

AllThings.Bio PRO

D3.1: Report of the first sequence of focus groups and co-creation workshops

WP 3 – Engagement for Game Missions

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AllThings.bioPRO - Game changer for the bio-based economy
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Technical References

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¹ PU = Public

PP = Restricted to other programme participants (including the Commission Services)

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1 Summary

Allthings.bioPRO wants to draw attention to the bioeconomy and its products from renewable raw materials and give citizens the opportunity to contribute their ideas and requirements to shape the industry. For this purpose, the project will co-create a serious game and a smartphone app together with citizens and other stakeholders spanning four different missions: food packaging, fashion and textiles, kids and schools and jobs and careers.

Each of the four game missions is co-developed by two regional project partners¹, local citizen groups and regional economic, research, policy and civil society experts, who are already active in the specific theme of the mission. Thus, the project gives voice to local people and communities. It seeks to strengthen the dialogue for practical opportunities in areas that are important for the region and for specific bioeconomy sectors, and to demonstrate the specific regional benefits while engaging with regional and local stakeholders. By including citizens and putting their perspective to the centre, the project supports the change to a quadruple helix model of stakeholder interaction.

The game development process is organised in two rounds of focus groups and co-creation workshops, followed by co-design meetings. The applied methodologies of stakeholder engagement in the first phase of the game development process are outlined below.

In the focus groups, participants discussed their needs, views and attitudes towards bioeconomy and the focus missions. The discussions were kick-started by exploring participants' first associations with the topic.

Among others, it became evident that

- Levels of understanding and attitudes differ across and within the focus groups
- Some participants knew about the latest developments and materials, others dealt with bioeconomy for the first time
- For many participants, it was unclear what the terms 'bioeconomy' or 'bio-based' really mean. They detected it to be somehow sustainable
- The complexity of the topic was repeatedly stressed
- Overall, bioeconomy was understood as utilisation and economisation of plant-based, renewable resources
- Participants frequently connected it with circular economy and reusability, waste reduction, a green way of thinking and nature-friendly behaviour, holistic thinking, innovation, technology and future
- While some participants were clearly positive about the opportunities that bioeconomy brings for achieving sustainability, fostering progress and safeguarding jobs, other participants took more critical positions

For the co-creation workshop, experts in bioeconomy and the respective mission topic from science, industry, politics or civil society joined the citizens as participants. The core element of this workshop was to brainstorm on first basic game design ideas, while considering possible 'players' and their user requirements. Some selected game design ideas to be further discussed and perhaps advanced were "free Flipper from plastic waste", "organise a sustainable fashion show", Pokémon Go bioeconomy edition for children and a coaching game for job seekers to develop their personal qualifications for a bioeconomy career.

The assessment of interim results and a reflection of applied processes, procedures and applied methodologies build the basis for the second sequence of participatory activities.

Outputs of all co-creation workshops are listed in the Annex to this report.

¹ For the Kids and Schools mission there is only one regional partner dealing with the co-creation process due to covid-related cancellation of the commitment of AIMV to organise engagement events in their school environment.

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List of Abbreviations and Acronyms

Abbreviation	Definition
BE	Belgium
BTG	BTG Biomass Technology Group B.V.
BSS	Bonn Science Shop (Wissenschaftsladen Bonn e.V.)
CSO	Civil Society Organisation
D	Deliverable
DE	Germany
EE	Estonia
FFG	Stichting Fashion for Good
FNR	Fachagentur Nachwachsende Rohstoffe e.V.
IBS	Institute of Baltic Studies
ICONS	Foundazione iCons
INTHUM	Laboratorio Interculturale di Ricerca e di Promozione della Condizione (H)umana
IT	Italy
M	Project Month
MOS	Municipality of Sigmaringen
MS	Milestone
NG	nurogames GmbH
NL	Netherlands
NMF	Stichting De Natuur – en Milieufederaties
PU	Publicly available
SE	Sweden
T	Task
TEEC	Tartu Environmental Education Centre
VA	Vetenskap & Allmänhet
WP	Work Package

2 Introduction

This document is a public deliverable (D3.1) related to the task “Co-Creation Phase” (T3.2, M5-13) and more specifically the subtask T3.2.2, due in July 2021 (M11) in WP3 Engagement for the Game Missions. This report is written by Bonn Science Shop (BSS) with the support of all regional partners² and describes the procedure and results of the first sequence of focus groups and co-creation workshops. Seven regional partners conducted the focus groups and co-creation workshops within the four missions in their regions.

²The document uses the term regional partners and mission partners. Regional partners refers to the (seven) project partners carrying out the co-creation activities across the four missions (food packaging, fashion and textiles, kids and schools, jobs and careers). The term mission partners is used to refer to the two regional partners working on one mission or to refer to the four mission teams.

The document structure is the following:

After introducing Allthings.bioPRO's focus themes ('missions') and the partners working in these missions the stakeholder engagement processes and the first round of participatory event methodologies are presented. After outlining the first round of focus groups with its goals, its procedure and group composition, the discussion results are highlighted, followed by a first reflection. Next, the document goes into details about the first round of co-creation workshops in chapter 7. Similar to the previous chapter, goals and procedure, group composition and workshop results, namely personas, user requirements and initial game design ideas are described. The document closes with the assessment of the interim results of the first round of events, a reflection on this first round and an outlook on the second sequence of participatory activities.

3 Missions and Regional Mission Partners

In Allthings.bioPRO we focus on four carefully selected themes that represent a variety of daily activities and settings for citizens (see Table **Fehler! Verweisquelle konnte nicht gefunden werden.**). We refer to the themes as 'missions'. They will be at the heart of our activities.

Table 1- Overview of the four missions themes in Allthings.bioPRO

Allthings.bioPRO missions
<p>Food Packaging</p> <p>Food is part of everyone's daily routine, be it shopping for groceries or getting a quick bite at lunch break. Next to conversations about healthy living, animal rights and sustainable food production, people are also getting increasingly sensitive about how food is being packaged and what happens to it after use: we want to reduce the use of plastic, increase the circularity of materials to minimise our impact on the environment. Allthings.bioPRO wants to investigate different bio-based packaging on the market and learn about citizens views on and needs for bio-based food packaging.</p>
<p>Fashion and Textiles</p> <p>Clothes and textiles are part of our daily life, and most people are naturally concerned about products they wear on the body. There is also increasing concern about sustainability: fashion is one of the most polluting industries globally and is known for its poor working conditions. Allthings.bioPRO wants to introduce citizens to sustainable clothing options provided by the bio-based economy and learn about citizens' views on and needs for, bio-based fashion and textiles.</p>
<p>Kids and Schools</p> <p>The youth has become a strong voice in sustainability discussions in our society. They advocate for a clear stand towards climate change and are influencing adults to change their behaviour. Schools are the places where the youth spend most of their days. In Allthings.bioPRO we want to engage in a discussion on the bioeconomy and sustainable bio-based products to be used in schools.</p>
<p>Jobs and Careers</p> <p>The bioeconomy is an important contributor to a sustainable and prosperous European Union and needs properly skilled and trained employees. The identification of opportunities to promote careers, education and research activities is on top of the agenda of the European bio-based industry. In Allthings.bioPRO we want to inform about the skills required to consider vocational training and career transition. Our focus will be on highlighting the career opportunities and job profiles that the bioeconomy is looking for.</p>

Seven **regional partners** with prior experience involving citizens and other local stakeholders will support the co-creation process. They were selected for their specific expertise and experience on one of the four mission themes.

Food Packaging: City of Sigmaringen (MOS) (DE) including its local institutions (e.g., University of Applied Science) is strongly engaged in discussions on plastic reduction in our daily lives and how this can be achieved on a local level. **Natuur en Milieufederaties (NMF)** (NL) is a major Dutch network for sustainable development implementing many activities related to circular and sustainable bioeconomy including projects related to plastics.

Fashion and Textiles: Vetenskap & Allmänhet (VA) (SE) and **Stichting Fashion for Good (FFG)** (NL) are both highly engaged in sustainable fashion projects and have access to a global stakeholder network including all parts of the textile and fashion value chains and sectors. VA has been specifically active in boosting the market uptake of innovative textiles (e.g., wood-based fibres). FFG covers the whole value chain of sustainable fashion and is an important communicator and multiplier in the field, having its own museum on sustainable textiles, which will be used to show results from the serious game.

Kids and Schools: The Tartu Environmental Education Centre (TEEC) (EE) has a successful track record in environmental education and innovative teaching methodology for pupils on primary school level. TEEC is committed to use the final results relevant for children in its future activities.³

Jobs and Careers: Bonn Science Shop (BSS) (DE) is one of the main actors in Germany, providing jobs and career information and services on a weekly basis. **INTHUM** (IT) is strongly involved in sustainable growth and social issues as well as local job creations in disadvantaged regions. Both partners are perfectly suited to support the development of a game mission, which is highly relevant for job seekers and students.

Table 2 – Regional Mission Partners

Regional Mission Partners				
Mission	Regional partner	Partner Abbreviation	Country	City/Region/Province
Food Packaging	Municipality of Sigmaringen	MOS	DE	Baden-Wuerttemberg
Food Packaging	Natuur en Milieufederaties	NMF	NL	Utrecht and the Hague
Fashion and Textiles	Fashion for Good	FFG	NL	Amsterdam
Fashion and Textiles	Vetenskap & Allmänhet	VA	SE	Stockholm
Schools and Children	Tartu Environmental Nature House	TEEC	EE	Tartu
Jobs and Careers	Bonn Science Shop	BSS	DE	North-Rhine Westphalia
Jobs and Careers	IntHum – Laboratorio Interculturale di Ricerca e di Promozione della Condizione (H)umana	INTHUM	IT	Sardinia

³ The second regional partner of the mission Kids and Schools could not organise engagement activities due to covid-19. Instead, the German perspective on this mission will be collected in a German feedback workshop, in which the results from TEEC will be presented and reviewed.

4 Stakeholder Engagement in Allthings.bioPRO

There is a broad consensus about the need for a socio-ecological economic transition in order to protect the planet and people. We are at the eve of change from a fossil-based economy to a sustainable and circular economy and this is a crucial moment for involving society. Since all individuals, whether as citizens or consumers, will be affected, they should be able to play a key role when shaping our future economy. Citizens need to have a say in political decisions and agenda-setting processes in the bioeconomy. On the other hand, the bio-based industry needs the input of citizens and consumers to make sure that the products developed are in tune with consumers' requirements and expectations.

As citizens, we enjoy the legal rights and privileges granted by our country and the European Union. But these rights come with responsibilities to consider and care for the community and to participate in our democracies. Broken down to the topic of the bioeconomy one might distinguish that on the one hand the citizens' view focuses more on the broad picture and the impact the bioeconomy and its products have on our society. On the other hand, the consumers' role has a more personal viewpoint. Consumers consider quality, functionality, the costs of products they use, and they care about the sustainable production and environmental impact of products they use on a daily basis.

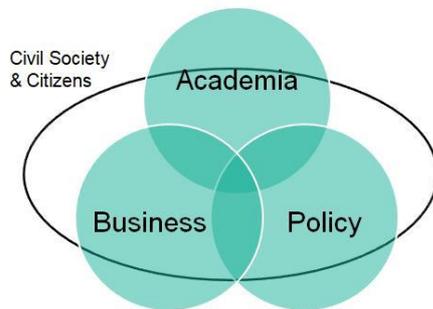
In Allthings.bioPRO we strive to foster citizens' awareness, participation and co-creation of the future of bioeconomy through a game development covering the four "daily life" themes (missions): food packaging, fashion and textiles, kids and schools and jobs and careers.

Allthings.bioPRO engages citizens from the very beginning and throughout the entire co-creative development of the serious game and the smartphone app. Co-creation follows an approach involving different perspectives and collaboratively designed tools, materials, processes, activities or strategies. This working objective concerns building and uniting affected communities in strategic ways and forging new partnerships among stakeholders in the bioeconomy environment and along the value chains.

Each of the four game missions is co-developed by two regional project partners, local citizen groups and regional economic, research, policy and civil society experts, who are already active in the specific area of the mission. Thus, the project gives voice to local people and communities. The purpose of the co-creation activities is to strengthen the dialogue on practical opportunities in areas or sectors that are important for the region as well as for specific bioeconomy sectors, and to demonstrate the specific, regional benefits while engaging with regional and local stakeholders. By including citizens and putting their perspective to the centre, the project supports a quadruple helix model of stakeholder interaction.

The game development process is organised in focus groups, co-creation workshops and co-design meetings. The first two of the three kinds of events will be described in the next chapters.

Graphic 1 – *Quadruple Helix Model*⁴



Source: Own graphic, based on Carayannis, Barth, Campbell (2012):
Five Helices of the Quintuple Helix

5 Methods

The events described in this report were citizen focus groups and co-creation workshops. A description of the methods follows. Due to the pandemic, both the focus groups and co-creation workshops were conducted online.

5.1 Citizen Focus Groups

A focus group is a qualitative method, which is designed to help the organisers learn more about community and group preferences, values and opinions regarding a defined topic and why these preferences, values and opinions exist by observing the structured discussion. Focus groups can reveal what the participants are really thinking and feeling, and group interactions and non-verbal communication can also be studied.

The participants build a small group (ideally 6-10 persons) who are selected according to certain common characteristics that relate to the focus group topic. The focus group is facilitated by moderators, whose task is to keep the group focused on discussing the specific topic. A focus group can be seen as a mix between an interview and a discussion group. Due to the pandemic, Allthings.bioPRO's focus groups were conducted online.

