

4.1. Boosting Debate, Communication and Participation in the Sustainable and Circular Bioeconomy

Insights from EU-Funded Projects

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1. Introduction

The European Green Deal was presented by the European Commission in December 2019 and aims to steer the transition to a fair and prosperous society, with a modern, resource-efficient, and competitive economy in Europe (European Commission 2019). This will involve the promotion of a new economic action plan to help to modernize the EU's economy and to capitalize upon the opportunities presented by the circular economy, both domestically and globally. The Green Deal is an integral part of the Commission's strategy to implement the United Nation's 2030 Agenda and the Sustainable Development Goals – SDGs – (United Nations 2015), the COP 21 Paris Climate Agreement (COP 21 2015), and the other green priorities that were announced in Commission President von der Leyen's political guidelines (von der Leyen 2019).

The updated Bioeconomy Strategy from 2018 (European Commission 2018a) claims that: »Global challenges like climate change, land and ecosystem degradation, coupled with a growing population force us to seek new ways of producing and consuming that respect the ecological boundaries of our planet.«

The bioeconomy has long been identified as a key element for both smart and green growth in Europe, dating back to the Europe 2020 Strategy that was released in 2010 (European Commission 2010). The bioeconomy already contributes almost 9 % to the EU-27's labor force and 4.7 % to the EU-27's GDP (Ronzon et al. 2020). According to the European Commission, the bioeconomy also includes sectors and systems that comprise »those parts of the economy that use, produce, process, or are driven by renewable biological resources from land and sea – such as crops, forests, fish, animals, and micro-organisms – to produce food, materials and energy«.

The circular bioeconomy can certainly contribute significantly to meeting a broad range of EU targets including climate change mitigation, reduction of the EU's greenhouse gas emissions, the circular economy, and resource efficiency, environmental protection, job creation, growth, and revenue. The circular bioeconomy also has the po-

tential to create and maintain sustainable economic prosperity and many high-value jobs in rural, coastal, and industrial areas, can reduce fossil carbon-dependence, and can improve the economic and environmental sustainability of primary production and processing industries.

Despite the important investments, strategies, and action plans that have been implemented at the regional, national, and European levels, the updated Bioeconomy Strategy from 2018 states that:

»[...] increasing public awareness and knowledge about all areas of the bioeconomy remains a major challenge, which the European Commission aims to address by supporting communication initiatives to raise awareness of the environmental and socio-economic impacts of the bioeconomy and bio-based products, and its benefits«.

Together with awareness and communication, the need for specific education about the bioeconomy is widely recognized, growing and will require more new employees in order to keep flourishing and innovating.

Finally, initiatives to engage stakeholders and the public have been rare in the context of the bioeconomy; those that have been held have tended to focus on one-way information transmission and bioeconomy policies have been criticized for paying too little attention to civil society (Overbeek et al. 2016).

2. Challenges to be Addressed in Bioeconomy Communication

Several initiatives have been launched in recent years at the European level to support and promote the transition towards a sustainable circular bioeconomy, ranging from projects that were funded by the European Commission, networks at the European, national, and regional levels, and by research and industrial clusters.

These initiatives have significantly contributed to the aforementioned transition by raising awareness, communicating, and educating a wide range of target audiences throughout Europe about the circular bioeconomy and its environmental and socio-economic impacts. There are also several projects that have facilitated mobilization and mutual learning among quadruple helix stakeholders (business, research, policy makers, civil society), thereby providing inspirational good practices, sharing knowledge, triggering debate, stimulating participation, assisting in the identification of challenges, and facilitating the co-creation of solutions.

Nevertheless, it has become evident that not all stakeholders play a central role in the debate or are in the position to determine policy and industrial agendas. Some actors, like primary producers and citizens, do not always actively participate, even though their awareness, knowledge, and education about sustainable production and consumption, are important factors that determine behavioural changes, thereby driving the transition.

The European-funded projects BIOVOICES (European Commission 2018b), Transition2Bio (European Commission 2021), Biobridges (BBI JU 2018), BIOWAYS (BBI JU 2016), LIFT (BBI JU 2019), and initiatives like the European Bioeconomy Network (Eu-BioNet 2021), have all contributed tremendously to the creation of an innovation eco-

system for the sustainable and circular bioeconomy. These projects engaged in a large number of communication activities, tools, channels, and materials that generated extensive lessons learnt and good practices.

