

Creating Networks for the Transition to a Bio-based and Circular Economy

BioSTEP Policy Paper



April 2017

ABOUT BIOSTEP

BioSTEP (www.bio-step.eu) aims to engage citizens and various stakeholder groups in discussions about the future development of Europe's bioeconomy. Its objective is to increase the overall awareness and understanding of the bioeconomy as well as its consequences and benefits by considering citizens' needs and concerns. BioSTEP applies a three-tier approach to reach all relevant actors in the bioeconomy domain by using tailored engagement tools, such as workshops, conferences, exhibitions and debates on the bioeconomy. At the regional level, BioSTEP applies and tests a 'living lab' approach to facilitate the involvement of public-private networks of stakeholders in bioeconomy-based innovation and business model development processes.

ABOUT THIS POLICY PAPER

This policy paper builds on the results of BioSTEP's stakeholder engagement activities, including an online stakeholder consultation and a series of policy workshops, and on the results of an in-depth analysis of participatory practices in national and regional bioeconomy strategies. The results of BioSTEP's activities can be accessed on www.bio-step.eu/results.

ACKNOWLEDGMENT & DISCLAIMER



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EXECUTIVE SUMMARY

At the heart of many recent policy initiatives is the understanding that the outcomes of current economic value chains do not fit the needs of society as a whole. In these cases, public policy aims to start economic transitions – for instance to a bio-based and a circular economy, but also towards greater regional cohesion. Those economic transitions require the formation of networks, including the companies of the value chain, regulators, policy-makers, researchers and citizens. These networks may spontaneously emerge where existing networks need only adaptation. In other cases, public policy is needed to support the development of those networks.

Changing the economic processes requires acceptance, but also the active contribution of many different actors in society. Changing, or even rebuilding that network of actors for the different processes in place is one major challenge of any economic transition. The required actors differ from economic process to economic process, but the following groups of actors should ideally be involved: companies, researchers, financing institutions, regulators and policy-makers, consumers and civil society.

Broad stakeholder and public engagement can be an important tool to form new networks and to realize the potential of the bio-based and circular economy. BioSTEP has developed the following key recommendations to improve participatory processes and the network building underlying economic transitions:

- 1 **Support small and medium-sized enterprises in the creation of new networks:** The development of innovative bio-based products and processes is often hampered by a lack of cooperation among relevant actors; the identification of new business partners can be a challenge. Public agencies should set up engagement processes in such a way that they act as matchmakers, which are needed for the transformation process towards a bio-based and circular economy. Furthermore, a coherent regulatory framework needs to be in place that ensures investor confidence.
- 2 **Facilitate involvement of civil society (actors) in bioeconomy and circular economy debates:** The development of balanced and inclusive bioeconomy and circular economy strategies implies that the traditional ‘triple helix’ of university, industry and government organisations must be expanded to also include civil society organisations. Appropriate tools and the provision of financial resources are required to strengthen the cooperation with non-governmental and civil society organisations in debates on the bio-based and circular economy.
- 3 **Increase public awareness of and engagement with the bio-based and circular economy:** Developing a common understanding of benefits (and how to share them) and risks (and how to mitigate them) is an important precondition for building the trust needed for a successful network. Open dialogue and engagement with the general public may increase the awareness of and engagement with issues that relate to the development of the bio-based and circular economy.
- 4 **Design and implement effective instruments for stakeholder and public engagement:** Broad and effective stakeholder and public engagement in the development of bioeconomy and circular economy strategies requires the design and application of innovative participatory instruments. In order to reach all relevant stakeholders with specific engagement tools suitable to their needs, a mix of instruments that covers the areas of education and information, dialogue and co-production of knowledge is needed.
- 5 **Provide opportunities for participation in the development, implementation and evaluation phases of bioeconomy and circular economy strategies:** While stakeholders generally see the need for built-in broad participation from an early stage in the strategy process, it is also required to provide for potential intervention points for relevant stakeholders and the general public in later stages, such as the implementation and the evaluation phases of a strategy.

