ORIENTING

D5.2

Report on users' needs and wishes

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Acronyms

ISO	**International Organization for Standardization**
LCSA	**Life Cycle Sustainability Assessment**
PEF	**Product Environmental Footprint**
PSF	**Product Sustainability Footprint**

Executive summary

ORIENTING is an H2020 project aimed at developing a comprehensive and operational methodology for the life cycle sustainability assessment (LCSA) of products and services. The innovation of this approach relies on the integration of environmental, social and economic impacts: the aim is to evaluate the products manufactured under both linear and circular business models, enabling professionals to understand and manage the possible alternatives.

In the framework of the project, the development and applicability of an LCSA methodology are supported by an active engagement of stakeholders, according to a bottom-up approach: the methodology will not be developed in the realm of academic and research institutions, but co-created together with the stakeholders that will use it for e.g., supporting the different steps of the product-related policy cycle, the definition of product design and development, more informed purchasing choices, just to mention some examples of decision situations.

This deliverable reports the first identification and mapping of stakeholders' needs and wishes about LCSA methodology, i.e., how stakeholders would like the methodology to be to fulfil their needs.

A three-step approach has been developed for mapping stakeholders' needs:

i. preliminary definition of the needs based on the background documentation and thorough analysis that brought to the presentation of the project' proposal
ii. refinement of the needs with the input of ORIENTING's partners
iii. organisation of a workshop on users' needs, during which stakeholders were asked to: confirm the identified needs; add new ones; prioritise the needs, for guiding the development of the LCSA methodology during the next steps of the project.

The stakeholders' workshop was held on April 23rd, 2021. 149 stakeholders registered at the workshop, and 112 attended effectively, out of which "Industry", "policy makers" and "civil society" represented 45% of the participants: they represent the recipient of the LCSA methodology and are in the position of directly affecting - and being affected by - the development of ORIENTING.

The following main needs were discussed:

- **Integrated assessment**. This consists of combining, interpreting and communicating the outcomes of different disciplines (environmental, social, economic, criticality, circular economy) in a coherent and comprehensive way, for decision making processes.
- **Communication**. The results of a sustainability assessment require to be communicated to different target audience, either internally (within the organization that performed and commissioned the study) and to the general public. This in turn implies the capability of making them understandable and meaningful to a diverse audience, with different know-how and level of awareness.
- **Responsiveness to the different decision-context situations**. A methodology for the sustainability assessment of products can be used to support the decision process in many different situations (industrial contexts and purchasing processes) and of different steps of the policy cycle.
- **Affordability**. The applicability of a methodology for sustainability assessment requires also reducing the complexity, the time needed to perform an LCSA and then also the costs.
- **Flexibility In scope**. A broad application of the methodology requires stability of the methods used, availability of data and possibility to apply it to different sectors/product groups, size of organisations and geographic contexts.

The feedbacks and inputs collected during the workshop pointed out a multitude of different needs for LCSA, depending on the stakeholder at hand. The needs identified by the project's partners have been confirmed, and new ones have been defined, or better, already identified needs have been refined and further detailed. As far as the identification of priorities is concerned, the outcomes of the sli.do poll (see Annex D) showed that the different options for each need are almost equally distributed, without a clear and outstanding priority but only slight preferences. These have been ordered as follows:

Need	Priority
Integrated assessment	Have separate results for each sustainability aspect, with clear indication of trade-offs
Communication	Availability of software tools and data for carrying out an LCSA study and visualizing the results in an effective way
Flexibility in scope	Capability of carrying out both screening and detailed assessment
	A Sustainable Product Footprint (SPF)-like approach, following the PEF example
Responsiveness to different decision-context situations	Comparing sustainability performance of different products
	Support ecodesign approaches within the organisations, for product and process development
Affordability	Develop open-access and user-friendly databases for LCSA

All these needs should be addressed for developing LCSA, taking into account the overarching principle of reliability, which implies ensuring scientific robustness in the approach. In addition to the above priorities, the following aspects were pointed out:

- Easy-to-use and transparent LCSA is crucial to obtain broad acceptance.
- Ensure the capability for an early-stage assessment.
- Invest on resources in developing training materials, webinars, courses, examples for supporting the use of the methodology.
- Weighting is considered a possibility to be further explored, per product category/sector/context.
- Connect the methodology to reporting standards for financial purposes.
- Ensure that the methodology is maintained also after the project and updated over time, in line with the new scientific developments.
- The assessment should be governed by the materiality.

All these inputs will be considered for the LCSA development, already started under the WP2. In addition to the technical work carried out by the project's partners, an important role will be played by external stakeholders' experts, who will be consulted during the project for addressing specific methodological and practical issues.

1. Introduction

The European Green Deal, Europe's new agenda for sustainable growth, highlights the need for reliable, comparable and verifiable sustainability information. The ORIENTING (Operational Life Cycle Sustainability Assessment Methodology Supporting Decisions Towards a Circular Economy) project has been created as a response to this need to develop a comprehensive and operational methodology for the LCSA of products and services. The innovation of this approach lies in the integration of environmental, social and economic impacts: the aim is to evaluate the products manufactured under both linear and circular business models, enabling professionals to understand and manage the possible alternatives.

ORIENTING aims to contribute to the development of a future Product Sustainability Footprint (PSF) at European level, evolving existing Product Environmental Footprint (PEF) and designing new indicators for the evaluation of material criticality and product circularity. New tools will be developed to support and simplify the methodology application in business and policy development. Tools include guidance and training materials, data and software specifications and a hands-on LCSA IT tool. The methodology and support tools will be applied in five industrial case studies (chemistry-based products, intermediate bio-based materials, recovered construction materials, food and apparel products) that will serve as demonstrators.

The project outcomes will enable informed business decisions and contribute to the development of a levelled playing field – a single market – for products based on robust (i.e., transparent and verifiable) sustainability information. In order to ensure the applicability of the outcomes of the project, the consortium aims to work in close cooperation with various stakeholders (e.g., industry associations and clusters, SMEs, consumer organisations, as well as governmental and standardisation bodies) through engagement and dissemination events.

Seventeen partners, including companies, associations, consultancies, research centres and universities from around Europe are boosting the project by working as a consortium. Participants cover the entire value chain of life cycle evaluations and provide a critical mass of expertise and excellence in key areas of the project. The project partners are Aclima, Anthesis Lavola, BASF, Ecopreneur, Ecoinnovazione, Ecoinvent, Eifer, Fraunhofer, Leiblein, PRé, Stora Enso, Solana, Tecnalia (coordinator), Ternua Group, Universiteit Gent, University for the Creative Arts and VTT Teknologian tutkimuskeskus.