The following challenges should be addressed in light of these experiences:

- Increase awareness and knowledge about the bioeconomy at large and about the related environmental and socio-economic impacts that they will have for European citizens.
- Promote education, training and skills throughout the bioeconomy, particularly with a view to attracting stakeholders from young generations.
- Facilitate the identification of bottlenecks and resistances that can hamper both the bioeconomy and the bio-based economy.
- Stimulate the debate and facilitate mobilisation and mutual learning, thereby fostering the direct engagement of all quadruple helix stakeholders.
- Promote the co-creation of policy and industrial agendas for the bioeconomy and the bio-based products at the local, regional, national, and European levels.

3. The Conceptual Model: BLOWHAT, BIOHOW, and BIOACT

The three dimensional model that is presented in this article is BLOWHAT, BIOHOW, and BIOACT. This model has been studied and conceptualized by the authors in the context of the Transition2Bio project in order to tackle the aforementioned challenges, thereby building on the intense and impactful communication activities that have been implemented by several European-funded projects; these are with which the authors have been closely involved.

The public perception of the bioeconomy has evolved since 2015, when the first European projects that promoted circular bioeconomy were funded. Back in 2015, the bioeconomy was a term that the majority of both citizens and stakeholders alike had never heard of; this process is referred to as BLOWHAT; namely, »what is the bioeconomy?«.

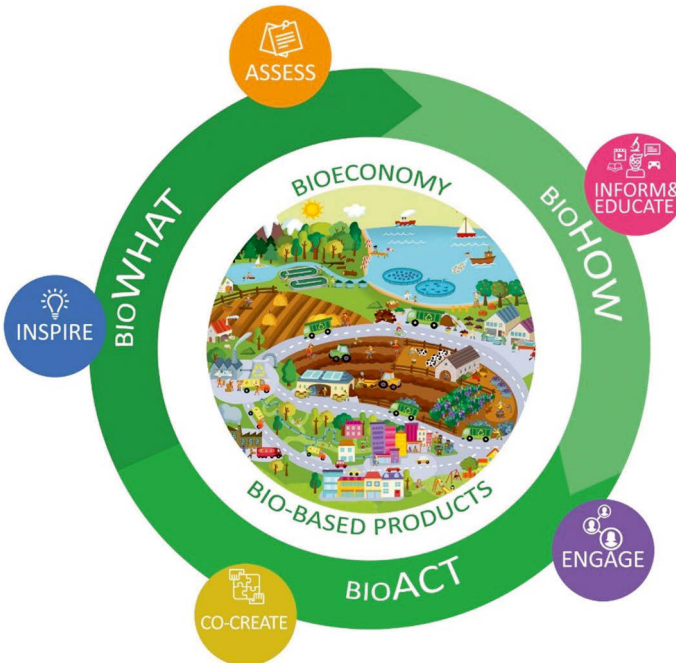
Only a few years later, the large public are looking for more information (BIOHOW) about the circular bioeconomy and about bio-based products. This was thanks to the joint efforts of projects and initiatives, which were supported by the European Commission by and large, as well as to increased civil society awareness about climate change and environmental questions following movements like »Friday for Future«. Specifically, citizens had become interested in understanding the circular bioeconomy's environmental, societal, and economic impacts and the bio-based products, including the potential negative aspects for both today and tomorrow.

The actual challenge for the sustainable and circular bioeconomy is to go beyond simply raising awareness and informing the consumers, instead promoting an inclusive, bottom-up process by which to co-create the future bio-society; this must be done in such a way as to respond to societal needs, must engage researchers, end-users, policy-makers, and civil society to assume their role (BIOACT) in the transition to a circular, sustainable bioeconomy.

The three dimensional model BIOWHAT, BIOHOW, and BIOACT different levels of stakeholders' maturity with regards to awareness of and engagement with the bioeconomy. These levels often coexist (e.g., some European countries still do not have a bioeconomy strategy, while others identify a key driver for their economies in the notion of the bioeconomy); therefore, communications about the bioeconomy should address different target audiences through tailored actions based on their diverse levels of maturity.

