**Safe-, sUstainable- and Recyclable-by design Polymeric systems
A guidance towardS next generation of plasticS**

Deliverable D1.3

Specification of end-user requirements

Work Package	1	Landscape analysis for the development of SSRbD polymers and guiding tool
WP Leader		CABRERA Géraldine - IPC
Lead beneficiary		GEONARDO LTD
Contributing beneficiaries		GEO, CEA, LEITAT, UGA, WFO
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Nature of the deliverable		
R	Report, document	☒
DEC	Websites, patents filing, press & media actions, videos, etc.	☐
DMP	Data Management Plan	☐

Dissemination Level		
PU	Public, fully open	☒
SEN	Sensitive, Restricted to a group specified by the consortium under conditions set out in grant agreement	☐

Quality procedure			
Contractual delivery date	28/02/2023 (postponed to 30/04/2023)		
Actual delivery date	28/04/2023		
Version accepted by the Steering Board	☒	**Report uploaded via Research Participant Portal**	☒

Version history

Version	Date	Partner - Author	Email	Comments[1]
V1	4/04/2023	GEONARDO	bese.pal@geonardo.com	Creation
V1.1	11/04/2023	IPC	delphine.tissier@ct-ipc.com Catherine.collin@ct-ipc.com	Modification
V1.2	13/04/2023	IPC	Geraldine.cabrera@ct-ipc.com	Modification
V1.3	17/04/2023	CEA	Andrea.tummino@cea.fr	Modification
V2.0	21/04/2023	GEONARDO	bese.pal@geonardo.com	Final version

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[1] Creation, modification, final version for evaluation, revised version following evaluation, final

Executive summary

This deliverable summarises the work done by GEO in the scope of Task 1.3. Analysis of currently available digital infrastructures for sustainable development and eco-design activities related to plastics has been conducted, advantages and limitations have been assessed and prepared for the technical specification of the new digital infrastructure.

To reach out a larger number of SMEs and collect quantifiable data, instead of interviews, end-user requirements have been collected via online questionnaire and the responses have been considered in the findings. Delivery of the work has been delayed due to the difficulties in reaching out enough respondents on the relevant fields within the original timeframe.

List of acronyms

BVB	Byggvarubedömningen
HPD	Health Product Declaration
LCA	Life-cycle assessment
LEED	Leadership in Energy and Environmental Design
NEQ	Nano exposure Quantifier
PFAS	Polyfluoroalkyl Substances
RMM	Risk Management Measures
SSRbD	Safe, Sustainable and Recyclable by Design
US DOE	United States Department of Energy
PCR material	Post-Consumer Recycled material

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1 Introduction

The SURPASS project aims to develop a digital infrastructure for SMEs that guides material scientists and innovators in designing sustainable and safe polymeric products. The digital infrastructure will build upon the results and data of previous and ongoing projects related to the safety and sustainability of polymeric materials. The goal is to provide a scoring system and associated guidance that can balance the performance of recyclable polymers with lower reliance on potentially harmful additives, reduced environmental footprint, and acceptable costs.

The SURPASS digital infrastructure will focus on environmental criteria, social criteria, and economic criteria, and will develop assessment methods applicable to different polymers. The aim is to make these methods available to the wider community, from scientists to policy makers. By fostering cooperation with other projects and initiatives, the SURPASS digital infrastructure will promote a dynamic approach to sustainability in materials science and innovation.

In line with this mission, during Task 1.3, GEO has conducted a detailed analysis of the currently available digital infrastructures for sustainable development and eco-design activities related to plastics and collected end-user requirements via online questionnaire. The aim of this analysis was to assess the advantages and limitations of existing infrastructures and feed the specifications for the development of a new digital infrastructure.

1.1 Purpose of this document

This document provides an overview of the work done by GEO in this area, including a summary of the key findings from the analysis of existing digital infrastructures and an outline of the specifications for the SURPASS digital infrastructure. It also highlights the potential benefits of the SURPASS platform and its role in supporting sustainable development and eco-design in the plastics industry.

The project was initiated by conducting secondary research, which involves utilizing data gathered by others, to examine currently available online services. This was subsequently complemented by primary research in the form of an online questionnaire to gather end-user requirements, namely European SMEs, thereby expanding on the findings obtained from the secondary research.

2 Secondary research on existing digital infrastructures

2.1 Sample and objective

To aid the project's development, secondary research was conducted, allowing the project to obtain a genuine understanding of comparable software that rivals a specific feature of the SURPASS digital system. Performing comparative assessments throughout the development stages is crucial to address inadequacies in functionality and user complications. Additionally, this method helps identify superior practices and features that are recommended to be incorporated into the SURPASS digital infrastructure.

2.1.1 Existing digital infrastructure

During the research, the selected websites were examined according to a predefined set of criteria. The database of tools to be tested was compiled by the project research partners according to their own experience and knowledge, based on individual recommendations. The main criterion for the selection was functionality, i.e. the testing of certain functions of the software - highlighted by the recommender - to support the development. The list of websites on which the study was based is shown in Table 1.

Table 1. List of analysed websites		
Website name	**Access**	**Recommended features**
SABYNA	https://www.sabyna.eu/sabyna-project/	Integration of existing databases, test methods, models, frameworks and tools.
SbD4 Nano	https://www.sbd4nano.eu/e-infrastructure	Scoring system.
IRISS project	https://www.ivl.se/english/ivl/project/iriss/about-the-project.html	-
Diamonds³	https://acc-diamonds.tno.nl/dashboard	Multiple tiers approach both safe by product and safe by process design. Scan for hotspots in the life cycle of innovative products. Supporting registrants to evaluate the quantitative effectiveness of a specific RMM or downstream users on the most suitable RMM for a given exposure or emission scenario.
SundaHus	https://www.sundahus.se/en/services/material-data/	Deep screening of materials and substances content. Scoring system recognized in Sweden for Building market: 50,172 products and 243,752 articles.
BYGGVARU BEDÖMNINGEN	https://www.byggvarubedomningen.se/	Deep screening of materials and substances content. Scoring system recognized in Sweden for Building market.
U.S. Green Building Council - LEED credit library	https://www.usgbc.org/credits	Very strong experience on Safe and Sustainable criteria for Buildings. Specific category on Materials and Resources.
WELL v2™	https://v2.wellcertified.com/en/wellv2/overview	Strong experience on Safe and Sustainable criteria for Buildings. Specific category on Materials and Resources.
Declare.	https://declare.living-future.org/	Deep screening on Safe criteria. Rating recognized by building environmental certifications. Large database: many products, applications and countries covered.

cradle to cradle products innovation institute	https://www.c2ccertified.org/products/registry	Rating recognized by building environmental certifications. Many covered products (consumer goods or building products).
hpd c	https://www.hpd-collaborative.org/hpd-public-repository/	Deep screening on Safe criteria. Rating recognized by building environmental certifications. Over 2000 products included.
GREENSCREEN FOR SAFER CHEMICALS	https://www.greenscreenchemicals.org/certified	Deep screening on Safe criteria. Rating recognized by building environmental certifications. Over 2000 products included.
RecyClass	https://recyclass.eu/recyclability/online-tool/	Hierarchical assessment of recyclability based on existing sorting infrastructure. While new methods will be needed to be taken into account in SURPASS, the general approach could serve as an inspiration.
ReMADE INSTITUTE	https://remadeinstitute.org/project-impact-calculator/	Probably too detailed, because it is an expert tool. Might be interesting to incorporate elements for impact categories, where data available, into user-friendly interface.

2.1.2 Methodology

During the study, the selected software packages were tested on several platforms. The analysis was carried out by the same person for all websites, in order to avoid possible inaccuracies and to aim maximum objectivity.

The primary objective was to gain a deeper understanding of how users in the relevant field interact with online infrastructures, and to identify their expectations regarding the SURPASS digital infrastructure. Therefore, the collected websites were analysed from the perspective of user experience. The main criteria of the analysis are summarised below.

2.1.2.1 Accessibility

In the context of websites, accessibility refers to the design and development of web content and technologies that can be used by individuals with disabilities. This includes ensuring that people with various types of impairments, such as visual, auditory, motor, or cognitive disabilities, can perceive, understand, navigate, and interact with web content and features effectively, efficiently, and independently.

Website accessibility involves following a set of guidelines and best practices, such as the Web Content Accessibility Guidelines (WCAG), which provide a framework for creating accessible web content. This can include measures such as providing alternative text descriptions for images, providing captions for videos, using clear and easy-to-read fonts and colour contrasts, ensuring keyboard accessibility, and avoiding content that may trigger seizures or other adverse reactions.

By ensuring that a website is accessible to all users, regardless of their abilities, it can enhance the user experience, increase the reach and impact of the website, and promote inclusivity and diversity.

2.1.2.2 Responsiveness, mobile compatibility

When we talk about responsiveness and mobile compatibility in the context of websites, we are referring to the ability of a website to adapt its layout and design to different screen sizes and devices.

Responsive design means that the website is designed in a way that allows it to adjust its layout and content to fit the size of the screen it is being viewed on. This means that the website will look different on a desktop computer, a tablet, or a smartphone, but it will still be easy to use and navigate. Responsive design is essential because more and more people are using mobile devices to browse the web, and a website that is not optimized for mobile can be frustrating to use and may turn away potential visitors.

Mobile compatibility means that the website is designed and developed specifically with mobile devices in mind. This means that the website may have different features, content, and navigation than its desktop counterpart to ensure that it is easy to use on a small screen with touch controls. Mobile compatibility is important because mobile devices are becoming the primary way that many people access the internet, and a website that is not optimized for mobile can be slow, difficult to use, and may not load properly on smaller screens.