In the framework of the project, the development and applicability of a Life Cycle Sustainability Assessment (LCSA) methodology are supported by an active engagement of stakeholders, according to a bottom-up approach. The methodology will not be developed in the realm of academic and research institutions but co-created together with the stakeholders that will use it for practical needs such as supporting the different steps of the policy cycle, designing and development of product concepts and taking more informed purchasing decisions, just to mention some examples of decision making situations. Stakeholders include academia and research representatives, policy makers, civil society, financial institutions and industry representatives, both SMEs and large corporations. They are key players in the

development of operational sustainability assessment methodologies and tools, and they are also having an active role in the transition towards the definition and implementation of the Sustainable Product Policy Initiative.

The engagement process is aimed at giving stakeholders an active role in the methodology definition. By listening to their needs, wishes and reported challenges for sustainability assessment and by collecting their input and suggestions, the partners of ORIENTING aim to design a methodology that is tailored to the needs of a broad audience, robust and applicable – also by reducing costs and knowledge-related barriers –, and able to support the decision-making process at all levels.

For this reason, within ORIENTING several events and opportunities for engaging with stakeholders will be organised all along the project, both with public and one-to-one events. Workshops, focus groups, interviews, questionnaires and ad-hoc meetings are the tools used for collecting views from a broad pool of stakeholders across countries and with different level of awareness on sustainability methodologies and tools.

This document reports the first identification and mapping of stakeholders' needs and wishes about LCSA, i.e., how they would like the methodology to be developed to fulfil their needs. The report is structured as follows. In **section 2**, the approach for the definition of stakeholders' needs is explained, while in **section 3**, the outcomes of the first stakeholders' workshop on users' needs are illustrated. Finally, in **section 4**, conclusions are drawn.

2. Approach for stakeholders' needs definition

The approach for a first definition of users' needs has been threefold:

- First, a preliminary definition of the needs has been carried out, based on the background documentation and thorough the analysis that brought to the presentation of the project' proposal. The outcome was represented by the taxonomy of needs, i.e., the identification of keywords for LCSA development, structured according to the key components of LCSA: framework, methodology, and tools (including data).
- The taxonomy of needs has been enriched with the inputs from the project's partners, in their double role: i) informed stakeholders, representing a specific category group (within Orienting, the whole LCSA value chain is represented: industry, academia, data providers, consultants, communication experts); ii) expert of both LCSA and of the specific topic addressed within the LCSA framework (environmental, economic, social, circularity and criticality aspects). On the basis of the inputs received, a set of questions has been defined to be submitted to the stakeholders in a dedicated workshop.
- Organisation of a workshop on users' needs, during which stakeholders were asked to: confirm the identified needs; add new ones; prioritise the needs, for guiding the development of the LCSA methodology during the next steps of the project.

These steps are illustrated and detailed in the next sections.

2.1. Internal mapping of potential needs

As briefly introduced in the previous section, the first step of the approach consisted in the identification of needs through the analysis of relevant sustainability-related literature[1], and on the background documentation that brought to the preparation of the project' proposal. In addition, also the call text for the H2020 topic "CE-NMBP-42-2020: Materials life cycle sustainability analysis", under which ORIENTING was awarded, was analysed.

As far as the call is concerned, the following needs were reported:

- **Integration** ("integrating social and economic benefits with environmental burdens, which fit these causal interrelations into a holistic approach understandable to different stakeholders")
- **Accounting for connections among systems** ("approaches and indicators that allow formalising connections between subsystems")
- **Build upon existing solutions** ("Existing standard methods (PEF) should be used in this project for assessing environmental impacts")
- **Quantitative approach** ("Develop a quantitative approach")
- **Support a variety of uses** ("More robust early-stage evaluations")

Regarding the project's proposal, the following needs were pointed out by the partners of ORIENTING, strengthening those highlighted in the call and adding new ones, expressed both as needs and as problems/challenges to be addressed:

- **Robustness of methods** (reliable, comparable and verifiable sustainability information to overcome fragmented and hardly comparable information on product sustainability performance)
- **Capability of dealing with** (i.e., understand and manage) **trade-offs**
- **Integration** of environmental, social and economic impacts
- Account for **material criticality and product circularity**
- **Applicability**, with reasonable investment of resources (sustainability assessment methods have to be manageable, while ensuring that results are reliable and comparable)

[1] Sala S, Farioli F, Zamagni A (2013) Life cycle sustainability assessment in the context of sustainability science progress (part 2). Int J Life Cycle Assess (2013) 18:1686–1697 DOI 10.1007/s11367-012-0509-5; Guinée, J. B. (2015). Life Cycle Sustainability Assessment: What Is It and What Are Its Challenges? In R. Clift & A. Druckman (Eds.), Taking Stock of Industrial Ecology (pp. 1–362). https://doi.org/10.1007/978-3-319-20571-7; Valdivia, S., Ugaya, C. M. L., Hildenbrand, J., Traverso, M., Mazijn, B., & Sonnemann, G. (2013). A UNEP/SETAC approach towards a life cycle sustainability assessment - Our contribution to Rio+20. International Journal of Life Cycle Assessment, 18(9), 1673–1685. https://doi.org/10.1007/s11367-012-0529-1

- **Comparability,** i.e., allows for comparison among products
- **Support a variety of uses**: methodologies should be adaptable to different industry sectors and allow both quick screening and more detailed assessments
- **Better communication** of sustainability assessment results, also benchmarked and/or aligned with other ongoing global sustainability initiatives (e.g. Sustainable Development Goals – SDGs)
- Account for **emerging environmental topics** (e.g., biodiversity loss, resource criticality)
- **Structured approach to Social LCA**, for defining materiality in relation to stakeholders, social themes and indicators
- Flexible, dynamic and fit-for-purpose **data collection approaches**

These needs, have then been further refined, harmonised and elaborated, resulting in the taxonomy of users' needs, illustrated in section 2.2.

2.2. Taxonomy of needs

The needs, expressed in terms of keywords as described above, where then clustered around the following key concepts: i) framework; ii) methodology; and iii) tools, including data. This structure mirrors the hierarchy adopted In ORIENTING for classifying the different levels at which conceptual and methodological developments will take place (Figure 1).

