D2.2.1 – Open Innovation Tools

Date of Report: 15/04/2025

Document Control Sheet

Work package Number	2
Work package Title	Transnational GREEN 4.0 Open Knowledge HUB for Digital transformation
Activity Number	2.2
Activity Title	Open Innovation Capacity Building Toolkit
Deliverable Number	2.2.1
Deliverable Title	Open Innovation Tools
Dissemination level	Confidential, only for members of the consortium
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Contributors	All partners
Quality Assurance	All partners

Versioning and Contribution History

Version	Date	Author/Editor /Reviewer	Contributors	Description/Comments
_D01	14/01/2025	Elena Mossali (PP7)	-	Table of Content & first draft
_D02	23/01/2025	Urszula Woźniak, Kacper Miodoński, Marcin Wilk (PP8)	Sarah Vidmar (LP)	Integration of the report on Open Innovation Tools – Expert Forum
_D03	28/01/2025	Maja Sušec (LP)	-	Integration of the report on Open Innovation Tools – Green Transition Playbook
_D04	07/02/2025	Tomáš Siviček (PP5)	-	Integration of the report on Open Innovation Tools – Business Model Generator
_D05	21/03/2025	All partners	-	Review of the final document
_D06	10/04/2025	EAB	-	Approval from EAB
_D1	15/04/2025	Elena Mossali (PP7)	-	Final version to be submitted
Due date of deliverable	15/04/2025			

Contents

Executive summary

The GREENE 4.0 project is dedicated to facilitating and supporting small and medium-sized enterprises (SMEs) in the manufacturing sector in adopting green production methods and leveraging digital technologies. Work Package 2 (WP2) focuses on creating solutions to address identified challenges while connecting these solutions with existing innovations. The ultimate goal is to build a robust innovation ecosystem that empowers SMEs to embrace sustainable practices. WP2 also serves as the foundation for the Transnational Open Knowledge Box, a repository of tools designed to foster innovation and capacity building.

The purpose of this document is designing an open innovation toolkit that will support green and digital transition of SMEs. Particularly, this Deliverable provides an overview on the GREENE 4.0 actions and developed tools during Period 3-4 for the *Activity 2.2 "Open Innovation Capacity Building Toolkit"*.

The activity began with the consortium identifying and selecting three tools to assist GREENE stakeholders in adopting green and digital technologies within their organizations. These tools will be integrated into the B2GreenHub platform. To manage and facilitate the development of these tools, three Joint Working Groups were established, each focusing on a specific area:

- Joint Working Group 1 – Green Transition Playbook (led by LP)
- Joint Working Group 2 – Expert Forum (led by PP8)
- Joint Working Group 3 – Business Model Generator (led by PP5).

In this phase partners aligned on the scope of the activity as well as on the templates created by the JWG leaders to ensure an effective and efficient mapping. Then, the identified tools were evaluated according to a specific assessment scale in order to select the best ones to be implemented within the B2GreenHub platform. Finally, a description of the possible implementation, integration and/or visualization in the platform was created. Finally, all the developed tools were also validated by the External Advisory Board (EAB). These tools act as a basis for the digital and green transition of SMEs towards a more competitive and resilient European industrial ecosystem.

The work reported in this deliverable is strongly connected to WP1, leveraging the identified gaps and barriers during the Activity 1.1. Furthermore, it will be the baseline for Activity 3.5 in WP3 concerning the development of the GREENE 4.0 innovation platform by aggregating the open knowledge box toolkit with new value chains models and with innovation program methodologies

1. Introduction

1.1 Project Overview

The GREENE 4.0 project aims at facilitating and supporting small and medium-sized enterprises (SMEs) in the manufacturing sector in the adoption and use of green production methods and digital technologies. GREENE 4.0 innovative approach is based on the capitalization of existing knowledge, solutions and outputs focused on smart and green manufacturing. The main objectives of the project are:

1. The design, testing and **deployment of a user acceptance model** for improving SMEs capacities and willingness to adopt digital technologies and green business models.

2. The **aggregation and integration of existing regional infrastructure** of labs, testbeds, living labs, prototyping, and testing facilities in Transnational Digital Transformation Sites. They will be involved in the co-creation approach and will apply the project's open knowledge box toolkit, which is capable of generating new integrated value chains in 7 pre-defined manufacturing sectorial clusters.

3. The creation of the **GREENE 4.0 innovation platform** by aggregating the open knowledge box toolkit with new value chains models and with innovation program methodologies as well as upgrading the tools and functionality of the existing digital platform PRO.Net.

4. **The engagement** of large and SME manufacturing companies (solution seekers) with IT and green tech SMEs (solutions developers), and with private equity investors in joint co-creation processes to promote industrial twin transition.

5. The set up of a **Policy Learning Centre** to develop Regional Actions Plans for putting into practice the transnational strategy vision and framework for learning, transferring and replicating GREEN 4.0 innovation platform with its entire capabilities, services and tools.

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1.2 Scope of the Document

This document reports the work of A2.2 "Open Innovation Capacity Building Toolkit", where IMECH/PP7, in joint cooperation with LP, PP5 and PP8 as JWG leaders, ran virtual meetings to distribute their experts in three joint working groups (JWG) that worked on designing the open innovation toolkit, establishing the working plan and milestones. Partners' experts analysed the most relevant open innovation approaches, their strengths, and weaknesses, and, using a defined assessment scale, selected 3 open innovation tools to be reviewed and discussed during the Transnational Design Thinking Camps (TDTC). The final developed toolkit has been then validated by EAB.

The final outcomes of A2.2 are reported in the present document and are: i) the creation of three joint working groups working on a Green Transition Playbook, an Expert Forum and a Business Model Generator , ii) the analysis and assessment of available tools and methodologies to identify strengths and weaknesses, and iii) the development of three tools to be then implemented in the B2GreenHub platform.

According to this, D2.2.1 "Open Innovation Tools" is divided into different sections:

- *Chapter 1 – Introduction*, explaining the project and the scope of the deliverable
- *Chapter 2 – Joint Working Groups*, describing the objectives for each JWG, its participants and the managements of activities in terms of periodical meetings and the Transnational Design Thinking Camp
- *Chapter 3 – Exploration Process*, where each partner lists and analyses the available tools and methodologies to take inspiration
- *Chapter 4 – Tools Assessment and Selection*, highlighting the evaluation process for each tool and the selection of the best ones to be adapted and integrated in the GREENE4.0 project
- *Chapter 5 – Implementation and Validation*, reporting the main features of the developed tools and their integration in the B2GreenHub platform
- *Conclusion*
- *Annex*

1.3 Audience

This document is meant to contribute to the GREENE4.0 project Output 2.1 "Transnational Open Knowledge Box", the interactive digital toolkit composed of open innovation maps, open innovation tools and private equity investment readiness tool, integrated as a dedicated section in the B2GreenHub platform. The document represents a formal report to be submitted to JEMS for the validation of project activities. The document is intended to be confidential, only reserved to consortium members.

1.4 Change control

IMECH/PP7 created this document, and it is subject to the standard project change control where PPs are requested to provide feedback on the stated definition or tools in writing to the deliverable responsible in a timely manner.

2. Joint Working Groups

The activity began with the consortium identifying and selecting three tools to assist GREENE stakeholders in adopting green and digital technologies within their organizations. These tools will be integrated into the B2GreenHub platform free of charge. The B2GreenHub ecosystem provides services through an alliance of numerous EU institutions, supported by a dedicated team of business professionals and technical experts collaborating across multiple EU-funded projects.

To manage and facilitate the development of these tools, three Joint Working Groups were established, each focusing on a specific area:

- **Joint Working Group 1 – Comprehensive sustainability programme (led by LP)**
  The objective is to provide manufacturing SMEs with a free suite of guides, tools, and templates and a step-by-step roadmap to integrate sustainability practices in their operations and to help teams and organizations create a comprehensive sustainability program

- **Joint Working Group 2 – Expert Forum (led by PP8)**
  The primary objective of Joint Working Group 2 (JWG 2) was to develop a mock-up of the Expert Forum, a tool to be integrated into the B2GreenHub platform. This tool facilitates interaction with specialists from diverse fields, offering personalized advice and support.

- **Joint Working Group 3 – Business Model Generator (led by PP5)**
  A Business Model Generator is a tool or framework designed to assist companies in creating, analysing, and refining their business models. It leverages various methodologies, such as the Business Model Canvas, to help organizations visualize, innovate, and optimize their business strategies. The objective is to create a tool able to facilitate brainstorming, collaboration, and strategic planning by providing a structured approach to identifying key components of a business model, including value propositions, customer segments, revenue streams, and cost structures.

As the first step, an online meeting was organized to establish the three Joint Working Groups (JWGs). The purpose of this meeting was to design the Open Innovation Toolkit, define a working plan, and set clear milestones. In alignment with the defined operational protocols, one representative from each partner organization was designated to participate in each JWG. This approach ensured the integration of multidisciplinary expertise and maintained a balanced distribution of contributions throughout the development process (Table 1).

Table 1: participants for each Joint Working Group.

PP	JWG 1	JWG 2	JWG 3
LP	**Maja Sušec** **Leader**	Sarah Vidmar	Borut Zrim
PP2	Michael Paduch	Bastian Hothas	Bastian Hothas
PP3	Selina-Maria Schiller	Mario Situm	Karin Steiner & Selina-Maria Schiller
PP4	Maruška Nardoni & Catalin Ilie	Maruška Nardoni	Maruška Nardoni & Catalin Ilie
PP5	Eliška Nacházelová/Jánská Michaela	Alice Reissová	**Tomáš Siviček** **Leader**
PP6	Antonín Štefan	Antonin Štefan	Štěpánka Portz

PP7	Elena Mossali	Annalisa Giavarini	Andrea Jester
PP8	Kacper Miodoński	**Urszula Woźniak** **Leader**	Marcin Wilk
PP9	Oliver Schiffer	Oliver Schiffer	Oliver Schiffer

2.1 JWG Management

The development process for the three Joint Working Groups was multifaceted and included the following steps:

- **Group Creation** – establishing the working group responsible for the tool's development

- **Kick-Off Meeting** – aligning objectives and planning the project scope

- **Exploration Process** – identifying existing tools and exploring user needs

- **Assessment and Selection Process** – evaluating and selecting the most suitable features and functionalities

- **Design and Creation of the tool Mock-up and supporting documents** – developing a visual and functional representation of the tool

A continuous collaboration among partners ensured a proper evaluation of the progress and an early identification of any critical issues, so that partners were able to apply the related mitigation action. This periodical alignment has been done through dedicated online meetings, physical workshops and emails, where common material and templates were shared and explained. Furthermore, dedicated folders for each JWGs were created to collect and store the produced materials.

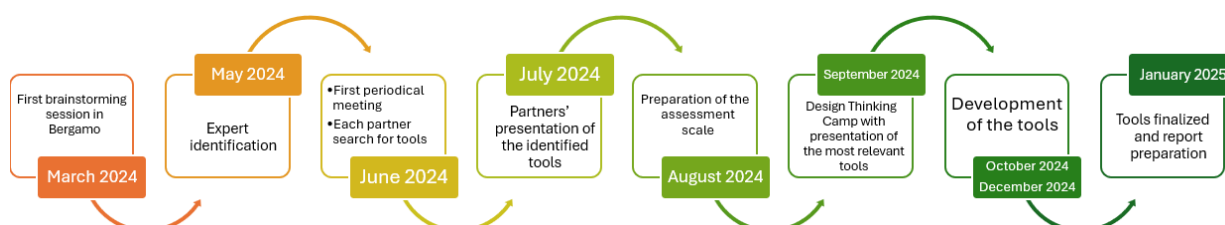According to this, the activities timeline is reported in Figure 1.

Figure 1: timeline of the JWGs activities to develop the Open Innovation toolkit.

2.1.1 Periodical meetings

Periodical meetings have been organized for each JWG with the objective of sharing with all partners the main achievements of the period, engaging the proper people and planning the following activities, clearly defining the tasks and the individual responsibilities. Then, JWG leaders updated each other to ensure a proper alignment and to share critical issues and successfully implemented methodologies, to find a solution together or to promote the transfer of these methodologies also to other JWGs.

In

Table 2, all the periodical meetings are reported, highlighting the main goal.

Table 2: JWGs periodical meetings.

JWG 1	JWG 2	JWG 3
06/06/2024 Online kick-off meeting **Goal:** brainstorming session and selection of open innovation tool to be developed	17/05/2024 Online kick-off meeting	24/05/2024 Online kick-off meeting
24/07/2024 Online meeting **Goal**: Identification of existing tools and presentation of the identified tools	23/10/2024 Online meeting **Goal**: guidance for IT team to develop the tool.	22/08/2024 Online meeting **Goal**: checking the results mapping, short discussion on corrections, preparation for Portorož.
15/10/2024 Online meeting **Goal**: Assessment and selection of the most appropriate tool	06/11/2024 Online meeting **Goal**: main functionalities to be included in the tool.	27/08/2024 Online meeting **Goal**: presentation of the tools, their strengths and weaknesses.
06/11/2024 Online meeting **Goal**: Upgrading the chosen tool: Division of work among for partners	05/12/2024 Online meeting **Goal**: draft presentation of the Expert Forum tool.	18/12/2024 Online meeting **Goal**: Decision on the core tool to be reviewed and upgraded; recommendations for improvements and design.
13/01/2025 Online meeting **Goal**: Presentation of updated documents and templates (How to guides , etc) to be included on the platform		
28/08/2024 Online meeting among JWG coordinators for the preparation of TDCT		
06/09/2024 TDCT - See 2.1.2		

During the periodical meetings, several digital instruments, such as the MIRO platform, were used to enable each partner to actively contribute and provide their input regarding the development of GREENE 4.0 Capacity Building Tools. The reported example (Figure 2) was the kick-off meeting of JWG2, where partners collaboratively addressed the following key questions:

1. What is the Expert Forum?
2. What elements and functionalities should the tool include?
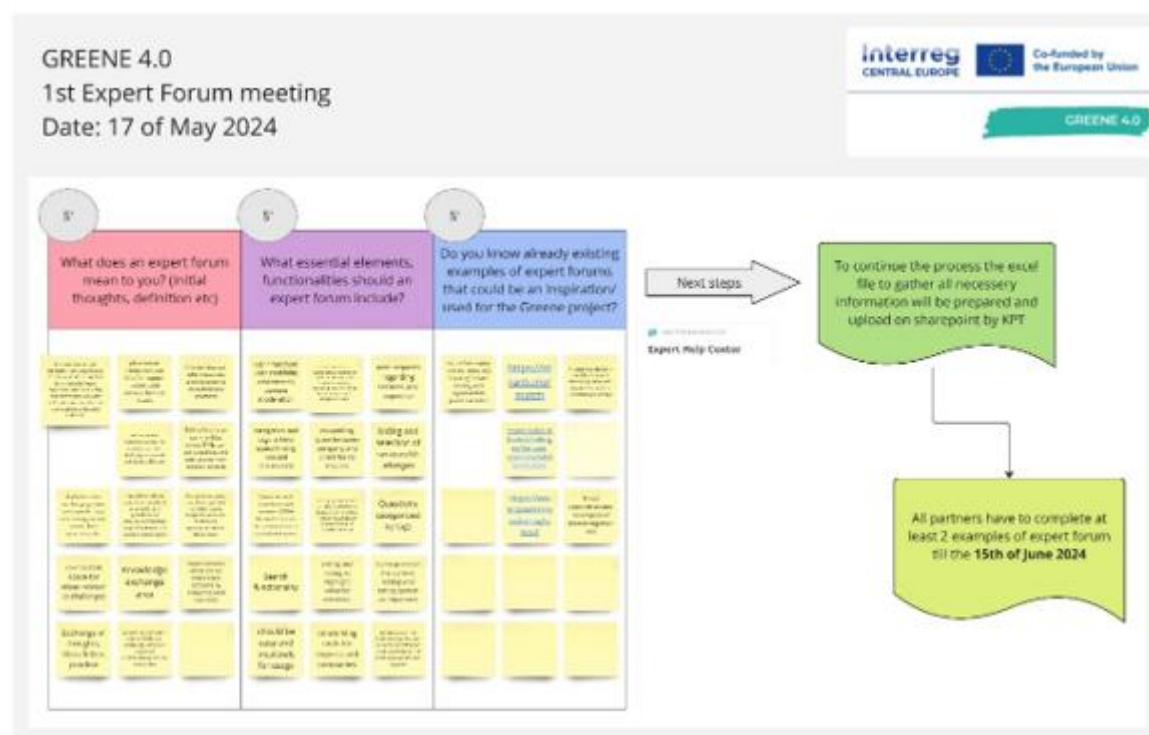3. Are there any existing examples of similar tools you are aware of?
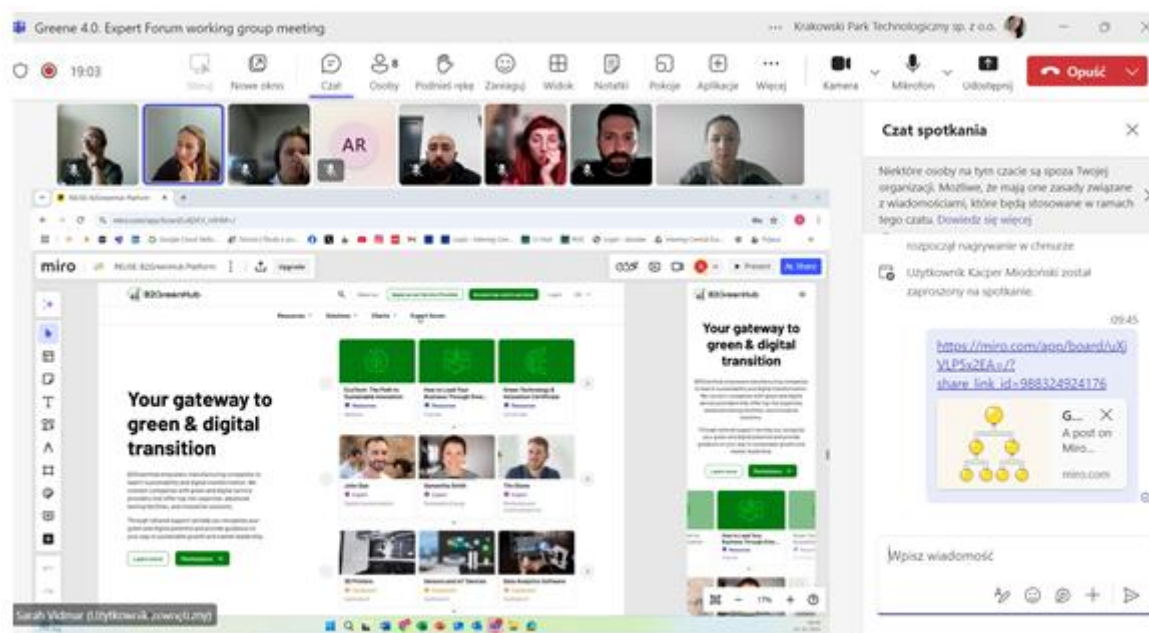
Figure 2: participants and use of interactive tools during the kick-off meeting of JWG2.

2.1.2 Transnational Design Thinking Camp (TDCT)

As reported in the Application Form, the development of the 3 Open Innovation tools was reviewed and discussed in Transnational Design Thinking Camps (TDTC) and physical workshops involving all partners. These camps were organized by the JWG leaders: LP, PP5 and PP8.

TDTCs were held in Portorož in Slovenia on the 6th of September 2024. The workshop focused on advancing and refining innovation tools under Activity A2.2: Open Innovation Capacity Building Toolkit, specifically the Comprehensive Sustainability Programme (JWG1), Expert Forum (JWG2), and

Business Model Generator (JWG3). At the meeting in Portorož, it was agreed that all tools from the three working groups would be presented to all project partners, regardless of their specific working group participation. This decision ensures that every partner is familiar with the baseline of each tool. During the workshop, each project partner introduced selected open innovation tools, offering diverse perspectives and establishing a foundation for further tool development within the project. However, as the partners progressed through the discussions, they recognized that the tools were too complex to fully understand and evaluate during the session. The presentation phase included shortlisted tools from each JWG. As a result, it was decided to postpone the assessments to the following weeks, allowing for a more thorough review. The workshop concluded with a brainstorming session, encouraging collaborative discussions aimed at refining and enhancing the tools for better impact.

The agenda of the TDTC is reported in Table 3, while Figure 3, Figure 4 and Figure 5 are pictures of the event.

Table 3: Transnational Design Thinking Camp Agenda

AGENDA		
Time	*Activity*	*Speaker*
13:20-14:30	*Presentation of selected open innovation tools by each PP*	*All project partners*
14:30-15:00	*Brainstorming session of further improvement*	*All project partners*

Figure 3: JWG1 Tool Presentation.

Figure 4: JWG2 Tool Presentation

Figure 5: JWG3 Tool Presentation

JWG1, JWG2 and JWG3 presented the selected 11 tools aimed at contributing to the Comprehensive sustainability programme, the Expert Forum and the Business Model Generator. However, as discussions progressed, it became clear that the complexity of the tools prevented comprehensive evaluation during the session. To address this, participants decided to postpone the assessment process to subsequent weeks, allowing for more in-depth reviews.