In summary, responsiveness and mobile compatibility are important considerations for websites because they ensure that the website is accessible and user-friendly across a range of devices and screen sizes, which can help to increase traffic, engagement, and conversion rates.

2.1.2.3 Multiple languages

Multiple language support refers to the ability of a website to display its content in multiple languages to cater to a diverse range of users who speak different languages. By offering content in multiple languages, a website can reach a wider audience and provide a better user experience for non-native speakers.

2.1.2.4 User experience

User experience, commonly abbreviated as UX, refers to the overall experience and satisfaction that a user has when interacting with a website. It encompasses all aspects of a user's interaction with the website, including its design, functionality, content, and usability.

A good user experience means that the website is easy to use, intuitive, and meets the needs of its users. It is designed with the user in mind, with a focus on providing a seamless and enjoyable experience that encourages users to stay on the website, engage with its content, and return in the future.

To create a good user experience, website designers and developers need to consider a wide range of factors, such as:

- Design: The website's design should be visually appealing, consistent, and easy to navigate.

- Content: The website's content should be informative, engaging, and well-organized.

- Functionality: The website's functionality should be reliable, fast, and intuitive, with clear calls to action and user feedback.

- Accessibility: The website should be accessible to all users, including those with disabilities or using assistive technology.

- Mobile optimization: The website should be optimized for mobile devices, with a responsive design that adapts to different screen sizes and orientations.

By providing a good user experience, a website can increase user engagement, retention, and loyalty, and ultimately drive business success by attracting and retaining customers.

2.1.2.5   Information architecture

Information architecture (IA) refers to the way that information is organized, structured, and presented on a website. It encompasses all aspects of how information is displayed, including the hierarchy of pages, the navigation menus, the labelling of content, and the grouping and organization of related content.

The goal of information architecture is to make it easy for users to find the information they are looking for and to understand the relationships between different pieces of content. This requires careful planning and consideration of the website's goals, target audience, and content strategy.

Some key elements of information architecture include:

- Site maps: Site maps are diagrams that show the structure of the website, including the hierarchy of pages and the relationships between them.

- Navigation: Navigation refers to the menus and links that allow users to move around the website and access different pages.

- Labels and categories: Labels and categories help users understand the content of a page or section and how it relates to other content on the website.

- Search functionality: Search functionality allows users to find specific content on the website quickly and easily.

Effective information architecture can improve the usability and user experience of a website by making it easy for users to find what they are looking for and to understand the structure of the content. It can also help to improve search engine optimization (SEO) by making it easier for search engines to understand the content and structure of the website.

2.2   Website analysis

2.2.1   SAbyNA

Information on the website: "SAbyNA aims to improve the usability of existing databases, test methods, models, frameworks and tools and integrated them into an interactive and user-friendly web-based guidance."

Summary by the recommending partner: Safe by Design strategies applied to paint and 3D printing sectors.

Table 2. SAbyNA	
Accessibility	Errors caused by missing form labels and very low contrast.

Responsiveness, mobile compatibility	Overall performance score is 44%. Total blocking time is high with the speed index of 10.0s.
Multiple languages	Available only in English
User interface	In general, the website has an appealing design that has been applied consistently throughout the website.
User experience	Apart from the Publications section, the website provides a generally smooth user experience.
Mandatory registration	The document repository is a Nextcloud instance that is only available to registered users.
Information architecture	The available information structured well and has proper labelling.
Functionality	As a project website it serves its purpose properly.

2.2.2 SbD4Nano

SbD4Nano develops a novel software infrastructure "e-infrastructure" to foster dialogue and collaboration between actors along the nanotechnology supply chain for a knowledge-driven definition of safe-by-design approaches based on hazard, exposure, product performance and cost criteria.

Summary by the recommending partner: Implementation of safe-by-design approaches based on hazard, exposure, product performance and cost criteria.

Table 3. SbD4Nano	
Accessibility	Errors: linked image missing alternative text, very low contrast
Responsiveness, mobile compatibility	Poor overall performance, scored 36%. Large amount of unused JavaScript, 1.7s of total blocking time reaching 7.9s of speed index.
Multiple languages	Available only in English
User interface	Nice, consistent and clean design.
User experience	Some content (e.g., work package overview) is represented as an image resulting in a poor user experience on mobile devices.
Mandatory registration	No registration is required, all information is available publicly.
Information architecture	Content delivered as image cannot be labelled and searched properly.
Functionality	As a project website it serves its purpose properly.

2.2.3 IRISS project

The IRISS project aims to connect, synergize and transform the Safe-and-Sustainable-by-Design community in Europe and globally towards a lifecycle approach, with a holistic integration of safety,

climate neutrality, circularity and functionality already in an early stage of designing and manufacturing materials, products and processes.

Summary by the recommending partner: n/a.

Table 4. IRISS project	
Accessibility	Generally speaking, the accessibility of the website is satisfactory. Only low-contrast errors appear.
Responsiveness, mobile compatibility	61% of performance score that can be considered average. Largest contentful paint takes 11.1s.
Multiple languages	Available only in English
User interface	The website's user interface is sleek and modern, making it easy to navigate and find the information I'm looking for.
User experience	User experience is satisfactory
Mandatory registration	No registration is required to access information about the project.
Information architecture	Information is structured in a logical way, navigation is easy.
Functionality	Describes the project properly.

2.2.4 Diamonds[3]

Registration to the website is mandatory, without it, basic information is not available. After registration, a verification e-mail is sent on first login. After sending the verification e-mail, you will be able to access the interface, where the following description is available: "DIAMONDS is a Generic Data Management and Data Integration Platform for the Life Sciences developed by TNO. DIAMONDS, has a broad scope and is used by many and very diverse Life Science projects. From estimating the Toxicity of Compounds, Safety Assessment of Targets, Allergenicity of Proteins up to Modelling Health parameters and providing Personalized Nutritional and Lifestyle Advice."

Summary by the recommending partner: Nano Exposure Quantifier (NEQ), Tool for exposure evaluation. Comparison between a reference scenario and a safe by design scenario. Automatically select the tier approach as function of data provide. Tool in development in the frame of SBD4. Hotspot Scan is a public tool that allows a systematic and efficient assessment of potential hotspots in the life cycle of innovative products. Searchable library of occupational and environmental Risk Management Measures.

Table 5. Diamonds[3]	
Accessibility	TNO has published the accessibility statement on its website. A single empty link causes an error.
Responsiveness, mobile compatibility	75% of overall performance with the page speed index of 3.8s. Large amount of unused JavaScript and the lack of compression decreases the performance.
Multiple languages	Available only in English

User interface	A simple, mobile-first user interface applied consistently.
User experience	Low user experience due to a cyclic email confirmation request. After the registration is complete, the user is not provided any guidance and the tool descriptions appear inmixed languages. The user experience is confusing in general.
Mandatory registration	Only basic information is available without a registration
Information architecture	Once the information is found (e.g., E-card) it is structured and labelled accurately and properly.
Functionality	The tools are advanced, can be used smoothly but requires some expertise of the user.

2.2.5 SundaHus

The tool for effective and result-oriented work with environmentally conscious material choices. SundaHus Material Data is the market leader for environmentally conscious material choices within the construction and property markets. The system provides a variety of features which contribute to the time and cost-effective use in the entire construction and management process.

On the webpage available right now 50.172 products and 243.752 articles, 4.690 brands, and 11.080 substances as well.

Summary by the recommending partner: "In Sweden, SundaHus material data and assessment database became almost a mandatory path to place building materials or products on the Swedish market. SundaHus evaluation system includes both Safe and Sustainable criteria."

Table 6. SundaHus [3]	
Accessibility	Large number of errors caused by missing alternative texts and form labels, empty buttons and links.
Responsiveness, mobile compatibility	86% of performance score, with high speed index (7.2s) and 4s of largest contentful paint and render-blocking static resources.
Multiple languages	Available in Swedish and English
User interface	The colour scheme of the website is soothing to the eye and complements the overall design. The font is easy to read, and the layout is well-organized.
User experience	Language selector is placed in the footer which is unusual and uncomfortable to find.
Mandatory registration	Valuable information available only for registered and paying users.
Information architecture	Limited information is available and structured mainly to support marketing purposes.
Functionality	n/a

2.2.6 Byggvarubedömningen

BVB is a Swedish database tool for environmental assessment of building materials. This system developed as a voluntary measure of the construction industry to incorporate environmental concern in housing construction.

Summary by the recommending partner: BVB is another Swedish environmental assessment tool for Building Materials. It includes both Safe and Sustainable criteria. Unfortunately, website is in Swedish.

Table 7. Byggvarubedömningen	
Accessibility	High number of errors due to missing alternative texts, invalid language definition, empty buttons and links. In general it reaches 47%, which is lower than average.
Responsiveness, mobile compatibility	Overall performance score is 60%. Score is decreased mostly because of unavailable and/or very large images.
Multiple languages	Available in Swedish and English
User interface	The website's user interface is intuitive and user-friendly, making it easy to find the information I need. The design is simple but effective, with a clear hierarchy of information.
User experience	The website provides a smooth user experience overall, however the registration procedure is cumbersome.
Mandatory registration	Registration is optional and a large amount of material is available without a registered account.
Information architecture	Information is structured logically; navigation is easy to follow.
Functionality	n/a

2.2.7 U.S. Green Building Council - LEED credit library

LEED (Leadership in Energy and Environmental Design) is the world's most widely used green building rating system in the world. Available for virtually all building types, LEED certification provides a framework for healthy, highly efficient, and cost-saving green buildings, which offer environmental, social and governance benefits. LEED certification is a globally recognized symbol of sustainability achievement and leadership.