5.2 Co-Creation Workshops

The methodology of co-creation emerges from transformative processes in the entrepreneurial world by bringing together users and producers for a collaborative creation of new products and services. Other fields like research and education have taken up this approach.

In co-creative approaches, the affected stakeholder(s) (groups) are actively and equitably involved in finding better solutions from the very beginning and throughout the whole process. In Allthings.bioPRO actors from (civil) society, policy, research and industry are brought together in co-creation workshops to share their

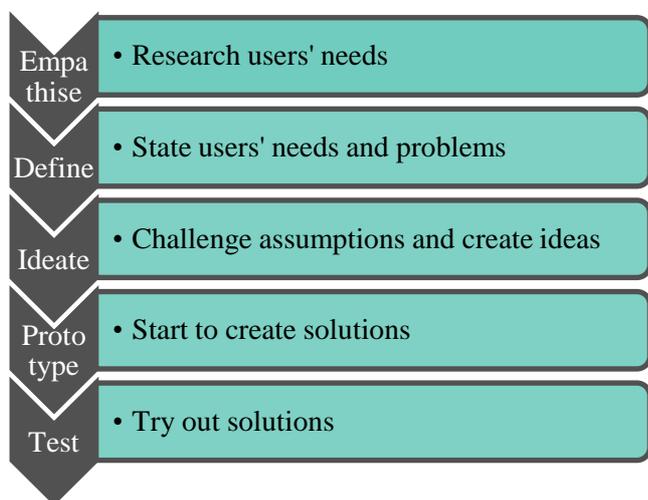
⁴ The structure of this quadruple helix model is based on the structure a quintuple helix model. In the quintuple helix model a fifth helix “environment” surrounds the four helices.

perspectives and ideas on eye level. Together they co-develop concepts for the serious game and the app, which benefit from the multitude of stakeholder expertise. With affected stakeholder groups co-developing the game and the app the likelihood that the outputs meet their needs will be increased and will materialise their visions for a future bio-based economy and the mission topics.

There is no pre-defined (or singular) concept of co-creation workshops, but typically co-creation workshops or workshop rows follow different phases like 1) opening and familiarising 2) diving into the topic, 3) ideating and 4) designing solutions, 5) closing and 6) evaluating and reflecting. Typically, the process is non-linear but iterative. For each of these phases a variety of different methodologies can be applied (see D3.4).

In the case of Allthings.bioPRO, the workshops also contained Design Thinking elements. Co-Creation and Design Thinking are overlapping concepts. In short, Design Thinking takes a human-centred approach and aims to create meaningful and helpful solutions for people. Typically, it is an iterative 5-stage process and follows the structure in Graphic 2 (see below). For every phase, different methods can be applied as well (see D3.4).

Graphic 2 – 5-Stage Process of Design Thinking



Source: Own graphic

6 Overview of the Co-Creation Phase and Governance

The co-creation phase in Allthings.bioPRO is at the centre of WP3 Engagement for Game Missions and takes place between month 3 and 13. It is described in Task 3.2 Co-Creation Phase, more specifically T3.2.1 and T3.2.2. The aim of the co-creation phase is to develop comprehensive concepts for the implementation of each game mission, which will be picked up by the game development partner (NG) to design the game in WP4.

The co-creation phase in Allthings.bioPRO is structured in two sequences of focus groups and co-creation workshops in seven regions across Europe. Each sequence includes two focus groups and two co-creation workshops for each of the four missions (1 of each per regional partner).

This deliverable (D3.1) reports the activities during the first sequence. The activities of the second sequence (June-September 2021) will be subject of the upcoming report (D.3.2).

The first sequence took place between January and May 2021. In the beginning, a Focus Group Training and a Co-Creation Training (MS3.1) were organised in month 6 by BSS for all regional partners. Initially, the focus groups and co-creation workshops were planned to be run as face-to-face events. Due to the pandemic, the events had to be held online. The above-mentioned trainings were adapted to the new requirements for virtual events. We used them to familiarise the implementing partners with (possible) online formats of the events. The methods were chosen and practiced accordingly.

The seven focus groups of the first sequence were conducted with citizens only. Their goal was to familiarise the citizen target groups with bioeconomy and the respective mission topics and learn about their needs, views and ideas on the topic.

The results of the local citizens focus groups were shared and discussed between the mission partners and were cross-fed into the co-creation workshops. To the co-creation workshops, in addition to the citizens, civil society, policy, research and industry stakeholders with expertise in the mission topics contributed. The main goal of the co-creation workshops in this round was to come up with initial game design concepts.

Between the rounds, an assessment of the interim results of the first sequence took place. Table 3 below shows the subsequent events, their timeframes, and their main purposes.

During the whole co-creation phase, WP3 Partner Meetings were organised every month. In these meetings, the regional partners exchanged experiences across and within missions and planned successively. Additionally, individual meetings were organised on demand.

Every third month, a HelpDesk Meeting substituted the WP3 Partner Meeting. In these meetings, selected helpdesk members from the consortium (other WPs) joined the regional partners. This way, WP-overlapping challenges could be addressed.

Table 3 – Overview of the Engagement Framework

	Focus Group 1	Co-Creation Workshop 1	Review of Sequence 1	Focus Group 2	Co-Creation Workshop 2
Who?	WP3	WP3	WP4 & WP3	WP3	WP3
Activities	Familiarise with bioeconomy & mission topic; understand participants' perspectives	Empathise with targeted user groups, develop user requirements; brainstorm basic game design ideas	Set up of technical & functional requirements; review and select user requirements & game design ideas	Discuss topic, approach and interim results; finalise user requirements	Advance selected game design ideas
Time	Jan-Feb 21	Mar-April 21	May 21	Jun-Aug 21	Aug-Sep 21

7 First round of focus groups

Between November 2020 and the beginning of 2021, citizens in the regions of the seven mission partners were contacted and mobilised for the first round of focus groups. The mobilisation was based on an initial stakeholder identification and mapping process. The stakeholder identification and mobilisation (Task 3.1 from month 1-3) is described in D3.4. Due to the change to online events, some regional partners have also recruited participants from regions other than their own.

The citizen focus groups in the first round then were conducted between the end of January and the end of March 2021. They were facilitated and moderated by members of the regional partner organisations.

The focus groups consisted of 8-14 participants and lasted between 1.5 and 3.5 hours.

The following sections describe the focus groups' compositions, goals, procedure, results and follow-up work.

7.1 Participants

Table 4 - Focus Group Participants

Focus Group Participants						
Mission Partner	Country	Nr.	Age range	Female	Male	Participant features
Food Packaging						
MOS	DE	11	23-65	5	6	Strong local focus - citizens were based in Sigmaringen and surrounding region (Baden-Wuerttemberg).
NMF	NL	14	<30->50	9	5	Citizens from different regions in the Netherlands, 5 participants with game experience, self-assessed bioeconomy knowledge was solid on average.
Fashion and Textiles						
VA	SE	9	20-70	9	0	Different backgrounds as student, researcher, sustainability expert, entrepreneur, communicator, pensioner and government representative.
FFG	NL	12	14-60	12	0	Citizens from Amsterdam and around, the majority showed regular interest in fashion and clothing, 3 followed a fashion related study, but no one is currently working in the field.
Kids and Schools						
TEEC	EE	8	10-14	6	2	Pupils in the Tartu Nature House.
Jobs and Careers						
BSS	DE	8	17-35	5	3	Pupils, students and graduates in career-orientation, one participant in re-orientation, all cared for sustainability.
INTHUM	IT	8	17-75	1	7	Students, retired eco-volunteer (former factory worker), computer and gamification expert, representatives of the world of cooperation working in the fields of green, agribusiness and livestock also engaged in activities of job placement of disadvantaged people, expert in bio dance, permaculture and production of organic soaps.

7.2 Goals and procedure

The goal of the first round of online focus groups was to familiarise participants with the bioeconomy and the respective mission topic and get to know participants views, needs and ideas on the future of the bioeconomy and the respective mission topic. **Fehler! Verweisquelle konnte nicht gefunden werden.** gives an overview of the exemplary procedure of the citizen focus groups. An outline of the average procedure follows:

- Before the event, factsheets about the bioeconomy and the mission topics (developed by WP2), a project presentation (developed by WP5) and informed consents were sent to the participants.
- The moderators started the focus groups with **welcoming** the participants, supporting to remove possible technical issues and explaining the event's **goal**.
- Participants were informed about the **data security and data usage** in Allthings.bioPRO again and the facilitators secured that they had received signed declarations of consent from all participants. Consent was obtained to record the meeting.
- Afterwards the basic principles of the used platform (Zoom, Webex and others) were explained. Other tools were explained right before deploying them (e.g., Mentimeter, Miro).
- To establish an inclusive and safe space where participants could feel comfortable to talk freely, conversation rules were established, and expectations and non-expectations were clarified.
- Then, participants introduced themselves and got to know each other better. For this, different **opener** methodologies were used.
- Some organisers granted time in the beginning of the event to let participants fill in a **baseline survey and a game/app questionnaire**. Other organisers had sent these surveys to their participants in advance. These surveys were provided by the evaluation partner IBS (WP7) and the game development partner NG (WP4) to obtain insights into the existing understanding of and attitudes towards bioeconomy, the mission topic, gamification and co-creation before joining the co-creation phase (the surveys are described more closely in chapter 9). Afterwards, the facilitators **presented their organisations and the project and introduced bioeconomy as well as the mission topic**. The aim of the input was to familiarise everyone with the main ideas and create a starting point for the upcoming group discussion. A small Q&A session followed.
- After a short break, the group discussions were kick-started by capturing and discussing **associations with bioeconomy and the focus themes**. Thus, a general level of the participants' understanding and views of bioeconomy and the focus themes became clearer. The **moderated group discussions** were based on guiding questions adapted to the mission topic. Nevertheless, the moderators also ensured an open and participant-led discussion. In some groups, the discussion was visualised with an online whiteboard tool.
- The focus group ended with a **summary** of discussed topics and a **reflection** of the focus group. The event finished with a **closer** to keep the event and the discussed content in mind (e.g., bioeconomy alphabet) (see D3.4 for methodologies). Eventually, the facilitators gave an **outlook** on the upcoming co-creation process and thanked the participants. Small presents were given to the participants.⁵

⁵ Regional partners had a small budget for incentives for the participants of the first focus group (10€ per participant). Items like cookies wrapped in bio-based plastics, gift cards, vouchers for local stores, local honey or a subscription of a job magazine were given to the participants before or after the event. As the focus groups were conducted online during the covid-pandemics the gifts were sent via mail or e-mail.

Table 5 - Example of a Focus Group

Example Focus Group Agenda ⁶
Welcome and goals
Data security and IT & Tools
Get to know each other
Baseline survey and game questionnaire
Project presentation
Input on bioeconomy and mission topic
Break
Associations with bioeconomy and mission topic
Group discussion with guiding questions
Summary and reflection
Closing

7.3 Summaries of results

In the focus groups, participants' first associations with bioeconomy and their respective focus mission were explored. Tools like Mentimeter supported this task and visualised results. The table below shows the participants' spontaneous associations.

Table 6 –Associations with bioeconomy and the mission themes

Associations with bioeconomy and the mission themes		
Mission Partner	Bioeconomy	Mission Theme
Food Packaging		
MOS	Food, biofuels, agriculture as basis for the economy, communication of bioeconomy important, frequent perception that biology and economy are contradictions, land consumption, degrowth, sustainable economic growth, circular economy, regionality, fair and decent working conditions and social justice, structural change, bioeconomy as solution?, waste reduction.	Can bio-based packaging maintain standards? High quality food needs high quality packaging, why pack organic food in plastic? Why package so much? Increasing waste in pandemic, how to convince consumers of bio-based packaging?, greenwashing, how does packaging affect products? Conflict between product design, consumer appeal and ecological thought, primarily food protection, more focus on packaging material choice needed.
NMF	Sustainability, biomass, re-using, circular, green, nature, zero waste, reduction of CO2 emissions, renewable resources, degradable, bio-based resources bring opportunities, transfer knowledge, green economic gains, eco-conscious.	Practical downsides of using bio-based packaging in the current system, disposal problems, large number of different words used on packaging confusing, need for true prices.
Fashion and Textiles		
VA	Sustainability, nature, pursuit of change, holistic perspective, new concept, biological resources, renewable, circular	More recycling, fewer clothes, “ugly” production, challenge and international cooperation, individual responsibility,

⁶ This is an exemplary agenda. There were small differences in the processes

	economy, ecology, innovation, future, long-term, profitable, costs, difficult, sustainable development goals (SDGs), obscure term.	essentials for life, necessity, future possibilities, not follow trends, create your own fashion with longer lifespan, sustainable production with low emission and chemistry – less of everything, better, innovation opportunities.
FFG	“Bio-based” seems to be sustainable but actual meaning unclear, concerns about complexity of topic.	Assumptions that bio-based clothing would be more sustainable, but no clear vision of what the term contains, buying sustainable or bio-based clothing is difficult, many different materials, innovation.
Kids and Schools		
TEEC⁷	Green way of thinking, nature-friendly behaviour, nature-friendly economy, natural economy, things are made of biodegradable materials, therefore not pollute nature, fast degradability, re-using things	Not explored/documentated.
Jobs and Careers		
BSS	Sustainable economy?, not necessarily sustainable if not combined with resource use reduction, bluff package, capitalism, circular economy, need-based consumption, future resource use, treat nature fair, renewable resources, environmental protection, sustainable agriculture, wood, food as fuel, biogas, energy from biomass, straw, corn, monocultures, bioplastics, packaging, research, technology, job market, innovation & progress, holistic thinking.	Great variety of jobs and possible career pathways in many fields, variety fosters chance of individual match, potential to steer young people towards sustainable, meaningful jobs, need to promote these jobs in educational institutions.
INTHUM	Biomass, timber utilisation, undergrowth, grid, energy, km 0 products, respect for nature, agritourism and educational farm, green chemistry, industrial chain vs. natural production chain, earth, farm life, study/work/opportunities, cooperation/networking between entrepreneurs, social farming.	Personal job may go in bioeconomy direction, confidence to choose study that will offer a profession, participants already working in agricultural and pastoral economy are trying to adopt corporate policy choices towards a sustainable economy for nature and workers, experiences with labour and health protection battles for less polluting industries.