The workshop concluded with a **collaborative brainstorming session**, encouraging partners to refine and enhance the tools. This final activity aimed to optimize the tools' design and functionality, ensuring they would have a greater impact as the project advanced.

3. Exploration Process

The exploration process was initiated with the objective of identifying existing open innovation tools and methodologies. This step involved the analysis of these tools to evaluate their strengths and weaknesses. Each partner was tasked with selecting and reviewing 2-3 tools for each JWG as part of this process.

3.1 Identified tools and methodologies

In order to collect the same information on the tools from all the partners, an Excel collection template was created and shared with the GREENE4.0 consortium. Thus, once partners identified two interesting tools for each JWG, they reported the main data and features on the table, making the comparison and the following selection easier. The Excel template contained the following information:

- Project partner proposing the tool

- Name of the tool

- Owner of the tool (to discuss the possibility to partially reuse or rework it)

- Short description (to highlight the main features that could be interesting for the GREENE4.0 tool to be developed)

- Transition area covered by the tool (energy efficiency, waste management, etc.)

- Maturity level of the tool

- If the tool is just an assessment or proposes concrete actions to be performed by the companies in order to promote an effective green transition

- Year of creation

- If it is an interactive digital tool or just a theoretical model and/or playbook

- Possible further developments to be integrated into the tool by GREENE4.0 partners to make it more effective, industrially attractive and complete in terms of areas and sectors

- The link of the tool

3.1.1 JWG1 analysis

Joint Working Group 1 was established to facilitate the structured development of a comprehensive sustainability programme for SMEs. During its kick-off meeting, which was held online on the 6th of May 2024 (Figure 6), Maja Sušec (PTP) presented the definition and objectives of the Green Transition Playbook / Sustainability programme, along with the methodologies and processes to guide its development. The alignment among partners on the type of tools to be searched was fundamental to ensure an efficient process.

Figure 6: JWG1 Kick-off Meeting (online)

In particular, following the introduction, partners engaged in a joint brainstorming session to collectively discuss:

- The definition of such a programme

- Key elements and functionalities that the examples should include.

- Existing examples of similar tools that JWG members might already be familiar with.

The primary task of the JWG was to define and explore existing Green Transition Playbooks and Sustainability programmes that incorporated comprehensive assessments and actionable plans. This exploration process was initiated during the meeting, focusing on identifying open innovation tools and methodologies with robust assessments and action plans. The subsequent step involved analysing these tools to evaluate their strengths and weaknesses.

As previously mentioned, each partner was assigned the task of selecting and reviewing 2–3 Comprehensive sustainability programme tools. Collectively, the JWG identified and evaluated **21 different tools**, which are listed in the table below.

Table 4: JWG 1 Exploration Phase Results

Tool	Description	Tool Functionalities
Sustainability Assessment Tool and Sustainability Action Plan	The manufacturing SME sustainability transformation pathway starts by evaluating the SMEs' degree of awareness and maturity regarding sustainability to finally identify sustainability related hotspots. This sustainability assessment is developed through the greenSME Sustainability Assessment Tool (SAT). Then, the responses of the SAT are used within the Advanced Sustainability Action Plan (ASAP) method with a scoring system to develop actions. The aim of the ASAP method is to provide elements for a roadmap for technological upgrading of a company to support environmental and social sustainability.	Digital tool It involves an Action plan
The 1.5°C Business Playbook	This is a handbook for CEOs, board members, business leaders and employees who want to engage in the fastest economic transition in history – and help accelerate it. They have developed it for companies and organisations of all sizes that want to align with the 1.5°C	Digital tool It involves an Action plan

	ambition through concrete action. It contains solid guidelines for setting climate targets, strategies, transition plans, taking action and disclosing results.	
The Circular Built Environment Playbook	Through the publication of The Circular Built Environment Playbook, the WorldGBC network aspires to increase awareness and accessibility of circular economy solutions, by guiding all stakeholders within the built environment value chain towards sustainable, circular decision-making. Through this work the global network is driving action towards our guiding goals for resource efficiency and circularity: "A built environment that facilitates the regeneration of resources and natural systems, whilst providing socio-economic benefits through a circular economy."	Theoretical The tool propose concrete actions to be taken by company to transition to next maturity level
Sme Climate Hub Action Guides	The SME Climate Hub Action Guides outline how SMEs can take action to reduce their emissions. The guides are linked to the different categories in the SME Reporting Tool and provide concrete steps to address the majority of emissions across all scopes.	Theoretical The tool propose concrete actions to be taken by company to transition to next maturity level
Handbook For Business Model Transformation	The handbook is the result of the EFRE-project "Lower Carbon Lower Carinthia (LOCA2) Transformation" aiming to support SMEs in achieving climate-friendly business objectives. The handbook provides an overview of a study on transformation barriers, example measures in three key technological areas, emission overviews in selected industries and economic evaluations for future investment and funding needs. It also gives specific action guidelines for the transformation process from creating a company vision to changing the business model.	Theoretical It presents action guidelines for the transformation process, including methods and tools that can be quickly applied by the company itself (see chapter 3 - Leitfaden). It also includes examples of successful companies and "Good Practices" for inspiration.
Mba Toolbox Sustainability Management	Collection of 20 tools that sustainability managers can use to tackle the necessary transformation. The collection contains three major categories: Tools - Practice – Expert. In addition, the tools are clustered for a quicker overview of the area of application: Analysis (1-6), Implementation (7-14), Communication (15-20).	Theoretical
Energy Transitions Playbook	A guide designed to help communities navigate the process of transitioning to clean and resilient energy systems. It outlines a seven-phase framework that includes key actions, resources and case studies for each phase of the transition. The Playbook provides practical tools such as worksheets, templates and downloadable PDFs.	Theoretical It provides detailed steps, resources and case studies tailored to each phase of the energy transition, helping to identify and implement specific actions.
Green Courier	The Green Courier offers a Strategic Planning Green Framework TOOLBOX. The TOOLBOX represents the Couriers Go Green methodology implemented into a multi-component platform for target companies, specifically courier, postal, and delivery service providers, to develop and review their green strategy. Users of this app include environmentally conscious individuals and businesses seeking eco-friendly courier services, as well as couriers committed to reducing their carbon footprint in package deliveries. Intended for CEOs, Managers, Directors, Environmental Officers and Operations Managers. Besides, the Green Courier website offers 'Measure my Green Readiness' digital assessment tool, a e-Training course and Professional Certification.	Theoretical Phase 1: Assessment of the green status of the company/ organization. It contains 3 actionable steps. Phase 2: Design of the Green Strategy. It contains 4 actionable steps Phase 3: Development of the Implementation. It contains 4 actionable steps.
The Toolbox	The Toolbox is a free suite of guides, tools, and templates housed within an eight-step process to help organizations create a comprehensive sustainability program. The Toolbox currently has more than 600 members, offer more than 50 free resources and a	Theoretical A set of 8 How-To Guides provide a step-by-step process for implementing a sustainability program within various

	community across 100 countries with its members working in 75 different sectors. The app is available in 4 languages (English, French, Spanish and Portuguese). For more advanced support in implementing the sustainability programme, the Toolbox Accelerator Programme can help.	organizations. These 8 How-To Guides are called Modules (1. Start a Sustainability Program; 2. Create a Policy; 3. Engage Stakeholders; 4. Identify Issues; 5. Set Targets; 6. Plan and Implement; 7. Assess Progress; 8. Report and Communicate). The Modules come with a number of concrete steps.
Circular Economy Business Models For The Manufacturing Industry	This is a practical guide that provides insight, examples and hands-on tools to help business transition to the circular economy. It is aimed at companies that want to differentiate themselves from their competitors, respond better to the needs of customers and other stakeholders as well as create more value with fewer resources. It specifically addresses companies that want to better meet customer expectations and deliver customer outcomes. It enables outcome-oriented solutions and new levels of efficiency through technology and digitalisation and it improves resource utilisation and mitigate risk from regulatory, investor and societal pressures.	Digital tool (app) Providing a blueprint of a transformation journey for companies to achieve circular advantage.
How To Develop A Small Business Sustainability Plan	It supports the creation of a sustainability plan for a small business will improve a company's bottom line, both in the traditional and environmental sense. It allows cost savings, risk reduction, positive brand association, environmental and public health improvements. It increases the ability to meet demand for environmentally friendly products and services, outweighing the cost of the initial integration of sustainability initiatives.	Digital tool It includes the steps to corporate sustainability.
Green Business Framework	This framework provides a structured approach for businesses to integrate green practices into their operations. It includes guidelines and checklists for improving energy efficiency, reducing waste, and implementing renewable energy solutions.	Theoretical It includes the steps to corporate sustainability.
Circular Economy Implementation Guide	A comprehensive guide to help businesses implement circular economy practices, focusing on reducing waste and enhancing resource efficiency.	Theoretical Each level includes a set of actionable steps.
Sustainability The Self-Assessment And Orientation Tool For Companies	SUSTAINability tool supports companies in: i) assessing the sustainability level of its processes and production activities with a view to their progressive improvement; ii) identifying intervention priorities and possible operational solutions in order to have better control of company risks; iii) improving external communication to inform customers and stakeholders regarding any action implemented to achieve more sustainable production processes.	Digital tool It provides detailed steps and strategies for circular economy implementation. A summary report summarizes the overall level of sustainability achieved by the company and synthetic operational tips are envisaged for the improvement of company's sustainability performance. The user will be able to refer to their contact Chamber of Commerce for assistance and guidance initiatives.
Circulytics	Circulytics is a framework of indicators for tracking circular economy performance. It allows companies to highlight successes in their transition and identify where to focus efforts for improvement in line with the three principles of a circular economy, all driven by design: eliminate waste and pollution, circulate products and materials, and regenerate nature. Circulytics platform is closed to submissions, but the resources are still available for organisations interested in using the	Theoretical Not available anymore: the original tool had several steps where industries received support in the definition of actions.

	indicators to support circular economy data collection and streamlining or harmonising measurement efforts.	
Basic Sustainability Assessment Tool	BSAT is a comprehensive, generic sustainability self-assessment tool. It can be used by any-size organization, in any sector, in any country. It may be especially helpful for small- and medium-sized enterprises (SMEs), and large organizations with minimal / no sustainability staff. It uses less than 20 multiple-choice questions to score the organization's sustainability performance.	Digital Presence of a set of general recommendations.
Sustainable Development Performance Indicators	The Sustainable Development Performance Indicators (SDPI) produced by UNRISD measure, in an authentic way, the sustainability performance of economic entities, including both for-profit enterprises and social and solidarity economy organizations. They assess impacts or performance against norms and thresholds that indicate a target consistent with the notion of sustainable development, as well as shed light on ignored or neglected issue areas within current measurement and reporting models.	
Carbon Trust Standard	The Carbon Trust Standard is a globally recognized certification that demonstrates an organization's commitment to sustainability through continuous improvement in carbon emissions reduction. It is designed to encourage businesses to measure, manage, and reduce their carbon footprints by adopting best practices in energy efficiency and carbon management.	Digital tool The Carbon Trust Standard involves a digital platform for data collection, carbon footprint measurement, and reporting. The certification process includes both digital assessment tools and on-site verification by Carbon Trust experts.
Gri Standards	The GRI Standards are a set of comprehensive, modular sustainability reporting standards used globally by organizations of all sizes and sectors. These standards provide a consistent framework for companies to report on their economic, environmental, and social impacts, helping them to improve transparency, accountability, and sustainability performance.	Theoretical While the GRI Standards focus on reporting and transparency, they encourage companies to perform materiality assessments to identify key sustainability issues. The process of reporting and stakeholder engagement often reveals areas for improvement and action. However, GRI Standards primarily serve as a framework for reporting rather than a prescriptive action-oriented tool.
B Impact	B Impact Assessment (BIA) is a free online tool that helps companies measure their overall impact on workers, community, environment, and customers. It forms part of the certification process for B Corp certification, evaluating companies on their social and environmental performance.	Digital tool BIA provides actionable steps to help companies improve their score and transition to the next level of maturity, with specific focus areas based on company size, industry, and location.
Ecovadis	EcoVadis provides a comprehensive sustainability rating platform assessing companies on their environmental, social, and governance (ESG) practices. It evaluates sustainability performance across global supply chains and assigns ratings based on a company's commitments to sustainable practices.	Digital tool EcoVadis provides companies with a detailed scorecard and actionable recommendations on how to improve sustainability performance and move to the next maturity level.

This comprehensive inventory served as the foundation for identifying and refining the functionalities required for the Green Transition Playbook. Following an in-depth review of these tools, PTP, as the group leader, advanced the assessment process by consolidating partner contributions and shortlisting 11 tools for the next stage of development.

3.1.2 JWG2 analysis

Also for JWG2, by the end of the exploration phase, the partners collectively identified and evaluated **23 different tools**, that served as the foundation for selecting and refining functionalities for the Expert Forum tool. The preliminary identified tools are reported in Table 5.

Table 5: JWG 1 Exploration Phase Results

Tool	Description	Tool Functionalities
The Green Forum	Online platform dedicated to environmental and sustainability issues. The site brings together people interested in environmental protection, offering a space for discussion, knowledge exchange and experience. Users can access educational resources, the latest research and innovations in the field of ecology.	The site includes discussion forums, articles, educational resources and tools to support knowledge sharing on sustainability and environmental protection.
FundingBox	Online platform dedicated to fostering innovation and technological development, offering access to a wide range of grants and public funding for startups and emerging companies. It allows users to network within a global community of entrepreneurs to foster knowledge and experience sharing. The platform also provides educational resources such as workshops and webinars that target the skills needed for successful fundraising and project management. Accelerator programs are also available to accelerate business growth through mentoring, expert support and access to specialized resources.	Users have access to a community, workshops, tools and resources needed to develop projects and raise funding. The platform also offers accelerator programs to help scale businesses and accelerate innovation.
Mighty	Platform designed to help users build and manage their own online communities. It provides tools to create spaces where you can offer courses, memberships, and interactive challenges, all within one integrated system. The platform emphasizes member engagement and offers customization features to tailor the community experience.	Creation and management of online communities, offering tools for running courses, managing memberships and organizing events. The platform also allows users to create groups, conduct surveys, and provides a mobile app for easier access and interaction.
Circle	Comprehensive online community platform designed to build, manage and engage communities under one brand. It enables discussions, events, courses and other content, offering features such as live broadcasts, group chats and private messaging. The platform is highly regarded for its extensive e-learning and digital product marketing features, making it a great tool for creators and brands. In addition, Circle allows integration with various third-party tools, making it more versatile and easier to manage communities.	Spaces (Ability to create dedicated spaces for different groups or topics within the community). Discussion and forums , Live streaming
ResearchGate	Social platform aimed at scientists and researchers to share knowledge, research results and publications. Users can network, ask questions and receive answers from other experts in their field, which promotes scientific development. The platform offers tools for analysing scientific impact, tracking citations and publication statistics. ResearchGate also promotes open access to scientific content, making research more accessible and visible worldwide.	Publications, Science Network, Q&A, Statistics and metrics, Projects, Recommendations, Open access options.
LinkedIn	Global social networking platform focused on professional life and business that connects professionals across industries. It allows users to create and share their professional profiles, which	Newsgroups, Company websites, Professional networking, News and industry articles, Online courses and trainings

	include information about their work experience, skills and achievements. LinkedIn also serves as a tool for making new professional contacts, searching for job opportunities and recruiting employees. The platform offers a rich set of tools for companies, such as company pages, ads and analytics tools to help promote and manage the brand. In addition, LinkedIn Learning offers courses and training to help users develop the skills needed in the rapidly changing job market.	
Quora	Social platform that allows users to ask and answer questions. It is characterized by combining aspects of a social network and a knowledge base, offering a space to share knowledge on a variety of topics. Users can both answer questions and rate others' answers, allowing the most valuable content to emerge.	Analytics for authors, User blogs, Questions and answers
Stack Exchange	A network of Q&A websites on various topics where experts provide answers to questions. The network consists of various communities that cover a broad range of topics, some of which are highly relevant to business and entrepreneurship.	Free expert opinions, active user community, tagging and categorization, voting system for answers, credibility assessment through user reputation scores, content moderation.
GrowthHackers Community	A place to learn with other community members and exchange experiences. The site is a community where people discuss growth, marketing, and experimentation. Members share what works, connect with peers, and stay updated on industry events. It's moderated to ensure discussions stay focused and valuable.	Active user community, moderation of discussions and content, log in function, voting system (scores).
Clarity.fm	Platform that connects entrepreneurs and professionals with industry experts through one-on-one phone consultations. Users can search for experts in various fields, schedule calls, and pay by the minute for personalized advice on business strategy, marketing, finance, and more.	Expert directory and search, direct call booking and scheduling, and call management and review system.
JustAnswer	Online platform that connects users with verified experts across various fields for personalized advice. Users can ask questions in areas like law, medicine, technology, and automotive, and receive detailed answers from professionals. The service operates on a subscription or pay-per-question model.	Detailed expert search, by category or other distinguishing factors, live chat and messaging, either subscription or pay-per-question, available on both PC and smartphones.
AGORA	Platform dedicated to stakeholders in the manufacturing sector, to get in touch with like-minded people interested in different topics, including digital and green across Europe. It has over 3,000 members from 1,400+ organisations and 37 European countries.	Focus Areas: Digital & Collaborative Solutions for Innovative Manufacturing Ecosystems, Flexible Production Systems for Competitive Manufacturing, Human-machine Co-working for Socially Sustainable Manufacturing, Low Environmental Footprint Systems & Circular Economy for Green Manufacturing.
Ellen MacArthur Foundation	Pioneering global community committed to taking action to drive systemic change. It convenes businesses, policymakers, financial institutions and academia to empower the transition to a circular economy.	Articles, circular startup index, measurements and reporting, publications, teaching resources, case-studies, podcasts, videos.
Trendlabor	A tool to recognize trends, develop innovations, expand market leads. The trend lab is a tool for understanding the present and successfully shaping the future of companies.	Dashboard for each cluster about messages, news, changes on the platform, etc. Innovation compass that shows chosen innovation within the cluster/sector (globally). Cluster innovation like best-practices, so you

		can see innovation within the regional clusters. Information about global start-ups, new research, ...
OECD	The Organisation for Economic Co-operation and Development (OECD) is an international organisation that works to create better policies for better lives. Its main goal is to create policies that promote prosperity, equality, opportunity and well-being for all.	There are a number of sections, including digitalisation and green technologies.
BuildHub	A group of volunteers (the Forum Foundation Group) founded BuildHub in 2016, a non-profit, online community of self-builders and renovators who would learn from, share with, and support each other through the building process. The forum currently has 18670 members altogether and 2270 active ('most online') users.	The forum contains a strong subsection entitled 'Environmental, Alternative and Green Building Methods'. It offers events search bar, (create a) blog page, recent posts/topics sections, blog entries statistics, popular content list, it enables the user to like individual posts or wave to newly-joined users (digital interactions), etc.
WeADAPT	Dynamic, collaborative space for knowledge exchange on climate change adaptions issues. It is designed to facilitate learning, knowledge exchange and collaboration to build a growing community of research, policy and practice on adaptation issues while developing policy-relevant tools and guidance for adaptation planning and decision making. It bring together a dynamic, global community of more than 7,000 users and nearly 5,000 organisations, all involved in climate change adaptation, research, policy and practice.	Personalizing information according to the user's needs and interests increasing visibility of users' work (i.e., registered users can add articles, case studies, blogs and events) and fostering connections. Other options: 'Read in your Language', 'Go green' (nudging the users towards reduced energy consumption by switching to dark mode and choosing low quality images); 'Map of case studies' (the interactive map allows users to explore and filter content by location); 'Follow and message peers'; 'Learn offline'.
Tech Innovation Forum	Organized by Octane OC, a Southern California group boosting innovation and job creation in tech and Medtech sectors through resources, capital, and events.	It offers events and programs to connect and support tech and medical industry professionals, including conferences and networking opportunities.
Lux Research Advisory Services	Concise overview of the advisory services offered by Lux Research, which typically include insights into emerging technologies, market trends, and strategic advice for businesses.	Offers categorized discussions, expert insights, networking, exclusive reports, and tools for user engagement, focusing on emerging technology and market trends.
Reddit	Social news aggregation, web content rating, and discussion website. Registered members submit content to the site such as links, text posts, images, and videos, which are then voted up or down by other members.	Subreddits: Specialized communities within Reddit focused on specific topics (e.g., r/sustainability, r/smallbusiness). Profiles, karma points, commenting, search, notifications.
GreenBiz	Platform dedicated to advancing the opportunities at the intersection of business, technology, and sustainability. It provides news, resources, and forums for professionals interested in green business practices.	Articles, webinars, forums, resource library.
Green Forum	Online interactive community space for professionals to share and discuss insights in pursuing a sustainable economic transition. The forum includes global discussion and allows users to create dedicated groups focused on specific themes, initiatives, and projects.	There are four sections: discussions, groups, events and opportunities.
Expert Hub Linking Center	The Expert Hub Connectivity Centre offers a team of consultants made up of industry experts who are	Mapping the service competencies of advanced manufacturers in the

	passionate about their work and will provide their expertise in specific areas. The Expert Hub contributes to the development of export performance of services in Central Europe and beyond in line with the overall mission of the ProsperAMnet project.	participating Central European regions through the online tool Service Performance Monitor in order to find out how excellent a company is in the field of industrial services. Development of an innovative artificial intelligence tool, the Service Export Radar. Intensify the links between advanced manufacturing stakeholders in the Central European regions and to create a hub where all the links converge and are accessible to the public.

