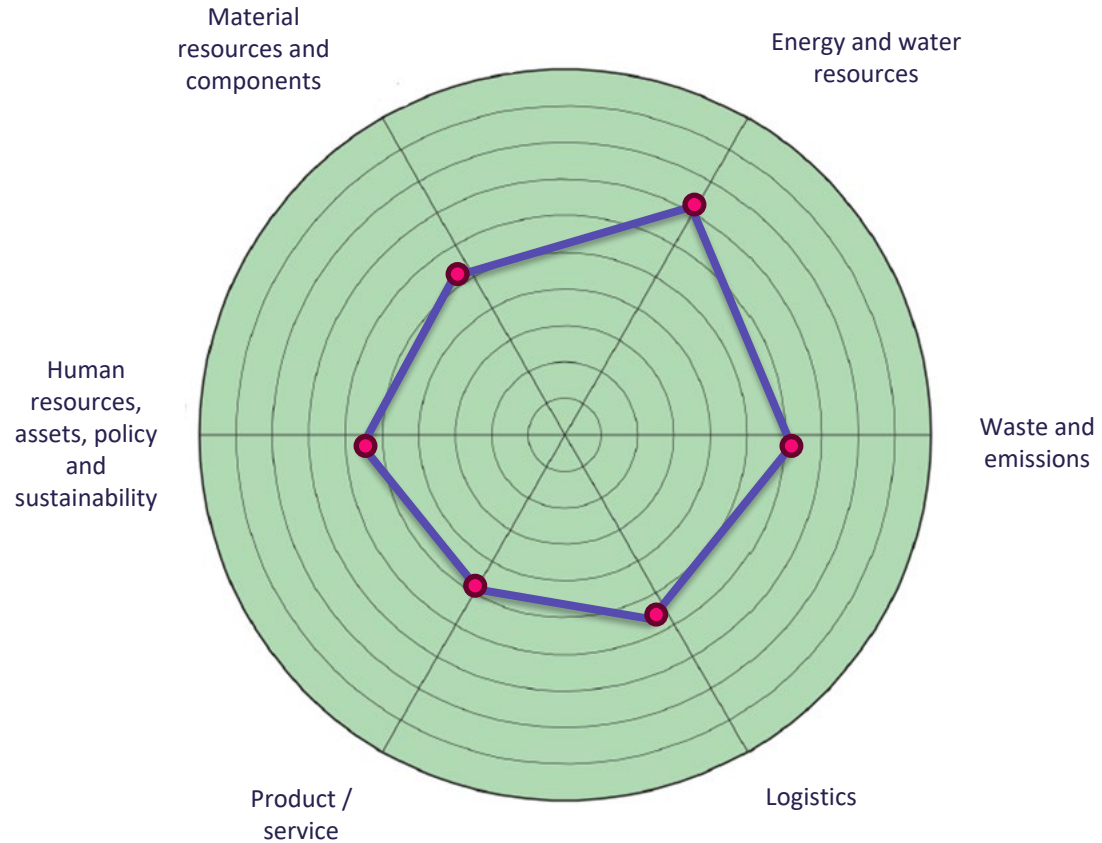
- **number** of the indicator;
- **description** of the indicator;
- **type of measurement** (quantitative, qualitative or semi-quantitative);
- quantity or **parameter measured** (mass, energy, economic, ad hoc);
- **type of data** (input, output, input and output, internal);
- **numerator** and **denominator** (if present) for calculation of the indicator;
- **correlated definitions** enabling proper understanding of the indicator (see clause 3);
- **type of assessment** (product and service, product, or service);
- **type of indicator** (core, specific or bonus).