Discussion results

The moderated group discussions were at the heart of the focus groups. They were kick-started with exploring participants’ association with bioeconomy and the mission topics. In many groups, tools like Mentimeter supported and visualised the start. The discussions’ goal was to get to know participants views, needs and ideas on the bioeconomy and the mission topics.

The regional partners agreed on guiding questions beforehand. These questions did not strictly lead every group discussion but provided a possible framework and landmarks to steer the discussion back to the project’s research interest.

⁷ In this mission no associations to the mission topic Kids and Schools arose. Therefore this column is not included into the table

The **guiding questions** are listed below:

- When you think about the bioeconomy – what are your first thoughts? (Spontaneous associations, state of understanding, attitudes, understanding of the role of bioeconomy for a sustainable future)
- When you think about <mission topic> - what are your first thoughts (on the background of bioeconomy)? What can it have to do with bioeconomy?
- How do you think bioeconomy and <mission topic> could contribute to solving resource and climate change issues?
- What would be necessary to advance <mission topic>? What information is needed? What tools? What incentives are necessary (to make informed decisions)?
- What do you need to contribute to <mission topic> (more effectively)? How can your access be improved?

The discussions were documented, and some were supported by virtual collaborative whiteboard tools. This helped to structure and visualise the discussion and activated participants to interact and write down their thoughts.

The following is a summary of discussions on bioeconomy and the mission topics.

Bioeconomy

Discussing bioeconomy, it became evident that levels of understanding differed across and within the seven focus groups. Some participants knew about the latest developments and materials, others dealt with the topic for the first time. Self-assessed knowledge of bioeconomy was rated rather low to medium (according to the baseline survey). To many participants it was unclear what the terms ‘bioeconomy’ or ‘bio-based’ really mean, but they detected it to be somehow sustainable. In some discussions, it served as synonym for sustainable economy or sustainability. Its perceived conceptual ambiguity was addressed repeatedly and caused confusion.

The complexity of the concept was discussed in several groups. This complexity also concerned and overwhelmed some participants. Bioeconomy, being a highly complex and ambiguous term and a broad sector, seemed to promote abstract discussions and hamper concrete perceptions and discussions, if not connected to specific fields or examples. On the other hand, this variety and ambiguity can attract the broader public, since many different aspects can be associated with bioeconomy.

Overall, bioeconomy was understood as utilisation and economisation of plant-based, renewable resources. Participants often connected it with circular economy and reusability, waste reduction, a green way of thinking and nature-friendly behaviour, holistic thinking, innovation, technology and future.

The attitudes towards bioeconomy and its role for a sustainable future also varied across the groups. Some groups associated mostly positive terms and were clearly positive about the opportunities that bioeconomy and bio-based industry bring for achieving sustainability, fostering progress and safeguarding jobs. Participants think the bioeconomy can exploit environmental resources but must do so while preserving natural balances.

In three focus groups, also critical positions on the bioeconomy were taken and the sustainability of the concept was discussed. In these groups, participants stated that bioeconomy cannot be sustainable if the overall resource consumption is not reduced, but only shifted from fossil-based to bio-based. The problem of increasing land use for bioeconomy and monocultures were mentioned. The need for a circular bio-based economy, increasing regional economic structures and need-based, conscious production and consumption were emphasised. Keywords like ‘greenwashing’ and ‘bluff package’ were connotated and the capitalistic logic of bioeconomy was discussed.

In two groups, it was noted that bioeconomy is still a growth-based economic model and the ability of growth-based economies becoming sustainable was critically discussed. Counter concepts like ‘post-growth’ or ‘degrowth’ economies were introduced as alternatives. These concepts question the possibility and sustainability of continuous economic growth on a finite planet and point towards its negative ecological, social and economic consequences. It is searching for ways to reduce societies’ dependencies on economic growth and make proposals to remain stable and prosper independent from economic growth. These critical discussions demonstrate awareness of the profound transformation our societies must undergo to preserve the foundations of life in the long term. They also demonstrate the challenges bioeconomy is facing.

Bioeconomy was mostly discussed from the ecological perspective. The social dimension was less a topic of discussion. Conversations about social or just bioeconomy were connected to cooperative and solitary economy, business structures, fair and decent working conditions and structural change. Up to now, bioeconomy is predominantly a concept driven by corporations and large companies. This way it is partly perceived out of reach for ordinary citizens. In the future, the landscape of bioeconomy business models becomes more diverse, embracing small and medium sized companies, cooperatives and initiatives. The importance of bioeconomy as a driver for structural change was especially addressed in the German focus groups.

Awareness raising and communication of bioeconomy to the general public were highlighted as essential, but also assessed as challenging due to its complexity and the diversity within societies. Further, educational institutions, social media and web-based platforms were identified as highly important to familiarise citizens with bioeconomy. Next to information campaigns the need for a coherent legal framework, economic incentives and further research for bioeconomy was stressed.

Single groups, like the one in Sardinia, Italy discussed bioeconomy and bio-based industry through local lenses, connecting it mainly with agriculture and chemistry. Not surprisingly, the discussions on bioeconomy were partly shaped by the mission topics.

Food Packaging

Bio-based food packaging was discussed in the focus groups of the Dutch partner NMF and the German partner MOS. In both groups, participants were concerned with the current amount and way of food packaging. Asking the participants how bioeconomy and food packaging are related for them, nature as role model, the usage of biodegradable packaging materials, the question of quality standards of bio-based packaging and consumer protection against greenwashing were addressed among others.

In the two group discussions, the following topics and possible adjusting screws across policymaking, business, industry and science to make food packaging more sustainable and to promote bio-based food packaging were discussed:

Clearly, both groups were confused about the different terms and labels used on packaging, as bio-based, biodegradable, compostable etc. The differences are not clear to lay people and participants are insecure about the right way of disposal. The mitigation of confusion of different packaging terms (e.g., biodegradable, compostable, bio-based etc.) through the clarification of their differences was requested.

Participants pointed out that the sustainability of bio-based packaging highly depends on its biodegradability/composability. A clearly stated need was to reduce packaging altogether, where it does not assure product quality, instead of substituting fossil-based with bio-based packaging.

The increasing demand for bio-based packaging increases land pressure and the development of regional materials makes it a local problem. The possibility to save scarce agricultural land and exploit regional packaging based materials by using bio-based residual streams was raised. Additionally, deposit systems would need to be promoted and waste systems would need to recognise bio-based options thus give consumers the possibility to dispose bio-based packaging sustainably. Further, participants requested the review of legal requirements for packaging and demanded an incentive system for bio-based packaging including products to reflect their true (ecological, social and economic) costs. On packaging, the

participants wished for references to the regionality of the food and multi-use possibilities. Eventually, further need for research was stated.

Participants identified the following possibilities to personally contribute to sustainable food packaging: making packaging a buying criterion, buying local thus less packaged, buying on markets instead of stores, talking to store owners, raising awareness, testing new ways, talking about personal consumption, consuming consciously, watching out for possibilities to do without packaging and being a role model, encouraging change and influencing others to do the same.

Fashion and Textiles

Bio-based fashion and textiles were discussed in the focus groups of the Swedish partner VA and the Dutch partner FFG. In both groups the terms 'bioeconomy' and 'bio-based materials' were perceived as obscure or confusing. Several participants had no clear vision of what the term 'bio-based' contained but suspected that bio-based clothing would be more sustainable. Participants were a bit concerned about the complexity of the topic and the affordability of the available bio-based clothes.

Participants regard a sustainable clothing transformation as a challenge that needs global cooperation and there was consensus on the difficulty of buying sustainable or bio-based clothing. Sustainable clothing is considered as individual responsibility and it means not only buying different materials but also buying less and reusing more. Fashion trends are in its concept not sustainable and extended fashion lifespan is needed. In the Dutch focus group, only few participants reported to use 'bio-based' explicitly as selection criterion for their clothing. In both groups, bio-based clothing was connected with innovation and future possibilities.

In the Dutch focus group, participants could take a virtual tour through an exhibition about bio-based clothing and materials. Afterwards they reported a better understanding about the term 'bio-based' and about the different materials and knew better what to look for. The participants were most enthusiastic about an exhibited bio-based glitter. Mentioned planned changes of behaviour after the focus group were increasing attention to the clothing materials, conscious shopping, including more second-hand shopping and more focus on sustainable brands. They stated that bio-based clothing can contribute to a more sustainable clothing industry but stressed that the substitution of innovative materials cannot stand alone. An absolute reduction in clothing consumption and an increase in repair and reuse would be crucial for true sustainability. Additionally, the need for sustainable clothing to become the new affordable normal instead of the exception was expressed.

In the Swedish focus group, some of the discussion was about what items and garments are made of biomass. The participants discussed their shopping behaviour of second-hand items. Everyone in the group knew that clothes can be made from biomass out of wood but there were some discussions on the how and on problems with production from a sustainable perspective as a lot of energy and chemicals are required in "ugly production".

Kids and Schools

Because this Estonian focus group addressed 10-14-year-old children, its length was limited to not overwhelm them. The facilitators limited the event to getting to know each other and the project, making the participants familiar with the bioeconomy and the mission topic, answering the baseline survey and the game questionnaire and asking for their understanding of bioeconomy. The children self-assessed their bioeconomy knowledge as average and associated bioeconomy with nature-friendly behaviour and economy, biodegradable products and the reuse of things.

In the German focus group, which was related to job-orientation in the bioeconomy, a discussion on bioeconomy in schools arose⁸: a strong need for a significant increase in sustainability and bioeconomy education in schools was expressed from former pupils. It was mentioned that dealing with sustainability would still require significant individual initiative but needs institutionalisation. Participants reflected that deploying the serious game in schools could help to excite less motivated pupils to learn about bioeconomy. Further, participants detected that sustainability and sustainable economy education would need to become much more holistic and interdisciplinary.

Jobs and Careers

The focus group in North-Rhine Westphalia, Germany discussed the occupational world in the bioeconomy and bio-based industry as a whole and the possibility for young citizens to access it in the phase of their career orientation. Whereas the focus group in Sardinia, Italy discussed the mission topic mainly in the local context. The occupational world of this region is shaped by agriculture and chemistry.

In both discussions, it was noticed that the participants considered the professions and career prospects in the bioeconomy and bio-based industry to be very promising. Participants either planned, could imagine or were already working in this sector or a related field. Involved students were confident that they have chosen a study that will give them a profession in this field.

In the German group, which did not take a field-specific, but general approach to jobs and careers in the bioeconomy, participants frequently emphasised the variety of career opportunities. Participants had no clear overview, which fields, professions and career paths belong to bioeconomy and the opportunities were perceived highly diverse. This variety brings advantages as well as disadvantages. It is advantageous that many citizens can connect individual interests and qualifications to bioeconomy and its job offers. However, this requires being informed. It was seen as a great opportunity that many young citizens in the phase of career orientation have not decided about their future profession yet and care about sustainability. This offers great potential to steer this generation towards sustainable bioeconomy jobs.

The disadvantage of the diversity of the bioeconomy job world is the lack of clarity, which professions and career pathways match with personal interests and qualifications. The vastness and range hindered concrete ideas. Fields, jobs and careers in the bioeconomy were rather discussed abstractly. The same issue of meta-discussions was observed for bioeconomy and bio-based industry in general.

This shows what was also expected: bioeconomy and its diverse job opportunities are still unknown to most of the public. This indicates a strong need for effective and target group-oriented awareness campaigns. Two channels to familiarise the public were discussed. Firstly, participants claimed increasing integration of learning about and experiencing jobs and careers in the bioeconomy in formal education. Secondly, social media heavily influences values and behaviour and should be utilised for familiarising with job and career opportunities in the bioeconomy. For social media, participants desired a shift from advertisement to responsible and transparent awareness raising.

When talking about information needed for career orientation, the following points were mentioned: connections with societal challenges, concrete descriptions of the job and everyday work, the versatility of the sector, links between qualifications and tasks of conventional professions and bioeconomy alternatives and cooperation opportunities with other initiatives.

When elaborating what is important for participants in a job, various criteria including economic security, sustainable and healthy lifestyles, personal development, and societal contribution were discussed. The professional world of the versatile bioeconomy with various fields appears to offer many career opportunities

⁸ Results from the mission Jobs and Careers are mentioned here under 'Kids and Schools' because they were thematically related to this mission. Further, the discussion results within 'Kids and Schools' were very limited. This results from little discussion time and only one partner in this mission.

that satisfy and unite all criteria. It was stressed that it is important to communicate this versatility and to not only communicate personal benefits, but also social and ecological utility of related job offers to job seekers.