The conceptual model (see Fig. 1) deploys the three dimensions mentioned previously (i.e., BIOWHAT, BIOHOW, and BIOACT) through five interconnected actions (Inspire, Assess, Inform & Educate, Engage, and Co-create). Each action is comprised of several activities, tools, and channels that have proven to be effective in the context of the projects mentioned previously.

Figure 1: BIOWHAT, BIOHOW, and BIOACT



Model visualization ©Albertini 2021. The inside drawing is extracted from ©Albertini/Pocaterra 2021

The BIOWHAT dimension is addressed through a suite of actions that aim to raise awareness and to inspire, but also to assess the perceptions, barriers, and worries of the public at large.

The BIOHOW dimension informs and educates, paying special attention to the young generations, future citizens, the workforce, and decision-makers.

Finally, the BIOACT dimension promotes bottom-up activities by which to engage and to co-create with the quadruple helix stakeholders (including the citizens) who work together to design shared industrial and political bioeconomy agendas.

4. Deployment of the Conceptual Model

As mentioned previously, the model proposed was developed on the basis of the practical experiences from several projects that involved conceptualizing the most relevant and effective actions that needed to be taken. This model's objective is to provide a framework by which to map and organize bioeconomy communication activities, thereby targeting stakeholders with different levels of maturity.

The following subsections deploy the conceptual model by sharing inspirational examples from the bioeconomy community in the form of actionable knowledge that is ready to be replicated in future communication activities.

4.1 BIOWHAT

The BIOWHAT dimension includes actions to *Inspire* and *Assess*.

4.1.1 INSPIRE

Raising the overall awareness about and understanding of the social, economic, and environmental impacts of the sustainable and circular bioeconomy at large, and about bio-based products, is of the utmost importance to promoting more sustainable consumption and lifestyle patterns; it also helps to create a market for bio-based products. Public awareness actions are needed, particularly at the regional and local levels, in order to inform the various target stakeholders, by using diverse arguments, messages, channels, and tools.

Awareness-raising is a good starting point; however, it is not sufficient to the change. Building upon this assumption, in the context of BIOWAYS and BIOVOICES, several tools and formats that aimed to INSPIRE target audiences (ranging from students, consumers, multipliers, and other stakeholders) were produced and promoted through different channels.

A successful example of an INSPIRE action is represented by the *BioArt Gallery* (see Fig. 2) which was developed by BIOWAYS and BIOVOICES, a powerful format to attract interest, to raise awareness, to inspire, and stimulate both curiosity and discussion. The BioArt Gallery consists of 16 thematic compositions of maxi pictures (64 images in total) with a high visual impact that showcases and explains several sustainable and circular bioeconomy applications and products. The BioArt Gallery covers all bioeconomy sectors and was exhibited in different contexts, including at high level events organized by the European Commission.

One INSPIRE format that was developed by BIOVOICES is based on *storytelling*; this vehicle was developed through *video-interviews*, involving, for instance, a researcher, an SME/StartUp owner, or other innovators, that narrates his/her circular bioeconomy

Figure 2: Exhibition of bio-based products and related biomass's pictures, completed by a narrative description called BioArt Gallery



story, thereby becoming an inspirational example for audiences. This concept was also used very effectively during the COVID-19 lockdown because it allowed for the creation of a personal connection between the public and the passionate protagonist of the story, despite the distance between the two. Storytelling about a business case (or any other success story), especially if the testimonial is from a peer (e.g., primary sector) is very effective in generating interest and trust, thereby facilitating the first step of a behavioural change and the adoption of innovation.

BIOVOICES also created the concept of a «*buffet of ideas*» in several of the 70+ mobilization and mutual learning workshops that were organized in 14 European countries at the regional, national, and European levels. This format consisted of organizing an intense session in which the participants presented several inspirational good practices (and sometimes also bad practices) in order to trigger the discussion and to provide inspirational ideas for subsequent debates.

An *INSPIRE* tool that was produced by Biobridges is a video of a young lady living a bio-based day, from the moment she wakes up until the moment she goes to sleep. She only uses bio-based products in different contexts: morning care, at the office, shopping, during an aperitif with friends etc. This video was translated into 8 languages and was distributed via social media channels and during online events.