3.1.3 JWG3 analysis

Finally, Joint Working Group 3 was established to develop an upgraded Business Model Generator for manufacturing SMEs, to help them identify necessary changes in their current business models or to design new ones as a result of their progress in digital and green transformation. Also in this case, during the kick-off meeting, Tomáš Siviček (PP5) presented the definition and objectives of the Business Model Generator, along with the methodologies and processes to guide its development. In particular, partners engaged in a discussion about:

- Key elements and functionalities that the examples should include.

- Existing examples of similar tools with which JWG members might already be familiar.

The mapping process was initiated during the meeting, and the subsequent step involved describing and analysing these tools to evaluate their strengths and weaknesses. Each partner was assigned the task of selecting and reviewing two to three business model generation tools. Collectively, JWG 3 identified and evaluated **27 different tools**, which are listed in the table below.

Table 6: JWG 2 Exploration Phase Results

Tool	Description	Tool Functionalities
ConvoBoss	Convoboss provides an AI-powered Business Model Canvas generator. This tool requires you to answer a few questions about your business, and it then generates a customized business model canvas. The generated canvases can be integrated with popular productivity tools and downloaded in formats such as Google Docs, Slides, Sheets, Microsoft Word, PowerPoint, Excel, or PDF	AI-based. It can be downloaded in formats such as Google Docs, Slides, Sheets, Microsoft Word, PowerPoint, Excel, or PDF. Actionable tips and example templates for various industries.
Canvaniser	Canvaniser is an online tool designed to facilitate the creation and use of the Business Model Canvas, a strategic management template developed by Alexander Osterwalder. The tool allows users to brainstorm, visualize, and iterate on business ideas using various pre-structured canvas templates (there are more types of canvases).	Canvas templates, anyone with the link can access private canvases, revocable links, full login, PDF & PNG export, upload images, choose fonts, mobile editing & camera use, project workspaces, team progress & collaboration, languages: EN, ES, FR, IT, NL, PL, view modes, filters, sidenotes
VISME	The Visme AI Business Plan Generator simplifies the process of creating comprehensive business plans by utilizing AI technology. It provides users with customizable templates and tools to generate detailed business plans efficiently,	AI text generator, AI image generator, variety of images, data analytics and visualisation, third party integration

	ensuring professional and visually appealing results.	
Design for sustainability	Design for sustainable business-tool consists of a method for designing more sustainable business models, products, and services, and designing more sustainable operations. It is a self-reflection tool for the use of entrepreneurs, management teams, or product leaders. The tool is for virtual, knowledge-intensive, service-centric business models but anyone can use it. It is specifically developed to assist designing sustainability in remote work and services. It is nice, user-friendly, free (and still in development), part of Interreg project.	The tool has modules which means a user or a group of users can choose to focus on some activities of a business model, such as products or services, or an activity system or managing operations. The tool provides instant feedback and recommendations.
Business Model Navigator	The Business Model Navigator offers a comprehensive platform for exploring and innovating business models. It leverages an interactive database of over 100 case studies to inspire and guide users through the process of business model innovation. The platform emphasizes on user experience and impact assessment, helping businesses identify and implement successful models with an evidence-based approach.	Interactive database containing detailed case studies of successful business models (best-practices). Ideation tool to generate innovative business models. Business Model Patterns (60) to inspire and structure business model innovation. Workshop and Consulting Service.
Business Model Kit	The Business Model Kit is a visual tool designed to help teams ideate, refine and communicate business models effectively. It aids in mapping out value exchanges between stakeholders and ensuring sustainable business models. The tool is particularly useful for brainstorming new business ideas, aligning team understanding and comparing different revenue models during exploratory phases.	Visual Mapping to simplify complex business models through clear visual representations. Stakeholder Mapping. Workshops. Digital and Physical Versions.
Circular economy BM	The BMG by BMI Lab focuses on creating and realizing sustainable business models for the circular economy. It provides a systematic methodology, developed with the University of St. Gallen, to help businesses navigate and implement circular ecosystems effectively. It is designed to facilitate ideation, design and integration of circular models, emphasizing impact assessment, user experience and platform sustainability.	Circular Economy Pattern Cards (40 cards). Circular Navigator. Workshop and Webinars for education. Circular Canvas to visualize the circular value chain. Circular Intrapreneurship Program to build a community of innovators within companies.
Creatly	Creately is a web-based diagramming and collaboration tool that allows users to create flow charts, mind maps, organizational diagrams and more. It offers a wide selection of templates and an intuitive drag-and-drop interface. With support for real-time collaboration, Creately is ideal for teamwork and brainstorming sessions.	Creately offers features such as real-time collaboration, an intuitive drag-and-drop interface, an extensive template library, and integrations with other tools like Google Drive, Confluence and JIRA. It enables the creation of a variety of diagrams, mind maps and organizational charts, supporting effective teamwork and organization of ideas.
Strategyzer	Strategyzer is a comprehensive business strategy and innovation toolkit that includes tools such as Business Model Canvas and Value Proposition Canvas. It enables teams to visualize, analyse and transform business models and value propositions. Known for its	Strategyzer offers interactive canvases, step-by-step guides, real-time collaboration, an extensive resource library and integrations with other business tools.

	user-friendly interface and robust methodology, Strategyzer supports companies to effectively plan and execute business strategies.	It enables the creation and analysis of business models and value propositions, supporting teams in planning and implementing business strategies.
Bizagi Modeler	Bizagi Modeler is a business process modelling tool that enables the creation and optimization of process maps. Its intuitive interface makes it easy to visualize business processes, supports collaboration and provides detailed documentation. Bizagi Modeler is widely used to streamline and automate processes in organizations.	Bizagi Modeler offers process modelling, real-time collaboration, powerful export options, simulation capabilities and integration with Bizagi BPM Suite. The tool enables the creation of detailed process maps that support optimization and automation of business activities.
Mapovate	It is designed to visualize and analyse customer experiences, providing real-time feedback analytics to help businesses enhance their customer service. Key features include customizable notifications, a wizard for easy map creation, real-time reporting dashboards, and the ability to capture Voice of Customer (VOC) feedback.	Customizable Notifications and Alerts: Set alerts for follow-up actions. Wizard for Easy Map Creation: Step-by-step guide for creating maps. Real-Time Reporting Dashboard: Up-to-date customer interaction data. Integration Capabilities: Integrates with existing feedback systems. Learning Bank: Resource repository for journey mapping and customer experience. Customizable Reporting: Tailored reports for company goals. Customer Experience Measurement Tool: Measures and improves customer experiences.
Lucidchart	Lucidchart is an online diagramming and visual collaboration tool that helps users create flowcharts, organizational charts, network diagrams, mind maps, and more. It combines diagramming, data visualization, and collaboration, making it a powerful platform for teams to work together in real time.	Customizable Canvas, Collaboration Tools, Integration Capabilities, Data Linking and Visualization, Version Control and History, Templates and Examples
Sustainability Impact Canvas	The Sustainability Impact Canvas (SIC, download here) is a tool to incentive sustainable product- and business model design by helping designers to identify and optimise positive and negative effects of the respective business activities. The SIC forces designers to look at the positive as well as the negative impacts of their product or business idea, therefore generating the first input for a realistic impact assessment. It is structured along three levels, which take into account all potential impact categories at the technology level, the application level and the systems level.	Template and Cue Cards to focus on the sustainability principles.
Sustainable Business Model Canvas	The Sustainable Business Model Canvas includes several new fields related to the impact of the product and business model. By thinking about sustainability aspects from the start, users can maximise the sustainability impact and generate more innovative business models and products. At the same time, the Sustainable Business Model Canvas retains all the advantages of the classic BMC.	It can be used together with the Sustainability Impact Canvas. It is rather a simple to use non-editable canvas with instructions and a game with a clue-card for a team idea generation.

Digital Product Ethics Canvas	The Digital Product Ethics Canvas is a simple tool to help Product Managers, UX Designers or Information Architects to identify the risk of digital products to individuals and society. The Canvas helps raise awareness to these risks with the senior management, allows Canvas-users to apply measures to limit harm and serves as a first step to a risk and impact assessment of digital products. It can be used to assess the internal "impact" of digital technology adoption processes on employees.	It is a canvas, which is non-editable. However, it is easy to be used. It is rather complementary to other tools e.g. Sustainability Impact Canvas, Sustainability SWOT Analysis or more suitable Sustainable Business Model Canvas.
Sustainability SWOT Analysis	The Sustainability SWOT Analysis (sSWOT) helps companies assess environmental risks and to drive action on environmental challenges. It helps individuals to engage and motivate colleagues. The sSWOT is useful to work across internal departments as well as with suppliers, customers and other stakeholders to create long-term sustainable business value. The Sustainability SWOT addresses this problem by "wrapping" the classical SWOT into a triple-bottom-line context: it forces users to first identify environmental and social trends and challenges, and then conduct a triple-bottom-line SWOT analysis to prioritize concluded actions. This way, a classical tool with high recognition value but low apparent sustainability relevance has been "upgraded" to incentivise professionals to consider environmental and sociocultural issues and force them to include these issues when considering relevant actions to take.	It is a canvas, which is non-editable. However, it is easy to be used. It is rather complementary to other tools e.g. Sustainability Impact Canvas, Digital Product Ethics Canvas or more suitable Sustainable Business Model Canvas.
Sustainability Balanced Scorecard	The sBSC is a management system that can motivate breakthrough improvements in such critical areas as product, process, customer, and market development. Due to the ability of the sBSC to integrate different business and information perspectives, it is ideally suited to enable a mainstream business to approach the challenges of corporate sustainability.	It is a canvas in a pdf format. Easy to be used, but non-editable. It translates a company's strategic objectives into a coherent set of performance measures. It belongs to the set of tools (Sustainability SWOT Analysis, Sustainability Impact Canvas…).
Business Model Toolbox (Social Business Model Canvas)	The tool allows the selection of business model patterns, through the use of simple tools and the sharing of examples. It seems to be mostly aimed at beginners / people just starting to think about founding their own business.	"Inspiration box" for direct expert feedback on ideas. "Private expert coaching" for entrepreneurs with concrete concepts
Trello for Startups - business templates	It allows to choice among many different BM templates created by a community, which can be adjusted and expanded upon.	Trello as a whole has many functions that can facilitate interpersonal cooperation in a company, including when the company grows and projects and tasks become more complex.
Value Proposition Design	Value Proposition Canvas is a tool for marketing experts, product owners, and value creators. This method from the bestselling innovation book Value Proposition Design is applied in leading organizations and start-ups worldwide.	Book, Workshops, Master Class

30 Revenue model cards (B2B)	Moderated list of revenue model examples that will help to identify sustainable new revenue streams. Use it to challenge revenue streams you have already developed, or to come up with alternative money-making tactics. This toolkit is most effective if you have a new idea and you are wondering how you can make it profitable or if you've already developed your business & revenue model and would like to challenge your current revenue-building strategy.	30 Patterns of generating revenue and value, with business examples. Visualization of stakeholders
Digital Business Modelling	The tool collects different frameworks on how digital Business models work. It can help in defining an integrated approach for B2GreenHub.	Framework, Glossary, Canvas templates, Best Practices
Domont Consulting Digital Transformation Toolkit	The tools is very interactive, explanatory, and uses multiple templates - 700 editable PowerPoint slides, 35 excel sheets, 88 minutes of video training, and literature on: i) Approach and Overview, ii) Digital transformation and iii) IT strategy. Materials are in English language and look intuitive, but there are no information on testing or potential integration into any other platform. The tool is universal (irrespectively on country, industry sector or even size of a company) and uses internationally recognized standard terminology.	Definition of Digital transformation strategy, of IT strategy and key pillars. Presence of business cases with steps to be taken.
CAT4.0=>CIRCULAR4.0 toolkit	The toolkit is free and it offers CAS & DMA Tools. It assess the level of digital technology readiness and commitment or the level of maturity and commitment of target firms for circular transformation. CAT4.0 is designed to steer and facilitate the circular transformation by deployment of digital technologies.	OTC Training modules for intermediary organisations (operators) providing knowledge and skills needed for understanding key circular economy principles, the application of the digital technologies and assessing company's investment opportunities.
BusinessMakeover Toolkit	The BusinessMakeover Toolkit is online tool designed to support SMEs and startups in transforming their business models. It offers a variety of resources, including templates, guides, and tools, that help companies innovate and adapt to changing market conditions. From an assessment perspective, the BusinessMakeover Toolkit is user-friendly, featuring an intuitive interface that allows users to quickly understand and implement the various tools provided. The platform is tailored to meet user needs, offering personalized recommendations based on specific business challenges, enhancing its effectiveness and usability.	Step-by-step guides for creating and transforming business model. Interactive online tools such as the Business Model Canvas, Value Proposition Canvas, and Value Mapping Tool. Tools for assessing innovation and aligning business strategies with changing market conditions.
Circular economy Toolkit (and assessment tool)	With the vast number of possibilities for creating value out of the Circular Economy and cradle-to-cradle thinking, it can be challenging to assess all the options. The Circular Economy Toolkit has consolidated all the opportunities and provided information on how companies could start finding benefits. It completes the 5 minute opportunity assessment tool and run specific workshops to start creating more valuable and sustainable products and services. It is	Information background (toolkit based on 100 concepts), complemented by interactive assessment tool as a preparation for following workshops to harness the potential. The web contains also slides and facilitator guide for workshops.

	based on academic research providing background, tool is easy to use and leads to areas with potential of improvement (but not a business model as such).	
OpenLCA	OpenLCA is a free, open-source tool developed by GreenDelta for conducting life cycle assessments (LCA) of products and processes. It supports impact assessments across environmental indicators and is user-friendly, flexible, and suitable for businesses of all sizes.	Canvas Builder for creating custom business models. Collaboration Features for real-time teamwork. Scenario Analysis to test different business strategies. Guided Frameworks to structure model creation. Data Integration for insights and performance tracking.

4. Tools Assessment and Selection

Following the Exploration Process to search for already existing tools or those in preparation which might be included into the Open Innovation Toolbox as part of the B2GreenHub platform, all PPs evaluated the identified tools according to pre-defined criteria. The criteria aimed at highlighting and comparing the characteristics of the tools to allow the selection of the best three ones.

4.1 Assessment Scale

The first step was the identification of a proper assessment scale to allow an easy, fast and objective validation of all tools. The criteria should score the effectiveness and the reusability of the tools according to the main objectives of the GREENE 4.0 project, in terms of integration in the online platform and of their ability to support manufacturing SMEs in their digital and green transition. Possible examples of questions are: if companies would use the tool, if the tool delivers a positive user experience, and if the tool might bring higher confidence and/or knowledge on their situations and options what regards digital and green transformation. All criteria were then ranked on a scale from 1 to 5 (1 = very poor; 2 = poor; 3 = fair; 4 = good; 5 = very good).

Then, the evaluation was made for each presented tool by filling out a voting table and assigning a score from 1 to 5 to each evaluation criteria. Each single score is accompanied by a comment explaining the motivations and other eventual elements which were considered beyond the mere numerical aspect.

The elements that were taken into consideration are:

- **Relevance**: **The relevance of the presented tools to specific partial capacity building goal** – Since the primary goal of the tools is to help build the capacity, we need to assess how the tool fulfils the specific capacity goals within each category of tools (each JWG maps different tools with different purpose).

- **Impact**: **The significance of the impact of the tool** – the individual impact factors can vary from tool to tool within the project but the question behind this criterion should be: are there measurable effects (e.g. number of users; improvement, business cases…)? Could it be sustainable? In which stage of development and usage the tool is? How long the tool is already in practice (and fine-tuned based on the experience)? Or is it in the development, testing, or early adoption phase? The level of innovation of the tool is assessed also with the respect to the current status of the partners' countries/ region. Is the tool new in our region/country? (Does any of the PPs have own experience, do we know that the tool is used? E.g. by DIH/EDIH, or other agents, agencies, support organisation etc.?)

- **Features**: **User Experience and Platform Suitability** – those criteria cover questions how and to what extent the tool can meet requirements from the point of users and the B2GreenHub platform. How is this tool suitable for the online platform, could it be easily integrated in the learning platform? Is it fully compatible, or does it need some modification? Or is not suitable at all? Does it allow automation?

- **Transferability of the tool** – i.e. the tangible possibility to transfer the concepts characterizing the tool in the context of the partners' countries/ region and from one industry (or industry cluster) to another.

Each partner was provided with the template criteria table (*Table 7*) and, after the presentation of each tool, proceeded with the assessment of each one of the evaluation criteria as follows: 1 = very poor; 2 = poor; 3 = fair; 4 = good; 5 = very good.

Table 7: table of criteria to be filled for each tool by each partner.

Assessment grid for tool #1			
Title of Tool #1:			
Relevance (to capacity building)			
Evaluation criteria	**Meaning of the evaluation**	**Score (1-5)**	**Justification**
The relevance of the tool to the goal	How much does it help to build capacity (in the context of each category and its specific goal)?		.
Impact			
Evaluation criteria	**Meaning of the evaluation**	**Score (1-5)**	**Justification**
Impact	Does the tool have already measurable results? (e.g. number of users; improvement, business cases…)		
Maturity	How long the tool is already in practice (and fine-tuned based on the experience)? Or is it in the development, testing, or early adoption phase?		
Level of innovation	How innovative is the presented tool in your region/country? (knowledge present at HUBs, Unis, Innovation Centres).		
Features			
Evaluation criteria	**Meaning of the evaluation**	**Score**	**Justification**

		(1-5)	
User experience	Is it friendly user? How clear, understandable and intuitive is the tool?		
Platform suitability	Is it fully compatible, or does it need some modification? Or is not suitable at all? Is it possible to be integrated into the platform? Does it allow automation?		.

Transferability			
Evaluation criteria	**Meaning of the evaluation**	**Score (1-5)**	**Justification**
Inter-regional transferability	How difficult is it to transfer and adapt the present tool to other regions/countries?		
Transferability among target groups (e.g. industries)	How easy can the tool be used for other target groups (e.g. from other industries or industry clusters)? How universal it is?		.
Total:			

4.2 Tools Selection

The selection of tools is a necessary step to make the activities of each JWG efficient: the most interesting features could be analysed in a focused way, avoiding wasted time and maximising the impact.

4.2.1 JWG1 results

The assessment process was guided by the detailed assessment grid developed and provided by PP5. Firstly, the 11 tools selected by JWG 1 leader **LP** were presented and discussed during the Transnational design thinking camps (details in subchapter 2.1.2). The tool assessment continued in the following weeks allowing for a more thorough review. After completing the assessment grids, the LP compiled the points awarded to each tool. The list of assessment points for each tool is presented below, with the evaluation scores descending by the number of points awarded:

Table 8: List of JWG1 tools evaluated and scoring results.

Name of the tool	Points obtained
The Toolbox	308
Sustainability assessment tool and sustainability action plan	287
Basic Sustainability Assessment Tool	286
Ecovadis	280
SME Climate Hub Action Guides	279
Circulytics	275
Energy Transitions Playbook	270
Green Business Framework	262
Sustainable Development Performance Indicators	261
SUSTAINability	248
How to Develop a Small Business Sustainability Plan	235

Based on the results, 2 tools were selected as the most relevant: the **Toolbox** and the **Sustainability Assessment Tool and Sustainability Action Plan**.

Partners agreed that the Toolbox is the ideal tool for integration and enhancement to meet the needs of manufacturing SMEs. To ensure a smooth process, the leader of JWG1 initiated a discussion with the Toolbox team to explore the possibility of using their existing templates, which partners plan to refine and customize further during the next phases of GREENE 4.0.

4.2.2 JWG2 results

After reviewing the initially selected 23 tools, PP8, as the leader of the group, moved forward with the assessment process. As a result of the evaluation, 11 tools were shortlisted for the next stage. These 11 selected tools were presented and discussed during the Transnational design thinking camps (TDTC) that were held in Portorož in Slovenia on the 6th of September 2024. The workshop centred around the development of the B2GreenHub Expert Forum. During the meeting each partner presented tools they selected and the rest of the partners completed the assessment form. After completing the assessment grids, **PP8** compiled the points awarded to each tool. Based on the results, 4 tools were selected as the most relevant.

The list of assessment points for each tool is presented below; the list was ordered by the number of points obtained:

Table 9: List of JWG2 tools evaluated and scoring results.

Name of the tool	Points obtained
Green Forum	311
GreenBiz	306
Research Gate	306
Stack Exchange	298
Reddit	296
Agora	288

Lux Research Advisory	282
Just Answer	263
Trendlabor	255
BuildHub	253
Mighty	245

Since ResearchGate is primarily focused on scientists and researchers, the partners chose to focus on the **Green Forum, GreenBiz, and Stack Exchange** for further exploration. Following this decision, a series of Joint Working Group (JWG) meetings were organized to discuss the three selected tools and design the mock-up for the B2GreenHub Expert Forum tool.