In both focus groups, it became clear that a (future) profession should match with personal interests and be value-oriented. Highlighted values were sustainability, justice, development, cooperation, solidarity and inclusion. Participants envisioned a job market that embraces these values as central elements. A job market that is attentive to the needs of people and nature and an economy that functions in harmony with people and planet.

Up to now, bioeconomy is predominantly a concept driven by corporations and large companies. The Italian focus group reflected on job opportunities linked to the size of enterprises. Sardinia's economy is shaped by agriculture and chemistry. The agricultural and pastoral enterprises are small and medium-sized, sole proprietorships or family businesses. The bioeconomy in Sardinia can count on the strength and knowledge of small businesses, on the slow pace of the land and respect for nature.

Potentially, these small businesses can diversify the corporate landscape of agricultural bioeconomy. On the contrary, industrial plants dominate chemistry. Participants recounted the labour and health protection battles for less polluting industries through their work experience. A possible intervention for the bio-based industry in Sardinia is to convert industrial chemistry into green chemistry. Although this area is difficult to influence because powerful companies govern it, actions of aware citizens can support the transition. These discussions demonstrate the need to make bioeconomy opportunities more accessible for small and medium-sized enterprises, cooperatives and CSOs acting regionally. This also overlaps with the intention to foster regionality of bioeconomies stated in the European bioeconomy strategy.

When discussing the bioeconomy's role for economic structural change, the importance of a worker-inclusive approach, holistic planning and vocational retraining was addressed. The necessary consideration of how to harness expertise and qualifications gained in the outdated professions in the new fields and how to communicate transferability were stressed further.

Discussing the improvement of access to jobs and careers in the bioeconomy, participants highlighted the role of online platforms. For these, transparency of the job profiles, everyday work and qualifications required are considered very important. Ideally, such platforms work two-sided and indicate requested qualifications, but also allow the input of personal qualifications as search criteria. In addition, individual consultation and personal exchange with bioeconomy staff and information about their personal experiences are desirable. Participants also want to know which knowledge and qualifications are needed for the different bioeconomy fields and demand an illustration of the diversity of job opportunities.

Discussing individual needs for successful professional re-orientation in the bioeconomy, similar aspects as above plus vocational re-training, promising career prospects and career illustrations with personal educational background and skills were mentioned.

7.4 Follow-up Work and Reflection on the First Round of Focus Groups

After the focus groups, the workshop organisers summarised the events in their local languages as well as in English and discussed and reflected on their results with their corresponding mission partner. The summaries were sent to the participants and served to inform the subsequent co-creation workshop about the previous focus group. The HelpDesk Meeting in the beginning of April 2021 was used to commonly reflect on the first round of focus groups with the whole project consortium and to collect learnings and take-aways from the experiences for the upcoming co-creation workshops. A reflection summary follows:

As **take-aways**, several regional partners concluded:

- They would have better sent the baseline surveys and the game and app questionnaire to the participants in advance instead of using up discussion time during the focus group
- To start with lay citizen participants only (instead of mixing them with experts) seemed to reduce communication barriers
- A ‘balanced’ moderation, which allows participants to talk, express their thoughts freely, but also steers towards the main topics helped to keep the flow
- It became clear that the levels of understanding of bioeconomy varied among participants and focus groups
- In several groups the obscurity of the term bioeconomy was discussed

As **highlights**, many regional partners reported highly enthusiastic and lively participation.

As **challenges**, the regional partners mentioned:

- Lengthy introductions to the project and the topics in the beginning of the event. This has cut into the valuable discussion time
- They also identified the difficulty to create a lively atmosphere and interaction in an online event, compared to physical meetings, especially in the beginning
- In the mission Kids and Schools, it was perceived difficult to adjust materials, explanations and questions to children

An **open question** was the ability to work hybrid once the pandemic eased and in-person events would work again. For the upcoming process, regional partners stressed the importance to acknowledge citizens' participation and to stay connected with the participants, thus enable constant feedback loops.

8 First Round of Co-Creation Workshops

The first round of co-creation workshops was conducted between March and May 2021. The mobilisation of participants is described in the following section. The workshops were facilitated and moderated by the members of the regional partner organisations.

The group sizes strongly varied between four and 18 participants and workshops lasted between 2 and 4 hours.

The concept for these co-creation workshops was co-developed by BSS and NG (WP4) with the support of all regional partners. Involving the game and app design developer NG in defining the desired output formats ensured that critical elements were considered along the way. Thus, WP4 could also pick up the co-created results effectively. Although the overall format and the desired outputs of the workshops were pre-defined, it was the clear goal to remain open and responsive throughout the process and not drive the participants' ideas into certain directions or limit their creativity.

The following sections describe the workshops' compositions, goals and procedures, results and follow-up work.

8.1 Participants

For the co-creation workshop, the focus group participants were invited again. Because not all of them confirmed, also new citizens were mobilised, who met the pre-defined selection criteria of the different missions and local contexts. Other than the focus group with citizens only, in the co-creation workshops, experts in bioeconomy and the respective mission topic from science, industry, politics or civil society joined the citizens and made up approximately half of the group.

The experts were contacted and mobilised according to the mission topics, the partners' existing networks and the discussion foci. Just as for the focus groups, the necessity to conduct online co-creation workshops increased the ratio of participants from different regions of the countries. The table below gives an overview about the group compositions.

Table 7 – Participants of the Co-Creation Workshops

Participants of the Co-Creation Workshops					
Mission Partner	Country	Number	Female	Male	Participant features
Food Packaging					
MOS	DE	16	7	9	Citizens, representatives from food and packaging industry, representatives from food and materials science, regional policymakers.
NMF	NL	17	9	8	Citizens, representatives from waste collection, government, bio-based industry, CSO, environmental knowledge institute.
Fashion and Textiles					
VA	SE	8	4	4	High school students, researcher, sustainability expert, entrepreneur, fashion expert, communicator and government representative.
FFG	NL	4	4	0	Citizens with fashion interests, professionals from sustainable fashion, app design experts.
Kids and Schools					
TEEC	EE	8	6	2	Pupils from Tartu Nature House, teachers, gaming expert.
Jobs and Careers					
BSS	DE	18	11	7	Young citizens in career-orientation, representatives from the German bioeconomy council, university (bioeconomy studies), CEO of a green job portal, CLIB cluster, Chamber of industry and commerce, experts from bioeconomy and serious gaming projects, research institute for employment and bioeconomy markets.
INTHUM	IT	16	3	13	Students, university lecturers, teachers, regional official, social policy expert, computer and gamification expert, representatives of CSOs and agricultural undertakings.

8.2 Goals and procedure

The **goal** of the first round of co-creation workshops was to bring together citizens and experts on different topics related to bioeconomy and/or the mission topic to understand potential users (personas), set up user requirements for the game, widely brainstorm game design ideas and then develop selected game design ideas further.

The topics discussed in the focus groups were often a foretaste of the topics touched in the following co-creation workshops. Open questions or essential contributions from the first focus groups were addressed by the moderators and participants in the co-creation workshop.

The exemplary agenda in Table 7 below gives an overview of the exemplary procedure of the co-creation workshop.

An outline of the average procedure follows:

- The moderators opened the co-creation workshops with **welcoming** the participants, supporting to remove possible technical issues and explaining the event's **goal**.
- Participants were informed about the **data security and data usage** in Allthings.bioPRO again and the facilitators ensured that they had received signed declarations of consent from all participants. Consent was obtained to record the meeting.
- Afterwards the basic principles of the used platform (Zoom, Webex and others) were explained. Other tools were explained right before deploying them (e.g., Mentimeter, Miro).
- Then, participants introduced themselves and got to know each other better. For this, different **opener** methodologies were used. Afterwards, the facilitators **presented their organisation, the project and summarised the focus group results**. A small Q&A session followed.
- The co-creation part started with developing representatives for potential user groups, so called personas in breakout rooms (described in the following section 7.3.1). This way, participants empathise with the target group. Afterwards, user requirements were developed (see section 7.3.2). After a break, the brainstorming phase started. Participants widely brainstormed potential game concepts for their mission and selected their favourites to advance those ideas further (see section 7.3.3). Those who wanted could pitch their game ideas in the plenum.
- The workshop ended with a **reflection**. In some events, the facilitators gave an **outlook** on the upcoming co-creation process and thanked the participants.

Table 8 – Example of a Co-Creation Workshop Agenda

Example Co-Creation Workshop Agenda ⁹
Welcome and goals
Data security and IT & tools
Get to know each other
Project presentation and summary of the first focus group(s)
Persona Development
User Requirements
Break
Brainstorming of game ideas
Developing and Pitching Basic Game Ideas
Reflection and Closing

8.3 Summaries of results

8.3.1 Personas

Personas were developed in four out of seven co-creation workshops. VA created personas in their focus group.

Persona development is a **method** to enter the phase of understanding. Personas are the descriptions of archetypal users or stakeholders. Each persona description is based on a fictitious character whose profile

⁹ This is an exemplary agenda. There were small differences in the processes.

represents the characteristics of an existing social group. It describes social and demographic characteristics, habits and cultural backgrounds as well as needs and desires, goals and expectations, challenges and fears. Defining personas helps the team to have a shared understanding of the real users in terms of their goals, capabilities, and contexts. Personas also help prevent "self-referential design" when the designer or developer may unconsciously project their own mental models on the game or app design which may be very different from that of the target user population. For the co-creation process in Allthings.bioPRO, the main personas created serve as a starting point from which user requirements and game designs will be developed. With the help of the personas, the participants can check if the products fit the target group along the co-creation

For the mission **Food Packaging**, four personas were developed: a 14-year-old middle school pupil who is actively involved in school gardening; a 43-year-old truck driver who has a minimal lifestyle and likes to play smartphone games; a 36-year-old doctor's assistant and mother who likes dancing and gardening; and a retired married insurance clerk with little bioeconomy knowledge but passion for gardening.

For the mission **Fashion and Textiles**, three personas were developed: a 20-year-old female influencer who wants to be a role model and fears that sustainability is boring, ugly and difficult; a 15-year-old pupil who wants to become a scientist and cares about climate change and the future; and a 25-year-old woman, working in the service sector who wants to be trendy and does not want to feel ashamed of her flying or shopping habits.

For the mission **Kids and Schools** no personas were developed.

For the mission **Jobs and Careers**, three primary and four secondary personas were developed. The primary personas represent job seekers and include a 22-year-old female student who wants to get a job and financial autonomy immediately after her studies and fears uncertainty; a 23-year-old female graduate of agricultural sciences who seeks for a societal contribution, self-realisation and sustainability-relation in her future profession; and a 33-year-old woman who gathered first job experiences in a corporation but seeks for a meaningful occupation with diverse tasks.

The Italian group working on jobs and careers created a transversal box of needs of their created personas and highlighted the commonalities. The key commonalities were the need to think sustainability with its environmental, social, legal and economic dimensions; the need that bioeconomy takes into account ethical and social principles and minds nature's regeneration rate and limits to growth; increased importance of health, especially since the start of the pandemic; the need for contextualisation in time and space and the responsibility of citizens as users and replicants of messages.

The full persona profiles and the table of needs can be found in the Annex.

8.3.2 User Requirements

User requirements define the requirements users address to the game and the app and list characteristics and mechanics that need to be in the game and the app. They build the groundwork for the game and app development.

In the workshops, the participants formulated requests to the developers with sentences starting with "I want/would like to" or similar. Participants indicated if requirements refer to all missions or are mission-specific, stated their priority (must have, nice to have), suggested implementation possibilities for some and explained their estimated importance. Some groups formulated the user requirements from the perspective of the previously developed personas.

Formulated user requirements included among others

- Barrier-free usage
- Learning effects
- Data saving and download options

- Reward systems
- Possibilities to play with others
- Social media integration

A list of the formulated user requirements can be found in the Annex.

8.3.3 Basic Game Design Ideas

To develop game design ideas, brainstorming methods like modifications of the “100 game ideas in an hour” method were applied. This technique is used to produce many ideas in a short time in a small group. The idea is to not stop the brainstorming process too early if an adequate idea is found and better ideas may be missed. Once the intended number of ideas is reached or the time is up, participants narrow down the number by discussing them and fleshing them out a bit more. Parameters like feasibility, fun, look and interesting narrative can be applied. Participants can distribute points or vote on favourite ideas. An extract of the brainstormed game ideas can be found in the Annex.

After a wide brainstorming session, participants selected their favourite ideas. Some of these favourites were developed further. To develop first game designs, their genre, target audience, concept, goal, story and platform were described in more detail.

The task could be completed alone or within a team. After the elaboration of the basic game design ideas, volunteers pitched their ideas in the plenum. Between 1-12 basic game design ideas resulted from each workshop.

In the mission **Food Packaging** the basic game ideas included among others

- Simulate circular regional development in terms of packaging
- Disposing, waste collection and recycling games
- Waste shooter
- Bio-based packaging quartet
- Packaging scan app

In the mission **Fashion and Textiles** the basic game ideas included

- Personal action plan for “my” sustainable (fashion) journey
- An interactive map with sustainable locations nearby
- Explore different ‘worlds’ of biomaterials and sustainable fashion
- Organise a sustainable fashion show
- Set up a sustainable fashion value chain

In the mission **Kids and Schools** the basic game ideas included

- Photograph bio-based labelled products in your school and develop skills, gain cool equipment and complete day-quests
- Collect as many products as you can with bio-based labels
- Pokemon go-like: find bio-based products in your school environment

In the mission **Jobs and Careers** the basic game ideas included among others

- (Value-oriented) job matching games with dating app character
- Digital coaching and mentoring in the form of a 3-week challenge with real life tasks to build up skills, a network and discover interesting profiles
- Cooperation games about structural change within an industry or a company

As a follow-up, the local partners mapped and summarised similar basic game ideas.