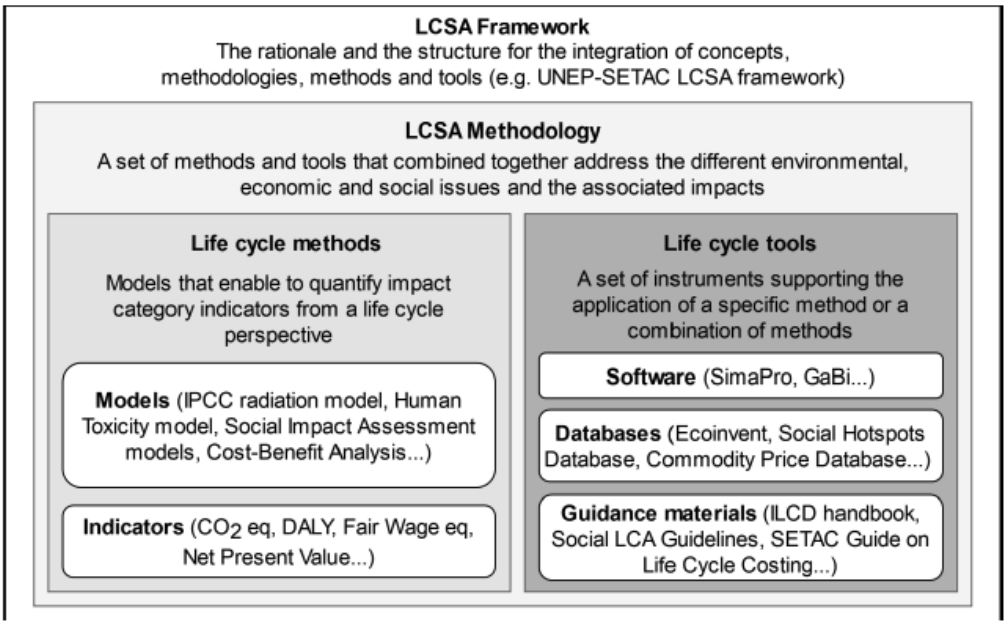


Figure 1. Hierarchy of concepts In the LCSA field (Source: Adapted from Sala et al., 2013)

At the LCSA **framework level**, needs are defined conceptually, covering overarching aspects of a life cycle-based sustainability assessment; at the LCSA **methodology level,** needs relate to the scientific approach to be adopted (i.e., which characteristics should the methodology have for their application by different stakeholders?); while at the life cycle

tool level, needs are technical and very specific, related to the implementation aspects. An example of clustering of needs according to this hierarchy is reported in Table 1.

Table 1. Example of needs' clustering according to the hierarchy of LCSA concepts

Level in the hierarchy	Needs
Framework	Integration of environmental, economic, social aspects
	Fit for circular economy
Methodology	Comparability
	Dealing with trade-offs
Tools and data	Applicability

Starting from this preliminary identification, the partners of ORIENTING have then further elaborated the needs, by translating them into specific questions. The detailed outcomes of this elaboration are included in the excel file "User Need Taxonomy", a working tool (internal documentation) for classifying and managing the user needs according to the stakeholders' categories identified in the Stakeholder Engagement Plan[2] (D 5.1), and to the potential relevance for each stakeholder. An extraction of the user need taxonomy file is reported in Annex A. The relevance has been evaluated on a Likert scale by the partner representing the specific stakeholder category he/she belongs to. The needs and related questions that obtained the highest scores have then been selected for being discussed during the stakeholders' workshop and are included in the following section.

3. Stakeholders' workshop

3.1. Structure of the workshop

The workshop was held on April 23rd, 2021, from 10:00 to 1:00 CEST time, through the GotoWebinar virtual platform. The event opened with a presentation of the Orienting project and of the workshop structure and aim. Then, the users' needs identified with the approach illustrated in the previous sections were presented and discussed with the audience.

The following main needs were discussed:

[2] Academia&RTOrganizations; PublicAdministrations; Business; Finance; StandardizationBodies; Civil Society.

- **Integrated assessment**, which consists of combining, interpreting and communicating the outcomes of different disciplines (environmental, social economic, criticality, circular economy) in a coherent and comprehensive way, for decision making processes.
- **Communication**. The results of a sustainability assessment require to be communicated to different target audience, either internally (within the organization which performed and commissioned the study) and to the general public. This in turn implies the capability of making them understandable and meaningful to a diverse audience, with different know-how and awareness.
- **Responsiveness to the different decision-context situations**. A methodology for the sustainability assessment of products can be used to support the decision process in many different situations (industrial context and purchasing processes) and of different steps of the policy cycle.
- **Affordability**. The applicability of a methodology for sustainability assessment requires also reducing the complexity, the time needed to perform an LCSA and then also the costs.
- **Flexibility in scope**. A broad application of the methodology requires stability of the methods used, availability of data and possibility to apply it to different sectors/product groups, size of organisations and geographic contexts.

The list of questions asked for each type of need is reported in

Table 2.

Table 2 Questions asked during the stakeholders' workshop

Need	Questions
Integrated assessment	***As a user of the LCSA methodology/of the results of an LCSA study and as recipient of the information out of an LCSA study I want (to):***
	Additional consideration of specific indicators on criticality aspects (beyond environmental economic and social ones)
	Additional considerations of specific indicators on circularity aspects
	Understand and quantify the contribution of a product/policy to the achievement of SDGs, either in terms of detrimental or beneficial contribution
	Have just a single score as result of the assessment, expressed in physical or monetary terms, or dimensionless
	Have separate results for each sustainability aspect, supported by guidance for interpreting the results and visualization techniques, but with clear indications of trade-offs

Need	Questions
Communication	***As a user of the LCSA methodology/of the results of an LCSA study and as recipient of the information out of an LCSA study, I want to:***
	Have available software tools for carrying out an LCSA study and visualize the results in an effective way
	Communicate also positive impacts
	Have a labelling system at EU level communicating the overall Product Sustainability Footprint
	Use LCSA to define Product Category Rules (PCRs) for Environmental Product Declarations (EPDs)
	Use the LCSA results to define sustainability criteria for products (e.g., for EU Ecolabel, Green Public Procurement or other certification schemes)
	Integrate the LCSA results into regulatory approaches (e.g., EU Ecodesign and product performance in CE marking)
Responsiveness	***As a private/public organization, I want to use the LCSA methodology/ the results of an LCSA study for:***
	Strategic choices
	Product and process development (ecodesign)
	Compare different suppliers
	Learning, education and training related to sustainability
	As a user of the LCSA methodology/of the results of an LCSA study and as recipient of the information out of an LCSA study, I want the LCSA to be used for:
	Benchmarking with other products on the market and making comparative claims about sustainability
	Purchase decisions and Learning about sustainability impacts
	Comparing sustainability performance of different products within the same product category
	As policy maker and investor, I want to use the outcomes of an LCSA study for:
	Estimate impacts associated with possible future interventions and consumers choices