Summary by the recommending partner: LEED, Leadership in Energy and Environmental Design (from US), is the world's most widely used green building rating system. It includes Safe and Sustainable criteria with a rating system. There is an online digital database for building projects.

Table 8. LEED credit library	
Accessibility	Low accessibility due to the high number of errors like missing alternative texts, form labels and empty links, as well as very low contrast.

Responsiveness, mobile compatibility	Exceptionally low overall performance (5%)
Multiple languages	Available only in English
User interface	The interface focuses on the functions and minimalistic.
User experience	Provides a really comfortable user experience despite of the massive amount of data it organises.
Mandatory registration	No registration is required
Information architecture	Information is well-structured. One can understand the data in an instance; labelling is perfect.
Functionality	Presentation of guiding materials and general information is easy to understand and use; serves its function properly.

2.2.8 WELL v2™

The WELL Building Standard™ version 2 (WELL v2™) is a vehicle for buildings and organizations to deliver more thoughtful and intentional spaces that enhance human health and well-being. WELL v2 includes a set of strategies—backed by the latest scientific research—that aim to advance human health through design interventions and operational protocols and policies and foster a culture of health and well-being. Built upon the pioneering foundation of the first version of the WELL Building Standard (WELL v1), WELL v2 draws expertise from a diverse community of WELL users, practitioners, public health professionals and building scientists around the world.

Summary by the recommending partner: WELL (US) is the 1st building certification that focuses exclusively on human health and well-being. It includes Safe and Sustainable criteria with a rating system. There is an online digital database for building projects.

Table 9. WELL v2™	
Accessibility	This website reaches high score in the dimension of accessibility, however it is difficult to navigate using only the keyboard.
Responsiveness, mobile compatibility	Since the website is a JavaScript application, its mobile performance is low (36%) due to the initial blocking time caused by the static resources to load.
Multiple languages	Available in English and Chinese
User interface	The user interface primarily focuses on presenting the data instead of delivering a visual experience. It fulfils requirements against single page applications completely.
User experience	Easy navigation, fast loading times, consistency across devices. Perfect user experience overall.
Mandatory registration	No registration is required

Information architecture	Information and functions are displayed in a properly structured and labelled way.
Functionality	This application gives access to a massive amount of information using an advanced layout and navigation solution.

2.2.9 Declare

Declare is a transparency platform and product database that is changing the materials marketplace.

Summary by the recommending partner: Declare label is a database for products (created in US) with a rating system on Safe and Sustainable criteria. It includes simple principles easily understood from industrials or end users. Interactions on place with other material databases (Red2Green, mindful materials).

Table 10. Declare	
Accessibility	Exceptionally high number of errors related to broken ARIA menus.
Responsiveness, mobile compatibility	Low performance score (47%) due to the high speed index and the lack of optimisation of static resources.
Multiple languages	Available only in English
User interface	Clean design and an intuitive search bar.
User experience	The lack of paging on the list view disturbs the user experience
Mandatory registration	No registration is required to access the primary content
Information architecture	Information is properly searchable and labelled.
Functionality	Mainly due to the search function the application fulfils the requirements.

2.2.10 Cradle to Cradle Products Innovation Institute

Cradle to Cradle Certified has long been regarded as the world's most trusted and advanced science-based standard for designing and manufacturing products that maximize health and wellbeing for people and our planet, providing a comprehensive and holistic assessment framework across different sustainability performance categories.

Summary by the recommending partner: Cradle to Cradle is a certification (created in US) for materials and products with Safe and Sustainable criteria.

Table 11. Cradle to Cradle Products Innovation Institute	
Accessibility	Apart of empty links and contrast errors the website is properly accessible.
Responsiveness, mobile compatibility	Its low performance score (31%) is caused by the images that are not optimised and the missing caching settings.

Multiple languages	Available only in English
User interface	Utilises several unique layouts and navigation solutions. Large spaces reduce the amount of useful information the system can display at once.
User experience	Apart from the unusual practices implemented on the website, that makes the user to spend a bit more time on getting familiar with it, the user experience is satisfactory.
Mandatory registration	No registration is required
Information architecture	Information is easy to search and categorised in a way that is esay to understand
Functionality	The application gives access to its information properly

2.2.11 The Health Product Declaration (HPD) Public Repository

The Health Product Declaration® (HPD) Open Standard is the leading standard in the building industry for reporting building product contents and associated health information.

Summary by the recommending partner: Health Product Declaration is a database with public repository of Safe evaluation of products.

Table 12. The Health Product Declaration (HPD) Public Repository	
<u>Accessibility</u>	Links cause low-contrast errors. Good accessibility performance overall
Responsiveness, mobile compatibility	Very low overall performance (28%) because of the large amount or render-blocking resources that could be bundled.
Multiple languages	Available only in English
User interface	The user interface has a simple and consistent design.
User experience	The navigation is not clear, sometimes to complex other times the same page is available from multiple places. Large amount of information is available in pdf documents. The system redirects the user to the "not found" page very often. Poor user experience overall.
Mandatory registration	No registration is required
Information architecture	A large amount of information is available in pdf, that is not an advanced way of structuring and labelling data. Also, searchability of the information is not clear.
Functionality	This website should be an information hub, but it does not serve its purpose well.

2.2.12 GreenScreen Certified™

GreenScreen Certified™ products are independent non-profit certified, free of Per- and Polyfluoroalkyl Substances (PFAS) and thousands of other chemicals of concern. GreenScreen Certified products promote the use of preferred chemistry by using the globally recognized GreenScreen® for Safer Chemicals suite of tools.

Summary by the recommending partner: GreenScreen is an evaluation method for Safer chemicals. It has large experience on Safe evaluation criteria. Note that digital database is outdated: greenscreen products are provided in table form with no digital features.

Table 13. GreenScreen Certified™	
Accessibility	High number of errors related to missing labels, empty buttons and links, broken ARIA menu items and low contrast.
Responsiveness, mobile compatibility	The website has 70% of performance score which could be increased by bundling render-blocking static resources and optimised images.
Multiple languages	Available only in English.
User interface	Has a simple and appealing design and uses a classic layout that is immediately familiar to most of the users.
User experience	Easy navigation, fast load times, generally good user experience, however there are some "dead ends". For instance, once the user find a certified product, there is no detailed information about it.
Mandatory registration	No registration is required
Information architecture	In general, information is structured properly and can be found.
Functionality	The website makes it easy to understand what the certification is about, how one can be certified and what products are already available.

2.2.13 RecyClass

RecyClass Online Tool assesses the recyclability of plastic packaging and shows to what extent it is suitable for recycling, rating it with a class system from A to F. The Tool can be used freely by the plastic industry to self-assess existing packaging or to stimulate the recyclability of innovative packaging concepts.

Summary by the recommending partner: RecyClass offers a classification scheme for recyclability (in existing infrastructure) and has mapped the underlying decision tree into a tool.

Table 14. RecyClass	
Accessibility	Some errors detected: missing language specification, some empty links and buttons. Low contrast issues.

Responsiveness, mobile compatibility	77% of overall performance score, that can be improved by optimising client-side resources.
Multiple languages	Available only in English
User interface	The user interface's design follows the content and supports the user in understanding it.
User experience	Easily distinguishable call-to-actions, proper navigation, fast load times.
Mandatory registration	No registration is required
Information architecture	The information available on the website is well-structured, one can understand it immediately.
Functionality	The online tool is intuitive and easy-to-use, serves its purpose properly.

2.2.14 REMADE

To help proposers calculate material efficiency and embodied energy benefits for their proposals and projects, REMADE has developed an Excel-based project impact calculator. The Project Impact Calculator is currently in beta testing though it has been revised into an updated version.

Summary by the recommending partner: Detailed tool to calculate impact of projects, based on REMADE initiative of US DOE. So far an Excel sheet as basis.

Table 15. REMADE	
Accessibility	Some accessibility errors found: missing alternative texts and form labels along with low contrast issues.
Responsiveness, mobile compatibility	Poor overall performance (12%) due to the high number of render blocking static resources.
Multiple languages	Available only in English
User interface	The website has a clean and appealing design.
User experience	The whole website's layout does not display much of information on a single screen, visuals use up the useful area mostly. The tools itself, as an Excel tool, has guidance as comments, which is not user friendly.
Mandatory registration	No registration is required to access the tool
Information architecture	Information is not easy to find (e.g., publications' abstract is not available). Within the tool information is properly described.
Functionality	The tool itself is useful but has a significant learning curve.

2.3 Summary and conclusions

Online services in the area of sustainable development and eco-design activities related to plastics are generally considered to be of average accessibility, with poor performance on mobile devices and a lack of translations. Despite these issues, it is worth noting that the user interfaces of such services are usually consistent and appealing. Information is typically structured well, which allows users to easily access the resources they need. Nonetheless, the navigation experience could be improved.

3 Primary research on end-user requirements

3.1 Objective

In order to get a more accurate picture of the end-users SMEs and their expectations to the SURPASS digital infrastructure, a primary data survey has been carried out during the first quarter of 2023.

3.1.1 Methodology

As it was important for us to be able to easily incorporate the results of the primary research into our work, we primarily relied on easily quantifiable data. For this reason, we finally chose the questionnaire methodology over workshops or bilateral interviews as the instrument for collecting primary data. This method was considered more appropriate because the result was considered more representative, more analysable and allowed for more feedback.

The questionnaire was compiled using Google Forms, as electronic self-completion was seen as the most efficient way of collecting data. It contains 17 questions and the link to complete was sent to respondents by email. In addition to the project's own built database, the list of addresses of the professional funders and partners involved in the research provided the address list for the questionnaire.

No personal data was collected, and no contact information has been shared within the consortium.

3.1.2 SMEs survey

The questionnaire aimed to ask questions that help in characterising the users' preferences, habits and expectations against digital infrastructures without being exhaustive.