9 Assessment of interim results

In May 2021, between the two sequences of engagement events, the game and app design developer NG compiled and commented on the developed user requirements and game designs from the first co-creation workshops.

User Requirements: NG compiled the user requirements from the different workshops in one excel file, differentiating between mission-overarching and mission-specific user requirements. A colour code was applied indicating the feasibility of the requirement. User requirements, which were not feasible, too vague, unclear or considered in a regular game development process anyway were commented and would need to be altered in the second round of focus groups or to be removed.

Game Designs: Developed game designs were condensed and compiled in a PowerPoint presentation, sorted by mission theme. A colour code was applied indicating the estimated aptitude of the game design (green: very good from scope, yellow: feasible with alterations, orange: not advisable but still doable with major alterations). Further, every game design idea was commented. The comments concerned scope, strengths and weaknesses, unclear points and tips how to improve the game idea.

NGs presented and discussed their activities and the interim results with the regional partners in the WP3 Partner Meeting in early June 2021. Thereby, regional partners got a better sense of what to consider in game design and which questions to ask to facilitate the way towards successful game designs.

The consortium decided to narrow down the number of ideas before giving them into the second round of events. For this, each mission team selected promising ideas generated within their mission. Selection criteria were among others the potential applicability across missions, the fit with the main target group and the unique selling point. The consortium arranged another meeting to discuss the game design selection in the plenum.

10 Process Reflection and Evaluation

Baseline Survey: A baseline survey was developed by the evaluation team (WP7) to assess the participants' baseline understanding of bioeconomy, mission topic, gamification and co-creation. The results of the baseline survey will not be presented in this deliverable but in D7.2 Evaluation of stakeholder involvement process. Here, the application of the baseline survey is being reflected.

Sending baseline surveys before the co-creation activities was more convenient than having participants complete the survey at the beginning of the event.

Some regional partners asked their participants to fill in and return the survey before the activity and other regional partners used some time of the co-creation events to let participants fill in the surveys. Regional partners who sent the baseline survey in advance reported satisfaction with the chosen procedure. They said it was helpful in setting the discussion framework for the co-creation activities in advance, getting the discussions more focused and getting some technical issues out of the way. Some regional partners, who integrated their surveys in the activities, reflected they could have sent the surveys in advance because there was much information at the start of the event.

Not all co-creation participants were asked to fill in the baseline survey and the game/app questionnaire. This bias must be considered in the evaluation.

Every (new) participant joining the co-creation process was supposed to fill in the survey the moment they entered the co-creation process. Because there were participants who joined the co-creation workshop, but

not the focus group, the procedure would have been repeated before or in the beginning of both events. Unfortunately, this was not clear to all regional partners from the start. Several regional partners only asked the focus group participants to fill in the baseline survey. This bias must be considered in the evaluation.

Game/App Questionnaire: A game and companion app questionnaire provided by the game development partner (WP4) was attached to the baseline survey. This way, the participants had to fill in a survey only once. This questionnaire was meant to gather information that will be helpful when designing the serious game and the mobile application in WP4. The results of the game/app questionnaire will not be presented in this deliverable but in one of the deliverables in WP4.

Moderator Self-Reflection Survey: To collect feedback regarding the regional partners' experiences with leading a co-creation activity (focus group and co-creation workshop), the evaluation team (IBS, WP7) asked each regional partner to fill in a moderator self-reflection survey immediately after each co-creation activity. This self-reflection aimed at giving feedback about the positive and negative aspects of co-creation that the regional partners may have experienced as mission co-creation moderators. The regional partners' input helps the evaluation team highlight the benefits, challenges, and potential solutions to enhance the effectiveness of the co-creation activities. The results of the moderator self-reflection survey will not be presented in this deliverable but in D7.2 Evaluation of stakeholder involvement process.

Process Reflection: The overall procedure of the activities of the first sequence of events followed the description of work in the Description of Action, specifically the descriptions in Task 3.1 Stakeholder Identification and Mobilisation and Task 3.2 Co-Creation Phase.

The project is understood as a living body, which is filled with life by all contributing parties and evolves over time, is interconnected with the context and gets shaped by it.

The WP3 team of seven regional partners, led by BSS, took a co-creative, iterative approach to further specify the work approach. The time period to which the more specific planning referred was usually 2-4 months ahead. Usually, rough working procedures and endeavoured aims, outcomes and outputs were suggested by BSS first (and later also NG) and then open to discussion and alteration. Many suggestions were based on previous need and idea queries of all regional partners. Suggestions were then discussed with all WP3 partners and adapted accordingly. Iterative planning and discussions usually took place in the monthly WP3 partner meetings and the HelpDesk meetings every third month.

A balanced approach to long-term planning is preferred.

BSS received the feedback of several regional partners that longer-term planning and more clearly defined procedures, outcomes and outputs would benefit their work. Other partners preferred less specification or less detailed specifications to bring in their own ideas and to better imagine how to apply it to their mission and local context and to give participants room to adapt. BSS will respond to the feedback and aims 1) to extend the time span to be planned and 2) to give clearer result formats in the second sequence. At the same time, the openness and responsiveness of the co-creative process is to be maintained. This requires a balance act between specifications and openness.

Monthly WP3 meetings would have benefited from more structure at the beginning of the WP3 activities. However, the meetings were deemed helpful and informative for the WP3 partners.

Next to the monthly WP3 meetings mentioned above, the mission teams organised themselves for exchange. Because the mission Kids and Schools is only carried out by TEEC, this partner exchanged with BSS and FNR instead of a mission partner. The exchange happened on demand and was related to processes and methodologies, but not to content. The mission teams had several check in moments, but the contact was rather loose and the meetings limited in time. In retrospect, the mission teams could have been more aligned throughout the first sequence of events. The cooperation is also reflected in light of the pandemic in the next section. Although, mission partners could learn from each other. They reported that it helped to inform each

other about their procedures, what worked, what did not work and their findings. They also complemented each other because foci, approaches and outcomes differed within the missions.

The co-creation events were enjoyable for the participants and the results of the meetings were both creative and informative.

Reflecting on the events, incentives for participation worked well and could be used to kick-start the discussions. Giving real life examples like articles of clothing or specific materials for clothing or food packaging helped participants to better understand and imagine bioeconomy and the mission topics. Organisers reported high enthusiasm and motivation to contribute and create among the groups. All workshop groups came up with highly creative and unique game design ideas. Participants enjoyed the playfulness of the events. Organisers realised that the energy level and performance within the group rose when they could become more active and organisers talked less. Lengthy introductions of project, aims and results were assessed problematic. The organising parties reflected that working in small groups (e.g. in breakout rooms) gave more space for individual input and interaction and fostered the team spirit, the creativity and the performance. For small groups it seemed easier to complete tasks and develop game design concepts. Further, more time would have been needed to include more participants. Clear endeavoured end results were reported to have helped success. The outcomes of the sessions within the missions were quite different due to a partly different choice in exercises and different focus, but this way the results can complement each other.

Creating a feedback loop between WP3 moderators and participants was helpful for the participants and helped confirm their suggestions were accurately recorded.

It was detected, that it is highly important to acknowledge participants' contribution in discussions and the game development and to frequently exchange with the participants, also between the events and give short reports from time to time. This is important to ensure that the process and the products reflect the needs, priorities and ideas of the target groups. It was also detected as very helpful to give the co-creation participants the opportunity to play the game once it is developed. This would support the evaluation and participants could see the realised product of their work.

Co-creation in times of the pandemic: The first year of the project, and thus the entire first co-creation sequence, passed without the consortium being able to meet in person. Originally, it was planned to hold selected internal project meetings (e.g. the kick-off meeting or the project meeting every 6 month) in person. We believe this influenced the interaction of regional partners across and within missions.

Not being able to meet in person hampered the team building between project partners as well as the development of a shared project vision.

Several partners had difficulties getting enough registrations and found it difficult to schedule the events. People, also the children, were booked with many online events. Also, a 'Zoom fatigue' was assumed. Some regional partners had to postpone events due to too few registrations or participants not showing up in the event. Liability in online events may be lower than in-person events.

The shift to online formats increased the participation rate of (high level) experts and citizens from different regions of the partner countries.

The shift to online formats allowed participants from other regions within the countries to join the events easily. Therefore, many regional partners could win (especially) experts (but also citizens) to join, who would probably not have been able to join an in-person event. This also made it easier to participate in partners' events within the consortium.

All regional partners reported enthusiasm and intrinsic motivation to contribute despite the online interaction.

It was perceived as difficult to make an online event as fun as a real-life workshop and create an environment where participants (and facilitators) would bond with and inspire each other. As experiences in online events can be quite flat and participants expect so, in many focus groups and co-creation workshops participants enjoyed the playful and active involvement and the ability to unleash creativity. All regional partners reported great enthusiasm and intrinsic motivation to contribute. They reported lively interactions and discussions and creative ideation. Here, small groups or small-group work in breakout rooms facilitated personal interventions thus influenced results positively.

Timing is a challenge for online co-creation. All regional partners advanced their facilitation skills in online co-creation.

In online events, a clearly shortened attention span is noticeable compared to in-person events. Many organisers have therefore scheduled shorter online meetings than they would have done in real life. The time limit condensed the events and participants sometimes felt rushed. The short time span was reported challenging to create a full game concept. Nevertheless, the organisers were positively surprised by the quality and quantity of the results achieved. Regional partners reported surprise about the feasibility to co-create online. Due to this exceptional pandemic experience, all partners advanced their facilitation skills in online co-creation.

What is important for the second round?

For the second sequence we endeavour to

- **Extend time periods for which we plan, provide clear guidelines and formats** in which the results can be shared in the consortium. Simultaneously, we strive to **remain open and responsive to participants, context and developments**. We aim at **avoiding strong solution-oriented work** and want to be willing to step back and assess the working process and the interim results regularly. This will be crucial to ensure real co-creation to take place. To manage this balance will be key for the successful implementation of the co-creation of the game and the app.
- **Keep goal-seeking loops with the participants**, also in between the events to ensure the gamification ecosystem will be meaningful and helpful to them
- Have back-up participants and pay extra attention to the group diversity in the second sequence.
- **Reduce the data volume and discuss and advance selected ideas pointedly**. The first round of workshops generated a vast amount of data. Simultaneously, we aim to avoid those potentially good ideas or good elements of ideas to drop out too early by keeping the data in a pool. This pool can serve as inspiration or toolkit in the upcoming events. It also shows the development of the co-creation process, documents the journey of co-creation and depicts how we arrived at the intermediate results.
- **We must not limit the co-creation in the second sequence to the game design but discuss potential content in connection with the design development**. The focus group discussions delivered first insights into possible content of the game. In the co-creation workshop, we mainly focused on the design of the game but not on the content. In fact, structure and content of the game will be interdependent.
- **Regional partners need to respond to the local communities' needs and views but consider the European dimension of the gamification system simultaneously**. As Allthings.bioPRO is a European project, the serious game and the companion app will have a European scope.
- We need to **create a gamification system that remains relevant and up to date over time**, even though resources are mainly limited to the project duration. This needs to be anticipated while co-creating and co-designing the game.
- Eventually, we seek for **close cooperation within and across the missions**.

11 Annex I – Personas

Food Packaging

Name: Emma (14) → 2 siblings (patchwork) → Middle school school garden team → Interests: Friends growing vegetables, sports (horse riding) → Device: smartphone, tablet o. laptop → Farmville, Sims etc. she plays.

Name: Erick Metzger (43) → Truck driver → Divorced lives with parents → (Minimalist - low income) → Likes barbecue → Navigation device, smartphone and laptop → Candy Crush etc.

Name: Daniela Grünwald (36) → doctor's assistant → 2 children → cooking, dancing and gardening → tablet, smartphone and laptop → plays board and digital games.

Name: Rüdiger (67) → Married → Dog and garden → Former insurance clerk → Little knowledge of bioeconomics → Plays golf, RV, dog and gardening → Smartphone, laptop, tablet, 2 TVs, radio and smartphone.

Fashion and Textiles

<p>Name: Akira Age: 20 Gender: Young girl. Family status: Lives at home in a big city. Education: High school – considers studying to be a assistant nurse. Profession: Influencer Interests/hobbies: Gadgets and shopping</p>		<p>– Relation to bioeconomy/ sustainable fashion –</p> <p>Fear: Being invisible, not being good enough.</p> <p>Prejudices: That sustainability is ugly and boring and difficult.</p> <p>Expectations: Wants to provide for herself as an influencer.</p> <p>Needs: Luxury, product collaborations, financial security, visibility.</p> <p>Wishes: Being an influencer and a role model.</p> <p>Favourite quote: Shop until you drop.</p>
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<p>Name: Kim Age: 13-16 years Gender: He/she Family status: Some older and some younger siblings. Education: Lower secondary school. Profession: Wants to be a scientist. Interests/hobbies: Games, fashion, sustainability, consumption, sports.</p>		<p>– Relation to bioeconomy/ sustainable fashion –</p> <p>Fear: The future, climate change.</p> <p>Dislikes: Requirements, stress, certain dishes.</p> <p>Prejudices: That the older generation doesn't want to change, that the older generation does not keep up with its time.</p> <p>Goal: Finish school/high school.</p> <p>Expectations: That you can change the focus of your studies. There are great opportunities. Looking forward to making your own decisions.</p> <p>Needs: To have fun. To have a context and to be part of a group. To be with friends.</p> <p>Wishes: Not to have to worry. To get better at gaming, playing sports and change level. Gain more knowledge to be able to make good decisions and make a difference for other people and for the environment.</p> <p>Favourite quote: One day or day one you decide!</p>
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Name: Anna
Age: 25
Gender: Female
Family status:
 No children but a partner.
Education: High school.
Profession: In the service sector.
Interests/hobbies: Health, fashion, appearance, social media.