TABLE OF CONTENTS

1	Background	5
1.1	Participation as an important tool to help building new economic value chains and processes	5
1.2	What new networks need to be created?	6
2	Concept of stakeholder and public engagement	7
3	Recommendations for effective engagement in the bio-based and circular economy	8
3.1	Support small and medium-sized enterprises in the creation of new networks	8
3.2	Facilitate involvement of civil society (actors) in bioeconomy and circular economy debates	9
3.3	Increase public awareness of and engagement with the bio-based and circular economy	10
3.4	Design and implement effective instruments for stakeholder and public engagement	12
3.5	Provide opportunities for participation in the planning, implementation and evaluation phases of bioeconomy and circular economy strategies	14

1 BACKGROUND

1.1 Participation as an important tool to help building new economic value chains and processes

In order to further develop Europe's economy in a social and environmental responsible manner, it is essential that engagement processes are embedded within current and future innovation pathways. Transitions towards new economic paradigms, such as a bio-based and a circular economy, require the formation of networks among various actors, among them companies along the value chain, regulators, policy-makers and citizens. Sometimes, such networks emerge spontaneously and autonomously, e.g. only adapting existing networks. However, in cases where no such networks exist, public policy seems to be needed more regularly to support the development and establishment of networks.

The organisation of inclusive participation processes is an important way of supporting the development of those new networks. BioSTEP has analysed different strategy processes and the results of this analysis point to several lessons learnt, which appear highly applicable to fostering network development in support of transitions towards a Bioeconomy and a Circular Economy.

Europe's bioeconomy is increasingly structured around clusters, which concentrate value chains and the available expertise in some regional areas. These clusters are forms of network structures characterised by multiple, nested actors or institutions who use clustering to accomplish organisational objectives. As Bonaccorso (2014)¹ observed, such a cluster-based economic structure stands in stark contrast to more traditional innovation systems where big enterprises define and drive innovation processes:

'Nowadays such innovation processes are governed by large, complex and structured production chains, with various economic and non-economic actors, often with a local connotation, influencing their characteristics and results'.

These complex networks and production chains are pivotal for success of the bioeconomy. However, such complexity can also be challenging when innovation policy seeks to set up stakeholder engagement processes to ensure the participatory development of national and regional strategies.

Adding to this complexity, the bioeconomy and circular economy agendas require a transformation of the economic value chain to additionally achieve social and environmental objectives. Achieving a bio-based and circular economy necessitates rebuilding and forging of networks of companies, regulators, consumers and many other stakeholders.



¹ Bonaccorso, M. (2014): The European Path to Bioeconomy Runs through Clusters. In "Renewable Matter. International Magazine on the Bioeconomy and the Circular Economy" (1/2014). Available at: www.renewablematter.eu/art/22/The_European_Path_to_Bioeconomy_Runs_through_Clusters

1.2 What new networks need to be created?

Changing the economic processes requires the support and active contribution of many different actors along value chains and their socio-political context. While the constellation of network actors will have to depend on the value chains in question, the following groups of actors should be considered for involvement:

- » **Companies:** Fostering the bio-based and circular economy in Europe requires the rebuilding of existing and the development of new value chains. Bioeconomy processes very often use materials that were not used before and produce waste that was not produced before. Therefore, the companies adopting bioeconomic processes need to build new capabilities as well as find new partners. Due to the degree of specialisation needed in bioeconomic value chains, partners from old networks may be less useful, and hence new partnerships need to be sought. If transport costs are a major concern (like in remote areas or for bulk goods or waste), finding local partners may make new partnerships even more challenging.
- » **Investors:** Even if the partners have been identified, financial support for new bioeconomy and circular economy operations might be difficult to obtain. Banks as financiers are generally risk averse and may shy away from investing into such operations, especially as many banks might not have the in-house expertise to understand the new process and its opportunities.
- » **Regulators and policy-makers:** Public policy and regulation can significantly influence the development of these new networks, both fostering and hindering it. Regulations very often focus on existing structures and processes, and therefore may require alignment with the needs in new economic value chains. Companies involved in building these new value chains need to interact and comply with different or new regulations and regulators more frequently than before. This could facilitate or complicate their activities in a bio-based and circular economy.
- » **Consumers:** New products and materials can meet resistance from consumers trying to avoid any perceived risks or perceived performance limitations of those products and materials. Providing credible and robust information to consumers is therefore another important precondition of a successful transition to a bio-based and circular economy.
- » **Civil society organizations and the general public:** Apart from consumers, there are many other relevant societal stakeholders, like environmental organisations and other civil society groups, or people living in the neighbourhood of new production facilities. Providing information and ensuring that they understand the benefits and risks of the new processes is crucial here. Applying appropriate means for communication and dialogue with those groups can help developers of these new production processes build trust.
- » **Science and academia:** The rebuilding of existing and the development of new value chains depends on the development of innovative products and processes. Research institutions can generate the required expertise and provide their acquired knowledge to other stakeholders. Universities and schools play an important role in the education of the future workforce for the bioeconomy.

One ambition of the bio-based and circular economy is to spread added value and wealth to economically less advanced regions, thereby contributing to regional development and cohesion in the EU. However, when regions lack the required infrastructures and institutions to facilitate network building among actors, the realization of the regional potentials of the bio-based and circular economy are put at risk. The recommendations in Chapter 3 shall describe ways in which engagement processes can be set up so that they support the development of new or strengthened networks in a bio-based and circular economy.

2 CONCEPT OF STAKEHOLDER AND PUBLIC ENGAGEMENT

Stakeholder and public engagement is considered a key element of EU policy development and responsible research and innovation. It is deemed to increase public understanding of science, improve trust, and inform research through the inclusion of diverse perspectives in research design, and thus enables innovations to better align with societal needs. It can be regarded as an important democratisation requirement, sometimes referred to as a 'right' of publics and stakeholders to be involved in decision-making processes.

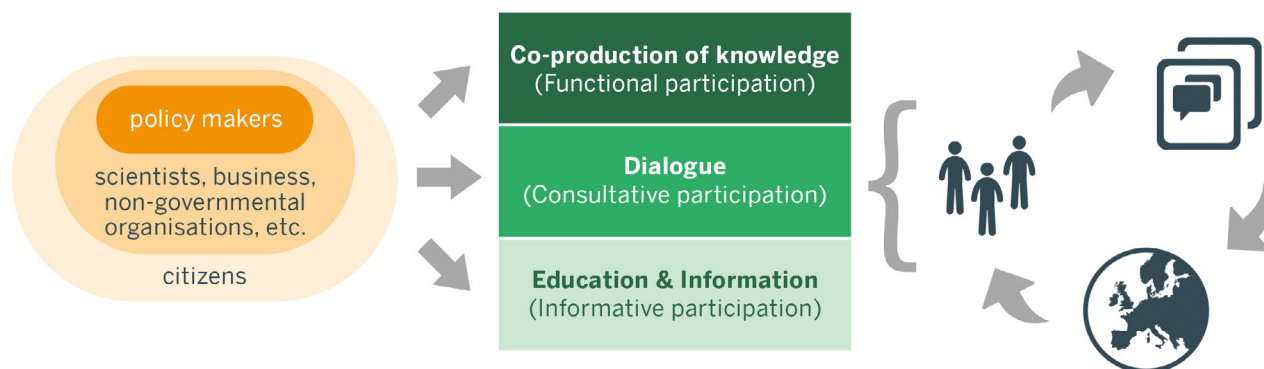
In terms of engagement in the bio-based and circular economy, many actors have a role to play, as such. It is therefore necessary to promote responsible and participative governance that engages both the general public (citizens and end-users) and key stakeholders (policy-makers, scientists, non-governmental organisations, civil society organisations, entrepreneurs, etc.) in an open and informed dialogue on the bio-based and circular economy. In this context, the need to separately consider the engagement of actors involved in regional or national strategies needs to be recognized, as national strategies are closely related to economic policy-making, while regional strategies may be developed by economic clusters and shaped by discrete groups of actors and networks in a specific region, often in less formal ways.