A couple of dozens of representatives of SMEs relevant to the field were invited to complete the questionnaire and the invitation has been posted on social media (LinkedIn) as well. A total of 23 responses were collected during the candidate period. The sample of 23 is presumably the result of the low willingness of the professional representatives of the SMEs we reached to fill in the questionnaire during the above mentioned period at the current stage of the project, without testing the software. Nevertheless, the sample size proved to be sufficient to provide useful information on the consumption habits of industry representatives to support the development of the project.

The survey was completed anonymously, and no personal data other than the role of the respondent and the name of the company employing them were recorded.

The first question of the questionnaire concerned the respondent's workplace - company name.

Based on the responses received, the national distribution of respondents is as follows:

- 6 persons Portugal

- 4 persons France

- 3 persons Italy

- 3 persons Spain

- 2 persons Germany

- 2 persons Sweden

- No data for 2 persons

The second question asks what role the respondent plays in his/her field: What is your role in the materials science and innovation field?

The aim of this question is to examine whether the feedback received from the respondent should be weighted in the future work phases according to his/her position and to what extent the answer to this question may lead to a future active user of the SURPASS digital infrastructure.

The possible answers are Research Scientist, Process Engineer, Product Designer, Material Chemist, Polymer Synthesizer, Material Characterization Specialist, Regulatory Compliance Officer, Quality Control Specialist, Supply Chain Manager, Sales and Marketing Professional, Business Development Manager, Project Manager, Consultant, Academician, Student/Research Assistant, Other.

Based on the responses received:

- 7 responses of Research Scientist: ●

- 4 responses of Regulatory Compliance Officer: ●

- 4 responses of Project Manager: ●

- 3 responses of Other: ●

- 2 responses of Business Development Manager: ●

- 1 response of Consultant: ●

- 1 response of Material Characterization Specialist: ●

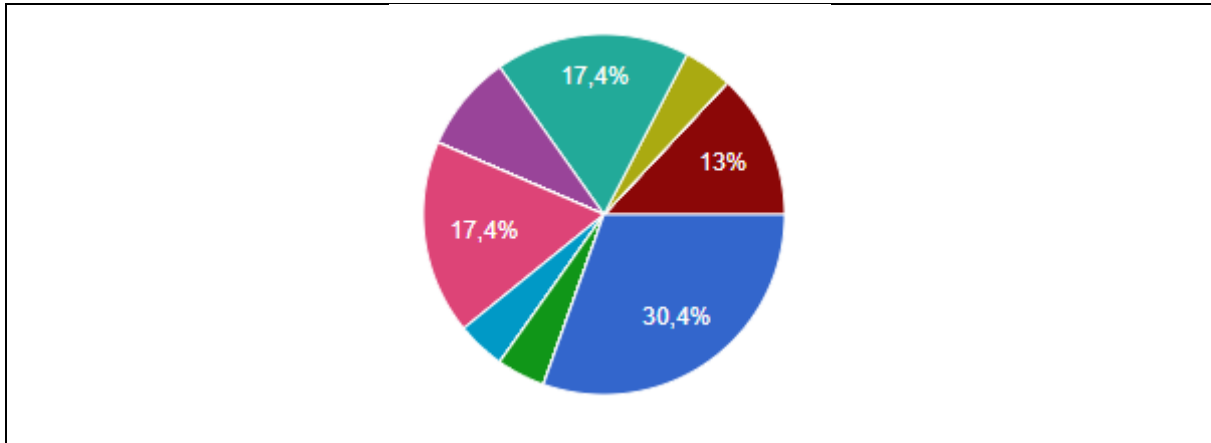- 1 response of Material Chemist: ●

Figure 1. Role in the materials science and innovation field

As shown in Figure 1, the highest percentage of responses received - 30.4% - was from Research Scientists. Project Manager and Regulatory Compliance Officer were equally represented with 17.4%. The percentage of respondents from other positions was 13%.

From the data received, the completion rate of 13% - 3 persons - for the other positions can be considered as satisfactory from a project point of view.

3.1.3 Data analysis

3.1.3.1 How important is sustainability in your work?

The question provides an answer to the extent to which the business takes sustainability into account. The aim of the question is to provide an up-to-date picture of the corporate environmental awareness of European SME respondents without specifying the definition of sustainability.

The question is presented on a single-question Likert scale from 1 to 5, with 1 being *not important* and 5 being *very important*. The odd-numbered row allows the respondent to indicate the mid-point, which also gives the opportunity to indicate if the respondent's perception of the sustainability of the business and/or the role of sustainability in his/her position does not clearly indicate one of the options "rather yes" or "rather no". In addition, the 5-point Likert scale reduces the decision stress of respondents.
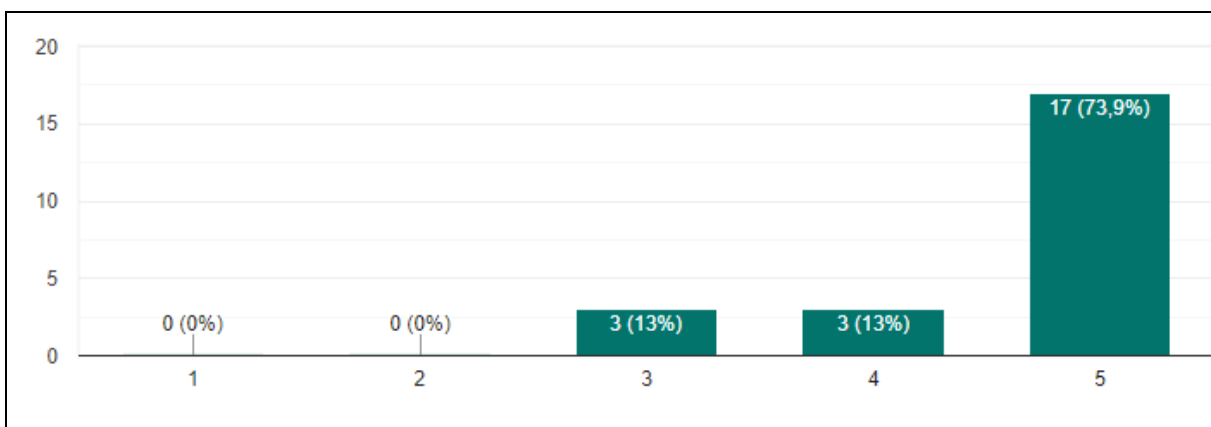

Figure 2. Importance of sustainability

As shown in Figure 2, 17 respondents, or 73.9%, gave the maximum importance to the question of sustainability, while 13% gave a value of 4. A medium value was also given by 3 respondents - 13%. As can be seen, there were no responses for 1 and 2.

This shows that a significant majority of respondents consider sustainability to be of high importance in their work, which leads to the conclusion that it is equally important for the company they represent. The questionnaire can therefore be considered a success, as it seems to have reached the target audience of the project, which suggests that the responses received are valuable and that the information received supports the development and implementation of further work processes and should be taken into account.

While keeping in mind, that the limited number of responses does not allow us to draw conclusions with significant statistical power, we can highlight some interesting details and get an impression of the primary user group.

Figure 1 shows that the highest proportion of researchers completed the questionnaire. Considering the raw data before aggregation, we find that 6 out of the 7 research scientists responded with a value of 5, while 1 of them, without us being able to determine the responder's identity, marked a value of 3 for the question of the importance of sustainability. This shows that the group with the highest percentage of respondents to the questionnaire.

Also shown in Figure 1, regulatory compliance officers represent 4 out of the 23 respondents, with 2 respondents indicating a maximum value based on their individual responses, while 2 respondents indicated a value of 4. So the proportion of this group is split 50/50 between response options 4 and 5. Which further confirms that the higher proportion of groups with a higher proportion of respondents rate sustainability as more important.

For project managers, also representing 17.4%, 3 out of 4 respondents indicated a maximum score of 5, while 1 indicated a median score of 3.

The last group with the highest percentage in Figure 1 is the group of people in other positions, with 13%. All three of them gave a maximum value to the importance of sustainability.

The overall distribution of responses by group is shown in Table 2.

Table 16. Sustainability importance matrix			
Role	Score 3	Score 4	Score 5
Regulatory Compliance Officer	-	2	2
Business Development Manager	1	-	1
Material Characterization Specialist	-	-	1
Consultant	-	-	1
Material Chemist	-	1	-
Project Manager	1	-	3
Research Scientist	1	-	6
Other	-	-	3

The responses received further confirm the fact that the survey was successful in reaching the target audience. It also suggests that sustainability is a major issue for European companies and their representatives today, which underlines the relevance of this project.

3.1.3.2 What kind of information do you typically need when designing new materials or products?

This question allowed for a free-choice response. The type of question does not limit the response options, thus not restricting respondents in formulating their related thoughts. The question is designed to collect a broad range of information from those active in the field. The personalised answers received will support the details of the SURPASS digital infrastructure development work, as well as expanding the related ideas and broadening the project vision.

Figure 3. Word cloud of responses

One respondent indicated that he/she does not plan to do so. 5 respondents referred to the product life cycle. 4 indicated a carbon footprint, and it is important to highlight that 3 of them referred to the product life cycle in addition to the carbon footprint. 3 made reference to recyclability. Standards and rules were mentioned by 4 and regulations by 3. Technical data and characteristics were highlighted by 5 respondents. In addition, toxicity, use of the product, customer functional specifications, food contact, and in the case of one respondent, durability were also mentioned as keywords.

It is clear from the responses that respondents take environmental impacts into account when designing materials and products. There is a significant consideration of recyclability, life cycle and the environmental impact of the production of the final product. This confirms the vitality of the SURPASS digital infrastructure, which aims to provide solutions to all these material design issues, as well as data and benchmarking.