– Relation to bioeconomy/ sustainable fashion –

Fear: That she can not afford, that she is not allowed to be in the groups she wants to belong to, that she lacks knowledge.

Dislikes: Being pessimist.

Prejudices: Risks being seen as a “outdoor person with a great interest in sustainability” or seen as too whole-some

Goal: She wants to contribute to a sustainable society but does not know how, and without giving up on her current lifestyle

Expectations: She wants to be trendy and doesn't want to feel ashamed of her flying or shopping habits.

Needs: Needs to know more about sustainability.

Wishes: It must not cost much more than today. It must be neat and brands with status.

Favourite quote: You can always do something.

Jobs and Careers

Persona



Lena A.
23
NRW

Masterab
solventin

Eltern
sind
Lehrer

ledig

kinderlos

Gründe unser Serious Game zu spielen

Kennt Bioökonomie noch nicht zu detailliert und möchte sich näher informieren

Was gibt es überhaupt für Berufe?

Persönlichkeit

lernt gerne neue Menschen kennen

kann gut auf andere zugehen

Interessen/Hobbies

aufgeweckt
wissbegierig
Social Media affin
Dokumentiert über Instagram

Ernährungsbewusstseien
kocht gerne
"Do it yourself"-Mensch

Pilze sammeln,
Spaziergänge,
Wandern,
Interessiert sich für Verhältnisse in anderen Ländern

Fähigkeiten und Kompetenzen

Lernt schnell

spricht Englisch und Spanisch

weiß, sich auszudrücken und mitzuteilen

Ausbildung/Beruf/Aufgaben

Masterabschluss Agrarwissenschaften

Abitur 1,6

Bedürfnisse, Wünsche, Motivation

Die Welt retten

Eltern sind viel gereist, Lena hat somit schon von klein auf mitbekommen, dass es in anderen Ländern nicht immer so luxuriös wie in Deutschland ist

gemeinnützig Arbeit, nicht direkt in die Wirtschaft

sich selbst verwirklichen

Erwartungen, Ziele

aktiv zur Veränderung beitragen

möchte, dass ihre Arbeit auch von anderen gesehen wird

Herausforderungen, Ängste, Abneigungen

Angst, den Klimawandel konkret zu spüren in ihrem Leben

Angst, sich nicht bedeutsam zu sein/werden - Angst, zu scheitern

Mag keine Spritschleudern
hat Angst vor Spinnen

Charakteristisches Zitat

"Be the change you wish to see in the world"

miro

Profile

- Lena A., 23 years old, graduate, lives in North-Rhine Westfalia
- Not married, no children, parents are teachers

Personality

- Open to get to know new people

Interests/Hobbies

- Lively, eager for knowledge, social media-savy, documents daily life on Instagram
- Nutrition-conscious, likes to cook, “do it yourself” person
- Collect mushrooms, taking walks, hiking, interested in the conditions in other countries

Skills and competences

- Learns quickly
- Speaks German, English and Spanish
- Knows how to express herself and communicate

Educational Background and Tasks

- Master degree in agricultural sciences
- Abitur: 1.6

Needs, desires and motivation

- Save the world
- Parents travelled a lot, Lena knows that conditions in other countries are not as luxurious as in Germany
- Volunteering, don't want to work in business directly
- Self-realisation

Expectations, goals

- Actively contribute to change
- Want her work to be seen by others

Challenges, fears and dislikes

- Fear to be directly affected by climate change
- Fear to be not meaningful, fear of failure
- Don't like gas-buzzer, fears spiders

Characteristic quote

- “Be the change you wish to see in the world!”

Reasons to play serious game

- No detailed knowledge of bioeconomy yet but wants to learn more about it
- What are the professions out there anyway?

Persona 2 in der Berufsumorientierung



Profile

- Anna, 30-35 years old, gathered first job experiences, now wonders how she can find more meaning in her job
- Academic degree; is interested in sustainability

Personality

- Mobile, not bound to one city
- Knowledge-oriented, value-oriented
- Wants to orientate herself politically or societal, but is not decided yet
- Many of her friends work in the art and social sphere
- Big friend circle with similar values

Interests/Hobbies

- travelling in touch with nature, among others hiking, yoga
- computer game, team sports, gardening

Skills and competences

- project management
- team work
- analytical thinking

Educational Background and Tasks

- first occupation in a corporation

- experiences in different internships
- role is precisely prescribed

Needs, desires and motivation

- I like nature and want to help and sustain nature

Expectations, goals

- Manifold work
- Sustainable and meaningful work
- Become project leader

Challenges, fears and dislikes

- “I won’t manage it”
- No experience/expertise in the field
- Fear to have to start from zero
- The first person in the family with an academic degree
- No network in the bioeconomy

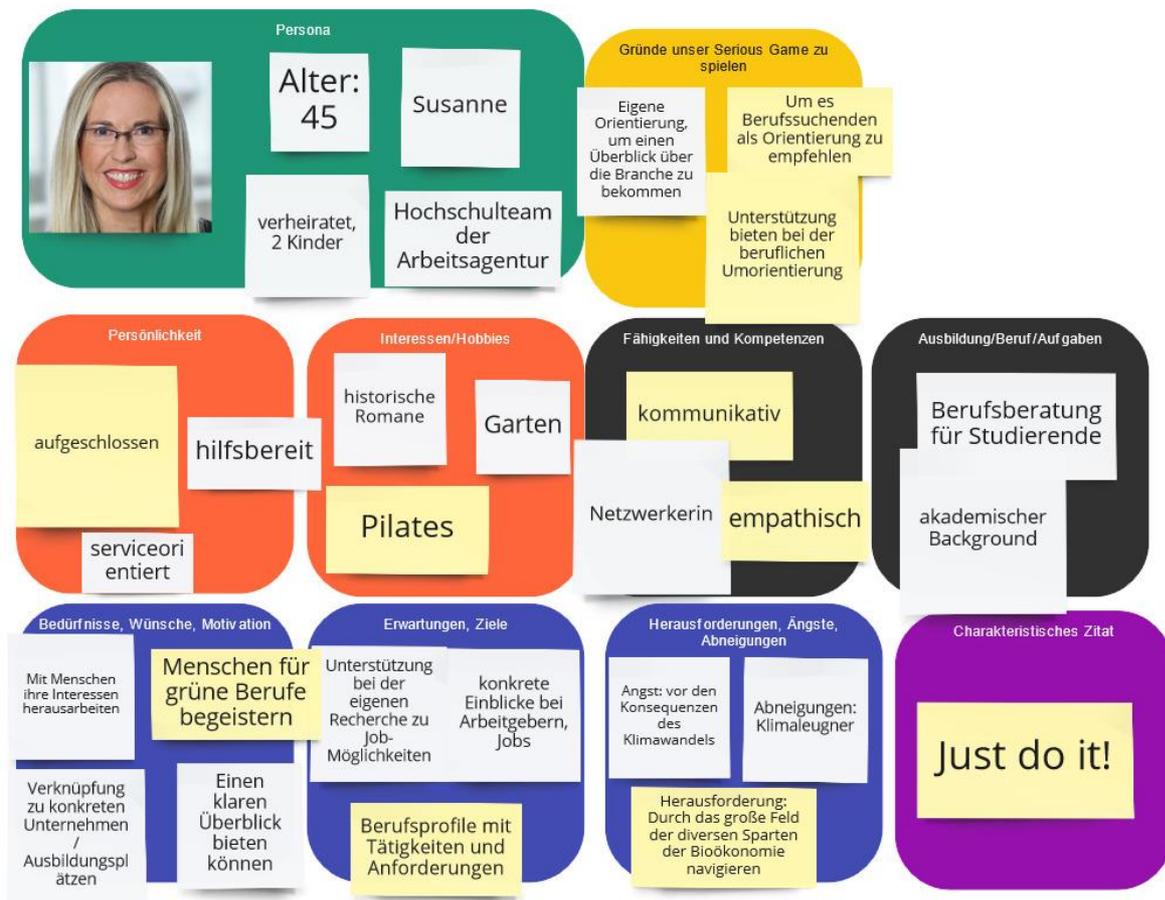
Characteristic quote

- “When, if not now?”

Reasons to play serious game

- Search for self-realisation
- Search for career start opportunities in the bioeconomy

Persona 3 - Berufsberatung/Arbeitsvermittlung



Profile

- Susanne, 45 years old, married, 2 children, academic team of job agency

Personality

- Open-minded, helpful, service-oriented

Interests/Hobbies

- Garden, historical novels, pilates

Skills and competences

- Communicative, empathic, networker

Educational background and tasks

- Vocational guidance for students
- Academic background

Needs, desires and motivations

- Working with people to identify their interests
- Inspire people to work in green jobs
- Offer a clear overview
- Connections to specific companies/apprenticeships

Expectations, goals

- Support for her own research on job opportunities (with the game/app)
- Concrete insights into employers and jobs
- Job profiles with tasks and requirements

Challenges, fears and dislikes

- Fears the consequences of climate change
- Dislikes climate change denier
- Challenge: navigating through the big field of diverse branches within the bioeconomy

Characteristic quote:

- “Just do it!”

Reasons to play the serious game

- Personal orientation to get an overview of the sector
- To suggest the game to jobseekers as orientation
- Offer support for the professional re-orientation

Persona 4 - Unternehmen/Arbeitgeber



Profile

- Ronald Schmitz, 45 years old, divorced, 2 children, lives in Frankfurt, Germany
- leader of the personnel department of a textile company

Personality

- goal-oriented, success-oriented
- open for new things

Interests/Hobbies

- stock exchange
- play chess
- hiking

Skills and competences

- motivates his department
- good listener

Educational background and tasks

- studied textile technology and business administration
- responsible for personnel decisions and innovation

Needs, desires and motivation

- save the world and get rich with that
- recognition from colleagues
- create a creative work environment for his employees
- win over the best candidates for the company

Expectations and goals

- benefits from using the game
- design a more sustainable value chain

Challenges, fears and dislikes

- to be overhauled by competitors
- economic losses through bioeconomy
- political barriers which influence his own profitability
- riding a hype/bioeconomy is not developing as expected

Characteristic quote

- “No risk, no money!”

Reasons to play the serious game/app

- Get help with decision-making in questions related to personnel and strategic questions regarding the organizational development
- Sees potential in a growing industry
- Information gains about chances of the bioeconomy in his own company

AllThings.Bio PRO

Creating an avatar: Young person in training

Name: Giulia**Age:** 22**Gender:** female**Place of origin:** Siligo (a small village in the north east of sardinia)**Family status:** unique daughter**Qualification:** short degree**Employment/work:** student**Interests/Hobbies:** sport, music, popular traditions, travel**Fears:** Uncertain future, fear of gaining weight**Dislikes for:** racists, carbohydrates**Prejudices:** gypsies**Objectives:** finish studies and find a job immediately**Expectations:** assert themselves in society**Needs:** financial autonomy, sociality**Wishes:** living in the city, getting to know foreign cultures**Characteristic quote:** Everything will be fine!

AllThings.Bio PRO

Creating an avatar: Researcher/Trainer

Name: Mauro	Fears: fattening
Age: 40	Dislikes for: for women
Gender: male	Prejudices: women
Place of origin: Nuoro	Objectives: consolidating political power
Family status: cohabiting	Expectations: become the mayor of his city
Qualification: high school diploma	Needs: assert its ideas and have recognition
Employment/work: councillor in a town hall	Wishes: buying a house
Interests/Hobbies: Football and tennis	Characteristic quote: He who acts alone acts for three!

Co-Creation Training

31/03/2021

AllThings.Bio PRO

Creating an avatar: Producers/entrepreneurs

Name: Giovanna	Fears: getting fat and not being able to pay all expenses
Age: 30-40	Dislikes for: locusts, global products and rude guests
Gender: female	Prejudices: to the countries near his, ogm
Place of origin: Lollove (a small village in the middle east of sardinia)	Objectives: have continuity of work for the family, consolidate its enterprise
Family status: cohabiting with a child	Expectations: recognition of their work and what they do
Qualification: high school diploma	Needs: understand the content of what it does and how to communicate it
Employment/work: :businesswoman	Wishes: leave his company to his son
Interests/Hobbies: Sardinian history and horse riding	Characteristic quote: Eat from the garden and live 100 years!