Effective engagement of stakeholders and the public in the development of bioeconomy and circular economy strategies requires the design and application of tailored communication tools that meet the needs of the different target audiences and provide policy-makers with the information they need.

In its work, BioSTEP has applied a three-tier approach to engagement (see Figure 1). This approach distinguishes between three modes of public participation:

- » **Education and information**, where experts provide other individuals and organisations with information on the bio-based or circular economy (informative participation);
- » **Dialogue**, where some stakeholders consult and seek the views of other individuals and organisations (consultative participation);
- » **Co-production of knowledge**, based on cooperation between a range of experts, citizens and interest groups (functional participation).

Figure 1: Modes of public participation as applied in BioSTEP



Adapted from: Sedlacko, M. (2012), WU Wien

3 RECOMMENDATIONS FOR EFFECTIVE ENGAGEMENT IN THE BIO-BASED AND CIRCULAR ECONOMY

In order to facilitate broad stakeholder and public engagement, which is needed to form new networks and to realize the potential of the bio-based and circular economy, the following recommendations should be taken into account:

3.1 Support small and medium-sized enterprises in the creation of new networks

The development of innovative bio-based products and processes is often hampered by a lack of cooperation among relevant actors. The organisation of the industry network around new products and value chains, including the identification of new business partners, is a key challenge for entrepreneurs. This can be an obstacle for all types of companies, but especially for small and medium-sized enterprises (SMEs) as they often lack the required resources.

Participatory processes can support the match-making needed for the transformation process towards a bio-based and circular economy. Coordination efforts by public bodies are regarded as a key instrument to bring relevant actors together. The high number of public agencies involved in regional development activities (incl. business support/funding) can be an obstacle, however, as it is not always clear who is in charge. As the governance structures of the regional bioeconomy strategies analysed by BioSTEP differed a lot, the type of public agency that could take over this task may also differ. The effective matchmakers we found had the following characteristics:

» **Intersectoral approach:** In order to provide support in the creation and development of new networks and clusters, it is necessary to select a responsible body for the coordination of economic development activities. The agency should have a broad outlook, as the new technologies and new networks will not easily fit into existing sector divisions. Industry forums organised by the agency can be an effective tool that facilitates network creation among relevant regional actors.

» **Technology transfer:** Apart from facilitating cooperation among different companies, an important role of the agency could be to support technology transfer. The transfer of knowledge from universities and research centres to the business community is often hampered, as academia and entrepreneurs speak different technical languages. Successful technology transfer offices should engage in communicating research activities and results from academia to the business sector.

» **Hybrid organisations:** The enabling agency needs to have strong links to universities and research centres, but at the same time needs a strong link to the business community. Examples for such organisations with links to the research and business communities are cluster bodies, innovation centres, regional development/enterprise agencies and training centres, especially if they have been set up by so-called 'triple-helix' (university-industry-government) partnerships. Good practice examples for such hybrid organizations are the Industrial Biotechnology Innovation Centre (IBioIC) in Scotland,



the SPRING cluster in Italy and the Bio-Based Delta Foundation (together with a range of other bodies) in the Netherlands.

Besides a public agency that facilitates match-making among relevant actors, SMEs are in need of a supportive policy and regulatory framework that includes:

- » **Financial and organisational support to SMEs:** One part of the creation of the value chain is the availability of financing for new companies and ventures. BioSTEP's online stakeholder consultation identified the lack of appropriate financing as one of the most

important challenges within the emerging bio-economy. Stakeholders highlighted the need for flexible grants offered by public bodies.

- » **Stable, long-term and supportive policies:** The establishment of a supportive regulatory framework encompassing policy coherence between different sectors is generally seen as a crucial pre-requisite for investor confidence on the way towards the bio-based and circular economy. In addition, the promotion of public private partnerships and the availability of funding from national bioeconomy programmes (e.g. for demonstration projects) turned out to be a key priority for stakeholders.