Need	Questions
	Quantify burdens and benefits associated to the implementation of different policy options
	Quantify the sustainability performance of a sector
	Support investment decisions (public and private), in particular: i) Respond to investor inquiries regarding climate impacts; ii) Provide sustainability information related to financial products according to (EU) 2019/2088 (Sustainability-related disclosures in the financial services sector)
Affordability	***As a user of the LCSA methodology/of the results of an LCSA study, I want (to):***
	Open-access and user-friendly databases for LCSA
	Develop data collection approaches that can reduce implementation costs to a level that can be afforded by SMEs
	Methods and tools that can calculate LCSA results timely
	Tools that can be used both by experts and non-experts
Flexibility in scope	***As a user of the LCSA methodology/of the results of an LCSA study and as recipient of the information out of an LCSA study, I want*:**
	a "general" methodology, that can be applied to any product group and cultural contexts
	A Product Footprint (SPF)-like approach, following the PEF example (i.e., specific rules at product group level)
	A methodology that can satisfy the different resources and know-how of organisations

The slides presented at the workshop, including the detailed agenda, are available in **Annex B.**

As far as the participation is concerned, 149 stakeholders registered at the workshop, and 112 attended effectively. The distribution of the participants among the different stakeholders' categories is illustrated in Figure 2. Most of the participants were from Europe, and only a minor share came from US, in particular North America. Overall, the level of participation was more than satisfactory, both in terms of number of participants and of exchanges and inputs provided. The following analytical parameters have been measured:

- attendance rate: 76,19%[3]
- average attentiveness 41,87[4]
- average interest rating 70%[5]
- average engagement 2,5[6]

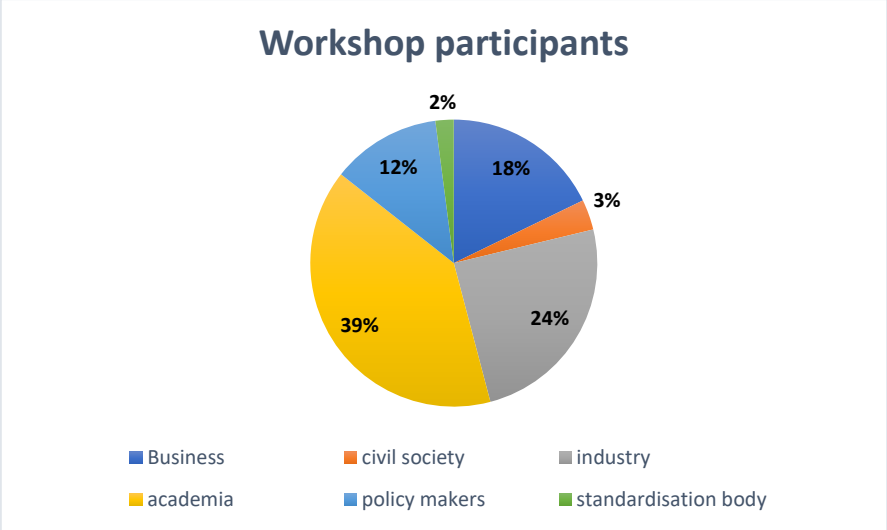


Figure 2. Distribution of workshop participants per category of stakeholder

The distribution, as displayed in Figure 2, shows that there was a significant participation of the stakeholder categories "Industry", "policy makers" and "civil society", which all together amount to 45%: they represent the recipient of the LCSA methodology and are in the position of directly affecting - and being affected by - the development of ORIENTING. Stakeholders from academia represented the major share as a single group, with 39% of all the participants: this stakeholder is the one in charge of providing methodological solutions to the recipients, and the workshop gave the opportunity to listen to users' requirements. This represents a value added, and a fundamental step toward the setting up of a full co-creation process in the field of LCSA. The stakeholder "business" represents the consultancy, which has been distinguished from the industry, for transparency. This stakeholder makes the link between industry and academia

[3] Percentage of the registered stakeholders who attended effectively the workshop
[4] The attentiveness measures how many attendees have the GoToWebinar Viewer on top of all other applications in comparison to those who have the Viewer in the background.
[5] It gauges attendee interest during the webinar. It is taken from an equation that evaluates each attendee's interactions on a scale of 1 to 100, based on the following parameters: % of completed optional questions, % of answered poll questions, attentiveness, % of completed a survey questions, attendance length, number of inputs, Q&A
[6] The average engagement measures the number of questions/comments raised during the discussion by each participant.

and should be able to translate the theoretical approaches into practical application in the day-by-day management and develop also tailored solutions.

The number of attendees connected to the workshop remained quite stable and high for the whole duration of the event, as displayed in Figure 3.

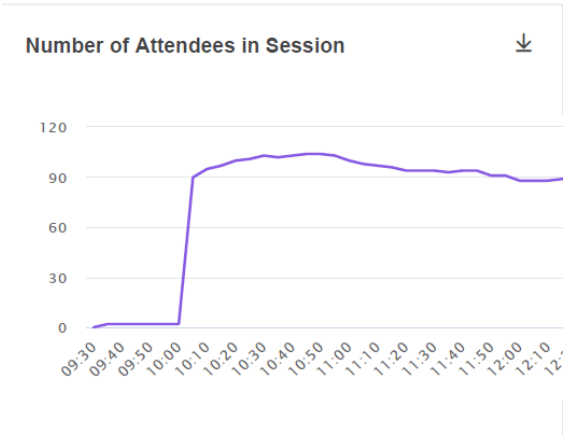


Figure 3. Number of attendees in session

During the discussion time, a poll has been launched via sli.do, asking participants to prioritise the needs previously Illustrated.

The results of the poll are reported In Annex D, while they are discussed, together with the questions and comments raised during the event, in section 3.2.

3.2. Discussion points and feedbacks

The feedbacks received and the comments raised are structured in this section along the main needs.

Integrated assessment

- **Principles of LCSA**. In addition to the SDGs, which were recognised as relevant by all the participants, also the Earth Charter principles were pointed out.
- **Aggregation**. Some key discussion points were raised:
    - Polarised discussion on the use of a single score for aggregating the results of a LCSA:
        - It was pointed out by some as a potential solution to the integration need, because considered to ease the comparison among products and the understanding of the results, especially by consumers. Concerns were raised on how to perform the weighting and on the availability of benchmarks for products comparability. Suggestions were also provided to investigate multicriteria decision aiding methods.