3.1.3.3 Have you used digital tools to assist in material design before?

The question gave you the option to give a yes/no answer. The question was designed to assess the proportion of respondents with previous experience of similar software for us to be better prepared to the level of digital literacy of the primary target audience. The question shows the extent to which the respondents, in their answers to subsequent questions to assist in the development, are expected to provide feedback based on their own experience.
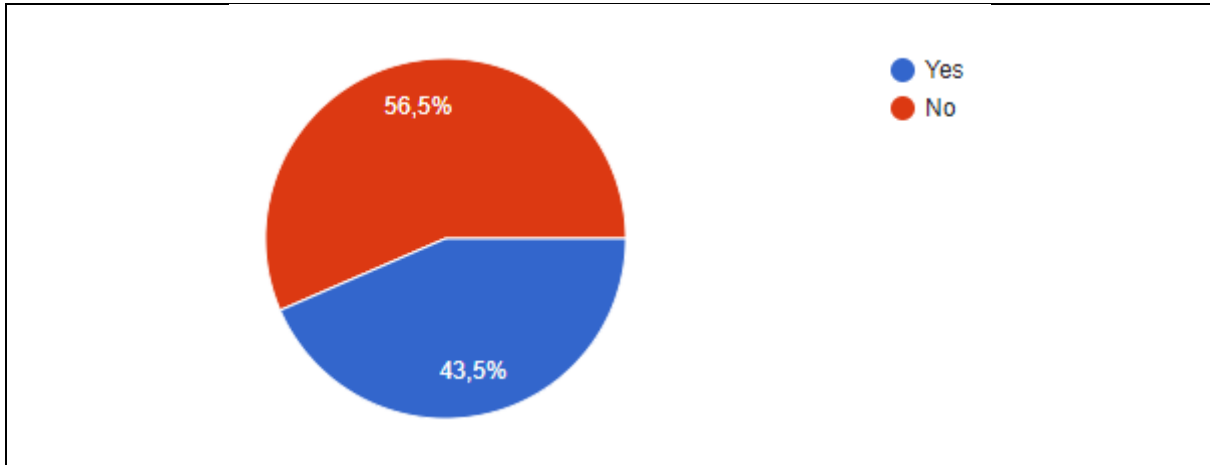
Figure 4. Use of digital tools to assist in material design

The question received 10 yes and 13 no answers. Figure 4 shows that the majority of respondents - 56.5% - have never used digital tools for similar purposes. However, it can also be observed that the difference between the two groups of respondents is not strong, with almost the same proportion of respondents from both groups, with a difference of only 13%. This suggests that we can rely on previous experience as a basis for comparison to support further development when considering further responses.

Based on the individual responses of the respondents, grouped by their position in the company, we see the following values:

- Research Scientist: out of 7 respondents, 3 indicated yes, while 4 indicated no. These indicate that almost 50% of the largest group of respondents have used some form of digital tool for similar purposes in the past.

- Regulatory Compliance Officer: none of the 4 respondents have used digital tools for similar purposes before.

- Project Manager: 2 of the 4 respondents said yes and 2 said no, so this group also has a 50% split.

- Other: For those in other jobs, 1 out of 3 answered no, while 2 answered yes.

- Material Chemist: 1 person represents this group and has not previously used digital tools to support material design.

- Material Characterization Specialist: 1 person, with a yes answer.

- Consultant: Also 1 person and the answer is yes.

- Business Development Manager: group of 2, again 50% split, so 1 person has used digital tools before and 1 person has not used digital tools before for a similar area.

When the responses are broken down by group, it is clear that even among those in active planning positions, there is a significant proportion who have not previously used digital tools to support planning. This leads us to conclude that we should take this into account when designing the user interface. In this context, the SURPASS digital infrastructure interface should strive for a simple, clean and easy to use design. During development, particular attention should be paid to the design of a user-friendly interface.

3.1.3.4   If so, what were they and what did you like or dislike about them?

Completion of this question was optional, taking into account the previous question. The question allows for a free-fill response. The question helps to obtain primary information, according to the experience of users, and supports competition monitoring. Of those who answered yes to the previous question, not all respondents gave a clear answer as to what they liked or disliked about the digital device.

One respondent liked the LCA-based eco-design and the possibility of impact labelling in the tool used. There was negative feedback on the lack of information on PCR materials. One other feedback commented on the lack of data, although he did not specify what kind of data he meant. For one respondent, the software used was material databases, material standard library, for which he did not specify his experience. One respondent indicated that he had used LCA "lightweight" tools such as those from NREL. His response indicated that the tool was difficult for him to use and that its applicability was limited unless it was for basic monomers. One respondent used Minitab, which includes data analysis, statistical and process improvement tools.

The above responses confirm the direction of a user-friendly interface and simple, easy-to-use SURPASS digital infrastructure that provides access and is supported by sufficient databases. They also support the purpose of the software, as experienced respondents have sought to use digital tools for a similar range of questions as the SURPASS digital infrastructure will be able to do.

3.1.3.5   How important is the ability to compare and evaluate different materials or products based on their environmental and social impacts?

The question is presented on a one-question Likert scale from 1 to 5, with 1 being not important and 5 being very important. The question asks for a numerical response to the importance that respondents attach to the comparability of each material or product and to the evaluation of the result in terms of both its environmental and social impact.

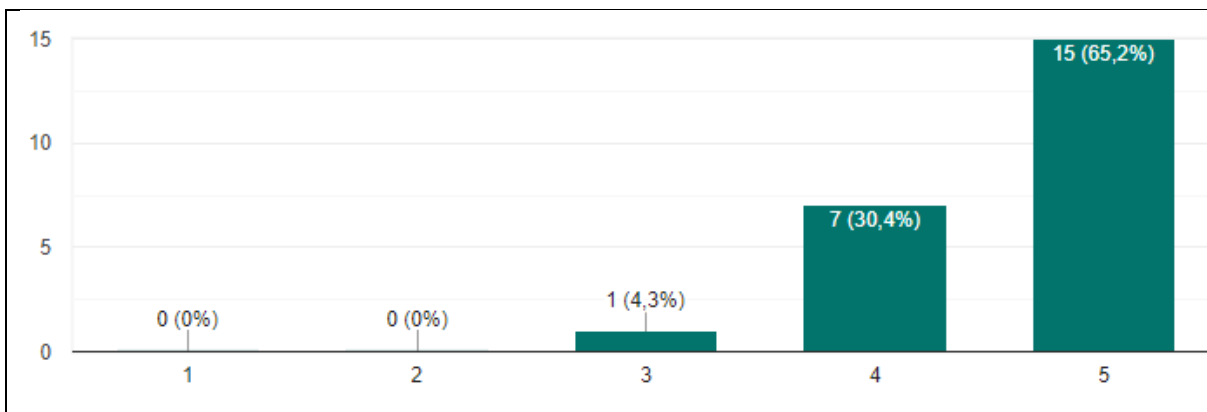The question aims to confirm or refute the need for this function of the SURPASS digital infrastructure.

Figure 5. Importance of comparing materials based on environmental and social impacts

As illustrated in Figure 5, a significant majority of respondents - 65.2% - consider the option of comparability of materials along the indicated themes to be of high importance. In addition, 30.4% of responses fell at a value of 4, and 1 respondent, indicated a median value of 3. These results indicate that 95.6% of respondents, i.e. the absolute majority, consider the presence of this feature to be

important at a level of 4 or higher. This confirms that this is the right direction for development, and that the presence of the feature should be a priority alongside the friendly interface in the prioritisation of further work.

3.1.3.6 How important is it to have a user-friendly interface for navigating the SURPASS digital infrastructure?

The question is presented on a one-question Likert scale from 1 to 5, with 1 being not important and 5 being very important. The question provides a concrete answer on the basic attitude of users towards the user interface. The question aims to confirm or refute the conclusions drawn from previous questions on the development of a user-friendly user interface.
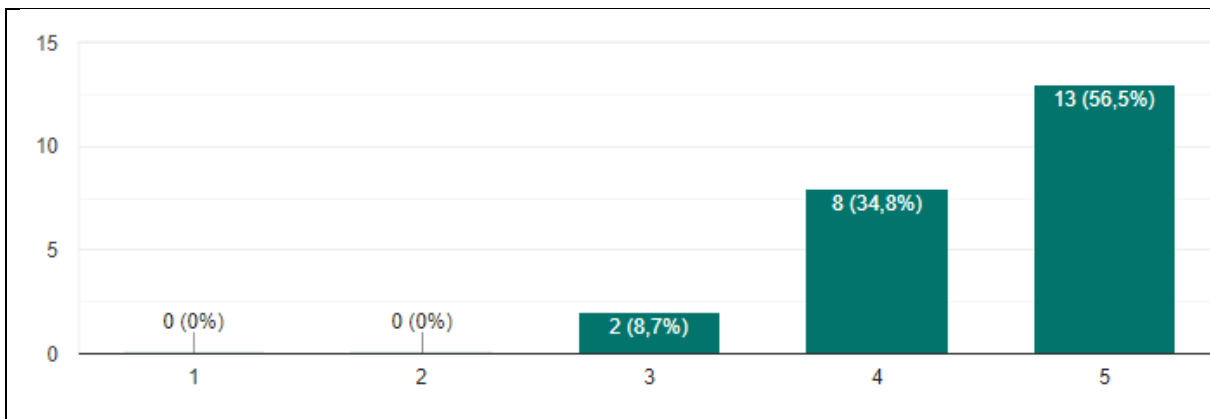

Figure 6. Importance of user-friendly interface

Figure 6 shows that more than half of the respondents - 56.5% - gave a maximum response to the question. A further 8 respondents - 34.8% - indicated that they rated the importance of a user-friendly interface as a minimum 4. A further 2 respondents, or 8.7%, chose the medium value. The responses clearly support the conclusion drawn from the answers to the previous questions that the development of a user-friendly interface should be a priority and that efforts should be made to keep the interface clean and simple, in order to make it as transparent as possible. This issue is also reflected in the negative feedback on software used in the past, where the complexity of the interface was also criticised.