3.2 Facilitate involvement of civil society (actors) in bioeconomy and circular economy debates

Building the network of companies for the value chain is just a single step in building the network. A key element of building a participatory bio-based and circular economy involves developing ways to engage societal stakeholders and citizens in the new and existing networks of the bioeconomy and the circular economy. This can be done through opening up a dialogue that progresses beyond the 'triple helix' to a 'quadruple helix' approach, which includes civil society (actors).

The findings of BioSTEP highlight the limitations in current participatory processes when it comes to the involvement of non-governmental organisations (NGOs), civil society organisations (CSOs) and the public. Civil society organisations are important in providing a critical voice on business/policy developments, in bringing in new and creative ideas, and due to their ability to communicate effectively with the wider public. Currently, there are very few examples of a quadruple helix cooperation. Nevertheless, attempts and willingness to move towards participative governance can be identified.

The following recommendations for strengthening the cooperation with NGOs and CSOs have been identified in the course of BioSTEP:

- » **Early involvement of civil society:** Currently, strategies and clusters for the bio-based economy are mainly shaped by triple-helix organisations. However, during BioSTEP's stakeholder engagement activities, some civil society actors expressed a strong interest in contributing to the development of strategies. At the same time, there were concerns among some NGOs that participation activities might be used as 'greenwashing', especially given the uncertainties around the environmental and social impacts of bio-based technologies/processes. Strategy leaders need to consider how to involve CSOs early and continually throughout the strategy process and to support them with the necessary tools and resources for participation.
- » **Participation is context-dependent:** The participation of NGOs and CSOs will vary between countries, depending on institutions and cultures. Therefore, there is a need to structure involvement in different ways; this will include long-term structured participation in some countries, but project-based engagement elsewhere. Participation strategies need to take account of the stage of bioeconomy or circular economy activities, e.g. early stage (characterised by planning, development and pilot

projects) or well established (with solid market growth and stabilisation) and assess how engagement could support further development.

- » **Engagement around sub-themes related to the bioeconomy:** There may already be effective, broader engagement on particular sub-themes of the bioeconomy, which are more appealing to civil society (e.g., bioenergy, forestry, food, and general, day-to-day topics such as waste prevention or recycling). Some countries or regions may prefer to organise a strategy process around those societal objectives rather than the high-level themes of 'bioeconomy' or 'circular economy'.
- » **Development of cost-effective instruments for NGOs and CSOs:** A widespread challenge of many NGOs and CSOs is the lack of financial and personnel resources. A partial core funding for relevant civil society organisations could be a suitable instrument to ensure active participation in the policy process. A good practice

example is the (core and/or case-by-case) funding that the European Commission provides for selected environmental NGOs to enable their engagement in certain policy debates.

- » **Participation in Bioeconomy Councils and Forums:** These groups are usually made up of triple helix partners because of the focus on economic and research development. In order to increase acceptance of the bio-based economy among civil society, their membership should be broadened also to include NGO- and CSO-representatives.
- » **Involvement of CSOs at regional level:** The regional level plays an important role for the development of the bio-based and circular economy. Therefore, representatives of regional and local civil society organizations, but also of local and regional authorities, should particularly be encouraged and supported to take part in the participatory process.

3.3 Increase public awareness of and engagement with the bio-based and circular economy

An important obstacle in the development of new economic processes and networks is that sometimes very different assumptions and perceptions about the risk and benefits of the new processes exist. Developing a common understanding of benefits (and how to share them) and risks (and how to mitigate them) is an important precondition for building the trust needed for a successful network. Open dialogue and participation of the general public may increase awareness and engagement with issues that relate to the development of the bioeconomy. This approach can generate trust in new innovative developments supporting a sustainable and circular economy. In the view of the stakeholders consulted in the context of BioSTEP's activities, this can be achieved by:

- » **Making better use of good practices:** Good practices from other sectors and debates (e.g.,

climate change, waste management) should be considered when designing public engagement strategies at the regional and local levels. There already is evidence on the engagement of citizens and SMEs in waste management, which is significant for the use of waste-based resources. At the regional level, provinces and municipalities could make widespread use of waste composters (biofermenters) and the associated infrastructure. This approach to waste management could improve citizens' awareness of the bio-based and the circular economy. Still, public investment is needed in projects that support public awareness; this should include (research) projects that develop new methods of engagement.