        - Others were in favour of ensuring more transparency of results, presenting indicators separately but with some guidance on how to aggregate them based on materiality. Besides being a practical issue, aggregating is also an ethical issue, the latter being dependent on ethical viewpoints and needs consideration beyond individual preferences.

    - The way in which results should be aggregated depends on the goal and scope: different levels of detail for difference types of users. For consumers a single score might work best, while experts should be able to look into separate impact categories.

    - Ensure that the assessment on the different dimensions considers national and international practices (i.e., for products, it needs to assess company practices within the country of production but also their impact in other countries considering suppliers, source of materials, etc.; for policies, it needs to assess not only their national impact but also their impact at an international level).

- **Circularity**. It was pointed out the need of addressing circularity within the LCSA. However, while having specific complementary indicators within LCSA was considered useful, that the following concerns and suggestions were raised:

    - circularity aspects are already accounted for with the indicators and calculation methods used in LCA.

    - criticality and circularity should also be considered in relation to how they influence environmental and social aspects.

<u>Communication</u>

- Communication issues need to be further investigated considering that future consumers will probably have a greater sustainability awareness so that they could be able to understand, in a faster way, single score and sustainability information. In this regard, they may not need a lower level of information.

- Tools to carry out the study and visualize the results are the first useful step towards communication of results.

- The communication of positive impacts is of relevance for a company aiming to show its effort in improving its sustainability performance; however, it is necessary to ensure that giving importance to the positive impacts of a product or activity, does not come at the expenses of an effort to reducing negative impacts.

<u>Responsiveness</u>

- Support investment decisions and reporting, i.e., responding to investor inquiries regarding climate impacts and providing sustainability information related to financial products according to (EU) 2019/2088 (Sustainability-related disclosures in the financial services sector).

- Make LCSA applicable by SMEs, with a focus on gate-to-gate assessment. This supports a modularity approach, according to which, the total LSCA is obtained by adding up the impact for each actor in the product value chain.

- Show the difference - in terms of sustainability performances - among different products but also among the same products from different manufacturers/providers.
- The method should allow organizations to improve on the considered aspects by establishing benchmarks.

Affordability

- Data accessibility, especially related to innovative/new products/product systems.
- Ensure data maintenance and update
- Integration into a software is a crucial point
- Be able to perform product specific assessments at a portfolio level in an economic way.

Flexibility in scope

- Need for a general methodology that can be applied to any product groups and cultural context, and that can be specified for each product group.
- Regarding the capability of the methodology to satisfy the different resources and know-how of organisations, doubts were raised about who should then apply the methodology: whether this should be also a role for SMEs was debated.

In addition to these aspects related to the previously identified needs, others were pointed out by the participants:

- Consider the social value of the use phase (e.g., safety, convenience, aesthetics) of the product since this influences the purchasing decision.
- It is essential to have a common format and nomenclature. This is key for exchange of data between stakeholders along the value chain but also to provide the possibility to create integrated approaches tapping into company specific data sources like e.g., PLM, emission tracking, waste management.
- Develop capabilities and functions for estimating and developing non existing inventories for products or system parts.
- Allows for early-stage assessment, especially if an organisation wishes to quantify the LCSA of its product portfolio. In this case, data collection is a potential issue for a complete LCSA and it is important to consider how to address this.
- Transparency is a key need: suggestion for developing a platform accessible to everyone was made, where all the different products and outcomes can be consulted, and the underlying methodology is explained, taking into account different stakeholders.

- Develop practical Guidance, going beyond the work done within the PEF Initiative, investing resources in training materials, webinars, courses, examples.
- Connect the methodology to the reporting standards for financial purposes.
- The assessment should be governed by the materiality, to avoid an overly complex method with too many impact categories.
- The topic is challenging, urgent and timely: it is then Important not to start from scratch but to build as much as possible on existing commonly accepted work.

The outcomes of the sli.do poll showed that the different options for each need are almost equally distributed, without a clear and outstanding priority but only slight preferences. A clearer ranking was obtained for the overarching priorities for LCSA, as displayed in Figure 4: reliability is a key need and criterion for guiding the LCSA development, together with the possibility of making LCSA verifiable, a characteristic that increases the robustness of the method.

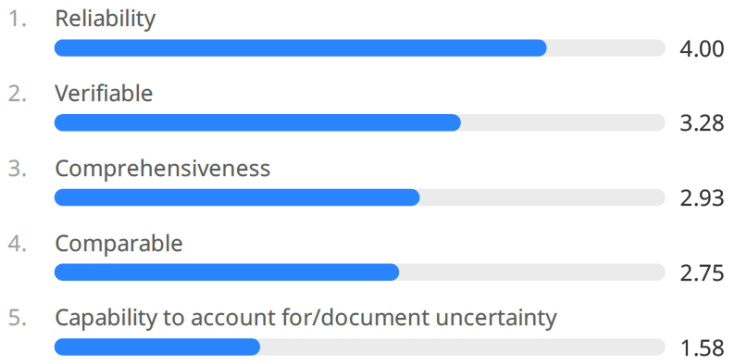


Figure 4 Overarching priorities for guiding the LCSA development

4. Conclusions

The feedbacks and inputs collected during the workshop pointed out a multitude of different needs for LCSA, depending on the stakeholder at hand. The needs identified by the project's partners have been confirmed, and new ones have been defined, or better, already identified needs have been refined and further detailed. As far as the identification of priorities is concerned, the outcomes of the sli.do poll showed that the different options for each need are almost equally distributed, without a clear and outstanding priority but only slight preferences. These preferences have been ordered and are illustrated in Table 3.

Table 3. Priorities among the stakeholders' needs

Need	Priority
Integrated assessment	Have separate results for each sustainability aspect, with clear indications of trade-offs
Communication	Availability of software tools and data for carrying out an LCSA study and visualizing the results in an effective way
Flexibility in scope	Capability of carrying out both screening and detailed assessment
	A Product Footprint (SPF)-like approach, following the PEF example
Responsiveness to different decision-context situations	Comparing sustainability performance of different products
	Support ecodesign approaches within the organisation, for product and process development
Affordability	Develop open-access and user-friendly databases for LCSA

All these needs should be addressed for developing LCSA, taking into account the overarching principle of reliability, which implies ensuring scientific robustness in the approach. In addition to the above priorities, the following aspects were pointed out and need to be taken into account in the LCSA development during the project:

- **Easy-to-use and transparent LCSA** is crucial to obtain broad acceptance
- Ensure the capability for an **early-stage assessment**
- Invest in **resources for supporting the use of the methodology** (training materials, webinars, courses, examples)
- Weighting is considered a possibility to be further explored, per product category/sector/context, starting from the approaches already developed
- Connect the methodology to **reporting standards for financials**
- Ensure that the methodology is **maintained**
- The assessment should be governed by the **materiality**

This will be achieved, in addition to the technical work carried out by the project's partners, also with the support of stakeholders' experts, who will be consulted during the project for addressing specific methodological and practical issues.