4.2.3 JWG3 results

After reviewing the initially selected **27 tools**, PP5, as the leader of the group, shortlisted 10 tools based on the overall suitability with relevance for the business model generation as the most important factor. The selected tools were presented and pre-discussed in the JWG prior the meeting in Portorož. All tools were presented to the PPs during the Transnational design thinking camps (**TDTC**) that were held on the 6th of September 2024 in Portorož in Slovenia. The workshop centred around the development of the B2GreenHub Expert Forum. During the meeting partners were able to complete or adjust the assessment form. After completing the assessment grids, **PP5** compiled the points awarded to each tool. Based on the results, 4 tools were selected as the most relevant.

The list of assessment points for each tool is presented below; the list was ordered by the number of points obtained:

Table 10: JWG3 Tool Scoring Results

Name of the tool	Points obtained
Open LCA	304
Circular Economy BM	287
Sustainability BM Canvas	284
Sustainability Impact Canvas	278
Business Make Over Toolkit	275
CAT4.0	270
Circular Economy Toolkit	262
DistanceLab Design for Sustainability	257
Social BM Canvas	253
30 Revenue Model Cards (B2B)	242

As a result, four tools were selected for further discussion among project partners (PPs) and potential users: **Open LCA**, **Circular Economy BM**, **Sustainability BM Canvas**, **Sustainability Impact Canvas**. The findings indicated that no single tool was ideal for immediate adoption, and extensive brainstorming (or further mapping) would be required. The identified limitations included licensing restrictions, high costs, and a lack of interactivity.

5. Implementation and Validation

After collecting feedback from the partners, the final version of the B2GreenHub Capacity Building Toolkit was completed. Partners, still divided in the three JWGs, developed the three GREENE 4.0 tools to be then integrated into the B2GreenHub Platform, preparing all the needed supporting documents. The produced toolkit is finally presented to the External Advisory Board (EAB) during an online meeting for the final validation.

This section provides a summary of the key insights gathered during the process.

5.1 Implementation

Owing to the fact that the tools to be developed differed greatly in terms of their objectives and main features, the three JWGs pursued varied approaches. For example, JWG1 organized a series of periodic meetings where partners were requested to complete specific tasks dividing the work into different modules, while JWG2 organized workshops with the use of Mural and interactive platforms to collect ideas and validate the tools proposed by the JWG2 leader. In the following paragraphs the final outcomes for each Joint Working Group are described.

5.1.1 JWG1 results

As previously anticipated, the lead partner conducted several coordination meetings with the Toolbox manager on November 11, 2024, November 29, 2024, and January 17, 2025. The discussions aimed to negotiate enhancements to the Toolbox to better serve the needs of manufacturing SMEs and to facilitate its integration into the B2GreenHub platform.

It was determined that the GREENE 4.0 project would spearhead the collaboration with the Toolbox team. In Annex 1 is reported the signed collaboration agreement. The plan involves a complete overhaul of the existing suite of templates, guides, and case studies to better suit the targeted user base. The revised resources will be published both on a dedicated section of the Toolbox website and within the 'Improve' → "Assessment and Planning" section of the B2GreenHub site, ensuring consistency in design and accessibility across both platforms.

The revised resources are intended to align with the eight-module structure of the Toolbox, ensuring that each stage of sustainability integration is comprehensively covered. The approach not only aims to enhance the usability of the Toolbox for manufacturing SMEs but also ensures that all modifications are in sync with the established workflow and resource format of the original Toolbox framework.

The Toolbox comprises eight comprehensive modules designed to assist organizations in embedding sustainability into their operations:

1. **Start a Sustainability Program** - Initiating a sustainability agenda within the organization.
2. **Create a Policy** - Developing policies that enforce sustainability measures.
3. **Engage Stakeholders** - Techniques for involving all relevant parties in sustainability practices.
4. **Identify Issues** - Identifying specific sustainability issues within the organization.
5. **Set Targets** - Setting clear and achievable sustainability targets.
6. **Plan and Implement** - Detailed planning and implementation of sustainability initiatives.

7. **Assess Progress** - Monitoring and evaluating the effectiveness of the sustainability strategies implemented.

8. **Report and Communicate** - Reporting back to stakeholders and communicating progress and challenges.

Each module will have its page in the website (Figure 7) reporting the name of the module, a short description, the resources used to create the content, the available templates to support the related activities a quick guide to be downloaded and a step-by-step visual guide for the specific module.
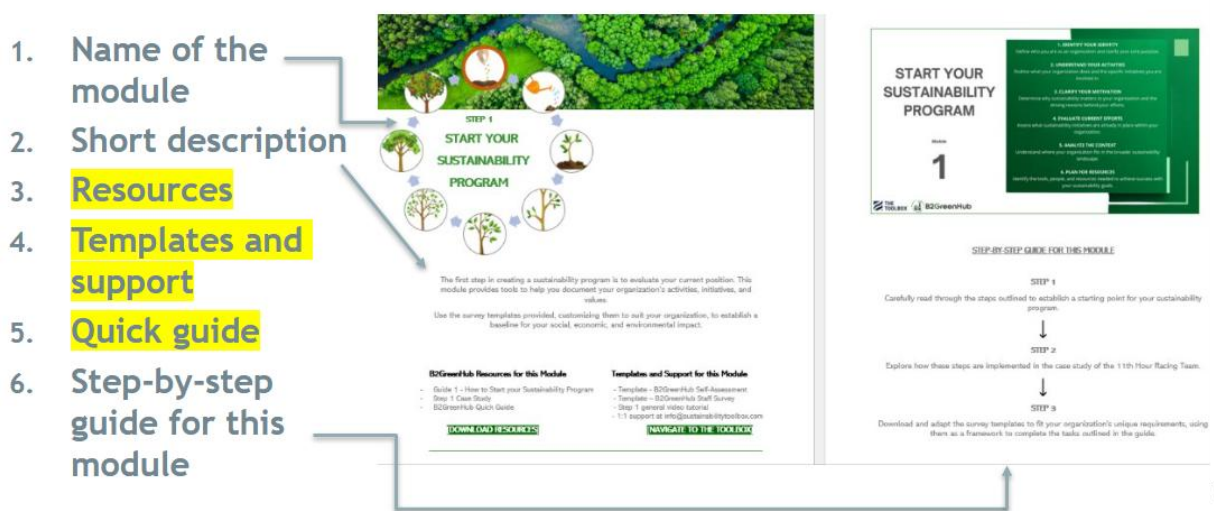
Figure 7: Visual layout on modules' webpage.

Clicking on the *Resources* section, a document will report a brief introduction (Figure 7), explaining how to assess the current situation through a series of questions and what type of actions should be performed to move on with the sustainability plan. Moreover, a real industrial case study is reported, as example provided by the responsible partner, to highlight the benefit of this approach in SMEs.

Figure 8: Visual layout of the available resources.

The *Quick Guide*, instead, shows the concrete steps to be performed in a bullet points list (Figure 9). According to the module, the path is different.

QUICK GUIDE

Figure 9: Visual layout of the downloadable quick guide.

Finally, each module has specific downloadable *templates* as supporting material for the SMEs. The document, generally and Excel file, present the same theme and branding of the B2GreenHub platform, as reported in Figure 10.

TEMPLATES

Figure 10: Visual layout of the developed templates.

This collaboration marks a significant step towards creating a more robust and tailored tool for SMEs embarking on sustainability journeys within the manufacturing sector. The updates are expected to increase engagement, improve user experience, and provide clearer guidance tailored to the specific needs of B2GreenHub's audience.

5.1.2 JWG2 results

A series of meetings were organized within JWG2 in order to provide a clear and straightforward guidance for the developers responsible for creating the tool. In particular, the main discussed key topics included:

- *User Profiles* – Creation of a mock-up for both Expert and User profiles, focusing on the structure and design on the website (Figure 11, Figure 12).
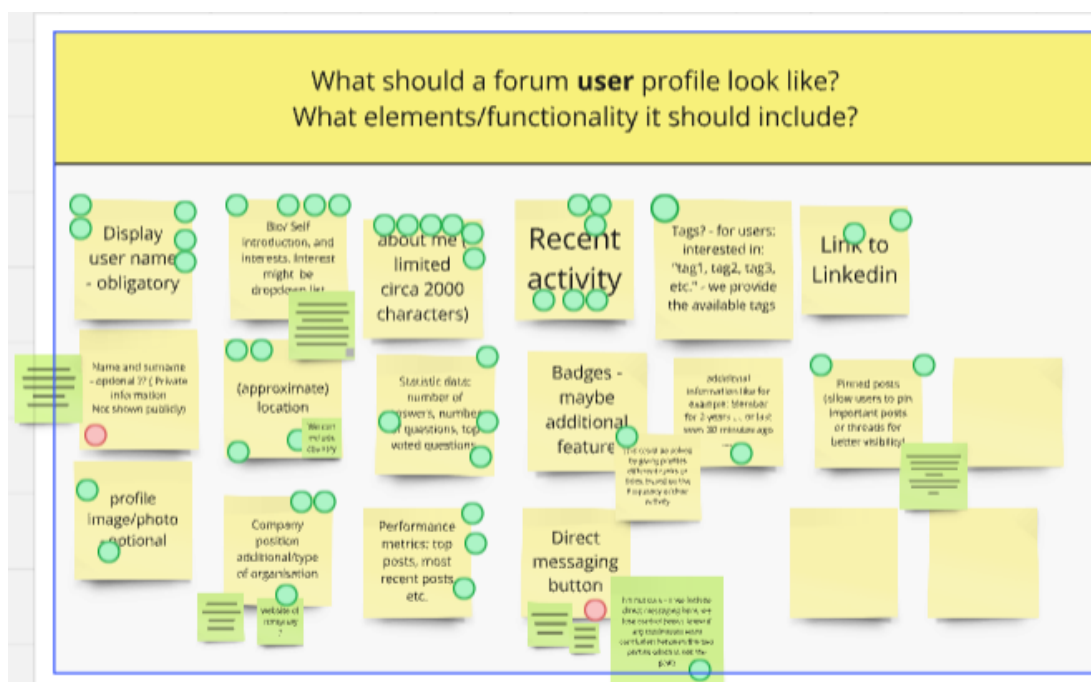

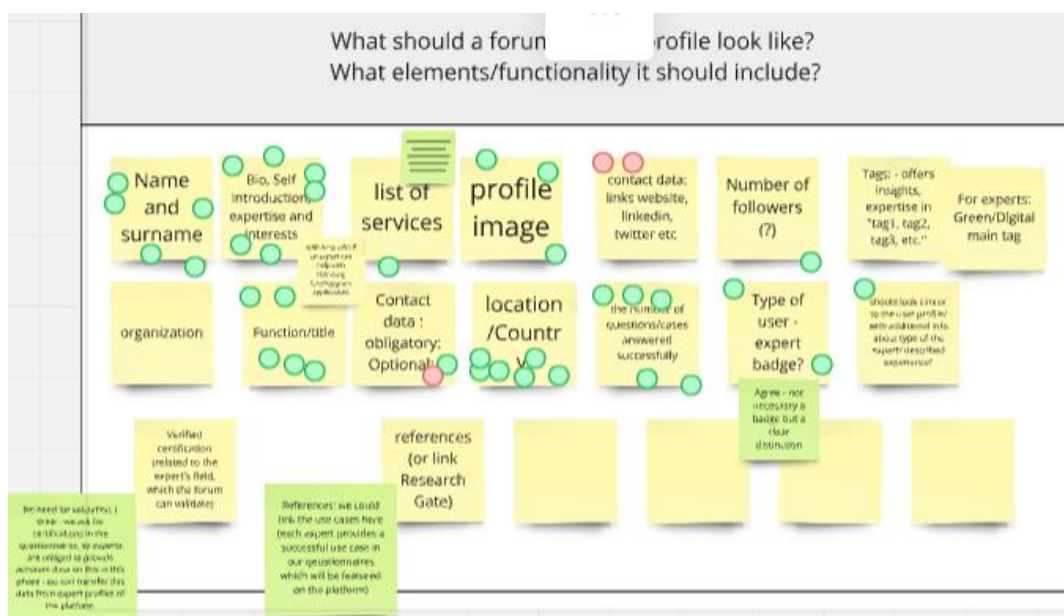*Figure 11: Mirò board to collect ideas on user profiles interface.*

Figure 12: Mirò board to collect ideas on user profiles functionalities.

- *Functionalities* – Discussion of the key functionalities to be included in the tool, followed by a list of desired features. The focus was to discuss the main functionalities to be included in the tool, such as categories, filters, conditions for badges, and metrics. The partners collaborated

to create a comprehensive list of features that should be incorporated into the Expert Forum (Figure 13, Figure 14).

Figure 13: Mirò board to collect ideas on tool functionalities.

Figure 14: Mirò board to collect ideas on tool contents and integration.

- *Code of Conduct* – Development of guidelines covering the rules for using the Expert Forum, including expected behaviour and community rules.

At the end, the final version of the B2GreenHub Expert Forum was completed, having four main sections: the Forum homepage, the Forum individual subpages, the individual threads page and the page for post creation.

Graph 1 shows a wireframe of a **Forum Homepage** with the following elements:

1. **Left column**: Contains navigation options like a search bar, links for groups, tags, experts, and contributors.

2. **Main content area**:

   o **Forum - Last Posts**: Displays recent forum activity in a table format with columns for categories (e.g., "Green," "Digital"), post count, latest posts (author, preview, and timestamp), and forum group names (e.g., "Electronics Forum Group").

   o **All Posts Section**: Includes sorting and filtering controls (order by, category selector, search bar) and a detailed table with columns for theme, publication date, category, comments, and solution status.

3. **Visual structure**: Features a clean layout with boxes, placeholders, and highlighted categories for easy navigation and user interaction.
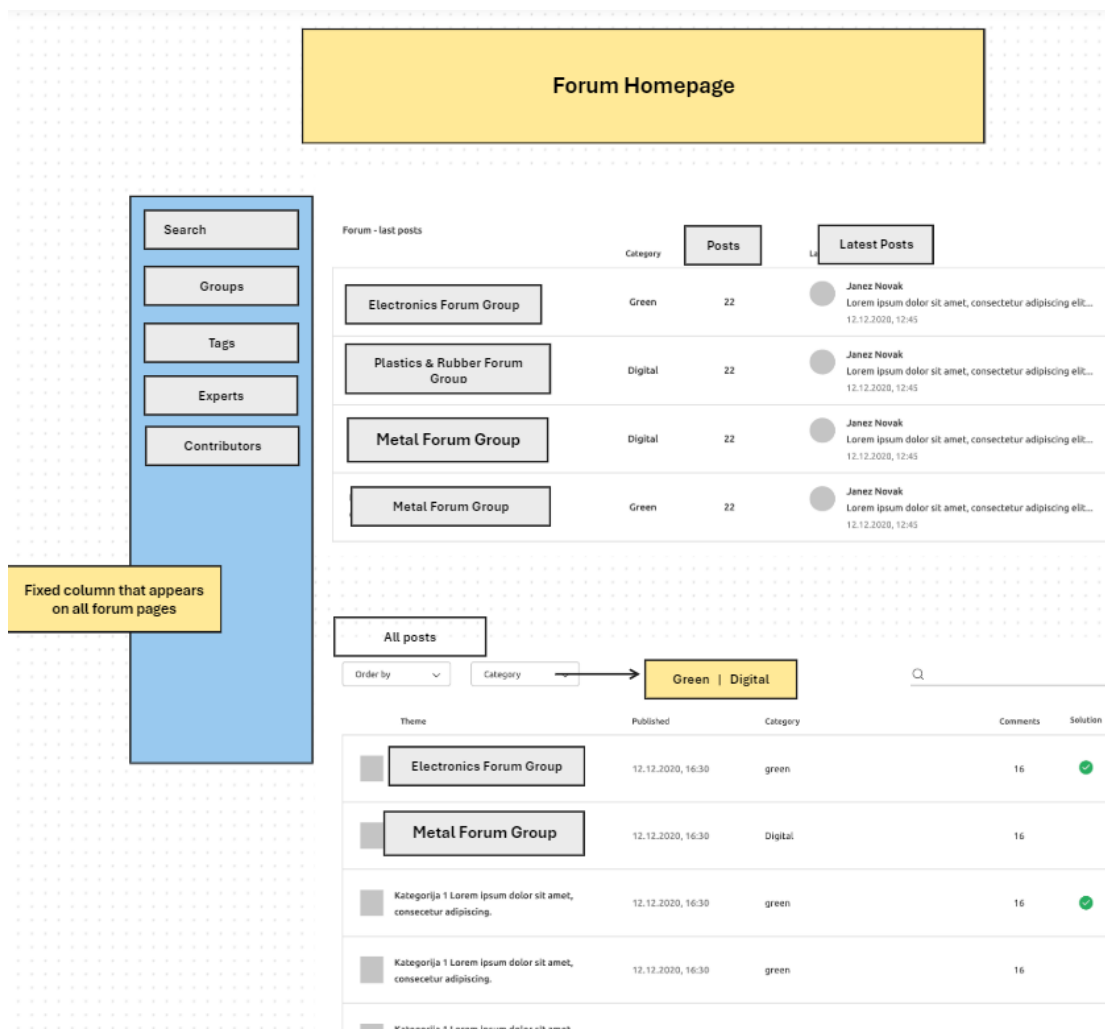

Graph 1: Visual structure of the Expert Forum tool.

Graph 2 depicts a subpage layout focused on **Market Sectors**, offering the following features:

1. **Page title**: Highlights content organized by market sectors.

2. **Search functionality**: A search bar for filtering by tag names, with an option to view tag synonyms.

3. **Sorting options**: To sort by popular, name, or new.

4. **Market sector tiles**: Includes seven clickable tiles for sectors like Electronics, Food & Beverage, and General, arranged in a grid for easy navigation.