BIOWAYS and BIOVOICES also experimented with games and gamified tools, targeting both kids and adults. Games are very effective in stimulating curiosity and facilitating initial contact with the circular bioeconomy and with bio-based products.

Social media are playing an important role in sharing suitable solutions to sustainability challenges, to which bio-based products can respond, particularly given that environmental issues are becoming more prevalent and are acknowledged frequently. BIOVOICES continuously looked for new ways to use social media channels to *INSPIRE* different target users, by posting interesting content every day (i.e., innovative bio-based products to attract both business and the general public or innovative research

findings to liaise with research), experimenting with creative tools and formats, uploading quizzes, competitions, questions, inviting calls to action, and promoting collaboration by tagging relevant actors.

BIOVOICES was one of the first EU funded projects that used Instagram as a channel to reach wide audiences and to involve potential multipliers (such as sustainability influencers). @BIOVOICES' channels reached 10.000 followers in four different channels, tailoring the messages based on the different social media audiences.

4.1.2 ASSESS

The second action that was proposed consisted of ASSESSing the needs, expectations, worries, and hesitation of the stakeholders through several activities.

BIOWAYS (Delioglani et al. 2017) and Biobridges (Biobridges Consultation – Consumers' awareness on bio-based products 2020) conducted a survey about the public perception of bio-based products, collecting useful information that provided insights into circular bioeconomy communication and info-education activities. The main highlights were:

- Young people are less aware about the bioeconomy; however, they are the ones who are more interested in buying bio-based products and who would be open to paying a higher price compared to the same fossil-based products.
- People are more interested in sustainability and environmental impacts that are generated by the bio-based products; meanwhile, though, there is a low perception of possible, positive economic and social impacts created by the bioeconomy.
- Packaging, single-use products, food, and textile are sectors that are perceived as promising for the bio-based economy's uptake.
- Consumers are sceptical about some sectors (pharma and nutraceutical, for instance) because they are worried about safety, sustainability, and health.
- Price remains an obstacle; however, clear information and trustable labelling are key motivational drivers in the acceptance of the premium price for bio-based products, as well as the perceived positive impacts on environment and health.

The ASSESS action was a central element of BIOVOICES, which promoted the participation of all quadruple helix actors to the circular bioeconomy debate through *multi-stakeholders' workshops*. One of this activity's main outcomes was the identification of challenges and bottlenecks that hamper the bio-based economy's uptake and the joint definition of recommendations and ideas to address these barriers (Niel 2021).

The »*Make your voice heard*« wall aimed to capture the general public's opinions, concerns, and ideas about the bioeconomy and about other innovative ideas, in the context of large-scale events. This solution enabled the collection of hundreds of answers, in only a few hours, and these can be used to facilitate bottom-up shape that the bioeconomy will take.

4.2 BIOHOW

The BIOHOW dimension includes the action to *Inform and Educate*.

4.2.1 INFORM and EDUCATE

Informing the General Public

Info-education represents an important element by which to promote attitudinal and behavioural change because it encourages consumers' critical thinking and informs choices, thereby enabling conscious and sustainable consumerism.

According to the LIFT project's analysis of over 65 EU-funded Coordination and Support Actions, the bioeconomy is too abstract, complex, and too difficult to understand. The project recommends addressing confusion and misunderstandings about bio-based products through communication that has a sound scientific basis and in terminology that is easy to understand. The information should always be both clear and transparent and should address societal and consumer requirements and concerns. The information provided should also examine the sustainability and impacts of bio-based products and services, in order to build trust and acceptance.

BIOVOICES produced a series of educational graphic cards (BIOVOICES 2021) in order to address these challenges and to inform the general public about the circular bioeconomy in layman's terms. The educational cards covered many arguments explaining concepts that are fundamental to the bioeconomy, such as biomass, biofuel, bioplastic, biodegradability, compostability, as well as many curiosities. The content of the cards was realized in collaboration with the Bio-Based Industries Joint Undertaking (BBI JU 2020) and other European projects, such as BLOOM (European Commission 2017a), Enabling (European Commission 2017b) and Glopac (European Commission 2018c).