Co-Creation Training

31/03/2021

Table of personas' needs

Young adults in training	Political decision-makers	Producers/entrepreneurs	Researchers/trainers	In common with all
Improving training paths	Sustainability in food production	Greater control over production and more constraints	Investing in the development of bio-material processes	Sustainability: economic environmental social
Increasing knowledge of processes	Control of the agri-food chain	Safeguarding all supply chains	Investing in recycling	Ethicality
Increasing knowledge of the supply chain-territory relationship	Nutrition education	Promoting the development of active strategies	Investing in education	More care for health and time
	Strengthening the link between supply chain and territory	Strengthening communication and information		Strategy Farm to fork
	Alignment of European strategies			Citizen responsibility
	Good use of the Recovery Fund			

12 Annex II – User Requirements

Formulated User Requirements	
Support for deaf users	No reliance on sound cues should be relevant, e.g., phone could vibrate.
Gender-sensitive language	Gender-neutral language will be used, avatars etc. will be gender-neutral (e.g. animals...), if there are gender differences in the app, all personalization options will be available for all genders.
Easy language	Overall language should be as easy as possible.
FAQs	I want to have a FAQ section in the game.
Project info	
Save	Game can be saved and returned to later.
Easy access	
Common thread	The game must have a common thread across different missions.
Reward system	I want to be rewarded for success, e.g. with badges, achievements, points etc...
Learning effect	What you learn in the game should be used in the game and give advantage in the game.
Use anywhere	You should be able to use the game anywhere.
Entertainment purposes as a primary goal	Entertainment purposes as a primary ingame goal.
Data saving	Data security should be ensured.
Data saving	Local data storage (not in a cloud).
Updateable	Can keep updating information.
Support for colour-blind users	
Learn effects	Raw material source/disposal route.
Individualisation	I want individual options.
Variable play time	Short vs. long
No linearity	The game should not be linear.
Social functions	Invite friends to the game and challenge them.
Learn about products	Learning about certain selected products and materials to become a sustainable consumer.
Teacher's guide	Instructions for teachers on how to use the game in their teaching.
Game function	High score at regional / national level / global level.
Social functions	It should be an advantage of playing in a group, but should be possible to play yourself.
Game function	You should connect to the place you are (log in, tags or so).

Mobile game accessibility	If it is a mobile game, you should be able to play with one hand.
Cloud based saving	
Reality	I want to play in a real world, no fable character.
Low data usage	Playable on the move, low data volume during use.
Play with children	I want to play the game with my children.
Group/class challenges	Special challenges for classes.
Explore different worlds	Different locations you can visit (worlds).
Game function	Choose difficulty level.
Support	Technical Support in the app / Troubleshooting.
Companion app	I want to access the companion app directly from the game.
Accessibility	The game should be accessible.

13 Annex III – Game Design Ideas

Food Packaging

Name	Packaging tycoon
Genre	Construction strategy, business simulation
Target Audience	From 14 upwards (or from 0 if you compare it to GameDev Tycoon).
Concept	<p>The fantasy product is defined on the basis of parameters (see, e.g., GameDev Tycoon or similar). This product is then created on the basis of the existing production and then brought to the customers once it is ready for the market. The marketing is itself a parameter that can be changed.</p> <p>Production steps and product types are gradually unlocked with investments. The transformation of production into another, however, partly disrupts or impairs this. External influencing factors such as changing laws that prohibit or impede certain products or types of production (packaging) must be taken into account.</p>
Goal	A self-chosen fantasy product has to be produced and brought to the customer in the most resource-efficient and sustainable way possible.
Story	<p>A company must be planned. In it, a product is first created, which is then to be marketed and shipped. Using parameters, the imaginative product creation is linked to reality.</p> <p>Packaging tycoon: An industry building game in which different sectors along the food chain have to work together (raw material, extraction, material and packaging production, LM producers, trade, consumer, end of life).</p>
Platform	Smartphone (online) or computer-based

Name	Upcycle and be happy
Genre	This is how I want to live, creatively shape my life
Target Audience	female, creative, conscious, fun to decorate
Concept	Start in a shop, by clicking on packaged product the selection opens into fantasy rooms that are pimped up
Goal	Raise awareness for re-use or re-purposing
Story	Share pictures with friends
Platform	Online, Smartphone,... with AR

Name	Then why don't you go to...
Genre	Strategy game
Target Audience	from 12 years upwards - no specific playgroup
Concept	A shopping list is handed out - the players have to get the products according to price, packaging material, etc. They have different suppliers to choose from. They have different suppliers to choose from, discounter, farm shop, internet
Goal	Highest possible score through combination of price and materila. Time factor etc.
Story	-
Platform	both

Name	Bio to go
Genre	Location based game (GPS-based) Augmented Reality
Target Audience	All smartphone owners

Concept	The environment can be scanned with the smartphone, e.g. packaging waste can be found and collected, (biopolymer) food packaging can be found in the supermarket, the number of steps can be collected, etc. The players can also scan their own food packaging. Points are awarded for all activities, which can be shared with the contacts or with all players if desired; points are awarded for behaviour with the best steering effect; food packaging purchased is scanned and asked where it should be disposed of; food packaging is photographed and the game shows action alternatives and informs about the advantages and disadvantages of the respective packaging; tag for reusable packaging, e.g. jute bags, lunch boxes, etc.; the game also shows the advantages and disadvantages of the respective packaging. e.g. jute bag, lunch box or coffee to go cup, how many turns or refills does the packaging have -> positive reinforcement of the behaviour for the reward system; Possibility to photograph (leftover) food and mobile phone suggests recipes based on this; link to food sharing distributors (local reference).
Goal	- The topic of bioeconomy should be integrated into everyday life and made tangible (e.g. find unpacked shops and enter them if not yet integrated). - Goal: Highest score - Strengthen physiological health through exercise
Story	Everyone writes their own story by creating an "avatar".
Platform	iOS and Android

Name	Save Flipper
Genre	Action Game
Target Audience	Occasional players
Concept	Clickable rubbish, but also rubbish that can be removed by puzzles or mini-games. When removing the rubbish, a fact is displayed about the type of rubbish, e.g. how long it takes for it to dissolve, what percentage is recycled, etc.
Goal	Free Flipper the dolphin from the rubbish before the shark comes (time pressure).
Story	Flipper has got tangled up in rubbish in the big rubbish whirlpool in the Fantastic Sea. Free him from the rubbish to save him from the ravenous sharks.
Platform	Android + iOS

Name	Space Cleaning Cooperation
Genre	Shoot-em- up
Target Audience	Occasional players (quick finger)
Concept	The player sucks up various types of rubbish. New waste collection goals depending on the level Minus points for incorrect vacuuming (satellite, ISS, or e.g. recycling rubbish instead of plastic) Reward system via read-through and then quiz (new extensions for the suction space ship) Round overview
Goal	Suck in approaching rubbish (space)
Story	Shoot down plastic waste (Space Invaders)
Platform	Android + iOS + Web application

Name	BestPack or BioPack or Pack me (Packaging quartet)
Genre	Card game
Target Audience	Families, 8 - 99+ years
Concept	Analogue to car quartet
Goal	Collect as many cards as possible. The winner is the card with the packaging with the highest potential environmental impact.
Story	As much packaging as necessary as little as possible. Evaluation criteria:

	Proportion of renewable raw materials, the higher the better [%]. Ecological footprint, the lower the better [kg / kg LM], tbd Recycling potential, the higher the better [%] (differentiation in Down, Up and Re) Reusability, the more cycles the better [number]. etc.
Platform	Mobile Version Alternatively, a card game is also conceivable → non-digital compaignion

Name	Food packaging Go!
Genre	Location-based game / Augmented reality
Target Audience	Youngsters
Concept	You walk around with your phone along certain locations (supermarkets, farms, bakeries, etc.) where you can collect food (in a package) (in the app). When your backpack is full, you can visit other locations (recycling points) where you can recycle your stuff. Once you're at the recycling points: what's allowed and what's not?
Goal	Collecting food, dropping off packages at the right place, this is how you can develop your character.
Story	There is a "main character" that you have to feed with raw materials to be able to upgrade. The residual materials that you have left over from the raw materials must be returned to different locations (distinguish different packages and locations). In this way, the distinction between biobased and biodegradable is also clearer. Energy meter for character. Food provides energy, taking away packaging costs energy. The more packaging, the more energy you lose.
Platform	Telephone

Name	The Sims: Sustainability Edition
Genre	Life simulation game
Target Audience	Young adults
Concept	Like with sims, you build a house. This time it's the most sustainable house you can think of, where waste separation is optimally organized. The Sim still has a free will, so the player must incentivize the Sim to live as sustainable as possible. You have the possibility to trade and collaborate with neighbors in an online version e.g. trading stuff to combat overconsumption.
Goal	Build as efficiently and sustainably as possible.
Story	
Platform	Computer, telephone

Name	The sustainable area manager
Genre	Simcity/tycoon-like game
Target Audience	All ages
Concept	As the region manager, you try to make your region circular in terms of packaging. There are several stakeholders (supermarkets, producers, ROVA etc) that you need to keep happy. You can invest in innovation (e.g. biobased), awareness etc. The right combination leads to a circular region! If you make wrong/unsustainable choices, everything becomes dead and black. Also, events can happen that make you change your strategy.
Goal	Keeping everyone happy and making the region circular
Story	To make a region circular, many parties have to be taken into account. The player learns that this is more complex than it seems. If you make the right choices, you can invest and keep everyone happy and the region flourishes; if you make the wrong choices, you end up with a growing mountain of waste, etc.
Platform	Tablet, phone, PC

Name	Packaging Pimper
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Genre	Shooter with research task
Target Audience	All
Concept	Shooting game where you can shoot environmental criminals. Rascals like men in ties who deceive you, recognise the misleading story about recyclability, sustainability etc.
Goal	Discover as many fake stories as possible, competition, be the best
Story	Translate the game into something physical. For example, you can earn credits at a supermarket to get extra information for the game. Credits can be earned by doing sustainable shopping
Platform	Tablet, phone, PC

Name	Wasteminigames
Genre	Puzzle
Target Audience	All ages
Concept	Puzzle with several options. You follow the story line, in which you encounter a problem. You get several options to choose from. If you make a wrong choice, you will get an explanation and you have to start again until you finished the storyline.
Goal	Finish the storyline through making the right choices. You can collect points by doing so, which you could use in a bigger platform (like the one from idea 3)
Story	For each puzzle, the story is different. This way it is also accessible for the other themes (e.g. biobased clothing). For example, you walk through the supermarket and you have to choose the most sustainable packaging, or you are a piece of packaging and you will follow your life cycle (from creation - use phase - recycling/end of life).
Platform	Phone/tablet

Name	From shed to (environmental) street
Genre	Simulation game
Target Audience	people who regularly go to the recycling centre to deposit materials
Concept	You have your own shed with lots of materials in it, including your recycling bins. You are asked to tidy up the shed, but to do so in the most sustainable way possible. At the same time, you have to make a pigeon loft. You are not allowed to use any other materials than the ones you have and you will have to pay for everything you bring away. The lower on the ladder of lansink your application is, the more you have to pay. You get a limited budget. With the budget, you must first go to an environmental site for the right delivery stations. Materials that can be reused earn money.
Goal	Ensuring that a product is as sustainable and circular as possible, by properly recycling and reusing the products in your shed
Story	Kees inherited a barn from his grandfather. He was a real hoarder. A lot of tidying up has to be done and that requires a number of bins. At the same time, a pigeon cage needs to be built for the inheritance. And grandpa also had a small municipal yard that can be used.
Platform	Tablet/phone

Name	WasteTycoon
Genre	Tycoon, puzzle, arcade.
Target Audience	All ages (especially youth)
Concept	See goal + story
Goal	A bio-lab that allows upgrades through missions around the world. These missions consist of a kind of small games (e.g. Candy Crush: you can make combos with 3 or more of the same packages / a sorting swipe game where you swipe the package into the right bin, which goes faster and faster). After completing x-number of missions you unlock news articles or information about bio-based topics that you can read back in a database of collectables. (If possible, achievements and

	leaderboard may also apply.
Story	A world that is totally polluted with waste. And every country in the world has an x-number of missions (e.g. the Netherlands has 12 missions, Belgium 16 etc.) And on the basis of completing those missions (3 stars per level or so) the "percent polluted" for that country drops. And then the goal is to make the whole world 100% sustainable.
Platform	Phone, tablet

Fashion and Textiles

Name	Game changer for a sustainable bioeconomy
Genre	<ul style="list-style-type: none"> • Pokémon collector • Tamagotchi • Mix • Quiz • Puzzle • Biosphere 2 inspired • Theme park as an inspiration • Simulation • Construction game • Minecraft • Survival and/or Sims • Simulation close to Civilization • Adventure and new worlds on new levels • Genshin Impact inspired • Valheim inspired • Strategy game
Target Audience (See Focusgroup Personas)	<ul style="list-style-type: none"> • International • English speaking • Youth • Schools
Concept	<ul style="list-style-type: none"> • Clear connection to reality / everyday life on earth • Pokémon go-like game that takes the player out into IRL businesses (sustainability in practice) • Be a consumer or a producer - Be Sustainable or not sustainable. • Various facts that you need to consider but nothing is "the right" • The world continues to evolve in real time no matter what you do. You move around and see how the world responds to your interventions • Collect type points / bonuses that the player can use in the game (or IRL?) Pimp your avatar or get a coffee from a partner company. Something in society that is recognizable - consumption patterns that we can use • Make a fashion show as sustainable as possible - Use as few and as few raw materials as possible • Repair / repair instead of buying new gives points or becomes keys to another level or similar • There are so many aspects of sustainability - you can get better in different parts and get points in different areas. For example, textile points if you wash your clothes in cold water. • The game should become more and more difficult by addition of new elements but not more complicated • The possibility of being able to die in the game, makes you want to play again if you fail. • Play a certain character - the environmental muppet, the influencer, the teacher and so you can choose and buy character traits • An entrepreneur who will set up a sustainable value chain to produce fashion. Many aspects to take in - including the end customer • You have to create - make innovations • Person who makes decisions in a world – strategy game • School classes competing in innovations and knowledge on sustainability – all over the EU • Two teams against each other - climate criminals against climate heroes. • You can play on both teams and against your friends in the opposite team.