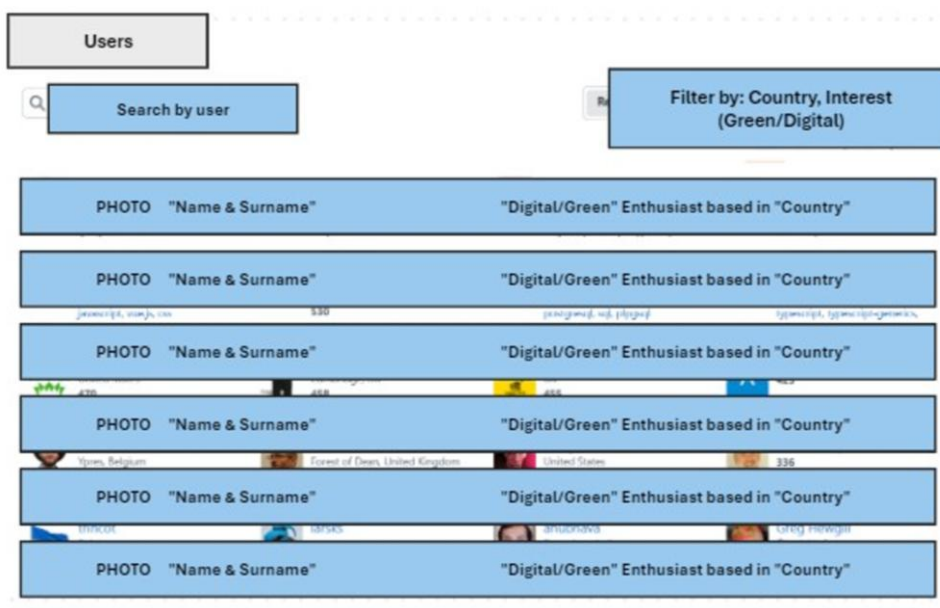5. **Visual layout**: Grid-style tiles provide access to sector-specific forums or content.
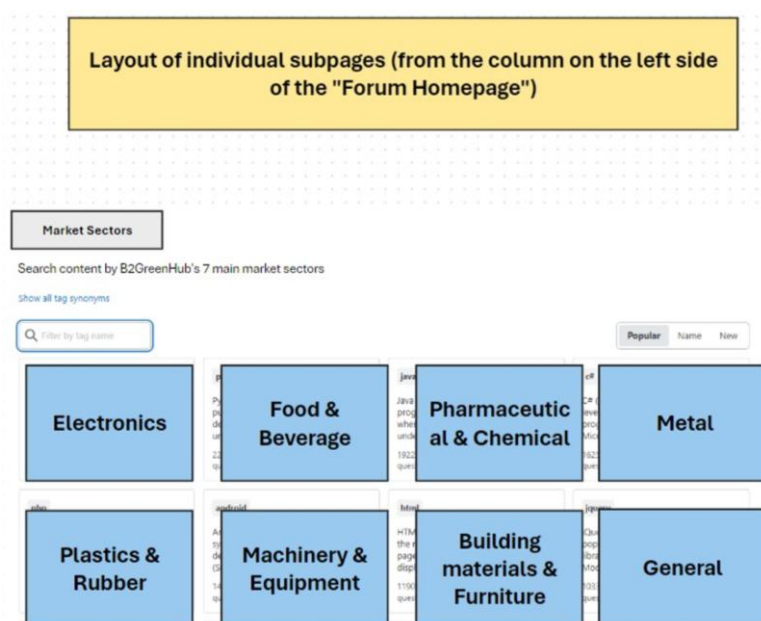
Graph 2: Layout of individual subpage - B2GreenHub Expert Forum mock-up.
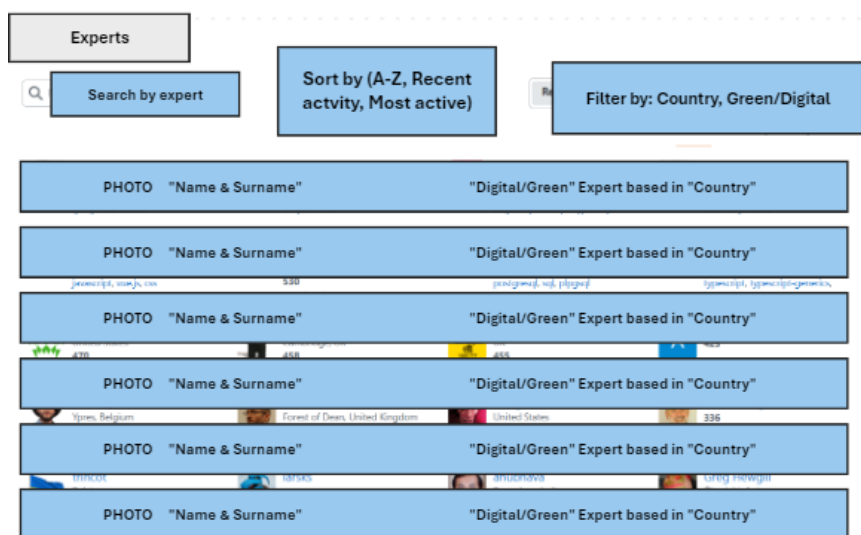
In Graph 3, Graph 4 and Graph 5 others sections are reported for the focus area, the users and the experts identified with the tool.
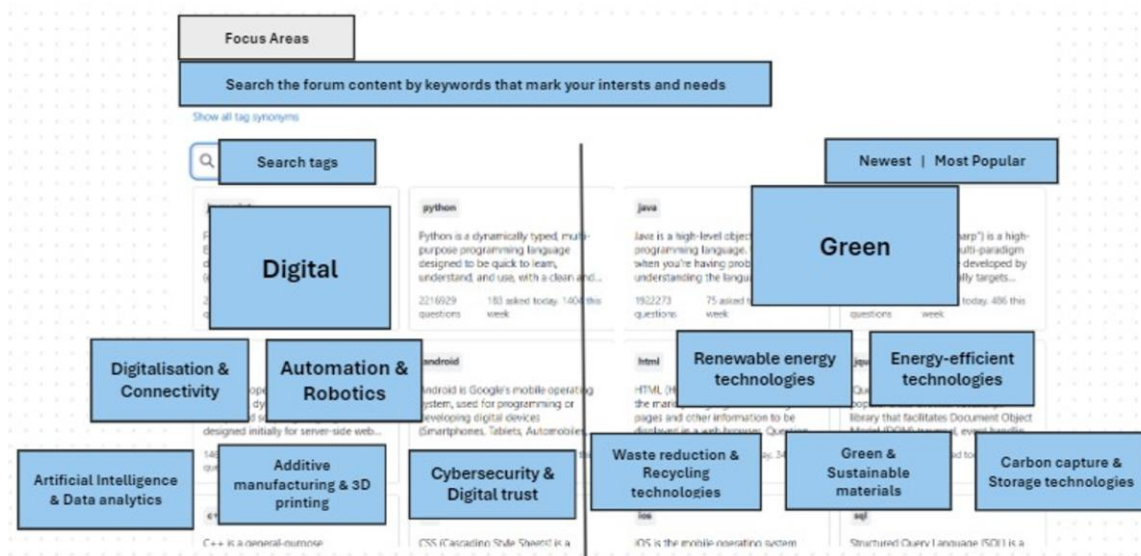
Graph 3: Searching functionality - B2GreenHub Expert Forum mock-up.

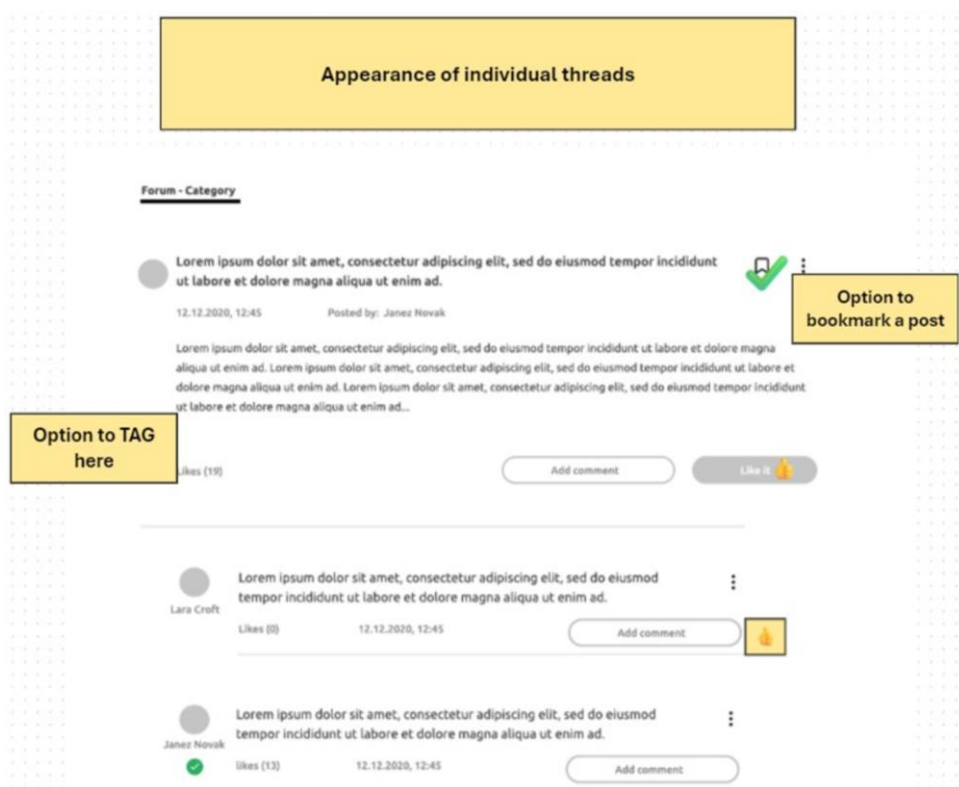*Graph 4: Users profiles - B2GreenHub Expert Forum mock-up.*

Graph 5: Experts profiles - B2GreenHub Expert Forum mock-up

Graph 6 illustrates an **individual thread layout** in a forum category, featuring:

1. **Thread overview**: Displays post title, content preview, timestamp, and author name.

2. **Post interactions**: Options to like, comment, or tag posts for organization.

3. **Bookmarking**: Users can bookmark posts, with saved posts indicated by a filled icon.

4. **Design layout**: Posts are stacked with clear separation, emphasizing interactive features for easy accessibility.

The design promotes user engagement and efficient navigation through interactive tools and organizational options.

Graph 6: Appearance of individual threads - B2GreenHub Expert Forum mock-up

Graph 7 is a wireframe for the **B2GreenHub Expert Forum** post creation page, with the following functionalities:

- Users can **post a question or start a discussion**.

- Options to select a **group** and **multiple tags** (e.g., "Digital" and "Green").

- **Title field** (max. 150 characters).

- **Content field** (max. 7000 characters for posts, 2000 for comments).

- **File upload** with restrictions on number and size.

- **"Publish" button** to submit the post.

Graph 7: Creating a post - B2GreenHub Expert Forum mock-up

5.1.2.1 Badge System

An integral part of the forum will be a system of badges, awarded for active participation. Its purpose is to encourage forum participants to be as involved as possible. Badges are divided into two general categories - awarded to experts and to other forum users. The following tables show the types of badges and the conditions for obtaining them.

Table 11: Badge system for experts.

Badge system for experts		
Badge rank	**Badge name**	**Conditions to Meet (All Must Be Fulfilled)**
Bronze Badge	Quick Helper	Provide 3 answers
	Engaged Expert	Post answers on 5 different days
	First Like	Post answers on 5 different days
	Problem Solver	Solve your first question with an accepted answer
Silver Badge	Reliable Responder	Provide 10 answers
	Community Favorite	Accumulate 25 likes across all answers
	Mentor	Share insights or feedback on 5 questions or answers (e.g., by commenting or discussing)
	Streak Solver	Provide answers on 3 different weeks within a month
Gold Badge	Expert Advisor	Provide 50 answers
	Esteemed Guide	Accumulate 250 likes across answers

	Pillar of Knowledge	Be recognized as an outstanding expert by a moderator (manual award)
	Long-Term Contributor	Answer questions consistently for 3 months (minimum 5 answers per month). If the condition is not met, the user will revert to the Silver badge

Table 12: Badge system for users.

Badge system for users		
Badge rank	**Badge name**	**Conditions to Meet (All Must Be Fulfilled)**
Bronze Badge	Curious Mind	Ask 3 questions with at least 1 liked
	First Answer	Post your first answer
	Collaborator	Comment on 3 questions or answers to start discussions
	Explorer	Ask or answer questions in 2 different categories
Silver Badge	Inquirer	Ask 10 questions, with at least 5 receiving a like
	Thoughtful Responder	Provide 5 answers
	Respected Contributor	Accumulate 50 total likes (questions + answers)
	Community Builder	Start a discussion that generates 5+ responses
Gold Badge	Prolific Contributor	Ask 20 questions, with at least 10 receiving a like
	Highly Trusted	Provide 10 answers
	Popular Voice	Accumulate 250 total likes (questions + answers)
	Mastermind	Post a question or answer that receives 20 likes

5.1.2.2 Code of Conduct

The partners also developed a code of conduct during the meetings, regulating the conditions of use of the forum and rules of behaviour. The contents of the code of conduct can be found below.

Welcome to the B2GreenHub Expert Forum!

Here's a quick introduction to start engaging with other Forum members and sharing with the community upcoming green growth-related activities.

The primary goal of the B2GreenHub Expert forum is to foster knowledge sharing and mutual support among users. Participants must adhere to the code of conduct outlined below to ensure a friendly and creative atmosphere conducive to fruitful discussions.

It is important for members to ensure that the community serves as a safe and comfortable space to exchange ideas. Please take the time to read our community guidelines:

Asking questions: Users may ask questions related to the green and digital transformation of the economy, potential business growth strategies, current technological trends, and other relevant topics.

Respectful communication: Forum participants must show mutual respect and maintain civility in their interactions. Insults or discriminatory remarks based on religion, gender, race, sexual orientation, or financial status are not allowed.

Consequences for misconduct: The forum administrator reserves the right to suspend any participant who violates the forum rules. Suspended users will be restricted from asking or answering questions but may still browse forum content. If behaviour that violates this code is observed, users can report it to the forum administrators.

Users can report inappropriate content by clicking the 'Report post' button. The site will prompt the user to provide a reason for the report and to clearly explain why the content violates forum guidelines. Once submitted, B2GreenHub administrators will review the report. If the content is found to breach forum rules, administrators may take appropriate action, such as deleting or editing the content. In cases of confirmed violations, the offending user will be notified and may face suspension.

All reports are confidential, and administrators will address violations promptly. Suspended users can appeal the decision by email at info@b2greenhub.eu.

Confidentiality and responsibility: Forum administrators are not responsible for any confidential information disclosed by users. Participants should refrain from sharing sensitive data about themselves or their businesses. Contributions made on the forum are considered non-confidential and may be freely reproduced.

Copyright compliance: Users must not share files, images, texts, or other media without holding full copyright for them. By publishing such materials, users declare they own the rights and grant other forum members a non-commercial license to use them. Users are encouraged to share content and insights. If the shared input is not their own original work, users must provide proper citation and give full credit to the original source.

Legal compliance: Posts must not violate the law, including incitement to illegal activity, threats, terrorism, or promotion of pornography, drugs, alcohol, or other illegal substances.

Focus on Relevance: Political, social, religious, and moral topics (unrelated to the main focus of the Forum) are prohibited.

Marketing and advertising: The forum is for knowledge and opinion exchange only. Self-promotion or spamming the forum with promotional content is not allowed. Users may not use it for marketing, advertising services, promotions, or discounts.

GDPR: Users' personal data will be handled in accordance with the General Data Protection Regulation (GDPR). Users have the right to delete their data and content.

B2GreenHUB Forum rights

The Forum administrators reserve the right to refuse or remove any content that violates guidelines outlined in this Code of Conduct document.

The B2GreenHub Forum has the right to terminate accounts at their discretion if the rules of engagement are deemed to have been breached by the user.

By continuing, you consent to follow all terms laid out by the Code of Conduct. If you encounter content or post that you believe violates the guidelines, please report it to us for review by clicking the 'Report post' button.

Any updates or changes to the code of conduct will be announced and communicated through the B2GreenHub Forum website.

5.1.3 JWG3 results

Finally, JWG3 organized a meeting on December 18, 2024, with the objective to provide clear and practical guidance for the developers and IT team working on the Business Model Generator tool. In particular, partners discussed:

- The core tool to be reviewed and upgraded

- Possible recommendations for improvements

- The integration in the B2GreenHub platform (feasibility)

- Related costs and sustainability (viability)

- Possible recommendations for the design

The workshop was framed by the progress of other working groups, the outcomes of the previous workshop, the shortlisted tools, and discussions with the LP. The findings highlighted that none of the existing tools fully met the project's needs, underscoring the necessity for further brainstorming and exploration. Key limitations identified included licensing restrictions, high costs, and a lack of interactive features. To align the process, PP5 prepared a Mural board for the brainstorming session, where the shortlisted tools, results, and visuals from other JWG discussions were presented (Figure 15).
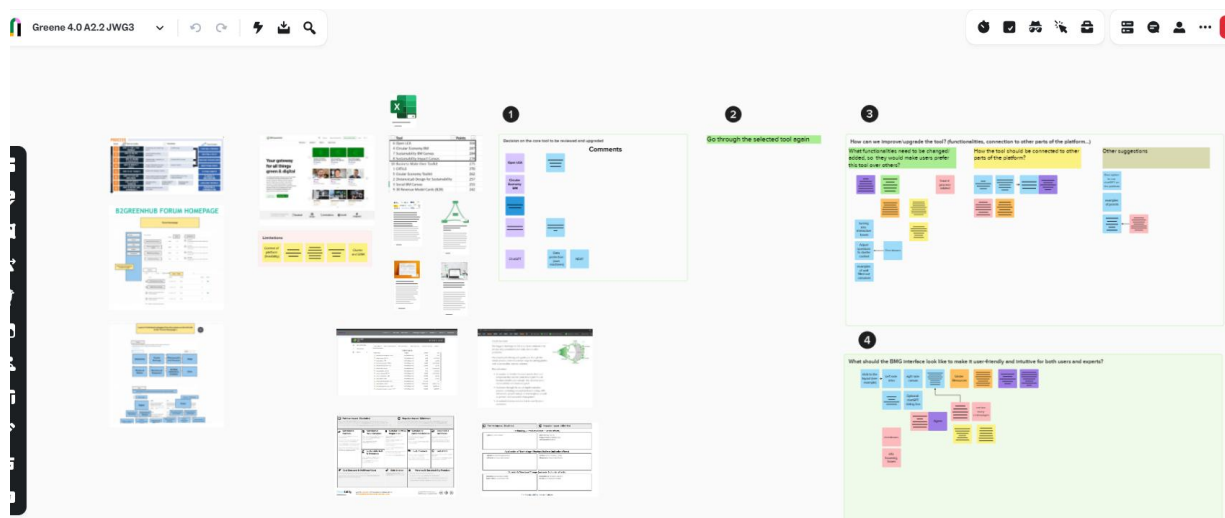

Figure 15: Mural – creating Business Model Generator.

In the first phase of the meeting, JWG3 identified the Sustainable Business Model Canvas (SBMC) as the **most suitable tool** for further development. Other tools were either more focused on product lifecycle aspects or complementary rather than central to the goal of the JWG. A new idea discussed was integrating ChatGPT functionality; however, concerns were raised regarding the security of business-sensitive data and proprietary information. Developing and running a private LLM on in-house hardware or a private cloud was considered more secure but highly costly.

In the next step, participants discussed **enhancements** to make the tool more appealing and interactive. Key suggestions, collected through Miró platform as reported in Figure 16, included:

- Incorporating sector-specific business model advice.
- Transforming static elements into interactive, editable components.
- Customizable questions based on industry clusters and processes.
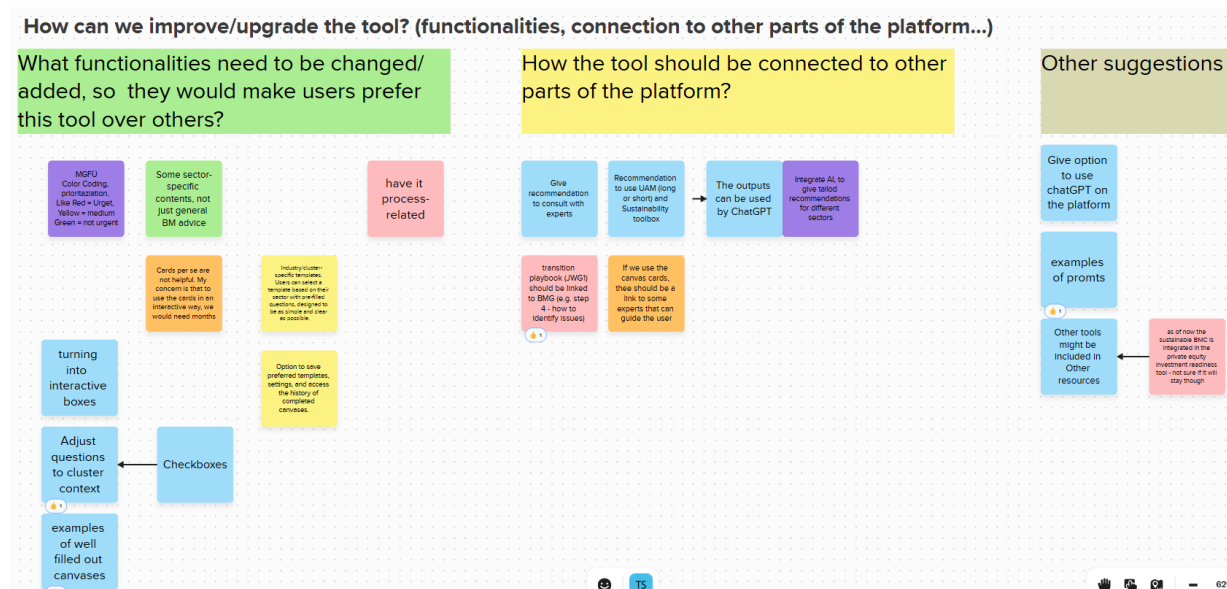- Options to save templates and track completed canvases.

Figure 16: Upgrading of the BMG.

The discussion also focused on improving the Business Model Generator (BMG) **interface** to make it more user-friendly (Figure 17). Key recommendations included:

- Maintaining a consistent layout with an introduction on the left and the canvas on the right.
- Clicking on the canvas should open a larger window for editing and answering questions (which may adapt based on cluster selection).
- Including ChatGPT-generated recommendations below the canvas, with an optional ChatGPT dialog box for further interaction via API or external services.
- Placing BMG under the "Resources" section instead of a separate menu link for better accessibility.
- Ensuring a simple interface with a single-page design, avoiding excessive subpages.
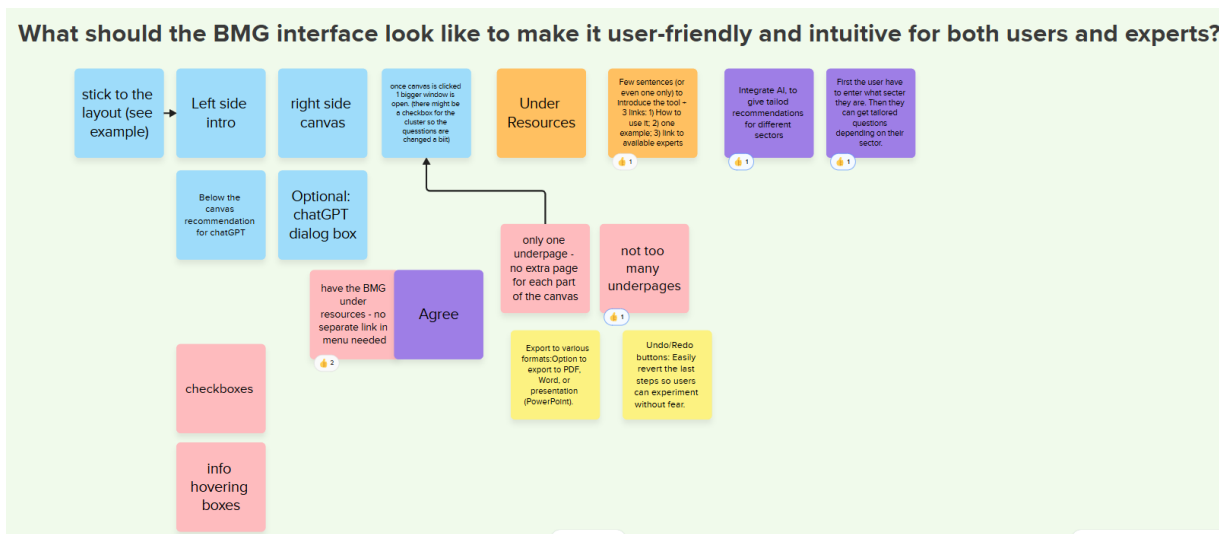
Figure 17: Brainstorming about the interface of the BMG.