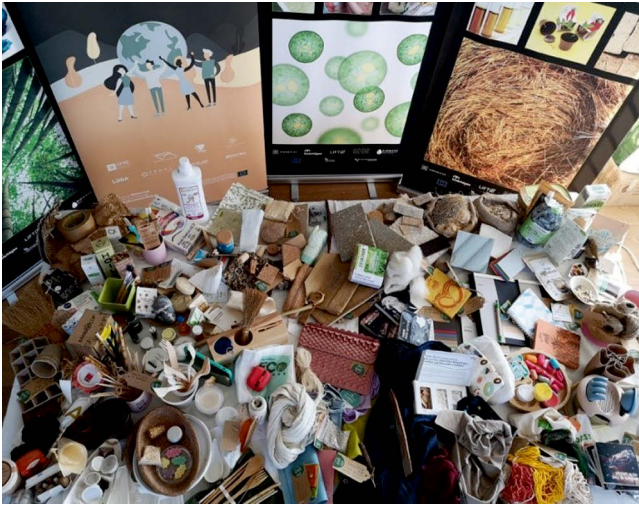
The cards were used for social media campaigns and as educational materials for teachers and students.

BIOWAYS designed the »Bioeconomy Village« (see Fig. 3) to enable participants to touch, feel, smell, and to experience the circular bioeconomy. It consists of an exhibition of over 350 samples of bio-based products, each with different uses, that are employed in daily life; these includes everything from cosmetics to building materials, from superfoods to textiles. The participants learn how both waste and residue can be transformed into resources and discover new innovative materials that stem from biotech research.

The Bioeconomy Village delivers an intense experience for the visitors, including testimonials from researchers and companies to explain their circular bioeconomy-related activities through real examples and experiments. These »hands-on« activities promote learning-by-doing and resulted in the consolidation of both understanding and learning.

The Bioeconomy Village was displayed dozens of times in national and European large-scale events. The Bioeconomy Village was then transformed into a virtual exhibition due to the travelling limitation imposed by COVID-19. After BIOWAYS, this format was

Figure 3: Exhibition of bio-based products so called Bioeconomy Village



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adopted by BIOVOICES and Transition2Bio, in order to deliver direct info-education activities to over 100,000 citizens.

The Bioeconomy Village 2021 edition, again in person, brings visitors to an actual-size cardboard house in which bio-based products are featured as part of daily life applications.

4.2.2 Educating Young Generations

The education of school children and of high school students is crucial to raising a generation that can understand the challenges and embrace the opportunities presented by the bioeconomy (Albertini/Vos 2020). Strengthening the knowledge and sensitivity of future generations to environmental issues, sustainability, and circularity can be achieved through information and education programs targeting younger generations. This effort can contribute to raising future-responsible citizens, as well as decision-makers and the workforce of tomorrow who will be informed by, and interested in, the circular bioeconomy.

BIOVOICES and Transition2Bio dedicate specific activities to the younger generation: one successful example is the collaboration that has been in place since 2018 with Lazio Region (Italy), Novamont, Re Soil Foundation, and Cluster SPRING in the promotion of the »bioeconomy prize« in the context of the school project »Starter School Academy«. The initiative promoted entrepreneurial skills among 39.000 high school students from 900 schools through a business plan competition. In this context, BIOVOICES and Transition2Bio delivered an educational package to both inform and educate teachers and students about the circular bioeconomy and about bio-based products.

Another example of an educational activity that was dedicated to young people was the book for kids (see Fig. 4) produced by BIOVOICES (Albertini/Pocaterra 2021). This book promotes the circular bioeconomy and bio-based solutions in an easy and comprehensive way, informing and educating readers about topics related to sustainable production, consumption, and lifestyles, engaging children from 5 to 8 years old and their parents, grandparents, teachers, and other adults who might read this book with them. The information has been validated by high level experts, from both academia and industry (a scientific committee composed of 33 European experts). 14.000 copies of the pilot version of the book were published in 11 different languages (English, Italian, Portuguese, Spanish, Greek, Dutch, German, Romanian, Slovak, Estonian, French and Hungarian) and were distributed in selected schools, bookshops, museums, and institutional contexts.