UNI/TS 11820 – DATA QUALITY

To ensure that any assessment of the circularity of an organization will be relevant and effective, it is essential that **the quality of the data under assessment be checked**. The characterization of the quality of such data, sources for which must be cited, should guarantee the following elements:

- a) Temporal Coverage
- b) Geographic Coverage
- c) Completeness
- d) Representativeness
- e) Reproducibility:
- f) Accuracy
- e) Topicality
- f) Consistency
- g) Credibility
- l) Comprehensibility
- m) Precision
- n) Availability
- o) Restorability

UNI/TS 11820 – CIRCULARITY LEVEL



- ✓ Circularity level is between **0% and 100%**
- ✓ It is recommended to calculate the level of circularity of **6 categories**
- ✓ Annex C contains two **calculation examples**

$$LC = \frac{\sum_{i=1}^n c_i + \sum_{j=1}^m s_j + 0,5 \sum_{k=1}^f p_k}{c + s} \times 100$$

UNI/TS 11820 – VERIFIED CLAIM (NO GREENWASHING!)



The voluntary trademark UNI Mark certifies that the certified requirements of products, services, people, organizations and assertions/claims are established by UNI through reference standards or practices. UNI entrusts the management of the granting of the UNI Mark to certification bodies accredited by Accredia (UNI CEI EN ISO/IEC 17029:2020)

Each organisation, once this level has been calculated, can evaluate the conformity of the level achieved with the provisions of this technical specification through a first, second or third party assessment activity. By assertion of circularity pursuant to this technical specification the following expression is meant:

Level of circularity of the organization xxxx as related to assessment boundary zzzz (ATECO code A.BB) measured in the year xxxx according to UNI/TS 11820:2022 at yyy%

Verifying and validating the claim through a third party means ensuring that the entire process follows the requirements of the technical specification (boundary, calculation of indicators, evidences, etc.)!

(Annex A UNI/TS 11820:2022, «Requirements for third party conformity assessment with the requirements defined by this technical specification»)

UNI/TS 11820 – 3 PHASES



Pre-measurement phase

- to understand which information is **already available** and which is not;
- to understand **which processes to modify and monitor** and which aspects to take into consideration;
- to **identify the organization's strategic stakeholders** on the topic of circular economy (e.g. suppliers, partners, etc.) and build a common path with them.



Measurement phase

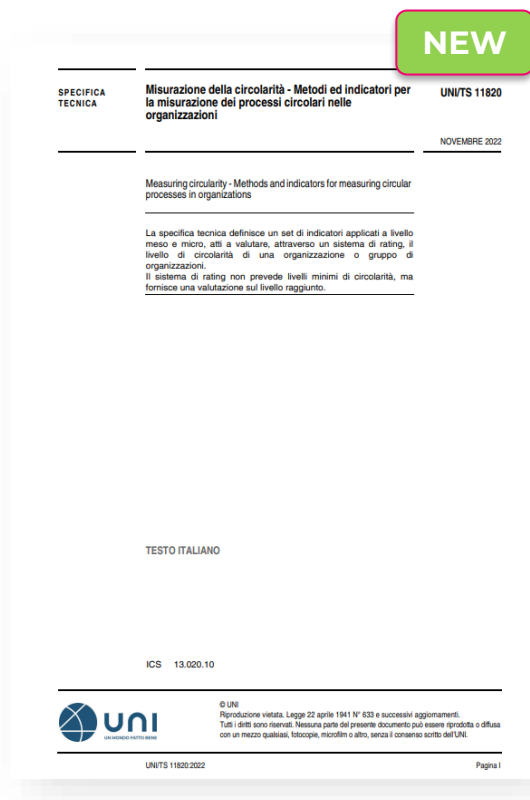
- to **calculate the level of circularity** of the organization and of the individual indicator categories
- for possible verification and validation of the **claim** with related communication actions (no greenwashing).



Post-measurement phase

- to establish **improvement priorities**, based on measurements;
- to create or **consolidate a circular economy strategy** within the organization;
- to have data to support your **sustainability reports**.

UNI/TS 11820 – NEXT STEPS





Following the application and various feedback received, UNI/CT 057 decided to revise the technical specification (from January 2024).