Goal	<ul style="list-style-type: none"> • You become a better figure when you reach a new level of sustainability • A collection - it never gets boring because there is always something new to collect • be as environmentally friendly as possible • Avoid the greenwashing trap and survive as a trademark • Make it HARD to do it right! • Opportunity to pitch sustainable ideas that you know will be taken further. • Use things in new ways – innovation game • The final boss is capitalism • A creature that represents the climate and that you have to keep alive and that is affected by how you act in the game
Story	<ul style="list-style-type: none"> • Start as environmental culprit and become more and more environmentally friendly • You have a Tamagotchi that feels worse the bigger the climate footprint you make • The more you develop your Tamagotchi / game character, the more difficult assignments and questions you get. The better you do ->It requires bigger * challenges • You create your own character through the course of the game • You should be able to play "The Story" both locally and globally Short rounds with functions that continue in the background (eg emission) • "World where everything works at first but then the system starts to collapse"
Platform	Mobile (but both mobile and desktop if possible.)

Name	My sustainable (fashion) journey
Genre	Adventure/ Casual
Target Audience	Age: 18 -35 Geography: local (Amsterdam) Language: English and Dutch Occupation: interested in making the personal wardrobe more sustainable
Concept	After indicating your personal intentions (based on https://fashionforgood.com/take-action-change-fashion/) aimed at making sustainable choices, the player can score points for achieving milestones during the personal sustainable (fashion) journey.
Goal	The goal is to provide the player with insight into the possibilities of sustainable consumption. The player earns points by performing good behavior and can see the impact he/she is making by choosing the sustainable options.
Story	The player makes a personal action plan with the intention of consuming more sustainably. The app then shows a personal roadmap that is linked to the action plan of the player. Points can be earned by completing milestones. Like for example not buying fast fashion for three months. The impact made by all players, by choosing sustainable options, can be shown in the app using an impact counter.
Platform	By choosing a web app, the game can be played on both a desktop and a mobile

Name	Journey of biomaterials and sustainable fashion
Genre	Adventure and Action
Target Audience	Age 12 - 50 Gender - Female + women Geography - EU + SEA Language - Main language is English + local languages Occupation - High school students + young professionals
Concept	The apps gives an interactive idea about the world of biomaterials and sustainable fashion. The user can travel to different 'worlds' from their own city.
Goal	The goal of the app is to let the user learn more about how clothes are made, what biomaterials are, and what kind of future materials there are. The bigger goal is education of the topic around sustainable fashion and materials.
Story	Example: Someone in Amsterdam 'travels' to the cotton fields in Myanmar to learn how it is made and after completing a task (grow something tamagotchi-wise, choose between different ways of farming etc.) can move to the next material or production step in the game.
Platform	By choosing a web app, the game can be played on both a desktop and a mobile

Name	Bio Locator
Genre	Informative
Target Audience	Age 14 - 50 Gender - mainly Female + women Geography - EU (but locally oriented everywhere) Language - Main language is English + local languages Occupation - High school students + young professionals
Concept	An interactive map where you can find the right locations nearby you to change your consumption habits. The locations on the map can be sustainable clothing stores, but also a local tailor or a sustainable coffee bar.
Goal	Making the change in habit as easy as possible by making it easy to find better alternatives. Possibly related to the personal actions from idea 1.

Story	The locations on the map can be sustainable clothing stores, but also a local tailor or a sustainable coffee bar. these can be filtered based on function, price range, distance etc.
Platform	By choosing a web app, the game can be played on both a desktop and a mobile without the need to download

Kids and Schools

Pokémon Go meets Minecraft

An augmented reality type game. Inspired by Pokemon-Go and trying to include some elements from the favourite games of children.

- You scan bio-labels with an app on your phone and through this activity you collect virtual blocks. The blocks can be different shapes and sizes and you can create/ build something with these blocks. The bio-labels have different value and you get different blocks based on the label you scan.
- The blocks are made out of different materials and they have different strength. Some of the blocks are made out of biobased materials. Then it is possible also to learn what kind of biobased building materials there are in addition to biolabels.
- There are monsters that appear around on school premises and you have to defeat them. It might be so that you build your fort out of the blocks you have collected and then you fight the monster there. Or it may be that the monster comes in the end of the day and tries to destroy your building – if you have built it from weak building blocks, the monster will break it and you have to start building again.
- There are hints where you have to go and what to find. Through this you learn something new.

When you play together with friends you get more blocks and you can build something bigger together.

Jobs and Careers

Dating

Name	Fusion of “The first sight. A look into the future.” and “It’s a match! Blind date with the bioeconomy”
Genre	Matching/dating game
Target group	Persona in career (re)orientation, career guidance/job placement: People between 20 and 40 years of age who are on a value-oriented job search. Primary target group: Over 25s who have already gained some work experience and are now looking for a more suitable job. Secondary target group: Career starters and all other job seekers who are primarily value-oriented in their job search.
Concept	<u>The first sight</u> : Employers should create a kind of image of the job in the bioeconomy that gives a good impression of the job, without giving exact references to the job description, e.g. job name, etc. The applicants should also create a value-oriented image of themselves. The applicants should also create a value-oriented image of themselves. In the case of a match, a chat is then made possible between job seekers and potential colleagues, and business social media profiles are (voluntarily) connected with each other. It’s a match: Multi-level matching app with the character of a dating app for occupational fields in the bioeconomy

	Several levels where users can swipe right or left for "interested" or "not interested": Sector (energy, product manufacturing, fashion...) -> job description -> company Simulated dates (at a virtual place of work?) where you get to know a job profile with videos. At the end, you decide to go on a second date (deeper insight) or to keep searching.
Goal	Value-oriented job matching Overview of sectors; find a suitable sector to work in
Story	Often the first impression or gut feeling is quite precise. Concerns, additional information, prejudices, frames can distort the first own judgement. Find your dream job in the bioeconomy
Platform	Both, but rather mobile because of dating app character

Name	Fusion of „GreenJobFinder“ and „Tour through the bioeconomy“
Genre	Role Play (Job Interview Simulation) Simulation Puzzles (in virtual rooms) Point 'n' Click
Target group	People looking for a job (career entry or re-orientation), pupils looking for training/studies. Counsellors (e.g. in job centres)
Concept	Virtual world/spaces in which I can navigate (using a smartphone (motion sensor)) and click to discover different sectors, training opportunities and jobs in the bioeconomy. The player has to find hidden elements that conceal information about jobs.
Goal	The aim of the game is to identify the job that matches my interests and any outstanding education/training steps. And to get topic-specific information (topic=virtual room).
Story	Players explore occupational fields in the bioeconomy in virtual spaces using smartphones.
Platform	Desktop or mobile

Name	Fusion of “The future is us” and “Job BaG (Better than any Google search)” and “Futurjob”
Genre	Open World Mini Games Socializing App Puzzle/riddle Reality Mix of simulation and adventure
Target group	Job starters/ Graduates from university/apprenticeship Accessible for all job seekers (job starter and career jumper; persons who plan a retraining); General interest in bioeconomy, sustainability Social media generation does not exclude disabled persons
Concept	Actively supports to find the dream job. Accompanied by a mentor (AI), you are presented with different tasks and thus gradually build up your profile with your own skills and interests (shopping basket). You get rewarded for successfully completed levels. Various occupational fields are presented and a closer understanding of the

	<p>bioeconomy is conveyed. Virtual day internships possible. Users can also find out about the job in different countries (may differ)</p> <p>In the course of the game the user finds out which professions fit his/her interests and what is required.</p> <p>There is a platform where you can view and sort profiles of other users and organisations and have them displayed according to the fit of your own profile.</p> <p>Network possibilities.</p> <p>At the end, I receive personalised search parameters for the most popular job search engines & I can network with mentors who come from the professional field (ticket function).</p>
Goal	<p>Get to know the topic</p> <p>Self-discovery/self-realisation</p> <p>Career recommendation</p> <p>Get internships / jobs (where I can score with my skills)</p>
Story	<p>Option 1): Avatar is in a dystopic world where pollution and climate damage are ubiquitous. Helping with mitigation.</p> <p>Option 2) Finished university – and now?</p> <p>Stress reduction during career orientation</p> <p>Option 3) Roleplay game with clear quests</p>
Platform	Browser and mobile app
Features	Easy to use; suitable for the disabled people; FAQ's; salaries/wages; learning; memory function; usual computer functions; professional coaching sessions can be booked or free simulations of interviews etc.
Included ideas from brainstorming	<p>List of potential employers and search terms for job search</p> <p>Networking opportunity - community game (international, country specific)</p> <p>Shopping basket for job skills (I collect skills)</p> <p>Gamemaster (mentors as contact persons)</p> <p>Day internship</p>

Name	The decision-maker: professions in the bioeconomy
Genre	Challenge and quiz-based
Target group	Young people after their first professional experiences, in search of a meaningful career. Uncertain about their own potential, bioeconomy only one of the possible paths - uncertain about the possibilities. Fear: Is it something for me? Can I get into it without previous experience?
Concept	Digital Coaching - Guidance on tasks around personality, values, and skills, followed by encouragement to grow your network and solve real-life tasks. All in the form of a 3-week challenge
Goal	Feeling whether the bioeconomy is something for you, awareness of your own expectations and skills that can be used in the sector.
Story	<p>Learning about a new field while studying your own values and hobbies? Is that possible? Yes! In an Angeletieten 3-week challenge, we will help you get closer to making a decision about working in the bioeconomy as well as building a network in the field. Sounds exciting?</p> <p>OR</p> <p>Involvement in the bioeconomy often stems from a strong passion for sustainability. How this passion can be used in a targeted way and what skills it needs to be complemented with in order to succeed in entering the industry around the bioeconomy is what you will learn in the 3-week challenge "Decision Maker".</p>

Platform	Desktop and mobile
Additions	<p>3 Week Challenge: new info revealed daily, plus small tasks (like writing to new LinkedIn contacts in the new field)</p> <p>Digital coaching: day 1, day 2, ... different tasks and information</p> <p>Reward system for completed tasks</p> <p>Character development throughout game challenge</p> <p>Suggest 3 friends to take part in experiment for new habit and build their path of success</p> <p>Try a new small task of an employer you never did before; evaluate how you liked task afterwards</p>

Name	<p>Merger of Anno Future (Path 1) and "Best Business" (Path 2) "Escape Game: The Company" (Path 3)</p> <p>and "together.bio" (Path 4)</p>
Genre	<p>Path 1) Build-up strategy Simulation Real-time production of goods Trade (with other players)</p> <p>Path 2) Simulation, Interaction</p> <p>Path 3) Puzzle game with team spirit</p> <p>Path 4) Role play Simulation Adventure Puzzle Strategy games Sports Online card game Management games</p>
Target group	<p>Path 1) Primarily career starters (i.e. pupils or graduates), but also for entrepreneurs or personnel managers.</p> <p>Path 2) Entrepreneurs, Employers, Employees, Persons interested to become one of the aforementioned.</p> <p>Path 3) Company employees who want to simulate the possibilities of converting their company to bio-based production.</p> <p>Path 4) Jobseekers and employers who are looking for new employees, employees of a company.</p>
Concept	<p>Path 1) Consideration of one industry (1 player*in=1 company; cooperation and competition between companies).</p> <p>Scenario starts as a non-sustainable industry with different companies that have non-sustainable production lines. Players have to convert the production of a company step by step to sustainable/biobased.</p> <p>Path 2) Companies of different industries exist, which are built up by the players. There are employers and employees who can behave as in real life. Companies can grow, act with each other, make decisions or even go bankrupt.</p>

	<p>Path 3) Consideration of a single company (cooperation within the company) Conversion of a single company: from fossil to sustainable raw materials. The challenge only succeeds if various puzzles are solved together as a team.</p> <p>Path 4) Cooperation game in which employers and (potential) employees are randomly assigned to work together on tasks that lead to a more sustainable economy.</p>
Goal	<p>Path 1) In competition with the other players, re-equip your own company as quickly as possible in a sustainable way. The first player to achieve the same production output as at the beginning with 0 emissions wins.</p> <p>Path 2) Developing a sense of operating within and between companies, trying oneself out in different industries and learning strategies, gathering information about building a business.</p> <p>Path 3) Break out</p> <p>Path 4) Find out whether employer & employee are a good match, learn from each other and get to know each other as equals, get to know each other's solution strategies.</p>
Story	<p>Path 1) Be the first to convert your company to sustainable production and achieve the same production capacity under climate-neutral conditions!</p> <p>Path 2) Unlimited space to build any business. Employers can hire employees and develop their business. Companies can work together to achieve goals or compete. Everything runs as in real life, so it is as close to reality as possible. Businesses with a lack of financial or executive resources lose their existence.</p> <p>Path 3) We are in a company that manufactures its products from fossil raw materials. Since these raw materials are severely limited in 2050 and are also politically punished and, in addition, highly morally reprehensible, the company is threatened with bankruptcy. To save jobs and production, there is only one way out. The company must learn to rely on sustainable raw materials. But how? Teamwork can solve the puzzles.</p> <p>Path 4) Identify areas in the company that are environmentally harmful. Commonly find ways to make your company more sustainable step by step and get to know each other in the process.</p>
Platform	Rather desktop, because of complexity
Additions	<p>Path 1) Anno/Siedler-like building of an environmentally friendly industry. Best workers go to sustainable companies The companies produce in real time, even when the user is not playing. As soon as he is online again, he can process the produced goods. Penalties if players still have high emissions after certain levels. Players can interact with each other by trading goods and dividing production chains among themselves, e.g. also develop integrated processes.</p>