It can be concluded that the simple, user-friendly presentation and navigation of the SURPASS digital infrastructure can be a major advantage over currently available digital support solutions.

3.1.3.7 How important is it for the SURPASS digital infrastructure to be accessible from multiple devices (e.g. desktop computers, tablets, smartphones)?

The question is presented on a one-question Likert scale from 1 to 5, with 1 being not important and 5 being very important. The question provides quantifiable, easily assessable information on how much weight users would give to other digital devices in addition to notebooks in this area. The purpose of the question is to provide direction on the range of sizes that user interface development should primarily target.
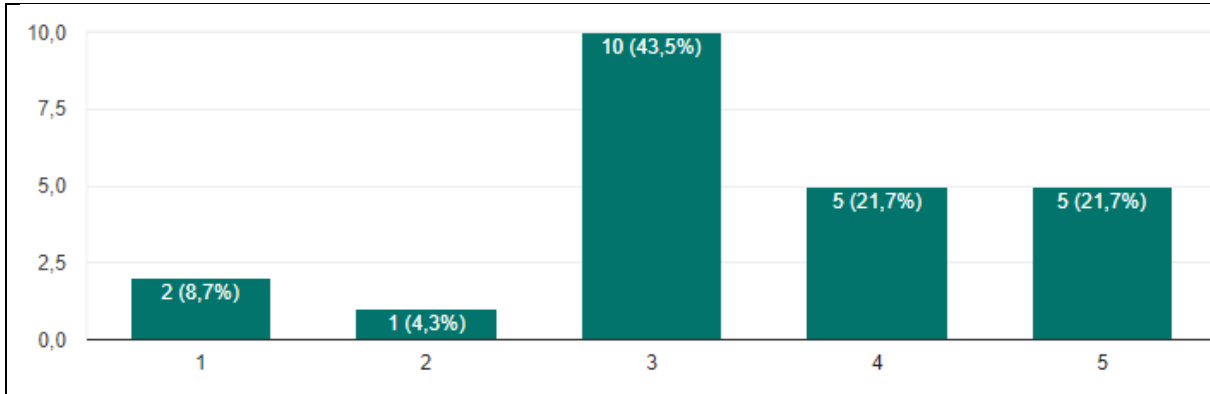
Figure 7. Importance of accessible from multiple devices

As Figure 7 illustrates, almost 50% of the responses - 43.5% to be precise - were at the median. The number of responses below the median is negligible, as can be seen, with a total of 3 respondents. Above the midpoint, the proportion of 4s and 5s is evenly distributed. So, for 43.4% of respondents, it is important that SURPASS digital infrastructure is accessible from multiple devices. It can be seen that the proportion of users who consider this feature important is almost as high as the proportion who marked the median value. For those who indicate a median value, this feature is presumably not as relevant, but they would like to avoid its absence.

It can be concluded that respondents do not do their work only and exclusively on desktops, and that there is a need to improve the interface to a wider range of sizes.

3.1.3.8 How important is it for the SURPASS digital infrastructure to support multiple languages?

The question is presented on a one-question Likert scale from 1 to 5, with 1 being not important and 5 being very important. The question is used to assess respondents' expectations of language preferences. The question is designed to confirm or deny the need for the SURPASS digital infrastructure interface to be available in multiple languages.
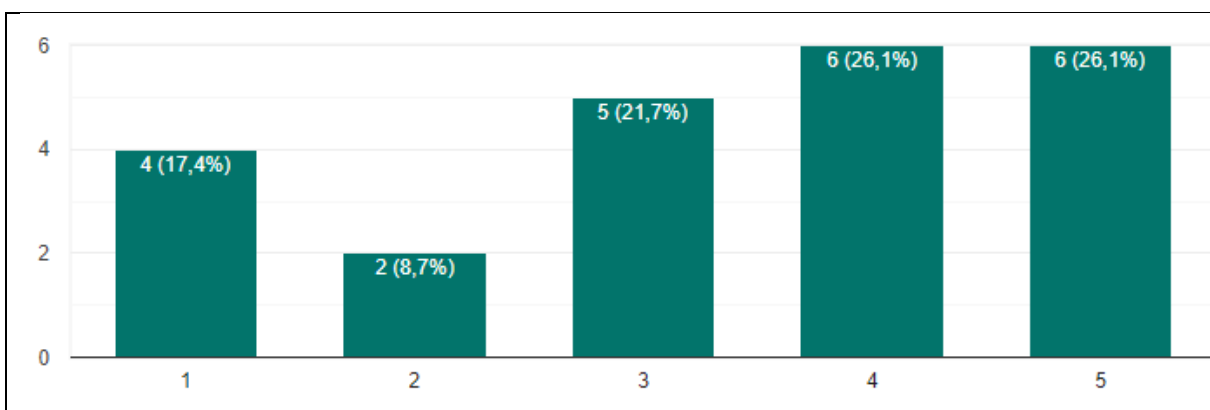

Figure 8. Importance of support multiple languages

Figure 8 represents the percentage distribution of responses received. The graph clearly shows that more than half of the respondents - 52.2% - marked a value of 4 or more. A further 21.7% responded with a value of 3. The number of respondents who gave a response below the mid-point, i.e. a score of 1 or 2, was only 6 - 26.1%. The responses received indicate that access to the SURPASS digital infrastructure in several languages is an important issue for users.

3.1.3.9 How important is it for the SURPASS digital infrastructure to provide a scoring system for comparing the safety and sustainability of different polymers?

The question is presented on a one-question Likert scale from 1 to 5, with 1 being not important and 5 being very important. The aim of the question is to confirm or deny the existence of a new feature.
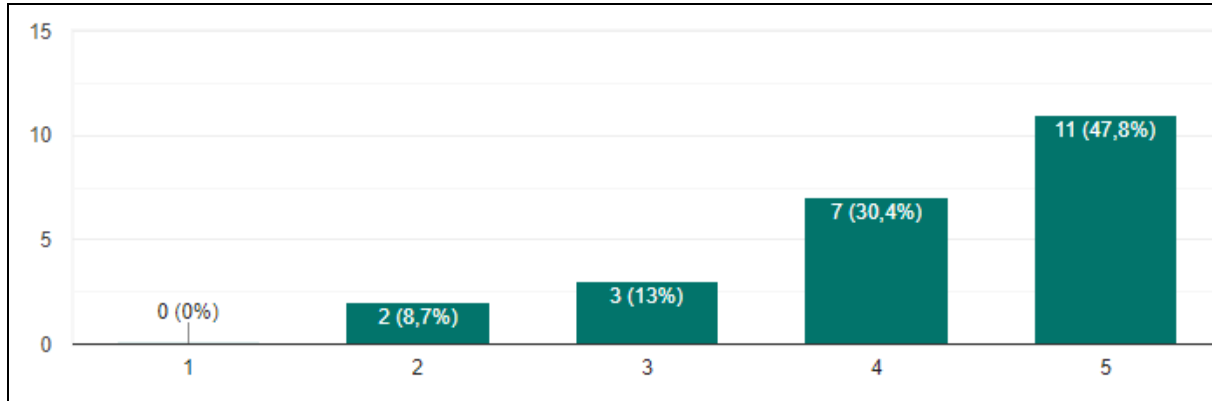

Figure 9. Importance of scoring system

The data in Figure 9 shows that the presence of a scoring system is also important according to the respondents' answers. 47.8% of the respondents, i.e., almost half of the respondents, rated the presence of this feature in the SURPASS digital infrastructure as the highest. A further 7 respondents - 30.4% - marked the playability as 4, i.e., more important than the average. No user indicated that the option was not at all important.

3.1.3.10 How important is it for the SURPASS digital infrastructure to provide guidance on how to design safer and more sustainable polymeric products?

The question is presented on a one-question Likert scale from 1 to 5, with 1 being not important and 5 being very important. The question is used to confirm the presence of an additional feature. The relevance of this question is to support the development direction of the SURPASS digital infrastructure data repository function.
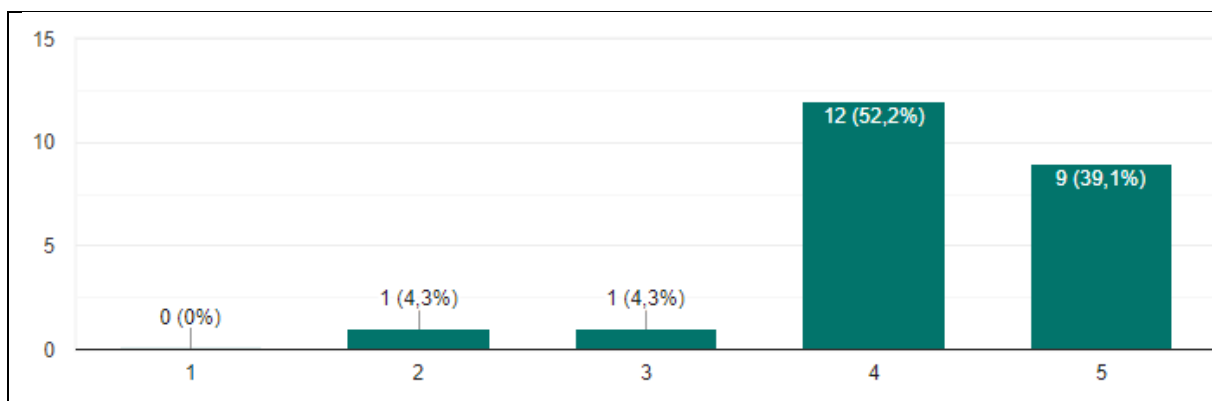

Figure 10. Importance of providing of guidance on design safer and more sustainable polymeric products

As can be seen in Figure 10, a significant majority of respondents - 52.2% - marked a score of 4, and a further 39.1% marked the maximum score of 5. Examining the individual responses, it is interesting to note that all project managers marked a score of 4, while both business developers who completed the questionnaire marked the maximum. Based on the proportion of responses to this question, the

presence of this feature is justified and necessary. Providing guidance for designing safer and more sustainable polymer products is important to respondents.