Annexes

Annex A – Extraction of the Taxonomy of users' needs

	Description of the needs	Level	Needs
DoW	consistent and comprehensive sustainability assessment method that considers all pillars of sustainability – environmental, economic and social impacts in an integrated way	Framework: Concepts and General purposes	Comprehensive assessment
DoW	consistent and comprehensive sustainability assessment method that considers all pillars of sustainability – environmental, economic and social impacts in an integrated way	Framework: Concepts and General purposes	consistency
DoW	highlighting, understand and manage possible trade-offs that may take place between the different sustainability domains	Methodology	trade-offs
DoW	development of a future Product Sustainability Footprint at European level	Framework: Concepts and General purposes	Harmonised European methodology
DoW	Sustainable Development Goals - SDGs, the EU Circular Economy Package, the revised Biodiversity Strategy, the RED-2, etc.)	Framework: Concepts and General purposes	Broad scope of analysis
DoW	RACER criteria (Relevant, Accepted, Credible, Easy to monitor, Robust), the S.M.A.R.T criteria (Specific, Measurable, Attainable and action-oriented, Relevant, and Time-bound),	Methodology	general criteria
DoW	methodologies built on existing standards, methods and tools	Methodology	exploit existing knowledge
DoW	previous work from the Joint Research Centre (JRC) for Life Cycle Impact Assessment methods	Models/Indicators	impact assessment
DoW	previous work from the Joint Research Centre (JRC) for Life Cycle Impact Assessment methods	Models/Indicators	exploit existing knowledge
DoW	adaptable to different industry sectors and allow both, quick screening and more detailed assessments	Methodology	flexibility in scope
DoW	adaptable to different industry sectors and allow both, quick screening and more detailed assessments	Methodology	flexibility in level of detail

Annex B - Slides presented at the workshop

ORIENTING

Workshop on users' needs

April 23, 2021

Alessandra Zamagni, Paolo Masoni - Ecoinnovazione

"This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 958231".

The Orienting's approach to LCSA development

We aim to design a methodology tailored to the needs of a broad audience, robust and applicable – also by reducing costs and knowledge-related barriers –, and able to support the decision-making process at all levels.

How do we aim to achieve this goal?

- Start from the available state-of-the-art approaches, further developed and made operational
- **Active engagement of stakeholders** for supporting the development and applicability of a LCSA methodology
- **Bottom-up approach**, starting from needs and wishes about how stakeholders would like a LCSA methodology to be developed

Today's workshop

Obj:

- **Discuss needs and wishes of stakeholders about sustainability assessment, i.e., how stakeholders would like the Life Cycle Sustainability Assessment (LCSA) to be developed.**
- **Prioritise needs and wishes**

- *We do not present solutions*, we do not answer questions (methodological or practical) about the LCSA solution we are going to develop
- We would like to hear your voice:
  - Do we capture the needs in a comprehensive way?
  - Is there anything relevant not considered yet?
  - What is most important to you?

Agenda for today

9:45	**Connection to the workshop**
10:00	*Chair*: Paolo Masoni (Ecoinnovazione) Welcome The Orienting project (M. Cordella - Tecnalia) Presentation of the workshop (A. Zamagni - Ecoinnovazione) Question time
10:30	Presentation of users' needs (A. Zamagni – Ecoinnovazione)
11:00	*Moderators*: P. Masoni, A. Zamagni, -Ecoinnovazione M. Cordella, E. Amat, Marina Sarralde - Tecnalia Open discussion with the participants
12:45	Chairs: P. Masoni, A. Zamagni – Ecoinnovazione Conclusions and next steps

Rules of the game

- Needs and wishes on LCSA will be presented to and discussed with all stakeholders
- Discussion of 15-20 minutes of each need, with prioritisation carried out via sli.do
- Please, write your comments/inputs directly **into the chat or raise your hand**
- Use the question box only for technical issues
- Rules for giving the floor and discussing the inputs:
  - **First come first served**
  - **Max 2 minutes per person**
  - **Max one intervention per person** (additional comments can be written into the chat)

Presentation of needs and wishes

Identification of needs

Starting point:

- Preliminary identification of needs, based on literature and knowledge of the partners (coverage of the LCSA value chain)
- Refining and grouping of the needs, taking into account:
  - *concepts and general purposes* of the framework for a life cycle-based sustainability assessment;
  - *methodology, tools and data*
  - *Decision contexts*.
- Needs and solutions are interconnected: do not focus on the solution you have in mind, but **consider the problem you would like to address**.

1st need: Integrated assessment

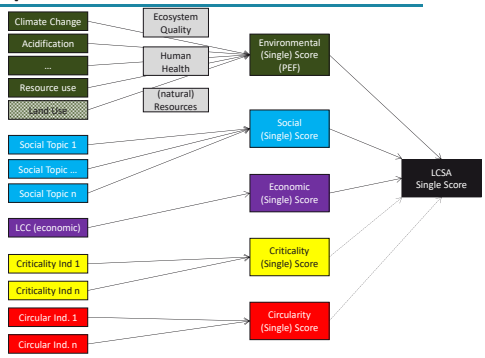
Definition

An integrated sustainability assessment consists of combining, interpreting and communicating the outcomes of different disciplines (environmental, social economic, criticality, circular economy) in a consistent and comprehensive way, for decision making processes.

As a user of the LCSA methodology/of the results of an LCSA study and as recipient of the information out of an LCSA study I want to:

- Additional consideration of specific indicators on criticality aspects (beyond environmental economic and social ones)
- Additional considerations of specific indicators on circularity aspects
- Understand and quantify the contribution of a product/policy to the achievement of SDGs, either in terms of detrimental or beneficial contribution
- Have just a single score as result of the assessment, expressed in physical or monetary terms, or dimensionless
- Have separate results for each sustainability aspect, supported by guidance for interpreting the results and visualization techniques, but with clear indications of trade-offs

Integrated assessment - example



2nd need: Communication

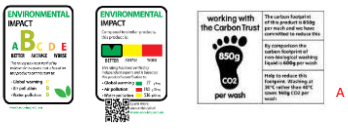
Definition

The results of a sustainability assessment require to be communicated to different target audience, either internally (within the organization which performed and commissioned the study) and to the general public. This in turn implies the capability of making them understandable and meaningful to a diverse audience, with different know-how and awareness.