Furthermore, additional **usability features** were suggested:

- Hovering info boxes for guidance.

- Export options (PDF, Word, PowerPoint).

- Undo/Redo buttons for better user flexibility.

- Brief introductions, sector-specific recommendations, and expert consultation links.

- AI-generated recommendations based on the selected sector.

- If ChatGPT integration is not feasible, the system could provide example prompts instead.

Among the suggested improvements, PPs proposed exploring AI-based solutions. As a follow-up, PP5 engaged an external expert to develop an AI-based model incorporating retrieval-augmented generation elements to enhance interactivity, creativity, and relevance in business model generation. The model was trained on contextual information, including:

- Seven industrial clusters.

- User acceptance models.

- Expected expert competencies.

- Services of labs and solution providers.

By analysing the company's sector, experience, digital/green transformation ambition, and problem areas, the AI-driven algorithm suggests improvements or new business models. These outputs can serve as a foundation for expert consultations with professionals within or outside the platform. Given AI's potential for errors and the sensitivity of business data, professional assistance is strongly recommended. PP5 tested two variations of the AI model in Czech, later refining the more complex version for English communication. Further development will depend on platform testing and additional functionalities, such as expert recommendations based on transformation goals and business models.

Final possible solution options are:

- Secure Option: The upgraded Sustainable Business Model Canvas, which remains fully editable and includes industry-cluster-specific guidance.

- AI-Integrated Option: A more interactive solution leveraging AI but carrying inherent risks regarding business-sensitive data.

For better **platform integration**, it was recommended to connect BMG with UAM and the Transition Playbook (Sustainability Toolbox/Program) to facilitate issue identification. The tool should also suggest expert consultations based on user needs. The placement of the Business Model Canvas within the private equity investment readiness tool was discussed, but its final positioning remains undecided. A decision on the final composition and interconnection of tools is still needed.

Finally, partners discussed the tool's **visual design,** which should align with the colours and layout of the initial landing page prototype. An draft of this is reported in Figure 18.

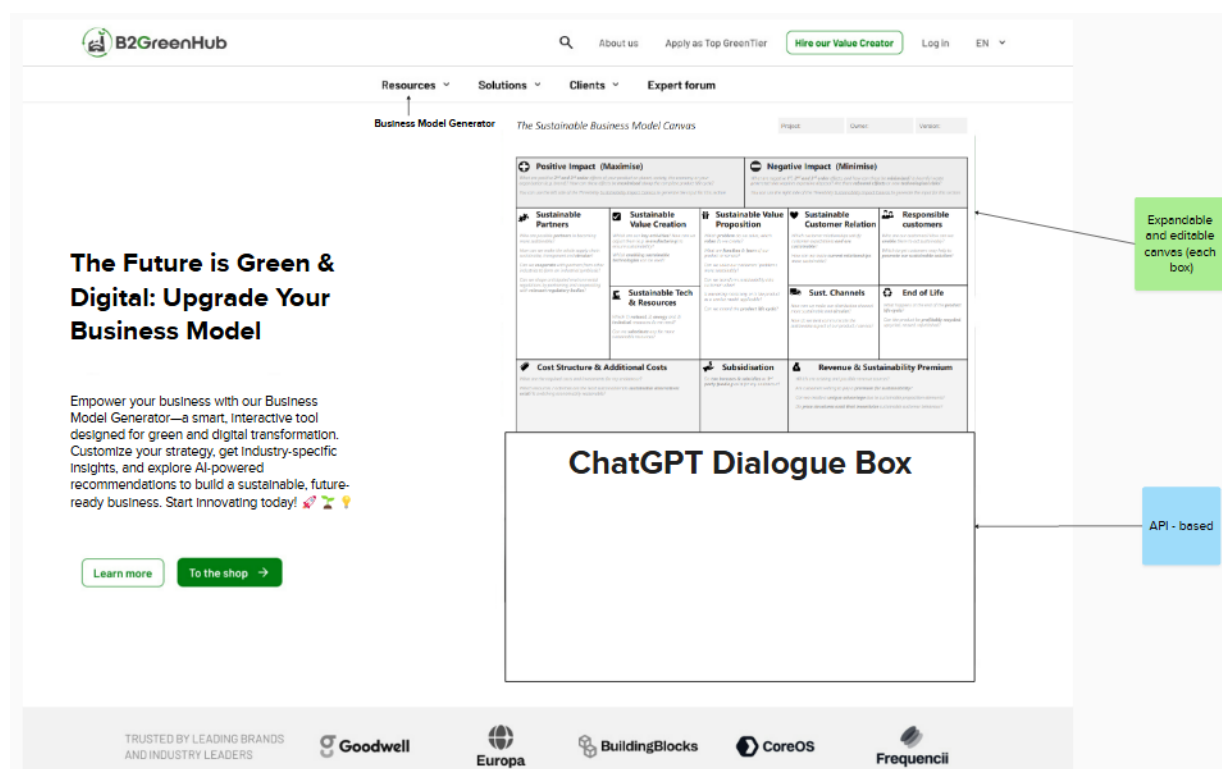*Figure 18: Business Model Generator Mock-up.*

In Annex 2 the suggested questions for each part of the Sustainable Business Model Canvas of JWG3, according to the selection of the industry cluster, are reported.

5.2 Validation

The final step of the process was the validation, performed by the **External Advisory Board** (EAB). The participants of the EAB are reported in the following table:

Table 13: EAB meeting participants.

Participants	***Organization***
Name Surname	*Organization*
Alessandro Marini	AFIL
Annalisa Giavarini	Intellimech Consortium
Bastian Hothas	Bautzen Innovation Centre
Hartych Marek	Regionální rozvojová agentura Ústeckého kraje
Joanna Kulczycka	AGH University of Science and Technology
Kacper Miodoński	Krakow Technology Park ltd.
Karolina Borovšak	Pomurje Technology Park
Katja Mohar Bastar	DIH Slovenia
Keresztúri Zsolt	DBH InnoHub
Lukáš Foltýn	Innovation Centre of Usti Region
Maja Sušec	Pomurje Technology Park
Nardoni, Maruška	University of Ljubljana
Nuša Lisjak	Pomurje Technology Park
Pierluigi Petrali	DIH Lombardia
Sarah Vidmar	Pomurje Technology Park
Schiffer Olivér	MFGU
Schiller Selina-Maria	University of Applied Sciences FH Kufstein Tirol
Schweitzer Lili	MFGU
Štěpánka Portz	Innovation Centre of Usti Region
Tomas Sivicek	Univerzita Jana Evangelisty Purkyně v Ústí nad Labem
Urszula Woźniak	Krakow Technology Park ltd.
Vojtech Jira	Univerzita Jana Evangelisty Purkyně v Ústí nad Labem

The EAB meeting was held online on 10th of April 2025. The meeting was intended to validate several tools through the active participation of involved people: the Open Innovation Capacity Building Toolkit, the Transnational Open Knowledge Box integration methodology, the Open Knowledge Training Program Curricula modules and the Innovation Call for proposal pack. Each section had a brief presentation showing the performed activities and the related documentation, followed by a discussion. The brainstorming sessions were stimulated by the use of Mentimeters.

The agenda of the EAB meeting is reported in Figure 19.

13.00 - 13.05	**Welcome and Introduction** Maja Sušec, Greene 4.0 Project Manager, Pomurje Technology Park, Slovenia
13.05 - 13.20	**Open Innovation Capacity Building Toolkit** Maja Sušec, Pomurje Technology Park, Slovenia Urszula Wozniak, Krakow Technology Park, Poland Tomas Siviček, Jan Evangelista Purkyne University, Czech Republic
13.20 - 13.30	**Validation Discussion** All participants
13.30 - 13.40	**Presentation of Transnational Open Knowledge Box integration methodology** Sarah Vidmar, Pomurje Technology Park, Slovenia
13.40 - 13.50	**Validation Discussion** All participants
13.50 - 14.00	**Presentation of Open knowledge training program curricula modules** Lili Schweitzer, MFGU, Hungary
14.00 - 14.10	**Validation Discussion** All participants
14.10 - 14.20	**Presentation of Innovation call for proposals pack** Urszula Wozniak, Krakow Technology Park, Poland
14.20 - 14.30	**Validation Discussion** All participants
14.30	**Closure of the meeting**

Figure 19: Agenda of the meeting with the EAB the 10th of April.

In Figure 20 are reported the main feedbacks related to the Toolbox and its modules, that was considered overall very positive. Most participants found the structure and flow of the modules to be clear and practical. When asked whether any of the tools or steps seemed less relevant or harder to apply to specific companies or contexts, all participants responded negatively, indicating that the content was broadly applicable and relevant across different situations. Regarding potential gaps in the modules or the sustainability journey, most respondents felt that nothing significant was missing. However, one person did suggest that a stronger connection to core business elements—such as profit and loss or long-term outcomes—could enhance the toolbox further. The templates and case studies provided within the modules were also seen as applicable to real-world settings. Finally, the assessment and reporting tools included in the later modules were considered generally effective in guiding the measurement and communication of progress.

Figure 20: received feedback for the Toolbox (JWG1).

In Figure 21 *Figure 20* are reported the main feedbacks related to the Expert Forum, that was considered overall very positive. Most participants found the value and the purpose of the Expert Forum clear and practical. When asked whether the Expert Forum seemed relevant in terms of innovation and needs, all participants responded positively, indicating that they are likely to explore collaboration opportunities using this tool. Regarding the most valuable aspects of the Expert Forum, the respondents highlighted the flexibility and openness of the tool, the availability of several experts engaged and the clarity of the scope of the tool. Finally, the participants suggested to integrate very short abstract of the covered topics to make them more attractive, as well as provide a rating score for the experts to better highlight their competences within the community.
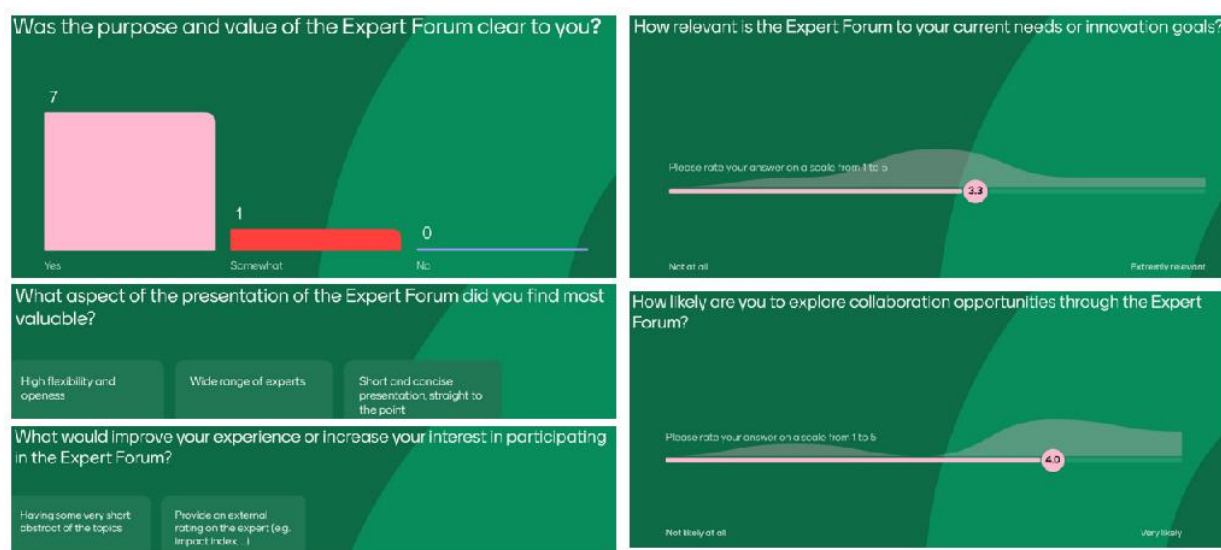

Figure 21: received feedback for the Expert Forum (JWG2).

In Figure 22*Figure 20* are reported the main feedbacks related to the Business Model Generator, that was considered overall very positive. Most participants found the Business Model Generator effective in supporting the identification of strategic opportunities and challenges within a business model. When asked whether the tool could be relevant to apply to specific companies or contexts, all participants responded positively, indicating that the content was broadly applicable and relevant across different situations. Regarding potential gaps, the respondents suggested to make it easily updatable according to the evolution of the market, to make visible the possible connection between the economic impact and the green transition, and to highlight innovation in terms of economics, deep research and easiness of adoption also for SMEs. In general, the Business Model Generator was perceived as clear and valuable, in particular if it integrates AI functionalities.
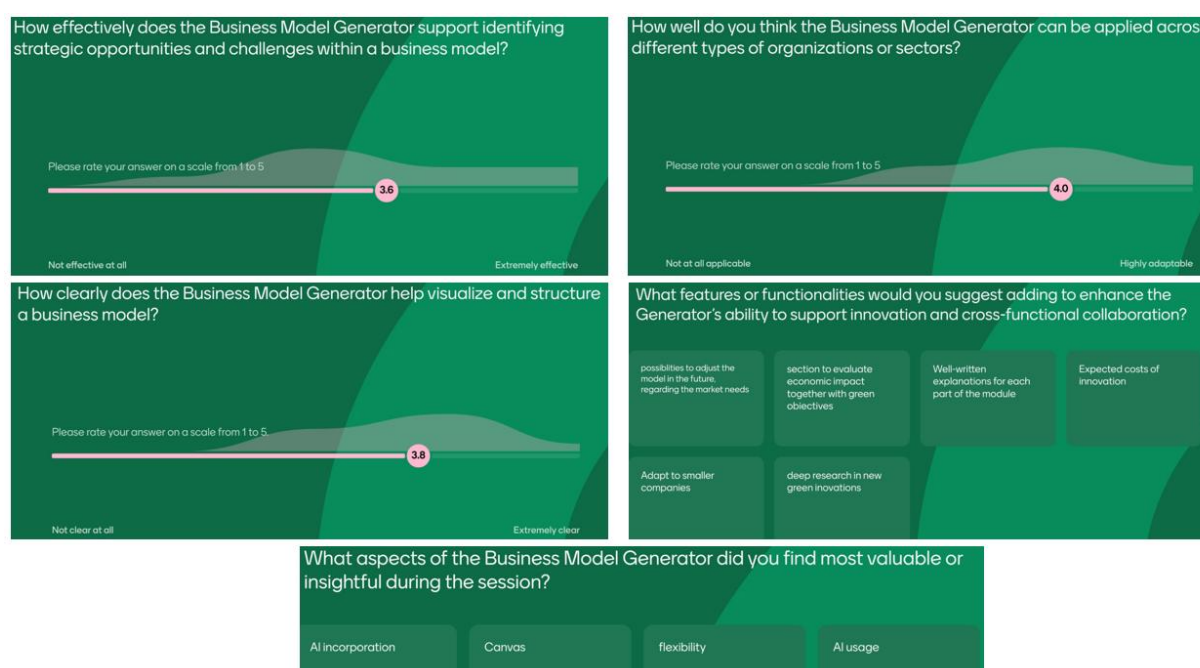

Figure 22: received feedback for the Business Model Generator (JWG3).

Conclusion

The purpose of this document is to develop the Open Innovation Toolkit, designed to support SMEs in their green and digital transition. Particularly, this Deliverable provides an in-depth analysis of the GREENE 4.0 methodologies and developed tools during Period 3-4 for the *Activity 2.2 "Open Innovation Capacity Building Toolkit"*.

The project partners undertook a structured and collaborative approach to design and implement the toolkit, ensuring the alignment with the specific needs of SMEs. The main phases of the process included:

- *The identification of relevant tools*: A comprehensive exploration of existing open innovation tools was conducted, leading to the identification of the most relevant and available solutions.

- *The assessment and selection*: The selected tools were rigorously assessed based on predefined criteria, including relevance, usability, impact, and transferability. This ensured that the tools chosen for further development would provide tangible value to users.

- *The identification of tool functionalities*: Partners worked collaboratively to define key functionalities for each tool, facilitating their integration into the B2GreenHub platform.

- *The development and validation of a mock-up*: The Joint Working Groups (JWGs) designed interactive prototypes and supporting documentation to enhance usability and effectiveness. The final toolkit was then validated by the External Advisory Board.

The Open Innovation Toolkit serves as a foundational element of the B2GreenHub ecosystem, offering SMEs practical resources to face the challenges of sustainability and digitalization. It will contribute to the broader objectives of GREENE 4.0, strengthening the resilience and competitiveness of European industrial ecosystems.

Annex 1

COLLABORATION AGREEMENT

Date: 12-02-2025

Between

- **Foxall Munro Ltd trading as The Toolbox**
  Foxall Munro, 11 Waterville Bay Cottages, Murreagh
  Waterville, County Kerry EIRE V23 YD42
- **B2GreenHub**
  Pomurje Technology Park, Plese 9a,
  9000 Murska Sobota, Slovenia

Referred to as "The Toolbox" and "B2GreenHub", respectively, and collectively as the "Parties"

Expiration Date: 12-02-2028

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1. Purpose

1.1 This Collaboration Agreement establishes the framework for collaboration between Foxall Munro Ltd trading as The Toolbox and B2GreenHub to integrate, adapt, and enhance sustainability tools and resources. It outlines responsibilities, licensing terms, and other important provisions to ensure a smooth and effective partnership.

1.2 This collaboration will leverage both Parties' platforms, audiences, and expertise to create value for the European enterprise community by supporting businesses in their transition towards sustainability and compliance with EU regulations such as TCFD and CSRD.

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2. Scope of Collaboration

Platform Hosting and Oversight

2.1 The tools created by The Toolbox and adapted by B2GreenHub will be hosted on The Toolbox platform.

2.2 The Toolbox will maintain oversight and approve each tool before publication.

2.3 All resources will be hosted in one location on The Toolbox platform, following the pre-existing 8-Step structure.

Foxall Munro Ltd. 1

Content Adaptation

2.4 B2GreenHub adapt templates and rewrite "How-To Guides" and "Quick Guides" to align with the manufacturing sector's needs, as per the Creative Commons licensing requirements.

2.5 Where modifications significantly and/or materially change the original source, The Toolbox reserves the right to publish and license it as a new asset on behalf of The Toolbox community.

2.6 Both The Toolbox and B2GreenHub logos will appear on all adapted resources.

Ownership and Collaboration

2.7 The Toolbox is a community platform and Foxall Munro Ltd retains ownership of the platform, and stewardship of the tools and resources on behalf of The Toolbox community.

2.8 B2GreenHub will be an active collaborating member of The Toolbox community and will have an interest in how the tools are promoted and utilised for the manufacturing sector.

3. Responsibilities of Each Party

The Toolbox

3.1 Host and maintain the tools and resources on its platform, ensuring reasonable access for approved B2GreenHub and associated beneficiaries.

3.2 Review and approve all tools and resources prior to publication.

3.3 Share user engagement data with B2GreenHub as specified in Section 4.

3.4 Collaborate on generating insights, case studies, and testimonials to foster community engagement.

B2GreenHub

3.5 Adapt templates and rewrite guides to meet the specific requirements of the manufacturing sector.

3.6 Integrate approved B2GreenHub beneficiary credentials into The Toolbox platform via an Application Programming Interface (API) to enable streamlined user access.

3.7 Collaborate with The Toolbox on insights, case studies, and user testimonials.

3.8 Display The Toolbox logo alongside the B2GreenHub logo on all adapted and newly created resources.

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4. Publication and Access

Data Reporting and Synchronisation

4.1 The Toolbox will provide B2GreenHub with automated monthly engagement and outreach data in CSV format, which will include:

4.1.1 Tools downloaded by each user.

4.1.2 Survey responses, including metrics such as carbon savings achieved, sustainability policies created, and stakeholder engagements.

4.1.3 Insights on collaborative opportunities for case studies and testimonials.

4.2 Both Parties will collaborate to use this data to report to stakeholders, enhance the tools, foster community engagement, and drive measurable impact.

5. Licensing and Intellectual Property

5.1 Resource Use

5.1.1 All tools and resources remain under the stewardship of Foxall Munro Ltd, offered to the Toolbox community through the Creative Commons licence.

5.1.2 Adapted templates and rewritten guides will be offered to the Toolbox community through the Creative Commons licence.

5.1.3 As per Creative Commons, the adapted tools must be approved and shared according to the specified licensing terms. The attribution must always be provided as specified, or the license is violated.

5.2 Licensing Terms

5.2.1 **No Derivatives**: The Toolbox PDF documents and images cannot be repurposed by any party other than The Toolbox.

5.2.2 **Creative Commons Attribution-NonCommercial-NoDerivatives 4.0**: The Toolbox reserves the exclusive right to authorise adaptations of these documents which must include the footer: *'(Document name) by the community of Toolbox users is licensed under a Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License.'*

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5.2.3   **ShareAlike:** All modifiable templates will be shared under the **Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International License.** The footer must read: *'(Document name) by the community of Toolbox users is licensed under a Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International License.'*

5.3 **Non-Commercial Clause:** All resources must remain free to use and cannot be resold.