- » **Trustworthiness** is an important precondition for the acceptance of the bio-based and circular



economy. This can be achieved by using ‘honest brokers’ who facilitate public engagement at the regional and local levels, e.g. museums or science centres, as the public views them as open and neutral, and the staff is trained in communicating with the public. However, this also requires that those institutions go beyond techno-centric views and pay thorough attention to social and ethical issues.

- » The discussion of the bio-based and the circular economy should be linked to **societal objectives** and **specific issues** that are of interest and importance to citizens (e.g., forest nature, sustainability). In order to empower citizens and stakeholders to engage, it is important that a knowledge base on the social, economic and environmental effects of bio-based products and processes is provided. Funding and policy decision-making should also make potential trade-offs more explicit (e.g., at the regional level).
- » The results of BioSTEP’s online stakeholder consultation and of the policy workshops show that **sustainability assurance** is a key issue when it comes to the development of bioeconomy strategies. Bioeconomy strategies should be linked to sustainable development strategies and sustainability of the bio-based economy needs to be credibly demonstrated through assurance systems such as (voluntary) standards and certification. Positive and negative lessons

learnt from existing examples (e.g., biofuels regulations, sustainable forest management, due diligence systems for timber trade) should be used to develop robust, flexible and user-friendly assurance schemes for bio-based products.

- » **Developing a socially robust assurance scheme:** An ideal certification or labelling scheme for bio-based products would be simple, efficient and transparent. New or adapted schemes could build on existing examples and should be socially robust (having support from societal stakeholders). The broader perspectives of experts that have consumer expertise should complement the perspective of NGOs and CSOs in initial grounding work. Independent accreditation bodies should then take the lead in further developing and operationalizing the assurance scheme. All parties should stay involved in the process; through continual feedback, the assurance scheme may become increasingly socially robust and gain public trust.
- » A move from traditional consultation towards **approaches more tailored to communities** (more creative, fun and relating to regional or local history) might lead to effective public participation in bioeconomy and circular economy debates; emotion-based responses of the public to the bioeconomy can help mobilize true emotions and values. Artists, celebrities, or ‘local heroes’ could be involved in the debate and play a key

role as ‘change agents’ or ‘ambassadors of the bioeconomy’. They can act as communicators and translators. The challenge is to link local strategies for the bioeconomy with local narratives. Ideally, the information process starts with a dialogue, finding out the needs and perceptions of the community, rather than delivering one-way information on the bioeconomy. Local communication channels (like markets or newspapers) should be used. Communities should be enabled to make choices in developing a regional strategy based on their own identity and on peer-to-peer interaction.

- » **Education** can help stimulate the enthusiasm of young people who will make up the next generation of employees in the bio-based and circular economy. The education sector, and in particular schools, play an important role in raising awareness of the bioeconomy. Schools should therefore be involved more intensively in the knowledge transfer process.

- » There is a need for a **policy and regulation**, which declares that the use of bio-based products will be required more often. There is potential for European and national governance to show better leadership through legislation (e.g., the current example of policy regarding the use of plastic bags in France and Italy). At the regional level, leadership could be shown in the form of a champion, i.e. an organisation that pursues citizen engagement, ensures that it is a key policy priority and designs and implements practical steps.

- » **Policy-media relationships** should be fostered in order to improve information transmission that can support public decision-making. It is not sufficient to inform stakeholders about strategy process only on governmental web pages.