Figure 4: The cover page of the BIOVOICES book for kids »What's bioeconomy?«



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Transition2Bio delivered an educational package that accompanied the books during distribution, the aim of which was to inform and educate primary school teachers about the circular bioeconomy and the bio-based products. The primary aim was to equip teachers with the necessary knowledge to better use the book in their school activities with children.

4.2.3 Beyond Civil Society

In order to drive transition and to inform people about bioeconomy-related opportunities, it is important to inform and educate not just citizens, but also other stakeholders like primary producers, industries, brand owners, retailers, entrepreneurs, procurers, intermediaries, and policy makers.

Different educational contents should be designed to reach and to inform the various stakeholders; this material should speak their language, should use motivating contents that make explicit the pros (and cons), opportunities, and should outline the benefits.

Transition2Bio supports Members States and regions in designing their circular bioeconomy educational hubs. They are also interested in introducing bioeconomy-related curricula to high schools and universities, vocational training, and lifelong learning programs. Finally, the project delivers capacity building to policy makers, public authorities, and local stakeholders, thereby facilitating knowledge and the exchange of good practices.

4.3 BIOACT

The BIOACT dimension includes the *Engage* and *Co-create* actions.

4.3.1. ENGAGE

The first BIOACT action ENGAGES the stakeholders to promote a bottom-up transition and empowers them to take a role in driving the change.

According to BIOVOICES and Biobridges experiences, it is necessary to facilitate the multi-stakeholder's debate about shared challenges, as well as to promote the connection and collaboration of actors along the value chains.

In order to address these objectives, Biobridges designed and validated two formats: *Bridge2Brands* and *Bridge2Value*.

Bridge2Brands promotes the connection between a sustainability challenge, expressed by a brand, and the corresponding solutions offered by innovation providers. It supports brands that are motivated to switch to bio-based alternatives, offering tailor-made support in shaping their requests for new solutions and in the identification of the best and most innovative proposals. This format facilitates brands' awareness and knowledge about potential bio-based solutions and contributes to the enlargement of the network. This enlargement, in turn, enables new cooperation with other companies and brands.

The format is flexible and is easily tailorable to the brand's needs and this was validated to address the sustainability challenges presented by two Brands: P&G (Procter & Gamble) and FCA (Fiat Chrysler Automobiles), attracting 100 innovation providers.

Bridge2Value connects different stakeholders in order to foster value chain generation, thereby facilitating dialogue and discussion about shared challenges. Biobridges highlighted the fact that productive sectors are affected by barriers and challenges that do not allow for collaboration or dialogue among the value chain's various actors, thereby resulting in the slowing down of the circular bioeconomy's development. These barriers also included fragmentation within the sectors, a lack of awareness about various

actors within the value chain, and the presence of both legislative and financial barriers. This format was validated by bringing together wool stakeholders in Italy, and later Europe, to identify solutions and synergies to valorise this underexploited resource.

Another example of an ENGAGE action was an experiment by Biobridges involving »Ambassadors« and »Influencers« in raising awareness and promoting Bio-based products. The activity took place by engaging famous people as #Bioheroes, people who had been informed and trained about the circular bioeconomy and bio-based products previously, in order to empower others with the necessary knowledge that they will multiply through their networks.

BIOVOICES also promoted a collaboration with ambassadors to come into dialogue with harder-to-reach target audiences (adults and mature citizens), by designing and producing 10 video shorts. These were called »Lo sai che?« in Italian (Do you know that?). It was promoted by famous Italian TV presenters who are sensitive to environmental issues (see Fig. 5). Syusy Blady and her daughter Zoe both show and explain various bio-based products, highlighting the circular bioeconomy's potential in everyday life. Syusy and Zoe compete to show each other who knows more about the circular bioeconomy in a generational mother/daughter playful discussion. The videos have over views on social media, engaging people who might never have heard about the bioeconomy before primarily.

Figure 5: Screen shots from the »Lo sai che?«-videos



One of the advantages of involving ambassadors to advocate for the transition involves leveraging the trusted relations that they already have with their public. This advocacy and action can significantly contribute to supporting behavioral change by providing real peoples' inspirational first-hand experiences. The same concept applies when engaging multipliers (like teachers, brands, retailers, professionals, journalists etc.), in explaining these concepts to their clients and audiences.