5.4 **Attribution:** Both The Toolbox and B2GreenHub logos must be displayed on all adapted resources.

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6. Technical Integration

6.1 An API will be established to allow approved B2GreenHub beneficiaries to log in to The Toolbox platform using their B2GreenHub credentials.

6.2 Both Parties will collaborate to ensure that the API is secure, efficient, and user-friendly.

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7. Support and Maintenance

7.1 **The Toolbox** will provide the technical support necessary for hosting and maintaining the resources on its platform.

7.2 **B2GreenHub** will provide sector-specific insights, ensuring that user feedback from manufacturing beneficiaries informs the continued development of tools.

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8. Financial costs

8.1 The parties are each separately responsible for the costs associated with the delivery of their respective responsibilities and deliverables outlined herein.

8.2 No other financial commitment is required between the parties.

8.3 Costs associated with any future development of the platform, assets, or services provided will be discussed and financial responsibility agreed between the parties before any such development commences.

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9. Term and Termination

9.1 This Collaboration Agreement is valid for an initial period of **three (3) years**, with an option for renewal upon mutual consent of both Parties.

9.2 Either Party may terminate the agreement with a **two (2)-month written notice**.

10. Governing Law

This agreement shall be governed by and construed in accordance with the laws of Ireland.

11. Signatures

The Collaboration Agreement shall be effective from the date of this document and represents the entire agreement which is entered into voluntarily by the Parties.

For and on behalf of The Toolbox:

Name: Damian Foxall
Title: Managing Director – Foxall Munro Ltd

Damian Foxall

Signature:
Date: 12-02-2025

For and on behalf of B2GreenHub:

Name: Marko Močnik
Title: DIRECTOR

Signature:
Date: 27. 3. / 2025

Pomurski
TEHNOLOŠKI PARK
Podjetje za pospeševanje podjetništva
Pomurja d.o.o.

END OF AGREEMENT

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Annex 2

Annex 2 reports the suggested questions for each part of the Sustainable Business Model Canvas of JWG3, according to the selection of the industry cluster.

Electronics

Sustainable Partners

- Who are possible partners in **sustainable raw material sourcing**, particularly for electronics (e.g., suppliers of recycled rare earth metals, conflict-free minerals)?
- How can we **increase transparency in our supply chain**, ensuring compliance with environmental and social standards (e.g., RoHS, REACH, ISO 14001)?
- Can we collaborate with **electronic waste recycling companies** or **remanufacturers** to close the product life cycle loop?
- Can we partner with **software and IoT solution providers** to enable smarter, more efficient manufacturing?

Sustainable Value Creation

- Which are our **key manufacturing activities**, and how can we **reduce energy consumption, emissions, and resource waste**?
- Which **advanced sustainable manufacturing technologies** (e.g., AI-driven process optimization, energy-efficient production lines) can we implement?
- How can we **reduce the use of critical materials** (e.g., cobalt, lithium) through product design?
- How can digital technologies (IoT, blockchain, AI) support **traceability and circularity** in our manufacturing processes?

Sustainable Value Proposition

- How can we **design electronics for longevity, repairability, and recyclability**?
- Can we offer **modular or upgradeable designs** to extend the product lifecycle?
- How can we transform **eco-design and responsible sourcing into customer value**?
- Can we introduce **Product-as-a-Service (PaaS) or leasing models** to enhance sustainability?
- How can we **integrate smart energy-saving features** into our electronic products to help customers reduce their carbon footprint?

Sustainable Customer Relations

- Which customer engagement strategies promote **sustainability awareness and responsible consumption**?
- How can we educate customers about **proper recycling or trade-in programs** for end-of-life electronics?
- How can we incorporate **digital tools (AI chatbots, IoT-enabled support) to enhance sustainability and customer satisfaction**?
- Can we use **data-driven insights** to customize sustainable offers based on user behaviour?

Responsible Customers

- Who are our **most sustainability-conscious customer segments**, and how can we **incentivize eco-friendly behaviours**?
- Can we collaborate with **corporate buyers looking to reduce their Scope 3 emissions**?
- How can we help customers track the **environmental impact of their electronics usage** (e.g., CO_2 dashboards, eco-ratings)?

Sustainable Channels

- How can we **reduce carbon emissions in logistics** (e.g., local production, green shipping solutions, digital product distribution)?
- Can we implement **reverse logistics** to take back used electronics for refurbishment or recycling?
- How do we communicate our **eco-friendly features in a way that resonates with customers and complies with green marketing standards**?

Sustainable Tech & Resources

- What **sustainable material alternatives** can replace traditional electronic components (e.g., biodegradable PCBs, lead-free solder)?
- How can we **minimize energy-intensive production processes** using automation and AI?
- Can we shift to **100% renewable energy sources** for manufacturing operations?
- How can we use **digital twins and predictive analytics** to optimize resource use and reduce production waste?

End of Life

- Can our electronics be **easily disassembled, refurbished, or recycled**?
- What **take-back schemes** can we offer to encourage responsible disposal and material recovery?
- How can we ensure compliance with **WEEE (Waste Electrical and Electronic Equipment) regulations**?
- Can we design **remanufacturing loops** that bring old products back into production with minimal waste?

Cost Structure & Additional Costs

- What are the **cost implications of switching to sustainable suppliers and materials**?
- Can we **reduce costs through circular economy practices** like remanufacturing or material recovery?
- Which energy-efficient upgrades offer the **best return on investment**?
- How do we account for **regulatory compliance costs** (e.g., EU taxonomy, EPEAT certification)?

Subsidization

- What **government incentives, tax breaks, or grants** exist for sustainable electronics manufacturing?
- Can we access **funding for digitalization projects** that improve sustainability (e.g., smart grids, AI-driven efficiency tools)?
- Can we apply for **EU Green Deal or Horizon Europe grants** supporting sustainable innovation?

Revenue & Sustainability Premium

- Are customers willing to pay a **green premium for eco-friendly electronics**?
- How can we introduce **circular revenue models** (e.g., device-as-a-service, pay-per-use)?
- Can we **monetize sustainability features**, such as energy-saving capabilities or carbon offset integrations?
- How do we structure pricing to **incentivize responsible consumption** (e.g., repair subscription models, buy-back discounts)?

Negative Impact (Minimize)

- How can we **reduce e-waste and hazardous material usage**?
- Are we generating **toxic by-products** that require costly disposal, and can we eliminate them?
- What are the potential **negative social impacts** (e.g., unethical sourcing, worker exposure to hazardous materials), and how can we mitigate them?
- Can we prevent **rebound effects**, where efficiency gains lead to increased overall consumption?

Positive Impact (Maximize)

- How can our products help reduce **energy use, emissions, or electronic waste** at scale?
- Can we integrate **circular economy principles** into our business to create positive environmental and social impact?
- How can **digitalization** enable more sustainable customer behaviours (e.g., energy tracking apps)?
- Can we leverage sustainability efforts to **enhance our brand reputation and market positioning**?

Food & Beverages

Sustainable Partners

- Who are possible partners in **sustainable ingredient sourcing** (e.g., organic, regenerative agriculture, fair trade suppliers)?
- How can we **ensure transparency and sustainability** throughout our supply chain, considering certifications like **Rainforest Alliance, Fair Trade, or Organic Certification**?
- Can we collaborate with **local farmers, cooperatives, or alternative protein suppliers** to promote sustainability?
- Can we partner with **food waste recovery organizations, composting facilities, or upcycling companies** to minimize waste?
- How can we engage with **regulatory bodies and industry associations** to anticipate environmental regulations affecting food production?

Sustainable Value Creation

- Which **key production activities** (e.g., farming, food processing, packaging) can be adjusted to **reduce water and energy consumption**?
- What **sustainable food processing technologies** (e.g., renewable energy-powered facilities, AI-driven food waste reduction) can we implement?
- How can we **reduce food waste and optimize resource use** through smart inventory management or predictive analytics?
- Can we substitute **unsustainable ingredients (e.g., palm oil, artificial additives) with environmentally friendly alternatives**?

- How can we incorporate **digital solutions (IoT, blockchain) to track sustainability metrics in production**?

Sustainable Value Proposition

- How can we **design food products with minimal environmental impact**, such as plant-based alternatives or upcycled ingredients?
- Can we use **sustainable, biodegradable, or compostable packaging** to reduce waste?
- How can we highlight **ethical sourcing, eco-friendly production, or carbon-neutral initiatives** to customers?
- Can we implement **direct-to-consumer (DTC) models or subscription-based food services** to minimize food waste?
- How can we **educate customers about sustainable consumption** (e.g., portion control, reducing food waste at home)?

Sustainable Customer Relations

- How can we build **long-term customer trust** through transparency about sourcing, carbon footprint, and sustainability initiatives?
- What digital engagement strategies (e.g., sustainability impact reports, interactive packaging with QR codes) can we use?
- How can we create **loyalty programs that reward sustainable consumer behaviour** (e.g., reusable container returns, discounts for local purchases)?
- Can we **leverage AI and data analytics** to personalize sustainable product recommendations for customers?
- How can we integrate **social responsibility campaigns (e.g., food donations, zero-waste challenges) into customer relations**?

Responsible Customers

- Who are our **most sustainability-conscious customers**, and how can we **engage them through responsible consumption programs**?
- Can we **partner with schools, restaurants, or businesses** to encourage sustainable food choices?
- How can we **educate consumers on reducing food waste, responsible disposal, and composting**?
- Can we create a **digital footprint tracker** that helps customers understand their **carbon impact from food choices**?
- How can we make sustainability an **accessible and attractive choice for mass consumers**?

Sustainable Channels

- How can we **reduce emissions in food distribution**, such as using **eco-friendly last-mile delivery solutions** (e.g., electric vehicles, bike couriers)?
- Can we optimize our **supply chain logistics to reduce food miles** and promote local sourcing?
- How do we communicate our **sustainability efforts through online and offline sales channels**?
- How can we implement **zero-waste packaging and returnable container systems** in our distribution?
- Can we leverage **digital channels (e-commerce, mobile apps) to offer sustainable food choices and educate consumers**?

Sustainable Tech & Resources

- What **sustainable ingredient alternatives** can replace traditional ones (e.g., lab-grown meat, vertical farming, alternative proteins)?
- How can we **integrate renewable energy sources** into our food production processes?
- Can we implement **AI-driven food safety and quality control systems** to reduce food spoilage and waste?
- How can we use **blockchain technology for traceability in food sourcing and waste tracking**?
- What **water-saving and energy-efficient innovations** can we incorporate into food processing and storage?

End of Life

- What happens to our food products and packaging at the **end of their lifecycle**?
- Can our packaging be **easily composted, recycled, or returned**?
- How can we **encourage customers to properly dispose of food waste** (e.g., composting partnerships, recycling incentives)?
- Can we **upcycle food by-products into new products** (e.g., repurposing surplus fruits into snacks)?
- What policies can we implement to **reduce landfill contributions from expired or unsold food items**?

Cost Structure & Additional Costs

- What are the **financial implications of switching to sustainable ingredients, energy-efficient processes, and eco-friendly packaging**?
- Can we **reduce costs through circular economy practices** like **food by-product utilization and waste reduction**?
- What is the ROI of investing in **green certifications and sustainability-focused marketing campaigns**?
- Are there opportunities to **optimize energy and water use to lower operational costs**?

Subsidization

- What **government grants, tax incentives, or subsidies** support sustainable food production and distribution?
- Can we access **funding for digitalization projects** that enhance sustainability (e.g., AI-driven food waste reduction, smart packaging)?
- Are there **partnerships or industry initiatives** that provide financial support for sustainable food businesses?

Revenue & Sustainability Premium

- Are consumers willing to pay a **premium for sustainably sourced and eco-packaged food products**?
- How can we integrate **circular business models** like **deposit-refund schemes for packaging** or **subscription-based food services**?
- Can we introduce **carbon offset programs or eco-labelling** to create additional value for consumers?
- How do we position our pricing strategy to **align with consumer expectations while covering sustainability costs**?

Negative Impact (Minimize)

- How can we **reduce greenhouse gas emissions, water use, and food waste** in our operations?
- Are we generating **hazardous by-products** (e.g., excessive plastic waste, unsustainable farming runoff), and how can we mitigate them?
- Can we **improve ethical labour practices in the supply chain** while maintaining cost efficiency?
- How do we ensure **responsible sourcing of raw materials** to prevent biodiversity loss?

Positive Impact (Maximize)

- How can we **promote regenerative agriculture and biodiversity conservation** in our sourcing?
- Can we **reduce food waste at the consumer level through better portion control and packaging innovations**?
- How can our food production methods **enhance soil health and water conservation**?
- Can we leverage **community-based programs or educational initiatives** to promote sustainable food systems?

Pharmaceutical & Chemical

Sustainable Partners

- Who are possible partners in **sustainable sourcing of raw materials and chemical ingredients**?
- How can we make the **entire supply chain more transparent, traceable, and compliant with green chemistry principles**?
- Can we form partnerships with **biotechnology firms, green chemistry labs, or material innovators** to develop sustainable alternatives?
- Can we collaborate with **waste management and circular economy partners** for safer disposal and recycling of chemical products?
- How can we **engage with regulators and industry associations** to shape upcoming environmental laws and sustainability standards?

Sustainable Value Creation

- Which **key manufacturing processes** can be optimized to reduce **carbon footprint, energy use, and water consumption**?
- How can we integrate **green chemistry principles** to minimize hazardous substances in our formulations?
- What **sustainable production technologies** (e.g., biocatalysis, AI-driven process optimization, closed-loop production) can we implement?
- Can we shift to **renewable energy sources** or **carbon-neutral production facilities**?
- How can **digital solutions (IoT, AI, blockchain) help monitor and improve sustainability metrics**?

Sustainable Value Proposition

- How can we develop **eco-friendly formulations, biodegradable packaging, or green alternatives to conventional chemicals**?
- Can we introduce **bio-based or synthetic biology-derived pharmaceuticals and chemicals** that reduce environmental impact?
- How can we integrate **circular economy principles** by designing **recyclable, reusable, or lower-impact products**?
- Can we offer **as-a-service models** for chemical and pharmaceutical products (e.g., chemical leasing, drug repurposing services)?
- How can we highlight **regulatory compliance, carbon reduction, and health & safety benefits** as part of our value proposition?

Sustainable Customer Relations

- How can we **educate customers** about the **environmental and social benefits** of sustainable pharmaceutical and chemical products?
- Can we create **customer engagement platforms** that provide transparency on **product lifecycle impacts and sustainability efforts**?
- How can we leverage **AI and predictive analytics** to offer **personalized sustainability recommendations** to customers?
- What partnerships with **hospitals, laboratories, or industrial customers** can promote **circular practices like take-back and recycling programs**?
- Can we build **long-term loyalty programs** that incentivize the use of eco-friendly products?

Responsible Customers

- Who are our **most sustainability-conscious customer segments**, and how can we **support them in making greener choices**?
- Can we **help hospitals, biotech firms, or industrial customers transition to safer and more sustainable chemicals**?
- How can we assist consumers in **responsible disposal or reuse of chemical and pharmaceutical products**?
- Can we introduce **impact tracking tools** that help customers monitor their carbon footprint and sustainability efforts?
- How can we make sustainability a **competitive advantage and a unique selling point in the market**?

Sustainable Channels

- How can we **minimize emissions in logistics** (e.g., low-carbon transportation, localized production, smart inventory management)?
- Can we implement **closed-loop distribution systems** to retrieve, recycle, or safely dispose of end-of-life products?
- How do we communicate **our commitment to sustainability through digital and traditional sales channels**?
- Can we utilize **blockchain or IoT-enabled tracking** to enhance traceability in sustainable sourcing and product distribution?
- What **eco-friendly packaging and supply chain innovations** can improve sustainability?

Sustainable Tech & Resources

- What **sustainable raw material alternatives** can replace traditional synthetic or fossil-based ingredients?
- How can we **minimize water-intensive and energy-heavy processes** in pharmaceutical and chemical production?
- Can we integrate **AI-driven automation, smart sensors, and machine learning** to enhance sustainability monitoring?
- How can we **use biotechnology, nanotechnology, or alternative synthesis methods** to make processes greener?
- Can we implement **real-time emissions and waste monitoring systems** to reduce environmental impact?

End of Life

- What happens to our **products, packaging, and chemical waste** at the **end of their lifecycle**?
- Can we **introduce take-back programs** for expired drugs or chemical residues?
- How can we **increase recyclability and biodegradability** of our formulations and packaging?
- Can we create **eco-friendly disposal guidelines** for industrial and consumer use?
- What partnerships with **waste treatment, recycling, or bio-remediation firms** can help reduce the environmental footprint?

Cost Structure & Additional Costs

- What are the **cost implications of switching to sustainable raw materials and production methods**?
- Can we **reduce costs through process optimization, energy efficiency, or waste reduction initiatives**?
- What is the financial impact of **complying with evolving environmental regulations**?
- How do we balance **investment in sustainability with maintaining competitive pricing**?

Subsidization

- What **government incentives, grants, and tax benefits** exist for **green chemistry and sustainable pharmaceuticals**?
- Can we access **EU Green Deal, Horizon Europe, or private sustainability funding** for digital and green transformation?
- Are there **industry alliances or funding programs** that support sustainable business models?
- How can **carbon credits, emissions trading, or sustainability-linked financing** be leveraged?

Revenue & Sustainability Premium

- Are customers willing to **pay a premium for sustainable pharmaceuticals and chemicals**?
- Can we develop **subscription-based models or circular business strategies** for sustainable chemicals?
- How can we **differentiate our products** based on sustainability, safety, and eco-certifications?
- Can we introduce **revenue streams from sustainable IP licensing, green technology consulting, or eco-friendly formulations**?

Negative Impact (Minimize)

- How can we **reduce emissions, hazardous waste, and toxic by-products** in production?
- Are we generating **pollution risks** (e.g., wastewater contamination, plastic microbeads), and how can we mitigate them?
- What are the potential **health and safety concerns in sourcing and manufacturing**, and how do we address them?
- Can we ensure **ethical labour practices and supply chain responsibility** while maintaining cost efficiency?

Positive Impact (Maximize)

- How can we promote **circular economy models** in pharmaceutical and chemical industries?
- Can we invest in **research for low-impact, high-efficiency sustainable alternatives**?
- How can **digital tools enhance transparency and sustainability reporting**?
- Can we position our company as a **leader in responsible and ethical innovation**?

Metals

Sustainable Partners

- Who are possible partners in **sustainable sourcing of raw metals and alloys** (e.g., suppliers of recycled steel, aluminium, and rare metals)?
- How can we ensure **traceability and transparency** in our metal supply chain, complying with standards like **ISO 14001, EU Green Deal, and ESG regulations**?
- Can we collaborate with **metal recycling firms, scrap metal processors, and secondary raw material providers** to reduce waste?
- How can we form **industrial symbiosis partnerships** to use by-products from other industries as raw materials?
- Can we partner with **digital technology providers** to implement **IoT, AI, and blockchain for tracking sustainability metrics**?

Sustainable Value Creation

- How can we optimize **metal extraction, casting, and fabrication processes** to reduce **energy consumption, emissions, and material waste**?
- What **clean technologies** (e.g., electric arc furnaces, hydrogen-based steel production, AI-driven process optimization) can enhance sustainability?
- Can we adopt **remanufacturing, upcycling, or metal recovery technologies** to minimize raw material use?
- How can **Industry 4.0 solutions** (e.g., digital twins, predictive maintenance) help optimize sustainability in metal processing?
- Can we replace **carbon-intensive processes** with **renewable energy-powered solutions**?

Sustainable Value Proposition

- How can we create **durable, long-lasting metal products** with enhanced **recyclability and minimal environmental footprint**?
- Can we introduce **lightweight, high-strength alloys** to reduce energy use in downstream applications (e.g., automotive, aerospace, construction)?
- How can we integrate **eco-design principles** to maximize **reuse, remanufacturing, and recyclability**?
- Can we offer **metal-as-a-service models** (e.g., leasing instead of selling, closed-loop metal reuse systems)?
- How can we ensure **compliance with circular economy regulations** to strengthen our market position?

Sustainable Customer Relations

- How can we communicate the **sustainability benefits of our metal products** to customers?

- What digital engagement strategies (e.g., **sustainability dashboards, real-time carbon tracking tools**) can help customers make informed decisions?
- How can we create **customer loyalty programs** that promote the use of sustainable materials?
- Can we offer **customized eco-friendly metal solutions** based on customer sustainability goals?
- How can we leverage **blockchain-based material passports** to ensure transparency in sustainability claims?

Responsible Customers

- Who are our **most sustainability-conscious customers**, and how can we support them in **choosing low-carbon and recycled metals**?
- How can we educate industrial customers on **circular economy practices**, such as metal recovery and closed-loop systems?
- Can we provide **lifecycle analysis (LCA) reports** to customers to quantify their carbon footprint savings?
- What **pricing models** incentivize customers to **return end-of-life metal products for recycling**?
- Can we **collaborate with downstream industries** (e.g., automotive, construction, packaging) to optimize metal reuse?