3.4 Design and implement effective instruments for stakeholder and public engagement

Motivations and objectives for planning and conducting engagement in national and regional bioeconomy strategies vary. Engagement with stakeholders (e.g., businesses, research and education organisations, policy-makers and non-governmental organisations) typically seeks to develop networks and collaboration between organisations, in support of business and research activity, and to inform and influence policy-making. Engagement with civil society may aim to increase people’s awareness of the bioeconomy, to gain public acceptance for a transition to a bio-based economy, or to gather the views and concerns of different groups to inform decision-making.

The impact of engagement activities on society or decision-making not only depends on the approach taken, but also on other dimensions, including: who participates, when engagement takes place, what issues are considered or excluded, the narrative, and power dynamics between participants. Broad and effective participation requires a

mix of instruments that cover the aspects of education and information, dialogue and co-production of knowledge. In any case, a comprehensive narrative has to be developed and convincingly communicated by way of storytelling. In general, engagement instruments are most effective when applied locally. In the context of BioSTEP’s stakeholder engagement activities, the following instruments have been suggested:

- » So-called ‘**change agents**’ and ‘**bioeconomy ambassadors**’ could act as communicators and translators. A good practice example comes from Finland, where change agents are deployed to bring innovations closer to the people.
- » **Competitions** on selected themes could be a means to reach out to the general public and engage them in the topic of the bioeconomy. Competitions can also be an effective tool to involve SMEs and potentially researchers.

- » The role of the education sector in the transformation process towards a more sustainable economy seems to be underestimated in the current discussions on the further development of the bio-based and circular economy. Thematic **events at schools** and tailored learning materials could serve to raise awareness of the bioeconomy among young people. These can also effectively be reached through 'cool' smartphone apps and games.
- » **Exhibitions or pop-up stores** with bio-based products can be effective means to explain the abstract concept of the bioeconomy to the general public. At the same time, they can also be used to initiate a dialogue with visitors, e.g. by means of a survey that explores the visitors' views on the benefits and challenges related to the development of bioeconomy strategies. Exhibitions can also be set up in a train or truck that tours across Europe.
- » **Targeted information** should be provided to people **in a creative way** when they are particularly susceptible to it, e.g. during waiting times at train stations or while shopping at the supermarket. Ideas include, without limitation, videos, displays with motion, and product-related life cycle information at the point of sale. Ideas can be developed involving students with a background in arts, music, communication, environmental sciences etc.
- » The establishment of an **online platform** that explains the – for many people still unknown – concept of the bio-based and circular economy and the process of strategy development can enable civil society organisations and citizens to “enter” the debate (also at a later stage in the process).
- » **Online consultations** can be cost-effective instruments to engage with civil society organisation and citizens.
- » **Thematic workshops**, e.g. on waste management / recycling and other everyday topics could be used to draw citizens' attention to the abstract concept of the bio-based and circular economy.
- » Particularly at the regional level, so-called **'living labs'** provide an opportunity for an interactive communication amongst entrepreneurs, scientists, policy-makers and citizens in order to find concerted solutions to common needs in terms of strategy development. In the same manner, a **'design thinking'** approach could serve as a tool for the direct involvement of relevant actors, including citizens, in the process of strategy development.