As a user of the LCSA methodology/of the results of an LCSA study and as recipient of the information out of an LCSA study I want to:

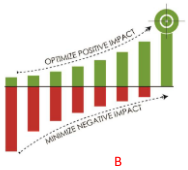
- Have available software tools for carrying out an LCSA study and visualize the results in an effective way
- Communicate also positive impacts
- Have a labelling system at EU level communicating the overall Product Sustainability Footprint
- Use LCSA to define PCRs for EPDs
- Use the LCSA results to define sustainability criteria for products (e.g., for EU Ecolabel, Green Public Procurement or other certification schemes)
- Integrate the LCSA results into regulatory approaches (e.g., EU Ecodesign and product performance in CE marking)

Communication: example



A

- Communicate negative/positive impacts



B

Eco-effective v eco-efficient vision Toxopeus et al. 2015, Cradle to Cradle: Effective Vision vs. Efficient Practice? Procedia CIRP 29 (2015) 384 – 389

3rd need: Responsiveness to the different decision context situations

Definition

A methodology for the sustainability assessment of products can be used to support the decision process in many different situations (industrial context and purchasing processes) and of different steps of the policy cycle.

As a private/public organization, I want to use the LCSA methodology/of the results of an LCSA study for:

- Strategic choices
- Product and process development (ecodesign)
- Compare different suppliers
- Learning, education and training related to sustainability

3rd need: Responsiveness to the different decision context situations

Definition

A methodology for the sustainability assessment of products can be used to support the decision process in many different situations (industrial context and purchasing processes) and of different steps of the policy cycle.

As a user of the LCSA methodology/of the results of an LCSA study and as recipient of the information out of an LCSA study, I want the LCSA to be used for:

- Benchmarking with other products on the market and making comparative claims about sustainability
- Purchase decisions and
  - Learning about sustainability impacts
  - Comparing sustainability performance of different products within the same product category

3rd need: Responsiveness to the different decision context situations

Definition

A methodology for the sustainability assessment of products can be used to support the decision process in many different situations (industrial context and purchasing processes) and of different steps of the policy cycle.

As policy maker and investor, I want to use the outcomes of an LCSA study for:

- Estimate impacts associated with possible future interventions and consumers choices
- Quantify burdens and benefits associated to the implementation of different policy options
- Quantify the sustainability performance of a sector
- Support for investment decisions (public and private), in particular:
  - Responding to investor inquiries regarding climate impacts
  - Provision of sustainability information related to financial products according to (EU) 2019/2088 (Sustainability-related disclosures in the financial services sector)

4th need: Affordability

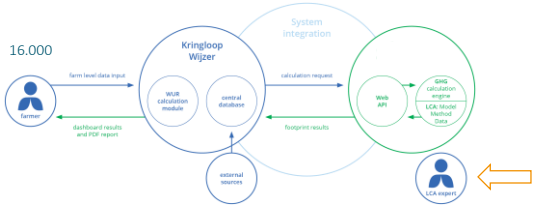
Definition

The applicability of a methodology for sustainability assessment requires – in addition to - also reducing the complexity, the time needed to perform an LCSA and then also the costs.

As a user of the LCSA methodology/of the results of an LCSA study I want:

- Open-access and user-friendly databases for LCSA
- Develop data collection approaches that can reduce implementation costs to a level that can be afforded by SMEs
- Methods and tools that can calculate LCSA results timely
- Tools that can be used either by experts and non-experts

4th need: affordability



- By providing a centralized solution that automatically uses farmer specific data individual footprints can be calculated in a consistent and robust way for 16,000 individual farms. The results are shared in the tool that farmers are used to work so they have easy access, while the expert can maintain the underlying model and perform meta-analyses.

5th need: flexibility in scope

Definition

A broad application of the methodology requires stability of the methods used, availability of data and possibility to apply it to different sectors/product groups, size of organisations and geographic contexts.

As a user of the LCSA methodology/of the results of an LCSA study and as recipient of the information out of an LCSA study I want :

- a "general" methodology, that can be applied to any product group and cultural contexts
- A Product Footprint (SPF)-like approach, following the PEF example (i.e., specific rules at product group level)
- A methodology that can satisfy the different resources and know-how of organisations

Conclusions

What next?

- Report on users' needs about LCSA: public document, shared with all the participants in the workshop
- Other engagement activities are being organized, addressing different stakeholders' categories
  - Workshop to present the draft of the methodology, the indicators' package and preliminary outcomes of the LCSA application
  - Open consultation on the LCSA methodology
  - Workshop with institutional stakeholders
  - Ad-hoc initiative with the different stakeholders' categories
- If you want to be engaged, please register as stakeholder at https://orienting.eu/login/ and follow us on LinkedIn and Twitter

Annex C – Sli.do poll

Need 1: Integrated assessment

Question 1

How would you rank the relevance of the following characteristics of an integrated Life Cycle Sustainability Assessment methodology?

Additional considerations of specific indicators on criticality aspects (beyond environmental economic and social ones)	1	2	3	4	5
Additonal considerations of of specific indicators on circularity aspects (beyond environmental economic and social ones)	1	2	3	4	5
Have separate results for each sustainability aspect, supported by guidance for interpreting the results and visualization techniques, but with clear indications of trade-offs	1	2	3	4	5
Have just a single score as result of the assessment	1	2	3	4	5
Understand and quantify the contribution of a product/policy to the achievement of SDGs	1	2	3	4	5

Need 1: Integrated assessment

Please select only one option

Question 2

Do you think that the assessment of circularity of products, and the inclusion of related indicators into the LCSA methodology, should :

- Be limited to materials (use of recycled materials; use of recyclable materials; use of renewable resources)
- consider business model aspects such as re-designing, re-use/2nd life, repair, refurbish, etc.

Need 2: Communication

Question 3

How would you rank the relevance of the following aspects related to the communication and use of LCSA results?

Availability of software tools and data for carrying out an LCSA study and visualizing the results in an effective way	1	2	3	4	5
Communicate also positive impacts	1	2	3	4	5
Have a labelling system at EU level communicating the overall Product Sustainability Footprint	1	2	3	4	5
Use the LCSA results to define sustainability criteria for products for voluntary approaches (e.g., for EU Ecolabel, Green Public Procurement or other certification schemes)	1	2	3	4	5
Integrate the LCSA results into regulatory approaches (e.g., EU Ecodesign and product performance in CE marking)	1	2	3	4	5

Need 3: responsiveness to different decision context situations

Question 4

How would you rank the relevance of the following needs the LCSA methodology should fulfil to support the decision process in different situations (industrial context and purchasing processes) and of different steps of the policy cycle?