Sustainable Channels

- How can we **reduce logistics-related emissions** by optimizing supply chain distribution (e.g., **low-carbon transport, localized production**)?
- Can we implement **circular logistics models**, where used metal components are returned for remanufacturing or repurposing?
- How do we communicate **our sustainability efforts through digital and offline sales channels**?
- Can we use **AI-driven demand forecasting** to prevent overproduction and reduce waste?
- What **digital tools (e-commerce platforms, sustainability reports, QR codes on packaging)** can enhance transparency in distribution?

Sustainable Tech & Resources

- What **alternative materials** (e.g., bio-based coatings, sustainable alloys) can we integrate into our production?
- How can we minimize **water-intensive and energy-heavy processes** in metal refining and finishing?
- Can we implement **real-time emissions tracking, AI-driven process control, and digital twins** to improve sustainability performance?
- What **energy-efficient manufacturing methods** (e.g., green hydrogen in steelmaking, electrification of metal casting) can we explore?
- Can we integrate **smart sensors and IoT** to optimize **resource efficiency and waste reduction**?

End of Life

- What happens to our **metal products at the end of their lifecycle**?
- Can we introduce **take-back schemes for industrial scrap, metal waste, and used components**?
- How can we increase **the recyclability and reusability** of our products?
- Can we develop **remanufacturing loops** that bring old products back into production with minimal resource use?
- What policies ensure **sustainable disposal and compliance with waste management regulations**?

Cost Structure & Additional Costs

- What are the **financial implications of switching to sustainable raw materials and energy-efficient production**?
- Can we reduce costs by **optimizing material recovery and process efficiency**?
- What are the costs of **complying with evolving environmental regulations**?
- How can digital transformation **reduce operational costs and increase efficiency**?

- How do we balance **investment in green technologies with maintaining competitive pricing**?

Subsidization

- What **government incentives, tax credits, and grants** support **low-carbon metal production and circular economy models**?
- Can we access funding for **digitalization projects** that enhance sustainability?
- Are there **EU Green Deal, Horizon Europe, or private funding programs** that we can leverage?
- Can we participate in **carbon credit programs or emissions trading schemes**?
- Are there financial incentives for **closed-loop recycling systems in the metal industry**?

Revenue & Sustainability Premium

- Are customers willing to **pay a premium for sustainably sourced and low-carbon metals**?
- Can we develop **circular revenue models**, such as **leasing metal products or material recovery services**?
- How can we position our products as **high-value sustainable alternatives** in competitive markets?
- Can we introduce **certification-based pricing models**, where certified sustainable metals are sold at a premium?
- How can we create new revenue streams through **recycling, remanufacturing, and digital services**?

Negative Impact (Minimize)

- How can we **reduce emissions, energy consumption, and hazardous by-products** in metal production?
- What **pollution risks** (e.g., mining tailings, heavy metal runoff) do we need to mitigate?
- Can we implement **waste heat recovery and industrial symbiosis** to reduce our environmental footprint?
- How do we ensure **ethical labour practices and responsible mining partnerships**?

Positive Impact (Maximize)

- How can we promote **circular economy models** in the metal industry?
- Can we integrate **carbon capture and utilization (CCU) technologies** to reduce emissions?
- How can **digital tools enhance sustainability reporting and compliance**?
- Can we position our company as a **leader in green metallurgy and sustainable innovation**?

Plastics & Rubber

Sustainable Partners

- Who are possible partners in sourcing **bio-based, recycled, or biodegradable plastics and rubber**?
- How can we ensure **traceability and transparency** in our supply chain to meet sustainability and regulatory standards (e.g., **EU Circular Economy Action Plan, ISO 14001, REACH**)?
- Can we collaborate with **waste collection, recycling facilities, or material recovery companies** to improve circularity?
- How can we form **industrial symbiosis partnerships** where by-products from other industries serve as raw materials for ours?
- Can we partner with **digital technology providers** to implement **blockchain, AI, and IoT for tracking sustainability metrics**?

Sustainable Value Creation

- How can we optimize **plastic and rubber production processes** to **reduce energy consumption, emissions, and waste**?

- What **clean technologies** (e.g., **biopolymer production, advanced rubber recycling, AI-driven material optimization**) can enhance sustainability?
- Can we substitute fossil-based plastics and rubbers with **bio-based, compostable, or recycled materials**?
- How can we implement **closed-loop production** by collecting and reprocessing our own waste materials?
- Can **Industry 4.0 solutions** (e.g., **predictive maintenance, process automation, real-time monitoring**) help improve sustainability?

Sustainable Value Proposition

- How can we create **durable, lightweight, and fully recyclable plastic and rubber products**?
- Can we introduce **biodegradable, compostable, or plant-based alternatives** to traditional plastics and rubbers?
- How can we integrate **eco-design principles** to maximize **recyclability, reuse, and reduced material waste**?
- Can we transition to a **Product-as-a-Service model** (e.g., leasing rubber components, reusable packaging solutions)?
- How can we ensure compliance with **circular economy regulations** to strengthen our market positioning?

Sustainable Customer Relations

- How can we communicate the **sustainability benefits of our plastic and rubber products** to customers?
- What digital engagement strategies (e.g., **carbon footprint tracking, lifecycle assessment (LCA) reports, QR codes on packaging**) can help customers make informed choices?
- How can we create **customer loyalty programs** that reward the use of sustainable materials?
- Can we offer **customized sustainable solutions** based on customer sustainability goals?
- How can we leverage **blockchain-based material tracking** to ensure transparency in sustainability claims?

Responsible Customers

- Who are our **most sustainability-conscious customer segments**, and how can we **help them transition to greener alternatives**?
- Can we **educate and collaborate with end-users** to encourage responsible disposal and reuse?
- How can we incentivize customers to **return used plastic and rubber products for recycling**?
- Can we develop **carbon footprint calculators** for customers to evaluate their impact?
- How can we align our **pricing models** with responsible consumption behaviours?

Sustainable Channels

- How can we **minimize emissions in logistics** through **supply chain optimization, eco-friendly transportation, and localized production**?
- Can we establish **reverse logistics models** to facilitate the return of plastic and rubber products for recycling?
- How do we communicate our **sustainability efforts across e-commerce, retail, and industrial channels**?
- Can we use **smart packaging, digital labels, or product tracking apps** to provide real-time sustainability data to customers?
- What **digital tools (e-commerce platforms, sustainability dashboards, QR codes on packaging)** can enhance customer engagement?

Sustainable Tech & Resources

- What **sustainable raw material alternatives** can replace traditional petroleum-based plastics and synthetic rubbers?
- How can we **minimize water-intensive and energy-heavy processes** in manufacturing?

- Can we implement **AI-driven automation, IoT-enabled sensors, and machine learning** to optimize sustainability performance?
- What **energy-efficient manufacturing methods** (e.g., **low-temperature curing, renewable energy-powered production**) can we integrate?
- How can **real-time emissions and waste tracking** improve sustainability monitoring?

End of Life

- What happens to our **plastic and rubber products after use**?
- Can we implement **take-back schemes for recycling, upcycling, or repurposing used materials**?
- How can we maximize **the recyclability and reusability** of our products?
- Can we develop **closed-loop recycling programs** where materials from old products are used in new manufacturing?
- How can we ensure compliance with **global and regional plastic waste regulations**?

Cost Structure & Additional Costs

- What are the **financial implications of switching to sustainable materials and production methods**?
- Can we **reduce costs through process optimization, energy efficiency, or circular economy practices**?
- How do **regulatory compliance costs impact our business**, and how can we turn them into a competitive advantage?
- How can digital transformation **reduce operational costs and increase efficiency**?
- How do we balance **investment in green technologies with competitive pricing strategies**?

Subsidization

- What **government incentives, grants, and tax credits** support the shift to **biodegradable plastics, advanced recycling, and circular economy models**?
- Can we access funding for **digitalization projects** that improve sustainability tracking and transparency?
- Are there **EU Green Deal, Horizon Europe, or private sustainability funding programs** available for green innovation?
- Can we participate in **plastic waste credit systems or circular economy investment programs**?
- What partnerships with **research institutions and government bodies** can help fund sustainable R&D?

Revenue & Sustainability Premium

- Are customers willing to **pay a premium for sustainable plastics and rubbers**?
- Can we introduce **circular business models**, such as **subscription-based rubber components or reusable packaging solutions**?
- How can we position our products as **high-value sustainable alternatives** in competitive markets?
- Can we introduce **certification-based pricing models**, where certified sustainable materials are sold at a premium?
- How can we create **new revenue streams through recycling, repurposing, and digital product services**?

Negative Impact (Minimize)

- How can we **reduce emissions, energy consumption, and plastic/rubber waste** in production?
- What **pollution risks** (e.g., microplastics, VOC emissions, waste disposal issues) do we need to mitigate?
- Can we implement **waste-to-energy systems or industrial symbiosis** to reduce landfill disposal?
- How do we ensure **ethical sourcing and responsible waste management** throughout our supply chain?

Positive Impact (Maximize)

- How can we promote **circular economy models** in plastics and rubber industries?
- Can we integrate **bio-based polymers and carbon-negative production techniques**?

- How can **digital tools enhance sustainability reporting and compliance**?
- Can we position our company as a **leader in green plastics and sustainable rubber innovation**?

Machinery & Equipment

Sustainable Partners

- Who are possible partners for **sustainable material sourcing** (e.g., suppliers of recycled metals, eco-friendly coatings, or energy-efficient components)?
- How can we increase **transparency and traceability** in our supply chain to meet **ISO 14001, EU Green Deal, and ESG regulations**?
- Can we collaborate with **remanufacturers, recyclers, and waste management firms** to create a closed-loop system?
- How can we establish **industrial symbiosis partnerships**, repurposing by-products from other industries in our machinery production?
- Can we partner with **technology providers for IoT, AI, and blockchain** to enhance sustainability tracking and efficiency?

Sustainable Value Creation

- How can we **optimize production processes** to reduce **energy consumption, emissions, and material waste**?
- What **clean technologies** (e.g., **3D printing for resource-efficient manufacturing, AI-driven process optimization**) can we implement?
- Can we incorporate **modular design principles** that allow easier repair, refurbishment, and component upgrades?
- How can **Industry 4.0 solutions** (e.g., **predictive maintenance, digital twins, and smart automation**) enhance sustainability in machinery operations?
- Can we transition to **green energy-powered production** and optimize supply chain logistics to reduce our carbon footprint?

Sustainable Value Proposition

- How can we design **durable, repairable, and energy-efficient machinery** with minimal environmental impact?
- Can we integrate **smart, energy-saving features** (e.g., self-optimizing motors, energy-efficient hydraulics) into our machines?
- How can we transition to **circular economy models**, offering remanufacturing, refurbishment, or leasing services?
- Can we create **machinery-as-a-service (MaaS) models**, where customers pay for usage rather than ownership?
- How do we ensure compliance with **sustainability regulations (e.g., EU Ecodesign Directive, WEEE Directive)** to strengthen our market positioning?

Sustainable Customer Relations

- How can we **educate customers** about the **long-term cost savings and environmental benefits** of sustainable machinery?
- What digital tools (e.g., **carbon footprint calculators, predictive maintenance apps**) can we provide to enhance customer sustainability efforts?
- Can we establish **loyalty programs** that incentivize customers to return end-of-life equipment for refurbishing or recycling?
- How can we **leverage AI-driven insights** to recommend **sustainable machinery options tailored to customers' needs**?
- How do we integrate **customer feedback loops** to continually improve sustainability features in our products?

Responsible Customers

- Who are our **most sustainability-conscious customers**, and how can we help them reduce their environmental footprint?
- How can we assist customers in **transitioning to energy-efficient, low-emission machinery**?
- Can we implement a **return, reuse, or repurpose program** to encourage responsible disposal of old equipment?

- How can we help customers integrate **circular economy principles** into their operations (e.g., remanufactured spare parts, refurbished machinery)?
- What pricing models incentivize customers to **choose more sustainable machinery solutions**?

Sustainable Channels
- How can we **optimize logistics and distribution** to reduce emissions (e.g., **localized production, low-carbon transport, digital documentation**)?
- Can we implement **reverse logistics** to recover and refurbish used machinery?
- How do we communicate **our sustainability efforts through digital and offline sales channels**?
- What **smart packaging and product labelling** can provide real-time sustainability insights for customers?
- Can we develop **an online marketplace for refurbished or upgradable equipment** to extend product lifecycles?

Sustainable Tech & Resources
- What **sustainable material alternatives** can replace traditional metals and plastics in machinery?
- How can we **minimize water-intensive and energy-heavy processes** in manufacturing?
- Can we integrate **AI-driven automation, smart sensors, and IoT monitoring** to optimize sustainability performance?
- What **energy-efficient manufacturing methods** (e.g., **low-temperature metal processing, green hydrogen-powered production**) can we adopt?
- How can **real-time emissions and waste tracking** improve sustainability monitoring?

End of Life
- What happens to our **machinery and equipment at the end of its lifecycle**?
- Can we **develop take-back programs** for refurbishment, resale, or responsible recycling of used equipment?
- How can we ensure **disassembly-friendly designs** that allow efficient material recovery?
- Can we provide **recycled and refurbished parts** as an alternative to new components?
- How can we comply with **WEEE (Waste Electrical and Electronic Equipment) Directive and other global recycling standards**?

Cost Structure & Additional Costs
- What are the **financial implications of switching to sustainable production methods and materials**?
- Can we reduce costs through **process optimization, energy efficiency, and circular economy practices**?
- How do regulatory compliance costs impact our business, and how can we turn them into a competitive advantage?
- How can digital transformation **reduce operational costs and increase efficiency**?
- How do we balance **investment in green technologies with maintaining competitive pricing**?

Subsidization
- What **government incentives, tax benefits, or grants** support sustainable machinery manufacturing?
- Can we access funding for **digitalization projects that improve sustainability tracking and efficiency**?
- Are there **EU Green Deal, Horizon Europe, or private funding programs** available for green innovation?
- Can we participate in **carbon credit programs or emissions trading schemes**?
- What partnerships with **research institutions and government bodies** can help fund sustainable R&D?

Revenue & Sustainability Premium
- Are customers willing to **pay a premium for energy-efficient, long-lasting machinery**?

- Can we introduce **circular business models**, such as **subscription-based industrial equipment services**?
- How can we position our products as **high-value, sustainable alternatives** in competitive markets?
- Can we introduce **certification-based pricing models**, where certified sustainable equipment is sold at a premium?
- How can we create **new revenue streams through refurbishing, remanufacturing, and digital service integration**?

Negative Impact (Minimize)

- How can we **reduce emissions, energy consumption, and hazardous waste** in production?
- What **pollution risks** (e.g., lubricant disposal, scrap metal waste, chemical coatings) need to be mitigated?
- Can we implement **waste-to-energy systems or industrial symbiosis** to minimize waste?
- How do we ensure **ethical sourcing and responsible supply chain management**?

Positive Impact (Maximize)

- How can we promote **circular economy models** in the machinery and equipment industry?
- Can we integrate **low-carbon materials, smart automation, and carbon-neutral production**?
- How can **digital tools enhance sustainability reporting and compliance**?
- Can we position our company as a **leader in energy-efficient and sustainable machinery innovation**?

Building Materials & Furniture

Sustainable Partners

- Who are possible partners in sourcing **eco-friendly raw materials** (e.g., FSC-certified wood, low-carbon cement, bio-based composites)?
- How can we ensure **traceability and sustainability** in our supply chain, complying with **ISO 14001, LEED, and EU Green Deal regulations**?
- Can we collaborate with **recycling companies, waste management firms, or alternative material suppliers** to reduce virgin material use?
- How can we form **industrial symbiosis partnerships**, repurposing waste from other industries for our products?
- Can we partner with **technology providers for digital tracking, lifecycle analysis, and AI-driven resource optimization**?

Sustainable Value Creation

- How can we **optimize production processes** to reduce **energy consumption, carbon emissions, and material waste**?
- What **clean technologies** (e.g., **3D printing for construction, AI-driven design optimization, green adhesives**) can enhance sustainability?
- Can we incorporate **modular and circular design principles** to enable disassembly and reusability?
- How can **Industry 4.0 solutions** (e.g., **IoT-based monitoring, digital twins, and automated production**) improve sustainability in furniture and building materials?
- Can we transition to **green energy-powered manufacturing** and optimize supply chain logistics to reduce our carbon footprint?

Sustainable Value Proposition

- How can we create **durable, recyclable, and energy-efficient building materials and furniture** with a minimal environmental footprint?
- Can we integrate **smart, energy-efficient features** (e.g., insulation panels, low-emission coatings, water-saving designs) into our products?
- How can we transition to **circular economy models**, offering repairable, upgradable, or modular products?

- Can we introduce **furniture-as-a-service (FaaS) or material leasing models**, where customers pay for use rather than ownership?
- How do we ensure compliance with **LEED, BREEAM, Cradle-to-Cradle, and eco-labelling standards** to strengthen our market positioning?

Sustainable Customer Relations

- How can we **educate customers** about the **long-term cost savings and environmental benefits** of sustainable furniture and building materials?
- What digital tools (e.g., **carbon footprint calculators, smart home integration, lifecycle assessment (LCA) reports**) can we provide to enhance customer engagement?
- Can we establish **buy-back or trade-in programs** for old furniture or building materials?
- How can we **leverage AI-driven insights** to recommend **customized sustainable solutions for customers**?
- How do we integrate **customer feedback loops** to continually improve sustainability features in our products?

Responsible Customers

- Who are our **most sustainability-conscious customer segments**, and how can we help them reduce their environmental footprint?
- How can we assist customers in **choosing low-carbon, non-toxic, and recyclable building materials and furniture**?
- Can we implement a **return, reuse, or repurpose program** to encourage responsible disposal of old products?
- How can we help customers integrate **circular economy principles** into their operations (e.g., **modular office furniture, repurposed building materials**)?
- What pricing models incentivize customers to **choose more sustainable options**?

Sustainable Channels

- How can we **optimize logistics and distribution** to reduce emissions (e.g., **low-carbon transport, decentralized production, digital inventory management**)?
- Can we establish **reverse logistics** to recover and refurbish used furniture and materials?
- How do we communicate **our sustainability efforts through online and offline sales channels**?
- What **smart packaging and digital labelling solutions** can provide real-time sustainability insights for customers?
- Can we develop **an online marketplace for refurbished or upcycled furniture and building materials** to extend product lifecycles?

Sustainable Tech & Resources

- What **sustainable material alternatives** can replace traditional plastic, composite, or non-recyclable building materials?
- How can we **minimize water-intensive and energy-heavy processes** in production?
- Can we integrate **AI-driven automation, IoT-based tracking, and machine learning** to optimize sustainability performance?
- What **energy-efficient manufacturing methods** (e.g., **solar-powered production, low-impact coatings, bio-based resins**) can we adopt?
- How can **real-time emissions and waste tracking** improve sustainability monitoring?

End of Life

- What happens to our **furniture and building materials at the end of their lifecycle**?
- Can we **develop take-back programs** for refurbishing, resale, or responsible recycling?
- How can we ensure **disassembly-friendly designs** that allow efficient material recovery?
- Can we provide **recycled and refurbished components** as alternatives to new materials?
- How can we comply with **extended producer responsibility (EPR) laws and other sustainability regulations**?

Cost Structure & Additional Costs

- What are the **financial implications of switching to sustainable production methods and materials**?
- Can we reduce costs through **process optimization, energy efficiency, and circular economy practices**?
- How do regulatory compliance costs impact our business, and how can we turn them into a competitive advantage?
- How can digital transformation **reduce operational costs and increase efficiency**?
- How do we balance **investment in green technologies with maintaining competitive pricing**?

Subsidization

- What **government incentives, tax benefits, or grants** support sustainable furniture and building material production?
- Can we access funding for **digitalization projects that improve sustainability tracking and efficiency**?
- Are there **EU Green Deal, Horizon Europe, or private funding programs** available for green innovation?
- Can we participate in **carbon credit programs or circular economy investment schemes**?
- What partnerships with **research institutions and government bodies** can help fund sustainable R&D?

Revenue & Sustainability Premium

- Are customers willing to **pay a premium for energy-efficient, long-lasting furniture and building materials**?
- Can we introduce **circular business models**, such as **subscription-based furniture solutions or material leasing**?
- How can we position our products as **high-value, sustainable alternatives** in competitive markets?
- Can we introduce **certification-based pricing models**, where certified sustainable products are sold at a premium?
- How can we create **new revenue streams through refurbishing, repurposing, and digital product services**?

Negative Impact (Minimize)

- How can we **reduce emissions, energy consumption, and material waste** in production?
- What **pollution risks** (e.g., VOC emissions, non-recyclable waste, landfill contributions) need to be mitigated?
- Can we implement **waste-to-energy systems or industrial symbiosis** to minimize waste?
- How do we ensure **ethical sourcing and responsible supply chain management**?

Positive Impact (Maximize)

- How can we promote **circular economy models** in furniture and building material industries?
- Can we integrate **low-carbon materials, smart automation, and energy-efficient production**?
- How can **digital tools enhance sustainability reporting and compliance**?
- Can we position our company as a **leader in sustainable furniture and eco-friendly building materials**?