Main aspects that will be taken into consideration:

- process that allows the **exclusion of non-applicable indicators**;
- definition of **cut-off thresholds** to specify which data can be neglected (e.g. coffee in machines);
- **link indicators to life cycle phases**, not just indicator categories and the 12 principles;
- a new clause about the structure of the **final report**, which will include data, calculations, evidence and results.

Circular economy standards – “THE 20 ALIGNMENT”

	 UNI/TS 11820	 ISO 59020
Applicability	Organization Group of organizations	Product/service Organization Group of organizations Regions, countries
Indicators	71 indicators 27 mandatory for S 33 mandatory for P	24 indicators 6 mandatory 18 optional
Output	Level of circularity verifiable by a third party	Assessment on circularity performance
Context	Italian and European	International (only Partly European)

Lots of data in common

Examples of UNI/TS 11820:2022 indicators

UNI/TS 11820 – EXAMPLES OF INDICATORS

Let's see some examples of UNI/TS 11820 indicators. The information to be collected is not always available and sometimes it may be necessary to request it from third parties (for example suppliers).

When thinking about data acquisition, the **objective evidence** supporting the data shall already be established

What is the meaning of "objective evidence"?

objective evidence

data supporting the existence or verity of something

Note 1 to entry: Objective evidence can be obtained through observation, measurement, test or by other means.

Note 2 to entry: Objective evidence for the purpose of the *audit* ([3.1](#)) generally consists of records, statements of fact, or other information which are relevant to the *audit criteria* ([3.7](#)) and verifiable.

[SOURCE: ISO 9000:2015, 3.8.3]

UNI/TS 11820 – EXAMPLES OF INDICATORS

Context

EcoCons SPA is a company providing various services that mainly deals with waste management and environmental consultancy. Its unique headquarters is located in Milan.

The sustainability department has been tasked with applying UNI/TS 11820:2022 to the entire organization. The results of the application will be shared with the accredited certification body chosen for the evaluation and validation of the claim with the UNI brand:



Circularity level of the EcoCons SPA organization relating to the evaluation perimeter of the Milan office (ATECO code 38.2) measured in the year 2023 according to UNI/TS 11820:2022 equal to pp%

UNI/TS 11820 – EXAMPLES OF INDICATORS

During the validation process of the claim by the chosen certification body, it will be necessary to attach **evidence** to support the data entered to the calculation of each indicator.

The evidence shall be strong and shall demonstrate the validity of the data entered.

What could be some examples of evidence for the following indicators, considering the specific context data?

UNI/TS 11820 – EXAMPLES OF INDICATORS 1/2

Indicator	Context infos	Possible evidences?
14 - Amount of water obtained from recovery and/or recycling compared to total water needs	EcoCons SPA has no internal monitoring mechanisms	
17 - Municipal and/or special waste collected and sorted compared to total waste generated	EcoCons SPA does not deal with special waste. For urban waste it uses the municipal separate collection service	

UNI/TS 11820 – EXAMPLES OF INDICATORS 1/2

Indicator	Context infos	Possible evidences?
14 - Amount of water obtained from recovery and/or recycling compared to total water needs	EcoCons SPA has no internal monitoring mechanisms	Evidence to be requested from the water service provider, possibly found in the bill in the case of some supply contracts
17 - Municipal and/or special waste collected and sorted compared to total waste generated	EcoCons SPA does not deal with special waste. For urban waste it uses the municipal separate collection service	Collection statistics of the municipality to which you belong or of the organization that deals with collection and disposal (for Italy: ISPRA national waste register)

UNI/TS 11820 – EXAMPLES OF INDICATORS 2/2

Indicator	Context infos	Possible evidences?
<p>30 - Value of supplies coming from suppliers having certifications of sustainability and/or circularity for their product and/or service and/or organization in year n compared to total value of supplies in year n</p>	<p>EcoCons SPA does not know the certifications of its suppliers</p>	
<p>41 - Value of products and services (excluding raw materials) procured from local suppliers (100 km from the application boundary) in year n compared to total value of products and services (excluding raw materials)</p> <p>Note: If the products and services procured may not be locally available, exclude them from the LC denominator</p>	<p>Eco Cons SPA has only data relating to the HQ of its suppliers (not the operational place from which the supply starts)</p>	