Nevertheless, since the circular bioeconomy is a relatively new concept, and several questions still remain controversial, it is important to empower ambassadors and multipliers with info-education and to support them (toolkits, informative material, facilitating the involvement of experts), in order to prevent the risk of miscommunication.

BIOVOICES explored the engagement of young students via testimonials to promote the bioeconomy's every day applications. Several videos, interviews, and TEDx style-presentations were designed, involving students who had been appropriately trained and supported. This impactful activity, called »from students to students« in Transition2Bio, providing bioeconomy educational contents from the voice of students.

Finally, an unprecedented level of engagement and collaboration among European-funded projects was triggered by the European Bioeconomy Network (EuBioNet), the proactive alliance launched by BIOVOICES that involves European-funded projects dealing with the promotion, communication, and education about the circular bioeconomy. The EuBioNet aims to maximize the efforts of projects and initiatives by increasing knowledge-sharing, networking, mutual learning, and the coordination of joint activities and events; the intention here is to increase the impact of all of the bioeconomy-related European funded projects.

4.3.2. CO-CREATE

The last of the BIOACT dimension's actions is to *CO-CREATE*. This bottom-up, multi-stakeholder approach ensures that all voices are taken into consideration and facilitates the identification of shared and acceptable solutions.

Co-creation is a process that ensures that all stakeholders are involved in the design of future policy and industrial agendas, thereby integrating their ideas and concerns to jointly identify and address opportunities, challenges, and risks. This approach contributes to responsible policy making and to strategic agenda setting, and take mutual perspectives, including citizens' views about the bioeconomy's challenges and opportunities, into consideration. The co-creation is widely recognized as a powerful methodology to ensure the acceptability of the solutions generated, as well as to provide insightful recommendations for the development of both bioeconomy strategies and action plans.

BIOVOICES and Biobridges have organized around 100 co-creation activities, using the mobilization and mutual learning methodology, involving quadruple helix stakeholders at the local, regional, national, and European levels.

The results of these activities were used as one of the main sources for LIFT Factsheets (Albertini/Vos 2020) and have been consolidated in lessons learnt and recommendations for the stakeholders in four policy briefs (BIOVOICES consortium 2021) that were delivered by BIOVOICES.

5. Conclusions and Recommendations

European Projects like BIOVOICES, Transition2BIO, Biobridges, BIOWAYS, LIFT, and the European Bioeconomy Network have all jumpstarted a new era by addressing awareness raising, communication, and stakeholder engagement in the promotion of the circular and sustainable bioeconomy.

As mentioned above, an integrated approach to bioeconomy communication must target the supply side (primary production, enterprises, biorefineries etc.), the demand side (citizens, consumers, B2B, end users, public procurers etc.), the multipliers (brands, retailers, consumers' associations, influencers, media etc.), and the supporting environment (policy makers, research and innovation, finance, etc). This strategy is critical to the promotion of the transition towards more sustainable production, consumption, and lifestyles.

While targeting these stakeholders, bioeconomy communication should take the different dimensions described in the conceptual model BIOWHAT, BIOHOW, and BIOACT into consideration in order to implement the actions proposed. Implementation must depend on the stakeholders' maturity, in terms of their bioeconomy awareness and uptake.

The conceptual model, together with the lessons learnt stemming from several experimental, innovative activities, tools, and channels, are available as an integrated package of actionable knowledge that is ready to be adopted by other projects and initiatives in the circular bioeconomy.

The deployment of this approach can help to close the gap between the European-funded projects' results and their implementation in the political and industrial agendas, thereby facilitating a bottom-up participative process involving supply, demand, multipliers, and the supporting environment.

In order to reach a wide audience, multipliers such as teachers and other professionals from non-formal education (museums, science communicators, youth organisations, community groups, theatres, festivals, fairs, amusement parks, journalists and media, NGOs etc.) should be engaged and provided with motivation, knowledge and tools on teaching the bioeconomy.

Last but not least, young people need to be engaged and empowered with information, capacities (including transversal skills) and opportunities to become ambassadors, to attract and influence other young people. A newly European funded Project »GenB« (Generation Bioeconomy) is built on these recommendations to move forward with regards to communication and education in circular and sustainable bioeconomy.

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