Capability of carrying out both screening and detailed assessment	1	2	3	4	5
A general methodology, applicable to any product group, without considering the peculiarity of different product groups	1	2	3	4	5
A Product Footprint (SPF)-like approach, following the PEF example (i.e., specific rules at product group level)	1	2	3	4	5
Benchmarking with other products on the market and making comparative claims about sustainability	1	2	3	4	5
Learning, education and training related to sustainability	1	2	3	4	5

Need 3: responsiveness to different decision context situations

Question 5

How would you rank the relevance of the following needs the LCSA methodology should fulfil?

Comparing sustainability performance of different products	1	2	3	4	5
Quantify burdens and benefits associated to the implementation of different policy options	1	2	3	4	5
Support investment decisions (public and private)	1	2	3	4	5
Support the disclosure of non-financial information	1	2	3	4	5
Support ecodesign approaches within the organisation, for product and process development	1	2	3	4	5

Need 4: Affordability

Question 6

How would you rank the relevance of the following characteristics for making LCSA affordable, i.e., reducing the time needed to perform an LCSA study and also the costs?

Develop open-access and user-friendly databases for LCSA	1	2	3	4	5
Develop data collection approaches that can reduce implementation costs to a level that can be afforded by SMEs	1	2	3	4	5
Availability of methods and tools that can calculate LCSA results timely	1	2	3	4	5
Develop tools that can be used either by experts and non-experts	1	2	3	4	5
Develop product group/sector- specific tools	1	2	3	4	5

Overarching requirements for LCSA

Question 7

How would you rank the relevance of the following characteristics the LCSA methodology should have?

Reliability	1	2	3	4	5
Copmrehensiveness	1	2	3	4	5
Comparable	1	2	3	4	5
Verifiable	1	2	3	4	5
Capability to account for/document uncertainty	1	2	3	4	5

Overarching requirements for LCSA

Question 8

- Which other characteristic, not listed in the previous questions, do you consider relevant to meet the needs of your stakeholder group?

Annex D – Results of the Sli.do poll

Need 1: Integrated assessment. How would you rank the relevance of the following characteristics of an integrated Life Cycle Sustainability Assessment methodology? (1/2)

0 5 7

1. Have separate results for each sustainability aspect, supported by guidance for interpreting the results and visualization techniques, but with clear indications of trade-offs — 9.40
2. Understand and quantify the contribution of a product/policy to the achievement of SDGs — 6.49
3. Additional considerations of specific indicators on criticality aspects (beyond environmental economic and social ones) — 6.33

Need 1: Integrated assessment. How would you rank the relevance of the following characteristics of an integrated Life Cycle Sustainability Assessment methodology? (2/2)

0 5 7

4. Additonal considerations of of specific indicators on circularity aspects (beyond environmental economic and social ones) — 5.98
5. Have just a single score as result of the assessment — 5.65

Need 1: Integrated assessment. Do you think that the assessment of circularity of products, and the inclusion of related indicators into the LCSA methodology, should: (please select one option)

0 5 4

Be limited to materials (use of recycled materials; use of recyclable materials; use of renewable resources) — 24 %

consider business model aspects such as re-designing, re-use/2nd life, repair, refurbish, etc. — 76 %

Need 2: Communication. How would you rank the relevance of the following aspects related to the communication and use of LCSA results? (1/2)

0 6 0

1. Availability of software tools and data for carrying out an LCSA study and visualizing the results in an effective way — 8.02
2. Integrate the LCSA results into regulatory approaches (e.g., EU Ecodesign and product performance in CE marking) — 7.53
3. Use the LCSA results to define sustainability criteria for products for voluntary approaches (e.g., for EU Ecolabel, Green Public Procurement or other certification schemes) — 7.52
4. Have a labelling system at EU level communicating the overall Product Sustainability Footprint — 7.00

Need 2: Communication. How would you rank the relevance of the following aspects related to the communication and use of LCSA results? (2/2)

0 6 0

5. Communicate also positive impacts — 6.65

Need 3. How would you rank the relevance of the following needs the LCSA methodology should fulfil to support the decision process in different situations (industrial context and purchasing processes) and of different steps of the policy cycle? (1/2)

0 4 8

1. Capability of carrying out both screening and detailed assessment — 8.35
2. A Product Footprint (SPF)-like approach, following the PEF example (i.e., specific rules at product group level) — 7.92
3. Benchmarking with other products on the market and making comparative claims about sustainability — 7.85

Need 3. How would you rank the relevance of the following needs the LCSA methodology should fulfil to support the decision process in different situations (industrial context and purchasing processes) and of different steps of the policy cycle? 048
(2/2)

4. A general methodology, applicable to any product group, without considering the peculiarity of different product groups — 7.29
5. Learning, education and training related to sustainability — 6.88

Need 3: responsiveness to different decision context situations. How would you rank the relevance of the following needs the LCSA methodology should fulfil? 050
(1/2)

1. Comparing sustainability performance of different products — 8.66
2. Support ecodesign approaches within the organisation, for product and process development — 8.04
3. Quantify burdens and benefits associated to the implementation of different policy options — 7.72
4. Support investment decisions (public and private) — 7.26

Need 3: responsiveness to different decision context situations. How would you rank the relevance of the following needs the LCSA methodology should fulfil? 050
(2/2)

5. Support the disclosure of non-financial information — 6.46

Need 4: Affordability. How would you rank the relevance of the following characteristics for making LCSA affordable, i.e., reducing the time needed to perform an LCSA study and also the costs? 047
(1/2)

1. Develop open-access and user-friendly databases for LCSA — 8.38
2. Develop data collection approaches that can reduce implementation costs to a level that can be afforded by SMEs — 7.81
3. Availability of methods and tools that can calculate LCSA results timely — 7.40
4. Develop product group/sector- specific tools — 7.11

Need 4: Affordability. How would you rank the relevance of the following characteristics for making LCSA affordable, i.e., reducing the time needed to perform an LCSA study and also the costs? 047
(2/2)

5. Develop tools that can be used either by experts and non-experts — 6.15

Overarching requirements for LCSA. How would you rank the relevance of the following characteristics the LCSA methodology should have? 040

1. Reliability — 4.00
2. Verifiable — 3.28
3. Comprehensiveness — 2.93
4. Comparable — 2.75
5. Capability to account for/document uncertainty — 1.58