UNI/TS 11820 – EXAMPLES OF INDICATORS 2/2

Indicator	Context infos	Possible evidences?
<p>30 - Value of supplies coming from suppliers having certifications of sustainability and/or circularity for their product and/or service and/or organization in year n compared to total value of supplies in year n</p>	<p>EcoCons SPA does not know the certifications of its suppliers</p>	<ul style="list-style-type: none"> - Searching for certifications in tax and transport documents - Direct contact with suppliers to ask for evidence - Survey among suppliers - Search on the supplier/manufacturer's website for valid certifications
<p>41 - Value of products and services (excluding raw materials) procured from local suppliers (100 km from the application boundary) in year n compared to total value of products and services (excluding raw materials)</p> <p>Note: If the products and services procured may not be locally available, exclude them from the LC denominator</p>	<p>Eco Cons SPA has only data relating to the HQ of its suppliers (not the operational place from which the supply starts)</p>	<p>Delivery notes, transport documents, shared tracking system reports (e.g. product passport)</p>



Standards to support Sustainability

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Circular Economy for Enterprises

1st March 2024, Aarhus, Denmark

Circthread project



circthread.com

Project Information

CircThread

Grant agreement ID: 958448



DOI

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1 June 2021

End date

31 May 2025

Funded under

SOCIETAL CHALLENGES - Climate action,
Environment, Resource Efficiency and Raw Materials

Total cost

€ 9 883 198,21

EU contribution

€ 7 994 956,75



Coordinated by

FUNDACION CARTIF

 Spain

Standardization Toolkit: 193 standards mapped



Standardization Toolkit



The CircThread standardization toolkit provides a comprehensive mapping of which regulations and standards are relevant for exchanging information about products across their life cycle, from manufacturing to usage to collection and repair to disassembly and recycling.

The toolkit is a key instrument giving you a rapid overview about current and upcoming EU regulations and global standards you should be aware of, especially if you work in the field of circular economy on digital solutions. It covers circular economy initiatives in the context of digital product passports, materials declarations, environmental management, and traceability, among others.

There are three dashboards for the overview (dashboard 1), regulations (dashboard 2) and standards (dashboard 3). You can navigate through them using the < 1 of 3 > navigation buttons in the grey Microsoft Power BI bar at the bottom of the page.

Technical Committees

193
Standards



57
Regulations

circthread.com/standardization-toolkit/

circthread.com/publication-results/project-deliverables/



Ref. Ares(2022)6801685 - 19/12/2022

**CircThread WP9
Regulation and Standardisation**

Task 9.1

Regulatory and Standardisation landscape scan

Deliverable 9.1

Standardisation Toolkit V1 [Online Interactive Tool](#) & Report

The future Digital Product Passport - Introduction

The **digital passport of a product** is an information system that serves to electronically record, process and share information related to the sustainability of products between companies in the supply chain, authorities and consumers. It is one of the measures provided for in the *Proposal for a Regulation of the European Parliament and of the Council establishing a framework for the establishment of eco-design requirements applicable to sustainable products and repealing Directive 2009/125/EC*, which is will be published throughout 2024, and in other European regulations such as the Proposal for the review of the European Construction Products Regulation or Regulation (EU) 2023/1542 relating to batteries and their waste.