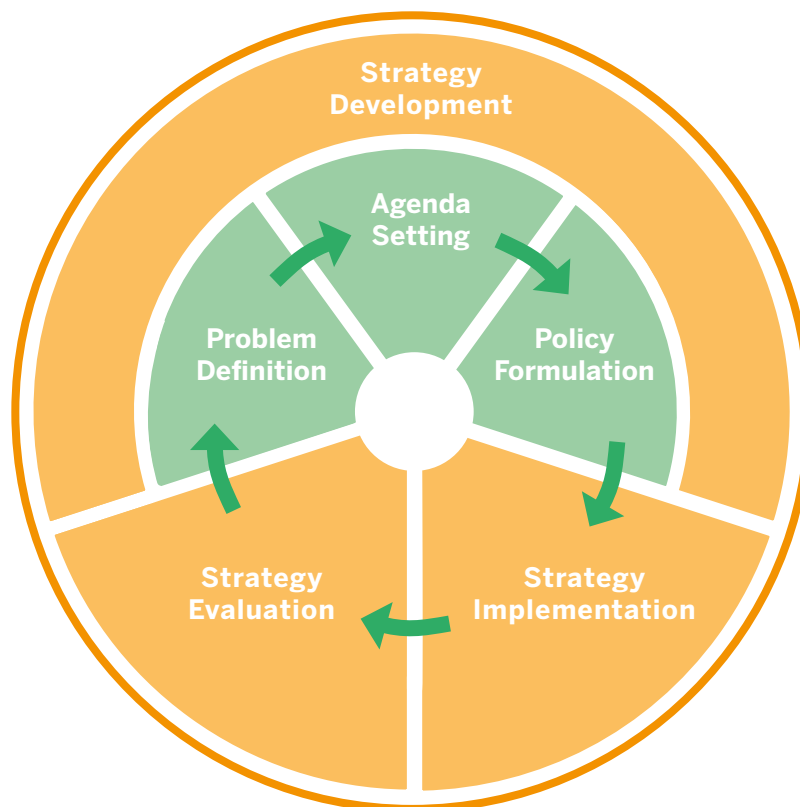
3.5 Provide opportunities for participation in the development, implementation and evaluation phases of bioeconomy and circular economy strategies

When talking about participation in (political) bioeconomy and circular economy strategies, it is important to take account of the temporal dimension of the process. The results of the work conducted in the course of BioSTEP show that there is a need to build-in broad participation from an early stage. In general, stakeholders and citizens should be involved in the development, implementation and evaluation of strategies whereas the level of involvement may vary from a more active to a more receptive one.

The **strategy development** phase includes three different stages: the definition and prioritisation of the societal problem or challenge, agenda setting and the formulation of policy objectives and measures. This first phase in the strategy process requires the broadest level of participation.

- » **Problem definition:** The potential pathways for the transition to a bio-based and circular economy need to be discussed with key stakeholders and the general public. As the implementation of the strategy will take place at the regional level, regional actors should be involved from the beginning.
- » **Agenda setting:** Once the problem is placed on the political agenda, it is of importance to decide which role relevant actors should play in the further strategy process. Potential intervention points for key stakeholders and the public to engage in the strategy implementation and evaluation phases should be defined and laid down in a management plan. This requires the design of appropriate instruments that facilitate the engagement of relevant actors in the respective phase of the strategy process.

Figure 2: Different phases of the strategy process



» **Policy formulation:** As a cross-cutting concept, the bioeconomy covers a range of policy domains, requiring the involvement of all relevant government departments in the strategy process (“whole-of-government” approach). A good-practice example for interdepartmental cooperation can be found in Austria, where three ministries (economy, innovation & technology, and environment) jointly manage the development of the national bioeconomy strategy. While policy-makers and regulators are in charge of formulating policy objectives and concrete policy measures, stakeholders should be consulted to provide feedback on alternative policy choices. Scientists, industry representatives and CSO representatives can serve as experts and advisors.

The **strategy implementation** phase is governed by policy-makers and regulators. However, experts may assist them in carrying out selected actions, e.g. scientists and consultants can provide methodological guidance on how to implement certain aspects of the strategy. In the consultations carried

out by BioSTEP, civil-society actors generally showed interest in participating in implementation processes; however, capacity issues were highlighted as potential obstacles. In the context of the bioeconomy, it is important to accompany the implementation of the strategy with appropriate communication and outreach campaigns. So-called ‘bioeconomy ambassadors’ could raise awareness among the wider public, e.g. by communicating stories (not concepts) and thereby support the implementation of measures set out in the strategy.

The **strategy evaluation** phase is where policy-makers need to assess whether the strategy’s objectives have been achieved. Researchers and consultants can help policy-makers to evaluate the impacts of the strategy and to draw conclusions on its efficiency and effectiveness. Transparency is a key aspect in an expert-based evaluation process. The results of the evaluation should be communicated to other stakeholders and the general public in an accessible way, potentially with the support of CSOs. In this way, the results of the evaluation can feed back into the strategy process.





Shaping the bioeconomy together

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