3.1.3.11 How important is it for the SURPASS digital infrastructure to provide information on the economic feasibility of using different polymers in products?

The question is presented on a one-question Likert scale from 1 to 5, with 1 being not important and 5 being very important. The question is designed to support an additional feature. In the design of the SURPASS digital infrastructure, the functions to be developed include the scoring of economic criteria.
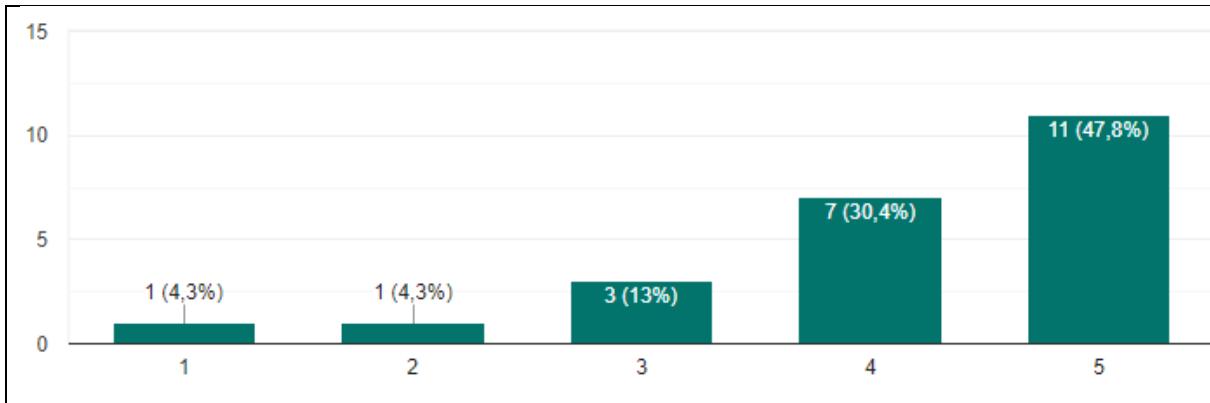

Figure 11. Importance of information related to economic feasibility

The data in Figure 11 show that almost half of the respondents again indicated the maximum value. In addition, a significant majority of them indicated a score of 4 in their response. The proportion of respondents with a score of 1 or 2 is again negligible, with only 1 to 1 respondent. Once again, the importance of the information function of SURPASS digital infrastructure on the economic feasibility of using different polymers in products is confirmed by the feedback from respondents.

3.1.3.12 Which of the following types of guidance would be most helpful when using the SURPASS digital infrastructure?

Respondents had to select one of 6 predefined answer options. The aim of the question was to assess the respondents' needs in terms of what would be the most effective way to help them learn using the SURPASS digital infrastructure.
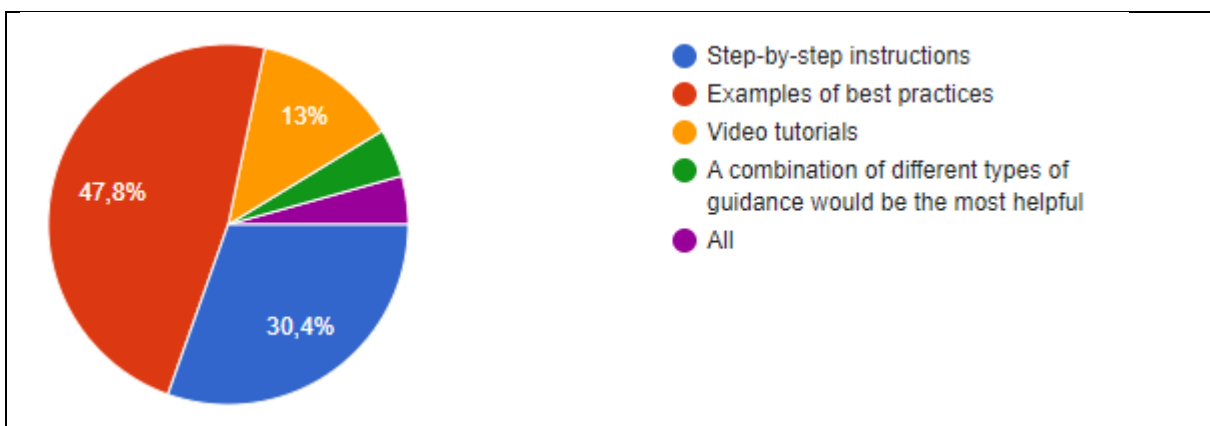

Figure 12. Most helpful guidance types

Figure 12 shows the distribution of responses received. Almost half of the respondents would prefer best practice examples, while a significant majority - 30.4% - also indicated step-by-step instructions. Interestingly, a combination of several different types and all response options each received only 1 response from 1 respondent, while a video tutorial was selected by 13%. When analysing the individual responses, no correlation between the role played by the respondent and his/her answer was observed.

It can be concluded that best practices and step-by-step instructions would be of most help to the respondents. This may be due to the fact that half of the respondents have not previously worked with a digital tool available in the field and that a user-friendly interface is of high importance to them. It may therefore be appropriate to offer users a solution to these two options.

3.1.3.13 What types of outputs would be most useful to you when using the SURPASS digital infrastructure?

Respondents had to select one of 6 predefined answer options. The aim of the question is to find out which of the options foreseen for the SURPASS digital infrastructure outcome products the respondents consider to be the most useful.
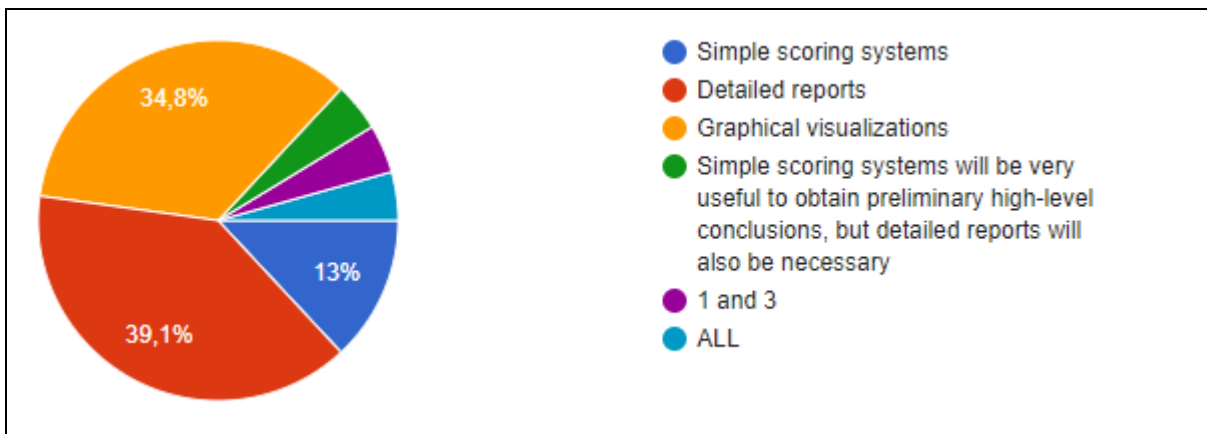

Figure 13. Types of outputs would be most useful

Based on the responses shown in Figure 13, 39.1% of respondents said that detailed reports would be best, while almost the same proportion - 34.8% - said that graphical visualisation would be best. The response rate for simple scoring systems was even more significant at 13%. For the other response options, the number of responses was negligible, with only 1 respondent indicating a response.

These results suggest that detailed reports or graphical visualizations would be most helpful to respondents, but that simple scoring systems would be less useful. Graphical visualisation in addition to detailed reports is, however, considerable, so it is advisable to illustrate the results of the statements with graphs, diagrams and other illustrative tools.

3.1.3.14 Are there any particular features or functions you would like to see included in a digital infrastructure for SSRbD materials design?

The question provided a free-choice response where answering was not mandatory. For optionality, not all respondents replied.

There were 6 responses to the question, all different for the 6 completers. Responses included processing instructions, graphs, LCA, importing from spreadsheets, mentioning data sources, providing transparency, and supplier and durability information.

3.1.3.15 Are there any other suggestions or feedback you would like to share regarding the development of the SURPASS digital infrastructure?

The question provided a free-choice response, and was optional. The purpose was to collect other information and suggestions. No response was received.

3.2 Summary and conclusions

In short, the primary research was a success. Except for the *other* feedback, all questions received a sufficient number of valuable responses, taking into account the proportion of respondents.

User-friendly presentation is considered to be of high importance by respondents, which may be due to the fact that more than half of them have not used digital tools to support their design work in this way before. Software may need to provide more languages for users. It should also be convenient to use on mobile devices. Respondents consider all planned features useful, thus supporting the planned development directions. For respondents, detailed reports and graphs would be the most useful features to facilitate the use of the data analysed by the software.

As the collected information is not self-contradictory or confusing, no further workshops or interviews were necessary.