The future Digital Product Passport – Challenges

- Universal readability of product data carriers across product groups
- Integration with existing product information management systems
- Standardised services IT access to retrieve and provide DPP data
- Common and up-to-date definitions and semantics
- Multi-language support in DPP information for multi-country use
- Setting adequate rights and responsibilities for each economic actor

circthread.com/publication-results/project-deliverables/



The future Digital Product Passport – Standardization SoA

- CEN/CLC JTC 24 “DPP” works started on December 2023.
- Next plenary: March 19th, 2024

Reference information	
1.	Harmonised standard(s) on unique identifiers
2.	Harmonised standard(s) on data carriers and links between physical product and digital representation
3.	Harmonised standard(s) on access rights management, information, system security, and business confidentiality
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7.	Harmonised standard(s) on data authentication, reliability, integrity
8.	Standards on APIs for the DPP lifecycle management and searchability

December
2023

December
2025

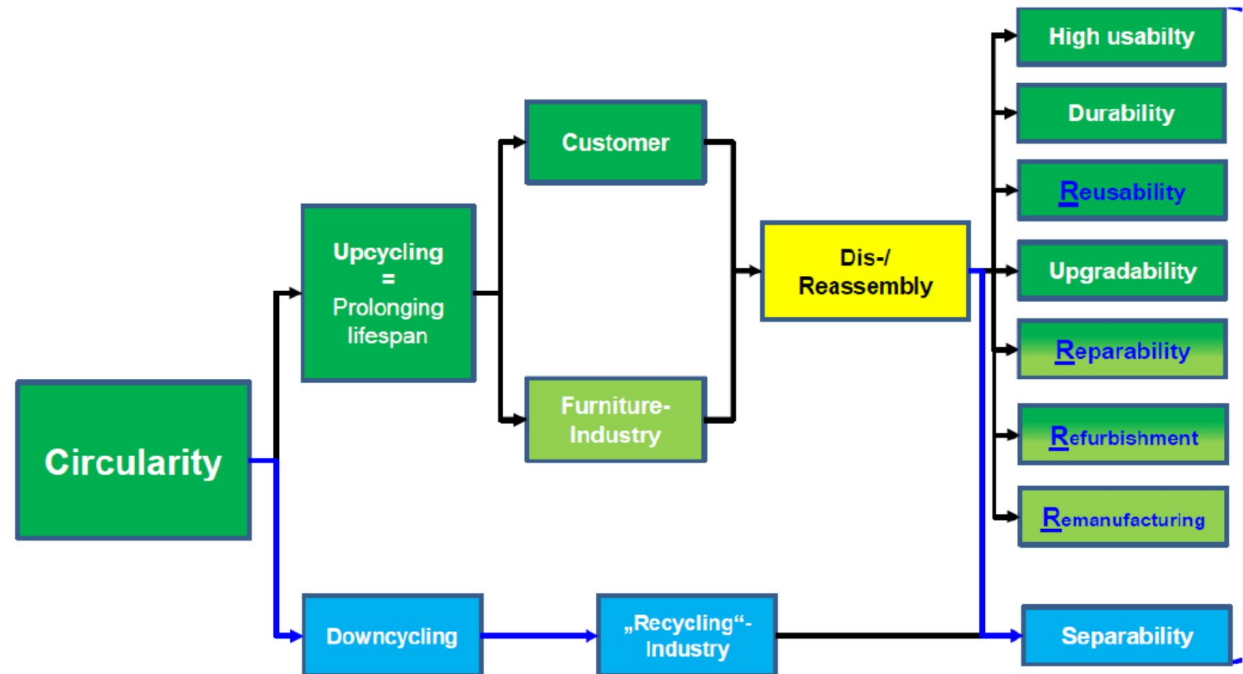
hENs



Specific circularity product group information/data standards for circularity will interlink with DPP

Standardisation committee CEN TC 207 (Furniture) and its WG 10 (Requirements and tools for furniture circularity) → working on standards for product aspects under article 5 of the ESPR

- **FprEN 17902 on evaluation method for dis/reassembly capability (2024)**



The future Digital Product Passport - A Circthread CWA proposal

**Guideline to create a Digital Product Passport –
the EU project CircThread experience**

Information
exchange
diagnosis

How the
DPP may
look like

Examples
of
application

Opportunities and Needs

Understanding the strategic state of
sustainability standards to support
companies



Standards + Innovation



An initiative by European standards organizations

With the financial support of





**Thank you for
your attention :)**

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