4 Findings

From the results of the two activities, the following conclusions can be drawn:

1. Online services related to sustainable development and eco-design activities are often lacking in accessibility, especially on mobile devices, and need improvements in navigation and the overall user experience. However, their user interfaces are generally consistent, appealing, and information is well-structured and easily searchable.

2. User-friendly presentation is crucial for users who are new to digital tools to support design work. Therefore, the software should provide more language options and guidance in getting started with the provided tools.

3. Results of analysis (e.g., scoring system for comparing the safety and sustainability of different polymers; estimation of economic feasibility) is preferred to be represented visually or by the mean of detailed report.

Based on these conclusions, there is a need for online services related to sustainable development and eco-design activities to improve their accessibility, overall performance (especially on mobile devices), and navigation. Additionally, the user interface design of such services should continue to prioritize consistency, appeal, and well-structured information.

These findings will be considered in the technical specification of the SURPASS digital infrastructure once its tools and features are defined. These results, along with the conclusions of Task 4.1 (Scoping for policy alignment and process structuration to operationalize and evaluate polymeric material

specific SSRbD criteria), will be the starting point of Task 5.1 (Structuration of the content of the knowledge-based digital infrastructure).
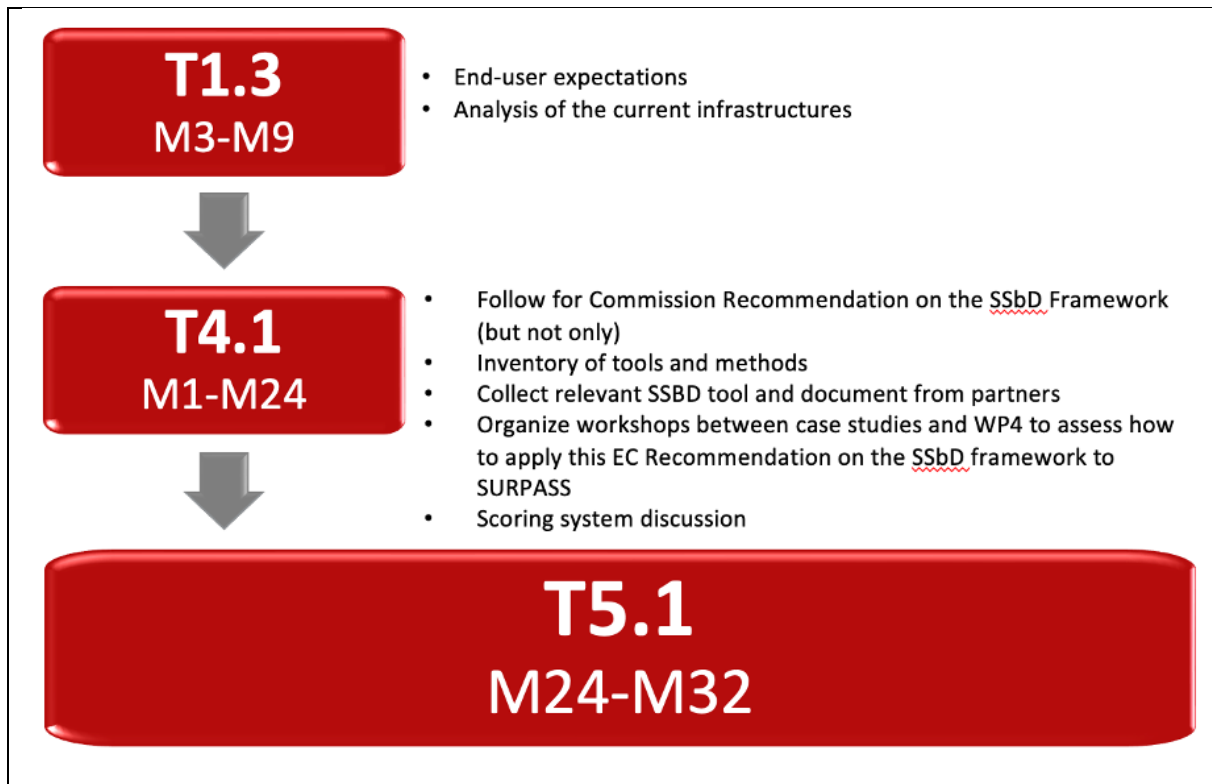
Figure 14. Next steps

Once Task 5.1 reaches its objectives, namely

- To define the overall structure of the SSRbD knowledge domains through the design of a workflow that organises and integrates different resources to target SMEs ;

- To define an SSRbDA scoring strategy that merges the indicators developed along WP4 ;

- To collect the main lessons learned from three case studies and include them for testing and validation;

the technical details of the infrastructure can be specified.

5 Annex I

5.1 SURPASS end user requirements questionnaire

5.1.1 Introduction

SURPASS digital infrastructure - end user requirements

Welcome to the SURPASS end user requirements questionnaire! This questionnaire is designed to help us understand your needs and preferences as a potential user of our digital infrastructure.

The SURPASS digital infrastructure will be a user-friendly, open-access platform designed to guide material scientists and innovators in designing candidate products and assessing their impacts early in the development process to select the most appropriate SSRbD polymeric systems. The infrastructure is foreseen to encompass criteria, metrics, tiered approaches, scoring strategies, customised decision support tools, references to relevant policies, regulations and standards and associated guidance to assist users in reaching the balance between high-performance recyclable polymers for safer plastics with lower reliance on potentially harmful additives, reduced environmental footprint and acceptable costs.

The SURPASS digital infrastructure will have several features to facilitate the development and assessment of sustainable and safe polymeric materials, such as:

1. Material selection guidance: The infrastructure will provide guidance to material scientists and innovators to select the most appropriate SSRbD polymeric systems based on their specific requirements and end-use applications.

2. Environmental impact assessment: The infrastructure will have tools to assess the environmental impact of different polymers, from raw material production to end-of-life disposal or recycling.

3. Toxicity assessment: The infrastructure will have tools to evaluate the potential human and environmental toxicity of different polymers and their components.

4. Scoring system: The infrastructure will propose a scoring system to evaluate the overall sustainability and safety of different polymers based on environmental, social, and economic criteria.

5. Data repository: The infrastructure will host a data repository to store and share data related to the safety and sustainability of different polymers, including material properties, environmental impact, and toxicity data.

Your feedback and input are critical in ensuring that the final product meets your expectations and is user-friendly. Thank you for your participation!

5.1.2 Questions

5.1.2.1 Company name

Type	Short answer
Mandatory	yes

5.1.2.2   What is your role in the materials science and innovation field?

Type	Dropdown
Mandatory	yes
Options	1. Research Scientist 2. Process Engineer 3. Product Designer 4. Material Chemist 5. Polymer Synthesizer 6. Material Characterization Specialist 7. Regulatory Compliance Officer 8. Quality Control Specialist 9. Supply Chain Manager 10. Sales and Marketing Professional 11. Business Development Manager 12. Project Manager 13. Consultant 14. Academician 15. Student/Research Assistant 16. Other

5.1.2.3   How important is sustainability in your work?

Type	Linear scale
Mandatory	yes
Scale	1 to 5 (Not important – Very important)

5.1.2.4   What kind of information do you typically need when designing new materials or products?

Type	Long answer
Mandatory	no

5.1.2.5   Have you used digital tools to assist in material design before ?

Type	Multiple choice
Mandatory	Yes
Options	1. Yes 2. No

5.1.2.6   If so, what were they and what did you like or dislike about them?

Type	Long answer
Mandatory	no

5.1.2.7   How important is the ability to compare and evaluate different materials or products based on their environmental and social impacts?

Type	Linear scale
Mandatory	yes
Scale	1 to 5 (Not important – Very important)

5.1.2.8 How important is it to have a user-friendly interface for navigating the SURPASS digital infrastructure?

Type	Linear scale
Mandatory	yes
Scale	1 to 5 (Not important – Very important)

5.1.2.9 How important is it for the SURPASS digital infrastructure to be accessible from multiple devices (e.g. desktop computers, tablets, smartphones)?

Type	Linear scale
Mandatory	yes
Scale	1 to 5 (Not important – Very important)

5.1.2.10 How important is it for the SURPASS digital infrastructure to support multiple languages?

Type	Linear scale
Mandatory	yes
Scale	1 to 5 (Not important – Very important)

5.1.2.11 How important is it for the SURPASS digital infrastructure to provide a scoring system for comparing the safety and sustainability of different polymers?

Type	Linear scale
Mandatory	yes
Scale	1 to 5 (Not important – Very important)

5.1.2.12 How important is it for the SURPASS digital infrastructure to provide guidance on how to design safer and more sustainable polymeric products?

Type	Linear scale
Mandatory	yes
Scale	1 to 5 (Not important – Very important)

5.1.2.13 How important is it for the SURPASS digital infrastructure to provide information on the economic feasibility of using different polymers in products?

Type	Linear scale
Mandatory	yes
Scale	1 to 5 (Not important – Very important)

5.1.2.14 Which of the following types of guidance would be most helpful when using the SURPASS digital infrastructure?

Type	Multiple choice
Mandatory	Yes
Options	1. Step-by-step instructions 2. Examples of best practices 3. Video tutorials 4. Other…

5.1.2.15 What types of outputs would be most useful to you when using the SURPASS digital infrastructure?

Type	Multiple choice
Mandatory	Yes
Options	1. Simple scoring systems 2. Detailed reports 3. Graphical visualizations 4. Other…

5.1.2.16 Are there any particular features or functions you would like to see included in a digital infrastructure for SSRbD materials design?

Type	Long answer
Mandatory	no

5.1.2.17 Are there any other suggestions or feedback you would like to share regarding the development of the SURPASS digital infrastructure?

Type	Long answer
Mandatory	no